Convair Trimble Copy

T.O. 1F-106A-2-2

TECHNICAL MANUAL

MAINTENANCE

GROUND HANDLING, SERVICING, AND AIRFRAME GROUP MAINTENANCE

USAF SERIES

F-106A AND F-106B

AIRCRAFT

See T.O. 1F-106A-2-2C

CHANGE NOTICE

LATEST CHANGED PAGES SUPERSEDE THE SAME PAGES OF PREVIOUS DATE

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THIS CHANGE INCLUDES SUPPLEMENT T.O. 1F-106A-2-2D DATED 17 FEBRUARY 1960 AND ALL SUPPLEMENTS OF PRIOR DATES

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10 MAY 1960

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LIST OF EFFECTIVE PAGES

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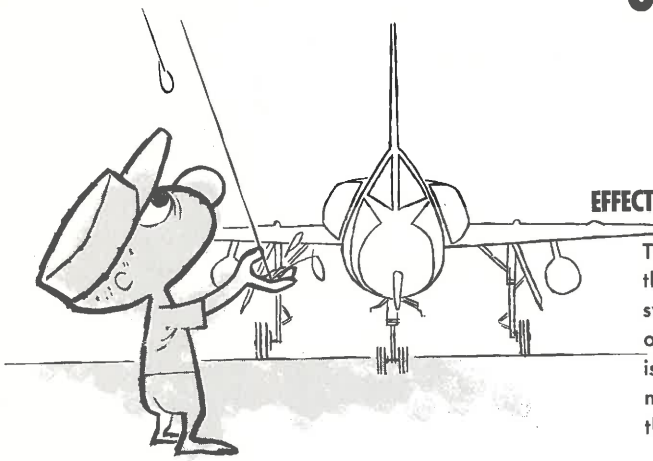
INTRODUCTION



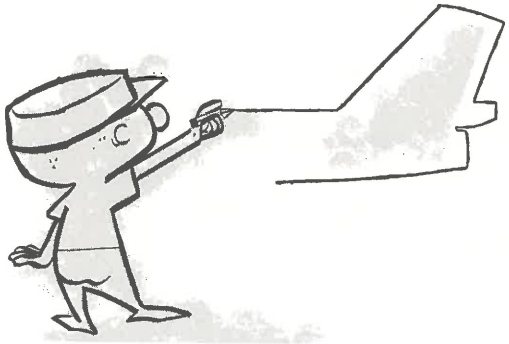
GROUND HANDLING, SERVICING AND AIRFRAME GROUP MAINTENANCE MANUAL

EFFECTIVITY

The information contained in this manual is applicable to the F-106A and F-106B. When the information on a particular system, component, or procedure is peculiar to a certain model or series, applicability to that model and the airplanes affected is specified. Some flight test aircraft are designated "JF-106A"; maintenance information for these airplanes is the same as that specified (with serial number limitations) for the F-106A.

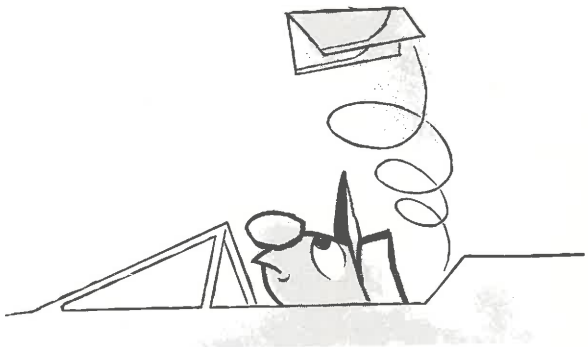
DESCRIPTION

This subsection contains an overall description of the complete system and includes the various normal and emergency function and description of each of the components in that system. The flow diagrams and schematics necessary for complete understanding of the systems, as well as the interconnections between other systems, are also provided in this section.



OPERATIONAL CHECKOUT

This subsection contains the step-by-step checkout of the system and components to assure that minimum requirements for the proper operation of the system are met.



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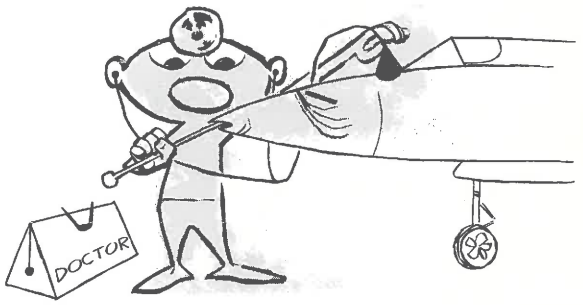
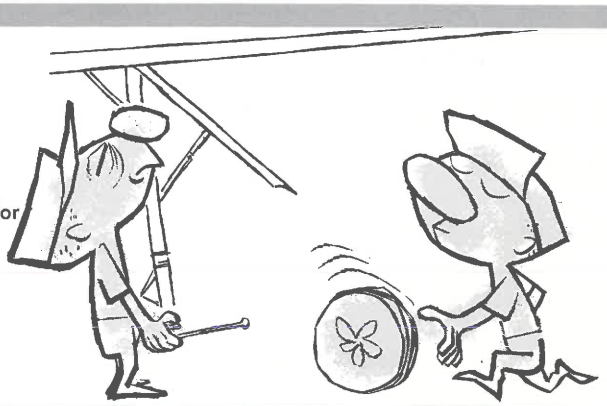
SYSTEM ANALYSIS

Contained under this heading is a list of troubles which could develop within the system or in one of its components. The trouble shooting chart lists the possible cause of the malfunction, indicates the isolation procedure to direct the mechanic as easily as possible to the trouble area, and prescribes the remedial maintenance action.



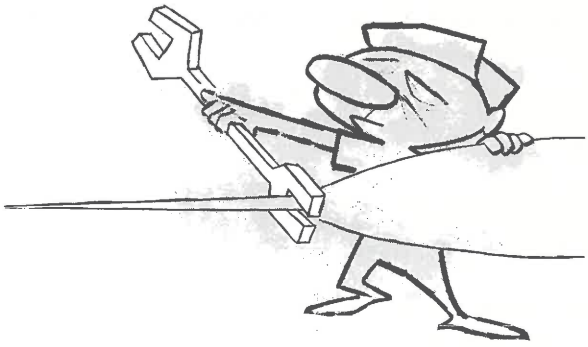
REPLACEMENT

This subsection contains detailed step-by-step procedures for removal and installation of system components.



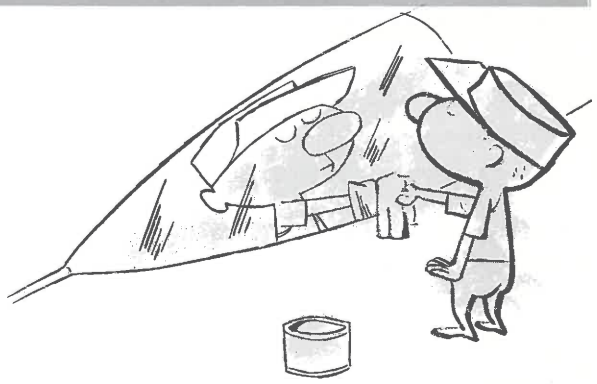
ADJUSTMENT

This subsection includes detailed step-by-step procedures for the adjustment of the complete system and the system components.



SERVICING

This subsection includes instructions for cleaning, draining, replenishing, and lubricating the system and components.



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LIST OF F-106A AND F-106B SYSTEMS MAINTENANCE MANUALS

T.O. 1F-106A-2-1 General Airplane

T.O. 1F-106A-2-2 Ground Handling, Servicing, And Airframe Group Maintenance

T.O. 1F-106A-2-3 Hydraulic and Pneumatic Power Systems

T.O. 1F-106A-2-4 Power Plant

T.O. 1F-106A-2-5 Fuel Supply System

T.O. 1F-106A-2-6 Air Conditioning, Anti-Icing, And Oxygen Systems

T.O. 1F-106A-2-7 Flight Control Systems

T.O. 1F-106A-2-8 Landing Gear

T.O. 1F-106A-2-9 Instrument Systems

T.O. 1F-106A-2-10 Electrical Systems

T.O. 1F-106A-2-11 Electronic Systems

T.O. 1F-106A-2-12 Armament Systems

T.O. 1F-106A-2-13 Wiring Diagrams, Airframe (F-106A)

T.O. 1F-106B-2-13 Wiring Diagrams, Airframe (F-106B)

T.O. 1F-106A-2-15 Aircraft and Weapon Control Interceptor Systems, Type MA-1 and Type AN/ASQ-25, Dock Instructions

T.O. 1F-106A-2-17 Aircraft and Weapon Control Interceptor System, Type MA-1, Wiring Diagrams (F-106A)

Serial Nos. 57-232 thru 57-238, 57-241 thru 57-245.

T.O. 1F-106B-2-17 Aircraft and Weapon Control Interceptor System, Type AN/ASQ-25, Wiring Diagrams (F-106B)

Serial Nos. 57-2508, 57-2510 Thru 57-2514.

T.O. 1F-106A-2-18 Aircraft and Weapon Control Interceptor System, Type MA-1, Wiring Diagrams (F-106A)

Serial Nos. 57-246, 57-2453 thru 57-2464.

T.O. 1F-106B-2-18 Aircraft and Weapon Control Interceptor System, Type AN/ASQ-25, Wiring Diagrams (F-106B)

Serial Nos. 57-2515 thru 57-2522.

T.O. 1F-106A-2-19 Aircraft and Weapon Control Interceptor System, Type MA-1, Wiring Diagrams (F-106A)

Serial Nos. 57-2466 thru 57-2506.

T.O. 1F-106B-2-19 Aircraft and Weapon Control Interceptor System, Type AN/ASQ-25, Wiring Diagrams (F-106B)

Serial Nos. 57-2524 thru 57-2531.

T.O. 1F-106A-2-20 Aircraft and Weapon Control Interceptor System, Type MA-1, Wiring Diagrams (F-106A)

Serial Nos. 57-2465, 58-759 and Subsequent.

T.O. 1F-106B-2-20 Aircraft and Weapon Control Interceptor System, Type AN/ASQ-25, Wiring Diagrams (F-106B)

Serial Nos. 57-2523, 57-2532 and Subsequent.

T.O. 1F-106A-2-22 (Formerly T.O. 1F-106A-2-16) Aircraft and Weapon Control Interceptor System, Type MA-1, Wiring Data (F-106A)

Serial Nos. 57-232 thru 57-238, 57-241 thru 57-245.

T.O. 1F-106B-2-22 (Formerly T.O. 1F-106B-2-16) Aircraft and Weapon Control Interceptor System, Type AN/ASQ-25, Wiring Data (F-106B)

Serial Nos. 57-2508, 57-2510 thru 57-2514.

T.O. 1F-106A-2-23 Aircraft and Weapon Control Interceptor System, Type MA-1, Wiring Data (F-106A)

Serial Nos. 57-246, 57-2453 thru 57-2464.

T.O. 1F-106B-2-23 Aircraft and Weapon Control Interceptor System, Type AN/ASQ-25, Wiring Data (F-106B)

Serial Nos. 57-2515 thru 57-2522.

T.O. 1F-106A-2-24 Aircraft and Weapon Control Interceptor System, Type MA-1, Wiring Data (F-106A)

Serial Nos. 57-2466 thru 57-2506.

T.O. 1F-106B-2-24 Aircraft and Weapon Control Interceptor System, Type AN/ASQ-25, Wiring Data (F-106B)

Serial Nos. 57-2524 thru 57-2531.

LIST OF F-106A AND F-106B SYSTEMS MAINTENANCE MANUALS (CONT)

T.O. 1F-106A-2-25 Aircraft and Weapon Control Interceptor System, Type MA-1, Wiring Data (F-106A)

Serial Nos. 57-2465, 58-759 and Subsequent.

T.O. 1F-106B-2-25 Aircraft and Weapon Control Interceptor System, Type AN/ASQ-25, Wiring Data (F-106B)

Serial Nos. 57-2523, 57-2532 and Subsequent.

T.O. 1F-106A-2-27 MA-1 AWCIS Pocketbook

Vol. I Flight Line Instructions

Vol. II Dock Instructions for Power, Radar and AAI Subsystems

Vol. III Dock Instructions for FC&M, Computer, CN&L Subsystems

SUPPLEMENTARY DATA

T.O. 1F-106A-01 List of Applicable Publications

T.O. 1F-106A-1 Flight Manual

T.O. 1F-106B-1 Flight Manual

T.O. 1F-106A-(CL)1-1 Pilot's Check List

T.O. 1F-106B-(CL)1-1 Pilots' Check List

T.O. 1F-106A-3 Structural Repair Manual

T.O. 1F-106A-4 Illustrated Parts Breakdown

T.O. 1F-106B-4 Illustrated Parts Breakdown

T.O. 1F-106A-5 Basic Weight Check List and Loading Data

T.O. 1F-106B-5 Basic Weight Check List and Loading Data

T.O. 1F-106A-6 Aircraft Scheduled Inspection and Maintenance Requirements

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T.O. 1F-106A-20 Product Improvement Digest

T.O. 1F-106A-21 Master Guide Aircraft Inventory Record

T.O. 1F-106A-29-1 Aircrew Weapon Delivery

Section I

GROUND HANDLING

Contents *Page*

GENERAL

1-1. GENERAL AIRPLANE.

The F-106A and F-106B airplane fuselages are divided into compartments and stations as illustrated in figure 1-1 and 1-2. Ground handling of the airplane will normally require the installation of special equipment, the use of which is discussed, for specific operations, in this section. Briefly, ground handling operations may be considered to be towing, parking, jacking, hoisting, securing the airplane, and engine ground operation.

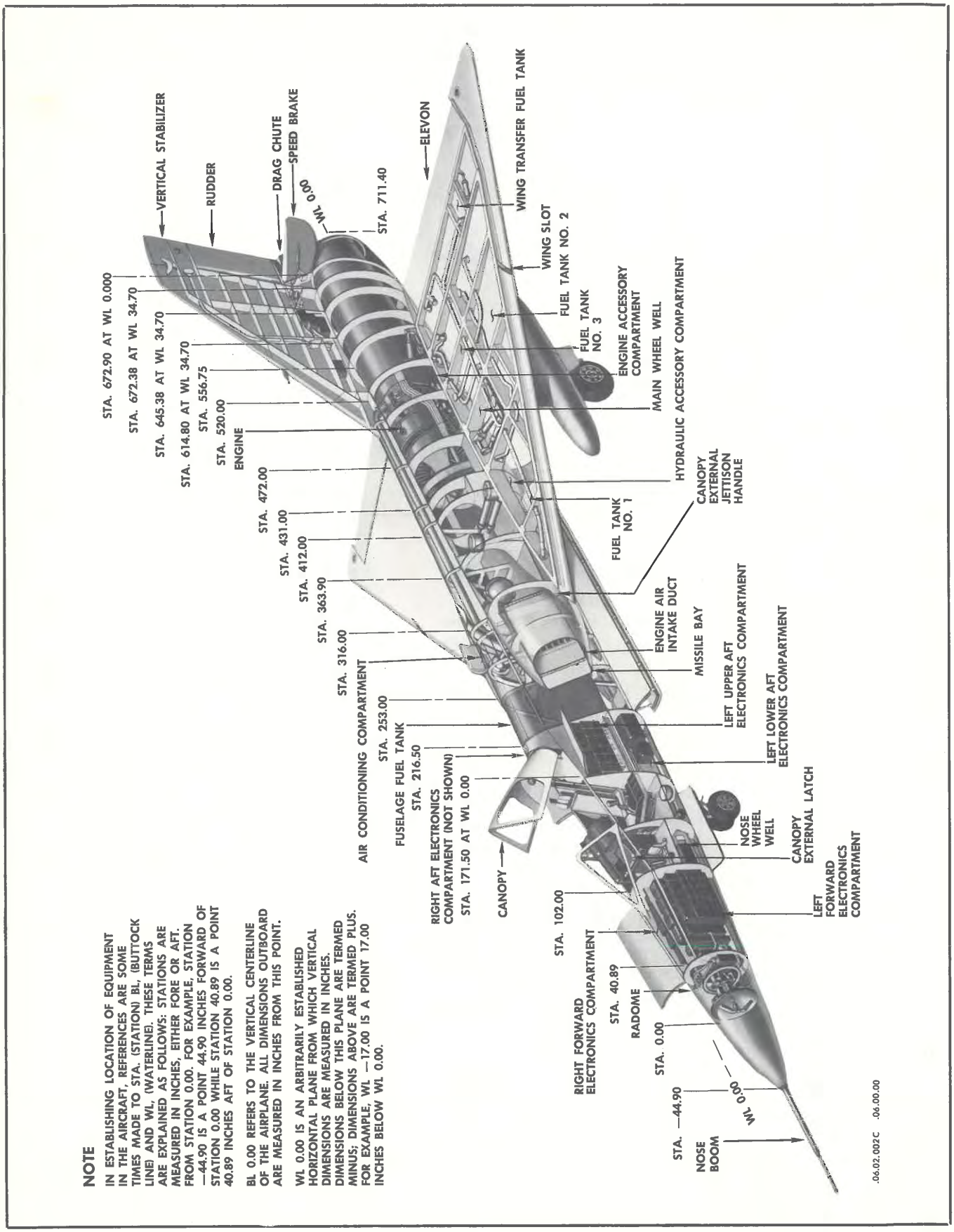


Figure 1-1. Airplane Stations and Compartments, F-106A

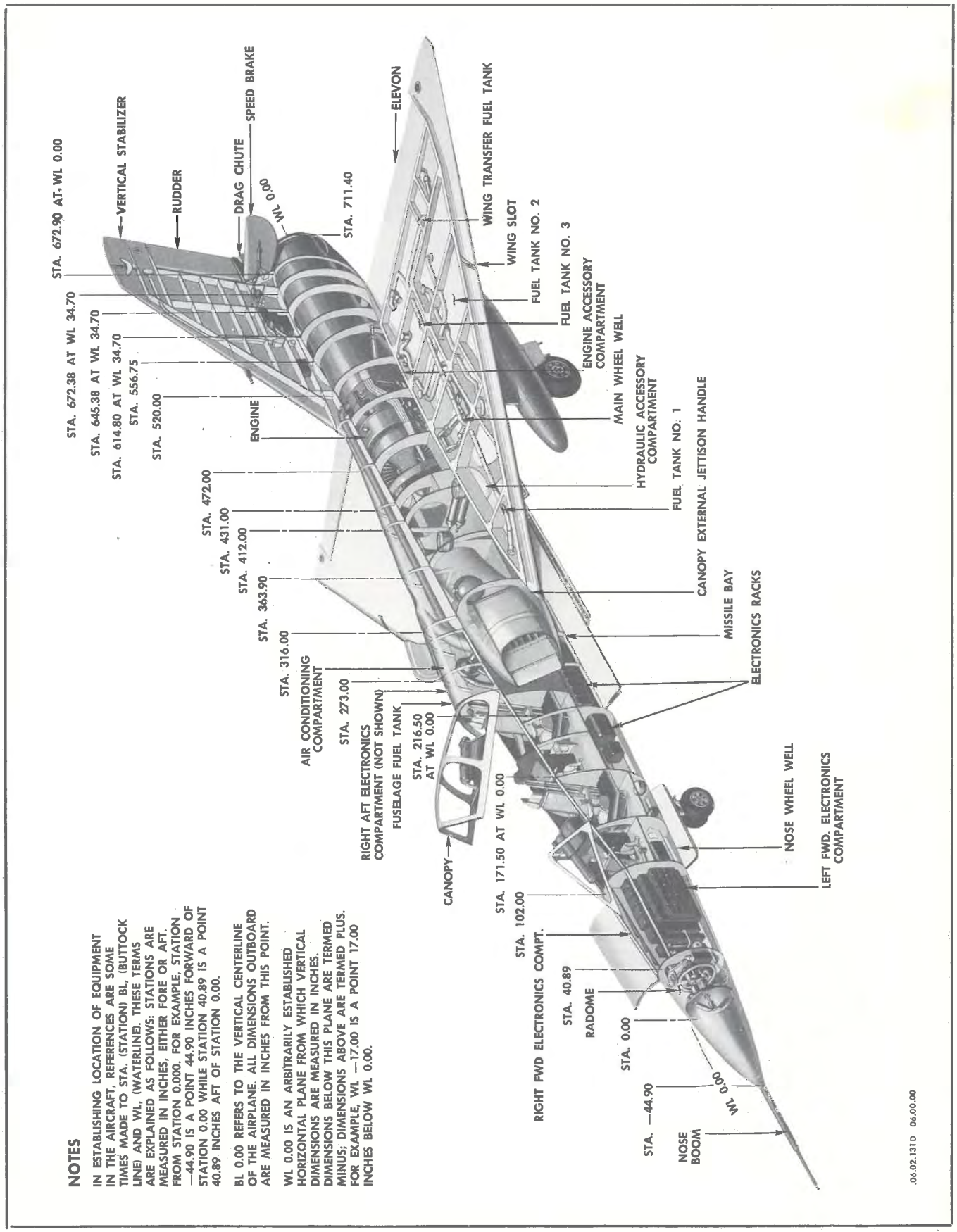
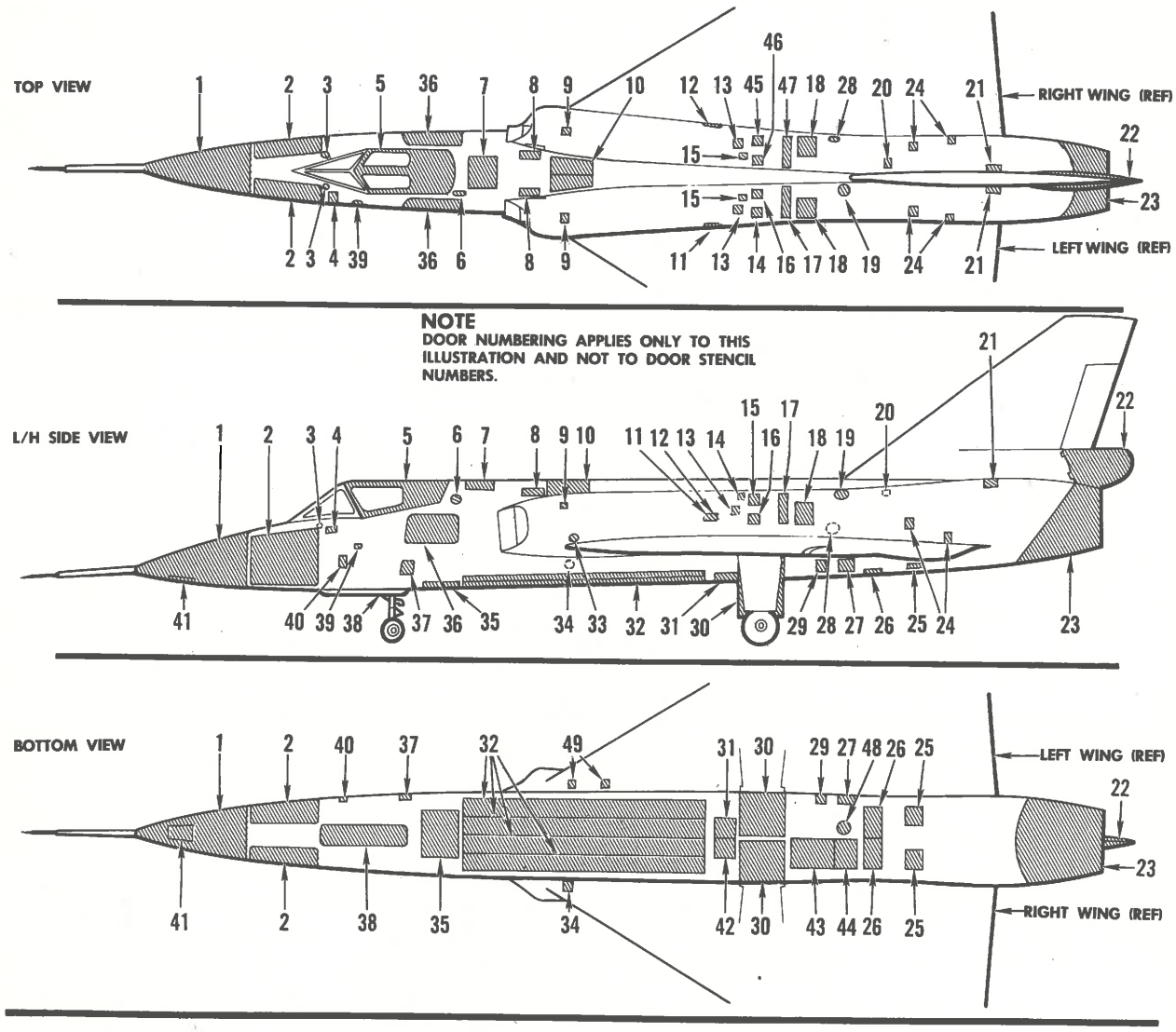


Figure 1-2. Airplane Stations and Compartments, F-106B



ACCESSIBLE EQUIPMENT

1. RADAR ANTENNA
2. FORWARD ELECTRONIC EQUIPMENT
3. BRAKE RESERVOIRS
4. EXTERNAL CANOPY CONTROL
5. COCKPIT FURNISHINGS
6. STRUCTURE ACCESS
7. FUEL TANK
8. FUEL LINES
9. VARIABLE RAMP PITOT-STATIC COMPONENTS
10. AIR CONDITIONING COMPONENTS, ANTI-ICING TANK, AND HIGH PRESSURE PNEUMATIC STORAGE FLASKS
11. MA-1 POWER TRANSFER RELAY BOX
12. PITCH AND YAW AMPLIFIER
13. STRUCTURE ACCESS
14. STRUCTURE ACCESS
15. ENGINE AIR-OIL COOLER VALVE
16. ENGINE AIR-OIL COOLER VALVE ACTUATOR
17. ENGINE AIR-OIL COOLER
18. FORWARD ENGINE MOUNT
19. ENGINE OIL TANK FILLER CAP
20. ENGINE BLEED AIR DUCT
21. AFT ENGINE MOUNT
22. SPEED BRAKE AND DRAG CHUTE MECHANISMS
23. ENGINE SHROUD AFT SUPPORT LINKS
24. ELEVON ACTUATOR
25. ELEVON VALVE
26. AFT ENGINE SECTION
27. HYDRAULIC PUMP
28. CONSTANT SPEED SYSTEM OIL TANK FILLER CAP
29. FIRE ACCESS DOOR
30. MAIN LANDING GEAR WHEEL WELL
31. RAM AIR TURBINE
32. ARMAMENT COMPONENTS
33. CANOPY EXTERNAL JETTISON HANDLE
34. REFUELING FITTING
35. LOWER AFT ELECTRONIC EQUIPMENT
36. UPPER AFT ELECTRONIC EQUIPMENT
37. EXTERNAL POWER RECEPTACLE
38. NOSE LANDING GEAR WHEEL WELL
39. ELEVON TORQUE TUBE
40. OXYGEN FILLER CONNECTION
41. NOSE BOOM CONNECTIONS
42. HYDRAULIC COMPONENTS
43. CONSTANT SPEED REMOTE GEARBOX
44. ENGINE ACCESSORIES
45. CONSTANT SPEED SYSTEM OIL COOLER VALVE ACTUATOR
46. CONSTANT SPEED SYSTEM OIL COOLER VALVE
47. CONSTANT SPEED SYSTEM OIL COOLER
48. PNEUMATIC STARTER CONNECTION
49. GROUND COOLING OR HEATING CONNECTIONS

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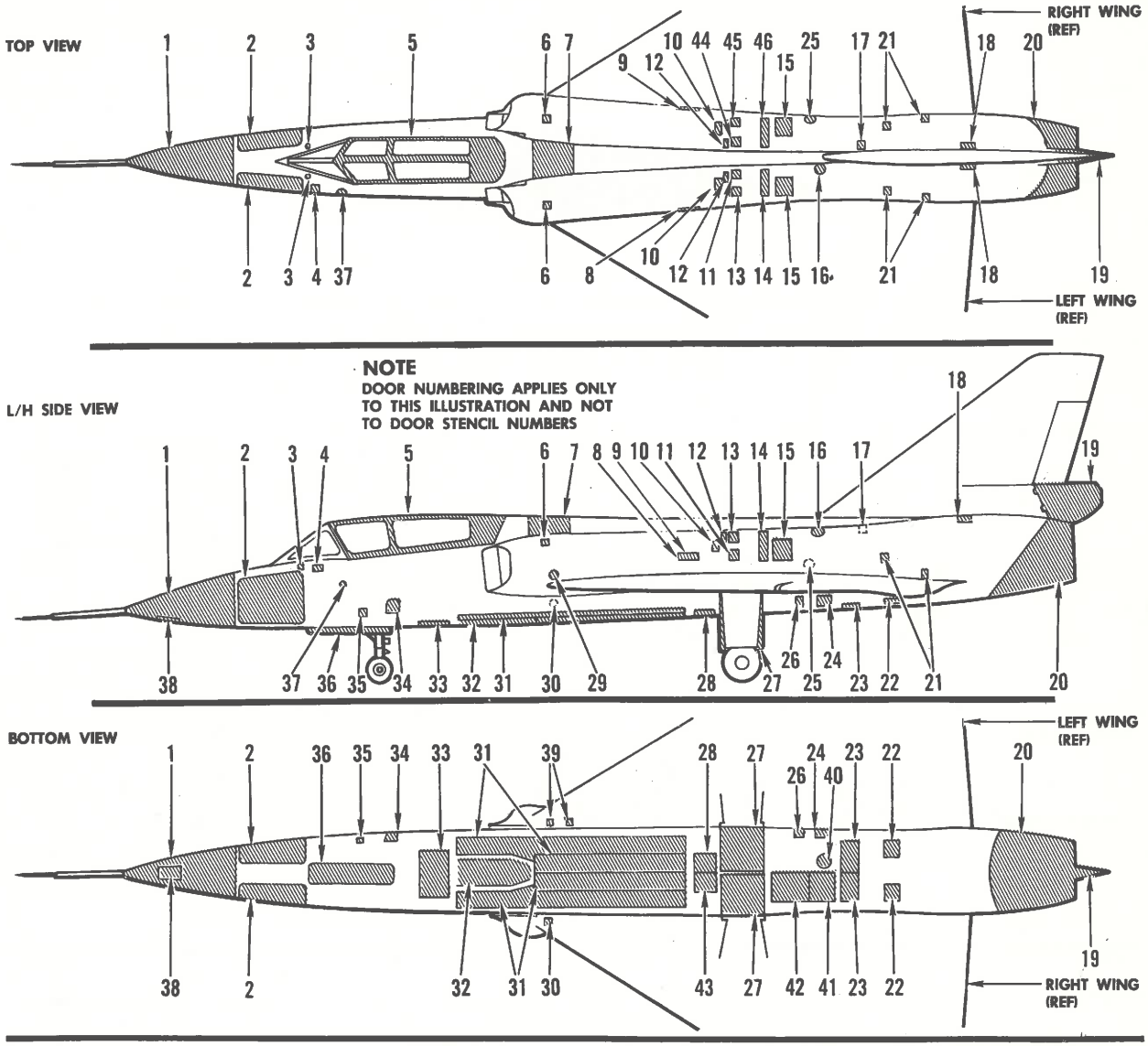
Figure 1-3. Access and Inspection Provisions, F-106A Fuselage



ACCESSIBLE EQUIPMENT

1. RADAR ANTENNA
2. FORWARD ELECTRONIC EQUIPMENT
3. BRAKE RESERVOIRS
4. EXTERNAL CANOPY CONTROL
5. COCKPIT FURNISHINGS
6. VARIABLE RAMP PITOT-STATIC COMPONENTS
7. UPPER AFT ELECTRONIC EQUIPMENT, AIR CONDITIONING COMPONENTS, ANTI-ICING TANK, AND HIGH PRESSURE. PNEUMATIC STORAGE FLASKS.
8. AN/ASQ-25 POWER TRANSFER RELAY BOX
9. PITCH AND YAW AMPLIFIER
10. STRUCTURE ACCESS
11. ENGINE AIR-OIL COOLER VALVE ACTUATOR
12. STRUCTURE ACCESS
13. ENGINE AIR-OIL COOLER VALVE
14. ENGINE AIR-OIL COOLER
15. FORWARD ENGINE MOUNT
16. ENGINE OIL TANK FILLER CAP
17. ENGINE BLEED AIR DUCT
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26. FIRE ACCESS DOOR
27. MAIN LANDING GEAR WHEEL WELL
28. RAM AIR TURBINE
29. CANOPY EXTERNAL JETTISON HANDLE
30. REFUELING FITTING
31. ARMAMENT COMPONENTS
32. LOWER AFT ELECTRONIC EQUIPMENT
33. LOWER MID ELECTRONIC EQUIPMENT
34. EXTERNAL POWER RECEPTACLE
35. OXYGEN FILLER CONNECTION
36. NOSE LANDING GEAR WHEEL WELL
37. ELEVON TORQUE TUBE
38. NOSE BOOM CONNECTIONS
39. GROUND COOLING OR HEATING CONNECTIONS
40. PNEUMATIC STARTER CONNECTION
41. ENGINE ACCESSORIES
42. CONSTANT SPEED REMOTE GEARBOX
43. HYDRAULIC COMPONENTS
44. CONSTANT SPEED SYSTEM OIL COOLER VALVE ACTUATOR
45. CONSTANT SPEED SYSTEM OIL COOLER VALVE
46. CONSTANT SPEED SYSTEM OIL COOLER

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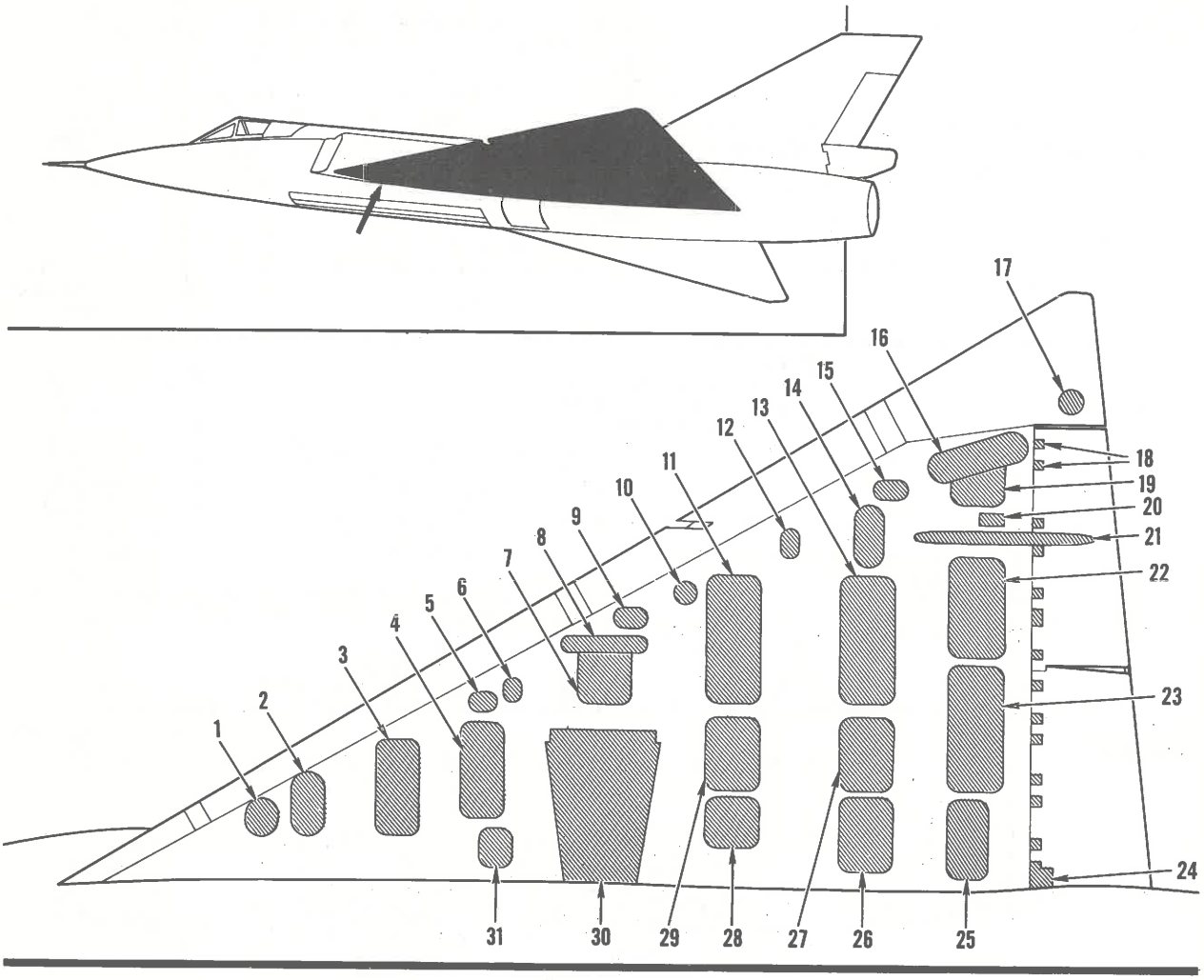
Figure 1-4. Access and Inspection Provisions, F-106B Fuselage



1. FUEL SYSTEM VALVES.
2. FUEL SYSTEM VALVES.
3. FUEL QUANTITY PROBES AND FUEL SYSTEM VALVES.
4. FUEL SYSTEM VALVES.
5. FUEL SYSTEM TUBING.
6. FUEL SYSTEM VALVES.
7. BOOST PUMP LOW PRESSURE SWITCH, FUEL TANK LOW PRESSURE SWITCH, EXTERNAL TANK AIR SHUTOFF VALVE, EXTERNAL TANK COMBINATION PRESSURE, VACUUM, VENT RELIEF AND DUMP VALVE.
8. STRUCTURE ACCESS.
9. FUEL SYSTEM TUBING.
10. STRUCTURE ACCESS.
11. FUEL QUANTITY PROBES AND FUEL SYSTEM VALVES.
12. STRUCTURE ACCESS.
13. FUEL QUANTITY PROBES AND FUEL SYSTEM VALVES.
14. FUEL SYSTEM VALVES.
15. STRUCTURE ACCESS.
16. STRUCTURE ACCESS.
17. POSITION LIGHT.
18. ELEVON HINGES (TYPICAL 7 PLACES).
19. STRUCTURE ACCESS AND HYDRAULIC TUBING.
20. ELEVON ACTUATOR BOLT.
21. ELEVON ACTUATOR.
22. FUEL QUANTITY PROBE AND FUEL SYSTEM VALVES.
23. FUEL QUANTITY PROBE AND FUEL SYSTEM VALVES.
24. ELEVON FITTING.
25. FUEL SYSTEM VALVES.
26. AFT BOOST PUMP, "T" DUAL CHECK VALVE, FUEL QUANTITY PROBES AND FUEL COMPENSATOR.
27. FUEL SYSTEM VALVES.
28. FUEL QUANTITY PROBE AND FUEL SYSTEM VALVES.
29. FORWARD BOOST PUMP AND FUEL SYSTEM VALVES.
30. MAIN WHEEL WELL.
31. FUEL QUANTITY PROBE.

NOTES

1. DOOR NUMBERING APPLIES ONLY TO THIS ILLUSTRATION AND NOT TO DOOR STENCIL NUMBERS.
2. REFER TO T.O. 1F-106A-2-5 AND TO DOOR STENCILS FOR SPECIFIC FUEL SYSTEM COMPONENTS ACCESSIBLE THROUGH ACCESS DOOR OPENINGS.

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Figure 1-5. Access and Inspection Provisions, Wing

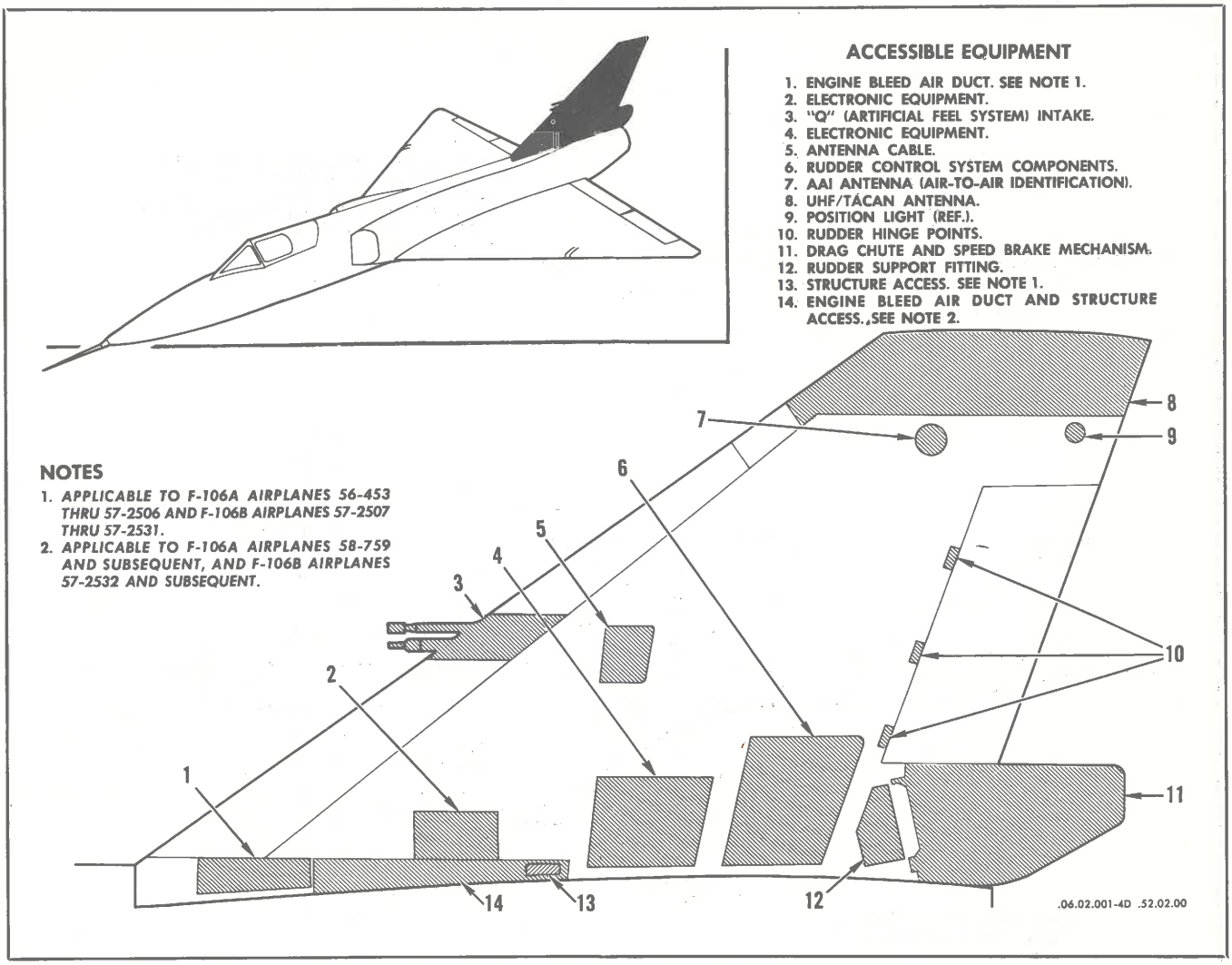

Figure 1-6. Access and Inspection Provisions, Fin

1-2. ACCESS AND INSPECTION PROVISIONS.

Access and inspection doors, provided throughout the airplane, are shown on figures 1-3, 1-4, 1-5, and 1-6. Information as to the equipment which may be reached through each door is included in the key list. Fuel tank access doors, located on the wing lower surface, are installed with special screws and fuel-tight Fairprene gaskets. The length and size of these special screws, and the location of each, is stenciled on the doors. The fuselage doors in the pressurized areas are installed with gaskets, which are formed with a special pressure and watertight sealant. Some equipment may be reached through open wheel wells, and additional equipment becomes accessible by removing the radome and the tail cone.

1-3. PRINCIPAL DIMENSIONS AND TURNING RADIUS.

Figures 1-7 and 1-8 provide overall dimensions and turning radius information for both the F-106A and the F-106B airplanes.

1-4. HAND SIGNALS.

A system of hand signals covering operations and movement of the airplane on the ground is illustrated in figure 1-9.

1-5. DANGER AREAS AND GROUND SAFETY PROVISIONS.

1-6. Engine Start and Operation.

The areas around engine air intake ducts can be dangerous to ground personnel during engine operation, due to inrushing air. The areas aft of the engine tail pipe and adjacent to the starter exhaust duct outlet are dangerous because of the high temperature and velocity of exhaust gases. These danger areas are illustrated in figure 1-10. The tail pipe area remains dangerous for at least 15 minutes after engine shutdown and particularly when smoke or vapors are apparent.

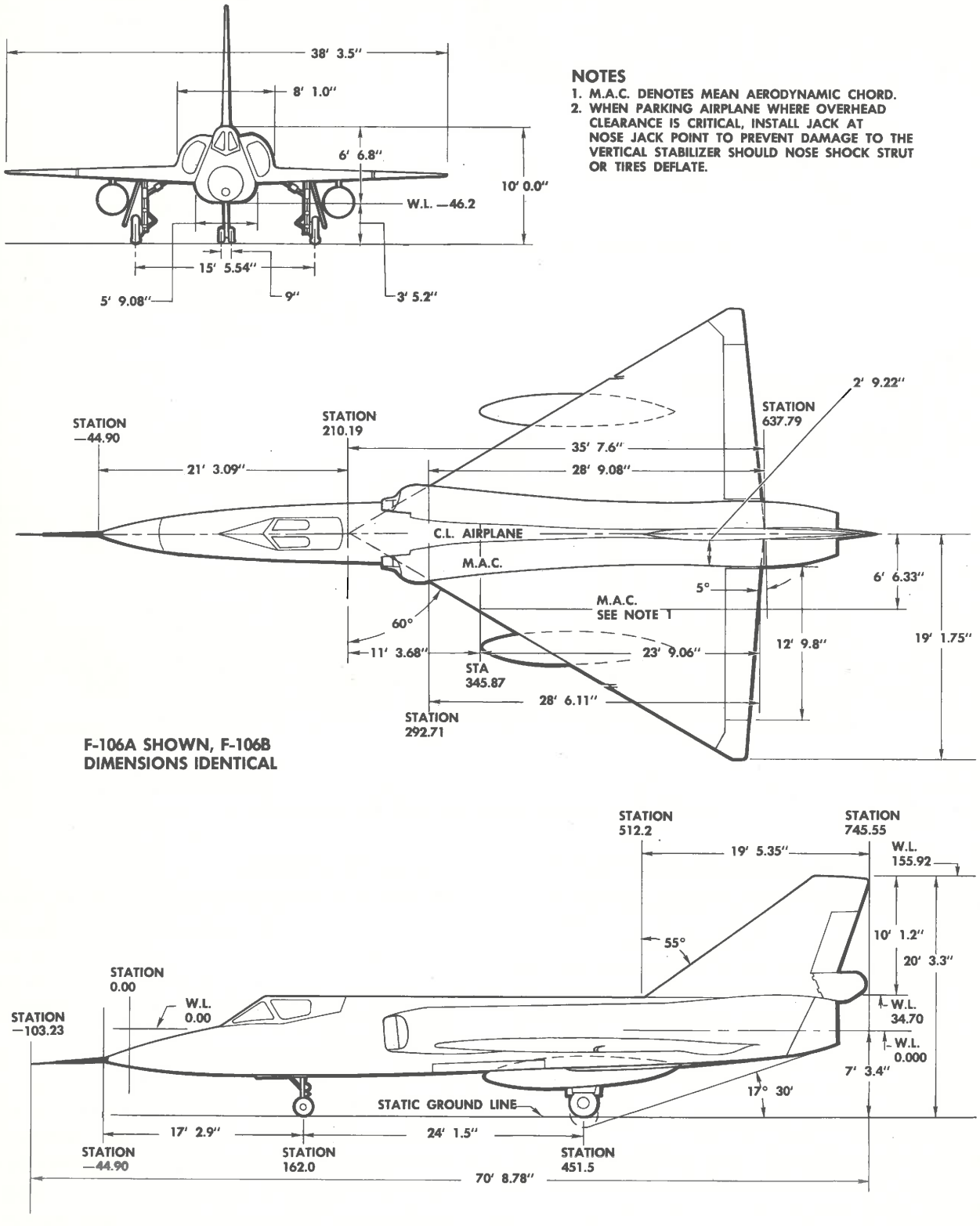

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Figure 1-7. Airplane Principal Dimensions

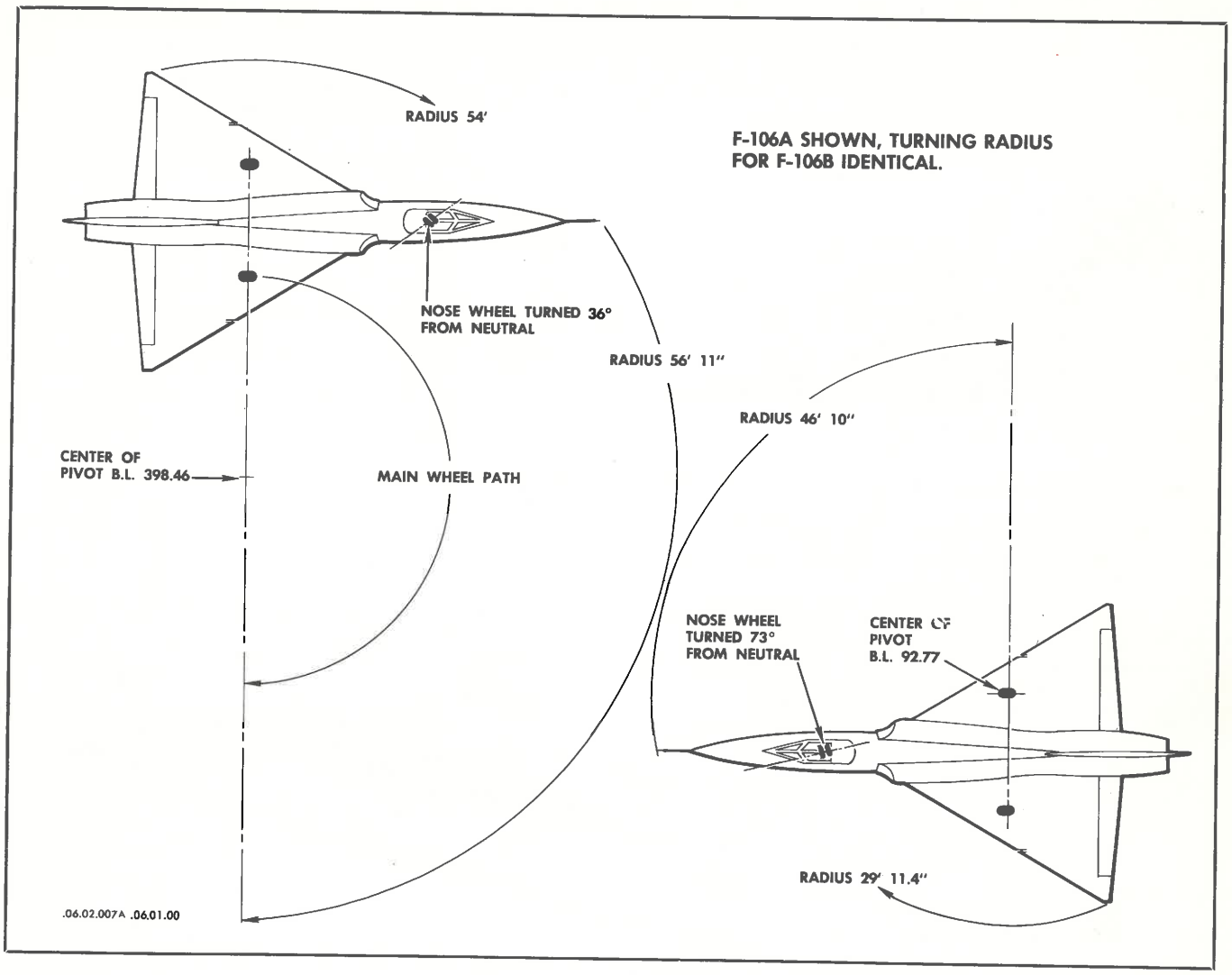


Figure 1-8. Turning Radii

1-7. Radiated Radio-Frequency Energy.

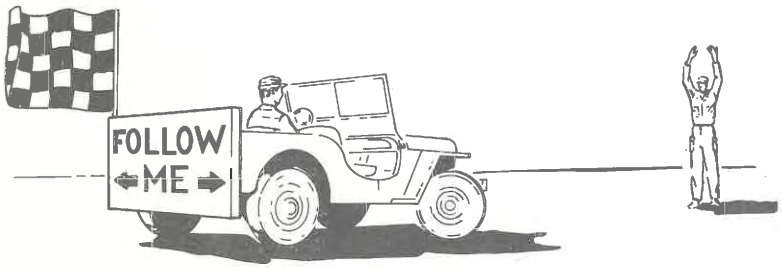
Exposure to radiated energy from radio-frequency components in this airplane can be hazardous to the health of personnel. In addition, the radiation of airborne-radar microwave energy can cause serious damage to equipment and facilities through fire or explosion. Refer to T.O. 31-1-511 for pertinent safety information on these hazards.

1-8. Canopy Jettison and Seat Ejection Safety Pins.

The ballistically-operated canopy and seat ejection system must be safetied at all times when the airplane is on the ground. The pilot's ground safety pin is stowed on the right-hand console of the airplane. When the pilot inserts the ground safety pin in the seat, the cockpit portion of the system is immobilized. If maintenance work is to be performed within the cockpit, additional safety pins must be installed to completely immobilize the system. Specific instructions as to when these safety pins shall be installed are given in figures 8-42 and 8-43 for airplanes equipped with upward ejection seats, and in figures 8-52 and 8-53 for airplanes equipped with rotational upward ejection seats.

1-9. External Fuel Tanks.

The ballistically-operated external tank jettison system is triggered by electrical power. The electrical impulse fires two cartridges, the burning gases from the cartridges forces the ejector piston and lifter block upward, the tank pylon attachment hooks are released, and the pylon and tank are jettisoned. When power is on the airplane, the electrical circuit to the wing tank release (tank jettison) switch in the cockpit is energized. Ground safety pin, 8-96168, must be installed immediately after the airplane is parked to prevent inadvertent operation of the system. To install the ground safety pin proceed as follows:

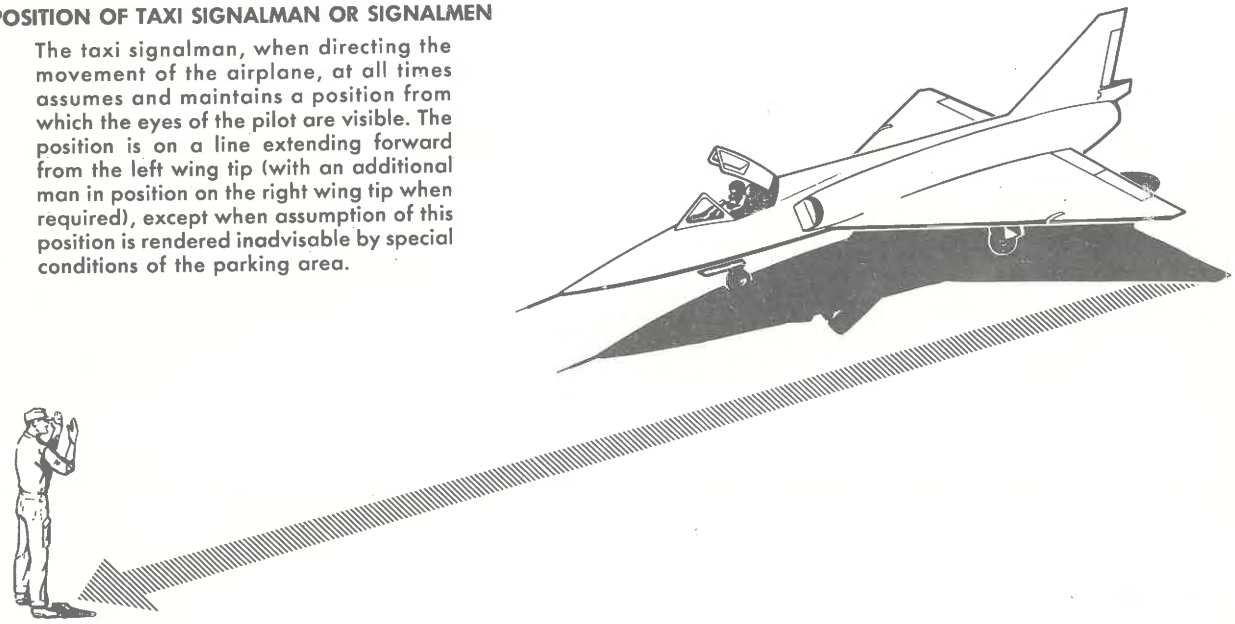


THE FLAGMAN, "FOLLOW-ME" JEEP, AND TAXI SIGNALMAN

When required by the volume or nature of traffic, a flagman or "follow-me" jeep is stationed on the landing field at a position far enough from the parking area to be clearly visible to the pilot of the approaching airplane. By use of a distinguishing flag of black and white checks, the flagman directs the pilot to the taxi signalman, or the "follow-me" jeep leads the pilot along a desired taxi path to the signalman. The signalman indicates that he is ready to assume guidance of the airplane by extending both arms perpendicularly at full length above his head, palms facing each other.

POSITION OF TAXI SIGNALMAN OR SIGNALMEN

The taxi signalman, when directing the movement of the airplane, at all times assumes and maintains a position from which the eyes of the pilot are visible. The position is on a line extending forward from the left wing tip (with an additional man in position on the right wing tip when required), except when assumption of this position is rendered inadvisable by special conditions of the parking area.



"COME-AHEAD" SIGNAL

The taxi signalman directs the pilot to taxi forward by raising both hands before him to eye level, with elbows flexed and palms turned toward face, and executing beckoning motions. The rapidity of the hand motions indicates the speed desired of the airplane.

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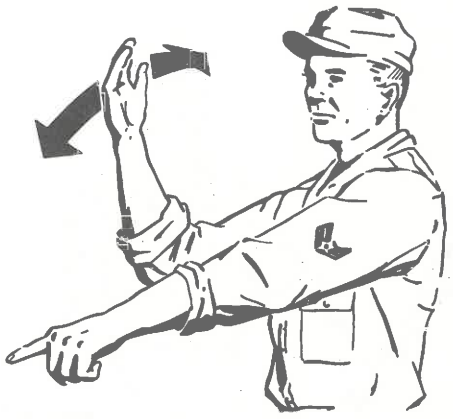
Figure 1-9. Hand Signals Governing Ground Operations of Aircraft (Sheet 1 of 6)

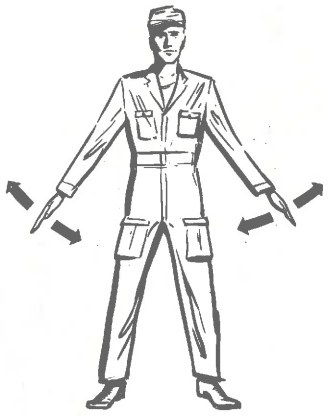
"LEFT-TURN" SIGNAL

To direct the pilot to turn left, the taxi signalman executes the "come-ahead" signal with his left hand and at the same time points with his right hand to the wheel that is to be braked (left wheel of airplane).



"RIGHT-TURN" SIGNAL

To direct the pilot to turn right, the taxi signalman executes the "come-ahead" signal with his right hand and at the same time points with his left hand to the wheel that is to be braked (right wheel of airplane).



"SLOW DOWN" SIGNAL

Arms down with palms toward ground, move up and down.

"STOP" SIGNAL

Arms repeatedly crossed above head; rapidity of arm movement to be related to the urgency of stop, that is, the faster the movement the quicker the stop.

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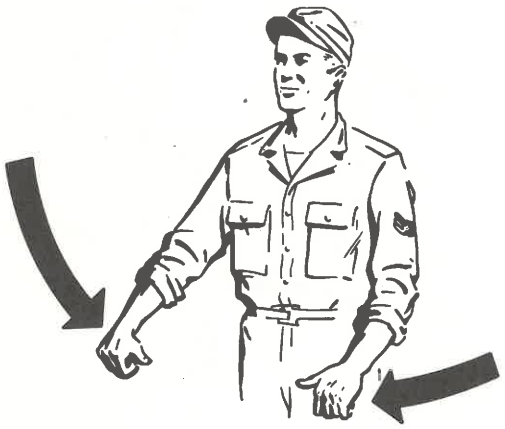
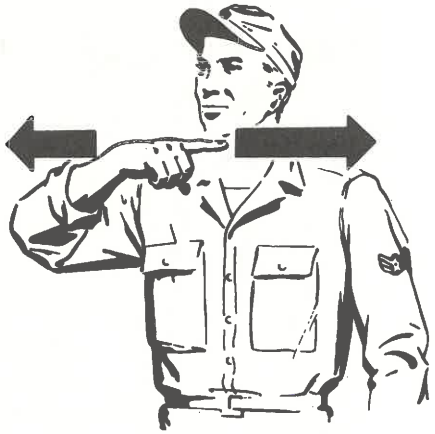
Figure 1-9. Hand Signals Governing Ground Operations of Aircraft (Sheet 2 of 6)

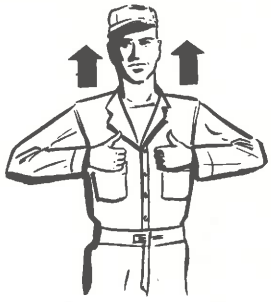


"INSERT-CHOCKS" SIGNAL
To direct the insertion of chocks, the taxi signalman sweeps his fists together at hip level with thumbs extended and pointing inward.

CONNECT EXTERNAL POWER UNIT
To indicate connection of the external power unit, the ground crewman will partially clench left fist and insert the extended index and first finger of the right hand into the circle made by the fingers of the left hand.



"CUT-ENGINE" SIGNAL
To direct the pilot to cut the engine, the taxi signalman draws the extended fore-finger of one hand across his neck in a "throat-cutting motion."



FIRE IN TAILPIPE. TURN ENGINE OVER WITH STARTER. (IGNITION DISARMED.)
With the thumbs of both hands extended up, make a gesture pointing upward. As soon as the signal is observed, use circular motion with right hand and arm extended over the head.

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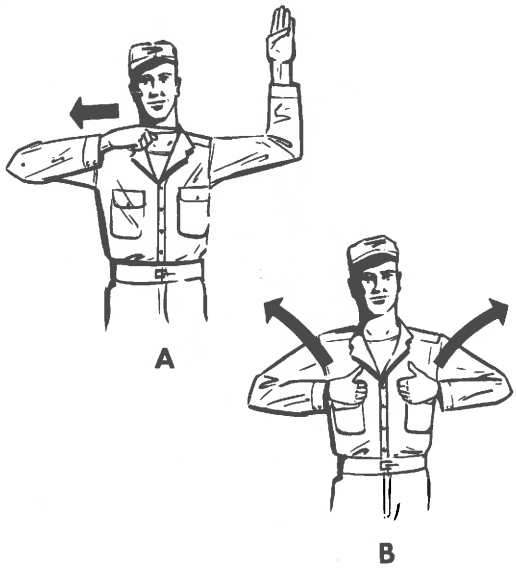
Figure 1-9. Hand Signals Governing Ground Operations of Aircraft (Sheet 3 of 6)

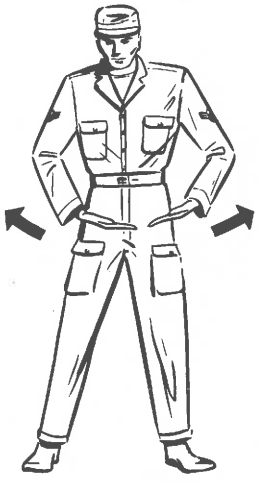


FIRE IN COMPRESSOR SECTION. SHUT DOWN ENGINE AND EVACUATE THE AIRCRAFT.

Draw right forefinger across throat. As soon as the signal is observed, extend both thumbs upward, then out.

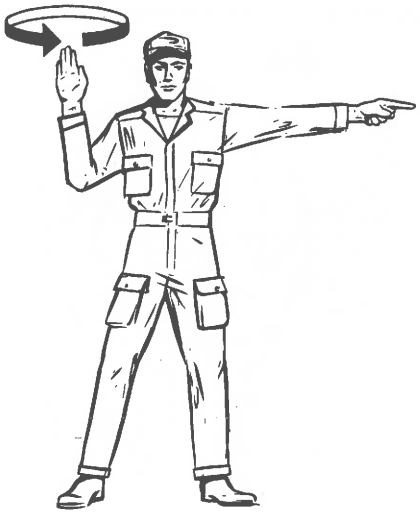
EXTEND RAM AIR TURBINE

Extend fingers of both hands and form "T" at chest level with left hand horizontal and tips of right fingers against left palm.



"OPEN MISSILE BAY DOORS" SIGNAL

The hands will be held with fingertips touching in front of the body, then swung down and outwards.



"START-ENGINE" SIGNAL

Before starting the engine, the pilot indicates to the taxi signalman, verbally, "Ready to start engine." The taxi signalman responds by rotating his right hand in a circling motion at head level with left arm pointing to engine.

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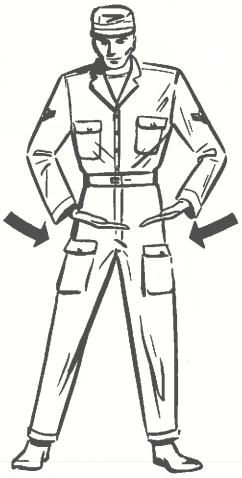
Figure 1-9. Hand Signals Governing Ground Operations of Aircraft (Sheet 4 of 6)



"CLOSE MISSILE BAY DOORS" SIGNAL

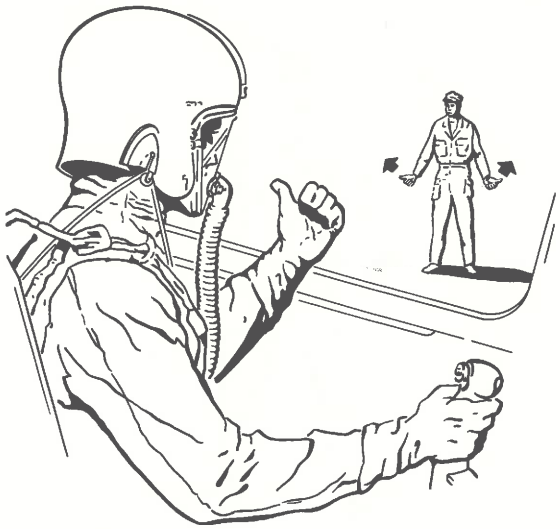
The arms will be extended, then swung downward and in until the fingertips touch in front of the body with elbows bent at approximately 45 degrees.

CHECK SPEEDBRAKES (OPEN OR CLOSE)

Hold the palms of both hands together, with the fingers extended. Using the heels of the palms as a hinge, open and close the hands several times in a flapping motion.

WITHDRAW EXTERNAL POWER UNIT

The withdrawal of the right hand from the left hand will indicate disconnection of the external power unit.



"PULL-CHOCKS" SIGNAL

To direct the pulling of chocks, the pilot checks the toe brakes to insure that the brakes are on, and then signals for chock removal by an outward sweeping motion of his fist, with the thumb extended and pointing outward. The taxi signalman acknowledges the signal with a sweep of his fists away from each other at hip level, with thumbs extending and pointing outward.

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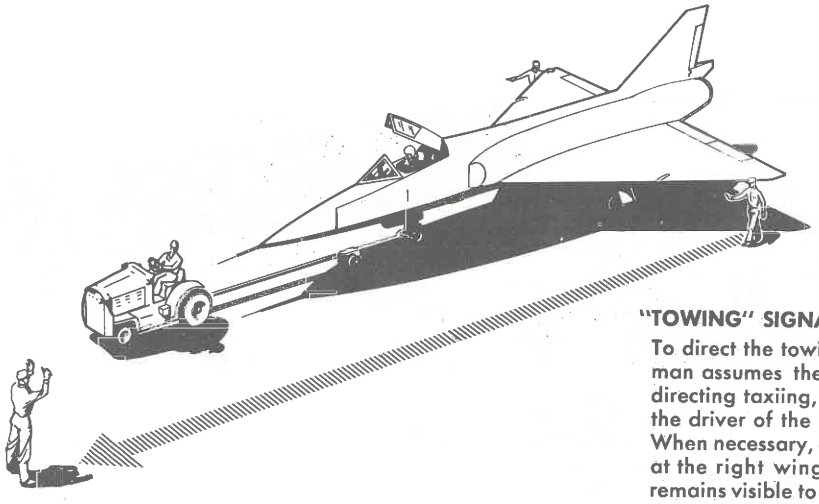
Figure 1-9. Hand Signals Governing Ground Operations of Aircraft (Sheet 5 of 6)

"ALL-CLEAR-TO-TAXI" SIGNAL

The "all-clear-to-taxi" signal is initiated by the pilot to indicate his desire to begin taxiing and is made by touching the tip of the index finger with the tip of thumb and the remaining fingers extended. The taxi signalman will respond with a similar gesture if all is clear to taxi.



"TOWING" SIGNAL

To direct the towing of an airplane, the taxi signalman assumes the same position as prescribed for directing taxiing, keeping the eyes of the pilot and the driver of the towing vehicle at all times visible. When necessary, an additional crewman is stationed at the right wing tip. This crewman at all times remains visible to the taxi signalman to whom he will direct all necessary signals.

NIGHT OPERATIONS

Where field illumination permits, the taxi signalman, during hours of darkness, stations himself in a lighted area and executes the signals as prescribed. In the absence of a suitable lighted area, the signals are executed by employing suitable illuminated wands (or flashlight if the wands are not obtainable), one to be held in each hand of the signalman. Signals used when employing wands or flashlights are identical to those used during daylight hours. Care must be exercised throughout to avoid flashing light in the eyes of the pilot.

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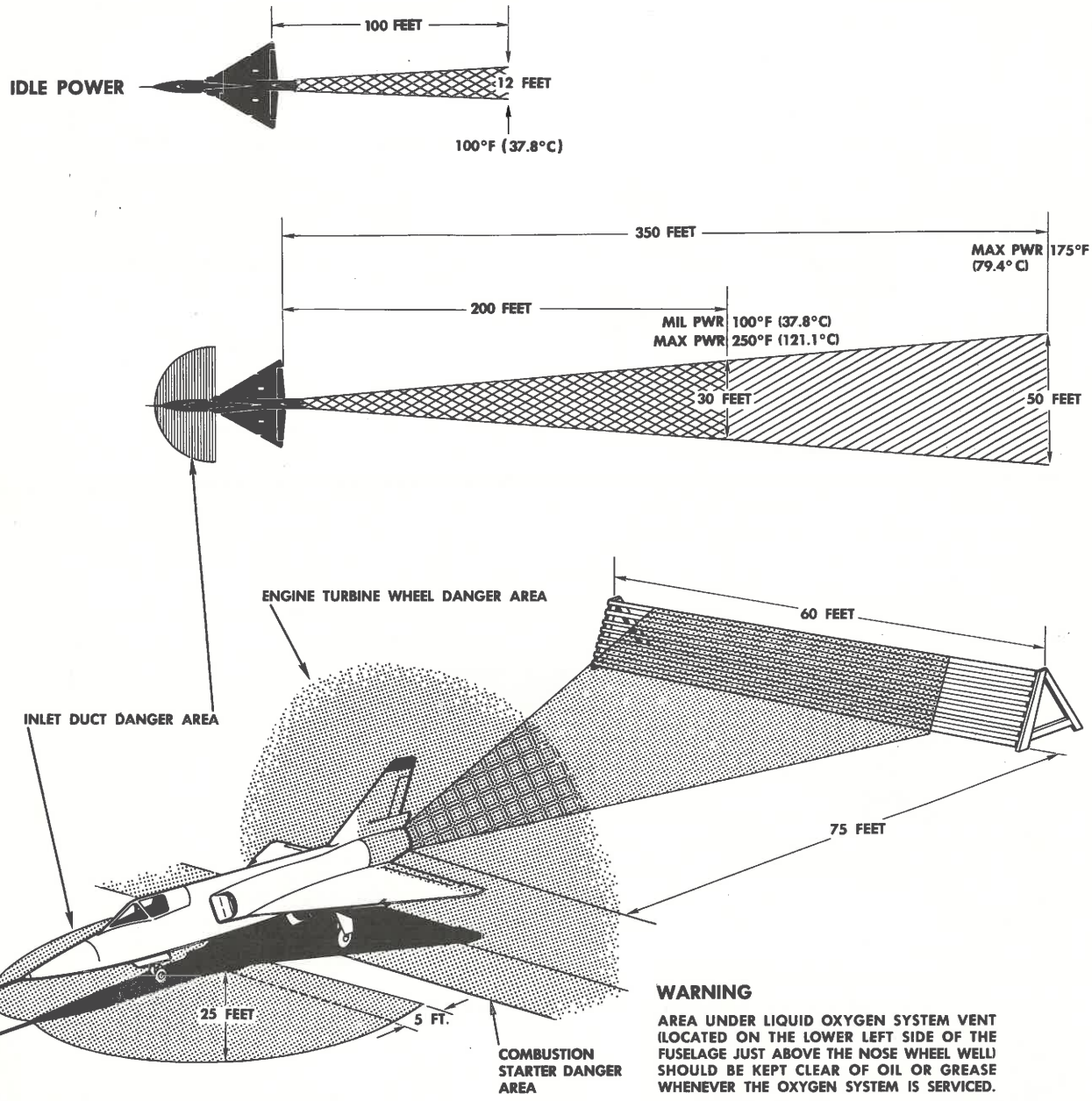
Figure 1-9. Hand Signals Governing Ground Operations of Aircraft (Sheet 6 of 6)



NOTE

IF BLAST DEFLECTOR IS NOT AVAILABLE, AREA MUST BE CLEAR AT LEAST 350 FEET BEHIND THE AIRPLANE.

WARNING

AREA UNDER LIQUID OXYGEN SYSTEM VENT (LOCATED ON THE LOWER LEFT SIDE OF THE FUSELAGE JUST ABOVE THE NOSE WHEEL WELL) SHOULD BE KEPT CLEAR OF OIL OR GREASE WHENEVER THE OXYGEN SYSTEM IS SERVICED.

ENGINE VARIABLE INLET RAMP EMERGENCY OPERATION WILL EJECT HYDRAULIC FLUID WITH CONSIDERABLE FORCE FROM AN OVERBOARD DRAIN LINE LOCATED UNDER THE LEFT HAND ENGINE INTAKE DUCT.

THE ENGINE BLEED AIR DISCHARGE DUCTS (LOCATED ON THE LEFT AND RIGHT FUSELAGE SIDES ABOVE THE WINGS) DISCHARGE HOT AIR DURING ENGINE OPERATION.

WHEN STARTING COMBUSTION STARTER EQUIPPED AIRPLANES, KEEP CLEAR OF AREA 10 FEET FORWARD AND AFT OF MAIN LANDING GEAR UNTIL START HAS BEEN COMPLETED.

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Figure 1-10. Danger Areas

a. Insert pin from right hand side (looking forward) through the holes in the cylinder, ejector piston, and lifter block until the pin extends through the left side of tank pylon fairing.

b. Install small safety pin in that part of the large safety pin extending from the left side of pylon fairing.

1-10. Missile Bay Door Safety Locks.

The missile bay doors are operated by the high-pressure pneumatic system and are very fast acting. When work is to be performed in the missile bays or adjacent to the doors, install the manual door control valve lock pin and then install the door actuating cylinder safety locks. See figure 1-11 for an illustration of ground safety lock installation. When it is necessary to operate these doors, make sure that all personnel and equipment are clear of the area.

1-11. Missile Launcher Safety Locks.

The forward and aft missile launchers are operated by high-pressure air. Extension or retraction of the missile launchers is rapid and can cause serious injury to personnel if the system is inadvertently actuated. Safety locks are provided to lock the missile launchers in the extended position. Whenever work is to be performed within or adjacent to the missile bays, the applicable missile launchers safety locks must be installed as shown in figure 1-12 or 1-13.

1-12. Landing Gear Ground Lock Safety Pins.

While the airplane is on the ground, the nose and main gear ground lock safety pins must be installed to prevent inadvertent retraction of the landing gear. These safety pins, which have red warning streamers attached, are inserted in holes at knee latch assemblies on the nose and main gear drag braces, as shown on figure 1-14. A lock pin is also provided to lock the nose steering unit when the nose wheel is being jacked. All lock pins must be removed prior to releasing the airplane for flight. Stowage is provided for these lock pins in a canvas bag located in the main gear wheel well.

1-13. Tail Hook Ground Safety Pin.

When the airplane is parked and the tail hook is retracted, the tail hook safety pin, 8-96514, must be installed to prevent inadvertent extension of the tail hook. See figure 1-15 for an illustration showing the installation of this safety pin.

WARNING

When it is necessary to extend the tail hook, make sure that personnel are clear of the area since once the hook is unlatched, extension is extremely rapid and forceful.

The safety pin must be removed just prior to flight and stowed in the canvas bag provided for the landing gear ground lock safety pins.

1-14. Canopy Hold-Open Support Assembly.

When the airplane is parked and the canopy is open, the 8-96038-801, (for 106A airplanes) or 8-96137, (for 106B airplanes) canopy hold-open support assembly must be installed to prevent inadvertent closing of the canopy.

WARNING

Malfunctioning of the canopy actuating system could cause rapid closing of the canopy resulting in serious injury to personnel and/or damage to aircraft structure.

1-15. Surface Controls.

The surface controls are actuated by hydraulic power, and can cause injury to personnel if they are struck by these moving surfaces. Whenever hydraulic power is on the airplane and it is necessary to work adjacent to the rudder or elevons, post a man at the cockpit to prevent inadvertent operation of the controls. When it is necessary to operate these units, make sure that all personnel and equipment are clear of the area.

1-16. Speed Brake Doors Safety Locks.

The speed brake doors are actuated by hydraulic power and can cause injury to personnel if they are struck by these fast moving doors. Whenever it is necessary to work in the area of the speed brakes, be sure that ground safety locks are installed on the door actuators as shown in figure 1-15. When it is necessary to operate these doors, make sure that all personnel and equipment are clear of the area.

1-17. Ram Air Turbine.

The ram air turbine assembly is extended by high-pressure air. When it is necessary to extend this assembly, make sure that personnel and equipment are clear of the area.

1-18. TOWING PROVISIONS.

The airplane may be towed from either the nose or main gears. Tow bar, SE 0932, is attached to lugs incorporated in the nose wheel axle for towing of the airplane on smooth, hard surfaces.

CAUTION

To prevent structural damage, the following overhead doors in the missile bay must be installed and secured before towing or taxiing the airplane. *Applicable to F-106A airplanes,* upper-aft electronic doors and doors stenciled Nos. 366, 367 and 736. *Applicable to F-106B airplanes,* doors stenciled Nos. 373, 597, 599 and and 600.

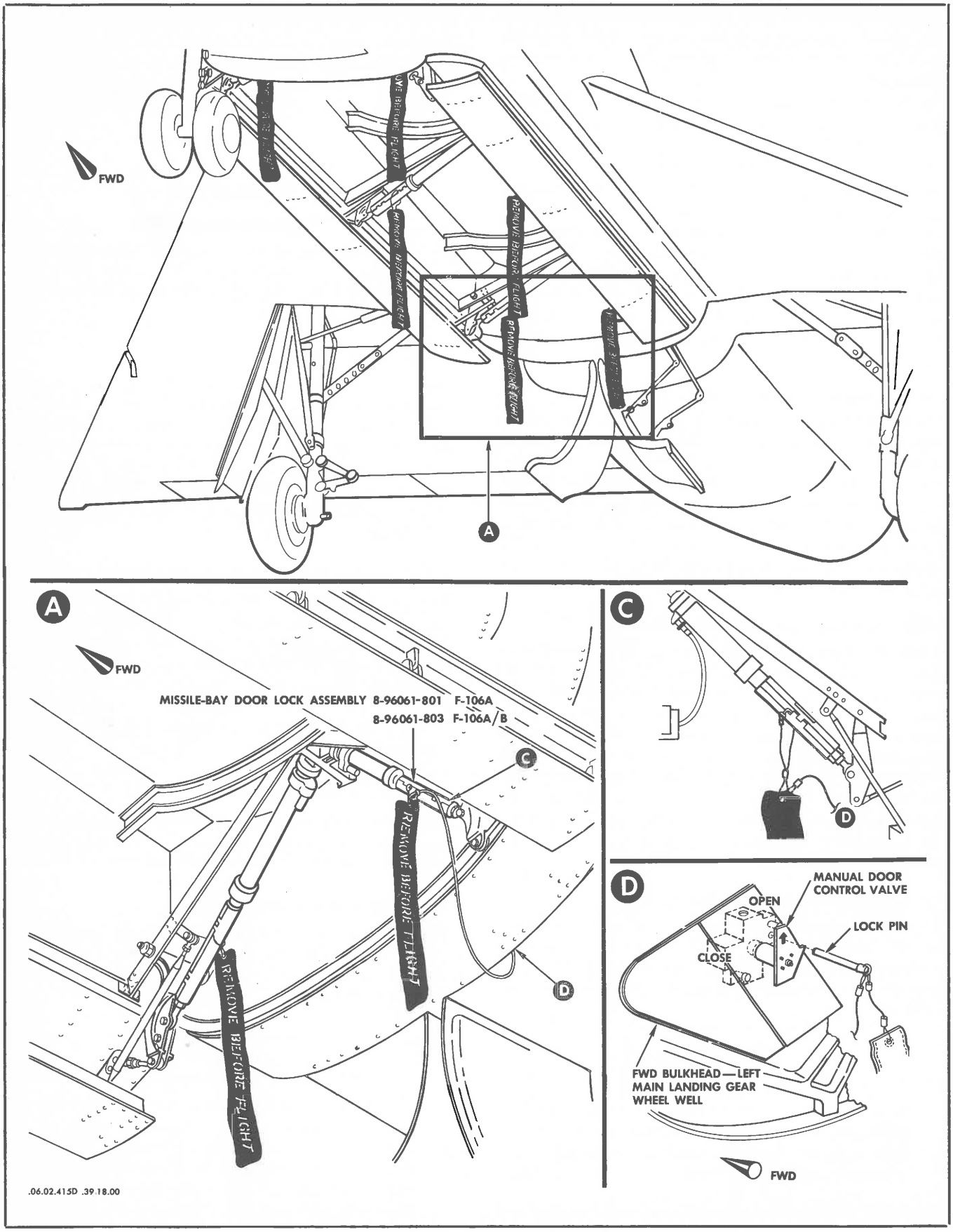


Figure 1-11. Missile Bay Door Safety Locks

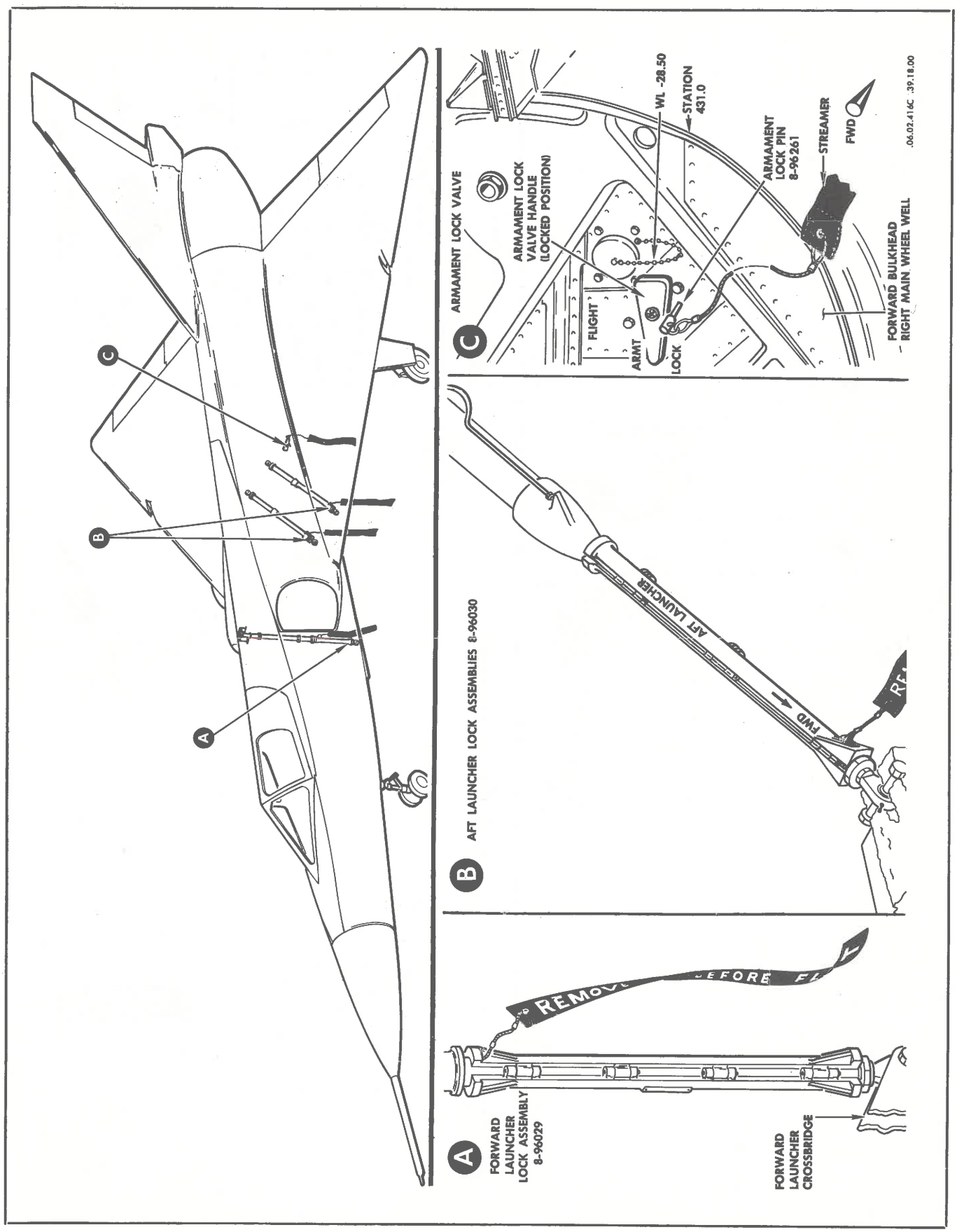


Figure 1-12. Missile Launcher Safety Lock, F-106A

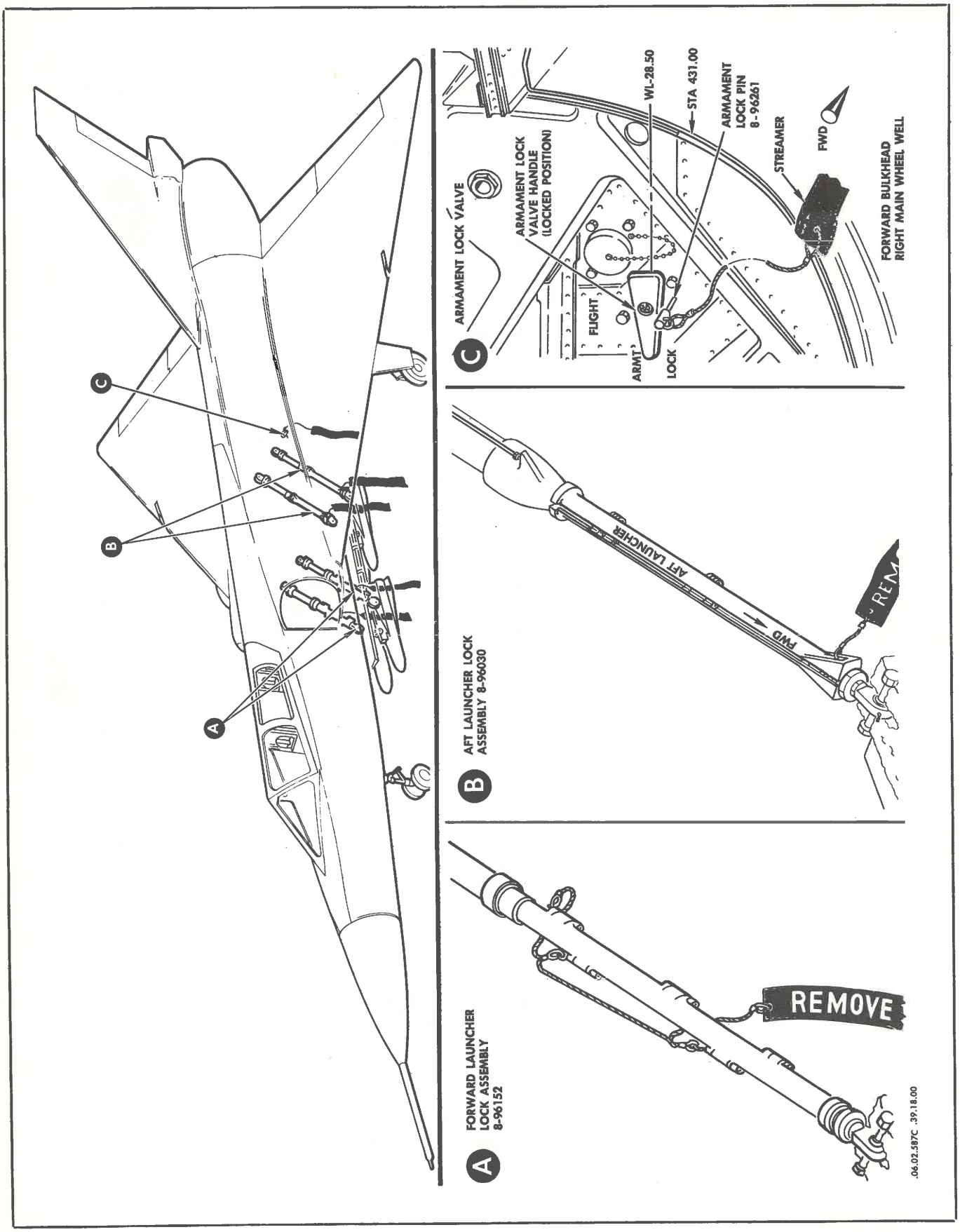


Figure 1-13. Missile Launcher Safety Lock, F-106B

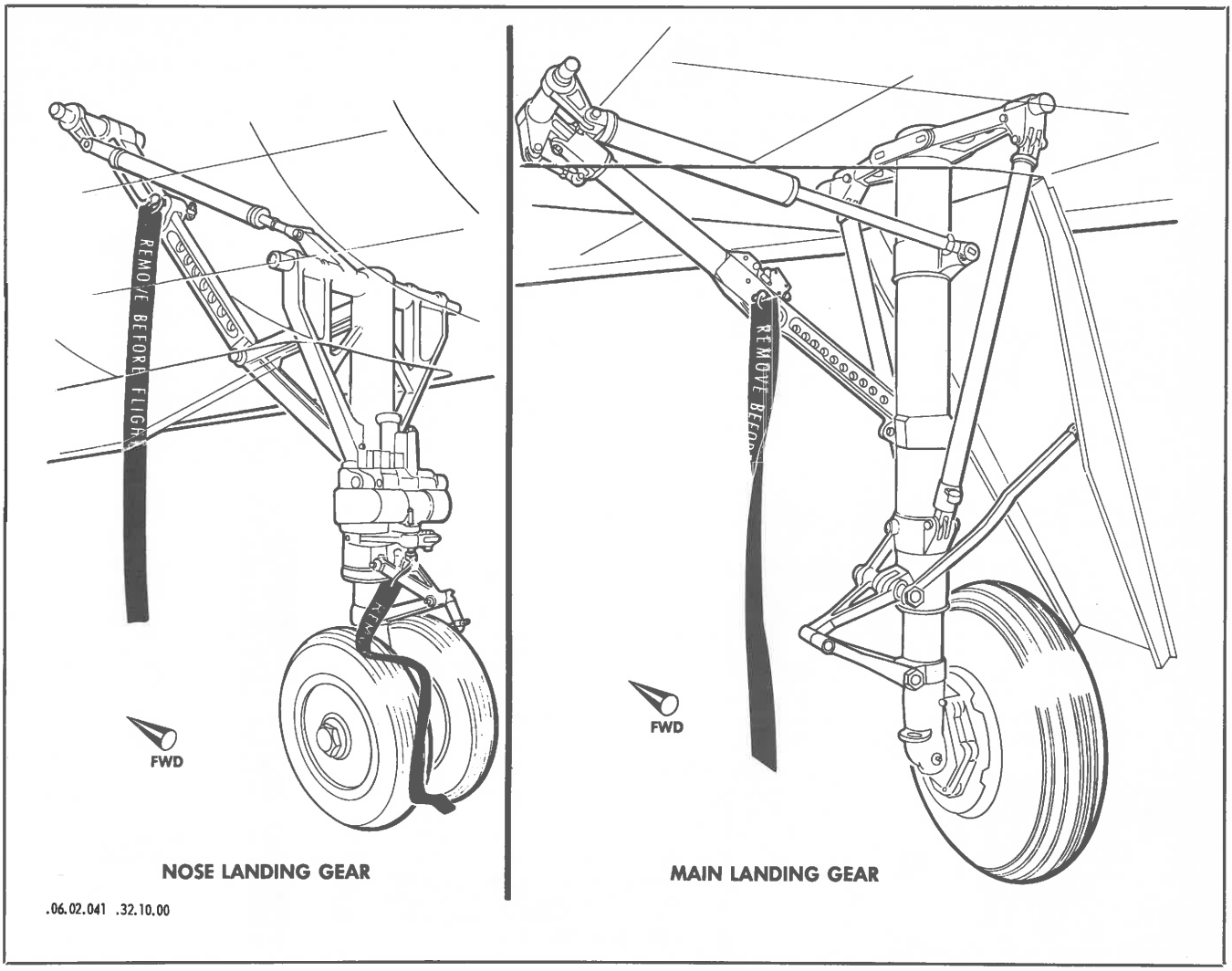


Figure 1-14. Landing Gear Ground Safety Lock Pins

When it is necessary to tow the airplane over soft or rough ground, or to pull a main wheel out of a hole, emergency tow cable, SE 1089-801, is attached to lugs at the bottom of the main gear struts. The tow bar has adjustable wheel attaching arms to accommodate various nose wheel configurations, and retractable wheels for ease of ground handling. Attachment of the tow bar and its adjustments are illustrated on figure 1-16.

CAUTION

When towing from the main gear struts, exercise extreme care to prevent the airplane from overriding the towing vehicle. Maintain a constant strain on the cable.

1-19. PARKING PROVISIONS.

Upon completion of a flight and engine shutdown, perform the following operations:

a. Place chocks fore and aft of each main landing gear wheel.

b. Install a ground safety lock pin in each main landing gear and the nose landing gear.

c. Statically ground the airplane at main landing gear.

d. Place the entrance ladder at the cockpit.

e. Open canopy and install canopy hold-open support assembly.

f. On F-106A airplanes, insure that pilot's ground safety pin is installed in the seat. On F-106B airplanes, insure that the ground safety pin is installed in each seat.

g. Install ground safety pins in external fuel tank jettison system.

h. *Applicable to airplanes equipped with tail hooks,* install tail hook ground safety pin.

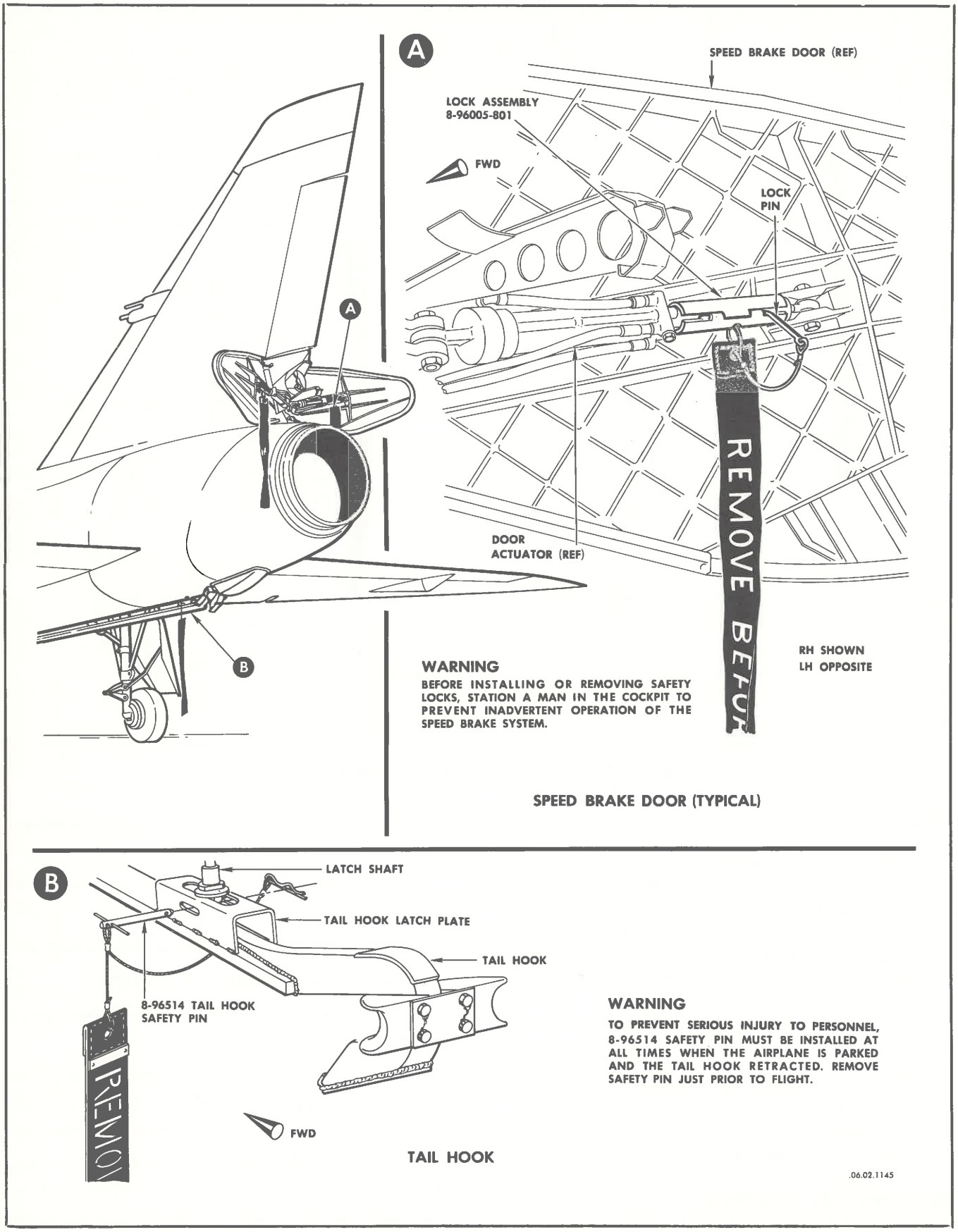


Figure 1-15. Speed Brake Doors and Tail Hook Safety Locks

i. If maintenance work is to be performed in the cockpit, install safety pins in the canopy and seat ejection system ballistic units. (Remove safety pins upon completion of work.)

j. Refuel and service the airplane; perform postflight check.

k. Install protective shields in engine air intake ducts, and plugs in the boundary layer intake openings, and install tail cone cover.

l. Refer to paragraph 1-20 for mooring provisions and instructions if aircraft is to remain parked for more than a short time.

1-20. MOORING PROVISIONS.

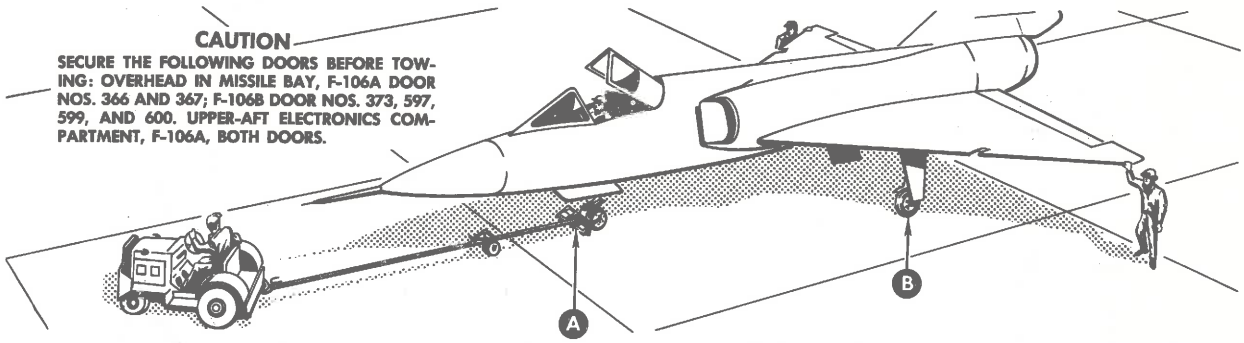
Mooring provisions are incorporated at six places on the airplane, as shown in figure 1-17. Screws are removed from fittings in number six spar on the lower surface of each wing, to permit installation of the wing mooring eyebolts, 8-96103. Removal of a cover plate, located at the center line of the fuselage forward of the nose wheel well, permits installation of the nose mooring eyebolt, 8-96060. Single mooring fittings are incorporated in each landing gear strut. The two conditions, "A" and "B," under which the airplane is moored are dependent on the wind velocity. The procedures under "Condition A" will apply when the wind velocity or gusts are not expected to exceed 63 knots. The procedure prescribed under "Condition B" will apply when velocities of surface winds or gusts are forecast which will exceed 63 knots, or when it is anticipated that sufficient personnel or facilities will not be available to adequately secure the aircraft. Mooring procedures for "Conditions A and B," and instructions for the installation of mooring kit, Part No. AN8015-2 are as follows:

CONDITION "A"

(Expected winds lower than 63 knots)

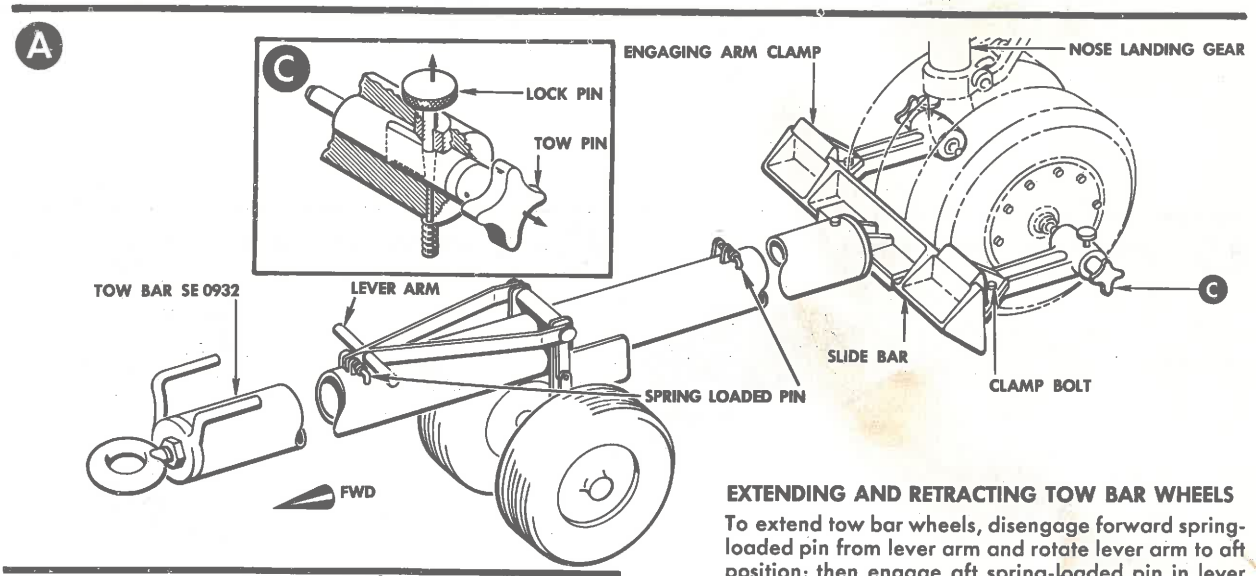
NOTE

Airplanes at minimum operating weight (without fuel or armament aboard) should be tied down first.



TOWING PRECAUTIONS

a. Determine that main and nose gear ground safety lock pins are installed
b. Make sure that distance between center lines of upper and lower nose gear torque arm (scissors) hinge bolts does not exceed 8.00".
c. Disconnect nose gear upper torque arm from lower torque arm at quick disconnect fitting.
d. Move all ground equipment clear of the airplane.
e. Make sure that canopy and seat ejection safety pin is installed.
f. Station a man in cockpit to operate wheel brakes.
g. Station a man at each wing tip and at tail to assist in towing operation.
h. Use minimum speed and exercise care during towing operations.
i. Connect nose gear upper and lower torque arms (scissors) at quick disconnect fitting after towing operations are completed.



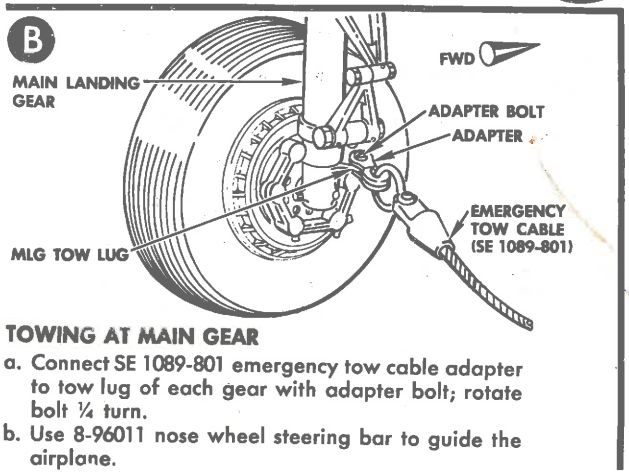
EXTENDING AND RETRACTING TOW BAR WHEELS

To extend tow bar wheels, disengage forward spring-loaded pin from lever arm and rotate lever arm to aft position; then engage aft spring-loaded pin in lever arm.

To retract tow bar wheels, place lever arm in forward position and secure with spring-loaded pin.

ADJUSTING NOSE WHEEL ENGAGING ARMS

To adjust nose wheel engaging arms, loosen two bolts through clamp on each arm and position arms on slide bar as required; then tighten clamp bolts. (Arms are adjustable from 9 to 18 inches and should be equidistant from center line of tow bar.)



TOWING AT MAIN GEAR

a. Connect SE 1089-801 emergency tow cable adapter to tow lug of each gear with adapter bolt; rotate bolt ¼ turn.
b. Use 8-96011 nose wheel steering bar to guide the airplane.

TOWING FROM NOSE GEAR

a. Lift lock pins and pull tow pins out on tow bar, SE0932. See detail "C."
b. Position tow bar over nose wheel.
c. Engage tow pins in recesses in nose gear axle. Lock pins will drop in place when aligned with holes in tow pins.

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Figure 1-16. Towing Provisions

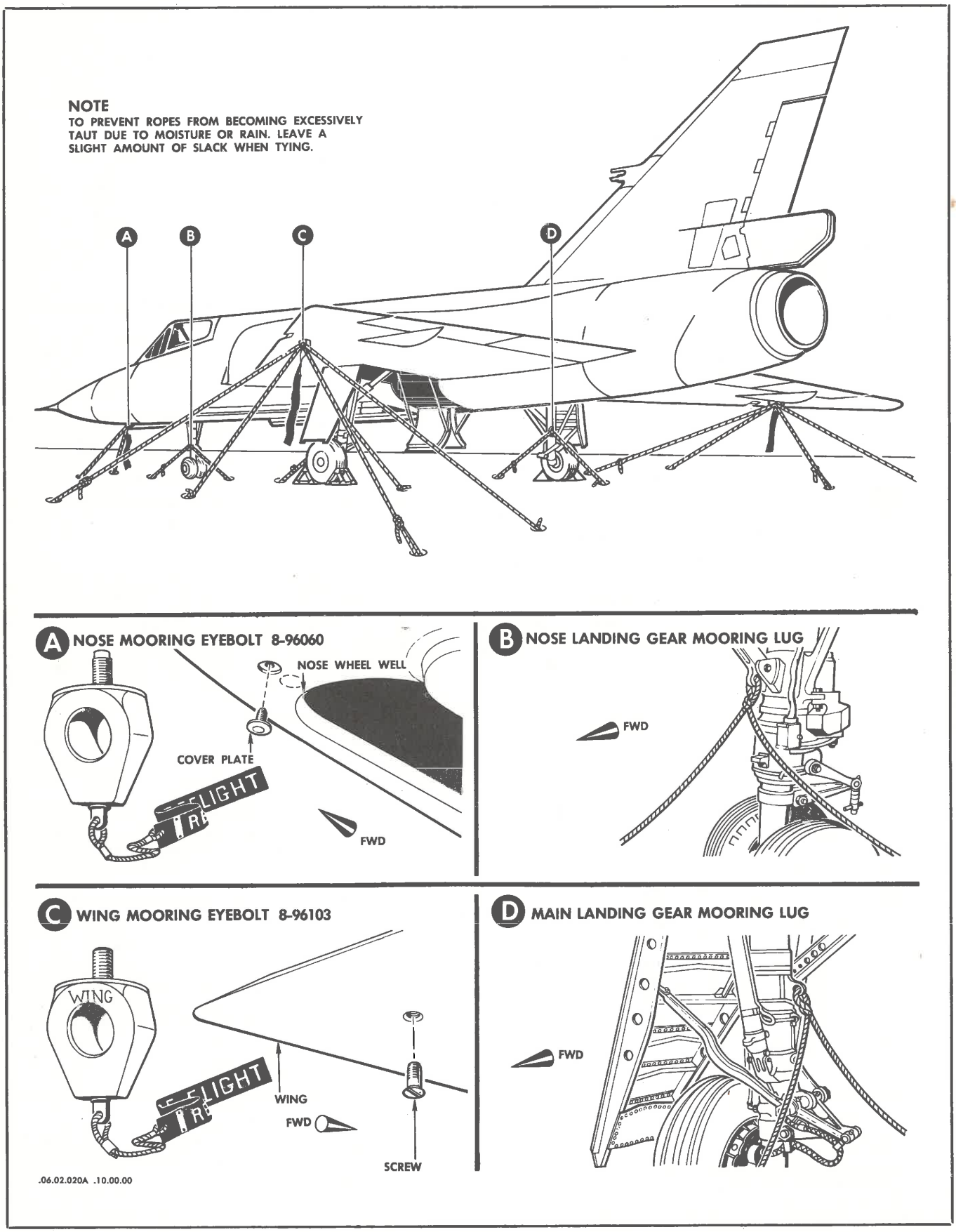


Figure 1-17. Mooring Provisions

a. After aircraft is properly located, place nose wheel in fore and aft position. Direction in which aircraft is to be parked will be determined by prevailing or forecast wind direction. When practicable, head aircraft into the wind.

b. Install landing gear ground safety lock pins.

c. Install approved type wheel chocks fore and aft of each main gear and secure together. Sand bags may be used in lieu of chocks when aircraft is parked on steel matting.

d. Statically ground airplane.

e. Tie down nose gear at mooring point, as shown on figure 1-17, using manila rope or chain with a 3000-pound pull test, or ¼-inch aircraft cable.

f. In cold weather, install aircraft covers and make provisions to prevent wheels freezing to the ground.

g. In desert regions, install aircraft covers as a protection from blowing sand.

h. If aircraft is parked in direct rays of sun and temperature exceeds 26.6°C (80°F), the following precaution should be taken to prevent excessive cockpit temperatures: Install 8-96007 canopy and radome cover on F-106A airplanes; install 8-96141 cover on F-106B airplanes. If there are no wind or dust conditions, loosen straps on cover, allow canopy to open an inch or so, then tighten straps to prevent cover flapping against the canopy plexiglas.

i. The requirement for installation of dust excluders is left to the discretion of responsible maintenance officer.

CONDITION "B"

(Expected winds of 63 knots or more, but less than 79 knots)

NOTE

Airplanes at minimum operating weight (without fuel or armament aboard) should be tied down first.

CAUTION

Structural damage can occur from high-velocity winds. Therefore, if at all possible and deemed advisable, the aircraft should be evacuated to a safe weather area if a tornado, hurricane, typhoon, or wind above 79 knots is expected. However, if aircraft have been subjected to wind velocities attaining or exceeding 63 knots, control surfaces, attachment fittings, etc., must be inspected for cracks or evidence of failure before the airplane is flown.

a. Park airplane headed into prevailing or forecast wind direction, or as nearly as possible, depending upon location of fixed mooring rings. If necessary, a 45-degree variation is considered to be satisfactory.

b. Locate airplane slightly more than wing-span distance from other airplanes with nose mooring point approximately five feet downwind from ground mooring anchor.

c. Place nose wheel in fore and aft position.

d. Deflate nose gear strut.

e. Fill fuel tanks to capacity, if time permits.

f. Place approved type wheel chocks fore and aft of each gear wheel and secure each set together. Use wheel chocks, Part No. 42D6594-2, Stock No. 8200-159001, Class 19-A, for normal conditions. For ice or snow, use metal collapsible ice-grip chocks, Part No. 50D6602, Stock No. 8200-159006, Class 10-A. Sand bags may be used in lieu of chocks when aircraft is moored on steel mats.

g. Tie airplane down at each gear and wing mooring point, as shown in figure 1-17, but eliminating all slack. Make tie-down with ¼-inch aircraft cable, using wire rope clips, Class 29, Stock No. 6700-19150, or chain with 3000-pound pull test and bolts. Manila rope with a 3000-pound pull test may be used if cable or chain tie-down is not available. To prevent "bouncing," tie-down for nose gear is to be attached in such a manner as to remove all slack. Antislip knots only, such as square or bowline, are to be used in tying mooring ropes.

h. In the event tie-down rings are not available on hard surface areas, move aircraft to an area where anchor kits, Part No. AN8015-2, Stock No. 8200-416300, Class 19-A, and/or fixed mooring anchors can be used.

i. Close cockpit canopy.

j. The requirement for dust excluders, canopy covers, and taping of openings is left to the discretion of the responsible maintenance officer.

k. Secure all maintenance stands, loose equipment, etc.

NOTE

After high winds, the aircraft is to be inspected for visible damage and for evidence of damage from flying objects.

WARNING

When typhoon conditions exist, it is to be remembered that the storm appears to pass two times, each time with a different wind direction. This necessitates turning the aircraft after the first passing.

1-21. Installation of Mooring Kit, Part No. AN8015-2 (8200-416300) Class 19A.

a. Screw anchor rod, Part No. 36A4468, into arrow, Part No. 36A4467.

b. Slip driving rod, Part No. 36B4466, over anchor rod and into socket of arrow.

c. Turn cam of driving rod so that prongs of arrow are not spread by driving.

d. If ground is hard, break surface with ground breaking pin, Part No. 38B3323.

e. Align rod with airplane mooring fitting and drive arrow into ground until driving rod handle is approximately three inches from ground.

f. Rotate driving rod handle 90 degrees and give it a sharp blow to spread arrow prongs.

g. Return driving rod to driving position and withdraw.

h. Align square socket of eye assembly, Part No. 36A4469, with squared end of anchor rod, fit it in place, and screw knurled nut down tight. When properly assembled, square end of anchor rod will extend through squared socket of eye approximately ⅛ inch.

i. Attach cable, rope and/or chain to eye assembly and give an upward pull to spread and set arrow prongs.

j. Secure cable, rope and/or chain in accordance with preceding instructions.

k. Withdraw anchor rods by turning eye assembly counterclockwise. Leave arrows in ground.

NOTE

Mooring of aircraft is not to be accomplished by attaching mooring or tie-down facilities to steel mats.

1-22. PROTECTIVE COVERS.

To protect the external surfaces and the internal components of the airplane during adverse weather conditions or long-term storage, install the following cover assemblies: radome and canopy, wing, nose landing gear, tire and wheel well, artificial feel system intake, and tail cone. For an illustration of cover and plug installation, see figure 1-18.

CAUTION

Inner surfaces of the canopy and radome cover that cover the areas of the radome, the windshield, and canopy glass must be clean prior to installation on the airplane. Be sure buckles and straps are secure to prevent damage to radome or airplane during strong wind conditions.

1-23. GENERAL PURPOSE COVER MATERIAL, DISPOSABLE.

During ground maintenance operations, components are removed that expose various systems and/or other components to contamination from dust, moisture, and other foreign matter. To protect these items, polyethylene sheet material is attached by masking tape, rubber bands, etc. The disposable cover is removed just prior to the installation of the removed component.

1-24. JACKING AIRPLANE.

All necessary precautions, such as removal of unnecessary and obstructing equipment and checking of overhead clearances, should be observed prior to performing jacking operations.

CAUTION

Do not inflate landing gear shock struts to raise the airplane in order to install jacks, or, to hold the airplane in order to remove jacks. Damage to shock strut components may result due to overpressurization.

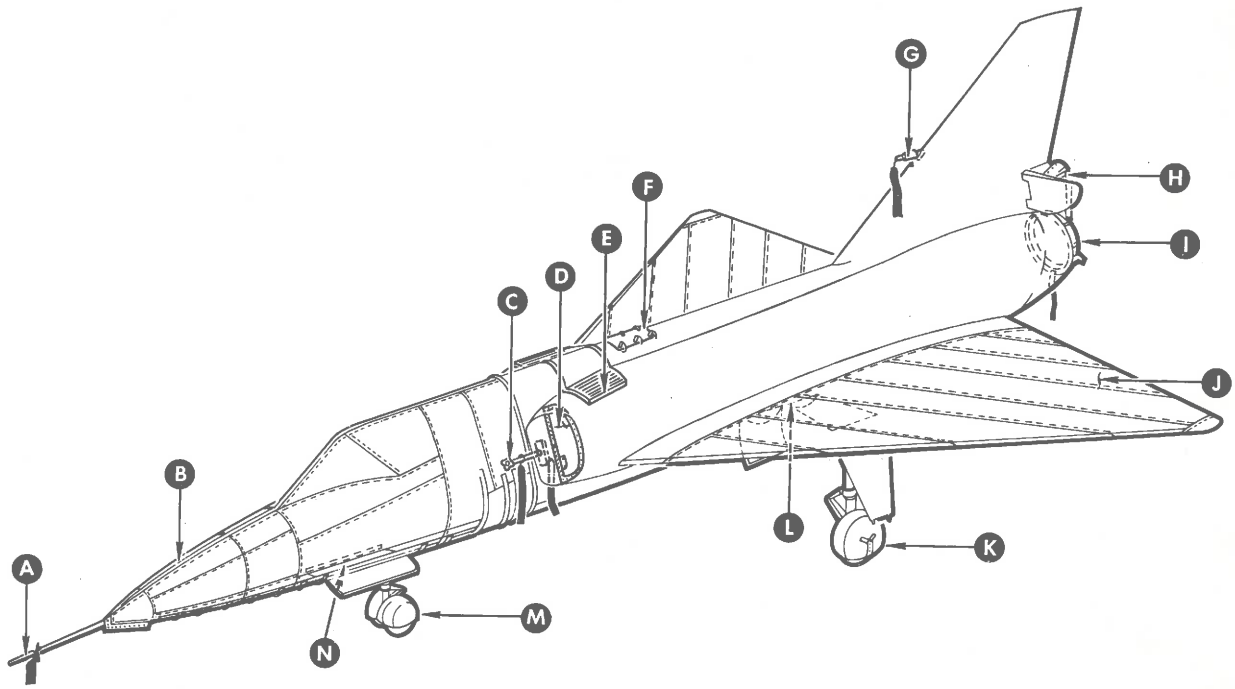
To prevent structural damage *on F-106A airplanes,* the fuselage access door located on right side above wing, stencilled No. 736, shall be installed and secured before jacking the airplane.

Jacking operations should be performed in a hangar whenever possible. If operation in a sheltered area or hangar is impractical, jacking may be accomplished outside except during gusty or high wind conditions. The maximum wind velocity in which jacking may be performed safely in an emergency, is considered to be 30 knots. When raising or lowering the airplane at 3 points, coordinate the action of all jacks to maintain the airplane in a level (laterally, level; longitudinally, level to a slightly nose down) condition. The airplane may be jacked at any individual gear.

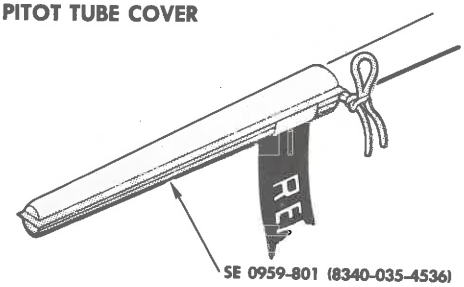
CAUTION

When jacking to a nose up condition (above level as indicated by spirit level on leveling lugs), install nose mooring eyebolt 8-96060 and attach manila rope (3,000 pound pull test) from eyebolt to tie-down fitting to prevent possible up-ending of airplane. Rope shall be taut, at all times, during procedure.

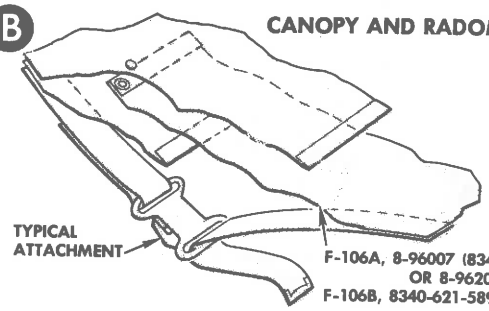
Three jack pads, SE-0580-7, provide a bearing surface for the USAF B-6 type (5120-246-9178) jacks used in jacking the airplane. Provisions to receive the jack pads are incorporated in each wing at the spar immediately aft of the main landing gear and at the center line of the fuselage forward of the nose wheel well. Jacking provisions are illustrated in figure 1-19. When jacking at any gear, the landing gear and external tank ground lock safety pins must be installed. The steer-damp unit ground lock pin must also be installed when jacking at the nose gear. Landing gear strut restraining clamps, 8-96175 (nose gear) and 8-96296 (main gear), are used in conjunction with the respective nose and/or wing jacks for all jacking operations that do not require gear strut extension. These clamps prevent the gear struts from extending thus the main landing gear safety switches are effective and a minimum jacking of the airplane will provide wheel clearance.



A PITOT TUBE COVER

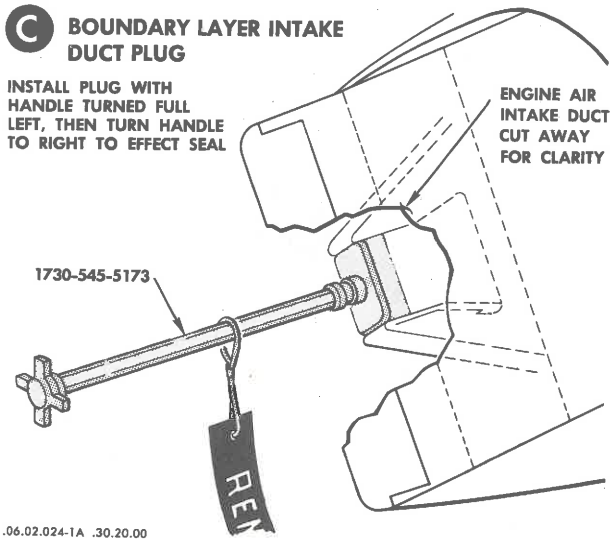


B CANOPY AND RADOME COVER



C BOUNDARY LAYER INTAKE DUCT PLUG

INSTALL PLUG WITH HANDLE TURNED FULL LEFT, THEN TURN HANDLE TO RIGHT TO EFFECT SEAL



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D ENGINE AIR INTAKE DUCT SHIELD

TO INSTALL, GRASP HANDLES AND WEDGE INTO DUCT

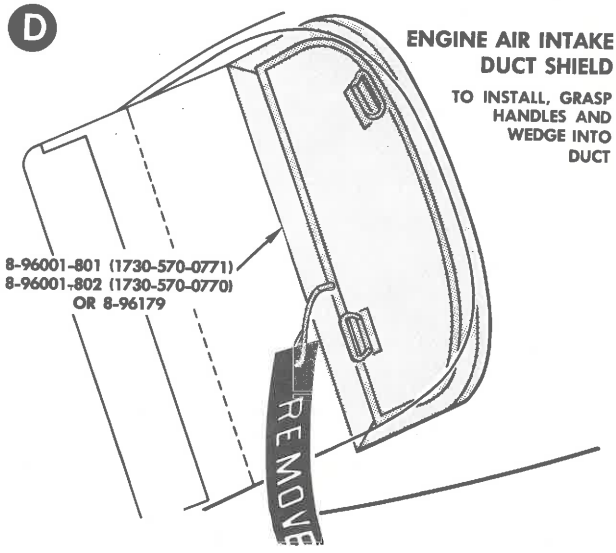


Figure 1-18. Protective Cover Installation (Sheet 1 of 3)

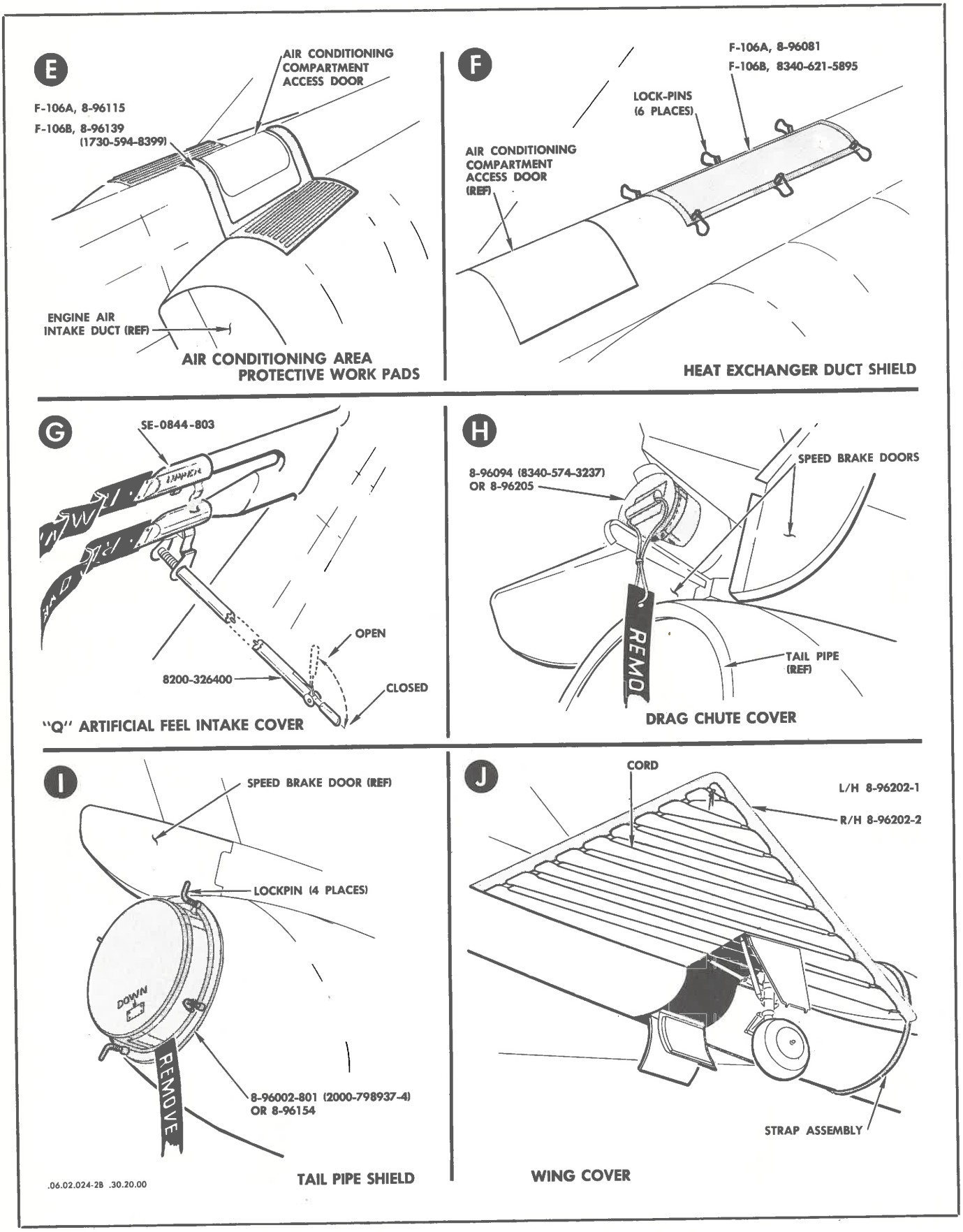


Figure 1-18. Protective Cover Installation (Sheet 2 of 3)

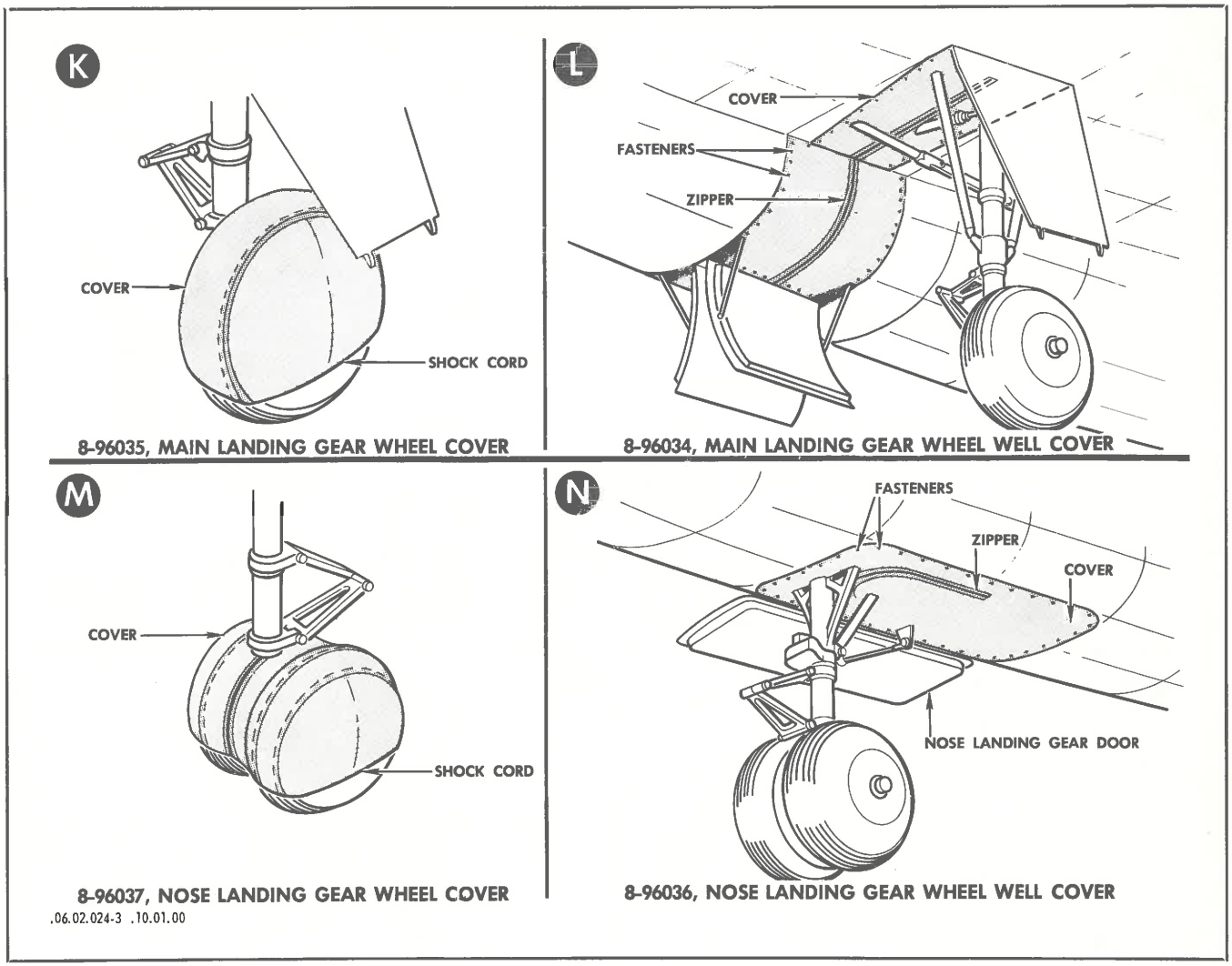


Figure 1-18. Protective Cover Installation (Sheet 3 of 3)

WARNING

Jacking the airplane with the main landing gear struts extended, deactuates the main landing gear ground safety switches. This readies the landing-gear-up circuit and other circuits for airborne type operation, use care to prevent inadvertent operation.

Integral jack pads are incorporated at the bottom of each main landing gear strut to permit jacking with a USAF A-6 type jack (5120-203-4697) for wheel and brake servicing. As an added safety precaution, the respective wing jack shall be installed and in contact with the wing jack pad when jacking at a gear strut pad.

NOTE

In special cases, such as electronic weighing, the aircraft may be jacked using only the USAF A-6 jacks under the main gear strut pads. The aircraft should be raised only enough to clear main wheels from ground; with nose wheel at the minimum height necessary for ground clearance and leveling.

1-25. LEVELING AIRPLANE.

Leveling lugs are incorporated in two places in the forward missile bay, and are shown on figures 1-20 and 1-21. To level the airplane perform the following operations:

a. Install landing gear and external tank ground safety pins.

b. Jack the aircraft; refer to paragraph 1-24.

c. Place a spirit level on the lateral leveling lugs.

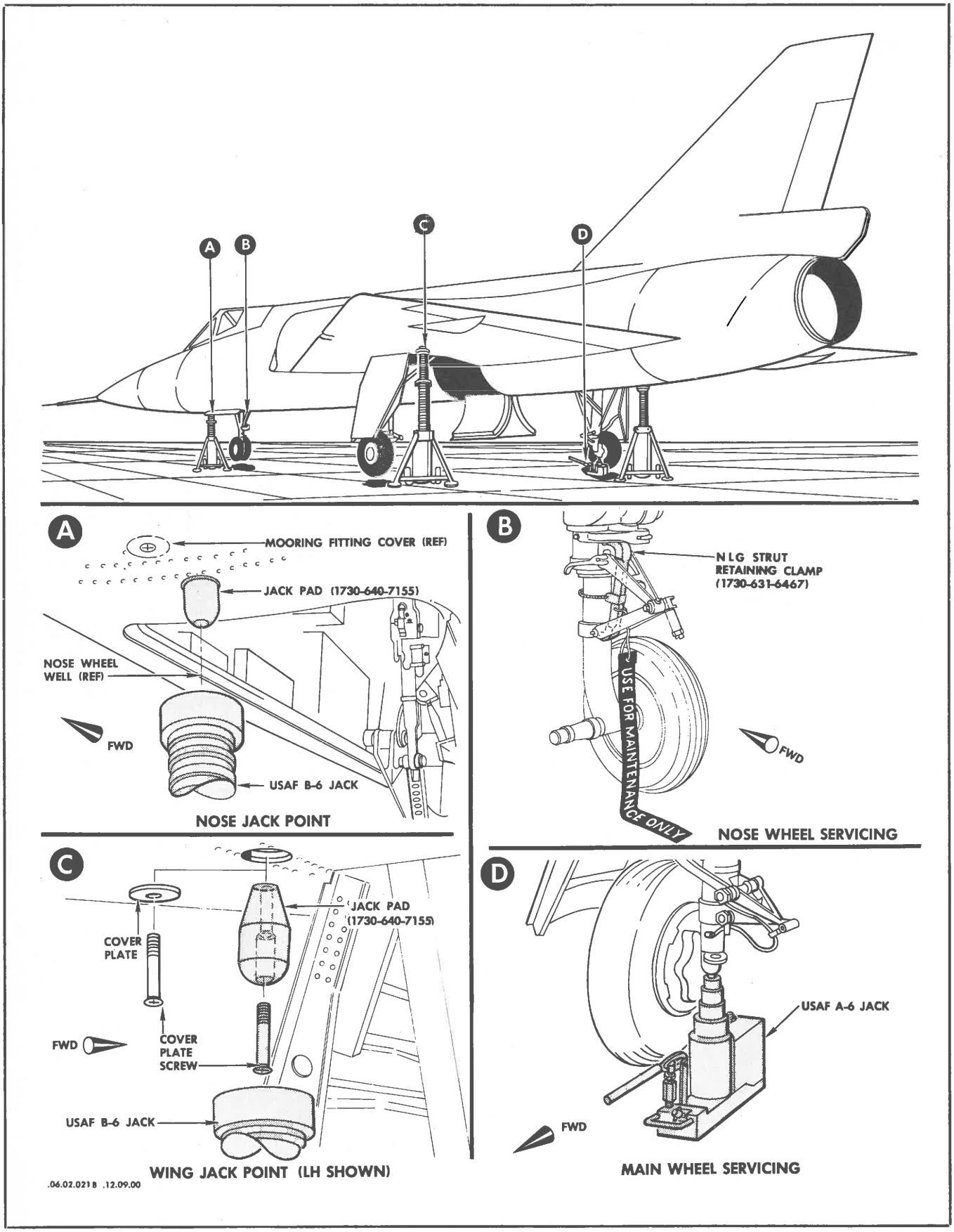
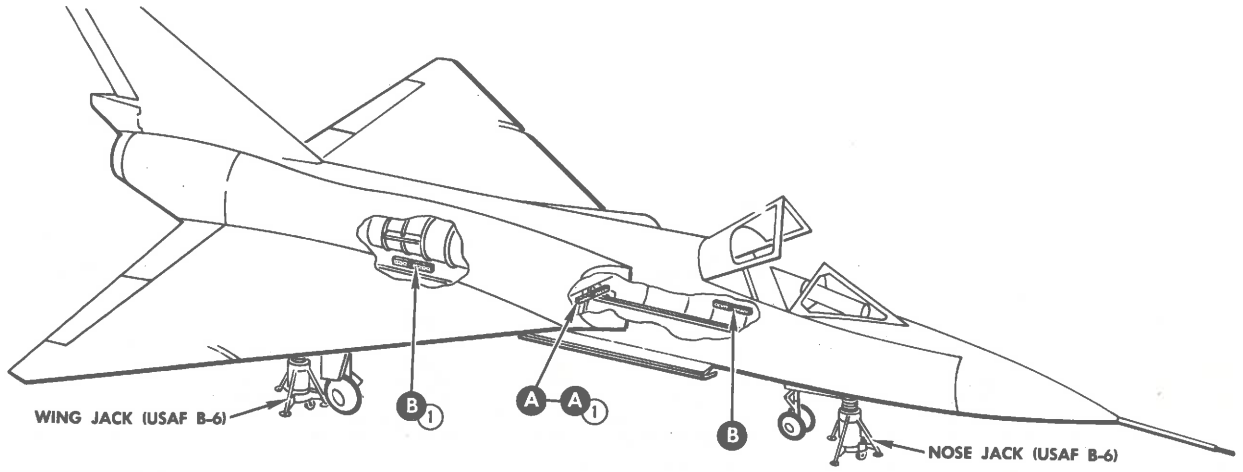
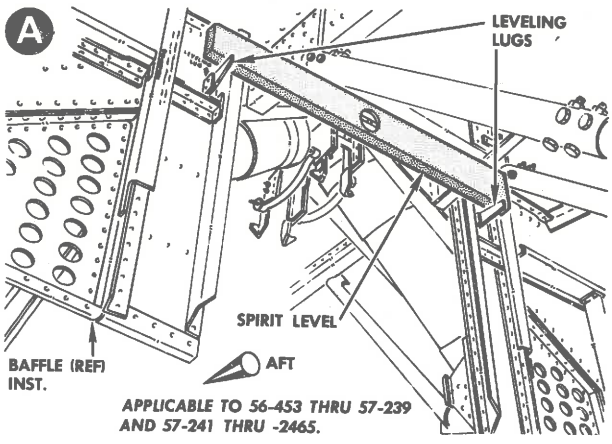
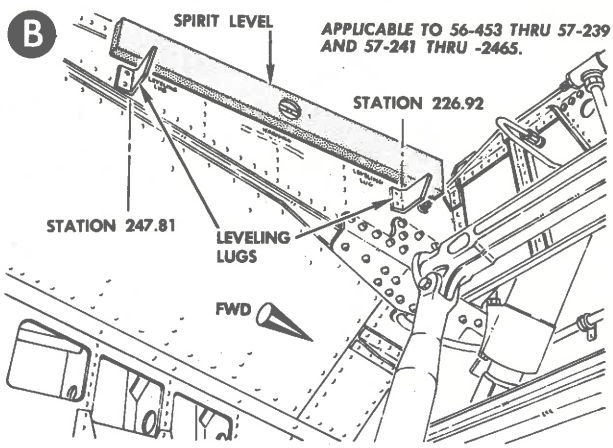


Figure 1-19. Jacking Provisions

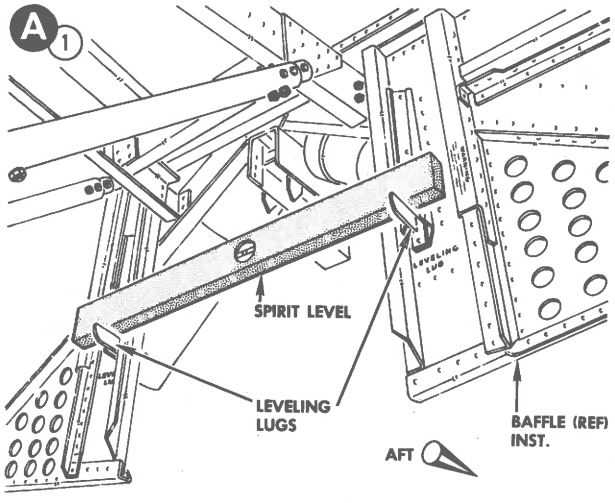




VIEW LOOKING AFT STATION 308.50 (MISSILE BAY)
LATERAL LEVELING LUGS



VIEW LOOKING OUTBOARD (LEFT SIDE, MISSILE BAY)
LONGITUDINAL LEVELING LUGS



APPLICABLE TO 56-240 AND 57-2466 AND SUBSEQUENT.

VIEW LOOKING AFT STA 308.50 (MISSILE BAY)
LATERAL LEVELING LUGS

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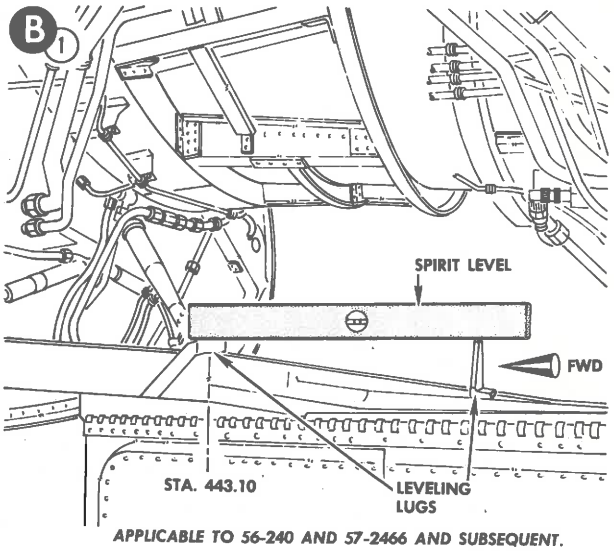
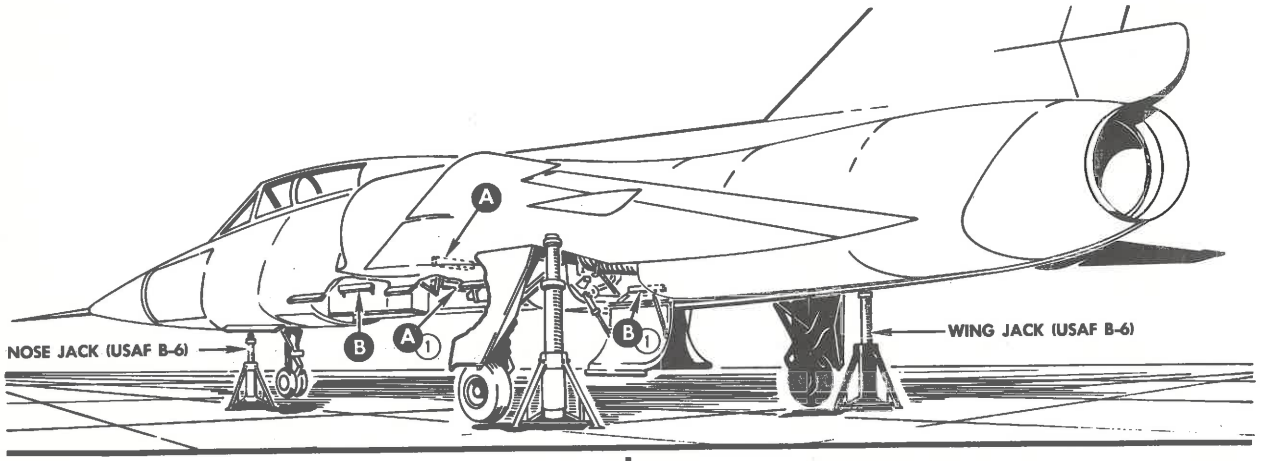
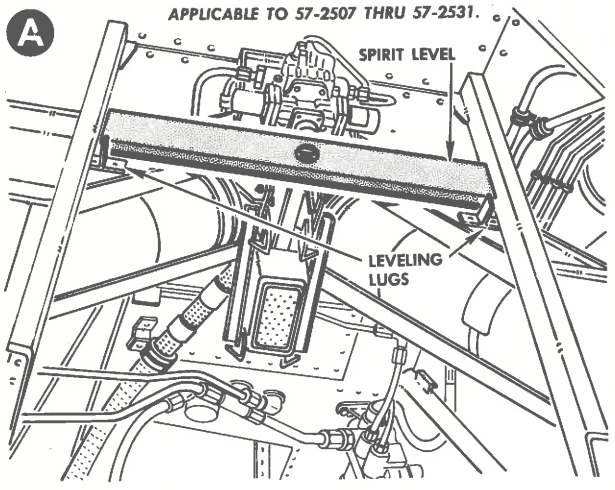


APPLICABLE TO 56-240 AND 57-2466 AND SUBSEQUENT.

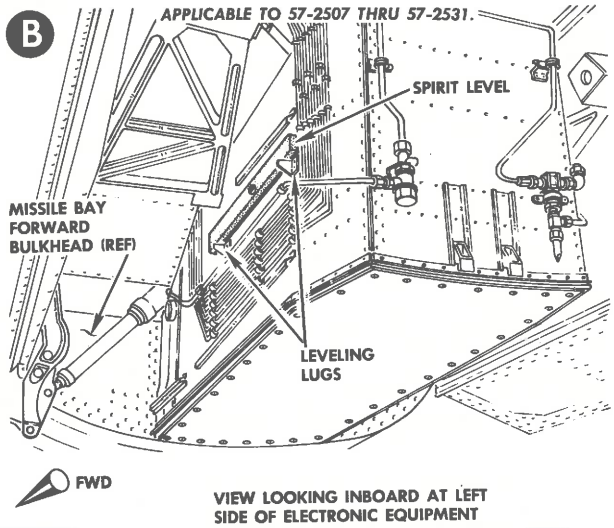
LH MAIN LANDING GEAR DOOR
LONGITUDINAL LEVELING LUGS

Figure 1-20. Leveling Provisions, F-106A

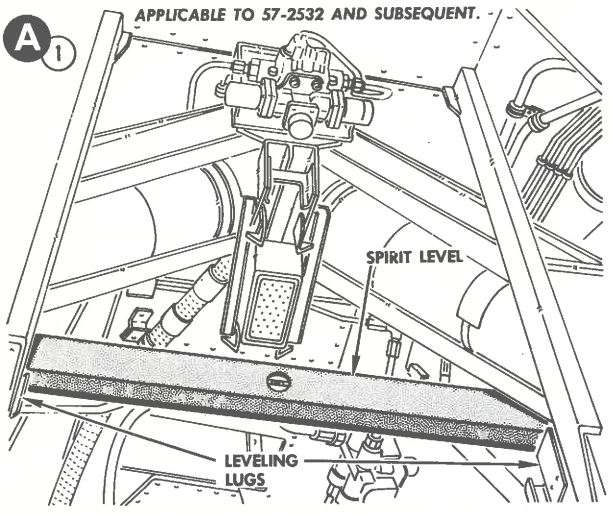




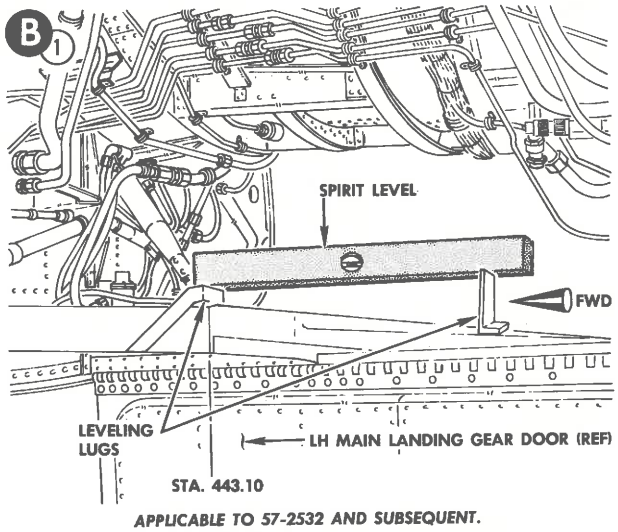
VIEW LOOKING AFT STA 308.50 (MISSILE BAY)
LATERAL LEVELING LUGS



VIEW LOOKING INBOARD AT LEFT SIDE OF ELECTRONIC EQUIPMENT
LONGITUDINAL LEVELING LUGS



VIEW LOOKING AFT STA 308.50 (MISSILE BAY)
LATERAL LEVELING LUGS



APPLICABLE TO 57-2532 AND SUBSEQUENT.

LONGITUDINAL LEVELING LUGS

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Figure 1-21. Leveling Provisions, F-106B

d. Place a spirit level on the longitudinal leveling lugs.

e. Adjust jacks to level the aircraft laterally and longitudinally.

1-26. HOISTING AIRPLANE.

Hoisting provisions are incorporated on the airplane to accommodate a four-point hoisting sling. This sling, 8-96039, permits the hoisting of the aircraft in a level attitude, with wings installed or removed. With the wings installed, the sling is attached to fittings on each side of the fuselage and in the upper surface of each wing. With the wings removed the sling is attached to fittings on each side of the fuselage, and to the hoisting adapter which is attached to the wing fittings on each side of the fuselage. Fuselage cradle assembly, 8-96093, is used to support the fuselage of the F-106A or F-106B when the wings are removed. Refer to T.O. 1F-106A-3 for hoisting procedures.

NOTE

It is desirable, but not essential, that the airplane be defueled and the engine removed when hoisting the airplane with the wings installed.

1-27. NORMAL COCKPIT ENTRY.

Normal entry into the cockpit is accomplished by the following method:

a. Position cockpit entrance ladder securely in place at left side of fuselage.

b. Open external canopy latch handle door located on left side of fuselage below the windshield.

c. *Applicable to F-106A airplanes.* Release canopy latches by pulling latch handle outboard approximately four inches. *Applicable to F-106B airplanes.* Pull handle outboard, rotate counterclockwise 100°, pull out as far as possible and then rotate handle 100° clockwise to release latches.

d. *Applicable to F-106A airplanes.* Open the canopy manually or electrically. *Applicable to F-106B airplanes.* Open the canopy by actuating the canopy control lever or the canopy control switch located aft of the latch handle. The canopy may also be opened manually.

WARNING

Actuation of seat ejection controls can cause loss of life when airplane is on the ground. A safety pin must be installed in the seat(s) whenever airplane is on the ground, and must be removed just prior to flight.

1-28. CANOPY EXTERIOR LATCHING PROVISIONS.

A mechanical means for latching or unlatching the canopy from the exterior is provided at the left side of the fuselage below the windshield. To operate the latches proceed as follows:

a. Position cockpit entrance ladder securely in place at left side of fuselage.

b. Open external latch control handle access door located on the left side of the fuselage below the windshield.

c. *Applicable to F-106A airplanes.* Unlatch canopy by pulling latch handle outboard approximately four inches. *Applicable to F-106B airplanes.* Pull handle outboard, rotate 100° counterclockwise, pull out as far as possible, and then rotate handle 100° clockwise to unlatch canopy.

d. *Applicable to F-106A airplanes.* Latch canopy by pulling handle outboard, rotate 90° clockwise and push handle in until mechanism bottoms out. Rotate handle 90° counterclockwise and push handle all the way in to the stowed position. *Applicable to F-106B airplanes.* Pull handle to full outboard position then rotate 100° counterclockwise to latch canopy. Push handle in one inch to disengage latch mechanism, rotate 100° clockwise, and push handle all the way in to the stowed position.

1-29. PNEUMATIC CANOPY ACTUATING SYSTEM, F-106A.

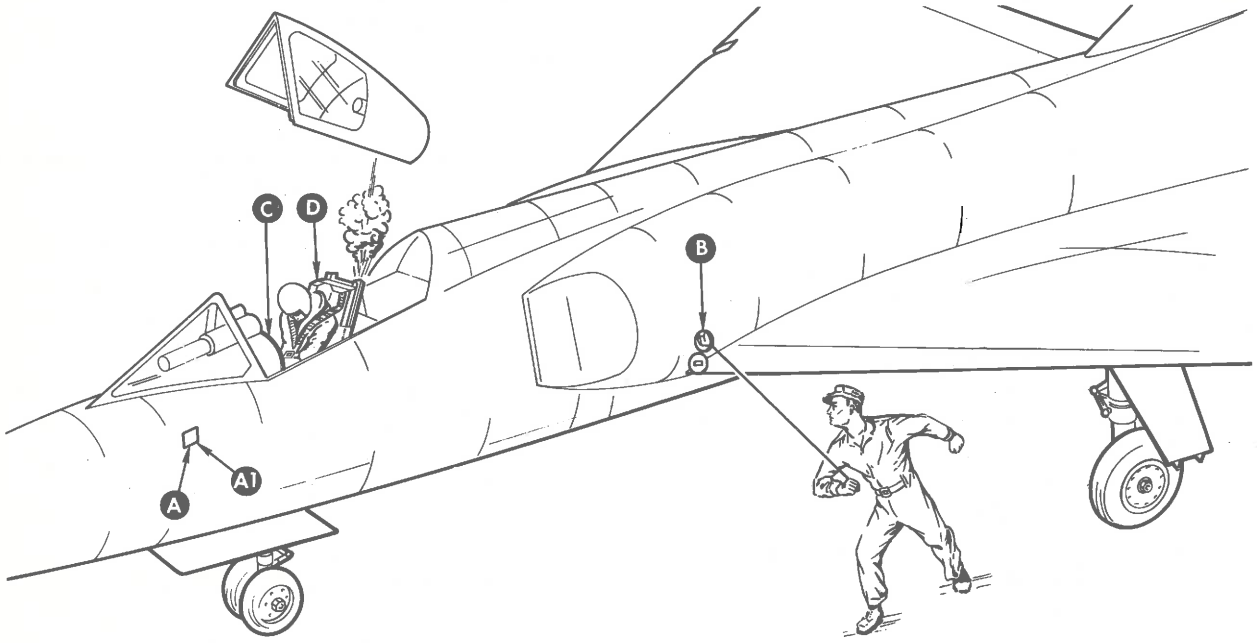
Applicable to 56-453 thru 57-243 prior to incorporation of TCTO 106J-525. The canopy system is designed to pneumatically balance the weight of the canopy, thus providing ease of control for manually positioning the canopy. The canopy is retained at the desired degree of opening, during engine ground runup or taxi operations, by actuating the switch installed on the forward left side of the canopy. Refer to Section VIII of this manual for detailed information.

1-30. ELECTRIC CANOPY ACTUATING SYSTEM.

Applicable to F-106A airplanes 57-244 and subsequent and 56-453 thru 57-243 after incorporation of TCTO 1F-106J-525. Applicable to F-106B airplanes 57-2515 and subsequent and 57-2507 thru 57-2514 after incorporation of TCTO 1F-106(J)B-519 and TCTO 1F-106(J)B-525. The canopy electric actuating system functions to raise, lower, or hold the canopy at the desired degree of opening during ground operations. The screw jack type actuator is motivated by a reversible electric motor that receives power through interlocking mechanically actuated switches and the control switches. The canopy may be operated from within the cockpit by a momentary toggle switch mounted on the right console, or from an identical switch mounted adjacent to the exterior latch control handle. Refer to Section VIII of this manual for detailed information.

1-31. PNEUMATIC CANOPY ACTUATING SYSTEM, F-106B.

Applicable to 57-2507 thru 57-2514 prior to incorporation of TCTO 1F-106(J)B-519 and TCTO 1F-106(J)B-525. The pneumatically actuated system opens or closes the canopy during ground operations. When the manually



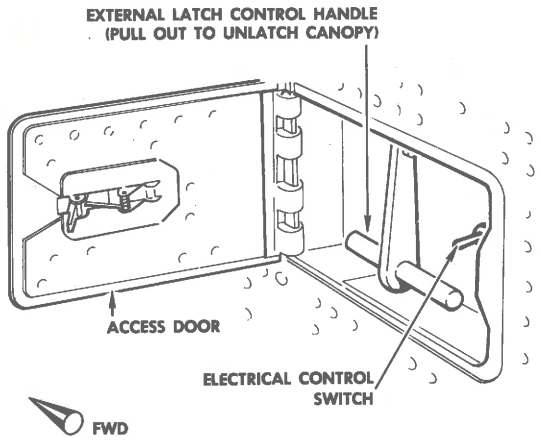
NOTE

THE FOLLOWING STEPS ARE PROVIDED AS A GENERAL GUIDE ONLY. CIRCUMSTANCES AT A CRASH SITE MAY REQUIRE DEVIATIONS IN PROCEDURE.

NOTE

F-106A AND F-106B AIRPLANES ARE EQUIPPED WITH EITHER PNEUMATIC OR ELECTRIC TYPE CANOPY ACTUATORS: MANUAL OPENING OF THE CANOPY IS POSSIBLE WITH EITHER CONFIGURATION.

A

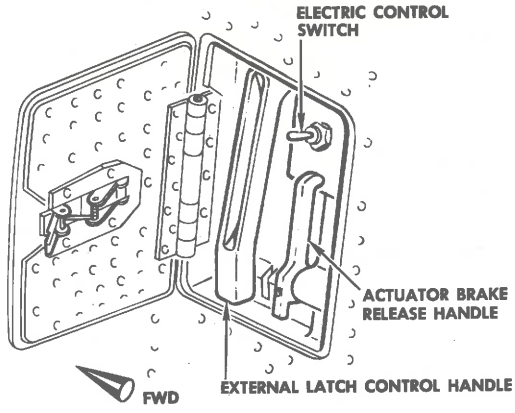


IF CONDITIONS PERMIT NORMAL ENTRANCE

a. Open access door beneath left windshield and pull external canopy latch control handle out four inches to unlatch canopy.
b. Manually raise canopy or hold control switch at "OPEN" position for electrical operation.

F-106A AIRPLANES

A1



IF CONDITIONS PERMIT NORMAL ENTRANCE

a. Open access door beneath left windshield. Pull handle out, rotate handle counterclockwise 100°, pull handle out again, and then rotate handle clockwise 100° to unlock canopy.
b. Hold electric canopy control switch or pneumatic canopy control lever at the "OPEN" position to raise the canopy.
c. To manually open electrically actuated canopy, rotate actuator brake release handle down 60° then return handle to original position when canopy is open.

F-106B AIRPLANES

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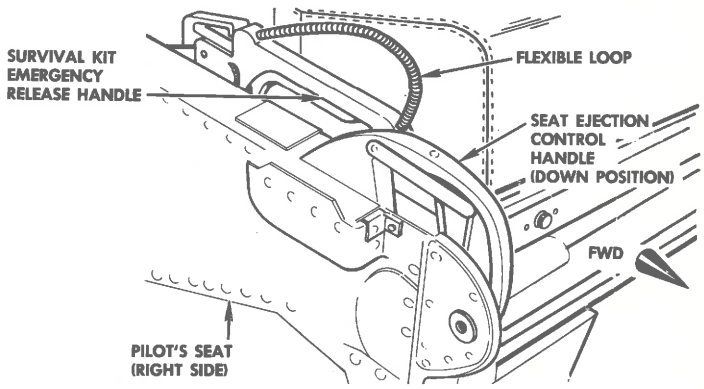
Figure 1-22. Upward Ejection Seat Emergency Rescue Operations (Sheet 1 of 2)

B

EMERGENCY ENTRANCE

WARNING

TO PREVENT EJECTION OF PILOT AND SEAT, CHECK POSITION OF SEAT EJECTION CONTROL HANDLES (BOTH SEATS ON F-106B AIRPLANES). IF HANDLES ARE UP, OPEN CANOPY BY APPLICABLE PROCEDURE GIVEN IN DETAILS "A" OR "A1." IF HANDLES ARE DOWN, AS SHOWN, PROCEED WITH THE FOLLOWING STEPS.



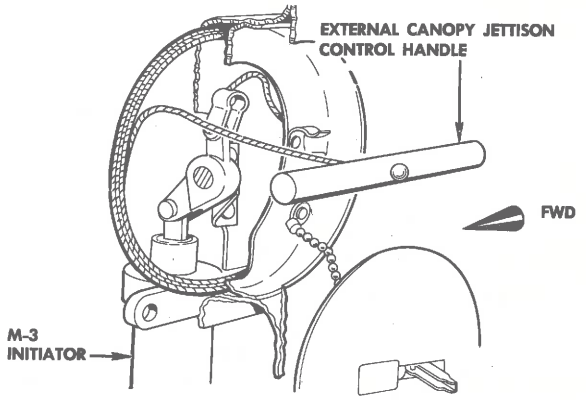
C

IF CONDITIONS DO NOT PERMIT NORMAL ENTRANCE

a. Remove access door on left inlet duct near leading edge of wing.
b. Grasp external canopy jettison handle and pull out until slack in cable is removed. Pull handle outboard to jettison canopy.

WARNING

SPARKS FROM CANOPY JETTISON EXPLOSIVE CHARGE MAY IGNITE SPILLED FUEL. RETREAT BENEATH WING AFTER PULLING CANOPY JETTISON HANDLE TO AVOID DANGER FROM FALLING CANOPY.



D

AFTER CANOPY IS OPENED OR JETTISONED:

a. Cut or disconnect seat ballistic hoses (3 places).

NOTE

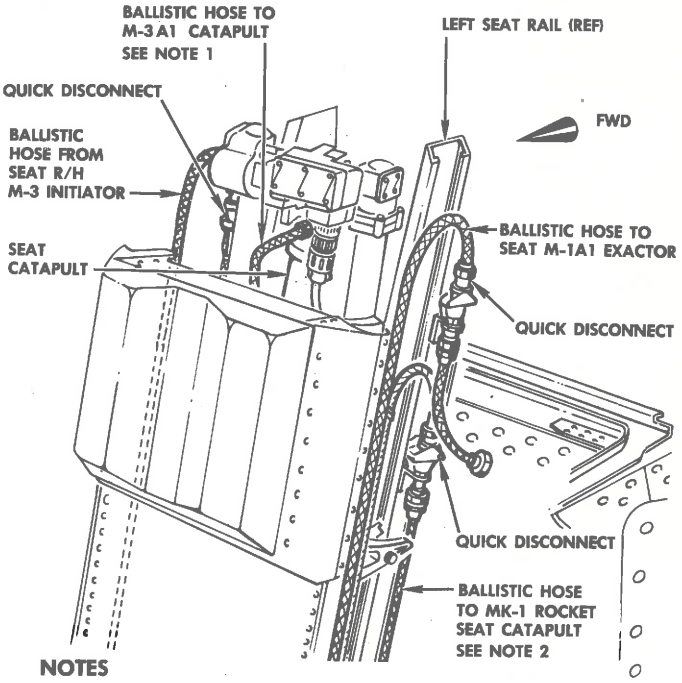
APPLICABLE TO FORWARD SEAT OF F-106B AIRPLANES, THE BALLISTIC HOSE TO THE M-3A1 SEAT CATAPULT DOES NOT INCORPORATE A QUICK DISCONNECT COUPLING.

b. Remove faceplate if pilot is wearing partial-pressure suit and helmet.

WARNING

THE HELMET FACEPLATE MUST BE REMOVED PRIOR TO RELIEVING THE SUIT PRESSURE. IF SUIT PRESSURE IS REMOVED FIRST, THE PILOT'S LUNGS MAY BE RUPTURED BY AIR FROM PRESSURIZED HELMET BEING FORCED INTO LUNGS.

c. Release seat belt and shoulder harness.
d. Pull up and aft on flexible loop of the survival kit's emergency release handle (painted yellow) shown in detail "B." Partial-pressure suit pressure will be relieved and pilot will be completely disconnected from the survival kit by this action.
e. Disconnect left-hand personal leads assembly at pilot's "G" and vent suit connections.
f. Remove pilot as gently as possible to avoid injury.



NOTES

1. APPLICABLE TO SEATS EQUIPPED WITH M-3 OR M-3A1 CATAPULTS.
2. APPLICABLE TO SEATS EQUIPPED WITH MK-1 ROCKET SEAT CATAPULT.

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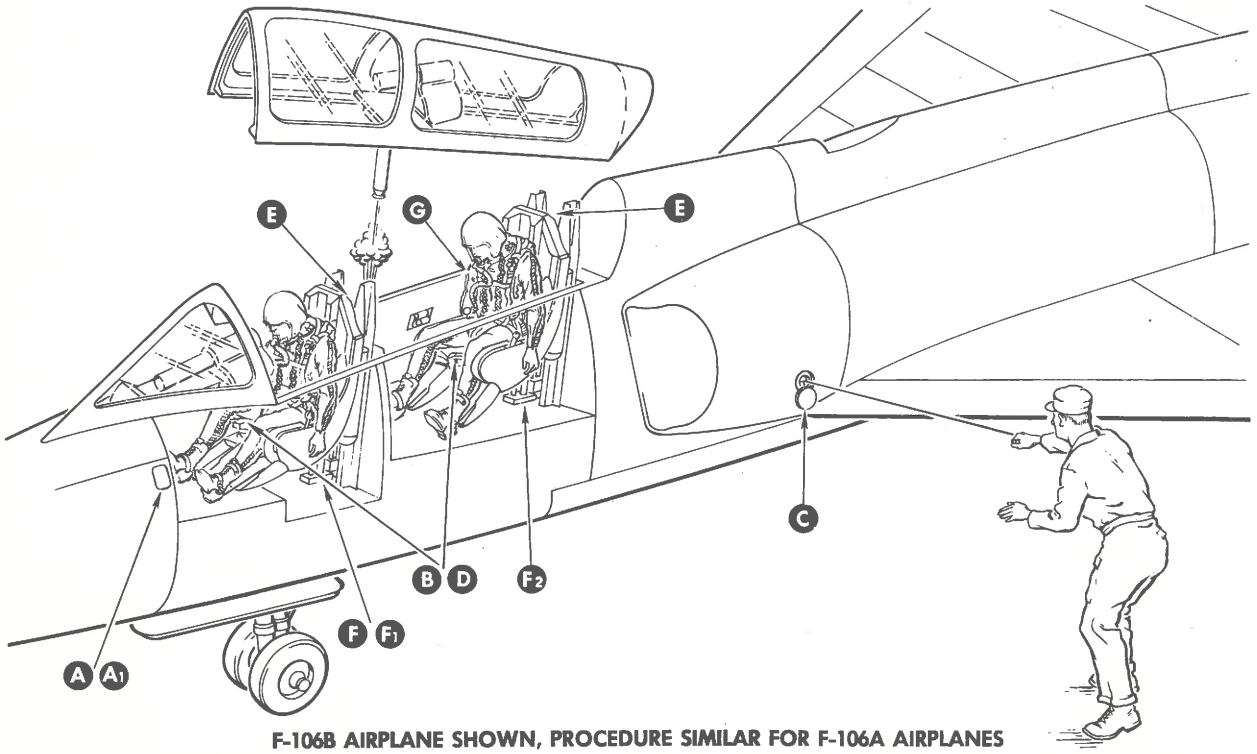
Figure 1-22. Upward Ejection Seat Emergency Rescue Operations (Sheet 2 of 2)



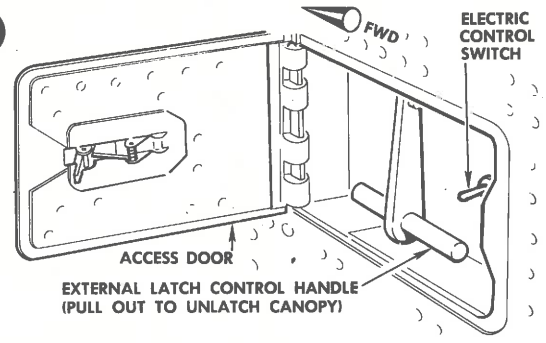
F-106B AIRPLANE SHOWN, PROCEDURE SIMILAR FOR F-106A AIRPLANES

NOTES

F-106 AIRPLANES ARE EQUIPPED WITH EITHER PNEUMATIC OR ELECTRICAL TYPE CANOPY ACTUATORS; MANUAL OPENING OF THE CANOPY IS POSSIBLE WITH EITHER CONFIGURATION.

THE FOLLOWING STEPS ARE PROVIDED AS A GENERAL GUIDE ONLY. CIRCUMSTANCES AT A CRASH SITE MAY REQUIRE DEVIATIONS IN PROCEDURE.

A

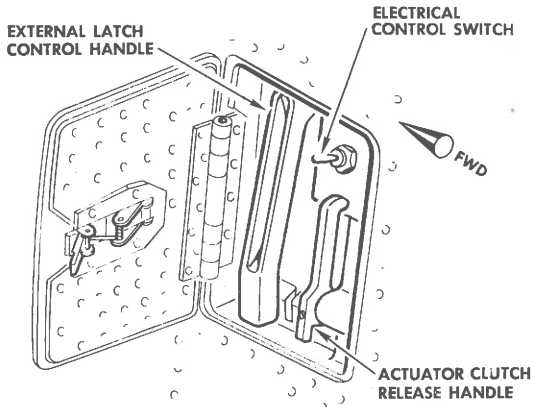


IF CONDITIONS PERMIT NORMAL ENTRANCE

a. Open access door beneath left windshield and pull external canopy latch control handle out four inches to unlatch canopy.
b. Manually raise canopy or hold control switch at "OPEN" position for electrical operation.

.06.02.1064-1 **F-106A AIRPLANES**

A1



IF CONDITIONS PERMIT NORMAL ENTRANCE

a. Open access door beneath left windshield. Pull handle out, rotate handle counterclockwise 100°, pull handle out again, and then rotate handle clockwise to unlatch canopy.
b. Hold electric canopy control switch or pneumatic canopy control lever at the "OPEN" position to raise the canopy.
c. To manually open electrically actuated canopy, rotate actuator clutch release handle down 60° then return handle to original position when canopy is open.

F-106B AIRPLANES

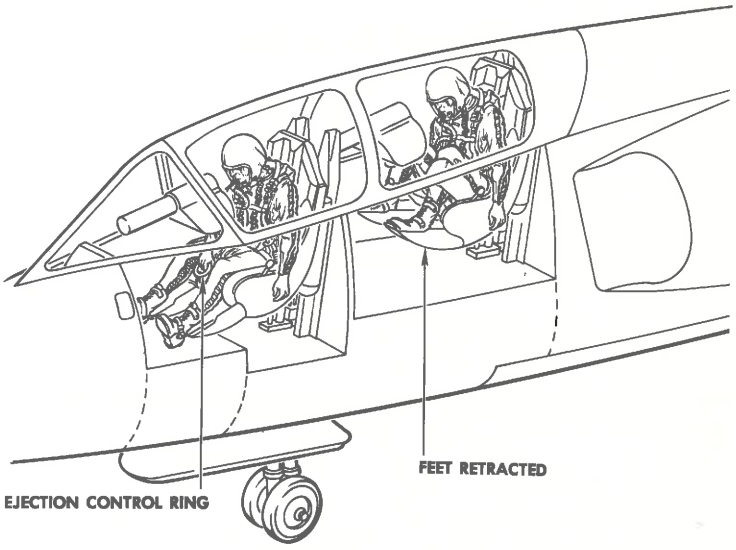
Figure 1-23. Rotational Upward Ejection Seat Emergency Rescue Operations (Sheet 1 of 3)

B

EMERGENCY ENTRANCE

WARNING

TO PREVENT EJECTION OF PILOT AND SEAT, CHECK THAT PILOT (BOTH PILOTS OF F-106B AIRPLANES) HAS NOT PULLED OR IS NOT HOLDING THE SEAT EJECTION CONTROL RING. *IN AFT COCKPIT OF F-106B AIRPLANES,* CHECK THAT PILOT'S FEET ARE NOT RETRACTED. IF EITHER OF THESE CONDITIONS EXIST, OPEN CANOPY BY APPLICABLE PROCEDURE GIVEN IN DETAILS A OR A1. IF EJECTION CONTROL RING (BOTH SEATS ON F-106B AIRPLANES) IS IN STOWED POSITION AS SHOWN IN DETAIL D, PROCEED WITH THE FOLLOWING STEPS.



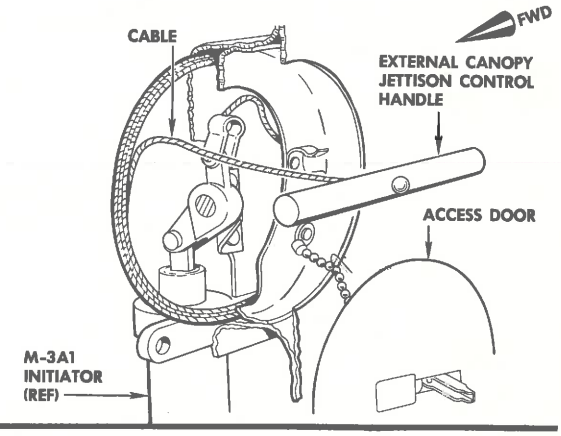
C

IF CONDITIONS DO NOT PERMIT NORMAL ENTRANCE

a. Remove access door on left inlet duct near leading edge of wing.
b. Grasp external canopy jettison handle and pull out until slack in cable is removed. Pull handle outboard to jettison canopy.

WARNING

SPARKS FROM CANOPY JETTISON EXPLOSIVE CHARGE MAY IGNITE SPILLED FUEL. RETREAT BENEATH WING AFTER PULLING CANOPY JETTISON HANDLE TO AVOID DANGER FROM FALLING CANOPY.



D

AFTER CANOPY IS OPENED OR JETTISONED

a. If ejection control ring is in stowed position, detach the pilot's ground safety pin warning streamer from the airplane structure by unsnapping buttons and install the safety pin at the forward edge of the seat. Proceed to step "c."

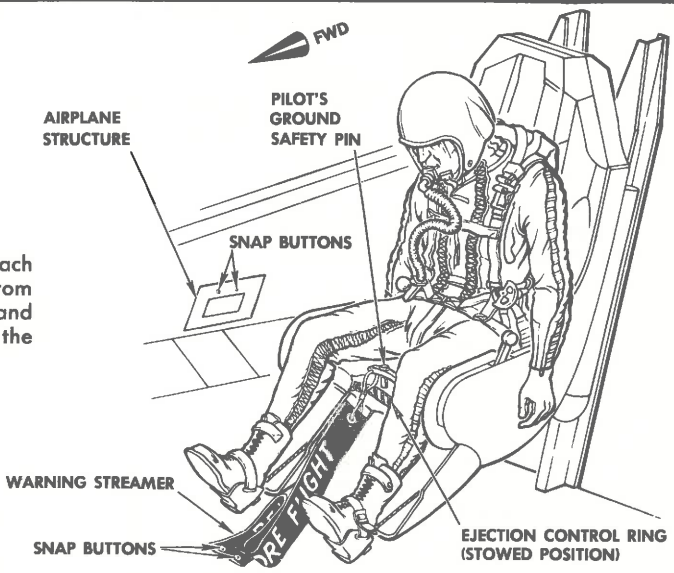


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Figure 1-23. Rotational Upward Ejection Seat Emergency Rescue Operations (Sheet 2 of 3)

E

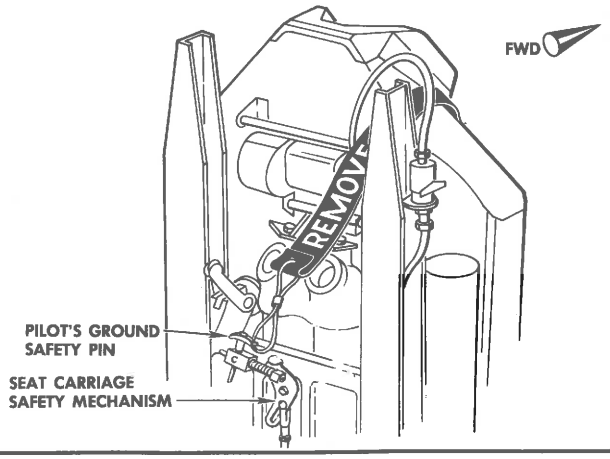
AFTER CANOPY IS OPENED OR JETTISONED (CONT'D)

b. If the pilot has pulled and/or is holding the ejection control ring, or if the pilot's feet (in the aft cockpit of F-106B airplanes) have been retracted as shown in Detail B, proceed as follows:

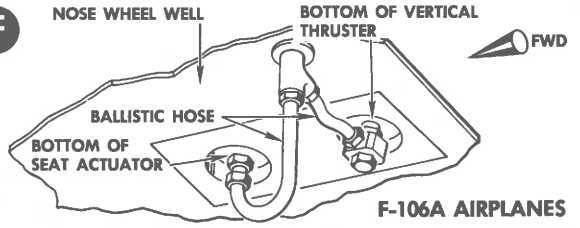
1. Detach the pilot's ground safety pin warning streamer from the airplane structure by unsnapping buttons or by cutting. Actuate seat carriage safety mechanism to safety position and install safety pin. Proceed to Step "c."

WARNING

SAFETY MECHANISM MUST BE RETAINED IN SAFETY POSITION BY SAFETY PIN.

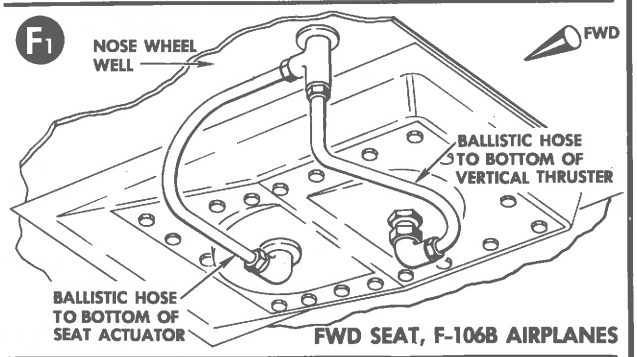


F



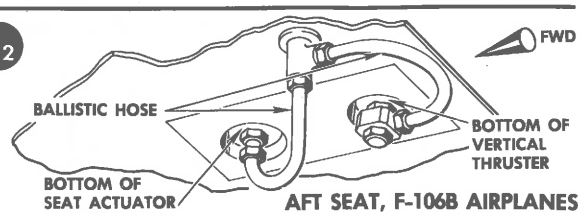
F-106A AIRPLANES

F1



FWD SEAT, F-106B AIRPLANES

F2



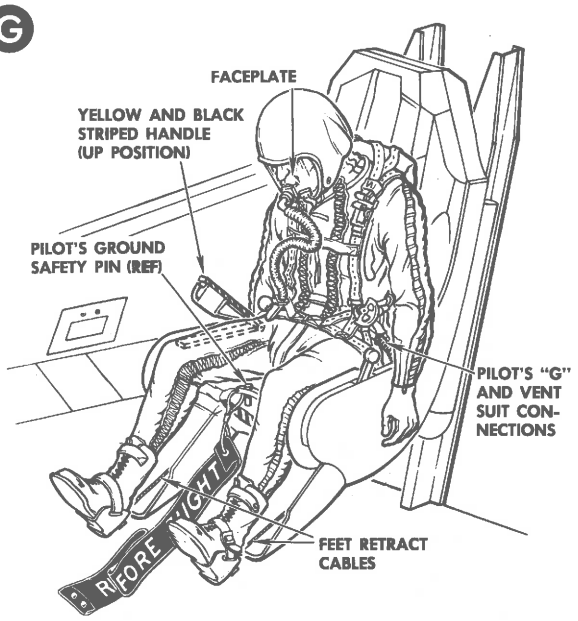
AFT SEAT, F-106B AIRPLANES

2. If conditions permit, cut or disconnect the ballistic hoses connected to the bottom of the seat actuator and vertical thruster. See applicable Detail F.

NOTE

ACCESS TO BALLISTIC HOSE ON F-106A AIRPLANES AND FORWARD SEAT OF F-106B AIRPLANES IS GAINED THROUGH NOSE WHEEL WELL. *ON AFT SEATS OF F-106B AIRPLANES,* ACCESS IS GAINED THROUGH LOWER AFT ELECTRONICS COMPARTMENT. ELECTRONIC EQUIPMENT AND ACCESS DOORS MUST BE REMOVED BEFORE HOSE IS ACCESSIBLE.

G



c. Remove faceplate if pilot is wearing partial pressure suit and helmet.

WARNING

THE HELMET FACE PLATE MUST BE REMOVED PRIOR TO RELIEVING THE SUIT PRESSURE. IF SUIT PRESSURE IS REMOVED FIRST, THE PILOT'S LUNGS MAY BE RUPTURED BY AIR FROM PRESSURIZED HELMET BEING FORCED INTO LUNGS.

d. Pull the yellow and black striped handle on the right arm rest of seat. This action relieves partial pressure suit pressure and pilot will be disconnected from seat, survival kits, and airplane except as noted in steps "e" through "g."
e. Disconnect left-hand personal leads assembly at pilot's "G" and vent suit connections.
f. Disconnect the feet retract cables from the pilot's heel plates by pushing down on cable end fitting.
g. Remove the pilot (parachute will still be attached) as gently as possible to prevent injury.

.06.02.1064-3B

Figure 1-23. Rotational Upward Ejection Seat Emergency Rescue Operations (Sheet 3 of 3)

operated control valve, which is located in the forward cockpit is positioned at "Open," or "Close," that respective operation takes place. Refer to Section VIII of this manual for detailed information.

1-32. EMERGENCY RESCUE OPERATIONS.

The method used in gaining entrance to the cockpit, during emergency rescue operations, is dependent on the individual circumstances such as fire (or impending fire), number of rescuers present, crash equipment present or the physical condition of the pilot. The methods illustrated in figures 1-22 and 1-23 of this manual are to be used as a guide only.

1-33. MISSILE BAY DOOR AND MISSILE LAUNCHER OPERATION.

Normal ground operation of the missile bay doors and the missile launchers is controlled by an electrical control panel. The panel is placarded "ARMAMENT MANUAL CONTROL" and is located in the right main wheel well. A receptacle in the panel receives the remote control harness assembly, 8-96092, when remote control operation is desired. *Applicable to F-106A airplanes 56-453 thru 56-456 and F-106B airplanes 57-2507 and 57-2509,* the electrical control panel is placarded "MISSILE BAY DOOR CONTROL" and controls only the operation of the doors.

1-34. Equipment Requirements.

FIGURE NO.	NAME	TYPE	ALTERNATE	USE AND APPLICATION
4-6	High Pressure Air Compressor	MC-11 (4310-541-7060)	SE0704-801 (4310-697-0858)	To pressurize air flask and supply system.
	Adapter Quick-Disconnect (Manual Disengagement)	SE1085 (4310-574-9334) *Applicable to F-106A airplanes 56-457 thru 57-231.*		To adapt compressor service hose to airplane quick-disconnect.
	Adapter Quick-Disconnect (Automatic Disengagement)	Besler 56150-15 (4730-630-3552) *Applicable to F-106A airplanes 57-232 and subsequent, and all F-106B airplanes.*		
1-25	Generator Set (Gas)	8-96026-801 AF/M32A-13 (6115-583-9365)	8-96026 AF/M3M-2 (6115-617-1417)	To energize electrical systems on aircraft equipped with special quick disconnect receptacle.
	Generator Set (Elec.)	8-96025-803 AF/ECU-10/M (6125-583-3225)	8-96025-805 A/M24M-2	
			8-96025 AF/M24M-1 (6125-620-6468)	
1-24	Generator Set		MC-1 (6125-500 1190)	To energize electrical systems (except AWCIS) on aircraft equipped with standard AN receptacle and on others by using adapter cable 8-96052-801.
			MD-3	

1-34. Equipment Requirements (Cont).

FIGURE NO.	NAME	TYPE	ALTERNATE	USE AND APPLICATION
1-26	Adapter Cable.	8-96052-801 (6115-690-4050)		To connect MC-1 and MD-3 units to aircraft equipped with special quick-disconnect receptacle.
1-11	Lock Assembly, Missile Bay Doors.	8-96061		Prevents inadvertent closing of missile bay doors during maintenance operations.
1-13	Lock Assembly, Forward Missile Launcher.	8-96029 (8200-625047-66)		Locks forward missile launcher in extended position.
1-13	Lock Assembly, Aft Missile Launcher.	8-96030 (8200-625047-65)		Locks aft missile launcher in extended position.
	Lock Pin, Manual Control Valve.	8-96135		Prevents inadvertent operation of missile doors when doors are opened by manual control valve.
	Armament Remote Control Box.	8-96092 (1720-601-2253)		To operate missile bay doors and missile launchers.

1-35. To Open Doors and Extend Launchers.

a. Make sure that personnel and equipment are clear of the area.

b. Connect external 28-volt dc power; refer to paragraph 1-42.

WARNING

To prevent possibility of inadvertent armament system operation, check that the "ARM/SAFE" switch is in the "SAFE" position, that the armament selector switch is in the "VIS IDENT" position and that the armament safety switch (nose wheel well) is in the door open position.

c. Check pneumatic system pressure. Charge system, if pressure is below 1500 psi, by procedure given in paragraphs 2-22 through 2-25.

CAUTION

Do not operate missile bay doors or missile launchers if pneumatic system pressure is below 1500 psi. Damage to actuating cylinders may result due to low snubbing pressures.

d. Place door switch in "OPEN" position; doors will open.

e. Place launcher switches in "DOWN" position; launchers will extend.

f. Lock manual control valve in "OPEN" position with lock pin attached to door cylinder safety lock 8-96061-801; see figure 1-11.

g. Install door safety locks as shown in figure 1-11.

h. Install applicable missile launcher safety locks as shown in figures 1-12 or 1-13.

1-36. To Retract Missile Launchers and Close Doors.

a. Check missile bay, missile bay doors and launcher mechanisms for tools or other items that may have been left during maintenance operations.

b. Check pneumatic system pressure. Charge system, if pressure is below 1500 psi, by procedure given in paragraphs 2-22 through 2-25.

CAUTION

Do not operate missile bay doors or missile launchers if pneumatic system pressure is below 1500 psi. Damage to actuating cylinders may result due to low snubbing pressure.

c. Remove missile launcher safety locks.

d. Remove door safety locks.

e. Remove control valve lock pin and place valve in "CLOSE" position.

f. Make sure that personnel and equipment are clear of the area.

g. Connect external power; refer to paragraph 1-42.

h. Place launcher switches in "UP" position.

i. Place door switch in "CLOSE" position.

1-37. To Open Doors When Electrical Power Is Not Available.

NOTE

This procedure allows the visual indicator pins of the door selector valves to remain in door closed or "in" position. Thus, the indicator pins are out of phase with the door position, and if manual door control valve is moved to "CLOSE" the doors will close without electrical selection.

a. Make sure that personnel and equipment are clear of the area.

b. Place handle of manual control valve, located in left main wheel well, in "OPEN" position; doors will open.

c. Install manual control valve safety lock pin 8-96135.

d. Install door safety locks as shown in figure 1-11.

1-38. To Close Doors After Opening Without Electrical Power.

a. Check that manual control valve is in "OPEN" position. Charge pneumatic system if pressure is below 1500 psi by procedure given in paragraphs 2-22 through 2-25.

CAUTION

Do not charge pneumatic system unless manual control valve is locked in "OPEN" position. If valve is in "CLOSE" position doors will attempt to close when the pneumatic system is pressurized.

b. Connect external 28-volt dc electrical power; refer to paragraph 1-42.

c. Check that "RESET PWR" fuse is inserted in the armament manual control panel.

d. Actuate the door control switch on the armament manual control panel to "OPEN." This positions the door selector valves to the door open position.

e. Remove door safety locks.

f. Remove manual control valve safety lock pin.

g. Make sure personnel and equipment are clear of the area.

h. Place the handle of manual control valve in "CLOSE" position; doors will not close.

i. Actuate door control switch to "CLOSE" position; doors will close.

1-39. To Open Doors When Pneumatic System Is Inoperative.

a. Remove access doors from outboard missile bay door.

b. Support door and remove bolts attaching door to actuating mechanism; open door.

1-40. EXTERNAL ELECTRICAL POWER RECEPTACLES.

Applicable to F-106A airplanes 56-453, -455, -456, -458 through -462 and 56-467, and F-106B airplanes 57-2507 and 57-2509. Three (two ac and one dc) power receptacles, as shown in figure 1-24, are provided for the connection of an external source of power to the airplane's electrical systems. When the airplane's engine is not operating and ground operations that require electrical power are being performed, external power must be used. The dc and ac power receptacles located in the right main wheel well are normally used for all ground operations requiring electrical power except during landing gear operational checks. The dc power receptacle located in the upper aft electronic compartment must be used during landing gear operational checks to permit closing of the landing gear doors.

1-41. *Applicable to F-106A airplanes 56-454, -457, -463 through 56-466, 57-229 and subsequent; and F-106B airplanes 57-2508, 57-2510 and subsequent.* One external power receptacle, as shown in figure 1-25, is housed within the fuselage at Station 171. The receptacle is designed to receive both ac and dc power from a single plug of the external power unit. Access to the receptacle is gained by opening the spring-loaded external power access door on the left side of the fuselage. Quick-disconnect provisions are included at the connection between the external power unit's plug and the airplane's external power receptacle. When the airplane starts to move in an emergency such as a "scramble," the external power connection to the airplane is automatically disconnected and the spring-loaded access door closes.

1-42. CONNECTING EXTERNAL ELECTRICAL POWER.

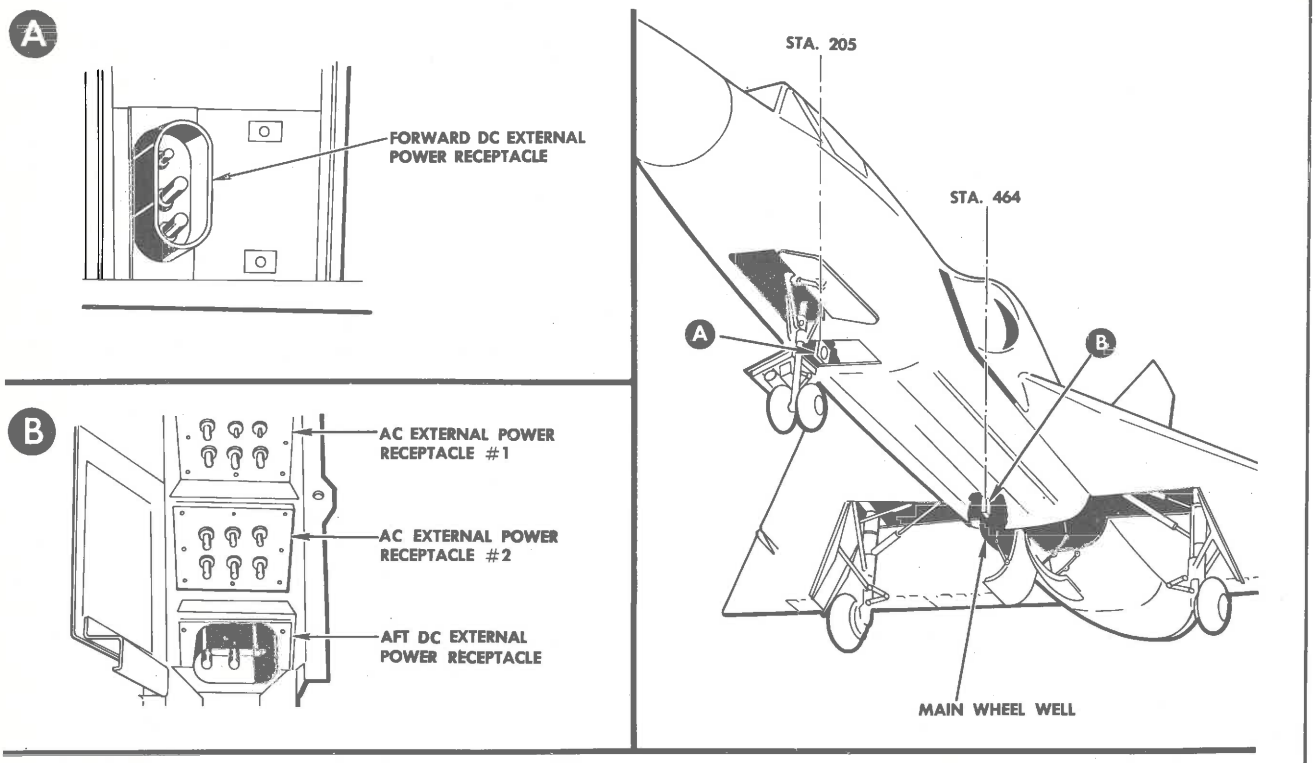
Connect external electrical power to the airplane as follows:

a. Place the following switches in the position indicated.

1. Master power switch, "OFF."
2. AC generator switch, "OFF."
3. DC generator switch, "OFF."
4. Pursuit switch, "OFF."
5. Armament selector switch, "VIS IDENT."
6. Armed-safe switch, "SAFE."
7. AWCIS power switch, "OFF."
8. Rain removal switch, "OFF."

b. Remove, invert, and place the following fuses in the stowed position if the affected systems are not to be operated.

1. "J-4 COMPASS 28-VDC" in right cockpit fuse panel.
2. "J-4 COMPASS ⌀B" in right cockpit fuse panel.
3. "J-4 COMPASS ⌀C" in right cockpit fuse panel.
4. "J-4 COMPASS & K4 TRANS" (3 places) in right cockpit fuse panel.



CONNECTING EXTERNAL POWER

a. Check that external power plugs are not energized.
b. Securely connect external power plugs of MD-3 or MC-1 external power units to airplane receptacles.
c. Energize dc, then ac external power.

DISCONNECTING EXTERNAL POWER

a. Actuate external power unit switches to "OFF" position.
b. Disconnect external power plugs.

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Figure 1-24. Connecting External Power
Applicable to F-106A airplanes 56-453, -455, -456, -458 thru -462 and 56-467; and F-106B airplanes 57-2507 and 57-2509

5. "AIC-10" in right cockpit fuse panel.
6. "TANK EJECT CONT" in left cockpit fuse panel.
7. "TANK EJECT PWR" in main wheel well fuse panel.
8. "RESET POWER" in main wheel well fuse panel.
9. "ARM POWER" in main wheel well fuse panel.

NOTE

If the canopy battery has been removed, invert the following fuses in addition to those listed above:

"CANOPY BAT" (3) in nose wheel well fuse panel.

"CANOPY SEC PWR" in nose wheel well fuse panel.

"CANOPY CLUTCH RELEASE" (F-106A airplanes only) in nose wheel well fuse panel.

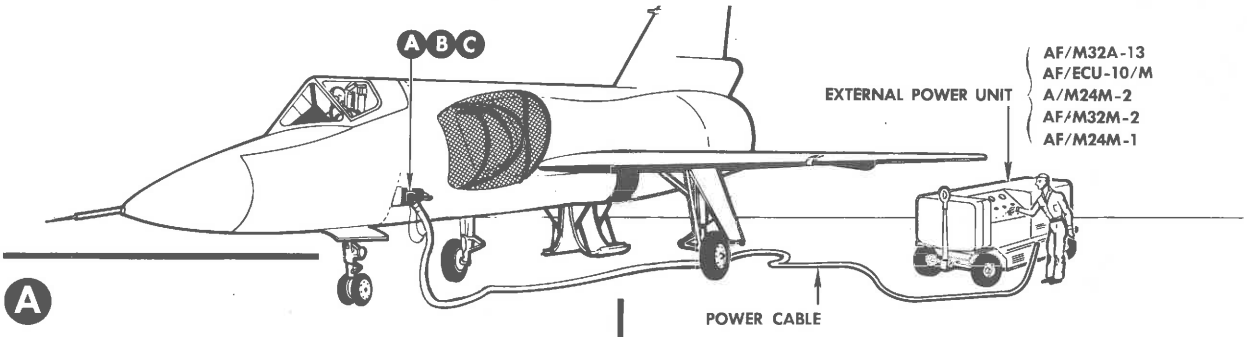
CAUTION

Replace all fuses in the operating position prior to flight.

c. Connect external power unit to airplane; see figures 1-24, 1-25, or 1-26 for procedure.

CAUTION

When connecting external power to the airplane, make sure that the electrical cable is routed aft of the main landing gear wheel. This precaution will prevent damage to the electrical cable by the wheel when the airplane is moved forward.



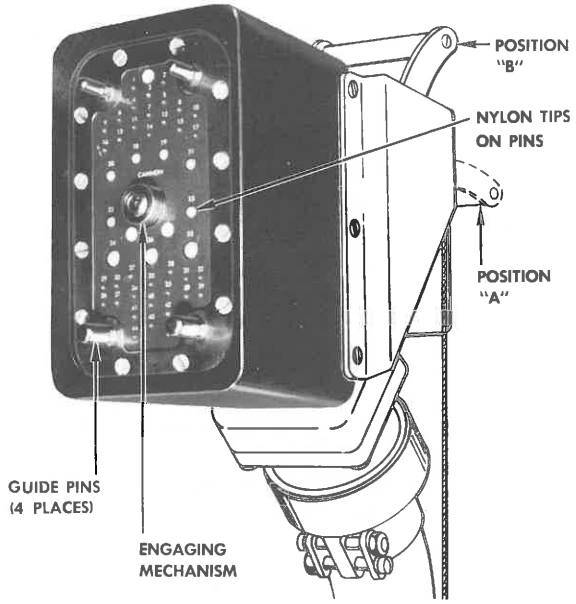
A

CONNECTING EXTERNAL POWER

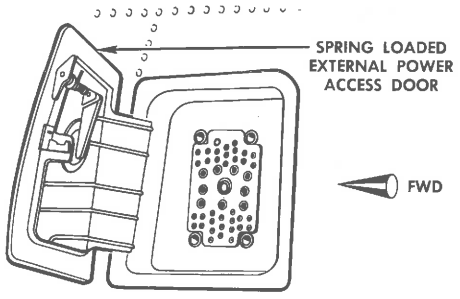
a. Check that external power plug is not energized.
b. Inspect external power plug for damaged nylon tips or broken pins.

CAUTION

TWO MEN SHOULD CONNECT THE EXTERNAL POWER PLUG TO THE AIRPLANE TO OBTAIN A FLUSH FIT AND PREVENT BREAKING POWER PLUG PINS DURING ENGAGEMENT.

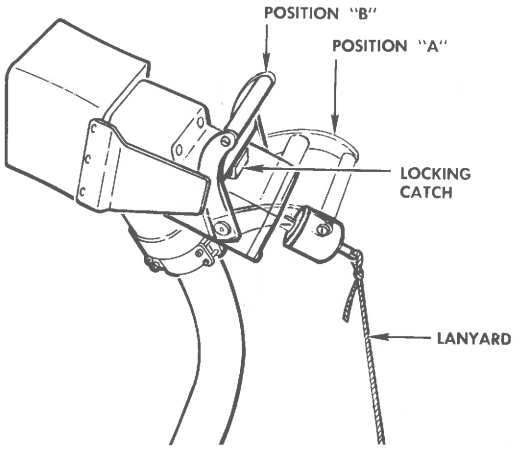


B



c. Open spring-loaded access door to external power receptacle.

C



d. Check that external power plug handle is in position A. Insert guide pins in guide sockets of receptacle and apply pressure on plug until engaging mechanism locks.
e. While supporting the plug, move handle to position B to engage external power plug pins in external power receptacle.
f. Turn on external dc and ac, and the AWCIS power.

DISCONNECTING EXTERNAL POWER

a. Deenergize external power plug.
b. Support the plug and pull on lanyard to release plug.

CAUTION

DO NOT ALLOW THE PLUG TO DROP TO THE GROUND.

c. Inspect external power plug for damaged nylon tips or broken pins. If nylon tips are damaged or pins are broken, inspect airplane receptacle for damaged parts.

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Figure 1-25. Connecting External Power (Preferred)
Applicable to F-106A airplanes 56-454, -457, -463 thru 56-466, 57-229 and subsequent; and F-106B airplanes 57-2508, 57-2510 and subsequent

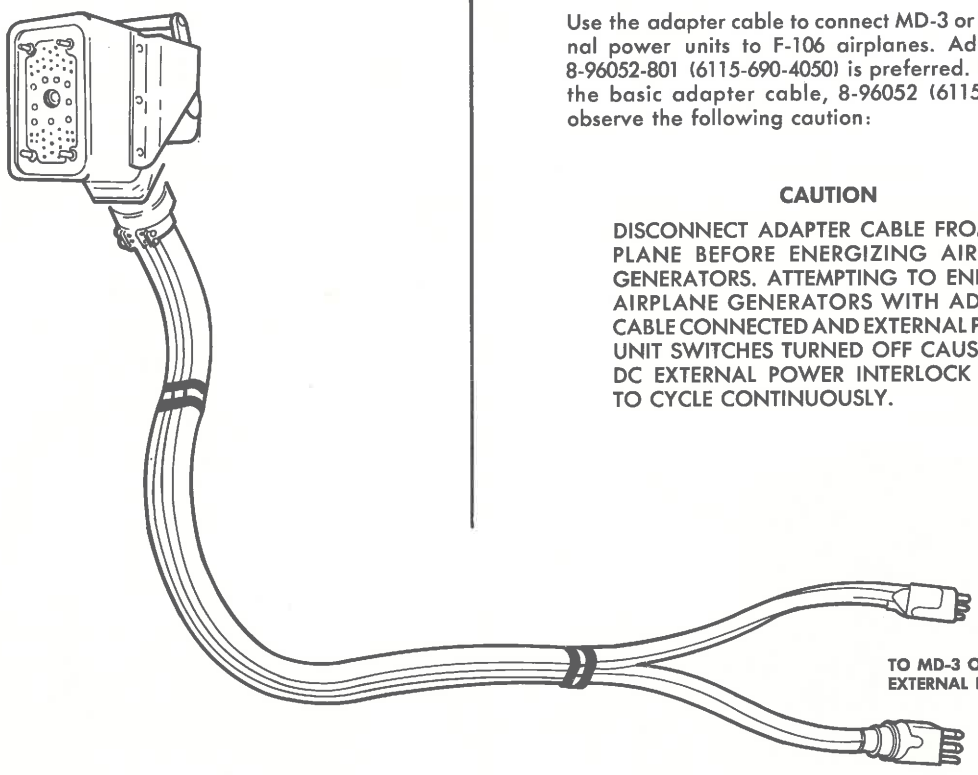

Figure 1-26. Connecting External Power (Alternate)
Applicable to F-106A airplanes 56-454, -457, -463 thru 56-466, 57-229 and subsequent; and F-106B airplanes 57-2508, 57-2510 and subsequent

d. *Applicable to F-106A airplanes 56-454, -457, 463 thru 56-466, 57-229 and subsequent, and F-106B airplanes 57-2508, 57-2510 and subsequent.*

Use adapter cable 8-96052 in conjunction with an MC-1 or MD-3 ground power unit when AWCIS generator set is not available. See figure 1-26 for connecting procedure.

e. *Applicable to F-106A airplanes 56-453 thru 57-2506 and F-106B airplanes 57-2507 thru 57-2531,* disconnect the plug from the battery in the emergency dc power package while external power is applied to the airplane.

CAUTION

Failure to disconnect the plug causes the battery to discharge.

ENGINE GROUND OPERATIONS

1-43. ENGINE GROUND RUNUP PROVISIONS.

Prior to engine ground runup, a restraining bridle, SE 0583-801, is attached to the main landing gear to hold the airplane stationary. This restraining bridle consists of two cables which are attached to lugs on the main landing gear struts and to a plate and shackle at the ground anchor installation. Figure 1-27 illustrates the restraining bridle. Protective screens are installed at the engine air intake ducts to prevent the entry of foreign material into the engine.

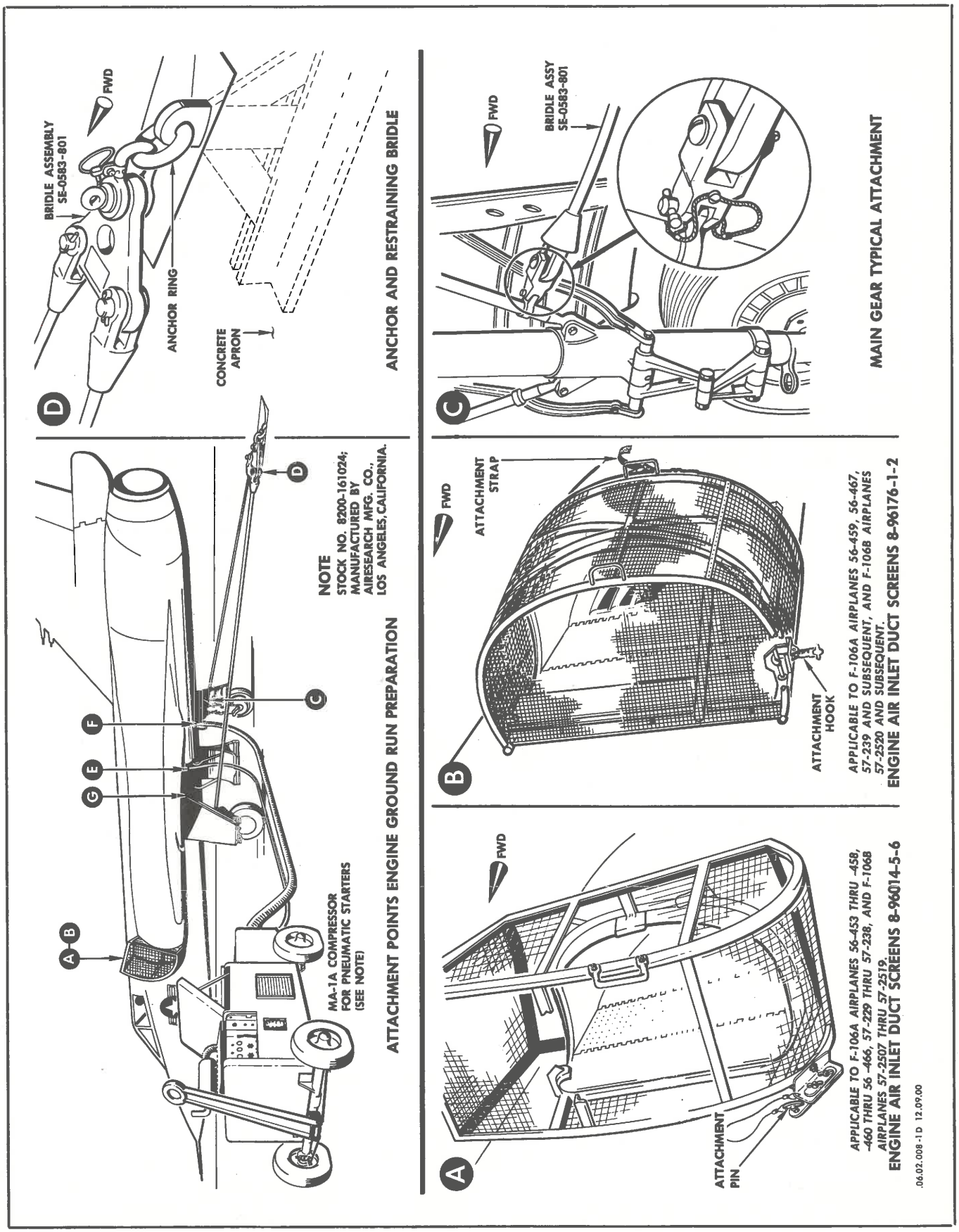

Figure 1-27. Engine Ground Run Preparation (Sheet 1 of 2)

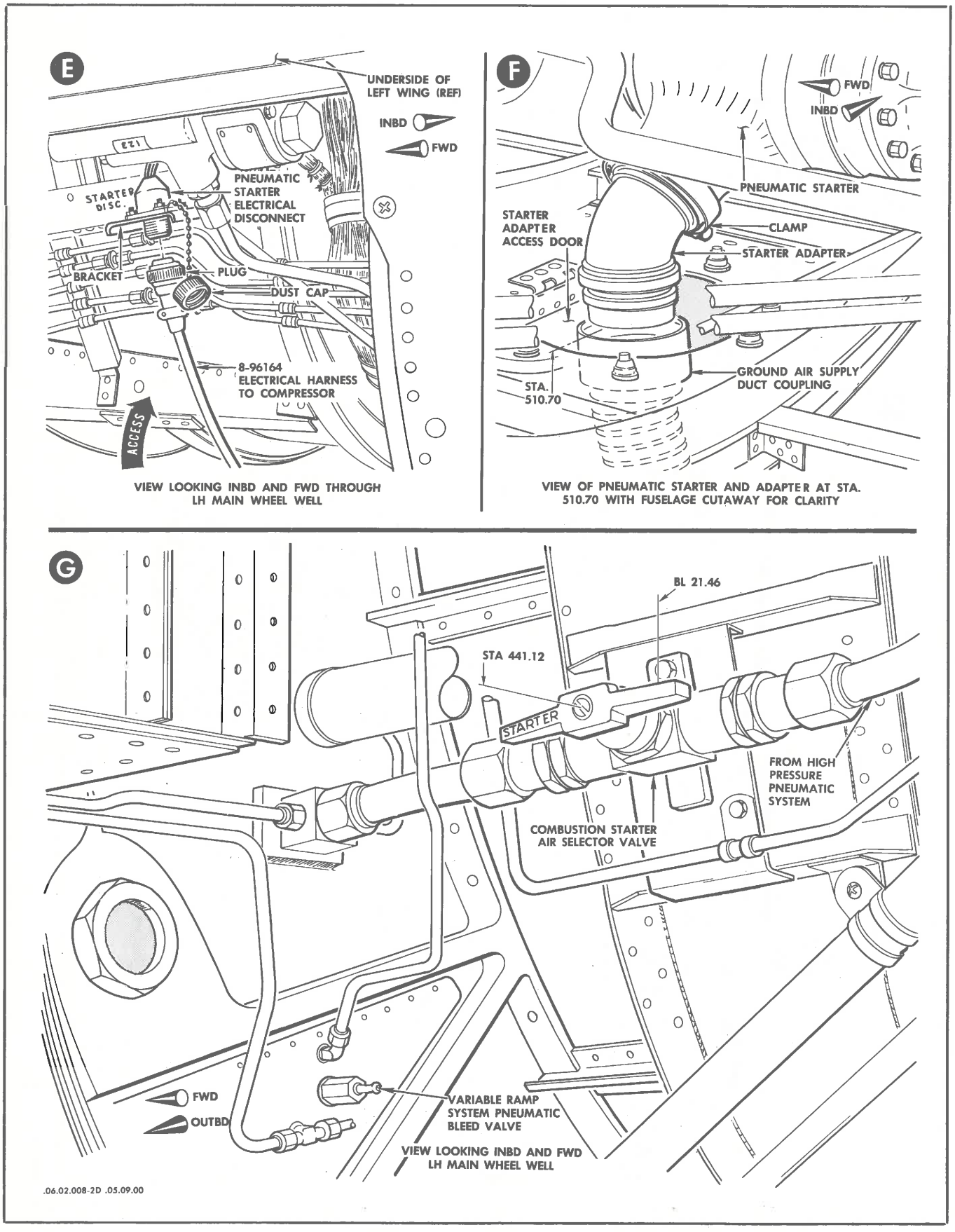

Figure 1-27. Engine Ground Run Preparation (Sheet 2 of 2)

WARNING

Inlet duct runup screens will not be installed or removed with engine operating.

The requirement for the use of air intake duct protective screens may be disregarded during conditions of icing and when making engine power trim checks. Runup with the screens removed will be made in a designated and thoroughly cleaned area. Figure 1-27 illustrates the air intake duct screens.

1-44. FIRE ACCESS DOOR.

The spring-loaded (closed) fire access door, located at Station 491 on the lower left side of the fuselage, provides a quick and easy means for inserting a fire extinguisher nozzle into the engine accessory compartment in the event of fire. The door is opened by pushing with the fire extinguisher nozzle.

1-45. EXTINGUISHING GROUND FIRES.

The procedures and extinguishing agents used to extinguish ground fires are dependent upon the multiple factors involved in each individual fire. The following procedures of extinguishing ground fires are to be used as a guide only; local orders will dictate procedures for extinguishing fires.

1-46. Fire Within Engine or Tailpipe.

Fire within the engine or tailpipe may occur during engine shutdown or on an aborted engine start. When an abnormal rise in exhaust temperature is indicated or if ground crew observer reports fire in tailpipe, proceed to blow out fire as follows:

a. Throttle – "OFF."

b. External high pressure air and external electrical power connected to airplane; master power switch – "OFF."

NOTE

If external electrical power is not available, the master power switch must be in the "ON" position.

c. Engine ignition disarming switch in main wheel well (combustion starters only) – "DISARMED."

d. All fuel shutoff switches – "CLOSED" OR "OFF."

CAUTION

If the safety wire has been broken on any of the fuel system switches, the left and right fuel shutoff valve indicators located on the valves must be visually checked to insure that the valves are in the open position when the fuel shutoff switches are placed in "ENGINE" or "OPEN." This procedure requires removal of the fire seal doors inboard of the valves. Refer to T.O. 1F-106A-2-5 for an illustration of the fuel shutoff valve installation.

e. Fuel boost pump switches – "OFF."

f. Depress throttle ignition button on combustion starter equipped airplanes and move throttle to "START," to "OFF," then to "IDLE." Permit starter to run full cycle; then release ignition button and return throttle to "OFF" position.

g. Throttle to "START" on pneumatic starter equipped airplanes and crank engine 20 seconds, return throttle to "OFF" position.

1-47. Fire Within Engine Accessory Compartment.

Fire within the engine accessory compartment or in the engine compartment is indicated when the fire detector warning light is illuminated. To extinguish fire proceed as follows:

a. Shut down engine.

b. Position fuel selector switch at OFF.

c. Open fire access door with fire extinguisher nozzle and discharge fire extinguisher.

1-48. ENGINE GROUND RUN OPERATION.

1-49. Equipment Requirements.

FIGURE NO.	NAME	TYPE	ALTERNATE	USE AND APPLICATION
1-27	Airplane Restraining Bridle.	SE-0583-801 (1730-615-0315)		To secure airplane for engine ground run.
	Wheel Chocks.	P/N42D6594-2 (8200-159001, Class 19A or equivalent.)	P/N50D6602 (8200-159006, Class 19A or equivalent.)	To aid in restraining airplane. Alternate chocks to be used under ice and snow conditions.

1-49. Equipment Requirements (Cont).

FIGURE NO.	NAME	TYPE	ALTERNATE	USE AND APPLICATION
1-27	Engine Inlet Duct Screens.	8-96014-5-6 -5(1730-612-9259) -6(1730-612-9261)		To prevent foreign material from entering ducts during engine ground run. *Applicable to F-106A airplanes 56-453 thru -458, -460 thru -466, 57-229 thru 57-238, and F-106B airplanes 57-2507, -2508, and 57-2510 thru 57-2519.*
1-27	Engine Inlet Duct Screens.	8-96176-1, -2 -1(1730-650-1413) -2(1730-646-8903)		To prevent foreign material from entering ducts during engine ground run. *Applicable to F-106A airplanes 56-459, 56-467, 57-239 and subsequent, and F-106B airplanes 57-2509, 57-2520 and subsequent.*
	Starter Air Valve Electrical Harness.	8-96164 (1730-622-1317)		To be used in conjunction with ground compressor unit when starting pneumatic starter equipped airplane.
	Gas Turbine Compressor Unit, (low-pressure air).	MA-1A (8200-161024)		Compressed air source for starting pneumatic starter equipped airplanes.
4-6	High Pressure Air Compressor.	MC-11 (4310-541-7060)	SE0704-801 (4310-697-0858)	Compressed air source for starting combustion starter equipped airplanes.
1-25	Generator Set (gas).	8-96026 (AF/M32 M-2)	8-96026-801 (AF/M32A-13) 8-96025-805	To energize electrical systems on aircraft equipped with special quick disconnect receptacle.
	Generator Set (elec).	8-96025 (AF/M24M-1)	(A/M24M-2) (AF/ECU-10/M)	
1-24	Generator Set.		MC-1 (8100-519374-453)	To energize electrical systems (except AWCIS) on aircraft equipped with standard AN receptacle and on others by using adapter cable 8-96052.
			MD-3	
1-26	Adapter Cable.	8-96052 (6115-557-8548)		To connect MC-1 and MD-3 units to aircraft equipped with special quick-disconnect receptacle.
	Fire Fighting Equipment.			Fire extinguishing agent in case of fire.
	Intercommunication Equipment.			For contact between cockpit and ground observer.

1-50. Preparing and Securing Airplane for Ground Run.

a. Park airplane on hard surfaced area with nose of airplane into the wind.

WARNING

Danger areas around the engine intake and discharge ducts must be kept clear of all personnel, vehicles, loose gear, stones, hardware, stands, etc. See figure 1-10 of this manual for an illustration of danger areas.

b. Secure airplane to an approved engine runup anchor, using the airplane restraining bridle, SE 0583-801, secured to the attachment rings on the main landing gear. See figure 1-27 for an illustration of the restraining bridle installation, and inlet duct screen.

c. Check all logs and records to see that work on previous flight discrepancies has been completed.

d. Check that the following ballistic ejection systems have ground safety pins installed or that the systems have been deactuated.

1. Canopy jettison and seat ejection (at ejection control handle of seat; both seats on F-106B airplanes).
2. External fuel tanks (at jettisoning mechanism of each tank).
3. Armament system; refer to T.O. 1F-106A-2-12.

e. Check that landing gear control handle is in the "DOWN" position.

f. Check that landing gear safety pins are installed.

g. Check that fire-fighting personnel and equipment are on hand and ready for engine start.

h. Remove all plugs and covers from engine air inlet and discharge ducts.

i. Check that all ducts are clear of hardware, dirt and oil, that ducts are not cracked, and that ramps are fully retracted.

j. On F-106A airplanes, close left and right upper-aft electronics compartment doors; secure all stressed panel fasteners.

k. Install applicable engine air inlet duct screens 8-96014-5 and -6 or 8-96176-1 and -2.

WARNING

Inlet screens shall be installed for engine run. Do not install or remove screens with engine running.

l. Check airplane for proper fuel servicing; refer to paragraphs 2-4 through 2-8.

m. Service engine oil tank. Refer to paragraph 2-16 for servicing instructions.

n. Check hydraulic system reservoirs for proper servicing; refer to paragraph 2-20.

o. Check air preload of hydraulic accumulators; refer to paragraph 2-21.

p. Check high-pressure pneumatic system for charge of 3000 psi; refer to paragraphs 2-22 through 2-25. On combustion starter equipped airplanes, connect external high pressure air source to fitting in left main wheel well. Starter air selector valve in main wheel well to be in "CLOSED" position. If start is to be made from airplane's high pressure pneumatic system, place starter air selector valve in "OPEN" position.

q. Check constant speed drive and engine starter systems for proper oil servicing; refer to paragraphs 2-17 and 2-19.

NOTE

After replacement of a remote or engine mounted gear box of the constant speed drive system or when the oil supply system has been disturbed, it is necessary to prime the constant speed drive oil system. Refer to T.O.1F-106A-2-4 for procedure.

r. *Applicable to F-106A airplanes 56-453 thru 57-2465, and F-106B airplanes 57-2507 thru 57-2522 prior to incorporation of TCTO 1F-106J-565.* Check that constant speed system generator air pressurization line is disconnected at the T fitting below the right hydraulic pump and that a warning streamer is attached. The line is to remain disconnected until after engine start to purge possible fuel fumes.

s. Connect external power, refer to paragraph 1-42 for procedure.

t. On pneumatic starter equipped airplanes, connect gas turbine compressor flex duct to pneumatic starter air duct; see figure 1-27. Connect starter air valve harness to receptacle in main wheel well.

u. On combustion starter equipped airplanes, check that the engine ignition disarming switch in the main wheel well is in the "ARMED" position.

v. Check that fuses are installed in the following panels:

1. Main wheel well fuse panel.
2. Nose wheel well fuse panel.
3. Cockpit RH fuse panel.
4. Cockpit LH fuse panel.

w. Check that constant speed drive shaft and shaft cover are properly installed. Refer to T.O. 1F-106A-2-4 for procedure.

CAUTION

Refer to T.O. 1F-106A-2-4 for constant speed engine mounted gearbox conditioning and operating limitations if the engine is to be operated with the constant speed drive shaft removed.

x. Check that there are no fuel puddles in engine tail pipe or in fuselage area near drain lines.

NOTE

Perform an engine trim check, as outlined in T.O. 1F-106A-2-4, using calibrated external instruments if any of the following conditions exist:

Engine has been replaced.

Fuel control has been replaced.

Afterburner has been replaced.

Maintenance or adjustment has been performed on afterburner exhaust nozzle.

Performance decay has been reported from previous flight operation.

Pressure ratio indication out of limits from previous engine run.

Fuel control "IDLE" or "TRIM" screw paint seal has been broken.

Fuel control "IDLE" adjustment has been made.

y. Replace the airplane's pressure ratio indicator if the external instruments indicate that the airplane's indicator is malfunctioning. Conduct engine trim procedure as outlined in T.O. 1F-106A-2-4, if the trim check run readings do not meet the specified requirements.

1-51. Engine Starting Description (Pneumatic Starters).

On pneumatic starter equipped airplanes, actuation of the engine starter is initiated by depressing and holding the ignition button. The throttle lever is then moved outboard to the "START" position. The throttle lever is spring-loaded to the "OFF" position and must be held in the "START" position.

WARNING

The areas around engine air intake ducts can be dangerous to ground personnel during engine runup due to suction of inrushing air.

The area aft of the engine tailpipe is dangerous because of the high temperature and velocity of exhaust gases. This danger area is illustrated on figure 1-10. The tailpipe area remains dangerous for at least 15 minutes after engine shutdown and particularly when smoke or vapors are apparent.

This movement operates the throttle position switch in the throttle quadrant which opens the starter air valve. Opening of the valve permits compressed air from the gas turbine compressor to actuate the starter. The throttle lever is held in the "START" position until the starter is turning the engine from 1% to 6% rpm. With the ignition button still depressed, the throttle lever is moved back to the "OFF" position. This movement of the lever initates ignition through the repositioning of the throttle position switch. Operation of the starter will continue as long as the ignition button is depressed, or until the starter centrifugal switches actuate due to starter overspeed. The throttle lever is then advanced toward "IDLE." This actuates the fuel control, permitting fuel to be injected into the engine combustion section. As the fuel is ignited, the engine rpm increases. The ignition button is held until the engine instruments indicate a positive self-sustaining light-off, and then is released.

CAUTION

Do not operate pneumatic starters more than 90 seconds during a 20-minute period.

In the event the ignition button is momentarily released, when the throttle is between "OFF" and "IDLE," and an engine light-off has not been attained, return the throttle lever to the "OFF" position. This action will prevent additional fuel from being injected into the engine combustion section. Ignition cannot be reinitiated without performing the complete starting procedure from the beginning. After returning the throttle to the "OFF" position, do not attempt another start until fuel drainage from the engine combustion chamber drain has ceased. If there is no fuel drainage from the engine at this time, check and correct cause of this malfunction.

1-52. Engine Starting Description (Combustion Starters).

During the engine starting procedure, care must be exercised to correctly operate the starter, ignition, and throttle controls to successfully complete the engine start. Actuation of the starter is initiated by depressing and holding the ignition button. The throttle lever is then moved and held at the "START" position until an rpm indication is noted on the engine tachometer.

WARNING

Release ignition button immediately if an rpm indication is not shown on the tachometer. When rpm is not indicated, the starter has not engaged the engine and continued starter operation could result in starter disintegration with danger from flying parts.

This action opens the starter air solenoid valve, air rotation of the starter begins, and the ignition systems of the starter and the engine are armed. With the ignition button still depressed, the throttle is moved to the" OFF" position and then to the "IDLE" position. This movement is to be a continuous motion with no hesitation at the "OFF" position.

Movement of the throttle from "START" to "IDLE" actuates the starter and engine ignition systems and permits fuel to be injected into the engine combustion chambers. Operation of the starter will continue until the ignition button is released, or until the starter fuel accumulator fuel supply is depleted or upon actuation of the starter overspeed switch.

1-53. Procedure, Engine Start.

The following procedure is recommended for starting the engine:

NOTE

On F-106B airplanes, ground starting is accomlished from the forward cockpit only. In the aft cockpit, place the master power switch at "ON" and the fuel switch at "NORMAL." The procedure that follows is applicable to F-106A airplanes and the forward cockpit of F-106B airplanes.

a. Place the following switches in the indicated positions:

1. Master switch, "OFF."
2. DC generator switch, "OFF."
3. AC generator switch, "OFF."
4. Fuel control, "NORMAL" ("EMER FUEL ON" light off).
5. Check that fuel system switches are in proper position to open shutoff valves in main tanks, "F" tank, and "T" tanks.

CAUTION

If the safety wire securing the fuel system switches has been broken, the left and right fuel shutoff valve indicators, located on the valves, must be visually checked to insure that the valves are in the open position. This procedure requires removal of the fire seal doors inboard of the valves. Refer to T.O. 1F-106A-2-5 for an illustration of the fuel shutoff valve installation.

6. Throttle lever, "OFF."
7. CG Control, "AUTO."
8. Idle thrust control, "OFF."
9. Variable inlet override switch. "NORMAL."
10. All electronic equipment including MA-1 or AN/ASQ-25 system and communication equipment, "OFF."
11. Refrigeration switch, "'OFF."
12. Cabin air switch. "OFF."
13. Cockpit canopy, "OPEN."
14. Rain clearing, "OFF."

WARNING

Items "a. 1." and "a. 10." thru "a. 12." must be maintained in the condition indicated after engine start to prevent entry of fuel fumes into the cockpit and electronic compartments through the air conditioning system.

b. All other switches in the nonoperating position.

c. *Applicable to F-106A airplanes 56-453 thru 57-2465 and F-106B airplanes 57-2507 thru 57-2522.* Check fire detection system by holding fire test switch in "OVHT;" light shall flash on and off. Position switch to "FIRE;" light shall illuminate steadily. *Applicable to F-106A airplanes 57-2466 and subsequent and F-106B airplanes 57-2523 and subsequent.* Check fire detection system by placing test switch in "LOOP 1" then place switch in "LOOP 2." The "FIRE" warning light shall flash on and off when placed in either loop position.

d. Check master warning system by depressing warning lights test switch on right console panel; all warning lights shall illuminate.

e. Set pressure ratio indicator "TAKE OFF" for the correct ambient air temperature. This value is determined by computing the ambient air temperature to a point halfway between the minimum and maximum lines of the trim check band on the trim chart shown in T.O. 1F-106A-2-4.

f. Check that all boost pump switches are in "OFF" position and that both "FUEL BOOST PRESS" lights are illuminated. Check operation of fuel boost pumps as follows:

1. Place both forward boost pump switches in "ON" position; both "FUEL BOOST PRESS" lights shall extinguish.
2. Place both forward boost pump switches in "OFF" position; both "FUEL BOOST PRESS" lights shall illuminate.
3. Place both aft boost pump switches in "ON" position; both "FUEL BOOST PRESS" lights shall extinguish.
4. Place both forward boost pump switches in "ON" position; leave aft boost pump switches in "ON" position.

g. On pneumatic starter equipped airplanes, start gas turbine compressor per instructions on unit; adjust to operating speed.

h. Initiate engine start as follows:

1. On pneumatic starter equipped airplanes, depress ignition button and hold; move throttle lever to "START." At a rpm indication of from 1% to 6%, with ignition button depressed, move throttle lever to "OFF," then to "IDLE."
2. On combustion starter equipped airplanes, depress the ignition button and hold; move the throttle outboard to "START" position. Check tachometer for positive rpm indication, then move the throttle inboard to "OFF," then forward to "IDLE." This procedure is accomplished by a continuous movement of the throttle.

WARNING

On combustion starter equipped airplanes, release ignition button immediately if no RPM reading is evident on the tachometer. Do not move the throttle inboard to the OFF position with the ignition button depressed if there is no RPM indication. This could result in disintegration of the combustion starter. No RPM reading indicates the starter failed to engage the engine. A maximum of two attempts should be made, but if still unsuccessful, the operation should be discontinued until the cause has been established and corrected.

3. Hold ignition button down until the engine instruments indicate a positive, self-sustaining light-off, or until 35% rpm is reached; release ignition button. During the start procedure, do not jockey the throttle lever.

CAUTION

Do not attempt to start the engine by air motoring the combustion starter. Due to the low engine RPM attained by air motoring, a hung start and subsequent fire may result.

Do not jockey the throttle as the starting fuel schedule is automatically controlled by the fuel control unit. Jockeying the throttle will interrupt this schedule.

Pneumatic starter operation must not exceed 90 seconds in a 20-minute period. Combustion starter cooling periods must be observed between starts to prevent damage from overheating. The following cooling periods must be observed.

Combustion starter duty cycle, at ambient temperatures up to 90°F (32.2°C), must be limited to two consecutive combustion runs in rapid succession followed by a cooling time of 30 minutes minimum. Succeeding runs must then be spaced a minimum of 25 minutes apart. If combustion starter duty cycle limitations are exceeded, remove the starter for overhaul.

Combustion starter duty cycle, at ambient temperatures above 90°F (32.2°C), must be limited to two consecutive combustion runs in rapid succession followed by a cooling time of 45 minutes minimum. Succeeding runs must then be spaced a minimum of 40 minutes apart. If combustion starter duty cycle limitations are exceeded, remove the starter for overhaul.

i. Engine indicators shall read as follows:

1. The exhaust temperature shall not exceed 600°C during acceleration to idle.
2. Idle rpm shall be 57% to 59%. On airplanes equipped with engine idle thrust control provisions, idle rpm with exhaust nozzle closed shall be 59% to 61%. Indication shall stabilize in total elapsed time of 35 to 50 seconds.
3. Exhaust temperature shall stabilize at 340°C or below.
4. Fuel flow shall be 1200 to 1500 pounds per hour.
5. Oil low pressure warning light shall be extinguished. On oil pressure gage equipped airplanes, gage shall indicate 45 (+5, −0) psi.

NOTE

The 45 (+5, −0) psi limitation is required to prevent illumination of the low oil pressure warning light on the pilot's master warning panel. A 40 to 50 psi oil pressure on the cockpit oil pressure gage is acceptable for continuous engine operation.

j. Reduce gas turbine compressor speed to idle.

k. Actuate "MASTER ELEC POWER" switch to "ON" position.

l. Actuate "AC GEN CONT" and "DC GEN CONT" switches to "ON" position.

NOTE

Applicable to F-106A airplanes 56-453, -455, -456, -458 thru -462, and 56-467. Actuate switch to "RESET" and then to "ON" position.

m. Turn off external ac and dc power and disconnect the external power plug(s); ac and dc power failure warning lights shall extinguish. If lights fail to extinguish, shut down engine and investigate cause of malfunction.

n. Reposition starter air selector valve in the left main wheel well to the "CLOSED" position if airplane high pressure air system was used to operate the combustion starter.

o. *Applicable to F-106A airplanes 56-453 thru 57-2465, and F-106B airplanes 57-2507 thru 57-2522 prior to incorporation of TCTO 1F-106J-565.* Connect constant speed system generator cooling air pressurization flex line to T fitting located below the right hydraulic pump. Remove warning streamer.

1-54. Unsatisfactory Start.

An unsatisfactory start has occurred if one or more of the following conditions occur:

a. Hot Start. The turbine discharge temperature exceeds the starting temperature limit of 600°C. If a greater than normal fuel flow is observed when the power lever is first placed in the idle position, or if the turbine discharge temperature exceeds 550°C, a "hot start" may be anticipated and the operator should be prepared to abort the start before the turbine discharge temperature is exceeded. A hot start may also be caused by a "false or hung start."

b. False Start or Hung Start. After lightoff has occurred, the rpm does not increase to idle but remains at some lower rpm. The turbine discharge temperature may continue to rise and the operator should be prepared to abort the start before temperature limits are exceeded.

c. No Start. The engine does not lightoff within 20 seconds after the power lever is placed in the idle position. If the turbine discharge temperature gage does not indicate a temperature rise, or if there is no increase in rpm, a lightoff has not been obtained.

d. The following procedure should be used in the event any of the requirements of a satisfactory start are not met or if any of the preceding conditions occur:

1. Throttle—"OFF."
2. Ignition button—not depressed.
3. Allow engine to stop.
4. Fuel boost pump switches – "OFF."
5. Refer to the troubleshooting chart in T.O. 1F-106A-2-4 and investigate the reason for the difficulty.
6. Allow a fuel drainage period of at least 30 seconds before attempting another start.

1-55. Procedure, Engine Clearing.

Clear the engine of trapped fuel or vapors in accordance with the following instructions.

a. On pneumatic starter equipped airplanes, connect gas turbine compressor to starter duct. Start compressor unit. On combustion starter equipped airplanes, connect external high pressure air source to the high pressure pneumatic system charging connection in the left main wheel well. Place starter air selector valve at "CLOSED" position.

b. Throttle—"OFF."

c. Engine ignition disarming switch—"DISARMED." (Main wheel well, for combustion starters only.)

d. Check that fuel system switches are in proper position to open shutoff valves in main tanks, "F" tank, and "T" tanks.

CAUTION

If the safety wire securing the fuel system switches has been broken, *on airplanes not equipped with valve position lights,* the left and right fuel shutoff valve indicators, located on the valves, must be visually checked to insure that the valves are in the open position. This procedure requires removal of the fire seal doors inboard of the valves. Refer to T.O. 1F-106A-2-5 for an illustration of the fuel shutoff valve installation.

e. Fuel boost pump switches – "ON."

f. Ignition button – depressed.

g. On pneumatic starter equipped airplanes, move throttle lever to "START" position and maintain starter operation for 40 to 50 seconds. On combustion starter equipped airplanes, move and hold throttle lever at "START" position until engine rpm is indicated, then move throttle lever to "OFF" position. This action will fire the combustion starter.

WARNING

Release ignition button immediately if an rpm indication is not shown on the tachometer. When rpm indication is not shown, the starter has not engaged the engine and continued starter operation could result in starter disintegration and danger from flying parts.

Permit starter to operate full cycle, then release ignition button. Observe starter cooling periods; refer to paragraph 1-53 for requirements.

CAUTION

Do not advance throttle from "OFF" position during starter operation; to do so will allow fuel flow into the engine.

h. Reposition engine ignition disarming switch on combustion starter equipped airplanes to "ARMED" position.

1-56. Procedure, Ground Run Check.

After a normal engine start has been completed, make ground checks with external power disconnected. Proceed as follows:

a. Electrical Power Supply System. If the requirements of this check are not met, refer to T.O. 1F-106A-2-10.

NOTE

Applicable to F-106A airplanes 56-453, -455, -456, -458 thru -462, and 56-467. These airplanes are equipped with two ac generator failure warning lights (No. 1 and No. 2) and two ac generator control switches (No. 1 and No. 2).

1. Actuate master power switch to "ON" position (on F-106B airplanes, both the forward cockpit switch and the aft cockpit switch must be in "ON" position).
2. Battery Check.
   Place ac generator switch "OFF"; then place dc generator switch "OFF." Check to see that dc power failure warning light and ac generator failure warning light are illuminated and battery powered equipment is operating.
3. DC Generator Switch, "ON."
4. DC Power Failure Warning Light, OUT.
5. AC Emergency Generator Check.
   Have ground crew member momentarily depress the emergency ac generator test switch (in the left-hand main wheel well) to energize the emergency ac generator. Place emergency ac generator control switch (if installed) at "EMER" position. Check voltage output of emergency generator. Return emergency ac generator control switch to "NORM" position and place ac generator switch "ON." Check that the ac generator failure warning light goes out and that ac power equipment is functioning properly.
6. AC Generator Failure Warning Light Check.
   Place ac generator switch "OFF"; then check to see that ac generator failure warning light illuminates. Place generator switch "ON" and check ac generator failure warning light extinguished.
7. AC Voltage Check 115 (±2) Volts; 26 (±1) Volts.
   All positions of the ac voltmeter selector switch should give voltmeter readings of 115 (±2) volts except the 26V position which should give a 26 (±1) volt reading.

b. Hydraulic Power Supply System. If the requirements of this check are not met, refer to T.O. 1F-106A-2-3.

1. Hydraulic Pressure-Low Warning Light Test.
   Depress master warning lights test button. Hydraulic pressure-low warning light should flash.
2. Primary Hydraulic System Check.
   (a) Hydraulic pressure, 3000 (±100) psi.
   (b) System check. With the engine operating at idle rpm, check operation of hydraulic system by slowly moving the control stick, using approximately 2 seconds for full stick travel, full forward and full aft. The hydraulic system pressure gage should allow a drop and then return to full system pressure within 2 seconds after stopping control surface movement.

NOTE

If the stick is positioned rapidly at idle rpm, there may not be a 2-second recovery of the system pressure as indicated above. Recovery time is relative to engine rpm and to the extent and speed of stick movement.

3. Secondary Hydraulic System Check.
   (a) Hydraulic pressure, 3000 (±100) psi.
   (b) System check. With the engine operating at idle rpm, check operation of hydraulic system by slowly moving the control stick, using approximately 2 seconds, for full stick travel, full forward and full aft. The hydraulic system pressure gage should show a pressure drop and then return to full system pressure within 2 seconds after stopping control surface movement.

NOTE

If the stick is positioned rapidly at idle rpm, there may not be a 2-second recovery of the system pressure as indicated above. Recovery time is relative to engine rpm and to the extent and speed of stick movement.

   (c) Speed brake switch, OUT. Extend speed brakes. Check with ground crew member for proper speed brake operation. Secondary hydraulic system pressure should drop momentarily and then return to normal.
   (d) Speed brake switch, IN. Retract speed brakes. Check with ground crew member for proper operation.

c. Flight Control System. If the requirements of this check are not met, refer to T.O. 1F-106A-2-7.

1. Elevons Check. With engine operating at idle, operate aileron and elevator controls. Check for correct movement and note that surfaces are free to move from stop to stop.

NOTE

If the control stick is operated rapidly, the hydraulic system low pressure warning light may momentarily illuminate. This momentary low pressure condition is normal.

2. Rudder Check. Check rudder for correct movement and rudder pedals for ease of operation.

CAUTION

Do not depress nose steering button while performing rudder check. Damage to tires and possible damage to the steering unit may result.

3. Elevon System Stability Check. Rapidly move the control stick, a small amount, fore and aft. There shall be no surface buzz.
4. Rudder System Stability Check. Rapidly move the rudder pedals, a small amount, in each direction. There shall be no surface buzz.
5. Damper Mode Check. Engage the damper mode and note that switches remain engaged when released. Note that engagement has no objectionable effect on controls or surfaces, and that controls and surfaces are free to move from stop to stop.
6. Damper Mode Check, Elevon Stability. Rapidly move the control stick, a small amount, fore and aft. There shall be no surface buzz.
7. Damper Mode Check, Rudder Stability. Rapidly move the rudder pedals, a small amount, in each direction. There shall be no surface buzz.
8. Turn Coordinator Check. Have ground crew member observe rudder action. Move stick slowly to right and hold right aileron. Rudder should move to right and then return to neutral position. Move stick to left and hold left aileron. Rudder should move to left and then return to neutral position.
9. Emergency Direct Manual, Disengage Check. Disengage damper mode by depressing the EMER DIR MAN switch on the control stick base. On airplanes equipped with AWCIS, the flight mode switch shall return to the "DIR MAN" position. On airplanes not equipped with AWCIS, the yaw damper and pitch damper switches shall return to the "OFF" positions.
10. Trim Check. Apply aileron and elevator trim in each of the four directions and check for control stick movement in the respective direction. Also apply left and right rudder trim and check for pedal movement in each direction.

NOTE

Applicable to F-106A airplanes 56-454, -457, 56-462 and subsequent and F-106B airplanes 57-2508 and subsequent. These airplanes have no stick movement or followup action when aileron trim is applied. Check aileron trim with aid of ground crew member.

11. Takeoff Trim. Press the takeoff trim button; check for green lights.

CAUTION

Applicable to F-106A airplanes 56-453 thru 57-234 and F-106B airplanes 57-2507 thru 57-2513. The trim servo switch must remain in "STANDBY" position until after surfaces have been trimmed for takeoff. Takeoff trim will malfunction if trim servo is engaged. Also repeated attempts to operate takeoff trim with the trim servo engaged will damage the elevator trim actuator.

1-57. Procedure, Engine Performance Check.

After a normal start has been completed, the following procedure is recommended for checking engine performance.

a. Run engine at idle until instrument readings have stabilized (approximately 3 minutes). After a new engine installation, or if fuel system has been opened since last engine run, run engine at idle for 5 minutes.

b. On airplanes equipped with the engine idle thrust system, actuate "IDLE THRUST CONT" switch to "ON" then to "OFF;" have ground crew observer check for opening and closing of the exhaust nozzle.

c. Advance throttle lever to "MIL POWER" and allow instrument readings to stabilize. Engine exhaust temperature shall not exceed 635°C for J75-P-17 during acceleration. Engine rpm shall not exceed 105.5% for J75-P-17. Temperature shall not exceed 630°C for J75-P-17 after five minutes stabilization at military power. Oil pressure shall be 45 (+5, −0) psi (oil pressure warning light extinguished). Pressure ratio indication shall be within the minimum and maximum points on the indicator bug.

CAUTION

Do not exceed 15 minutes operating time with throttle lever set at "MIL POWER."

d. Record engine instrument readings.

e. Advance throttle to the full forward position, then outboard to "AFTERBURNING." Allow engine to stabilize. Record engine instrument readings; readings shall conform to those given in step "c."

CAUTION

Do not exceed 5 minutes operating time with throttle lever set at "AFTERBURNING." If there is a rapid increase of tailpipe temperature and an rpm reduction, the exhaust nozzle has failed to open. Terminate afterburning immediately. Investigate malfunction.

f. Simulate afterburner electrical failure by removing "AB PWR" fuse from main wheel well fuse panel. Move throttle lever to nonafterburning, but do not retard; afterburning shall continue.

g. Check operation of afterburner mechanical shutoff valve as follows, with "AB PWR" fuse removed.

1. Retard throttle lever until afterburning terminates.
2. Advance throttle lever to a position above minimum afterburning range; afterburning shall not occur.
3. Install "AB PWR" fuse. Advance throttle lever to "MIL POWER," then outboard to "AFTERBURNING." Afterburning shall occur.

h. Turn off all boost pumps momentarily; boost pump failure warning light and master warning shall illuminate. Turn on "FWD L" and "FWD R" boost pumps. Actuate master warning light switch to "RESET" to extinguish light.

i. Retard throttle slowly to minimum afterburning. There shall be no indication of engine roughness as throttle is being retarded. Terminate afterburning immediately if roughness is encountered.

j. Retard throttle to "IDLE." Allow afterburner drainage period of three minutes maximum.

k. Check engine emergency fuel system by placing fuel control switch in "EMER" position. "EMER FUEL" light shall illuminate.

CAUTION

To prevent possible engine overspeed, do not position fuel control switch to "EMER" when engine is operating at full power. To prevent possible compressor stalls, reduce engine speed to idle before switching from "EMER" to "NORMAL." During operation of the emergency fuel system, the automatic control features of the fuel control are bypassed. Extreme care must be exercised when operating the throttle lever. Move throttle slowly, and carefully check the exhaust temperature and tachometer to prevent engine over-temperature or overspeed. Damage to the turbine section will occur and lead to engine failure if these procedures are not carefully followed.

l. Advance throttle slowly to "MIL POWER" and stabilize for 1 minute. Record rpm, fuel flow, pressure ratio, and exhaust temperature. Fuel flow, with inlet duct screens 8-96014 installed, shall be as follows:

1. J75-P-17 engine with thick lip inlet ducts ..... 8810 to 10010 pph.
2. J75-P-17 engine with thin lip inlet ducts ..... 8860 to 10060 pph.

NOTE

The above figures have been adjusted for duct loss with inlet duct screens installed. If inlet screens are removed, add 130 pph to the above values.

For each 1000 feet of field elevation above sea level, subtract 210 pph fuel flow from the above values. For inlet duct configuration identification, refer to T.O. 1F-106A-2-4. The effect of temperature on fuel flow need not be considered in fuel flow calculations.

NOTE

For each degree F (0.55C) ambient temperature reading above standard day, only 1 pph would be added to the fuel flow limits. For each degree F (0.55C) ambient temperature reading below standard day, only 1 pph would be subtracted from the fuel flow limits.

m. Move throttle momentarily to "AFTERBURNER" to check afterburning action; afterburner shall light. Return throttle to normal; afterburning shall cease. Retard throttle to "IDLE." Place fuel control switch in "NORMAL" position; "EMER FUEL" light shall extinguish.

1-58. Procedure, Engine Shut Down.

a. Allow engine to idle for five minutes after power run before shutting down engine to prevent possible seizure of the rotors.

NOTE

In an emergency, the engine may be shut down at once.

b. Connect external ac and dc power sources to the external power receptacles. Refer to paragraph 1-42 for procedure.

c. Fuel boost pump switches "OFF."

d. On pneumatic starter equipped airplanes, connect gas turbine compressor unit to starter duct and start unit. On combustion starter equipped airplanes, connect external high pressure source to the charging connection of the high pressure pneumatic system in the left main wheel well. Place starter air selector valve at "CLOSED" position.

e. Retard throttle lever to "OFF" position.

CAUTION

If an abnormal rise in exhaust temperature is indicated on shutdown or if ground crew observer reports fire in tailpipe, perform the following:

Fuel boost pump switches, "ON."

Fuel tank selector switches "ENGINE" or "OPEN."

On pneumatic starter equipped airplanes, move throttle lever to "START" position and crank engine for 20 seconds. Return throttle lever to "OFF" position. On combustion starter

equipped airplanes, depress ignition button, move throttle lever to "START" position, and then move throttle lever to "OFF" position. This action will fire the starter. Do not advance throttle lever from "OFF" position. Permit starter to operate full cycle then release ignition button.

f. As engine coasts down, check primary and secondary hydraulic system warning lights by slight movement of flight controls. Flashing light indicates one system decreasing below 1000 to 800 psi pressure. Steady light indicates both systems are below 1000 to 800 psi pressure.

g. Return all switches to the nonoperating position.

h. Check engine and constant speed drive oil level. Refer to paragraphs 2-16 and 2-19 of this manual for procedures.

i. *Applicable to F-106A airplanes 56-453 thru 57-2465, and F-106B airplanes 57-2507 thru 57-2522 prior to incorporation of TCTO 1F-106J-565.* Disconnect constant speed system generator cooling air flex line at T fitting located below right hydraulic pump. Install warning streamer at this point.

NOTE

This procedure is necessary to prevent possible entry of engine fuel into the generator cooling system. The flex line is to remain disconnected until the next engine operation.

EXTREME WEATHER OPERATIONS

1-59. GENERAL.

Aircraft stationed in arctic or desert regions are subject to extreme temperatures and climatic elements and will require special maintenance and precautionary measures.

1-60. DESERT MAINTENANCE.

The abrasive qualities of dust and sand upon moving parts of the airplane, and the destructive effect of heat upon instruments and certain aircraft equipment, make special maintenance practices necessary. The maintenance site should be kept as free from sand and dust as possible, and the direction of prevailing winds should be considered.

1-61. Lubrication.

The most injurious action of sand and dust results from its adherence to lubricated bearing surfaces. When mixed with a lubricant, sand and dust produce a very destructive abrasive compound. The following recommendations should be observed to lengthen the service life of the airplane and its components under these climatic conditions:

a. Lubricate only where absolutely necessary, and then sparingly.

b. Remove all excess lubricant to prevent accumulation of sand and dust.

c. Wipe landing gear shock struts clean frequently, particularly prior to operation, to prevent damage to seals and polished surfaces.

d. Wipe the piston rods and bearings of all actuating cylinders clean, frequently.

1-62. Ground Cooling Provisions.

Ground cooling of specific compartments of the airplane is accomplished by operating the airplane's engine or by using the external air-conditioning unit 8-96118, type MA-3 in conjunction with adapter 8-96151, 8-96529, or 8-96213. Provisions are incorporated to receive the adapter at Station 312 and Station 339 on the left side of the fuselage adjacent to the lower surface of the wing.

a. Cooling, During Engine Operation. Engine operation permits the use of the airplane's air-conditioning system to cool the cockpit and electronic compartments. When cockpit air-conditioning is not required, the cabin air switch should be positioned at "OFF" so that all refrigerated air will be routed to the electronics compartments for cooling. Engine and constant speed drive unit oil cooling, as well as engine compartment cooling, is provided by an automatic system which is in operation during engine run.

b. Cooling, Using External Unit. When the external ground air-conditioning unit is connected by the quick-disconnect adapter to the airplane at Station 312, cooling air flows through ducting to the cockpit, the electronic compartments, and the missile bay. The cabin air switch should be positioned at "OFF" when cockpit air-conditioning is not required, thus allowing all of the cooling air to flow to the other compartments. The external unit should be connected and operating at all times when electronic gear is being operated and the airplane's engine is not operating. When the external unit is connected by the adapter to the airplane at station 339, the entire flow of cooling air is directed into the missile bay compartment. If the external unit is left connected during an emergency "scramble," the 8-96529 adapter will disconnect when the airplane starts to move.

1-63. Protective Covers.

The temperatures of the airplane surfaces, cockpit and various compartments are dependent upon the heating effects of the sun and whatever cooling any existing wind may afford. Low wind velocities will result in surface

temperatures being one and one-half times ambient temperatures, which at times may be over 54° C (130° F). Interior temperatures will usually be somewhere between outside and surface temperatures. Protective covers should be placed over the canopy, but must not touch plexiglas canopy windows. Covers should also be erected over areas where work is being accomplished, and mats or pads placed on hot surfaces to protect the hands and knees. The canopy and compartment doors should be kept closed whenever the airplane is unattended, to prevent the entry of sand and dust, even though the inside temperature may be 10 to 20 degrees lower with them open. When attended by maintenance personnel, the canopy and compartment doors may be opened for ventilation and to prevent heat warping of delicate equipment. All openings such as engine air intake ducts, tailpipe, vents, exhaust outlets, pitot and artificial feel system intake heads, should be covered and protected with tight-fitting covers to keep out all sand and dust. See figure 1-18 for airplane protective covers.

1-64. Precautions.

The following precautions should be observed during maintenance and servicing of aircraft:

a. Wear gloves to prevent burns from hot metal surfaces.

b. Take every precaution to exclude sand and dust from fuel and oil during replenishing operations.

c. Perform all possible ground checks before starting the engine to minimize engine ground run time. All controls should be checked to insure sand-free and easy movement.

d. Do not run up engine to the windward of other planes, personnel, or ground installations.

1-65. ARCTIC MAINTENANCE.

The airplane will require protection from ice and snow, and the cockpit and various components in the airplane systems will require preheating for satisfactory operation. The following general precautions should be observed during maintenance and parking of the airplane:

a. Use caution in touching and handling cold metal. Moisture on the hands may freeze skin to the metal.

b. Do not use too much tension in making repairs and in tightening of nuts, bolts, and cables when the airplane is very cold, as failure or malfunction of the various units may occur when the airplane expands on warming.

c. Avoid wet, slushy areas when parking the airplane.

NOTE

In extremely low temperatures, diaphragm and tubular type door seals become hardened and subject to cracking on light impact. Closing of doors with these seals should be avoided under these conditions. When absolutely necessary to close doors in extremely low temperatures, closing should be done gently so that seal contacts are made without striking. Whenever possible, these doors should be closed while the aircraft is sheltered, before towing outside to the flight line.

d. Exercise care during servicing to prevent moisture from entering airplane systems.

e. Avoid use of airplane battery whenever possible during low temperatures. Battery should be removed and stored in a warm place in accordance with instructions given in T.O. 1F-106A-2-10.

f. Dry the exterior surfaces of the airplane, as thoroughly as is practical, before installing fabric covers. This prevents covers from freezing to the airplane surfaces.

g. Clean landing gear shock struts and actuating cylinder piston rods of all ice, dirt, and grit. Check shock struts for proper inflation.

h. Check tires for proper inflation.

i. Apply a light coat of petrolatum, Federal Specification VV-P-236, to the canopy seal mating surface to prevent the canopy from freezing closed.

1-66. Ground Heating Provisions.

Ground heating of the engine compartment (prior to engine start) and the exterior components of the airplane is accomplished by use of ground heater SE-0973 or SE-1055. Heating of specific compartments is accomplished by operating the airplane's engine or by using the ground heater in conjunction with adapter 8-96151, 8-96529, or 8-96213. Provisions are incorporated to receive the adapter at Station 312 and Station 339 on the left side of the fuselage adjacent to the lower surface of the wing.

CAUTION

Do not discharge hot air directly against plexiglas canopy windows.

a. Heating, During Engine operation. Engine operation permits use of the airplane's heating system to heat the cockpit. The engine compartment is heated by radiation from the engine.

b. Heating, Using External Unit. When the ground heating unit is connected by the quick-disconnect adapter to the airplane at Station 312, heated air flows through ducting to the cockpit, the electronic compartments, and the missile bay. When the ground heating unit is connected by the adapter to the airplane at Station 339, the entire flow of heated air is directed into the missile bay compartment. If the ground heating unit is left connected during an emergency "scramble," the 8-96529 adapter will disconnect from the airplane when the airplane starts to move.

1-67. Airplane Surfaces.

Removal of engine, cockpit, and miscellaneous covers should be delayed until just prior to engine start when inclement weather conditions prevail.

a. Check entire airplane surface for snow, frost or ice; any such deposit can cause loss of lift and induce treacherous stalling characteristics during flight.

b. Brush off loose snow and/or frost.

c. Remove ice by directing heated air from a ground heater onto ice accumulation.

CAUTION

Do not chip off ice; damage to airplane surfaces will result. Prevent flow of water, from melting ice, into critical areas such as flight controls and tank vents.

d. Apply heat to control surface hinges and actuator areas. Check flight control surfaces for freedom of movement. Sudden drops in temperature cause ice to form on inner hidden areas, as well as on outside visible areas. All accumulations of ice must be removed or control surface movement will be restricted.

e. Apply defrosting fluid, USAF Specification 3609, to airplane surfaces in accordance with applicable technical directives if rapid frosting conditions prevail.

CAUTION

Defrosting fluid must not be applied to cockpit canopy or adjacent area since damage to canopy plexiglas could result.

1-68. Drains and Vents.

The fuselage and wings incorporate numerous vents. drains, and sensing outlets that must be free of snow and/or ice prior to and during flight.

a. Check that vents, drains, and sensing outlets are free from ice or snow.

b. Drain only enough oil from engine oil tank to insure free flow by procedure given in figure 2-7. Drain oil after preheat and immediately before engine start.

c. Drain fuel from defueling point drain and fuel tank drains after preheat. A minimum of one-half gallon will be drained into a clean metal container grounded to the airplane. Immediately after draining, the fuel will be transferred into a clear plastic or glass container and inspected for the presence of water and other contaminants.

WARNING

The transfer of fuel from metal to plastic or glass container will be made away from the airplane.

1-69. Releasing Tires Frozen to Ground.

When the airplane is parked at temperatures below −37°C (−35°F), the tire treads may freeze to the ground and the tires may develop a flat spot. Solid freezing of the tires to the ground combined with the flat spot makes movement of the airplane difficult and heat, not to exceed 71°C (160°F), must be applied to the tire and ground. After the tires are freed from the ground, tow the airplane from the main gears. The flat spots on the tires will usually disappear during the initial movement of the airplane.

1-70. Engine Runup.

Engine runup, under arctic conditions, requires that additional emphasis be placed on the following precautions.

a. Check that wheel chocks are the ice gripping type P/N 50D6602 (8200-159006, Class 19A or equivalent).

b. Check that restraining bridle assembly is properly secured; check ground anchor for security.

c. Check that airplane is positioned in runup area so as to prevent jet blast from throwing ice or snow on other airplanes.

d. Leave throttle lever at "IDLE" for five minutes after starting an engine that has cooled to an ambient temperature of −30°C (−22°F) or lower.

Section II

SERVICING

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AIRPLANE CLEANING

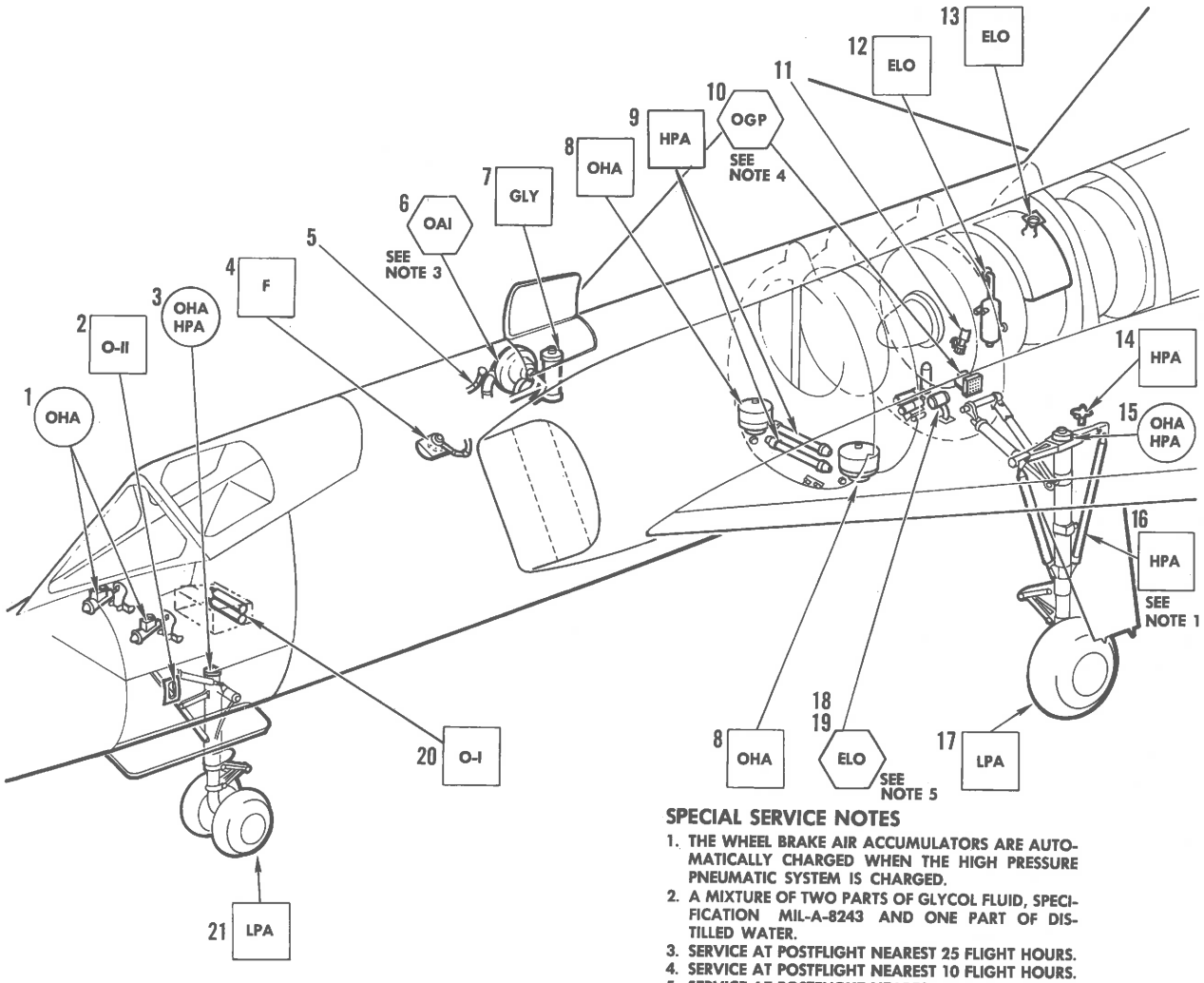
REPLENISHING AND DRAINING

2-1. GENERAL.

Servicing instructions, which concern replenishing and draining of certain systems as required during normal operation, are covered in this section. See figure 2-1 for servicing chart. "On assembly" servicing requirements, when applicable, are discussed in manuals pertaining to the functional systems.

2-2. SYSTEM CAPACITIES.

TANK	US (GAL)	IMP (GAL)	METRIC (LITERS)
FUEL, INTEGRAL TANKS (9) (Use Fuel, Specification MIL-J-5624, Grade JP-4). *Applicable to F-106A airplanes 56-453 thru -458, -460 thru 56-466, and 57-229 thru 57-243 prior to incorporation of TCTO 1F-106(J)A-585.*			
Total Capacity	1276.0	1062.52	4829.66
Unusable Fuel	36.0	29.97	136.26
Net Usable Fuel	1240.0	1032.54	4693.40



SPECIAL SERVICE NOTES

1. THE WHEEL BRAKE AIR ACCUMULATORS ARE AUTOMATICALLY CHARGED WHEN THE HIGH PRESSURE PNEUMATIC SYSTEM IS CHARGED.
2. A MIXTURE OF TWO PARTS OF GLYCOL FLUID, SPECIFICATION MIL-A-8243 AND ONE PART OF DISTILLED WATER.
3. SERVICE AT POSTFLIGHT NEAREST 25 FLIGHT HOURS.
4. SERVICE AT POSTFLIGHT NEAREST 10 FLIGHT HOURS.
5. SERVICE AT POSTFLIGHT NEAREST 50 FLIGHT HOURS.

LIST OF SERVICING MATERIALS

MATERIAL	SYMBOL	SPECIFICATION	TYPE
FUEL	F	MIL-J-5624	GRADE JP4
ENGINE OIL	ELO	MIL-L-7808	
ANTI-ICING FLUID	GLY	SEE NOTE 2	
HYDRAULIC OIL	OHA	MIL-H-5606	
LUBRICATING OIL	OAI	MIL-L-6085	
LUBRICATING OIL	OGP	MIL-L-7870	
OXYGEN (GASEOUS)	O-I	BB-O-925	GRADE A TYPE I
OXYGEN (LIQUID)	O-II	BB-O-925	GRADE A TYPE II
DRY HIGH PRESSURE AIR	HPA		
LOW PRESSURE AIR	LPA		

FREQUENCY SYMBOLS (DENOTE REFILLING ONLY)

POST FLIGHT (DAILY) — PERIODIC (100 FLIGHT HOURS) — SPECIAL

1. WHEEL BRAKE RESERVOIRS.
2. OXYGEN SYSTEM FILLER CONNECTIONS.
3. NOSE GEAR STRUT.
4. REFUELING FITTING.
5. DEFUELING AIR FITTING.
6. REFRIGERATION UNIT.
7. ANTI-ICING TANK.
8. HYDRAULIC SYSTEM RESERVOIRS.
9. HYDRAULIC SYSTEM ACCUMULATORS.
10. EMERGENCY A C GENERATOR DRIVE
11. DE-FUELING FITTING.
12. CONSTANT SPEED UNIT OIL TANK.
13. ENGINE OIL TANK.
14. HIGH PRESSURE PNEUMATIC SYSTEM FILLER CONNECTION.
15. MAIN GEAR STRUTS.
16. WHEEL BRAKE AIR ACCUMULATORS.
17. MAIN WHEEL TIRES.
18. PNEUMATIC STARTER.
19. COMBUSTION STARTER.
20. SURVIVAL KIT EMERGENCY OXYGEN BOTTLES.
21. NOSE WHEEL TIRES.

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Figure 2-1. Airplane Servicing

2-2. SYSTEM CAPACITIES (CONT).

TANK	US (GAL)	IMP (GAL)	METRIC (LITERS)
FUEL, INTEGRAL TANKS (9) (Use Fuel, Specification MIL-J-5624, Grade JP-4). *Applicable to F-106A airplanes 56-459, 56-467, 57-244 and subsequent; and 56-453 thru -458, -460 thru 56-466, 57-229 thru 57-243 after incorporation of TCTO 1F-106(J)A-585.*			
NORMAL CONDITION			
Total Capacity	1368.8	1139.80	5180.91
Unusable Fuel	32.8	27.31	124.15
Net Usable Fuel	1336.0	1112.49	5056.76
OVERLOAD CONDITION			
Total Capacity	1562.8	1301.34	5915.20
Unusable Fuel	32.8	27.31	124.15
Usable Fuel	1530.0	1274.03	5791.05
FUEL, INTEGRAL TANKS (9) (Use Fuel, Specification MIL-J-5624, Grade JP-4). *Applicable to F-106B airplanes 57-2507 thru -2514 and 57-2523 prior to incorporation of TCTO 1F-106(J)A-585.*			
Total Capacity	1313.5	1093.75	4971.60
Unusable Fuel	44.5	37.05	168.44
Net Usable Fuel	1269.0	1056.70	4803.16
FUEL, INTEGRAL TANKS (9) (Use Fuel, Specification MIL-J-5624, Grade JP-4). *Applicable to F-106B airplanes 57-2515 thru -2522, 57-2524 and subsequent; and 57-2507 thru -2514 and 57-2523 after incorporation of TCTO 1F-106(J)A-585.*			
NORMAL CONDITION			
Total Capacity	1306.3	1087.76	4944.34
Unusable Fuel	29.8	24.81	112.79
Net Usable Fuel	1276.5	1062.95	4831.55
OVERLOAD CONDITION			
Total Capacity	1479.8	1232.22	5601.04
Unusable Fuel	29.8	24.81	112.79
Net Usable Fuel	1450.0	1207.41	5488.25
FUEL, EXTERNAL TANKS (2) (Use Fuel, Specification MIL-J-5624, Grade JP-4).			
Total Capacity	466.0	388.03	1763.71
Unusable Fuel	6.0	4.99	22.61
Net Usable Fuel	460.0	383.04	1741.10
OIL, ENGINE (Use Oil, Specification MIL-L-7808).			
Expansion Volume (Tank)	1.0	0.83	3.78
Tank Refill Capacity	4.5	3.75	17.03
System (Less Tank)	1.0	0.83	3.78
Total	5.5	4.58	20.71
OIL, CONSTANT SPEED DRIVE SYSTEM (Use Oil, Specification MIL-L-7808). *Applicable to F-106A airplanes 56-453 thru 57-238 and F-106B airplanes 57-2507 thru 57-2514.*			
Expansion Volume (Tank)	1.1	0.92	4.16
Tank Refill Capacity	1.5	1.25	5.67
System (Less Tank)	1.5	1.25	5.67
Total	3.0	2.5	11.34

2-2. SYSTEM CAPACITIES (CONT).

TANK	US (GAL)	IMP (GAL)	METRIC (LITERS)
OIL, CONSTANT SPEED DRIVE SYSTEM (Use Oil, Specification MIL-L-7808). *Applicable to F-106A airplanes 57-239 and subsequent and F-106B airplanes 57-2515 and subsequent.*			
Expansion Volume (Tank)	1.2	1.00	4.54
Tank Refill Capacity	2.37	1.97	8.97
System (Less Tank)	1.5	1.25	5.67
Total	3.87	3.22	14.64
OIL, HYDRAULIC SYSTEMS (At 70° F [21° C]) (Use Hydraulic Oil, Specification MIL-H-5606).			
Primary			
Tank Refill Capacity	1.72	1.43	6.51
System (Less Tank)	2.31	1.92	8.74
Total	4.03	3.35	15.25
Secondary			
Tank Refill Capacity	1.9	1.58	7.19
System (Less Tank)	4.53	3.77	17.14
Total	6.43	5.35	24.33
FLUID, ANTI-ICING — Mixture of Two Parts of Glycol Fluid, Specification MIL-A-8243, and One Part of Distilled Water.			
Capacity	2.0	1.67	7.57

2-3. SERVICING FUEL SYSTEM, GENERAL.

The fuel system is serviced with fuel, Specification MIL-J-5624, GRADE JP-4, at a single refueling point located at Station 312.

NOTE

It is permissible to use the lowest available grade of aviation gasoline, Specification MIL-G-5572 (no oil mix required); JP-5, Specification MIL-J-5624; or JP-6, Specification MIL-F-25656, as emergency fuels for one-time ferry missions. Where the tactical situation requires the use of these fuels, the engine military trim must be readjusted to meet the pressure ratios given in T.O. 1F-106A-2-4 before the airplane can be flown. Since JP-5 freezes at −48.3°C (−55°F) and JP-6 at −40°C (−40°F), missions on which these fuels are used shall be restricted to altitudes where temperatures below these limits are not encountered. When using aviation gasoline, particular attention shall be given to engine tailpipe temperature during starting and throughout the flight.

Access to the refueling point is gained by opening a hinged door on the lower surface of the right engine air inlet duct fairing. Fuel tank provisions include four integral tanks in each wing, one integral tank within the fuselage, and optional provisions for mounting one jettisonable external tank to the lower surface of each wing. Integral tanks are identified in the text to follow as Nos. 1, 2, 3, fuselage tank, and transfer tank. Figures 2-2, 2-3, 2-4, and 2-5 illustrate the location of the tanks and the refueling flow. Refueling procedures are outlined in paragraphs 2-7 and 2-8. Procedures for defueling the entire system or specific tanks are outlined in paragraphs 2-12 through 2-15.

2-4. Safety Precautions, Fueling and Defueling.

Refer to T.O. 00-25-172, T.O. 01-1-309, and local safety regulations.

a. Service aircraft in all possible cases with "cold soaked fuel." Refer to T.O. 42B1-1-9 for additional information.

b. Refuel aircraft as soon as possible after landing.

c. Maintain fuel servicing nozzle free of snow, water, and mud at all times.

d. Drain fuel tank drain valves and defueling point drain of water 15 minutes after each servicing, 30 minutes after each removal from heated shelter, and immediately after each flight. Preheat will be used when required to insure free flow. A minimum of one-half gallon of fuel will be drained into a clean metal container grounded

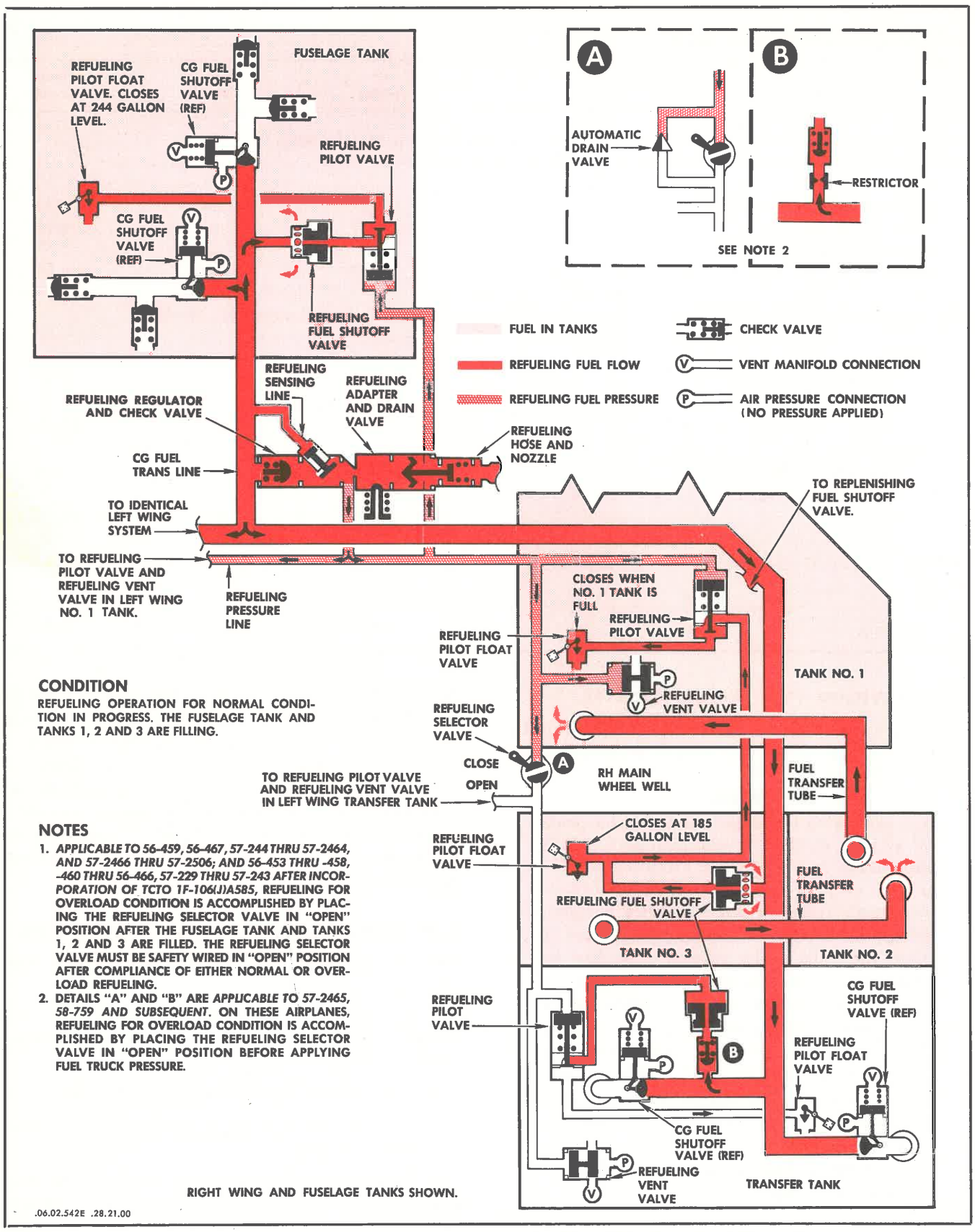


Figure 2-2. Refueling Fuel Flow, F-106A
Applicable to 56-459, 56-467, 57-244 and subsequent; and 56-453 thru -458, -460 thru 56-466, 57-229 thru 57-243 after incorporation of TCTO 1F-106(J)A-585

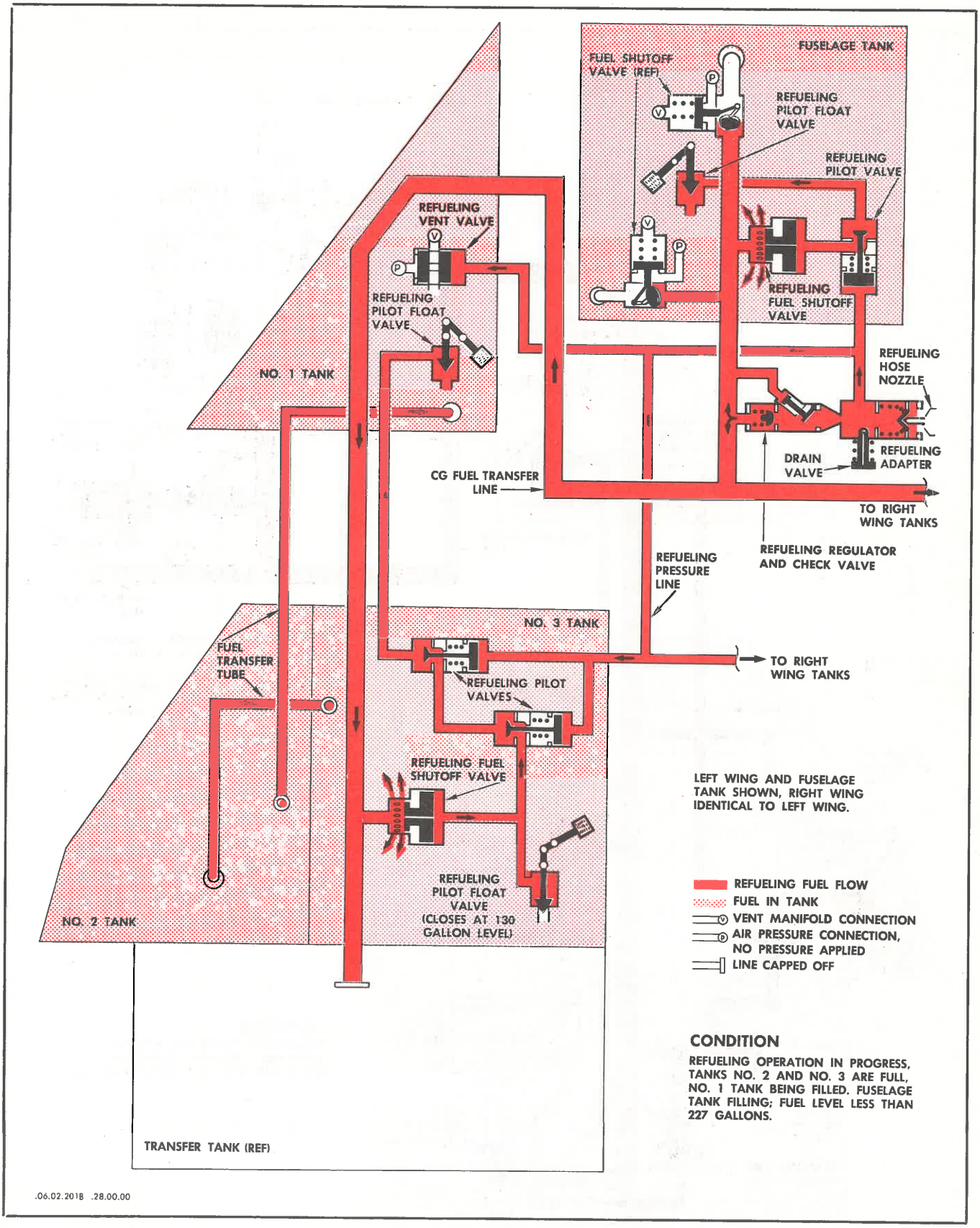


Figure 2-3. Refueling Fuel Flow, F-106A
Applicable to 56-453 thru -458, -460 thru 56-466, and 57-229 thru 57-243 prior to incorporation of TCTO 1F-106(J)A-585

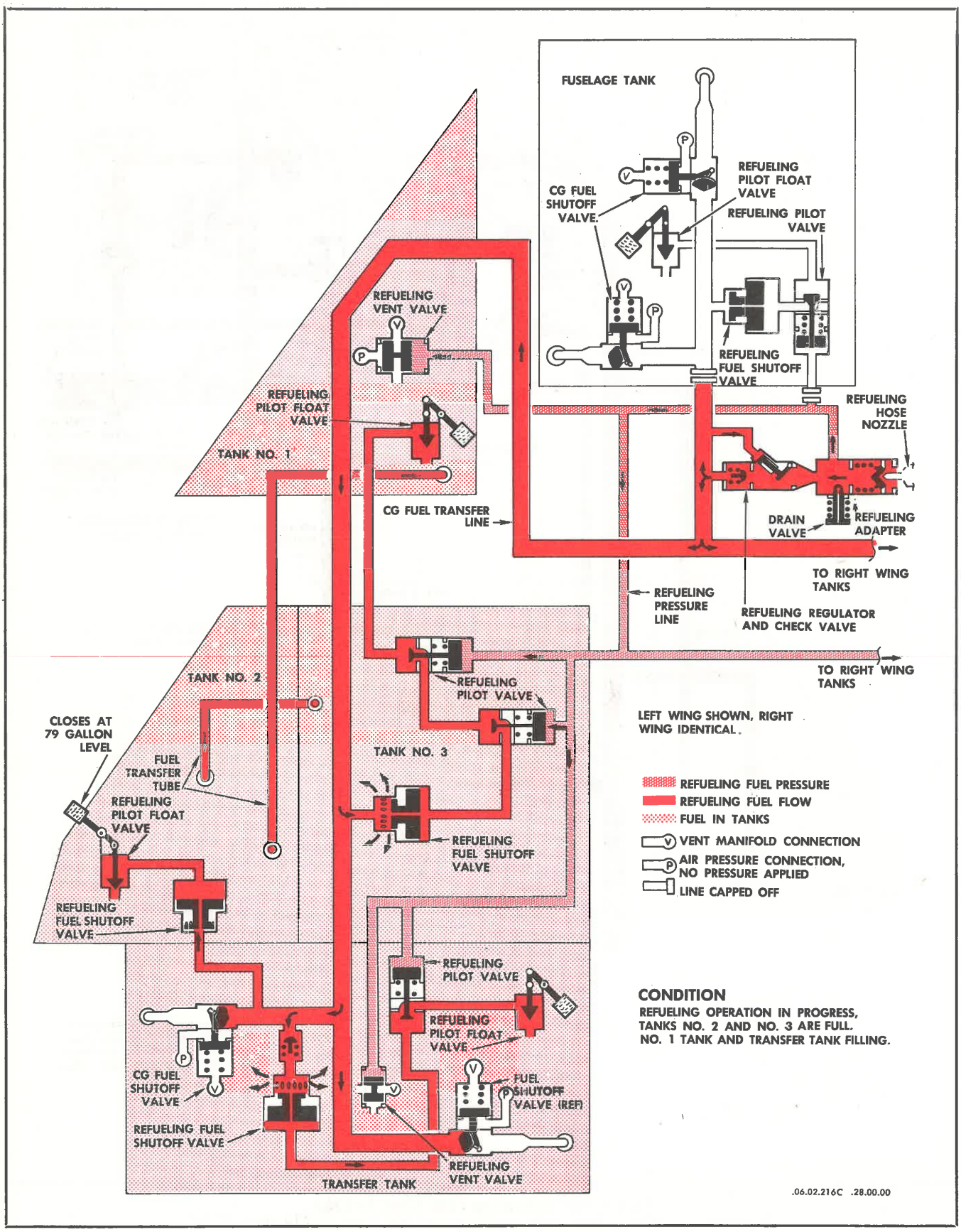


Figure 2-4. Refueling Fuel Flow, F-106B
Applicable to 57-2507 thru -2514 and 57-2523 prior to incorporation of TCTO 1F-106(J)A-585

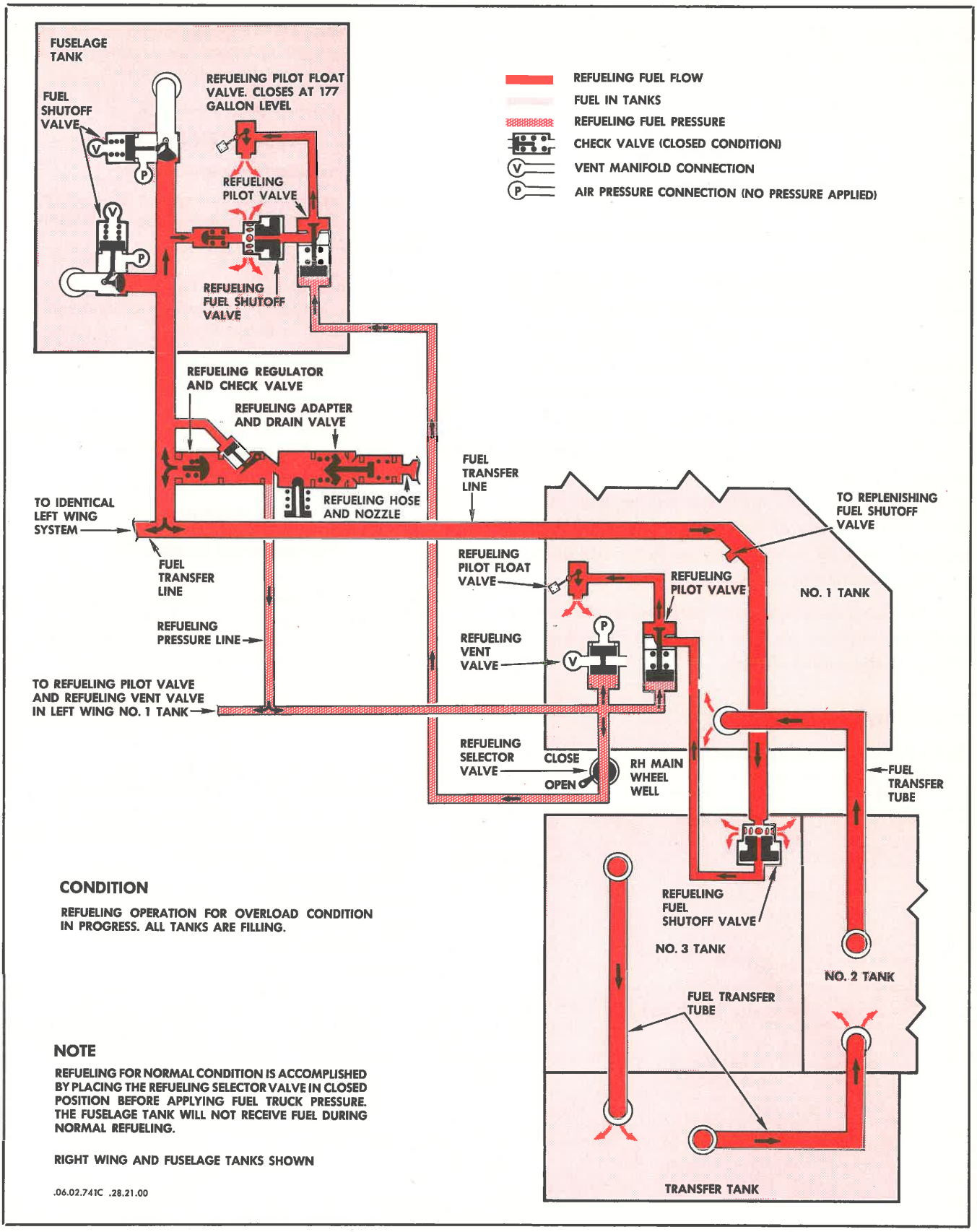


Figure 2-5. Refueling Fuel Flow, F-106B
Applicable to 57-2515 thru -2522, 57-2524 and subsequent; and 57-2507 thru -2514, 57-2523 after incorporation of TCTO 1F-106(J)A-585

to the aircraft. Immediately after draining, the fuel will be transferred into a clear plastic or glass container and inspected for presence of water and other contaminants.

WARNING

The transfer of fuel from metal to plastic container will be made away from the aircraft.

e. Leave fully serviced aircraft outside of enclosures and subject to ambient temperatures insofar as possible.

f. Maintain alert hangars and heated maintenance shelters at the lowest possible temperature (during cold weather operations) consistent with comfortable working conditions, to prevent condensation in fuel tanks.

g. Perform no work on the aircraft or in immediate vicinity during fueling operations; all airborne and ground radar and radio equipment will be made inoperative within a radius of 300 feet of fueling operations; no aircraft will be serviced with jet fuel while its radio or radar transmitting equipment is in operation.

h. Park aircraft in open area; park fuel trucks heading away from airplane; smoking will not be allowed within 50 feet of the parked aircraft.

i. Provide hand CO_2 fire extinguishers, as well as adequate mobile firefighting equipment; lighting and flashlights, as required, shall be explosion-proof.

WARNING

When electrical power is required on aircraft during fueling or defueling operations, a mobile fire truck standby is required.

j. Attach static ground cables from one of the landing gear assemblies and from fuel truck to ground rods, and from truck directly to the aircraft.

k. Use ohmmeter on each grounding connection; the resistance between any two grounding connections shall not exceed 10 ohms.

l. Always ground filler nozzle to aircraft structure before touching nozzle to a filler opening.

WARNING

Refueling of aircraft loaded with armament is hazardous. Whenever practicable, aircraft will be refueled before being loaded with explosives. Enforcement of all fire prevention measures must be emphasized.

2-5. SYSTEM REFUELING.

2-6. Equipment Requirements.

FIGURE	NAME	TYPE	ALTERNATE	USE AND APPLICATION
	Fuel Truck.	MJ-1 (5045-668055)	Equivalent capable of delivering 200 to 600 gallons per minute at 30.0 to 60.0 psi pressure.	Fuel supply source for refueling.
1-25	Generator Set (Gas).	8-96026-801 AF/M32A-13 (6115-583-9365)	8-96026 AF/M32M-2 (6115-617-1417)	To energize electrical systems on aircraft equipped with special quick disconnect receptacle.
	Generator Set (Elec).	8-96025-803 AF/ECU-10/M (6125-583-3225)	8-96025-805 A/M24M-2	
			8-96025 AF/M24M-1 (6125-620-6468)	

2-6. Equipment Requirements (Cont.)

FIGURE	NAME	TYPE	ALTERNATE	USE AND APPLICATION
1-24	Generator Set.		MC-1 (6125-500-1190) MD-3	To energize electrical systems (except AWCIS) on aircraft equipped with standard AN receptacle and on others by using adapter cable 8-96052-801.
1-26	Adapter Cable.	8-96052-801 (6115-690-4050)		To connect MC-1 and MD-3 units to aircraft equipped with special quick-disconnect receptacle.
	Ohmmeter.	7CAC601000		For checking ground bonding of aircraft.
	Fire Extinguisher.	CO_2		Fire extinguishing agent (available at all times).

2-6. Equipment Requirements (Cont).

FIGURE	NAME	TYPE	ALTERNATE	USE AND APPLICATION
	Fire Truck.			Fire extinguishing agent (when required, refer to paragraph 2-4).

2-7. Procedure, Integral Tank Refueling.

a. Observe safety precautions listed in paragraph 2-4.

b. Check that manual defuel valve is in "CLOSED" position; O-ring and plug installed in valve.

c. Connect 28-volt, dc external electrical power and 115/200-volt, 3-phase, 400-cycle ac external electrical power to receptacles, if required.

NOTE

Electrical power is required during the refueling procedure only for a check of the fuel quantity and fuel quantity indicating system. Fuses for the indicating system are located on the nose wheel well and cockpit fuse panels.

d. Open refueling door located at Station 312 on lower surface of right engine air inlet duct fairing and insert fuel nozzle ground jack plug into grounding receptacle shown in figure 2-6.

e. Remove red dust cap from refueling adapter and attach fuel hose nozzle; shutoff valve on nozzle shall be in "OFF" position.

f. *Applicable to F-106A airplanes 56-459, 56-467, 57-244 thru 57-2506; and 56-453 thru -458, -460 thru 56-466, 57-229 thru 57-243 after incorporation of TCTO 1F-106(J)A-585.* Place refueling selector valve in "CLOSE" position for normal or overload refueling.

g. *Applicable to F-106A airplanes 58-759 and subsequent. Applicable to F-106B airplanes 57-2515 thru -2522, 57-2524 and subsequent; and 57-2507 thru -2514, 57-2523 after incorporation of TCTO 1F-106(J)A-585.* Place refueling selector valve in "CLOSE" for normal refueling. Place refueling selector valve in "OPEN" position for overload refueling.

h. Start pump on fuel truck, and adjust fuel pressure to 50 psi. Open shutoff valve on fuel hose nozzle, allowing fuel to be pumped into system. Maintain 50 (±5) psi fuel pressure during refueling operation.

CAUTION

While fuel is flowing into the tanks, check for air flow from the vent outlet in the bottom of each wing. If air is not detected flowing from each vent, shut off fuel flow and investigate the trouble.

i. Maintain fuel truck pressure, to the fuel system, for approximately five minutes after the tanks are full and fuel flow ceases.

j. Reduce fuel truck pressure to 0 psi. Turn on electric power source and check that airplane fuel quantity system indicates that all tanks are full.

NOTE

Applicable to F-106B airplanes 57-2507 thru -2514 and 57-2523 prior to incorporation of TCTO 1F-106(J)A-585. The fuselage tank contains fuel for ballast purpose only, and is not connected to the fuel system. This tank has a separate refueling fitting located adjacent to the forward left-hand corner on the top of the tank.

k. *Applicable to F-106A airplanes 56-459, 56-467, 57-244 thru 57-2506; and 56-453 thru -458, -460 thru 56-466, 57-229 thru 57-243 after incorporation of TCTO 1F-106(J)A-585.* Place refueling selector in "OPEN" position and safety-wire handle.

NOTE

If only normal refueling is required, continue with procedure. If overload refueling is required, repeat steps "h" thru "j" to fill transfer tanks and then continue with procedure.

l. Close shutoff valve on fuel hose nozzle.

m. Disconnect nozzle from refueling adapter and remove grounding jack from its receptacle. Install red dust cap on refueling adapter.

n. Place metal container under refueling adapter drain valve. Ground container to airplane. Depress refueling adapter drain valve until fuel flow stops. Release drain valve and close refueling access door.

WARNING

Any fuel spilled on airplane should be removed immediately. If fuel is spilled on the ground the area should be flushed with water.

o. Remove ac and dc external electrical power.

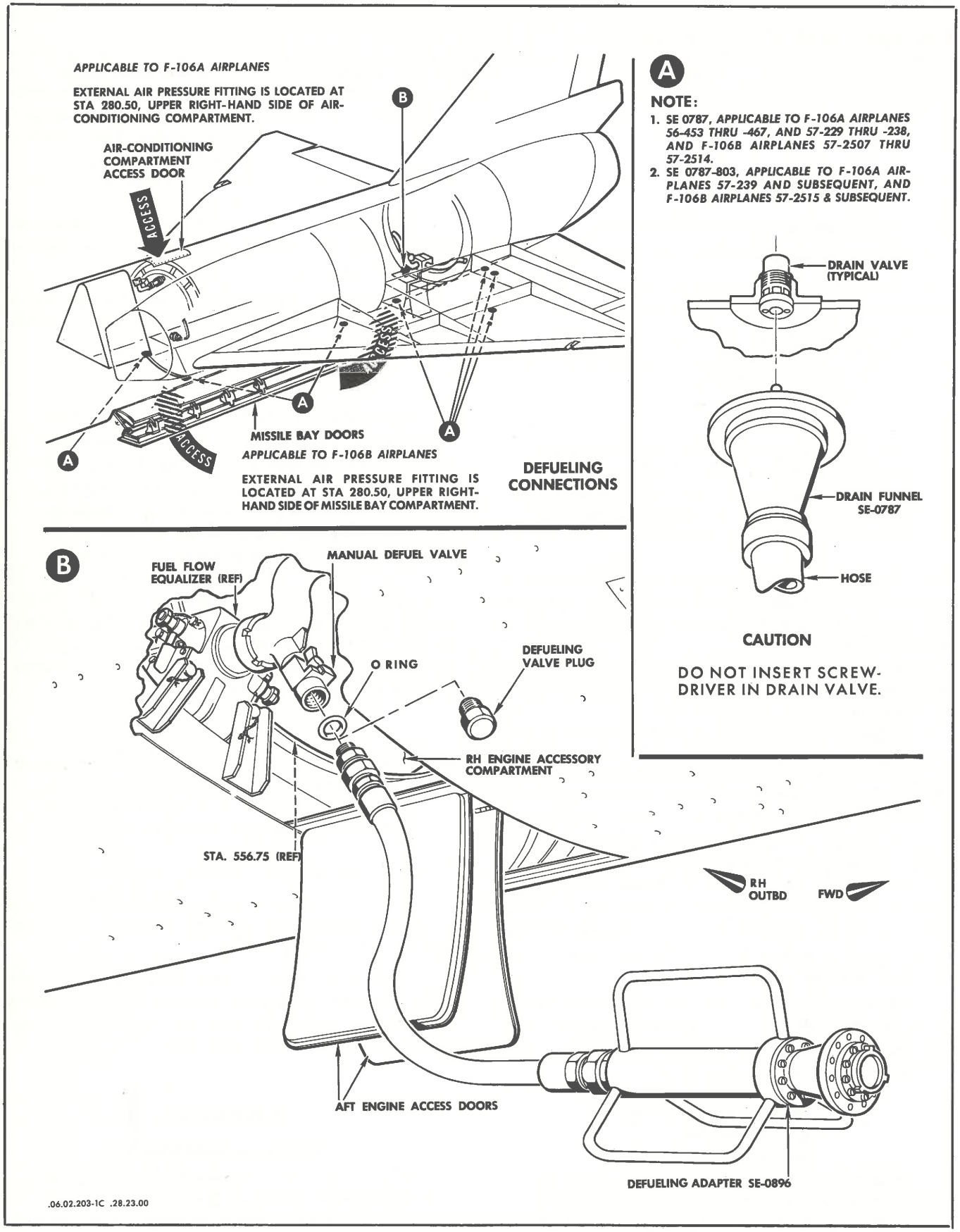
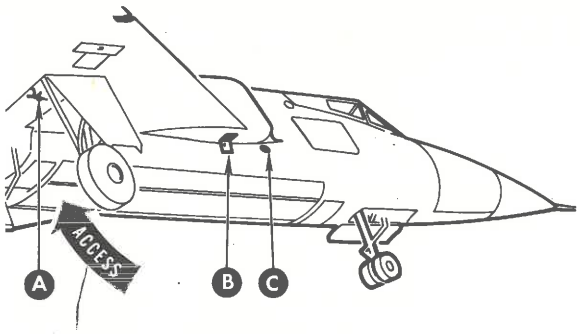


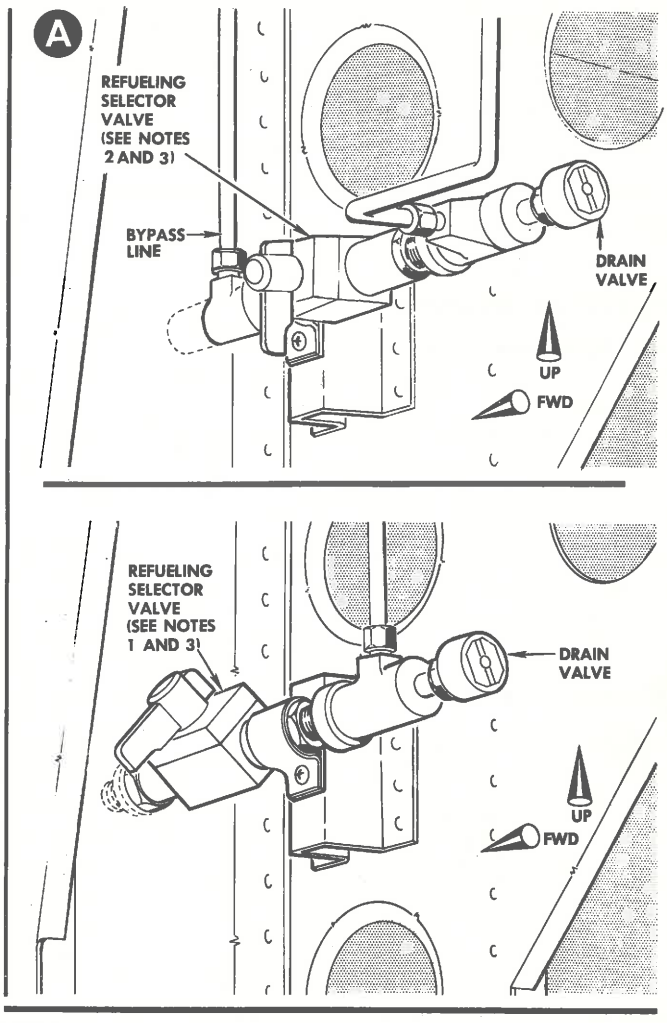
Figure 2-6. Fuel System Servicing Connections (Sheet 1 of 2)



REFUELING CONNECTIONS

NOTES

1. INSTALLATION SHOWN IS *APPLICABLE TO F-106A AIRPLANES 56-459, 56-467, 57-244 THRU 57-2506; AND 56-453 THRU -458, -460 THRU -466, 57-229 THRU 57-243 AFTER INCORPORATION OF TCTO 1F-106(J)A-585. APPLICABLE TO F-106B AIRPLANES 57-2515 AND SUBSEQUENT; AND 57-2507 THRU 57-2514 AFTER INCORPORATION OF TCTO 1F-106(J)A-585.*
2. INSTALLATION SHOWN IS *APPLICABLE TO F-106A AIRPLANES 58-759 AND SUBSEQUENT.*
3. REFUELING SELECTOR VALVE IS SHOWN IN CLOSED POSITION FOR NORMAL REFUELING.



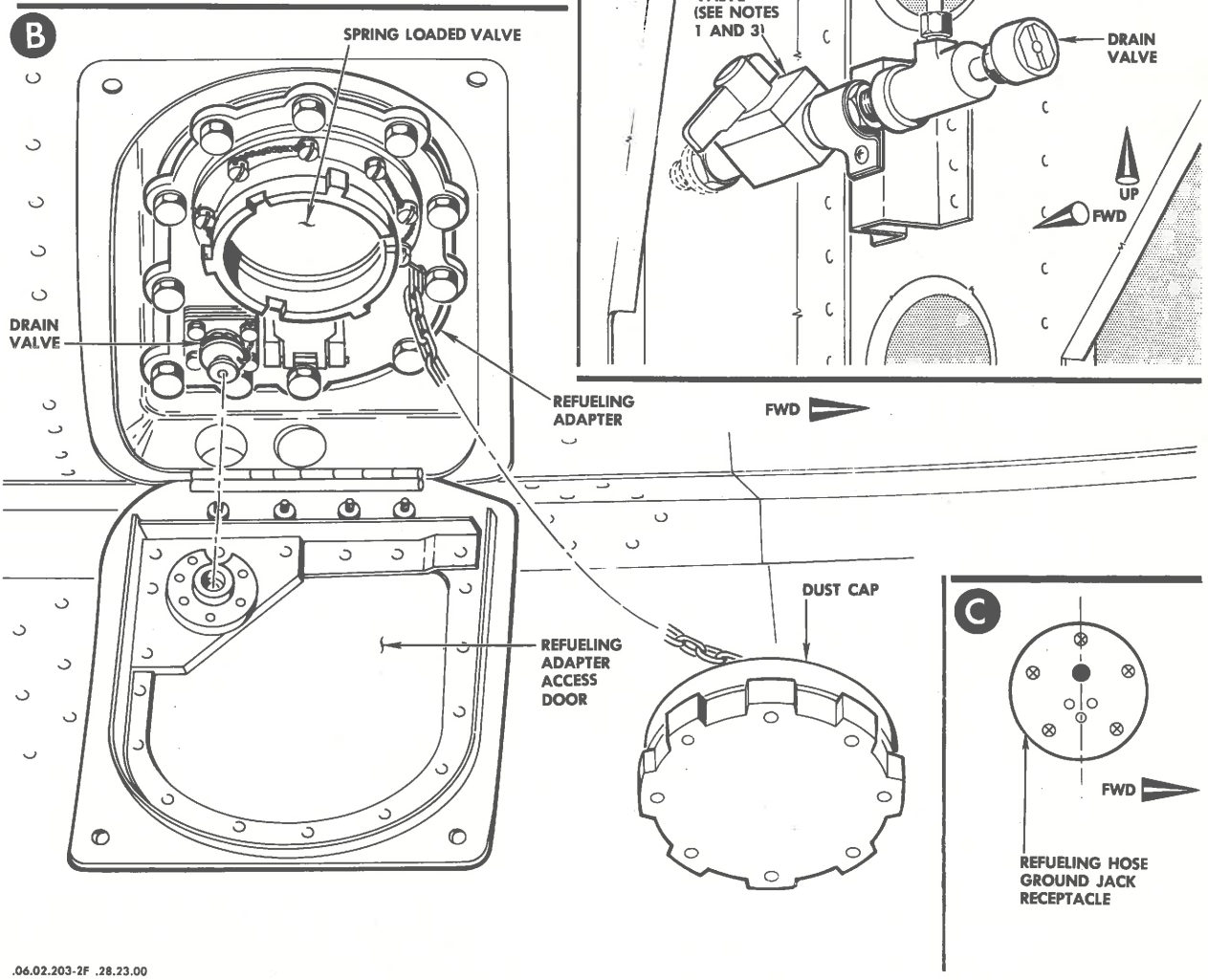


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Figure 2-6. Fuel System Servicing Connections (Sheet 2 of 2)

2-8. Procedure, External Tank Refueling.

a. Observe safety precautions listed in paragraph 2-4.

b. Remove filler cap at top aft surface of tank.

c. Ground filler hose nozzle to aircraft.

d. Insert filler hose nozzle in tank and fill.

e. Remove filler hose nozzle, install filler cap, and remove ground wire.

f. Check that tank pylon to wing chock bolts are torqued to a minimum of 100 inch pounds; refer to T.O. 1F-106A-2-5 for procedure.

CAUTION

Tank pylon to wing chock bolts must be torqued after each time that the external tanks are refueled.

2-9. SYSTEM DEFUELING.

2-10. Equipment Requirements.

FIGURE	NAME	TYPE	ALTERNATE	USE AND APPLICATION
	Fuel Truck.	MJ-1 (5045-668055)	Equivalent	To provide pump and receptacle for fuel being drained.
2-6	Defueling Adapter.	SE-0896-801 *Applicable to F-106A airplanes 56-453 thru 57-231* SE-0896 (4920-330-4095) *Applicable to F-106A airplanes 57-232 and subsequent and F-106B airplanes*		To connect truck defueling hose to airplane defueling valve.
Refer to T.O. 1F-106A-2-5	Fuel System Test Stand.	8-96199 (4920-659-6372)	Equivalent air pressure source	To provide air pressure for pressurizing fuel tanks at 50 (+20, −0) psi.
1-25	Generator Set (Gas).	8-96026-801 AF/M32A-13 (6115-583-9365)	8-96026 AF/M32M-2 (6115-617-1417)	To energize electrical systems on aircraft equipped with special quick disconnect receptacle.
	Generator Set (Elec).	8-96025-803 AF/ECU-10/M (6125-583-3225)	8-96025-805 A/M24M-2	
			8-96025 AF/M24M-1 (6125-620-6468)	
1-24	Generator Set.		MC-1 (6125-500-1190)	To energize electrical systems (except AWCIS) on aircraft equipped with standard AN receptacle and on others by using adapter cable 8-96052-801.
			MD-3	

2-10. Equipment Requirements (Cont).

FIGURE NO.	NAME	TYPE	ALTERNATE	USE AND APPLICATION
1-26	Adapter Cable.	8-96052-801 (6115-690-4050)		To connect MC-1 and MD-3 units to aircraft equipped with special quick-disconnect receptacle.
	Ohmmeter.	7CA601000		For checking ground bonding of airplane.
	Fire Fighting Equipment.	CO_2 bottles and mobile fire truck		Fire extinguishing agent in case of fire.
2-6	Fuel Tank Sump Drain Funnel.	SE 0787, *Applicable to F-106A airplanes 56-453 thru 57-238 and F-106B airplanes 57-2507 thru 57-2514* SE 0787-803, *Applicable to F-106A airplanes 57-239 and subsequent and F-106B airplanes 57-2515 and subsequent*		For aid in draining residual fuel from tanks at completion of defueling procedure.
1-19	Jacks (3).	USAF B-6 (5120-246-9178)		Provides means of jacking airplane for defueling procedure.
1-19	Adapter-Wing and Nose Jack Pads (3).	SE 0580-7 (1730-640-7155)		Provides a bearing surface for USAF B-6 jacks.
1-20 or 1-21	Spirit level.	Local procurement.		Used to determine attitude of airplane (6° nose up) for defueling procedure.
1-17	Nose mooring eyebolt.	8-96060		Provide means of securing manila rope to airplane during jacking procedure.
	Manila rope (3,000 pound test).	Local procurement.		Used to snub the nose when jacking to 6° nose up for defueling procedure.

2-11. Defueling Preparations.

a. Observe all safety precautions outlined in paragraph 2-4.

b. Install nose mooring eyebolt, nose jack pad, and wing jack pads. Jack the airplane to a 6° nose up attitude; this is necessary since complete defueling can only be accomplished with the airplane in this attitude. Refer to paragraph 1-24 for information on jacking the airplane; see figures 1-17, 1-19, 1-20, and 1-21.

CAUTION

When jacking airplane to 6° nose up condition, install nose mooring eyebolt 8-96060 and attach manila rope (3,000 pound test) from eyebolt to tie-down fitting to prevent possible up-ending of airplane. Rope shall be taut, at all times, during procedure.

c. Remove plug from manual defuel valve in engine accessory compartment. Attach defueling adapter, SE 0896 or SE 0896-801 to defueling valve. See figure 2-6 for an illustration of the defueling valve and adapter.

d. Ground defueling hose to aircraft structure.

e. Connect nozzle of defueling hose to defueling adapter.

f. Connect external air source, capable of delivering a sustained pressure of 50 (+20, −0) psi, to the fuel tank pressurization fitting located in the upper right side of the air-conditioning compartment *for F-106A airplanes. On F-106B airplanes,* this fitting is located on the aft side of the forward missile bay bulkhead.

NOTE

Applicable to F-106A airplanes 57-246 and subsequent; and 56-466, -467, and 57-243 thru 57-245 after incorporation of TCTO 1F-106(J)-626. Applicable to F-106B airplanes 57-2515 and subsequent; and 57-2509 after incorporation of TCTO 1F-106(J)-626. The left forward main landing gear door closed switch must be held in the door closed position to obtain air pressure for external tank defueling. Release switch when defueling is completed.

g. Connect ac and dc external power to the airplane. Refer to paragraph 1-42 for procedure.

NOTE

Check fuses pertaining to the fuel system on fuse panels in the right main landing gear wheel well, nose wheel well, and left and right cockpit fuse panels.

2-12. Procedure, Defueling Integral Tanks.

a. Place manual defuel valve in "OPEN" position.

b. Turn on generator set.

c. Place fuel system switches in proper position to open shutoff valves in main tanks, "F" tank, and "T" tanks (both cockpits on F-106B airplanes).

d. Place fuel boost pump switches to "ON" position. Check that fuel boost pressure warning lights are extinguished.

e. Turn on external air pressure source; adjust to 50.0 (+20.0, −0.0) psi. Check that fuel tank pressure warning lights are extinguished.

f. *Applicable to F-106A airplanes,* check fuel quantity indications during defueling operation to verify that the fuselage tank transfers fuel to the main fuel system.

NOTE

Applicable to F-106A airplane 57-240, the transfer tanks are defueled by attaching a defueling truck to refueling adapter on tank access door and applying truck suction. *Applicable to F-106B airplanes 57-2507 thru -2514 and 57-2523 prior to incorporation of TCTO 1F-106(J)A-585,* the fuselage tank is defueled by applying suction to the fitting located, at the forward left-hand side, on the top of the tank or by opening the drain valves on the right side of the fuselage.

g. Defuel until meter on defueling truck shows no further fuel flow. Check fuel quantity indications to verify that tanks are empty. Place fuel boost pump switches in "OFF" position.

CAUTION

Do not operate boost pumps when tanks are empty.

h. Shut off fuel truck suction. Turn off and disconnect external air source.

i. Check that all applicable switches referenced in step "c" are in "ENGINE," "OPEN," or "NORMAL" position. Disconnect external power.

CAUTION

If the safety wire has been broken on any of the fuel system switches, the left and right fuel shutoff valve indicators located on the valves must be visually checked to insure that the valves are in the open position. This procedure requires removal of the fire seal doors inboard of the valves. Refer to T.O. 1F-106A-2-5 for an illustration of the fuel shutoff valve installation.

j. Disconnect defueling hose ground from aircraft. Disconnect defueling adapter from defueling hose.

k. Drain remaining fuel from wing tank sumps and fuselage tank through drain fittings. Drain fittings are located at the lowest point of each wing tank and at the side of the fuselage. Use fuel tank sump drain funnel SE 0787 or SE 0787-803 in conjunction with a metal container; the funnel must be grounded to the container.

2-13. Procedure, Defueling Fuselage Tank and One Wing System.

a. Refer to paragraph 2-11; perform steps "a" through "g."

NOTE

Applicable to F-106A airplanes 56-459, 56-467, 57-244 and subsequent; and 56-453 thru -458, -460 thru 56-466, 57-229 thru 57-243 after incorporation of TCTO 1F-106(J)A-585. Applicable to F-106B airplanes 57-2507 thru -2514 and 57-2523 prior to incorporation of TCTO 1F-106(J)A-585. The following procedure will

defuel both the left and right transfer tanks regardless of the wing selected. *Applicable to F-106B airplanes 57-2515 thru -2522, 57-2524 and subsequent; and 57-2507 thru -2514, 57-2523 after incorporation of TCTO 1F-106(J)A-585.* The following procedure will defuel only the transfer tank of the wing selected.

b. Refer to paragraph 2-12; perform steps a. and b.

c. Place fuel system switches in proper position to open shutoff valves in "F" tank, "T" tank, and in main tank of wing to be defueled. Close the main tank shutoff valves for the wing that is not to be defueled by placing switches in the proper position.

d. Place fuel boost pump switches, applicable to the selected wing, in "ON" position.

e. Refer to paragraph 2-12; perform steps "e" thru "k."

2-14. Procedure, Defueling One Wing Only.

a. Refer to paragraph 2-11; perform steps "a" through "e" and step "g."

NOTE

Applicable to F-106B airplanes 57-2515 thru -2522, 57-2524 and subsequent; and 57-2507 thru -2514, 57-2523 after incorporation of TCTO 1F-106(J)A-585, the following procedure will defuel tank Nos. 1, 2, 3, and the transfer tank of the wing selected. *Applicable to F-106A airplanes 56-459, 56-467, 57-244 and subsequent; and 56-453 thru -458, -460 thru 56-466, 57-229 thru 57-243 after incorporation of TCTO 1F-106(J)A-585,* the following procedure will defuel tank Nos. 1, 2, and 3 of the wing selected but will not defuel the transfer tank. If the transfer tank must be defueled, refer to entire procedure given in paragraph 2-13.

b. Refer to paragraph 2-12; perform steps a. and b.

c. Place fuel system switches in proper position to open shutoff valves in the main tanks of the wing to be defueled. Close the main tanks shutoff valves of the wing that is not to be defueled by placing switches in the proper position.

d. Place fuel boost pump switches, applicable to wing selected, in "ON" position. Apply defueling truck suction.

NOTE

Fuel boost pump pressure and defueling truck suction will provide motive power for moving fuel.

CAUTION

Check for inflow of air into vents located in lower surface of wings. If air does not flow into vents, stop defueling and investigate cause.

e. Refer to paragraph 2-12; perform steps "g" through "k." Drain fuel from wing tank sumps only.

2-15. Procedure, Defueling External Tanks.

The external fuel tanks will defuel when defueling the entire system, or when defueling the fuselage and one wing system with external air pressure applied and ac and dc power connected to the airplane. Procedure for entire system defueling is covered in paragraph 2-12, and for one wing and fuselage in paragraph 2-13. The external tanks replenish No. 1 tanks due to the air pressure differential.

NOTE

Applicable to F-106A airplanes 57-246 and subsequent; and 56-466, -467, and 57-243 thru 57-245 after incorporation of TCTO 1F-106(J)-626. Applicable to F-106B airplanes 57-2515 and subsequent; and 57-2509 after incorporation of TCTO 1F-106(J)-626. The left forward main landing gear door closed switch must be held in the door closed position to obtain air pressure for external tank defueling. Release switch when defueling is completed.

Each external tank is independent of the other. When one wing tank system is defueled the respective external tank also defuels.

NOTE

After defueling ceases and external air pressure is removed, remove drain plug in bottom of external tanks to drain residual fuel; replace plug.

The external tanks may be defueled through the tank filler opening by using the following procedure:

a. Observe safety precautions listed in paragraph 2-4.

b. Remove filler cap at top aft surface of tank.

c. Ground suction hose to aircraft.

d. Insert suction hose into tank and defuel.

e. Remove suction hose, and ground connection.

f. Remove drain plug from bottom of external tank to drain residual fuel; replace plug.

g. Install tank filler cap.

2-16. SERVICING ENGINE OIL TANK.

The engine oil tank is serviced with lubricating oil, Specification MIL-L-7808. Access to the engine oil tank filler cap is gained by removing the access cover located at Station 510 on the upper left side of the fuselage.

NOTE

The engine oil tank should be serviced as soon as possible after engine shutdown. Complete instructions for filling and draining the engine oil tank are given on figure 2-7.

2-17. SERVICING STARTER.

Lubricating oil, Specification MIL-L-7808, is used to service both pneumatic type starters and combustion type starters. To gain access to the starter, open the hydraulic pump access door located at station 510 on the lower left side of the fuselage. Figure 2-8 provides complete instructions for servicing of pneumatic starters. Figure 2-9 illustrates filling and draining procedures for combustion starters.

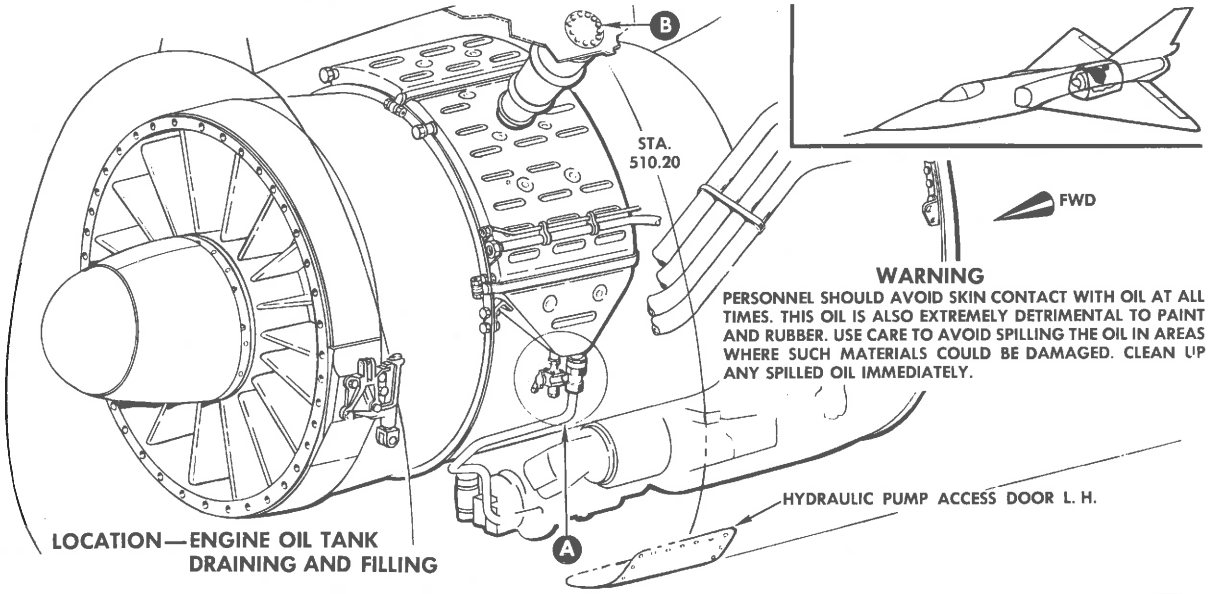
2-18. COMBUSTION STARTER FUEL SYSTEM BLEEDING.

Upon completion of a combustion starter replacement, or completion of maintenance on the starter where the fuel system has been opened, the following bleeding procedure is required.

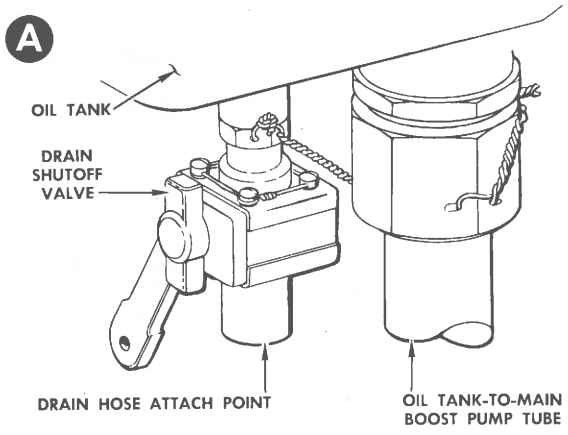
a. Open constant speed drive unit access door.

b. Observe the following safety precautions during this procedure.

1. Do not perform other maintenance work on the airplane.



LOCATION—ENGINE OIL TANK DRAINING AND FILLING



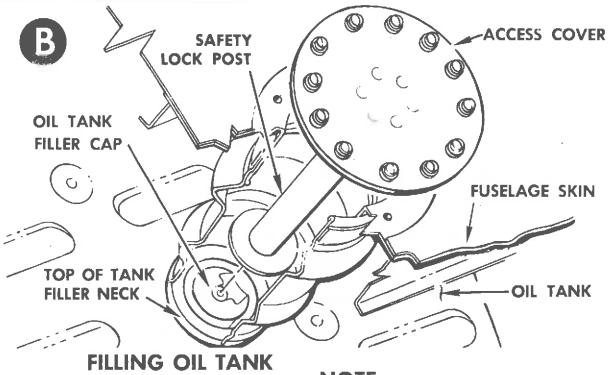
DRAINING OIL TANK

a. Open hydraulic pump access door on left side of fuselage.

NOTE

DRAIN TANK IMMEDIATELY AFTER ENGINE SHUTDOWN. IF TANK IS TO BE DRAINED AFTER EXTENDED ENGINE SHUTDOWN PERIOD, RUN ENGINE TWO MINUTES PRIOR TO DRAINING, TO PUMP RESIDUAL OIL OUT OF THE ACCESSORY CASE.

b. Attach a drain hose to tank drain valve.
c. Place a container under drain hose.
d. Open drain shutoff valve and drain tank.
e. When draining is completed, close drain shutoff valve and remove drain hose; install door.



FILLING OIL TANK

NOTE

THE OIL TANK SHOULD BE CHECKED AND FILLED WITHIN 15 MINUTES AFTER ENGINE SHUTDOWN; AS OIL WILL DRAIN FROM THE TANK INTO THE ACCESSORY GEAR CASE IN SUFFICIENT QUANTITIES TO PREVENT AN ACCURATE QUANTITY CHECK. IF ENGINE HAS NOT BEEN OPERATED, CHECK OIL QUANTITY AND REPLENISH AS NECESSARY AFTER FIRST ENGINE RUN-UP AND PRIOR TO FLIGHT.

a. Place protective mat on wing during servicing of oil tank.
b. Open access cover on top left side of fuselage and remove filler cap.
c. Fill tank with oil, Specification MIL-L-7808 until oil level is 2 inches below top of tank filler neck.
d. Replace tank cap and install the fuselage access cover. If the access cover will not fit flush with the fuselage the tank cap is not secured.

NOTE

THE SAFETY LOCK POST CONFIGURATION OF THE ACCESS COVER IS *APPLICABLE TO F-106A AIRPLANES 57-2465, 58-759 AND SUBSEQUENT, AND F-106B AIRPLANES 57-2523, 57-2532 AND SUBSEQUENT.*

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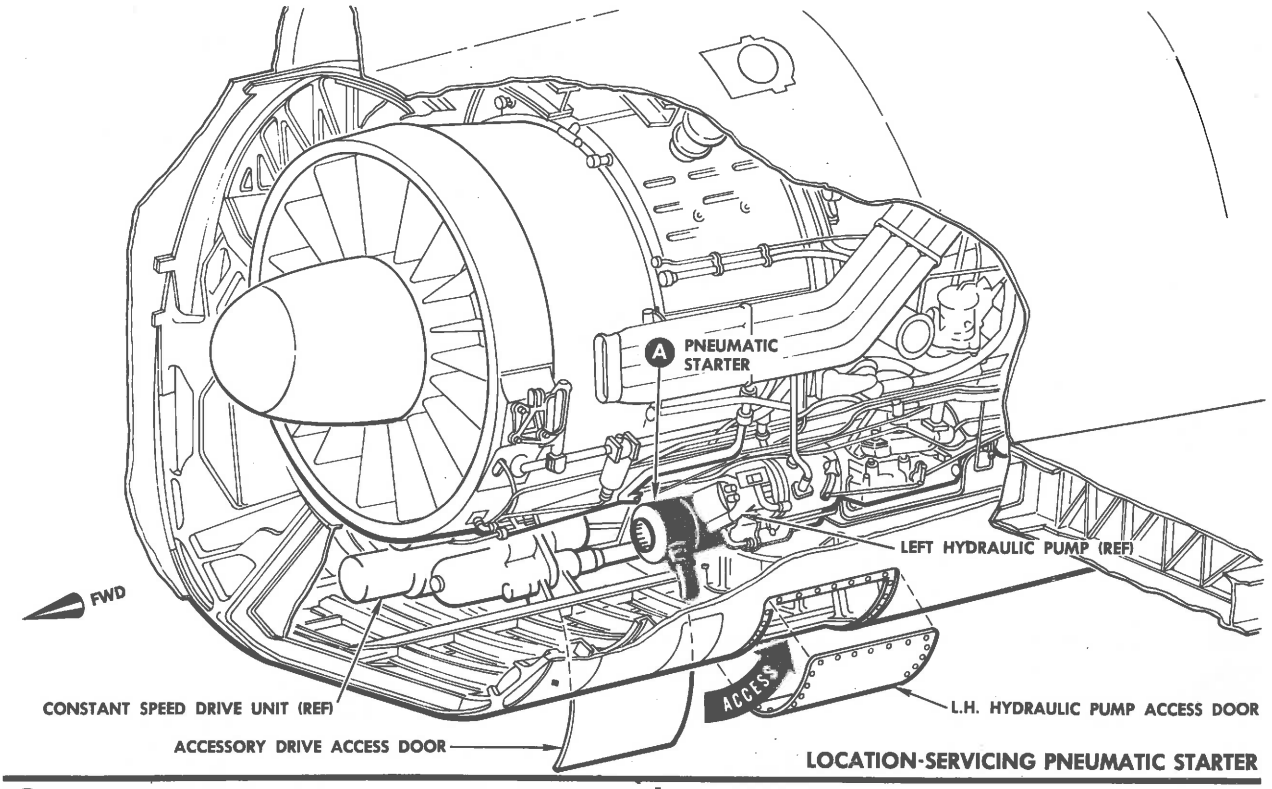
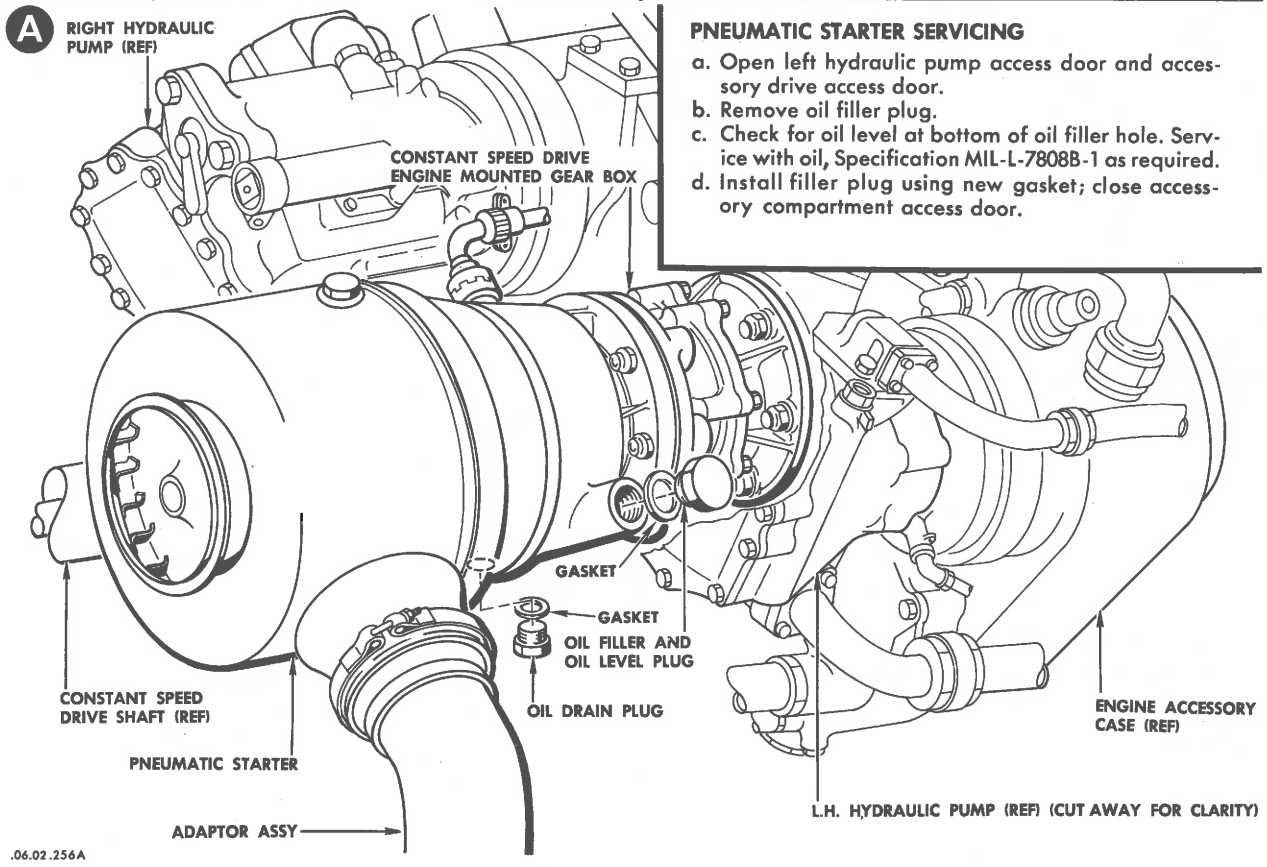
Figure 2-7. Filling and Draining Engine Oil Tank



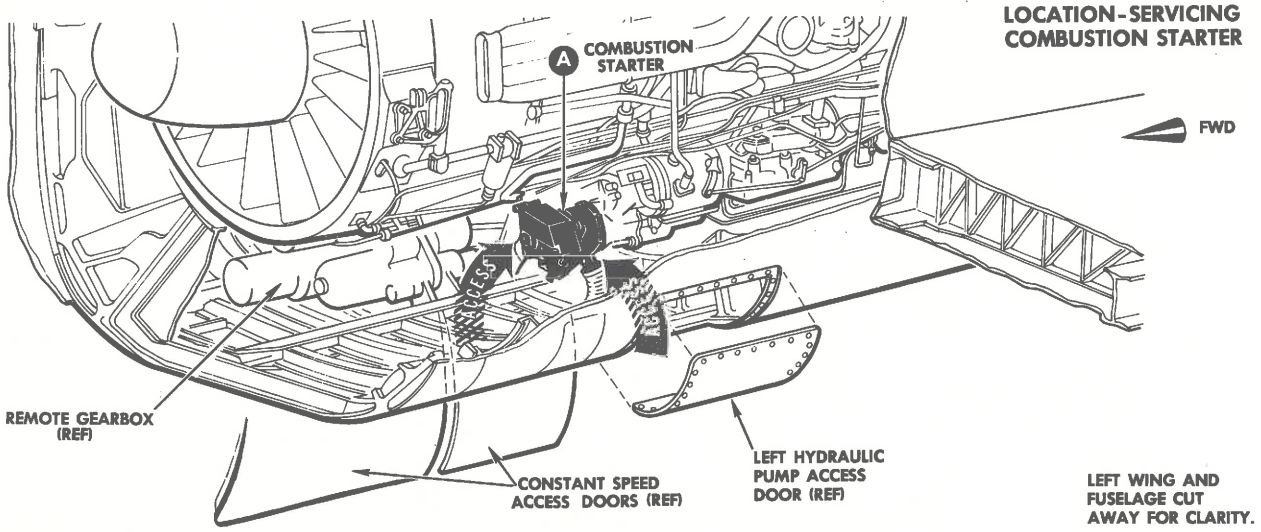
LOCATION-SERVICING PNEUMATIC STARTER

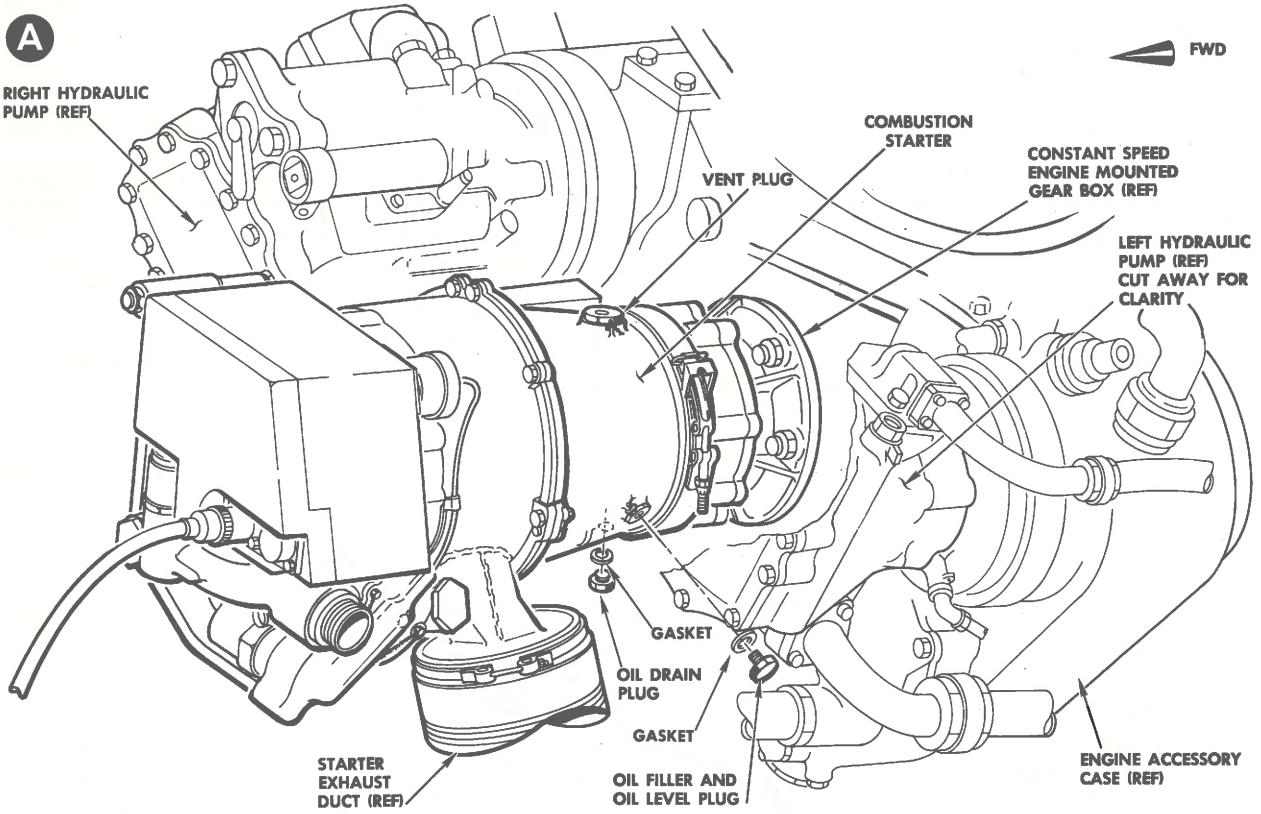


PNEUMATIC STARTER SERVICING

a. Open left hydraulic pump access door and accessory drive access door.
b. Remove oil filler plug.
c. Check for oil level at bottom of oil filler hole. Service with oil, Specification MIL-L-7808B-1 as required.
d. Install filler plug using new gasket; close accessory compartment access door.

Figure 2-8. Pneumatic Starter Servicing





COMBUSTION STARTER SERVICING

a. Open left hydraulic pump access door and accessory drive access door.
b. Remove oil filler plug.
c. Check for oil level at bottom of oil filler hole. Service as required with oil, Specification MIL-L-7808. Recheck in a few minutes and top-off if necessary.
d. Install filler plug using new gasket; close access doors.

NOTE

AFTER COMPLETION OF AN ENGINE REPLACEMENT OR REINSTALLATION, OR AFTER STARTER REPLACEMENT OR MAINTENANCE, BLEED ENTRAPPED AIR FROM THE STARTER FUEL SYSTEM.

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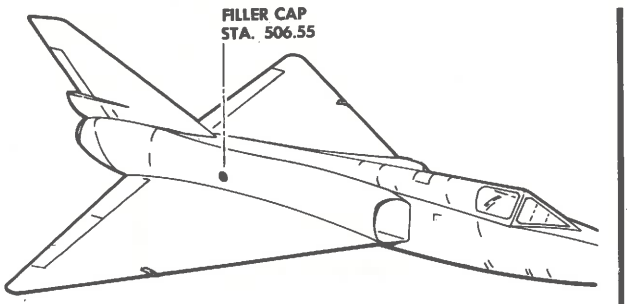
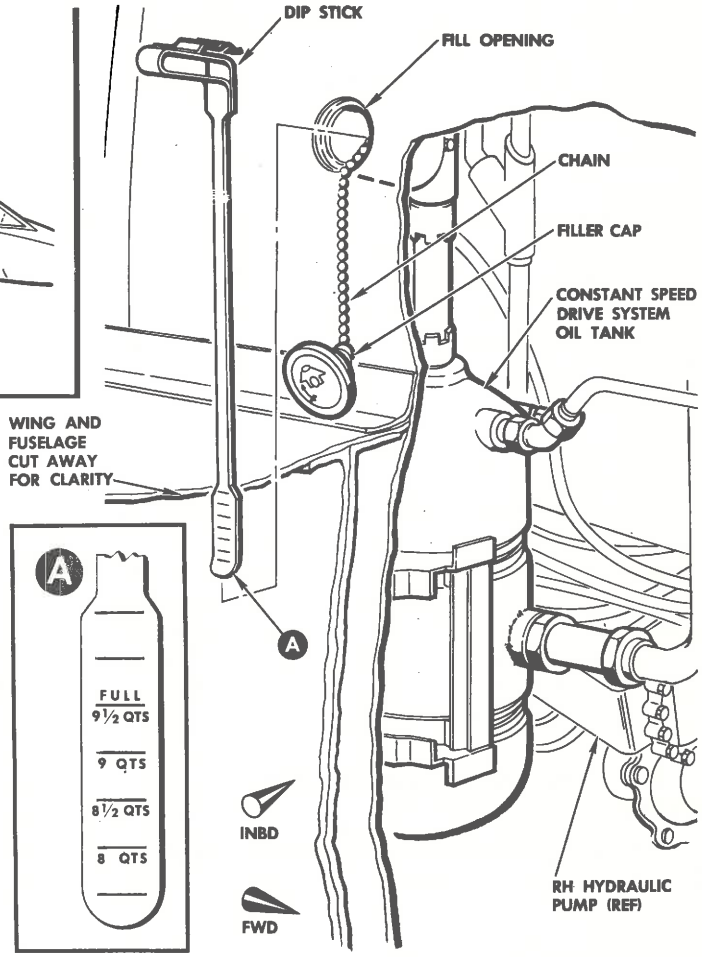
Figure 2-9. Combustion Starter Servicing



LOCATION—CONSTANT SPEED DRIVE UNIT OIL TANK FILLER CAP



SERVICING

a. Remove filler cap.
b. Remove dip stick by pulling outboard and up.
c. Check oil level as indicated on dip stick. Fill tank slowly (approximately 1 qt. every 30 seconds) with oil, Specification MIL-L-7808 as required. Check oil level. Wait for a period of at least 5 minutes, then recheck oil level. Add oil if required. Wipe up oil spilled on the airplane.
d. Install dip stick.
e. Install filler cap.

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Figure 2-10. Servicing Constant Speed Drive Oil System

2. Do not operate airborne and ground radar and radio equipment within a radius of 300 feet of the airplane.
3. Do not permit smoking or an open flame within a radius of 50 feet of the airplane.
4. Provide hand CO_2 fire extinguishers and a mobile fire truck on standby.
5. Check grounding connections to the airplane with an ohmmeter; resistance shall not exceed 10 ohms.

c. Connect external source of 28-volt dc and 115/200-volt, 3-phase, 400-cycle ac power to the airplane; refer to paragraph 1-42 for procedure. Turn on electrical power.

d. Pressurize airplane fuel supply system by operating one fuel boost pump.

e. Open fuel bleed line at plugged tube on right side of starter.

f. Allow fuel to flow into a metal container, that has been grounded to the airplane, until a solid stream of fuel issues from the bleed tube. Cap tube.

g. Turn off boost pump and close access door.

h. Disconnect electrical power.

2-19. SERVICING CONSTANT SPEED DRIVE OIL SYSTEM.

The constant speed drive system is serviced with lubricating oil, Specification MIL-L-7808, as shown in figure 2-10. Removal of the filler cap at Station 506 on the right side of the fuselage provides access to the oil tank. Complete instructions for filling and draining the constant speed drive oil system are given in T.O. 1F-106A-2-4.

NOTE

Normal oil consumption for the constant speed drive system is one pint for each hour of operation. Oil consumption exceeding one pint per hour will require checking system for external leaks and for excessive oil drainage at the overboard vent.

Applicable to F-106A airplanes 59-001 and subsequent, and F-106B airplanes 57-2542 and subsequent. A trap is formed in the vent-to-tank line which under normal condition does not affect the performance of the system. However, if the tank is filled at a rate exceeding 1 quart every 30 seconds, or if the tank is overfilled, the trap in the vent-to-tank line fills with oil, causing an airlock. The airlock, in turn, causes a false oil level indication on the tank dipstick when servicing the tank past the 8.5 quarts to the 9.5 quarts "FULL" level because of the premature filling of the dipstick well. Rapid filling of the dipstick well past the 8.5 quarts oil level is the only indication personnel have that the vent-to-tank line contains oil. Subsequent engine operation will blow the oil out of the vent-to-tank line and empty the dipstick well to the 8.5 quarts level. A check of the oil level following such an occurrence would indicate the system was approximately 1 quart below capacity. To insure that the oil tank is filled to the 9.5 quarts "FULL" level, the amount of oil added shall be checked against the change in oil level indicated on the dipstick. If the amount added is less than the amount indicated on the dipstick, the vent-to-tank line contains oil. To eliminate the airlock, disconnect the vent-to-tank line at the swivel fitting and drain the line. Gain access to the swivel fitting through the small aft constant speed drive access door on the lower right side of the fuselage.

2-20. SERVICING HYDRAULIC SYSTEM RESERVOIRS.

Hydraulic fluid, Specification MIL-H-5606, is used in the primary and secondary hydraulic systems. Access to the hydraulic systems' reservoirs is gained by extending the ram air turbine and opening the hydraulic access door at Station 424. Instructions for filling and draining the hydraulic system's reservoirs are given in figure 2-11. When a reservoir is replaced or if an inner tank cover has been removed for any reason, flush the system by the procedure given in T.O. 1F-106A-2-3.

WARNING

Any hydraulic fluid spilled in or on the airplane should be removed immediately, and the area wiped clean. Hydraulic fluid will cause deterioration of electrical harness insulation and is a serious fire hazard.

2-21. CHARGING HYDRAULIC SYSTEM ACCUMULATORS.

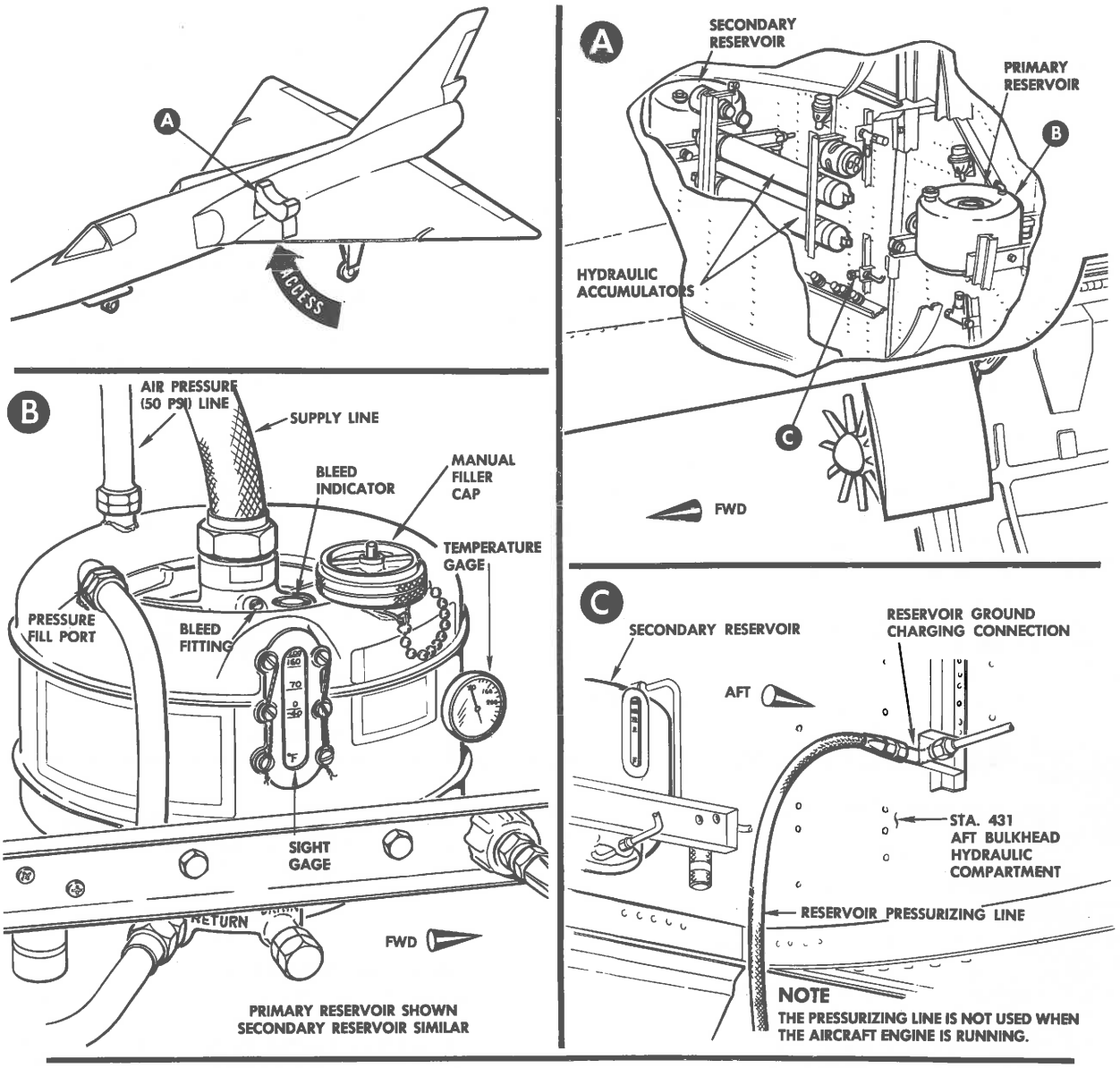
The hydraulic system accumulators are charged with dry air or nitrogen. See figure 2-12 for instructions.

2-22. CHARGING HIGH-PRESSURE PNEUMATIC SYSTEM.

The high-pressure pneumatic system is charged by connecting an external source of air to the ground charging connection located in the left main landing gear wheel well. All components of the pneumatic system are automatically charged to their respective pressures through the ground charging connection.

2-23. Equipment Requirements.

FIGURE	NAME	TYPE	ALTERNATE	USE AND APPLICATION
4-6	High Pressure Air Compressor.	MC-11 (4310-541-7060)	SE 0704-801 (4310-697-0858)	To pressurize air flask and supply system.
2-13	Adapter Quick Disconnect (Manual Disengagement)	SE 1085 (4130-574-9334) *Applicable to F-106A airplanes 56-457 thru 57-231.*		To adapt compressor service hose to airplane quick disconnect.
	Adapter Quick Disconnect (Automatic Disengagement)	Besler 56150-15 (4730-630-3552) *Applicable to F-106A airplanes 57-232 and subsequent, and all F-106B airplanes.*		



PREPARATION

a. Check hydraulic accumulators for proper precharge level 750 (±25) psi; charge accumulators if necessary.
b. Relieve hydraulic pressure in primary and secondary systems by operating flight controls.
c. Pressurize reservoirs with air to 50 (±5) psi.
d. Check "BLEED" indicator. If "BLEED" is indicated, open bleed fitting until clear oil flows; then retighten fitting. Do not use "BLEED" fitting to depressurize reservoirs.
e. Check the fluid level in the hydraulic reservoirs; use the full mark corresponding to the reading on the reservoir temperature gage.

NOTE

THE FLUID LEVEL CHECK SHALL BE MADE WHILE THE RESERVOIR IS PRESSURIZED AT 50 (±5) PSI, ALL HYDRAULIC PRESSURE RELIEVED, LANDING GEAR EXTENDED. WHEN THE RESERVOIRS ARE PRESSURIZED, A FLUID DROP OF MORE THAN 1/4 INCH IN EITHER RESERVOIR INDICATES AIR IN THE HYDRAULIC SYSTEMS. BLEED HYDRAULIC SYSTEMS AS NECESSARY. IF THE SPEED BRAKES ARE OPEN WHEN THE SECONDARY RESERVOIR IS FILLED, THE RESERVOIR FLUID LEVEL WILL RISE APPROXIMATELY 1/8 INCH WHEN THE SPEED BRAKES ARE CLOSED.

If the reading on the sight gage is ¾ inch or more below the full mark fill the reservoir by one of the appropriate methods on sheet 2.

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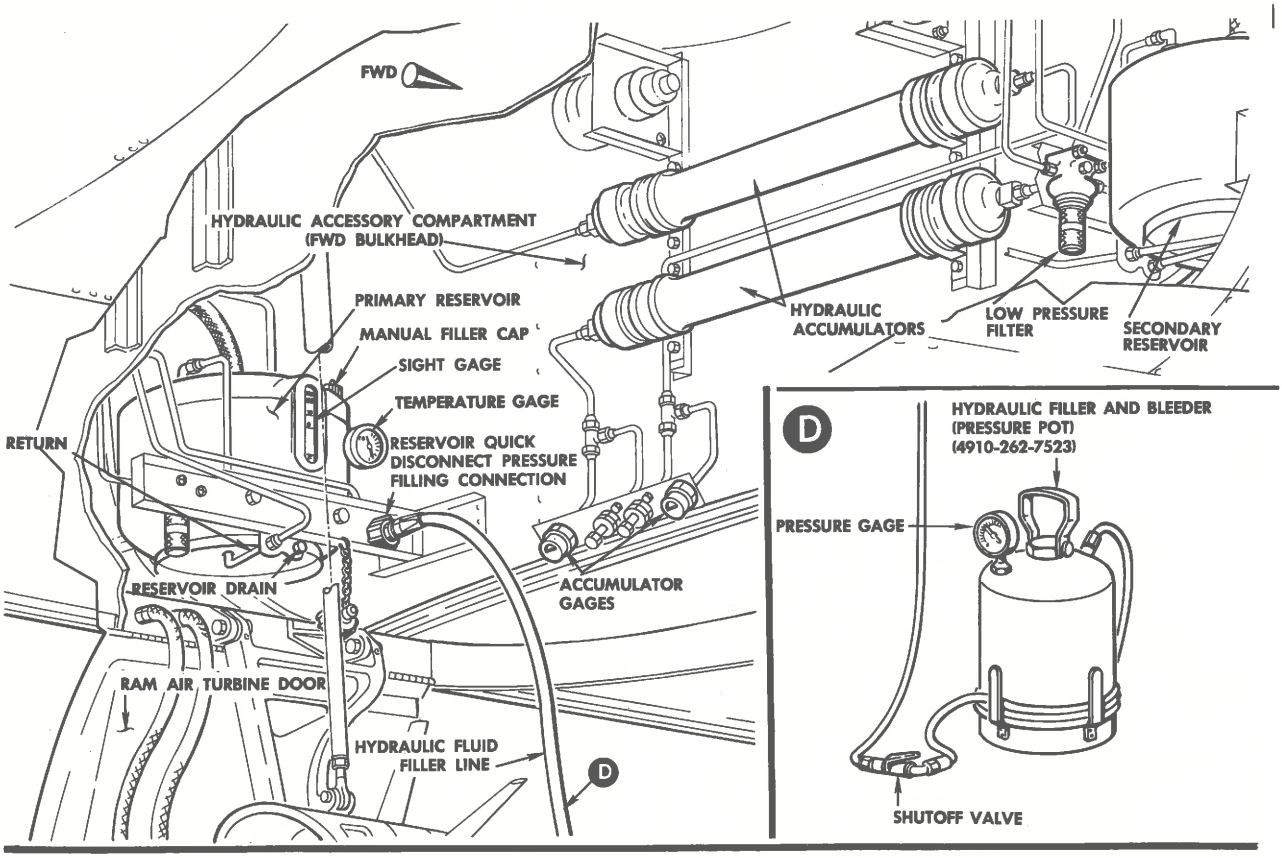
Figure 2-11. Servicing Hydraulic System Reservoirs (Sheet 1 of 2)



FILLING RESERVOIR USING HYDRAULIC FILLER AND BLEEDER UNIT.

NOTE

FILLING THE HYDRAULIC RESERVOIRS WHEN AMBIENT TEMPERATURE IS BELOW 20°F (—6.7°C) SHOULD BE ACCOMPLISHED IMMEDIATELY FOLLOWING TAXI IN FROM FLIGHT. IF THIS TYPE POSTFLIGHT SERVICING IS ACCOMPLISHED, ONLY A PREFLIGHT CHECK FOR LEAKAGE IS NECESSARY. IF NO LEAKAGE IS FOUND, RESERVOIRS ARE PROPERLY SERVICED.

This procedure may be used with the aircraft engine running.

a. Charge hydraulic filler and bleeder (4910-262-7523) to 75 psi.
b. Purge air from hose on hydraulic filler and bleeder and connect hose to reservoir quick disconnect pressure filling connection.
c. Open shutoff valve on hydraulic filler and bleeder and fill reservoir with hydraulic fluid, Specification MIL-H-5606, until level on the sight gage is at the full mark corresponding to the reading on the reservoir thermometer; then close shutoff valve.

NOTE

IF THE ENGINE IS NOT RUNNING OR THERE IS NO EXTERNAL SOURCE BEING USED TO PRESSURIZE THE RESERVOIR, FILL THE RESERVOIR, SLIGHTLY ABOVE THE FULL MARK CORRESPONDING TO THE READING ON THE RESERVOIR THERMOMETER AND REPEAT STEPS "c" THRU "e" OF PREPARATION.

d. Disconnect hydraulic filler and bleeder hose from quick disconnect filling connection.

FILLING RESERVOIR MANUALLY

a. Relieve reservoir air pressure by depressing valve on top of manual filler cap.
b. Remove manual filler cap and fill reservoir slightly above the full mark corresponding to the reading on the reservoir thermometer.
c. Repeat steps "c" thru "e" of PREPARATION.

NOTE

THE RESERVOIRS MAY ALSO BE FILLED FROM THE HYDRAULIC TEST STAND RESERVOIR WHEN THE TEST STAND IS CONNECTED TO THE PRIMARY AND SECONDARY HYDRAULIC SYSTEMS.

DRAINING RESERVOIRS

a. Relieve hydraulic pressure in primary and secondary hydraulic systems by operating flight controls.
b. To drain either reservoir, remove drain plug at lower side of reservoir and drain fluid into a suitable container.

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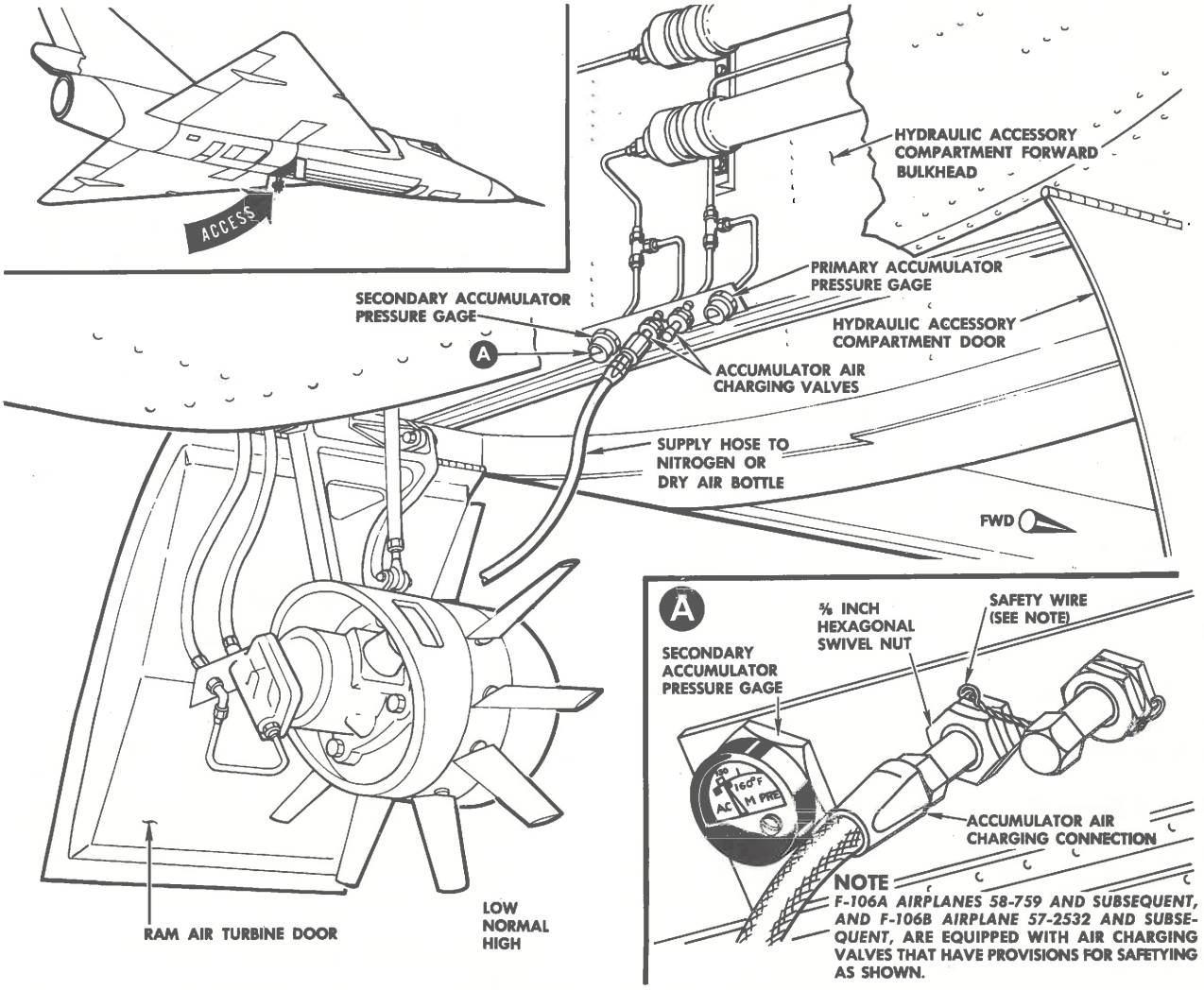
Figure 2-11. Servicing Hydraulic System Reservoirs (Sheet 2 of 2)



CHARGING ACCUMULATORS

a. Relieve pressure in primary and secondary hydraulic systems by operation of flight controls.
b. Remove valve cap from charging valve.
c. Attach supply hose from dry air or nitrogen bottle to charging valve.

WARNING

DO NOT USE OXYGEN TO CHARGE ACCUMULATORS.

d. Loosen ⅝-inch hexagonal swivel nut on valve a maximum of ¾ of a turn.
e. Charge accumulators to proper pressure according to the following chart:

AMBIENT TEMPERATURE			ACCUMULATOR CHARGE (HYDRAULIC PRESSURE AT 0 PSI)
LOW	−65°F	(−53.9°C)	560 PSI
NORMAL	70°F	(21.1°C)	750 PSI
HIGH	160°F	(71.1°C)	870 PSI

NOTE

FOR INTERMEDIATE TEMPERATURES, IT WILL BE NECESSARY TO ESTIMATE PROPER PRESSURE.

DO NOT USE ACCUMULATOR PRESSURE GAGE WHEN PRECHARGING ACCUMULATORS. USE GAGE ON NITROGEN OR AIR BOTTLE.

f. Torque hexagonal swivel nut to 50-70 inch-pounds.
g. Remove supply hose and replace valve cap.

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Figure 2-12. Charging Hydraulic System Accumulators

2-24. Preparation.

WARNING

Before charging high-pressure pneumatic system, check that all components of systems powered by high-pressure air are properly connected. Check that control valves and switches for these systems are properly positioned to prevent inadvertent operation. If maintenance has been performed on the armament system, check that visual indicator pins on missile launcher selector valves and missile bay door selector valve are in phase with their respective cylinder actuating rods. Refer to Section II of T. O. 1F-106A-2-12 for detailed information on this subsystem. Failure to observe the foregoing precautions may result in serious injury to personnel and/or structural damage.

a. Connect compressor service hose to airplane connection; see figure 2-13 for an illustration of this connection.

b. Start air compressor; refer to T.O. 34Y1-125-1 for MC-11, or T.O. 34Y1-56-31 for SE 0704-801, for operating instructions.

2-25. Procedure.

a. Open the compressor servicing line shutoff valve. When the airplane's high-pressure pneumatic system gage indicates 3200 psi, close the compressor service line shutoff valve. Figure 2-13 illustrates the location of the airplane's pressure gage.

NOTE

For quick-turnaround servicing, proceed to step "b." For normal servicing, recheck pressure after a 30-minute cooling period. Recharge system if pressure is below 3000 psi.

b. Disconnect the compressor service hose from the airplane's ground charging connection. *Applicable to airplanes not equipped with Besler connections,* install dust cap on airplane's ground charging connection.

NOTE

Applicable to F-106A airplanes 57-232 and subsequent, and all F-106B airplanes. For quick-turnaround servicing, the Besler quick disconnect fittings are equipped with a lanyard which will automatically disconnect the fittings as the airplane pulls away from the compressor.

c. Continue to operate air compressor until compressor storage flasks (tank) are charged to maximum operating pressure. Shut down compressor.

2-26. RELIEVING HIGH-PRESSURE PNEUMATIC SYSTEM PRESSURE.

See figure 2-14 for procedure for relieving pneumatic system pressure.

2-27. Depressurizing and Draining Drag Brace Accumulators.

A check valve isolates each of the aft main gear drag brace accumulators and prevents reverse flow of air from the aft drag braces into the high-pressure pneumatic system. To depressurize and drain the wheel brake accumulators see figure 2-14.

2-28. SERVICING MAIN AND NOSE GEAR SHOCK STRUTS.

Complete instructions for filling, inflating, deflating, and draining of the main and nose gear shock struts are given in figure 2-15.

WARNING

When inflating shock struts (weight of airplane resting on ground), inflate struts slowly with a servicing line that is equipped with a pressure regulator. Do not inflate shock struts when the airplane is on wing jacks. Failure to comply with the preceding precautions may result in serious injury to personnel and/or structural damage to the airplane.

2-29. SERVICING LANDING GEAR BRAKE SYSTEM.

The landing gear brake system is serviced with hydraulic oil, Specification MIL-H-5606. *Applicable to F-106A airplanes 56-453 thru 57-2464 and 57-2466 thru 57-2506. Applicable to F-106B airplanes 57-2507 thru 57-2522 and 57-2524 thru 57-2531.* See figure 2-16 for servicing procedure. *Applicable to F-106A airplanes 57-2465, 58-759 and subsequent. Applicable to F-106B airplanes 57-2523, 57-2532 and subsequent.* See figure 2-16A for servicing procedure.

2-30. Bleeding Landing Gear Brake System.

Refer to T.O. 1F-106A-2-8 for information on bleeding procedures for the landing gear brake system.

2-31. SERVICING MAIN AND NOSE GEAR TIRES.

The nose landing gear tires are inflated to 140 psi under all load conditions. Pressure values of the main landing gear tires vary due to different fuel load conditions; see figure 2-17 for tire inflation chart. Weight of fuel, MIL-

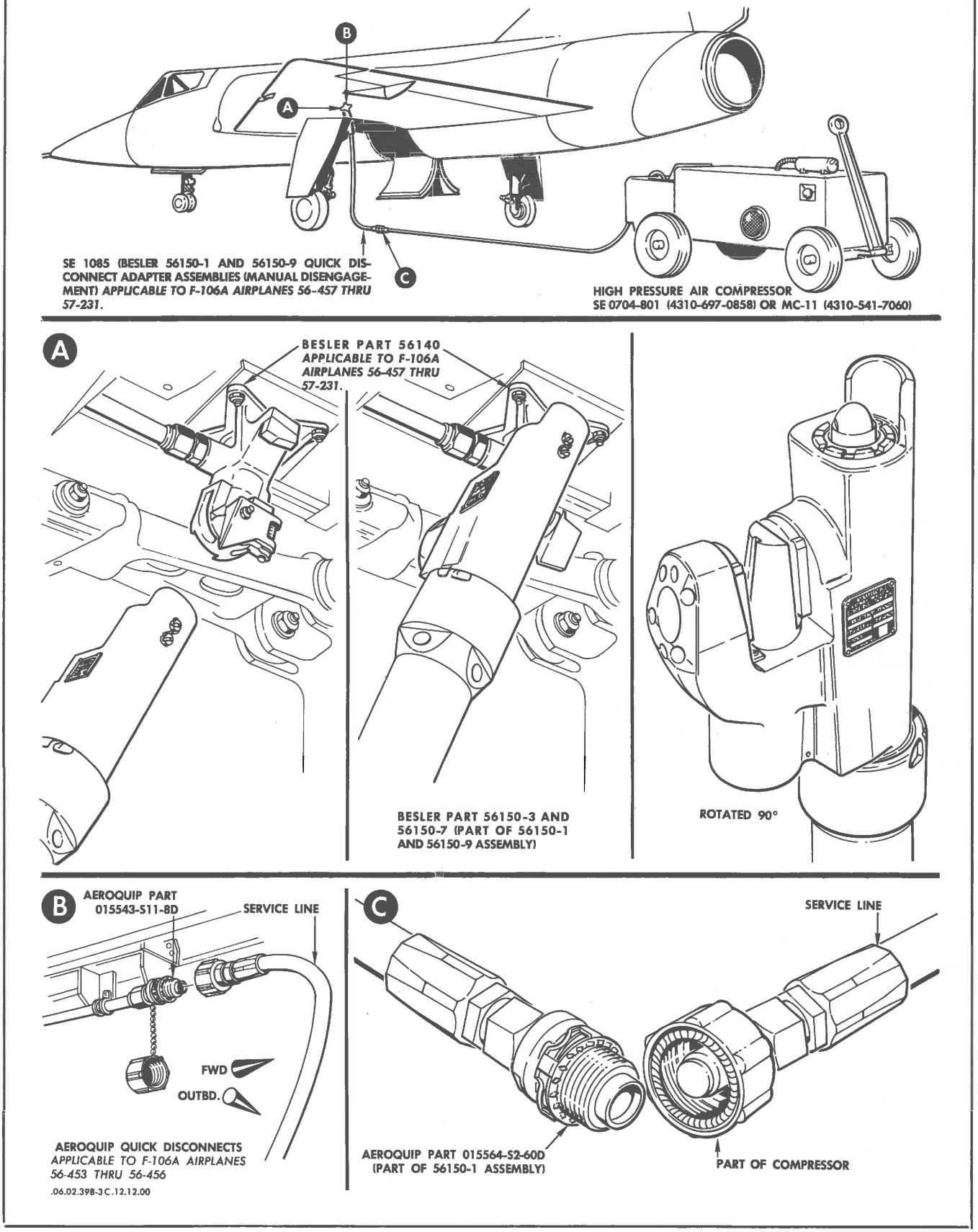


Figure 2-13. High Pressure Pneumatic System Servicing Connections (Sheet 1 of 2)

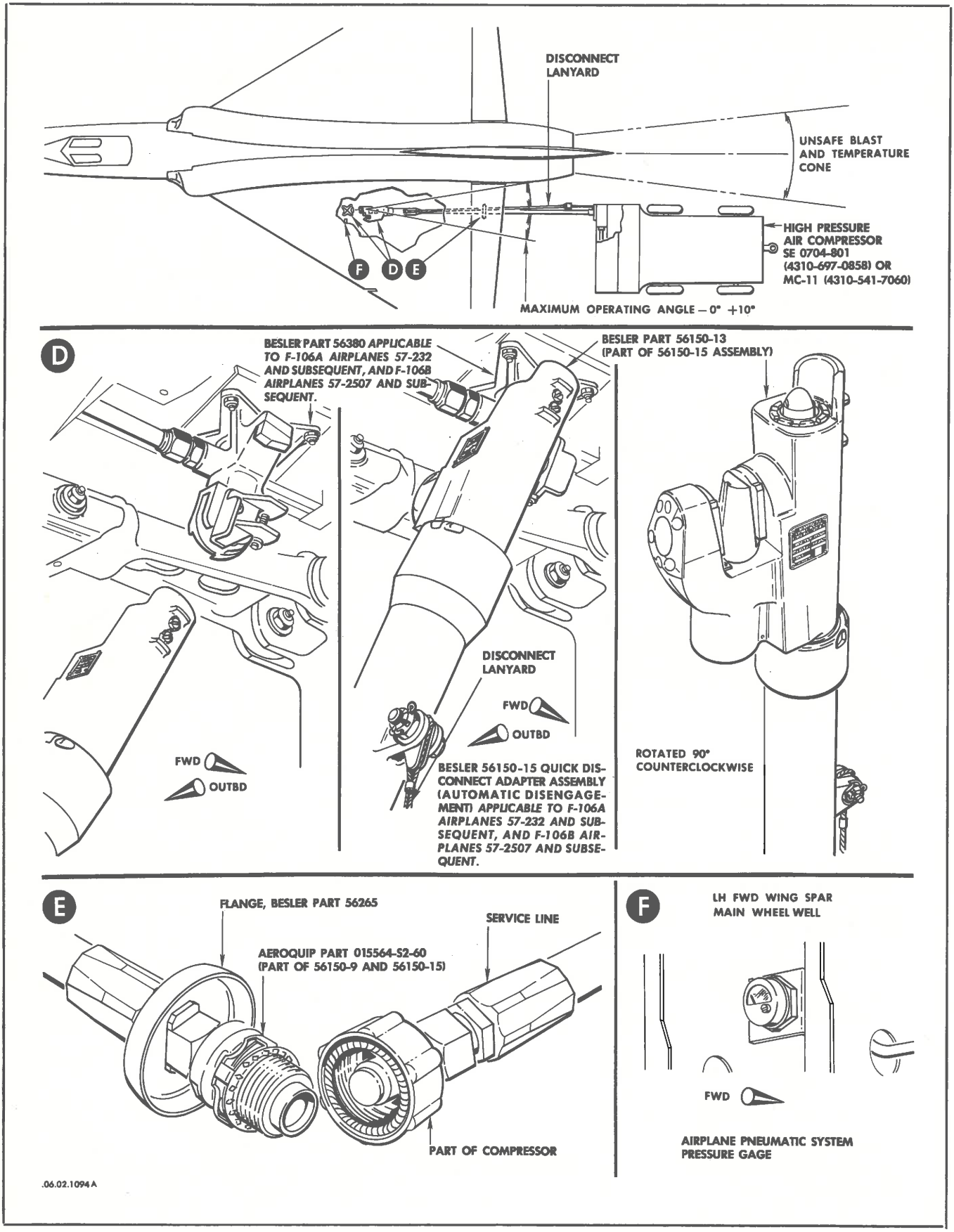
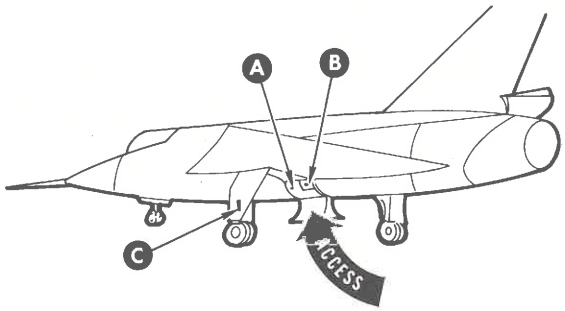
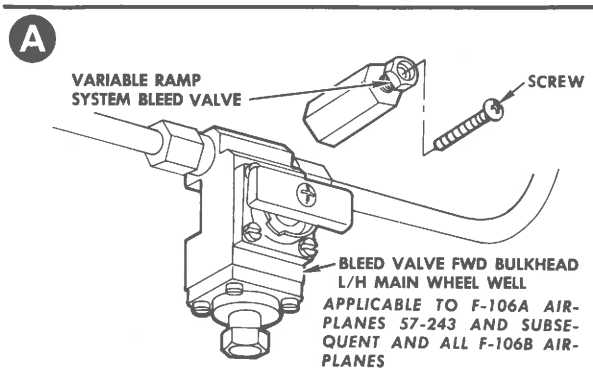


Figure 2-13. High Pressure Pneumatic System Servicing Connections (Sheet 2 of 2)





WARNING

ESCAPING HIGH PRESSURE AIR IS EXTREMELY DANGEROUS. DO NOT ALLOW IT TO STRIKE HANDS, FACE, OR ANY PART OF THE BODY.

On F-106 airplanes equipped with a manual bleed valve, relieve system pressure as follows:

a. Pull out bleed valve handle and rotate handle 90 degrees counterclockwise.
b. Remove screw from variable ramp bleed valve. Loosen valve 1½ turns to bleed off pressure.

WARNING

VALVE COULD BE EXPELLED WITH DANGEROUS FORCE IF LOOSENED EXCESSIVELY BEFORE PRESSURE IS RELIEVED.

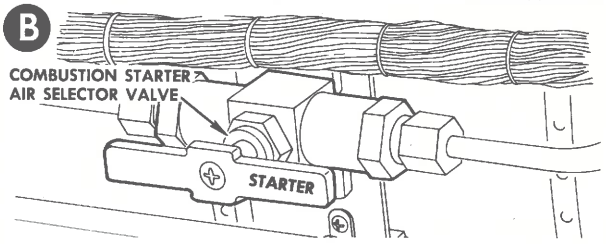
On all F-106 airplanes, high pressure air isolated by a check valve in each of the aft drag braces may be bled as follows:

c. After pressure has been relieved in the main air flasks, operate the brake pedals until venting at each brake relay valve ceases.
d. *Applicable to F-106A airplanes 56-453 to 57-2464, 57-2466 thru 57-2477, and F-106B airplanes 57-2507 thru 57-2522, 57-2524 thru 57-2526,* slowly loosen the drain plug at each aft drag brace and allow the pressure to escape. *Applicable to F-106A airplanes 57-2465, 57-2478 and subsequent, and F-106B airplanes 57-2523, 57-2527 and subsequent,* remove screw from bleed valve and loosen valve 1½ turns to relieve air pressure. See detail C.

NOTE

THE THREE FOLLOWING STEPS ARE APPLICABLE TO AIRPLANES EQUIPPED WITH PNEUMATIC CANOPY ACTUATING CYLINDERS.

e. Open canopy and install canopy hold-open support.
f. Applicable to F-106A airplanes. Place canopy position lock switch in "UNLOCK" position. Loosen pneumatic hose connection at upper actuating cylinder port.
g. Applicable to F-106B airplanes. Operate canopy lift control lever to down position, then to up position. Repeat operation until venting at the canopy control valve ceases.



On F-106A airplanes not equipped with a manual bleed valve, pressure from the main air flasks may be bled through the variable ramp system as follows:

a. Open combustion starter air selector valve.
b. Remove screw from variable ramp bleed valve.
c. Loosen valve 1½ turns to bleed off pressure.

On F-106A airplanes not equipped with a manual bleed valve high pressure air isolated in the forward drag braces may be bled as follows:

d. Slowly loosen a drain plug in one of the forward drag brace accumulators.

WARNING

THE DRAG BRACE ACCUMULATORS ARE CHARGED WITH AIR AT 3000 PSI. THIS PRESSURE COULD CAUSE THE DRAIN PLUG TO BE EXPELLED WITH DANGEROUS FORCE IF LOOSENED EXCESSIVELY BEFORE PRESSURE IS RELIEVED.

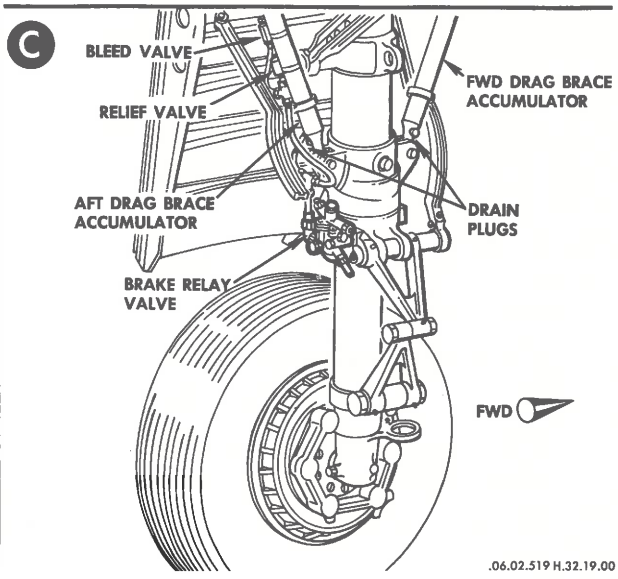
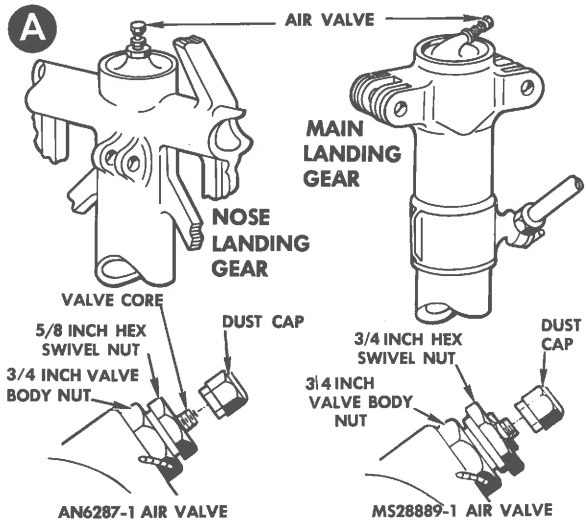


Figure 2-14. Relieving High Pressure Pneumatic System



DEFLATING MAIN AND NOSE GEAR SHOCK STRUTS

NOTE

THE P/N MS28889-1 HIGH PRESSURE AIR VALVE IS BEING ISSUED IN PLACE OF AN6287-1 VALVE ON ATTRITION BASIS. THIS VALVE HAS A 3/4- INCH HEX SWIVEL NUT AND DOES NOT HAVE A VALVE CORE AS A SECONDARY SEAL. PRIOR TO DEFLATING SHOCK STRUT DETERMINE WHICH VALVE IS INSTALLED.

CAUTION

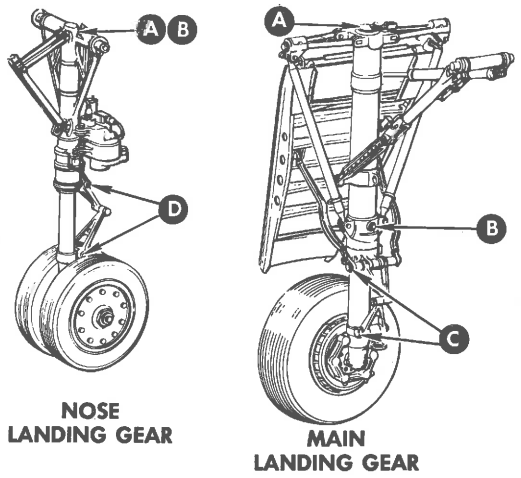
MAKE SURE THAT PERSONNEL ARE CLEAR OF AIRPLANE. DETERMINE THAT ALL OBSTRUCTIONS, WHICH MIGHT CAUSE DAMAGE WHEN AIRPLANE IS LOWERED, ARE REMOVED FROM UNDER FUSELAGE AND WINGS.

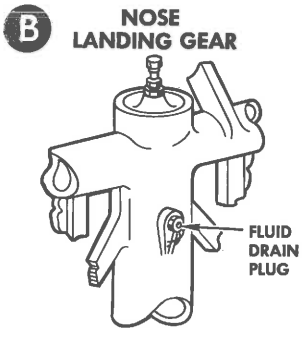
a. Remove dust cap from air valve at top of strut.

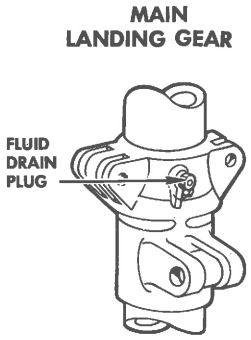
CAUTION

THE MS28889-1 VALVE DOES NOT CONTAIN A VALVE CORE. WITH VALVE IN CLOSED POSITION, LOOSEN DUST CAP ABOUT ONE TURN TO ALLOW THE AIR, WHICH MAY BE TRAPPED BETWEEN THE METAL TO METAL SEAL OF THE VALVE AND CAP, TO ESCAPE. REMOVE CAP. DO NOT LOOSEN THE 3/4 INCH VALVE BODY WHEN STRUT IS PRESSURIZED.

b. On AN6287-1 valve loosen 5/8 inch hex swivel nut up to a maximum of 3/4 of a turn. Depress valve core. If small amount of air, only, is to be discharged, loosen 5/8 inch nut 1/10 of a turn and depress valve core.
c. On MS28889-1 valve loosen 3/4 inch swivel nut slowly. Keep 3/4 inch valve body from turning by holding with another wrench. The amount the 3/4 inch swivel nut is loosened will govern the rate of air discharge.
d. When air pressure is discharged and strut is collapsed, or desired amount of air has been removed, tighten the swivel nut to 50-70 inch-pounds torque.
e. Replace and tighten valve cap to extreme finger tightness.







DRAINING MAIN AND NOSE GEAR SHOCK STRUTS

WARNING

DEFLATE SHOCK STRUT COMPLETELY, FOLLOW PROCEDURE OUTLINED IN THIS ILLUSTRATION.

a. Unsafety valve body nut and use a 3/4 inch wrench to remove valve assembly from top of shock strut. See Detail A.
b. Remove shock strut drain plug and drain strut.

NOTE

NOSE LANDING GEAR MUST BE RETRACTED, WITH DOOR DISCONNECTED, FOR THIS OPERATION.

c. Reinstall and safety drain plug after draining.

FILLING MAIN AND NOSE GEAR SHOCK STRUTS WITH FLUID

WARNING

DEFLATE SHOCK STRUT COMPLETELY, FOLLOW PROCEDURE OUTLINED IN THIS ILLUSTRATION.

a. Unsafety valve body nut and use a 3/4 inch wrench to remove air valve from top of shock strut. See Detail A.
b. Fill shock strut to level of air valve opening with hydraulic fluid, Specification MIL-H-5606.
c. Reinstall air valve and tighten 3/4 inch hex. nut to 100-110 inch-pounds torque. Safety wire valve to strut.

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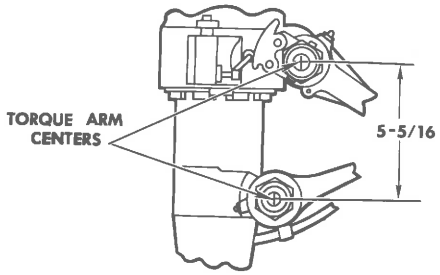
Figure 2-15. Servicing Landing Gear Shock Struts (Sheet 1 of 2)

C MAIN LANDING GEAR



SERVICING MAIN GEAR SHOCK STRUT WITH AIR

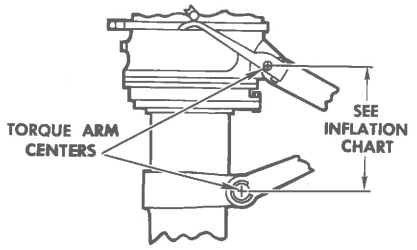
a. Remove cap from valve at top of strut.
b. Attach dry air or nitrogen supply hose to valve.
c. Loosen 5/8 inch hex swivel nut installed on AN6287-1 air valve or 3/4 inch hex swivel nut installed on MS28889-1 valve to a maximum of 3/4 turn.

WARNING

DO NOT INFLATE SHOCK STRUTS IN ORDER TO INSTALL OR REMOVE JACKS. DO NOT INFLATE SHOCK STRUTS WHEN JACKS ARE INSTALLED. SERIOUS INJURY TO PERSONNEL AND/OR STRUCTURAL DAMAGE TO THE AIRPLANE MAY RESULT.

d. With airplane resting on gear, inflate shock strut to dimension shown. If dimension is greater than shown, deflate strut below dimension and then inflate to dimension. Oscillate the wing, when inflating or deflating shock struts, to minimize piston friction.
e. Tighten 5/8 inch or 3/4 inch swivel nut, as applicable, to 50-70 inch-pounds torque.
f. Remove dry air or nitrogen supply hose from valve.
g. Replace and tighten valve cap to extreme finger tightness.

D NOSE LANDING GEAR



SERVICING NOSE LANDING GEAR SHOCK STRUT WITH AIR

Due to airplane CG variations caused by different airplane loaded weight configurations, it is necessary to check shock strut air pressure as well as extension distance. Proceed as follows:

a. Remove valve cap and attach dry air or nitrogen service line including a teed-in 0 to 1000 psi air pressure gage.
b. Loosen ⅝-inch hex swivel nut installed on AN6287-1 air valve or ¾-inch hex swivel nut installed on MS28889-1 valve to a maximum of ¾ turn. Take a pressure reading; tighten hex swivel nut.
c. Find pressure in the inflation chart nearest the gage reading and note proper strut extension for that pressure.
d. Measure distance between torque arm centers; this measurement shall agree within ±0.25 inch of strut extension distance noted in step "c." If measurement is not within tolerance, inflate or deflate strut as required.
e. Tighten hex swivel nut to torque of 50-70 inch-pounds and remove servicing line. Install valve cap; tighten to extreme finger tightness.

NOTE

ON INITIAL AIR SERVICING AFTER COMPLETE DEFLATION, TAKE PRESSURE READING AFTER STRUT PISTON HAS EXTENDED APPROXIMATELY ONE INCH WITH WEIGHT OF AIRCRAFT ON GEAR. CONTINUE INFLATING UNTIL EXTENSION DISTANCE AGREES WITH STRUT AIR PRESSURE AS SHOWN ON THE INFLATION CHART. TOLERANCE GIVEN IN STEP "d" IS NOT APPLICABLE.

INFLATION CHART

STRUT EXTENSION (Torque Arm Center Distance Inches)	STRUT PRESSURE (Gage PSI)	STRUT EXTENSION (Torque Arm Center Distance Inches)	STRUT PRESSURE (Gage PSI)
3¾	967	5¾	343
3⅞	873	5⅞	329
4	795	6	317
4⅛	730	6⅛	304
4¼	680	6¼	294
4⅜	632	6⅜	284
4½	587	6½	275
4⅝	549	6⅝	266
4¾	516	6¾	257
4⅞	486	6⅞	249
5	457	7	242
5⅛	428	7⅛	235
5¼	408	7¼	228
5⅜	388	7⅜	222
5½	372	7½	215
5⅝	356	7⅝	209
		7¾	202

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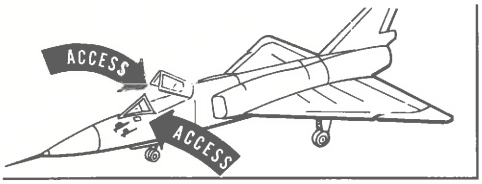
Figure 2-15. Servicing Landing Gear Shock Struts (Sheet 2 of 2)



SERVICING

a. *Applicable to F-106A airplanes 56-453 thru 57-243 and F-106B airplanes 57-2507 thru -2510, -2512 thru 57-2514,* gain access to the cylinder reservoirs thru the cockpit. *Applicable to F-106A airplanes 57-244 thru 57-2464 and 57-2466 thru 57-2506 and F-106B airplanes 57-2507 thru 57-2522 and 57-2524 thru 57-2531,* gain access to the cylinder reservoirs thru the brake servicing access doors RH and LH side Sta 105 just under windshield skirt structures.

b. Remove filler plug on each brake master cylinder reservoir.

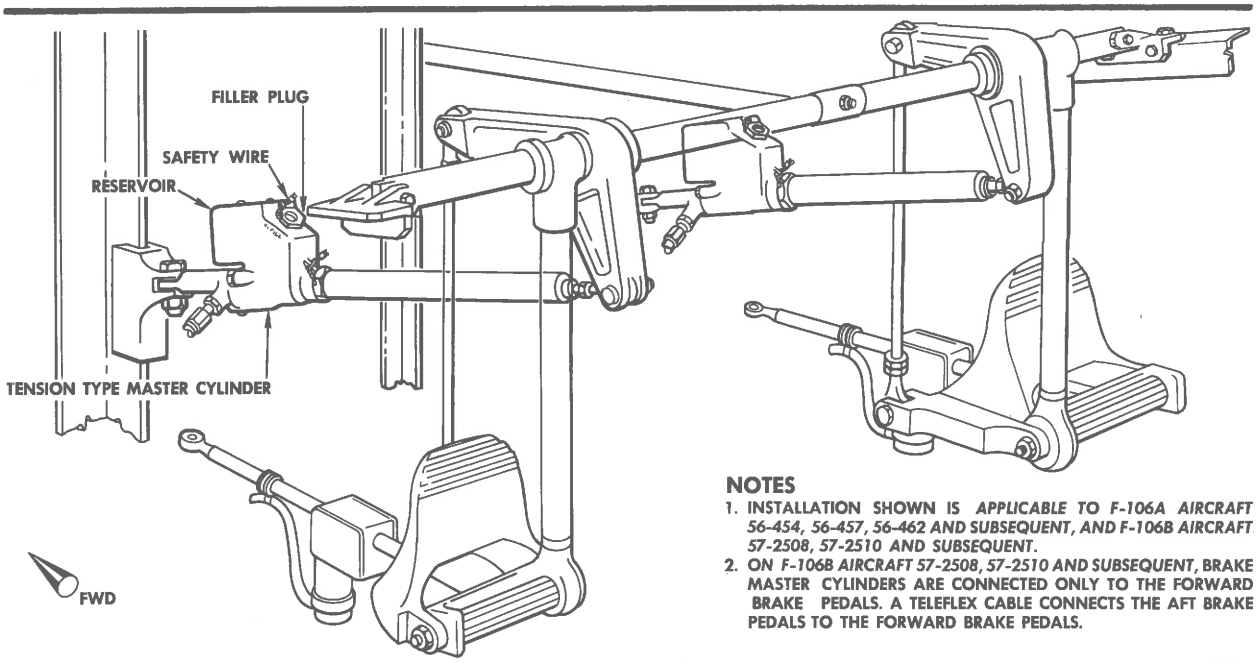
c. Check the reservoir for proper fluid level. The specified reservoir fluid level is 0.8 inch below the top of the filler port. This provides proper volume for oil expansion.

d. If fluid level is low connect hydraulic filler and bleeder (4910-262-7523) to bleed port on brake relay valve and fill to proper level. Use only hydraulic oil, Specification MIL-H-5606.

e. Replace and safety filler plug on each reservoir.

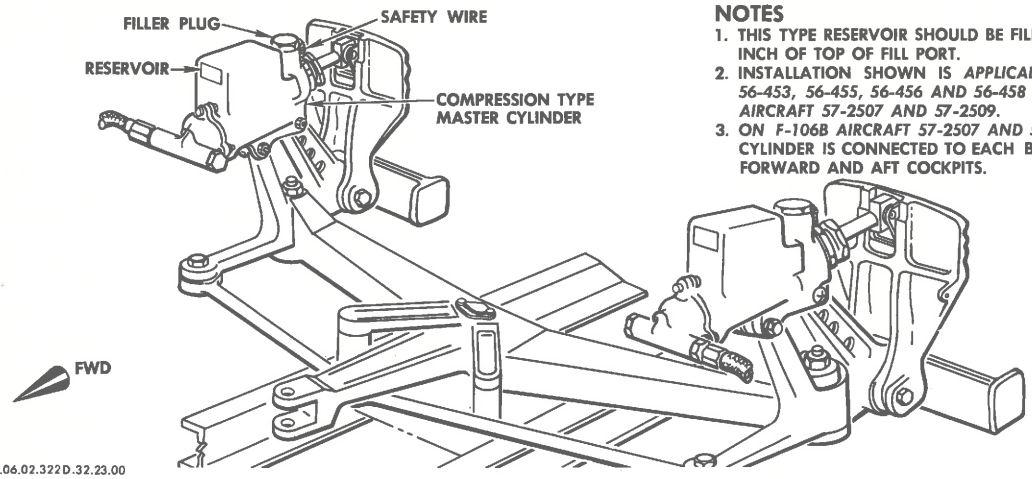
NOTE

IF THE FLUID IS ONLY SLIGHTLY LOW THE RESERVOIR CAN BE FILLED THROUGH THE FILLER ON THE RESERVOIR. HOWEVER, IF THE HYDRAULIC PORTION OF THE BRAKE SYSTEM HAS BEEN OPENED OR DRAINED, OR IF PRESENCE OF AIR IS SUSPECTED THE BRAKE SYSTEM MUST BE FILLED THROUGH THE BRAKE RELAY VALVE AND ALL AIR MUST BE BLED FROM THE SYSTEM.



NOTES

1. INSTALLATION SHOWN IS *APPLICABLE TO F-106A AIRCRAFT 56-454, 56-457, 56-462 AND SUBSEQUENT, AND F-106B AIRCRAFT 57-2508, 57-2510 AND SUBSEQUENT.*
2. *ON F-106B AIRCRAFT 57-2508, 57-2510 AND SUBSEQUENT,* BRAKE MASTER CYLINDERS ARE CONNECTED ONLY TO THE FORWARD BRAKE PEDALS. A TELEFLEX CABLE CONNECTS THE AFT BRAKE PEDALS TO THE FORWARD BRAKE PEDALS.



NOTES

1. THIS TYPE RESERVOIR SHOULD BE FILLED ONLY TO WITHIN 0.50 INCH OF TOP OF FILL PORT.
2. INSTALLATION SHOWN IS *APPLICABLE TO F-106A AIRCRAFT 56-453, 56-455, 56-456 AND 56-458 THRU 56-461, AND F-106B AIRCRAFT 57-2507 AND 57-2509.*
3. *ON F-106B AIRCRAFT 57-2507 AND 57-2509,* A BRAKE MASTER CYLINDER IS CONNECTED TO EACH BRAKE PEDAL IN BOTH THE FORWARD AND AFT COCKPITS.

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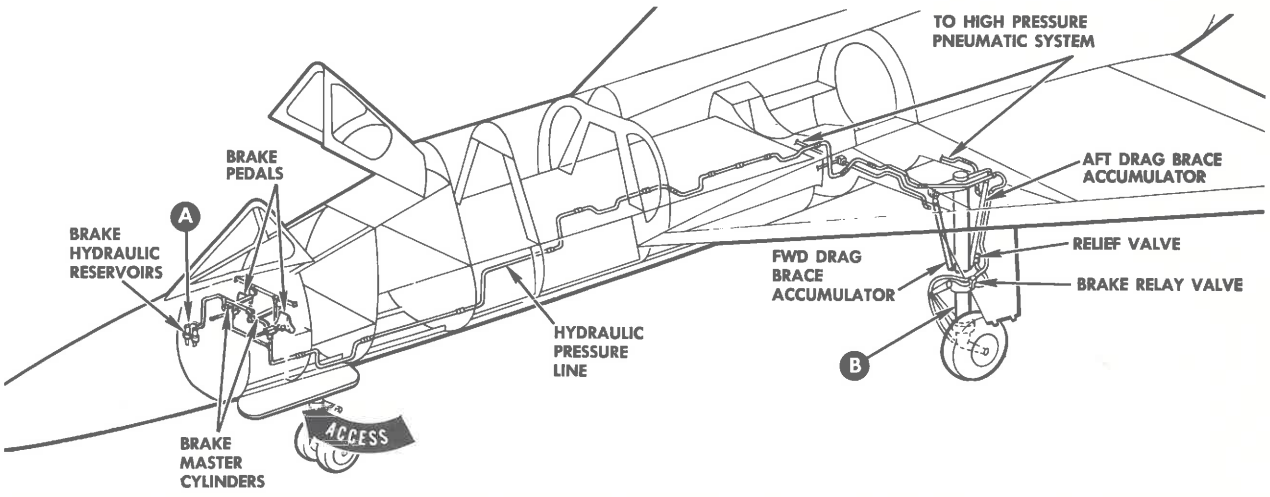
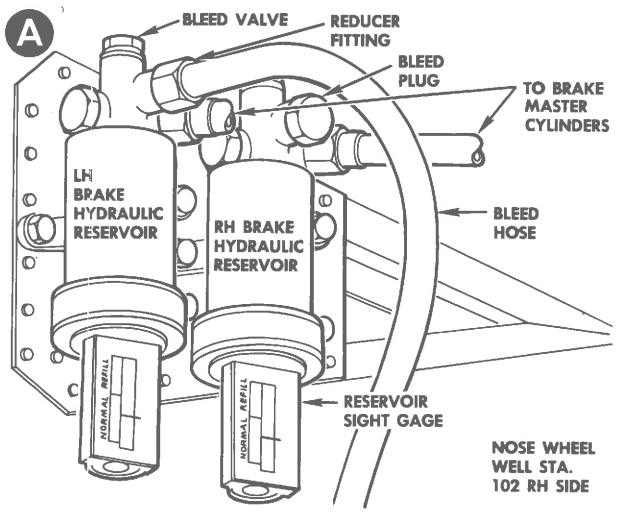
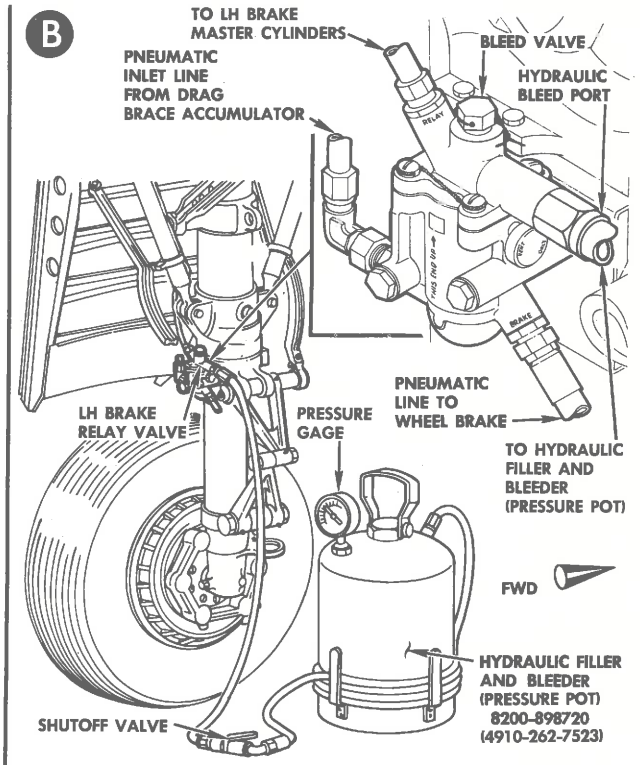
Figure 2-16. Servicing Landing Gear Brake System
Applicable to F-106A airplanes 56-453 thru 57-2464 and 57-2466 thru 57-2506.
Applicable to F-106B airplanes 57-2507 thru 57-2522 and 57-2524 thru 57-2531.



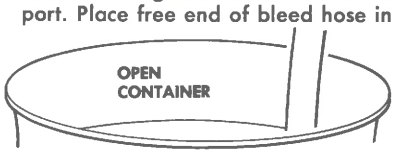




SERVICING AND BLEEDING BRAKE HYDRAULIC SYSTEM

Gain access to the brake reservoirs through the nose wheel well. Check reservoir sight gage. If indicator is in the REFILL area, fill and bleed the brakes as follows:

a. Remove bleed plug from reservoir and install reducer fitting and bleed hose in reservoir bleed port. Place free end of bleed hose in container.



b. Remove plug from hydraulic bleed port on brake relay valve.
c. Service hydraulic filler and bleeder to proper level with hydraulic oil, Specification MIL-H-5606.
d. Purge air from hose on hydraulic filler and bleeder 8200-898720 (4910-262-7523) and connect hose to bleed port on brake relay valve.
e. Charge hydraulic filler and bleeder to 50 psi from an external source.
f. Open hydraulic bleed valve on brake relay valve two full turns counterclockwise.
g. Open bleed valve on top of reservoir two full turns.
h. Open shutoff valve on hydraulic filler and bleeder and allow fluid to flow through brake system for five minutes minimum.
i. Close bleed valve on reservoir; then close bleed valve on brake relay valve.
j. Open bleed valve on reservoir until indicator reaches the normal line; then close bleed valve.
k. Remove reducer fitting and bleed hose from reservoir and install bleed plug. Safety-wire bleed plug and bleed valve.
l. Remove line from hydraulic filler and bleeder at brake relay valve. Safety-wire bleed plug and bleed valve.

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Figure 2-16A. Servicing Landing Gear Brake System
Applicable to F-106A airplanes 57-2465, 58-759 and subsequent.
Applicable to F-106B airplanes 57-2523, 57-2532 and subsequent.

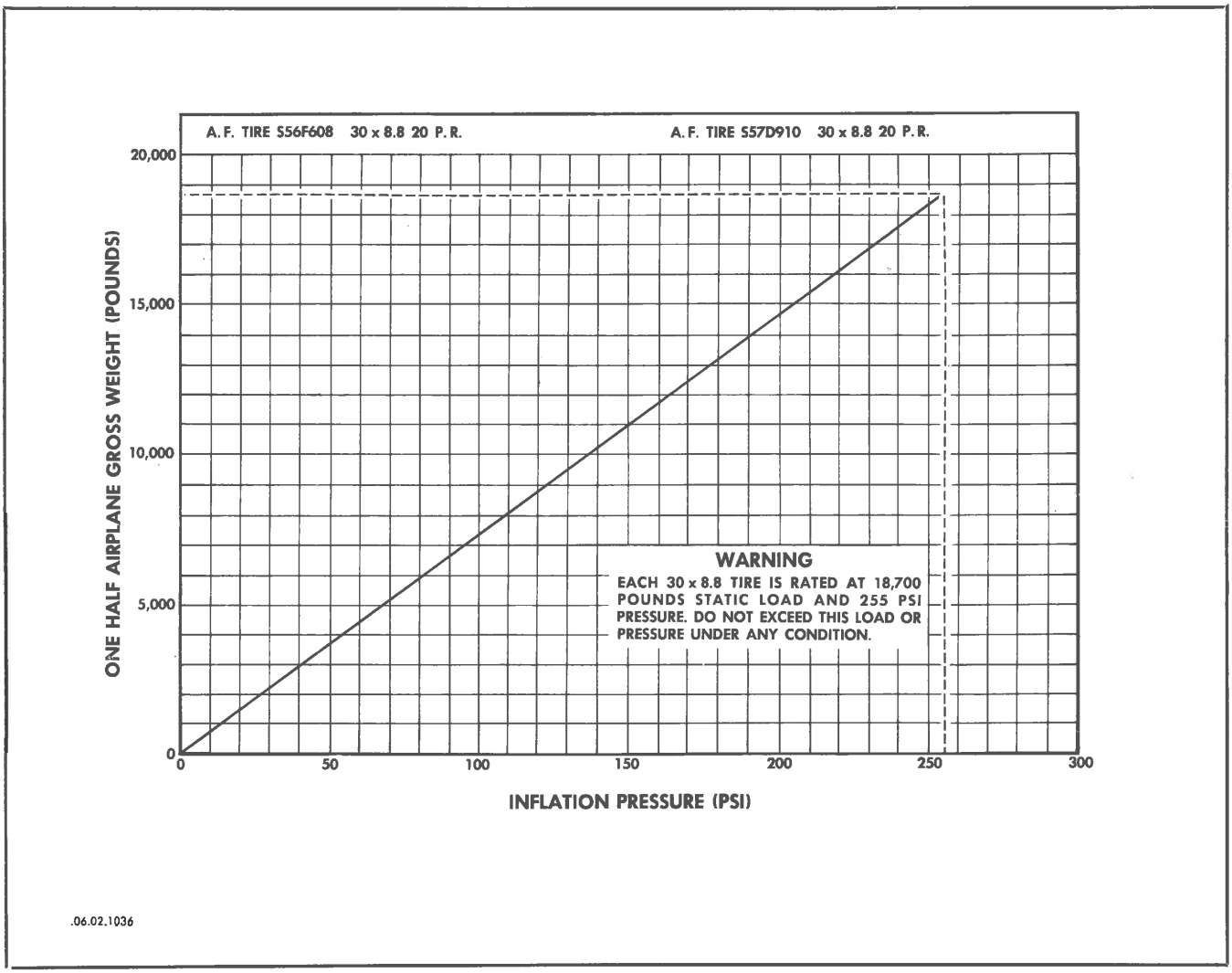


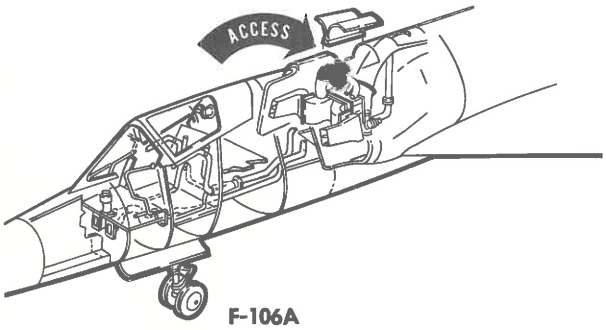
Figure 2-17. Main Landing Gear Tire Inflation Chart

J-5624 (Grade JP-4), varies from 6.2 pounds per gallon at 140°F (60°C) to 6.9 pounds per gallon at −40°F (—40°C); fuel loads given below are computed at 6.5 pounds per gallon at 52°F (11.1°C). The pressures listed below do not include the weight of a full armament load nor the weight of full external fuel tanks. If the airplane has a full armament load, increase tire pressure 10 psi to compensate for this extra load. If the airplane's external tanks are installed and fueled to capacity, increase tire pressure an additional 20 psi (total pressure not to exceed 255 psi) to compensate for extra fuel load.

WARNING

Each 30 x 8.8 20 P.R. tire is rated at 18,700 pounds load and 255 psi pressure. Do not exceed this load or pressure under any condition.

FUEL LOAD CONDITION	TIRE PRESSURE
Applicable to F-106A airplanes 56-453 thru -458, -460 thru 56-466, and 57-229 thru 57-243 prior to incorporation of TCTO 1F-106(J)A-585.	
CAPACITY	224 psi
Applicable to F-106A airplanes 56-459, 56-467, 57-244 and subsequent; and 56-453 thru -458, -460 thru 56-466, 57-229 thru 57-243 after incorporation of TCTO 1F-106(J)A-585.	
NORMAL CAPACITY	225 psi
OVERLOAD CAPACITY	234 psi
Applicable to F-106B airplanes 57-2507 thru -2514 and 57-2523 prior to incorporation of TCTO 1F-106(J)A-585.	
CAPACITY	234 psi



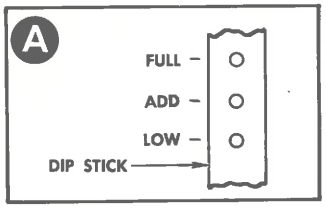
F-106A

DRAINING OIL RESERVOIR

a. Remove drain plug.
b. Allow oil to drain into suitable container (oil capacity approximately 17 ounces).
c. Install a serviceable gasket; reinstall drain plug and safety-wire in place.

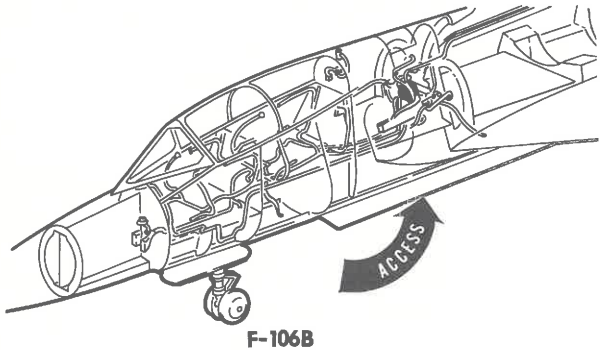
FILLING OIL RESERVOIR

a. Remove filler cap.
b. Add oil, Specification MIL-L-6085, until oil reaches "FULL" mark on dip stick (cap. 500 cc).
c. Install a serviceable gasket; reinstall filler cap.



NOTE

MAXIMUM OIL CAPACITY IS 500 CC (APPROXIMATELY 17 OUNCES). MAINTAIN OIL LEVEL BETWEEN "ADD" AND "FULL".



F-106B

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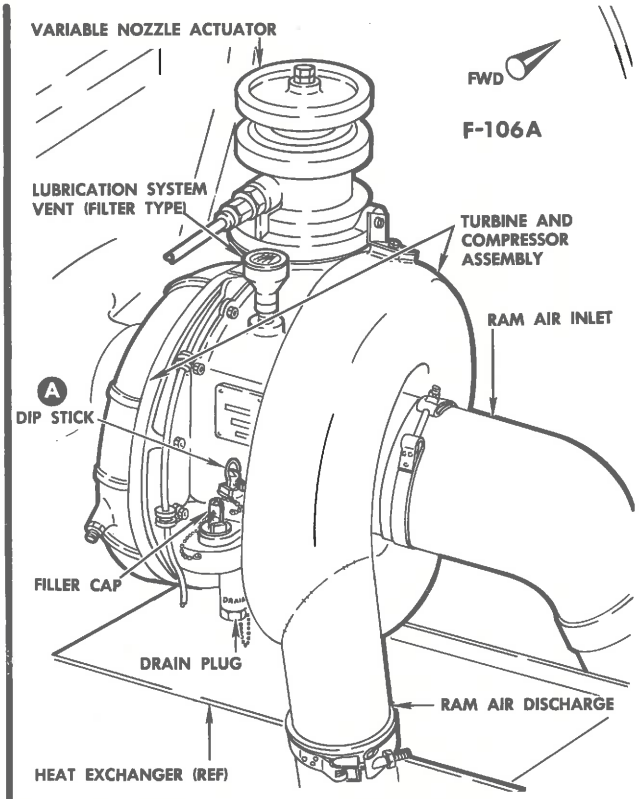


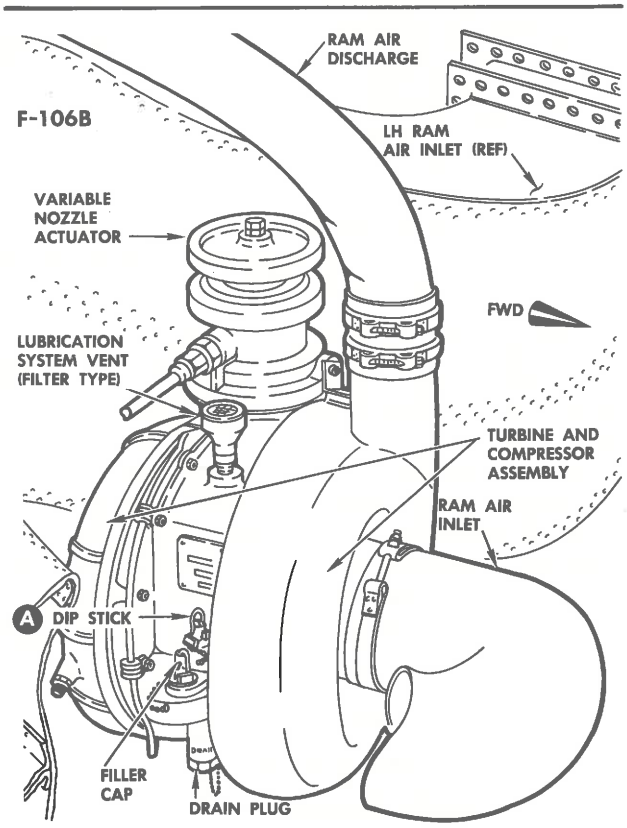
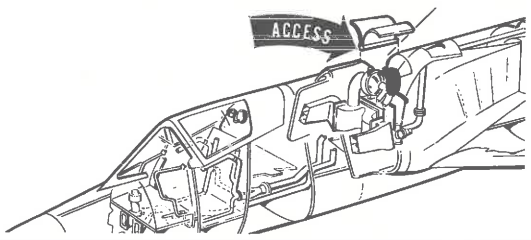


Figure 2-18. Servicing Refrigeration Unit Turbine and Compressor Assembly



FILLING ANTI-ICE FLUID TANK

a. Gain access to tank through air conditioning compartment access door at top of fuselage.

NOTE

APPLICABLE TO F-106B AIRPLANES, THE ANTI-ICE FLUID TANK IS LOCATED IN THE RIGHT HAND FORWARD SECTION OF THE REFRIGERATION COMPARTMENT.

b. Depressurize tank by pressing relief valve button on center of filler cap. Hold cloth over cap to prevent spillage of fluid which may escape with released air.
c. Remove filler cap and fill tank with a mixture of two parts of Glycol Fluid, Specification MIL-A-8243A and one part of distilled water. Tank capacity, 2 U.S. gallons (1.67 Imperial gallons, 7.57 metric liters).
d. Replace filler cap and tighten to extreme finger tightness.

DRAINING ANTI-ICE FLUID TANK

a. Gain access to tank through air conditioning compartment access door at top of fuselage.
b. Depressurize tank by pressing relief valve button on center of filler cap. Hold cloth over cap to prevent spillage of fluid which may escape with released air. Remove filler cap.
c. Remove cap from drain fitting and drain fluid into clean container.
d. Replace cap on drain fitting and filler cap on top of tank.

NOTE

APPLICABLE TO F-106A AIRPLANES 56-453 THRU 58-798 AND F-106B AIRPLANES 57-2507 THRU 57-2515, 57-2517 THRU 57-2522, 57-2524 THRU 57-2536, AND 57-2538 THRU 57-2541 PRIOR TO INCORPORATION OF T.O. 1F-106-606, STENCILED SERVICING INSTRUCTIONS ARE TO BE DISREGARDED.

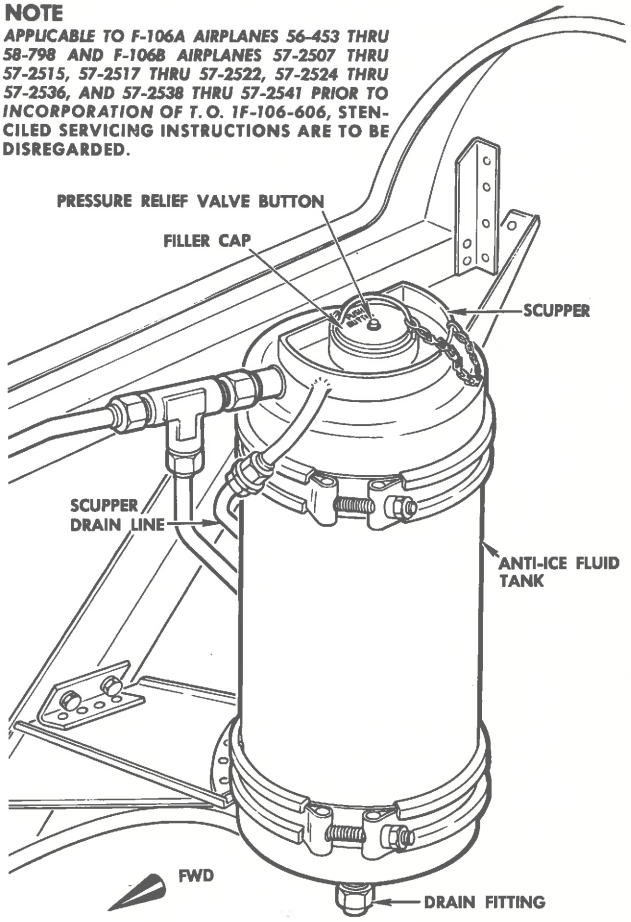


Figure 2-19. Filling and Draining Anti-Icing Tank

FUEL LOAD CONDITION (Cont)	TIRE PRESSURE
Applicable to F-106B airplanes 57-2515 thru -2522, 57-2524 and subsequent; and 57-2507 thru -2514, 57-2523 after incorporation of TCTO 1F-106(J)A-585.	
NORMAL CAPACITY	234 psi
OVERLOAD CAPACITY	242 psi

2-32. SERVICING REFRIGERATION UNIT.

Lubricating oil, Specification MIL-L-6085 is used to service the refrigeration unit. *Applicable to F-106A airplanes.* Access to the oil reservoir is gained by opening the air-conditioning compartment access door at Station 294 on the top of the fuselage. *Applicable to F-106B airplanes.* Access to the oil reservoir is gained by opening the air-conditioning access door located in the roof of the missile bay. Instructions for filling and draining the refrigeration unit are given in figure 2-18.

2-33. SERVICING RADOME ANTI-ICING SYSTEM.

The radome anti-icing system is serviced with a mixture of two parts Glycol Fluid, Specification MIL-A-8243, and one part water. The anti-icing tank is located at the upper right side of the air-conditioning compartment. Complete servicing instructions are given in figure 2-19.

2-34. SERVICING LIQUID OXYGEN SYSTEM.

Liquid oxygen, Federal Specification BB-O-925, Grade A, Type II, is supplied at a temperature of about −299°F (−184°C) to fill the airplane's low-pressure oxygen system. Access to the filler connection is accomplished by removing a door at Station 123 on the left side of the fuselage. The properties of pure oxygen are such that combustion may be initiated by a spark or merely by contact with petroleum products. The safety precautions listed in the following paragraph must be observed.

2-35. Safety Precautions.

The following safety precautions must be observed at all times while working with liquid oxygen:

a. Liquid oxygen is extremely cold. Contact with skin will cause freezing or extreme frostbite. Do not handle tubes or fittings through which liquid oxygen is flowing with bare hands. Protective gloves (FSC 8415-634-6522), and a face shield (FSC 4240-202-5811) will be worn at all times when handling liquid oxygen. Sleeve cuffs should be snugly fitted over the gloves, or, if the arms are elevated, the gloves should be worn over the sleeve terminals.

b. Do not allow liquid oxygen to flow onto any part of the body or clothes where it might become entrapped. Wear clothing of tightly woven, non-static generating material such as herringbone material. Trouser legs without cuffs should extend over high cut shoes.

c. Physical contact with liquid oxygen and the possibility of injury to personnel is most probable during oxygen servicing. Greatest care should be taken at this time. The overboard vent line is utilized as the overflow line for the converter. Maintenance personnel should familiarize themselves with the location of this outlet and insure that the immediate area is clear of personnel while servicing. Escape of liquid oxygen is also possible while connecting or disconnecting the supply hose from the liquid oxygen cart to the airplane filler valve.

d. All clothing, tubing, fittings, and equipment in the vicinity of oxygen must be kept free of oil, grease, fuel, hydraulic fluid, and other combustible material. The surrounding area must also be free of rags, oil, grease, or other petroleum products.

e. Post area around airplane being filled with oxygen with suitable warning signs. Prohibit smoking, or operation of electrical equipment. Prohibit refueling of airplanes or other equipment within 200 feet of area.

f. Do not store liquid oxygen, even temporarily, in enclosed containers which are not provided with adequate safety valves or rupture discs.

g. All containers in which liquid oxygen is stored must bear suitable warning signs to indicate that metal surfaces and fittings of container may be extremely cold and that skin may adhere to these surfaces upon contact.

h. Locate suitable fire-fighting equipment in oxygen servicing area. Suitable fire-fighting agents include sand, carbon dioxide, and water-solid stream or fog, either high or low velocity. Do not use soda and acid extinguishers, mechanical (liquid) foam, methyl bromide, or carbon tetrachloride extinguishers.

2-36. Filling and Draining.

Fill and drain the oxygen system as directed in figure 2-20 or 2-21. Observe safety precautions in preceding paragraph.

2-37. Purging.

Refer to T. O. 1F-106A-2-6 for the oxygen system purging requirements and procedures.

2-38. SERVICING EMERGENCY OXYGEN CYLINDERS, UPWARD EJECTION SEAT.

The emergency oxygen system storage bottles are incorporated in the survival kit assembly. The bottles are serviced with gaseous oxygen, Federal Specification BB-O-925, Grade A Type I. The properties of pure oxygen are such that combustion may be initiated by a spark or merely by contact with petroleum products. Before servicing the system, refer to steps "d," "e," and "h" of paragraph 2-35 and proceed as follows:

a. Gain access to bottles by opening aft lid of survival kit.

b. Remove cap from filler valve and connect hose from high pressure supply source.

c. Adjust valve on supply source to deliver 1900 psi.

d. When survival kit's pressure gage indicates 1900 (±100) psi, turn off supply source, disconnect filler hose, install cap on filler valve, and close lid of survival kit.

2-39. SERVICING EMERGENCY OXYGEN CYLINDERS, ROTATIONAL UPWARD EJECTION SEAT.

The emergency oxygen storage bottles are incorporated in the seat assembly. The bottles are serviced with gaseous oxygen, Federal Specification BB-O-925, Grade A Type I. The properties of pure oxygen are such that combustion may be initiated by a spark or merely by contact with petroleum products. Before servicing the emergency oxygen bottles, refer to steps "d," "e," and "h" of paragraph 2-35 and proceed as follows:

a. Gain access to the emergency oxygen filler valve by removing the seat pad.

b. Remove cap from filler valve and connect servicing hose from supply source.

e. Adjust valve on supply source to deliver 1900 psi.

d. When the emergency oxygen system's pressure gage indicates 1900 (±100) psi, turn off valve at supply source.

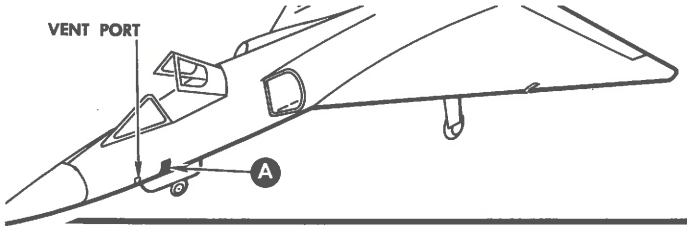
e. Disconnect servicing hose from filler valve; install cap. Install seat pad.

2-40. SERVICING BATTERY.

When properly filled, the silver-zinc alkaline battery contains sufficient electrolyte for its full service life; additional filling is not required nor recommended. Level of the electrolyte varies with the battery's state of charge, and the specific gravity of the electrolyte is not an indication of charge. The use of a hydrometer is unnecessary. Battery servicing requires removal of the battery from the airplane after a specified number of flight hours or an elapsed period of time. Refer to T.O. 1F-106A-2-10 for battery removal and servicing instructions. T.O. 1F-106A-6 specifies inspection and servicing intervals.

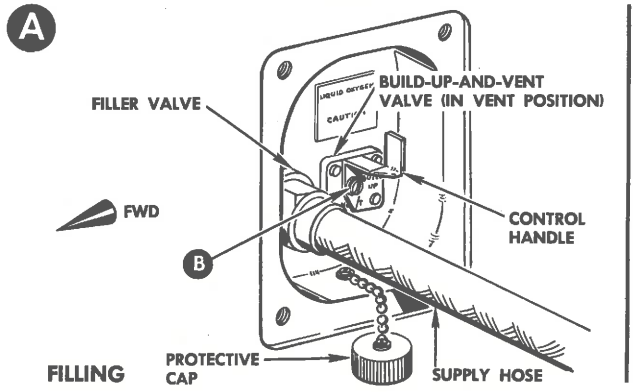
2-41. DRAINING PITOT-STATIC SYSTEM.

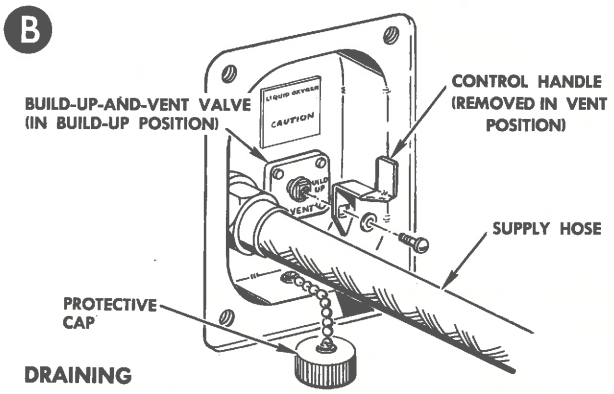
Applicable to F-106A airplanes 56-453, -455, -456, -458 thru -462, and 56-467. Four water drain traps are located in the nose wheel well, at the lowest points of the pitot-



NOTE

APPLICABLE TO F-106A AIRPLANES 56-453, -455, -456, -458 THRU -462 AND 56-467, THE BUILDUP-AND-VENT VALVE IS LOCATED DIRECTLY ABOVE THE FILLER VALVE.





FILLING

WARNING

SERVICE SYSTEM WITH LIQUID OXYGEN SPECIFICATION BB-0-925, GRADE A, TYPE II. OBSERVE ALL PRECAUTIONS.

a. Insure that the control lever on the pilot's oxygen panel is positioned to "OFF" (check the panels in the forward and aft cockpit F-106B airplanes).
b. Gain access to the filler-valve and buildup-and-vent valve through the access panel located on the left-hand side of the fuselage above the nose wheel well door.
c. Turn the buildup-and-vent valve control handle to the "VENT" position.
d. Remove, chain attached, protective cap from the filler valve.
e. Connect supply hose, from oxygen servicing cart, to the filler valve.

WARNING

STAY CLEAR OF OVERBOARD VENT PORT LOCATED JUST FORWARD OF THE LEFT-HAND WHEEL WELL DOOR. POSITIONING THE BUILDUP-AND-VENT VALVE TO "VENT," INTERCONNECTS THE VENT AND LIQUID OXYGEN OVERFLOW LINE. LIQUID OXYGEN WILL FLOW FROM VENT LINE WHEN THE CONVERTER IS FULL.

f. Adjust supply pressure on the servicing cart to 35 (± 5) psig.
g. Open supply hose valve from servicing cart. Flow rate is approximately one liter per minute.
h. Close supply hose valve, from servicing cart, when liquid oxygen flows in a steady stream from vent port.

NOTE

OVERBOARD SPILLAGE MAY BE CONTROLLED BY CONNECTING AN OIL FREE SECTION OF TUBING BETWEEN THE VENT LINE AND A CLEAN, OIL FREE, OPEN CONTAINER.

WARNING

ESCAPE OF LIQUID OXYGEN IS POSSIBLE WHILE CONNECTING OR DISCONNECTING THE SERVCING CART SUPPLY HOSE TO THE AIRPLANE FILLER VALVE.

i. Disconnect oxygen servicing cart supply hose from airplane filler valve.
j. Turn the buildup-and-vent valve control handle to the "BUILDUP" position.
k. Reinstall the chain attached, protective cap on the filler valve and replace the access door.
l. Check the quantity and pressure gages in the cockpit for proper readings.

DRAINING

WARNING

OBSERVE ALL PRECAUTIONS.

a. Perform steps "a" thru "e" under filling instructions.
b. Turn the buildup-and-vent valve on the supply cart to the "VENT" position.
c. Remove control handle from airplane buildup-and-vent valve and place valve in "BUILDUP" position. Liquid oxygen will flow from airplane converter into supply tank on service cart.
d. After oxygen has been drained, place the oxygen buildup-and-vent valve in the "VENT" position and install the control handle.
e. Perform steps "i" thru "k" under FILLING instructions.

CAUTION

PURGE THE OXYGEN SYSTEM PRIOR TO RESERVICING. RESERVICE SYSTEM AS SOON AS POSSIBLE TO PREVENT EXCESSIVE MOISTURE ACCUMULATIONS DUE TO CONDENSATION.

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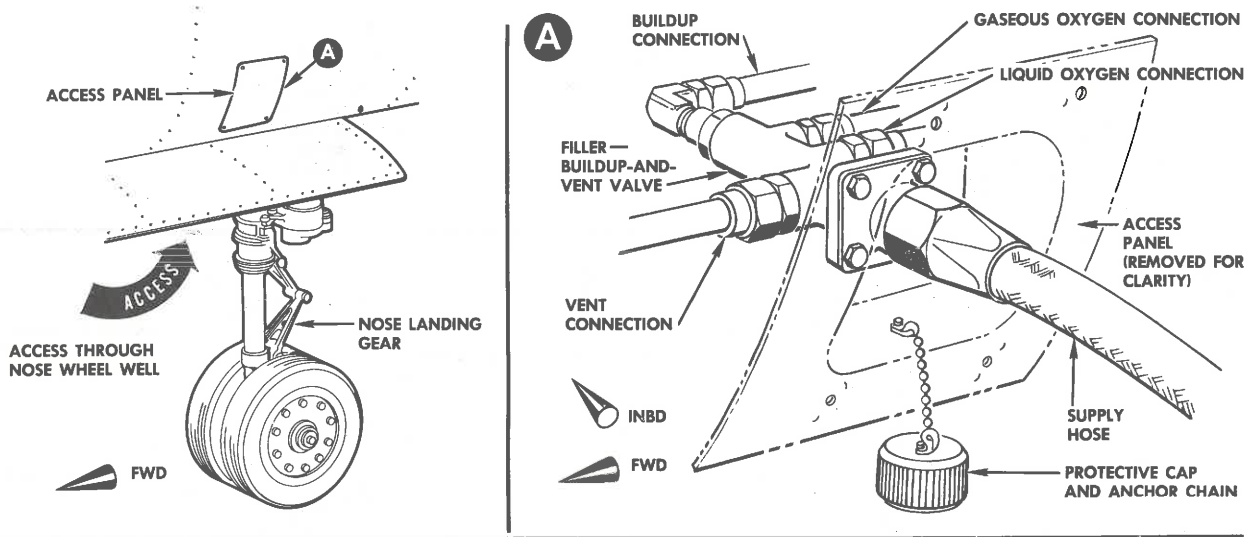
Figure 2-20. Filling and Draining Liquid Oxygen System
Applicable to F-106A airplanes 56-453 thru 57-243 and F-106B airplanes 57-2507 thru 57-2518



FILLING

WARNING

SERVICE SYSTEM WITH LIQUID OXYGEN SPECIFICATION BB-0-925, GRADE A, TYPE II. OBSERVE ALL PRECAUTIONS.

a. Insure that the control lever on the pilot's oxygen panel is positioned to "OFF" (check the panels in the forward and aft cockpit in F-106B airplanes).
b. Gain access to the filler-buildup-and-vent valve through the access panel located on the left-hand side of the fuselage above the nose wheel well door.
c. Remove, chain attached, protective cap.
d. Insert filler adapter from supply hose on oxygen servicing cart.

WARNING

STAY CLEAR OF OVERBOARD VENT PORT LOCATED JUST FORWARD OF THE LEFT-HAND WHEEL WELL DOOR. INSERTION OF THE FILLER ADAPTER INTERCONNECTS THE VENT AND LIQUID OXYGEN OVERFLOW LINE. LIQUID OXYGEN WILL FLOW FROM VENT LINE WHEN THE CONVERTER IS FULL.

e. Adjust supply pressure on the servicing cart to 35 (± 5) psig.
f. Open supply hose valve from servicing cart. Flow rate is approximately one liter per minute.
g. Close supply hose valve from servicing cart when liquid oxygen flows in a steady stream from vent port.

NOTE

OVERBOARD SPILLAGE MAY BE CONTROLLED BY CONNECTING AN OIL FREE SECTION OF TUBING BETWEEN THE VENT LINE AND A CLEAN, OIL FREE, OPEN CONTAINER.

WARNING

ESCAPE OF LIQUID OXYGEN IS POSSIBLE WHILE CONNECTING OR DISCONNECTING THE SERVICING CART SUPPLY HOSE TO THE AIRPLANE FILLER VALVE.

h. Disconnect supply hose filler adapter from airplane filler valve.
i. Install, chain attached, protective cap on airplane filler valve and install access panel.
j. Check the quantity and pressure gages in the cockpit for proper readings.

DRAINING

WARNING

OBSERVE ALL PRECAUTIONS.

NOTE

GASEOUS PRESSURE AND/OR LIQUID OXYGEN CAN BE DEPLETED BY THE PROCEDURE OUTLINED. NO PROVISIONS ARE MADE FOR RECOVERING LIQUID OXYGEN.

a. Insure that the control lever on the pilot's oxygen panel is positioned to "OFF" (check the panels in the forward and aft cockpit in F-106B airplanes).
b. Remove survival kit. Refer to T.O. 1F-106A-2-2 for instructions.
c. Insert suitable adapter in ship's portion of ship-to-kit disconnects to allow free flow of gaseous oxygen.
d. Position control lever, on oxygen control panel, to "ON" to permit a flow of gaseous oxygen. (Check the panels in the forward and aft cockpit in F-106B airplanes).
e. After the overboard flow of gaseous oxygen stops, position control lever, on oxygen control panel, to "OFF". (Check the panels in the forward and aft cockpit in F-106B airplanes).
f. Remove adapter from survival kit ship-to-kit disconnects.

CAUTION

PURGE THE OXYGEN SYSTEM PRIOR TO RESERVICING. RESERVICE SYSTEM AS SOON AS POSSIBLE TO PREVENT EXCESSIVE MOISTURE ACCUMULATIONS DUE TO CONDENSATION.

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Figure 2-21. Filling and Draining Liquid Oxygen System
Applicable to F-106A airplanes 57-244 and subsequent, and F-106B airplanes 57-2519 and subsequent

static system, and are shown in figure 2-22. Refer to paragraph 2-43 for draining procedure.

2-42. *Applicable to F-106A airplanes 56-454, -457, -463 thru 56-466, 57-229 and subsequent, and F-106A airplanes.* The two low points of the pitot-static system are in the nose wheel well and are provided with drain traps. Draining procedures are outlined in the following paragraph. See figure 2-22 for an illustration of the system drain traps.

2-43. Draining Procedure.

To drain the pitot-static system proceed as follows:

a. Remove drain fitting caps and allow water to drain.

b. Dry inside of drain fitting caps.

c. Install drain fitting caps.

2-44. DRAINING ENGINE PRESSURE RATIO SYSTEM.

The engine exhaust pressure tubing drain trap is located adjacent to the nose wheel well fuse panel. To drain the system proceed as follows:

a. Remove drain fitting cap and allow condensate to drain.

b. Dry inside of drain fitting cap then install cap.

2-45. FUSELAGE STRUCTURE DRAINAGE PROVISIONS.

The location of F-106A fuselage structure drain holes and drainage provisions are illustrated on figure 2-23. Figure 2-24 illustrates the location of these drain holes and drainage provisions for F-106B airplanes. Drain holes shall be kept free of snow, ice, and foreign material to insure proper drainage.

2-46. SERVICING EMERGENCY AC GENERATOR DRIVE.

The emergency ac generator drive gearbox is serviced with lubricating oil, Specification MIL-L-7870. The unit is mounted in the aft inboard corner of the left main wheel well. Complete servicing instructions for this unit are given in figure 2-25.

2-47. RETRACTING AND LATCHING TAIL HOOK.

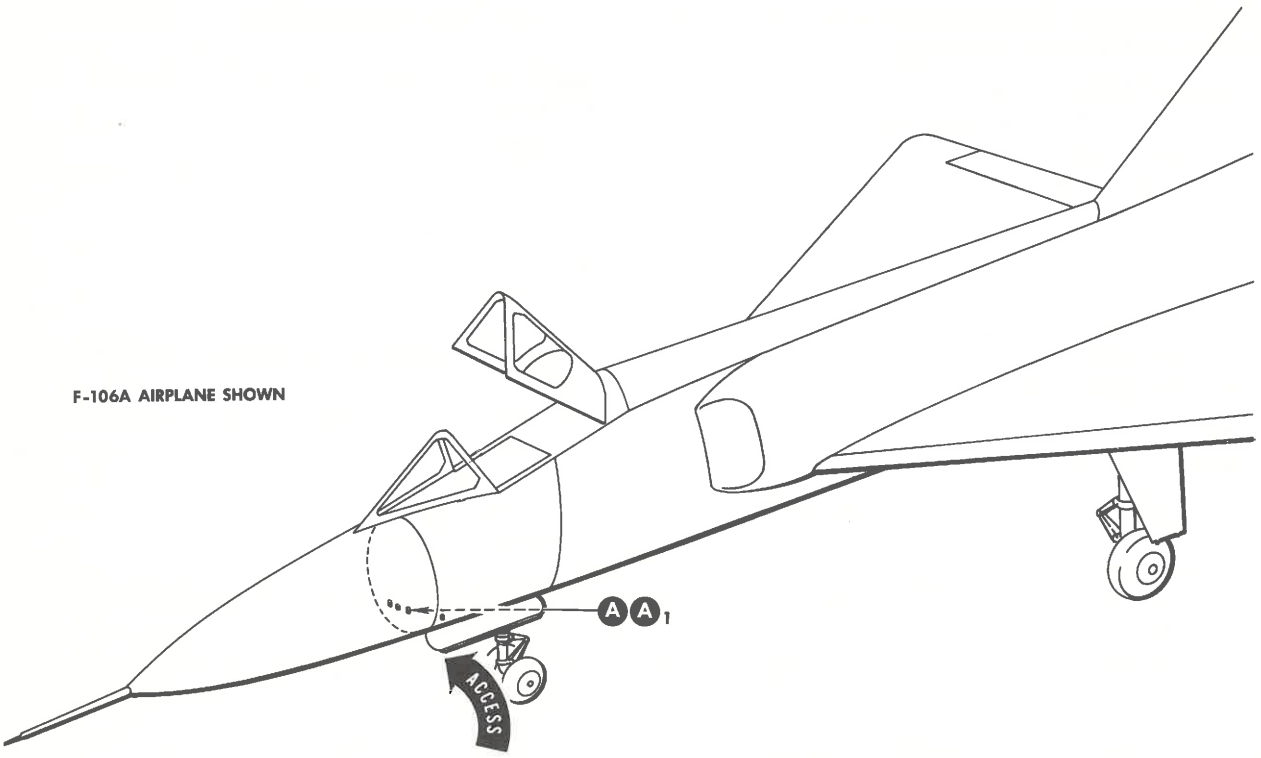
Servicing of the emergency arresting system consists of retracting and latching the tail hook. See figure 2-26 for procedure.

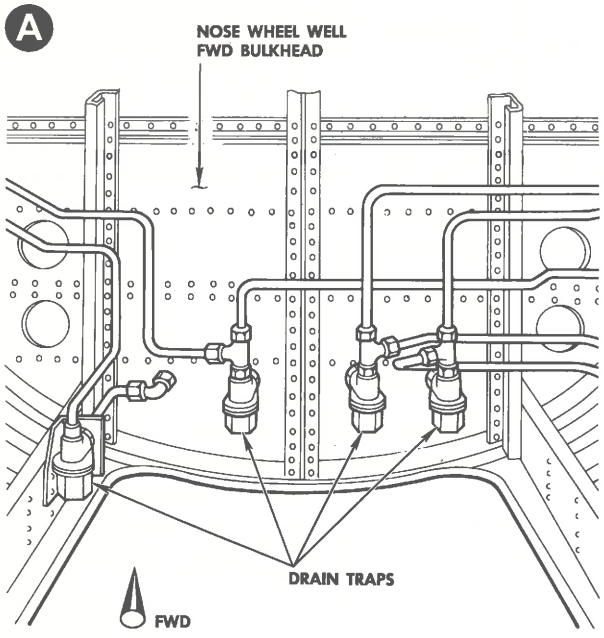
2-48. SERVICING DRAG CHUTE SYSTEM.

Servicing of the drag chute system normally consists of installation of the packed chute prior to flight. Occasionally it will be necessary to remove the chute; procedures are given in paragraphs following:

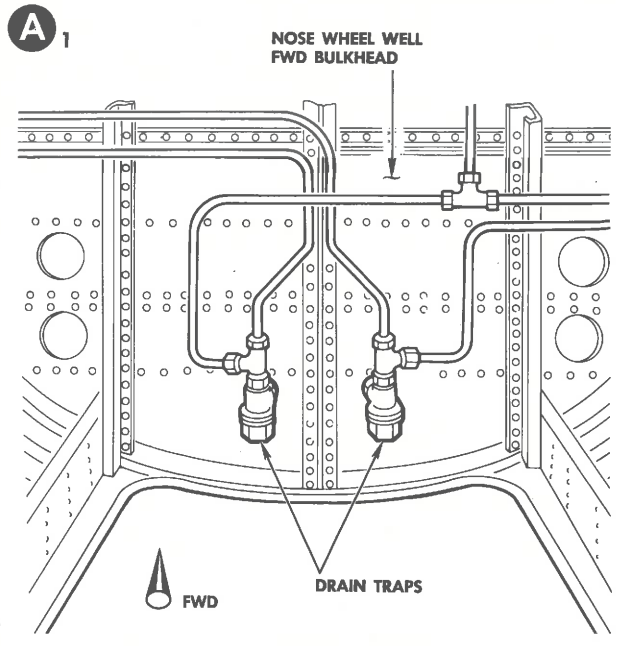
2-49. Equipment Requirements.

FIGURE	NAME	TYPE	ALTERNATE	USE AND APPLICATION
1-25	Generator Set (Gas)	8-96026-801 AF/M32A-13 (6115-583-9365)	8-96026 AF/M32M-2 (6115-617-1417)	To energize electrical systems on aircraft equipped with special quick disconnect receptacle.
	Generator Set (Elec.)	8-96025-803 AF/ECU-10/M (6125-583-3225)	8-96025-805 A/M24M-2	
			8-96025 AF/M24M-1 (6125-620-6468)	
1-24	Generator Set		MC-1 (6125-500-1190)	To energize electrical systems (except AWCIS) on aircraft equipped with standard AN receptacle and on others by using adapter cable 8-96052-801.
			MD-3	
1-26	Adapter Cable	8-96052-801 (6115-690-4050)		To connect MC-1 and MD-3 units to aircraft equipped with special quick disconnect receptacle.
4-4, 4-5	Portable Hydraulic Test Stand (Gas)	SE 1061 (4920-517-1028)	SE 0567-801 (4920-204-2462)	To supply pressure to hydraulic systems for ground operation.
	Portable Hydraulic Test Stand (Elec.)	SE 0976 (4920-204-3115)		





APPLICABLE TO F-106A AIRPLANES 56-453, -455, -456, -458 THRU -462 AND 56-467.



APPLICABLE TO F-106A AIRPLANES 56-454, -457, -463 THRU 56-466, 57-229 AND SUBSEQUENT AND F-106B AIRPLANES.

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Figure 2-22. Pitot-Static System Drain Traps

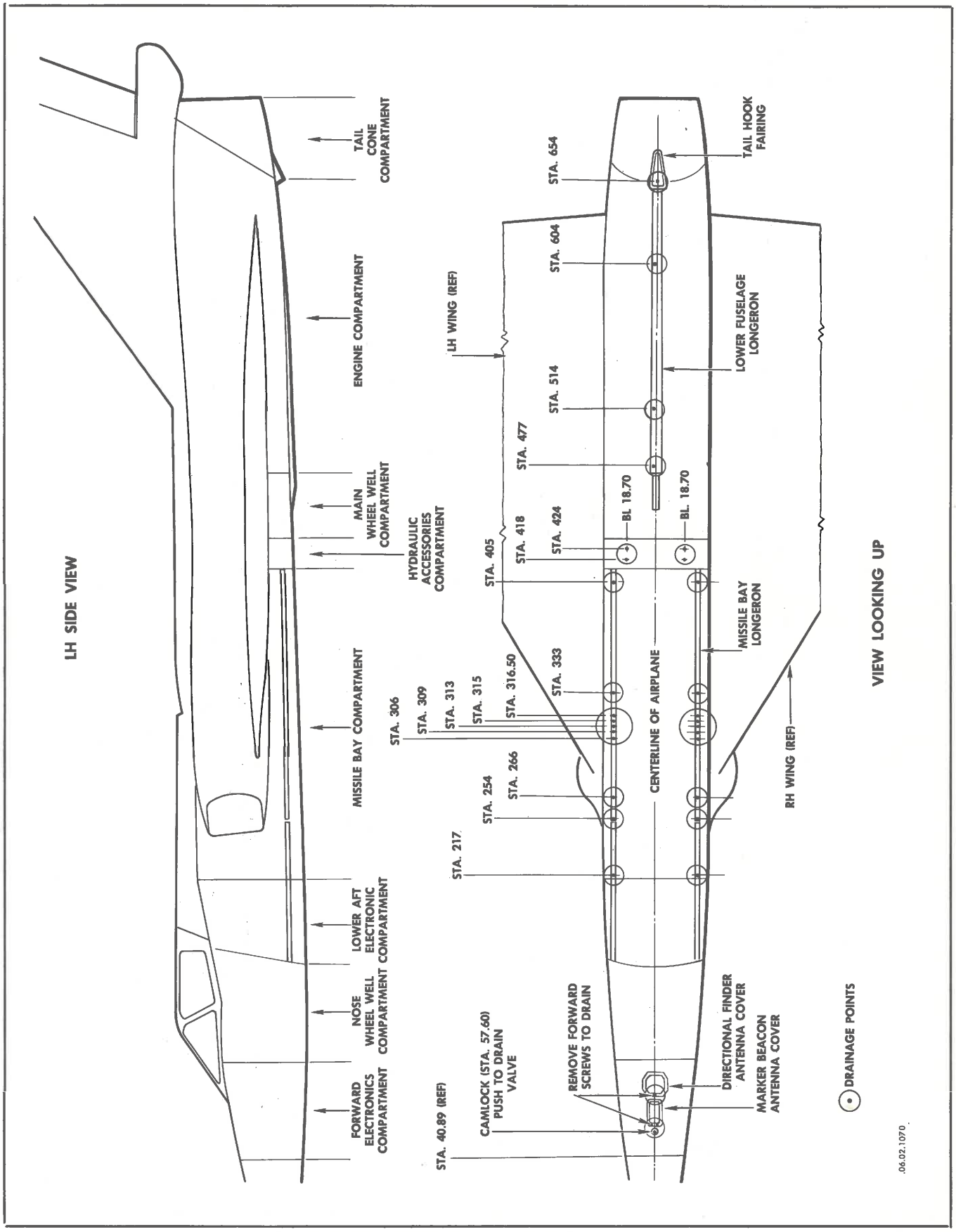


Figure 2-23. Fuselage Structure Drainage Provisions, F-106A

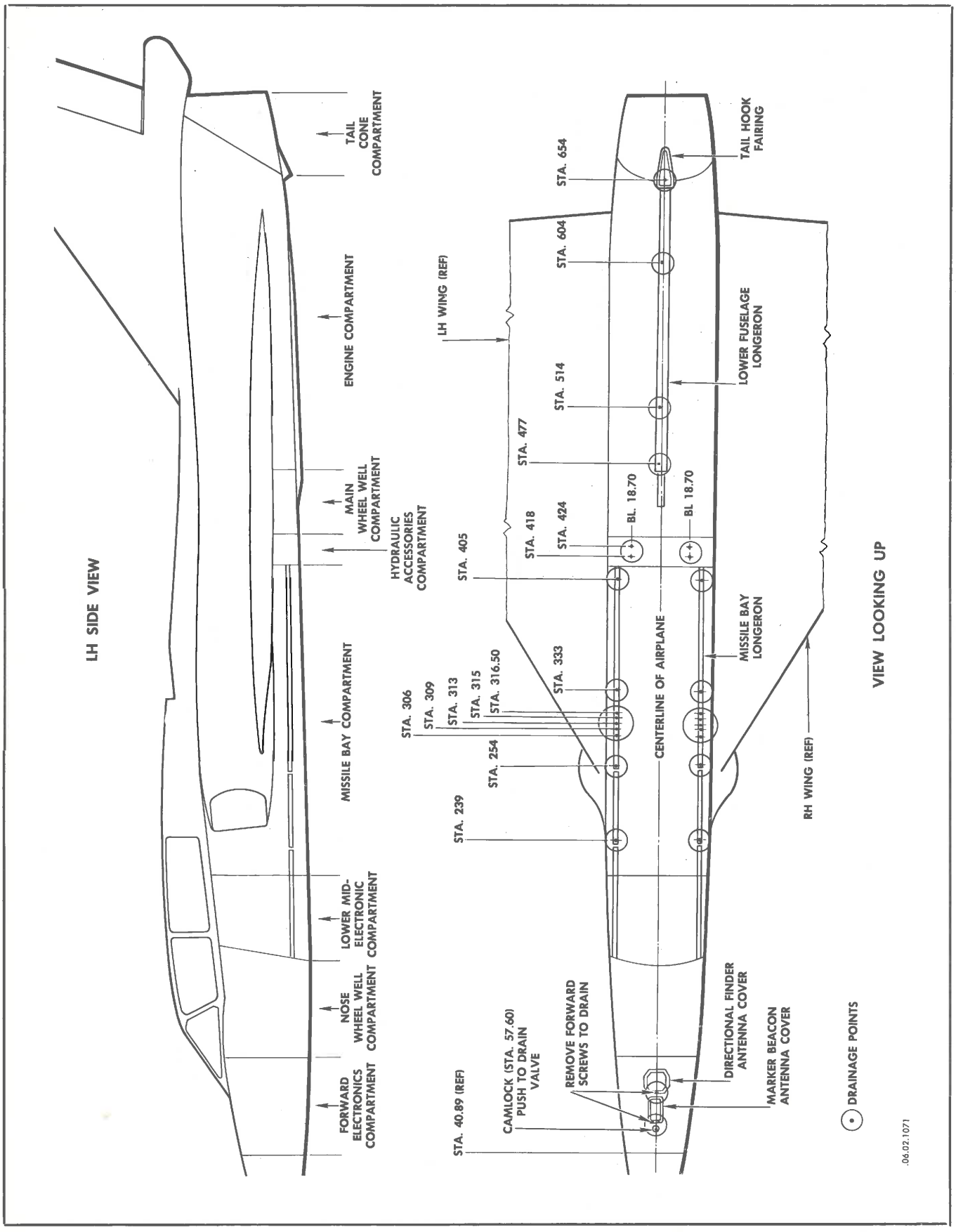
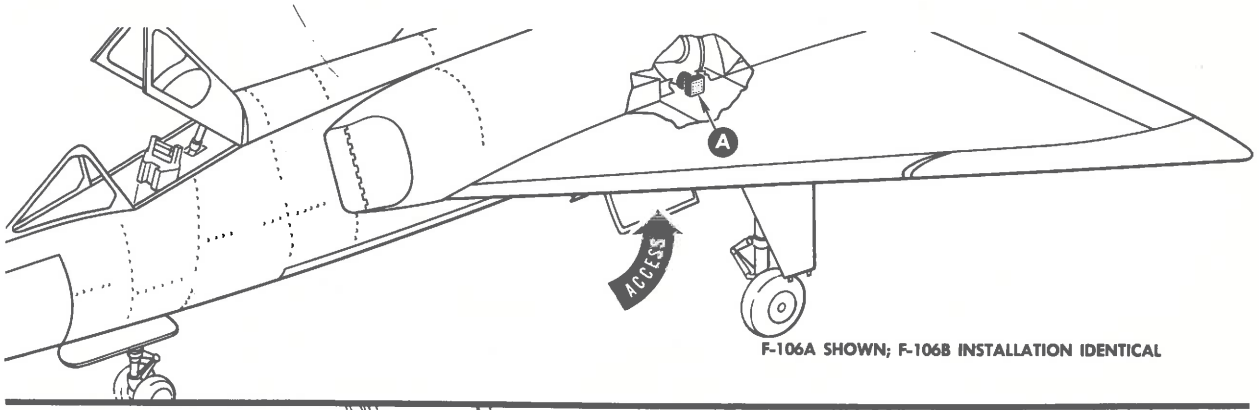
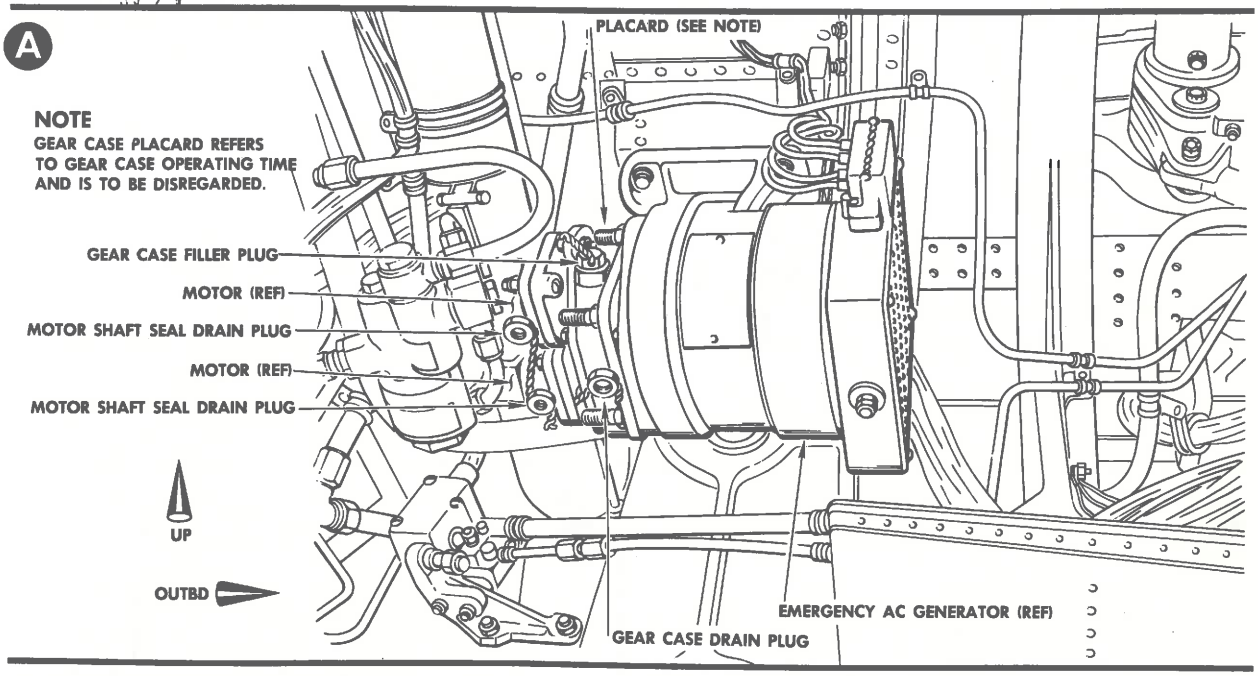


Figure 2-24. Fuselage Structure Drainage Provisions, F-106B



F-106A SHOWN; F-106B INSTALLATION IDENTICAL



SERVICING

a. Remove motor shaft seal drain plugs (2 places) and drain into a graduated container.

CAUTION

IF OVER 6 CC OF HYDRAULIC FLUID IS PRESENT AT EITHER ONE OR BOTH SHAFT SEAL DRAIN PORTS, THE UNIT SHALL BE CHECKED FOR LEAKAGE WHILE IN OPERATION. THE LEAKAGE CHECK SHALL BE MADE AFTER THE FIRST MINUTE OF OPERATION. IF THE LEAKAGE RATE IS OVER 2 DROPS PER MINUTE AT EITHER DRAIN PORT, THE MOTOR SHAFT SEAL IS DEFECTIVE AND THE MOTOR OR MOTORS SHALL BE REPLACED. REFER TO T. O. 1F-106A-2-10 FOR REPLACEMENT PROCEDURE.

b. Install motor shaft seal drain plugs with serviceable O-rings (Vickers P/N 175922); safety-wire plugs to each other.
c. Remove gear case filler plug.

CAUTION

IF OIL FLOWS FROM THE GEAR CASE, GEAR CASE OIL IS CONTAMINATED BY HYDRAULIC FLUID AND DRIVE ASSEMBLY MUST BE REPLACED. REFER TO T. O. 1F-106A-2-10 FOR REPLACEMENT PROCEDURE.

d. Check that oil level is even with bottom of filler hole.
e. Add oil, Specification MIL-L-7870, until oil level is even with bottom of filler hole.
f. Install gear case filler plug with serviceable O-ring; safety-wire plug.

DRAINING

a. Remove safety wire from gear case drain plug.
b. Place container under drain plug; remove plug and allow oil to drain.
c. Install gear case drain plug with serviceable O-ring; safety-wire plug.
d. Perform steps "c," "e," and "f" of SERVICING procedure.

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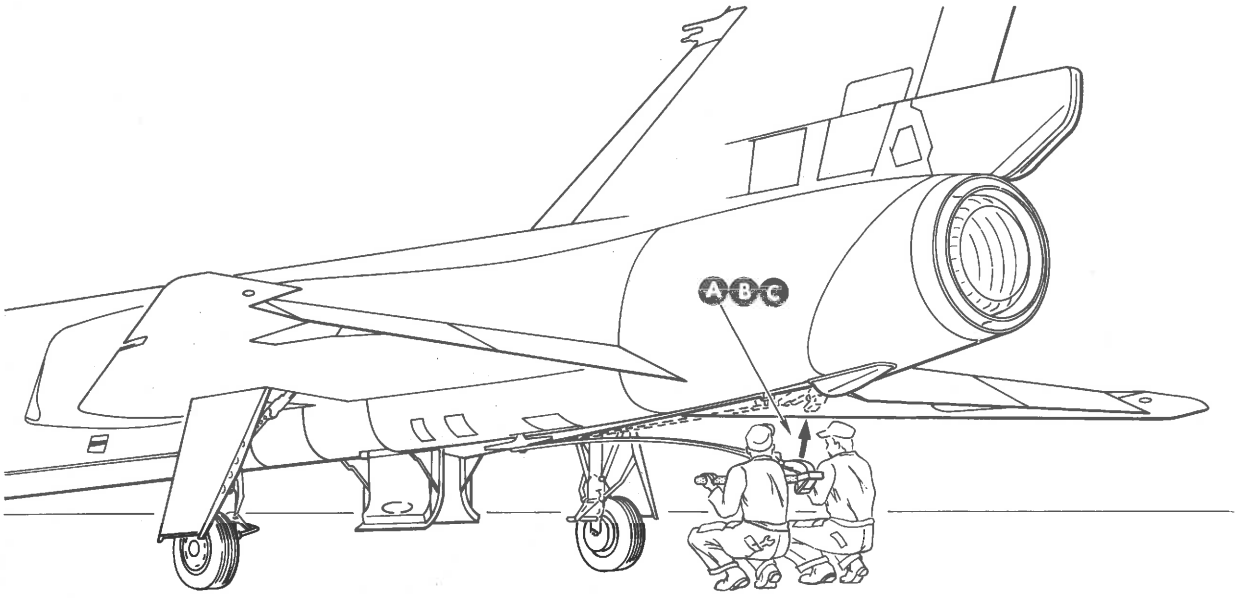
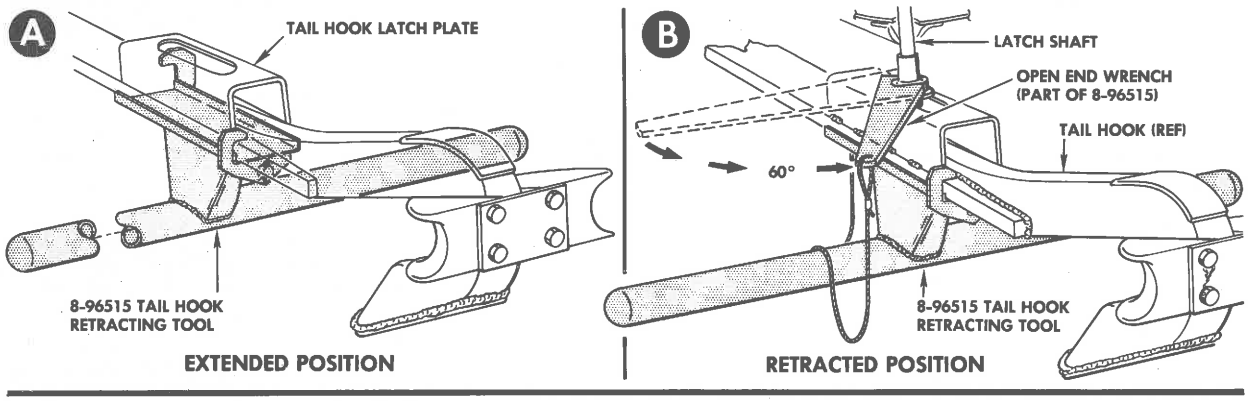
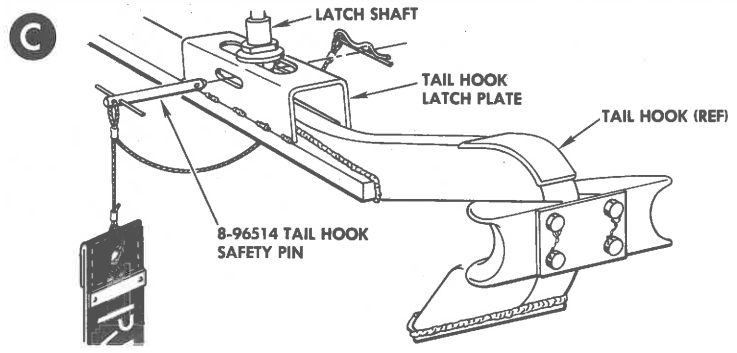
Figure 2-25. Servicing Emergency AC Generator Drive



RETRACTING AND LATCHING TAIL HOOK

a. Engage the tail hook retracting tool, 8-96515, as shown in detail A.
b. Raise and hold the tail hook at the retracted position. Engage latch shaft with open end wrench, rotate latch shaft approximately 60° as shown in detail B. Remove wrench from latch shaft; check that shaft remains in latched position.
c. Remove tail hook retracting tool.
d. Install the tail hook safety pin, 8-96514, as shown in detail C.





WARNING

TO PREVENT SERIOUS INJURY TO PERSONNEL, 8-96514 SAFETY PIN MUST BE INSTALLED AT ALL TIMES WHEN THE AIRPLANE IS PARKED AND THE TAIL HOOK RETRACTED. REMOVE SAFETY PIN JUST PRIOR TO FLIGHT.

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Figure 2-26. Retracting and Latching Tail Hook

2-49. Equipment Requirements (Cont).

FIGURE	NAME	TYPE	ALTERNATE	USE AND APPLICATION
4-3	Adapters (2 each)	8-96080		Used with test stand SE 0567-801 to connect test stand hoses to quick-disconnect fittings.
4-3	Adapters (2 each)	SE 1093		Used with test stand SE 1061 or SE 0976 to connect test stand hoses to quick-disconnect fittings.
	Speed Brake Locks	8-96005-801 (1ABK-1560-614-1324)	8-96005 (1730-522-2742)	Prevents inadvertent closing of speed brakes.
	Pilot Chute Spring Pin			To safety drag chute spring mechanism.

2-50. Preparation.

a. Connect external source of 28-volt dc power to airplane; refer to paragraph 1-42 for procedure.

b. Connect hydraulic test stand to airplane. Operate test stand in "Stand Reservoir" position. Refer to T.O. 1F-106A-2-3 for procedures.

WARNING

Before performing the following step, make sure that personnel and equipment are clear of the area adjacent to the speed brake doors.

c. Extend speed brake doors by placing speed brake control switch on the throttle control lever in "OUT" position.

d. Shut down and disconnect hydraulic test stand from airplane. Relieve hydraulic systems pressure by operating flight controls.

e. Relieve high pressure pneumatic system pressure by procedure given in figure 2-14 or take other suitable precautions to assure that drag chute mechanism will not be operated inadvertently.

f. Disconnect external source of electrical power.

g. Install speed brake door locks (2); see figure 2-27 for an illustration of this installation.

2-51. Procedure, Drag Chute Removal.

a. Insert pilot chute spring pin into inner hole of drag chute cone.

NOTE

See figure 2-27 for an illustration showing the components referenced in the following steps.

b. Remove drag chute rip pin from cone and retaining straps.

c. Remove pin from drag chute jettison switch.

d. Disengage D-ring and risers from jaw clamp of drag chute deploy and jettison mechanism.

e. Remove drag chute from canister.

2-52. Procedure, Drag Chute Packing.

The procedure for drag chute packing is given in T.O. 14D1-3-112. The drag chute must be packed in an approved type parachute loft by qualified personnel.

2-53. Procedure, Drag Chute Installation.

The installation procedure of the drag chute is given in figure 2-27.

2-54. TUBE CODING.

Examples of the tube coding identification tapes for the various fluid and pneumatic systems in the airplane are illustrated on figure 2-28. Each tape is coded by a color or combination of colors, and by a symbol for color-blind personnel. In addition to the coding, each tape has the system name printed in the color portion. Line functions and systems not shown on figure 2-28 are designated by white tape with black lettering.

2-55. TORQUE VALUES.

Servicing and maintenance procedures, require that components of the various systems be disconnected and/or removed. Unless a special torque value is required by a specific procedure, the standard torque values shown in figures 2-29 and/or 2-30 shall be used to install and/or connect a component.

2-56. SAFETY WIRING.

Approved methods of safety wiring are shown on figure 2-31.

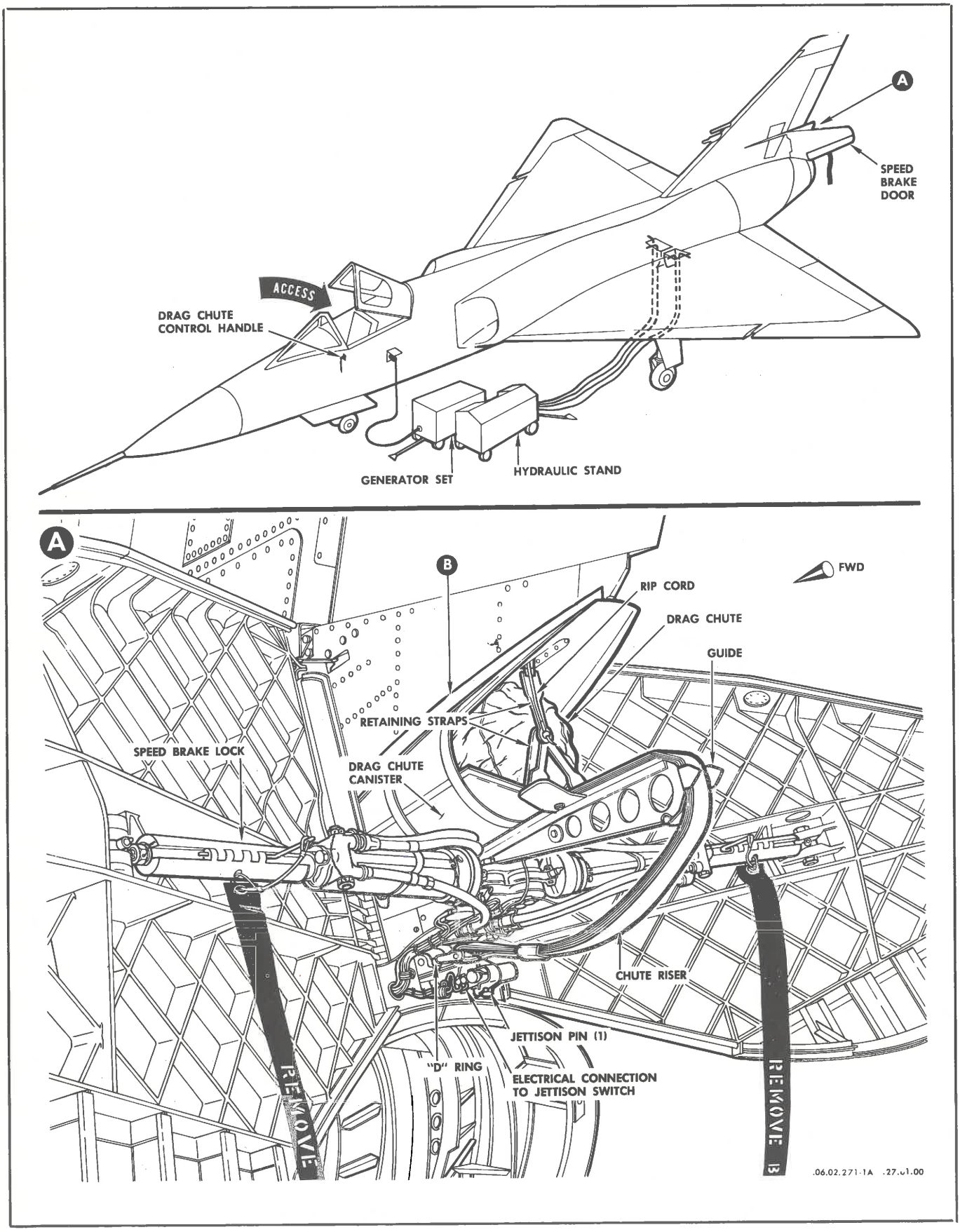


Figure 2-27. Drag Chute Installation (Sheet 1 of 2)

PREPARATION

a. Check inspection tag to make sure chute is serviceable and that prescribed inspection interval has not been exceeded.
b. Check condition of deployment bag and other visible drag chute components. Make sure D-ring jettison pin lanyard, spacer, and shear pin are installed.
c. Open speed brake doors and install speed brake locks; refer to Section VII.
d. Check that drag chute handle is pushed in; remove electrical and hydraulic power.
e. Check condition of all drag chute system components on airplane and that rip cord is serviceable and properly installed.

INSTALLATION

a. Insert the drag chute into the canister so that the riser lies flat under the deployment bag and the closing flaps of the pilot chute are positioned at 45° angle as shown in Detail D.
b. Check that keeper on rider is on top riser and under pilot chute section of deployment bag and that riser is positioned on guide bracket.
c. Place the three drag chute canister straps over the pilot chute and insert rip cord pin in cone of retaining straps. Upper retaining strap to be attached last.
d. Pull riser until positioning keeper is against the canister straps and insert D-ring in jettison mechanism jaws. Release locking pawl to allow arm to rest against top of movable jaw.
e. Insert pin in jettison switch.
f. Pull drag chute deployment handle in cockpit, check jaws for locking, check rip cord pin to determine if the pin has been pulled.
g. Push drag chute deployment handle to the "IN" position.
h. Release locking pawl to allow arm to rest against top of movable jaw.

CAUTION

FAILURE TO RELEASE LOCKING PAWL MAY RESULT IN DRAG CHUTE AUTOMATICALLY JETTISONING WHEN DEPLOYED.

i. Check that keeper on rider is on top riser and under pilot chute section of deployment bag and that riser is positioned on guide bracket.
j. Place the three drag chute canister straps over the pilot chute and insert rip cord pin in cone of retaining straps. Upper retaining strap to be attached last.
k. Remove pilot chute spring pin (pin with streamer); return pin to parachute loft.

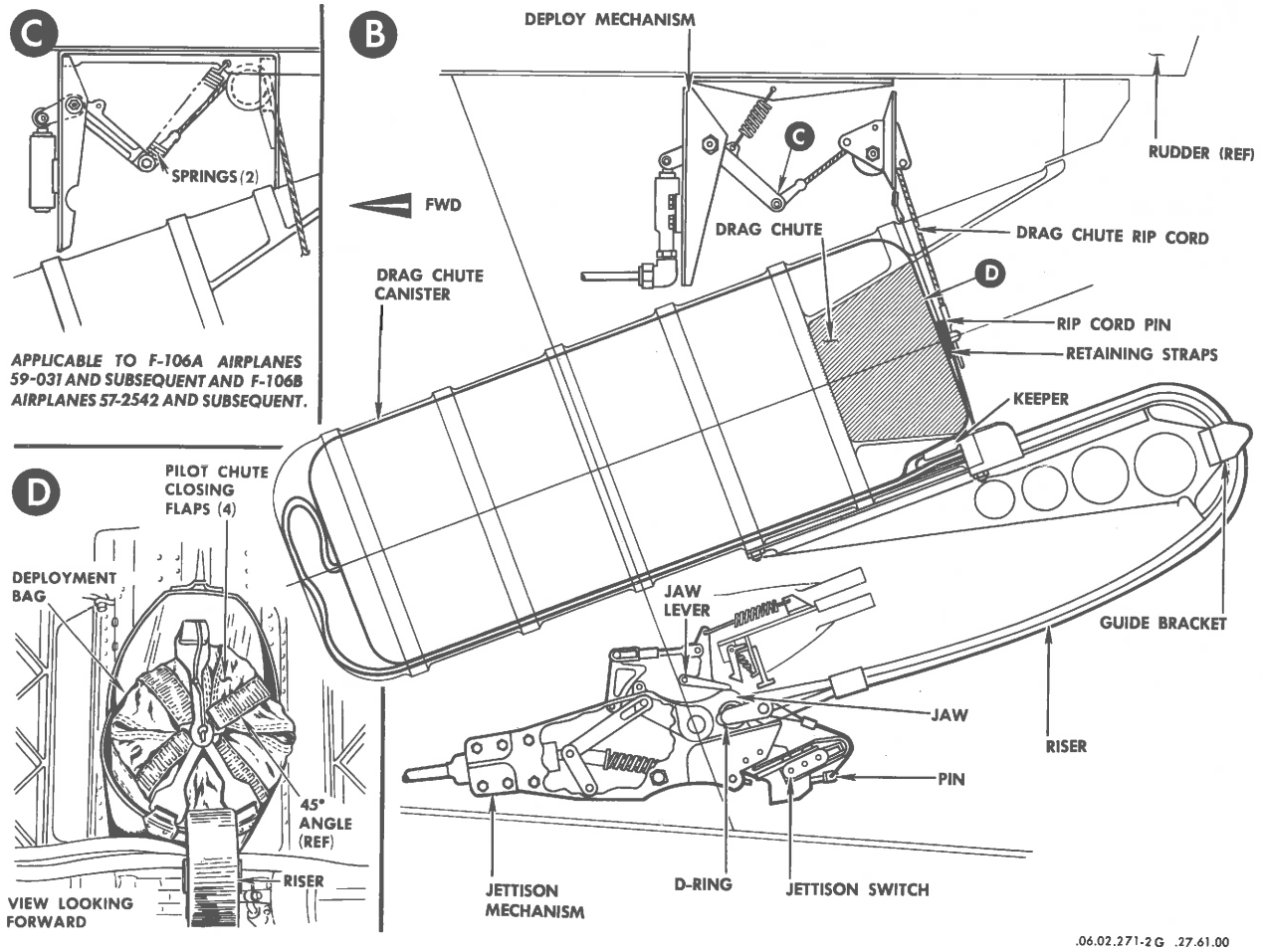
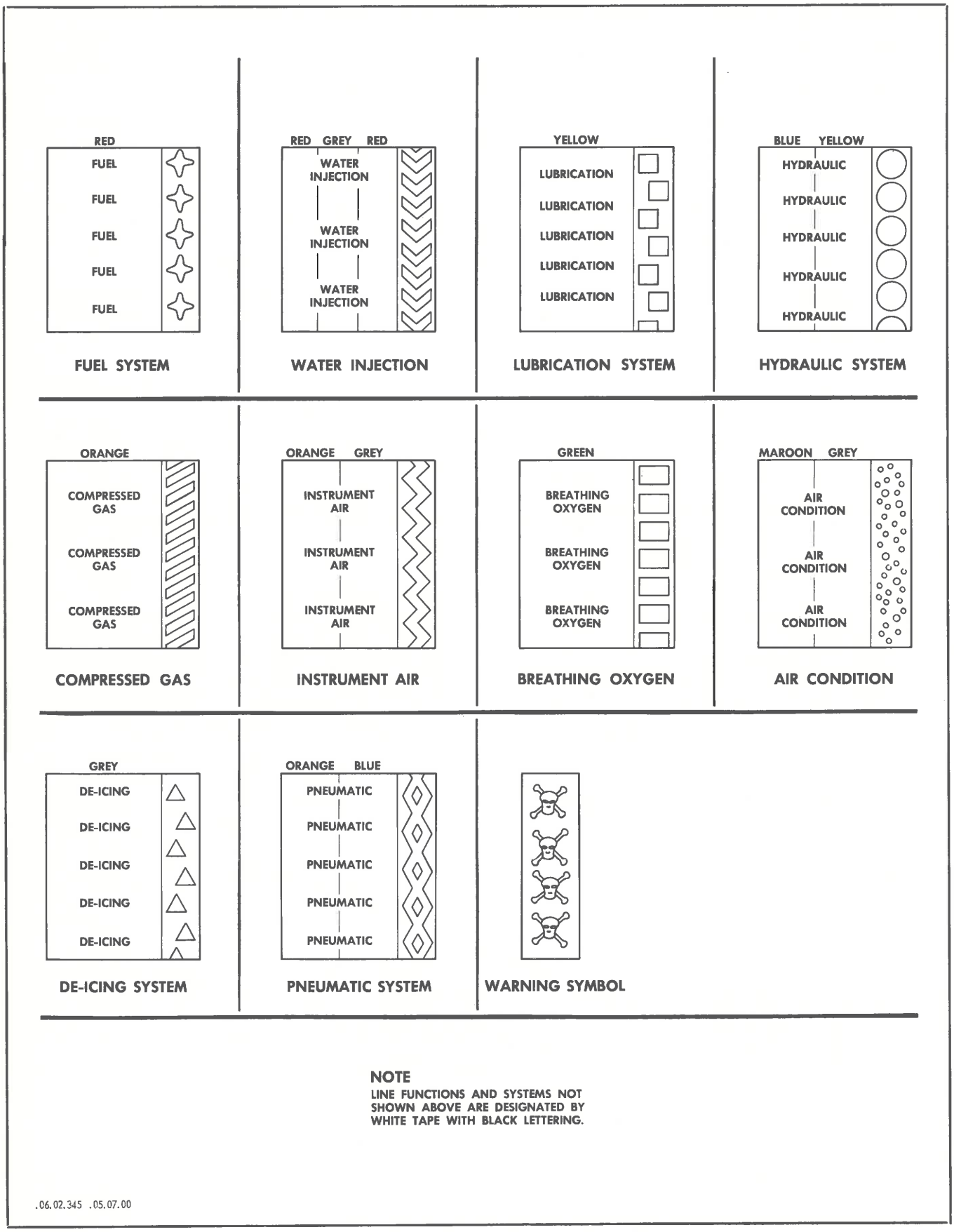


Figure 2-27. Drag Chute Installation (Sheet 2 of 2)



NOTE

LINE FUNCTIONS AND SYSTEMS NOT SHOWN ABOVE ARE DESIGNATED BY WHITE TAPE WITH BLACK LETTERING.

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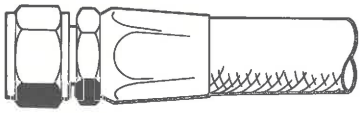
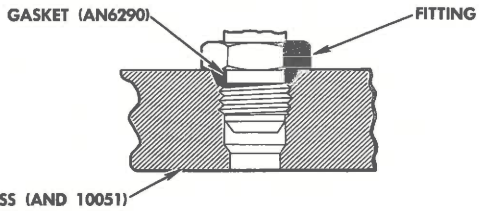
Figure 2-28. Identification of Tube Coding



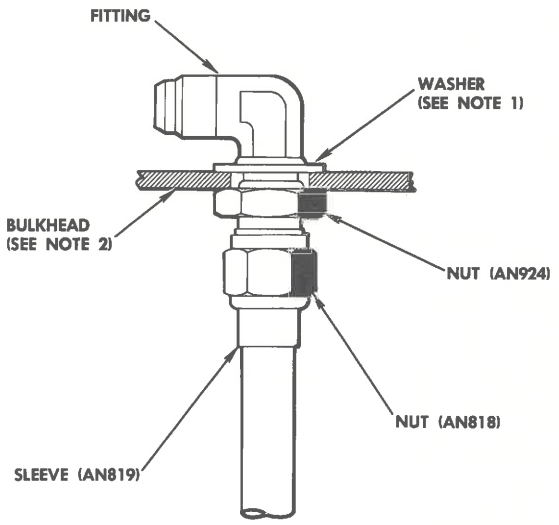
INSTALLATION OF HOSE ASSEMBLIES

a. Lubricate threads on hydraulic hose fittings with the system hydraulic fluid.
b. Lubricate threads on pneumatic hose fittings with grease, Specification MIL-L-4343.
c. Lubricate threads on oxygen hose fittings with MIL-T-5542; see warning.
d. Torque hose assembly fittings to values shown in right-hand column of table below.



INSTALLATION OF FLARED NON-POSITIONING TYPE FITTINGS

a. Lubricate gasket with applicable lubricant; see sheet 2 and warning.
b. Install gasket in groove on fitting.
c. Screw fitting assembly into boss until it bottoms tightly against boss.



INSTALLATION OF FLARED-TUBE, STRAIGHT-THREADED CONNECTORS

NOTES

1. USE AN AN690 WASHER, 1/16 INCH THICK FOR FITTINGS SIZE —6 OR SMALLER, AND A WASHER 3/32 INCH THICK FOR FITTINGS LARGER THAN SIZE —6. A WASHER IS NOT REQUIRED WHERE FITTING END HAS HEX INSTEAD OF FLANGE SHOWN.
2. FITTING WITH BULKHEAD END CONFORMING TO AND 10057 IN SIZE —6 AND SMALLER MAY BE USED THROUGH BULKHEADS UP TO 3/16 INCH MAXIMUM THICKNESS. FITTING WITH BULKHEAD END CONFORMING IN SIZE —8 AND LARGER, AND ALL SIZES OF AN832 FITTINGS MAY BE USED THROUGH BULKHEADS UP TO 3/8 INCH MAXIMUM THICKNESS.

WRENCH TORQUE VALUES FOR FLARED TUBING NUTS (INCH-POUNDS)

TUBING OD INCHES (HOSES ID)	5052-0 ALUMINUM ALLOY TUBING FLARE AND 10061 OR AND 10078		6061-T6 ALUMINUM ALLOY TUBING FLARE AND 10061 OR AND 10078		STEEL AND TITANIUM TUBING FLARE AND 10061		HOSE ASSEMBLY FITTINGS MS28740 AN6292 AN6270	
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
3/16	35	60	35	70	90	100	70	100
1/4	40	65	70	120	135	150	70	120
*5/16	60	80	80	130	180	200	85	180
*3/8	75	125	130	180	270	300	100	250
*1/2	150	250	300	400	450	500	210	420
5/8	200	350	430	550	650	700	300	480
3/4	300	500	650	800	900	1000	500	850
1	500	700	900	1100	1200	1400	700	1150
1-1/4	600	900	—	—	—	—	—	—
1-1/2	600	900	—	—	—	—	—	—

* SEE NOTE 3

NOTES

1. WHERE ALUMINUM ALLOY TUBING IS USED IN STEEL FITTINGS, TORQUE VALUES FOR ALUMINUM ALLOY TUBING WILL APPLY.
2. WHERE ALUMINUM ALLOY THREADED PARTS ARE MATED WITH STEEL THREADED PARTS, TORQUE VALUES FOR ALUMINUM ALLOY TUBING WILL APPLY.
3. *APPLICABLE TO 5052-0 ALUMINUM ALLOY TUBING USED IN LIQUID OXYGEN SYSTEM ONLY,* SUBSTITUTE THE FOLLOWING VALUES:
   5/16—100 MIN, 125 MAX
   3/8 —200 MIN, 250 MAX
   1/2 —300 MIN, 400 MAX

WARNING

DO NOT USE PETROLEUM LUBRICANTS WITH OXYGEN FITTINGS.

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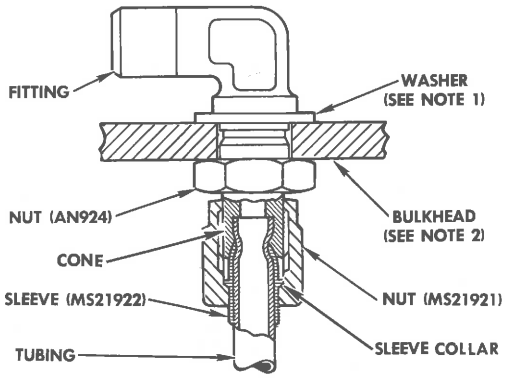
Figure 2-29. Tubing Torque Values (Sheet 1 of 2)



NOTES:

1. USE WASHER AN960, .062 THICK FOR FITTINGS SIZE -6 OR SMALLER, AND .031 THICK FOR FITTINGS SIZE -8 OR LARGER WHEN BULKHEAD IS .187 THICK OR LESS. WHEN BULKHEAD IS THICKER THAN .187, WASHER IS NOT REQUIRED PROVIDED HOLE IN BULKHEAD IS EQUAL TO THE HOLE IN APPLICABLE AN960 WASHER. SIZES -8 AND LARGER MAY BE USED THROUGH BULKHEADS UP TO .281 MAXIMUM THICKNESS. ENDS IN ACCORDANCE WITH MS33515, STYLE E, MAY BE USED THROUGH BULKHEADS UP TO .187 MAXIMUM. WASHER IS NOT REQUIRED WHERE FITTING END HAS HEX INSTEAD OF FLANGE SHOWN, PROVIDED HOLE IN BULKHEAD IS EQUAL TO HOLE SIZE IN APPLICABLE AN960 WASHER.
2. FITTING WITH BULKHEAD END CONFORMING TO MS33515, STYLE S, IN SIZES -6 AND SMALLER MAY BE USED THROUGH BULKHEADS UP TO .250 MAXIMUM THICKNESS. SIZES -8 AND LARGER AND ALL SIZES OF MS21903 MAY BE USED THROUGH BULKHEADS UP TO .375 MAXIMUM THICKNESS.

INSTALLATION AND TORQUE PROCEDURES FOR FLARELESS TUBE FITTINGS

a. Check that all parts are free from dirt, burrs and foreign particles.
b. Lubricate fittings and tube sleeve. See gasket selection table.
c. Install tube in fitting. Check that sleeve is in full contact with cone seat and that nut makes full contact with sleeve collar.
d. Tighten tube nut with wrench until sleeve is in full contact with tube. This will be indicated by a sharp rise in torque. Nut must tighten smoothly until this contact is made.

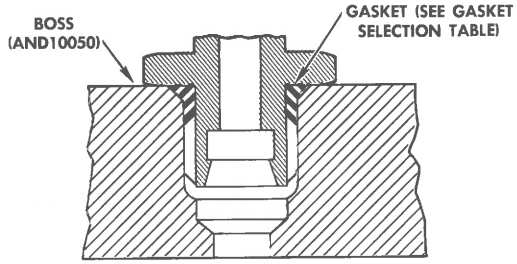
CAUTION

NEVER OVERTIGHTEN A LEAKING MS FITTING. THIS WILL DEFORM THE SLEEVE OR TUBE AND CAUSE ADDITIONAL LEAKS.

e. Tighten nut an additional ⅓ turn more (two hex flats of nut), no more or less. Fittings must be firmly held during this procedure to prevent rotation.
f. If leak occurs after installation, disconnect fitting and check for foreign material that may prevent tight seal. Check inside diameter of the affected tube at the sleeve area using ball gage test. If tube collapse is too great, replace tube. If tube passes test, reinstall and repeat tightening procedures.

TUBE BALL GAGE TEST CHART

TUBE O.D.	WALL THICKNESS					
	.022	.028	.035	.042	.049	.058
	BALL SIZE					
3/16	1/8	7/64	3/32	5/64	1/16	–
1/4	3/16	11/64	5/32	9/64	1/8	7/64
3/8	5/16	19/64	9/32	17/64	1/4	15/64
1/2	7/16	27/64	13/32	25/64	3/8	23/64
5/8	9/16	35/64	17/32	33/64	1/2	31/64
3/4	11/16	43/64	21/32	41/64	5/8	39/64
1	15/16	59/64	29/32	57/64	7/8	55/64
1-1/4	1-3/16	1-11/64	1-5/32	1-9/64	1-1/8	1-7/64
1-1/2	1-7/16	1-27/64	1-13/32	1-25/64	1-3/8	1-23/64



GASKET SELECTION TABLE

APPLICATION	GASKET AN OR MS NO.	APPROPRIATE LUBRICANT FOR GASKETS AND TUBE FITTINGS
HYDRAULIC	AN6290	MIL-H-5606
PNEUMATIC	AN6290	MIL-L-4343
ENGINE OIL	AN6290	MIL-L-7808
FUEL	MS29512	MIL-H-5606
OXYGEN	AN6290	MIL-T-5542
OTHER USES	AN6290	FLUID USED IN SYSTEM

INSTALLATION OF FLARELESS NON-POSITIONING TYPE FITTINGS

a. Lubricate the gasket in appropriate liquid (see table).
b. Install gasket on the fitting as shown in detail.
c. Screw the fitting assembly into the boss until it bottoms tightly on the boss as shown.

WARNING

DO NOT USE PETROLEUM LUBRICANTS WITH OXYGEN FITTINGS.

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Figure 2-29. Tubing Torque Values (Sheet 2 of 2)

BOLT SIZE	STEEL BOLTS				ALUMINUM ALLOY BOLTS (AN365D NUTS)		
	NUT TYPES AN365 AND AN310		NUT TYPES AN364 AND AN320				
	INCH LBS	FOOT LBS	INCH LBS	FOOT LBS	BOLT SIZE	INCH LBS	FOOT LBS
10-32	20-25	—	12-15	—	3/16	10-14	—
1/4-28	50-70	—	30-40	—	1/4	20-35	—
5/16-24	100-140	9-12	60-85	5-7	5/16	50-75	4-6
3/8-24	160-190	13-16	95-110	8-9	3/8	80-110	7-9
7/16-20	450-500	38-42	270-300	23-25	7/16	100-140	8-12
1/2-20	480-690	40-57	290-410	24-34	1/2	170-220	14-18
9/16-18	800-1000	67-83	480-600	40-50	5/8	400-460	34-38
5/8-18	1100-1300	92-108	660-780	55-65			
3/4-16	2300-2500	192-208	1300-1500	109-125			
7/8-14	2500-3000	209-250	1500-1800	125-150			
1-14	3700-5500	308-458	2200-3300	184-275			
1-1/8-12	5000-7000	417-583	3000-4200	250-350			
1-1/4-12	9000-11000	750-916	5400-6600	450-550			

When using torque wrench adapters, if the desired torque is known, the torque wrench dial reading may be found as follows:

T_w = Wrench dial reading.
T_a = Desired torque at end of adapter.
L = Lever length of torque wrench.
A = Length of adapter (center distance).

FORMULA — $T_w = \frac{T_a \times L}{L + A}$

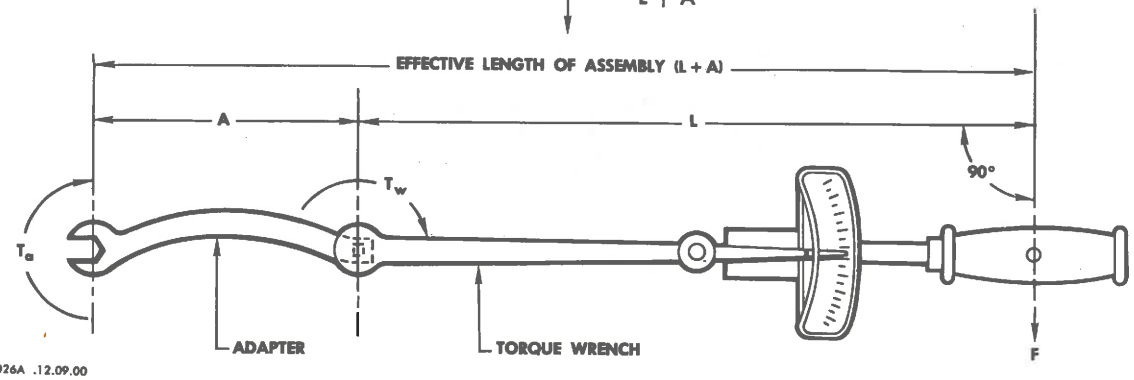

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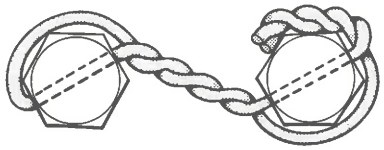
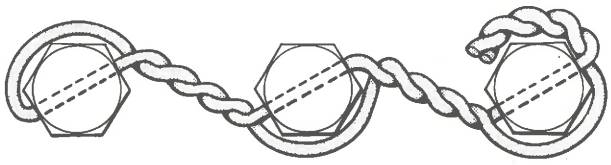
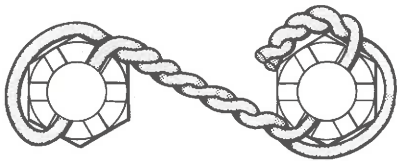
Figure 2-30. Nut and Bolt Torque Values



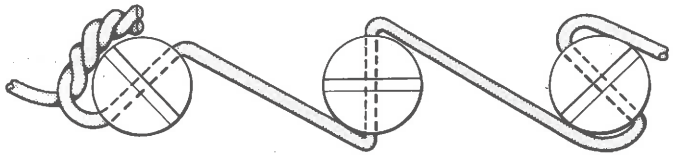
TWO UNIT SAFETY-WIRING



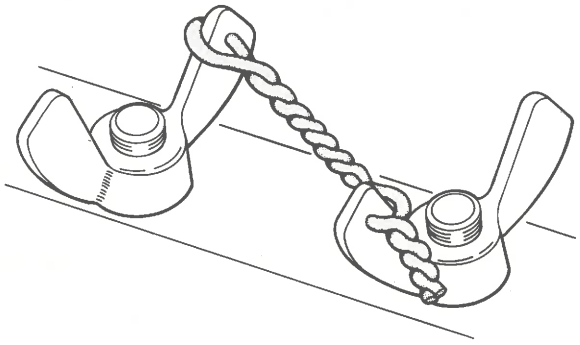
THREE UNIT SAFETY-WIRING



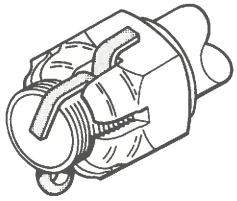
SAFETY-WIRING CASTELLATED NUT



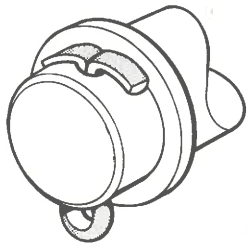
SINGLE STRAND SAFETY-WIRING



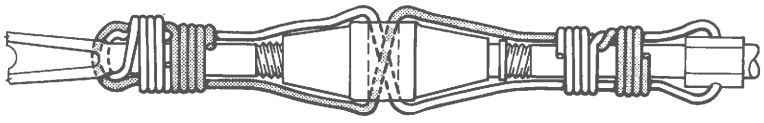
SAFETY-WIRING WING NUTS



COTTERING OF CASTELLATED NUT



CLEVIS PIN COTTERING



NOTE

BEFORE ADJUSTING TURNBUCKLES, INSURE THAT TURNBUCKLES ARE STARTED EVENLY, HOLD BOTH TERMINALS TO PREVENT TWISTING OF CABLES AND TIGHTEN TURNBUCKLES WITH A TOOL INSERTED THROUGH THE SAFETY WIRE HOLE OF THE TURNBUCKLE. AFTER FINAL ADJUSTMENT, THE MAXIMUM EXPOSED THREADS ON EITHER END OF THE TURNBUCKLE IS THREE FULL THREADS.

TURNBUCKLE SAFETYING

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Figure 2-31. Safety Wiring

AIRPLANE CLEANING

2-57. GENERAL.

The airplane should be kept clean at all times to reduce corrosion, eliminate fire hazards, and preserve aerodynamic smoothness. Foreign materials such as dirt, mud, or grease, if allowed to accumulate on exterior surfaces, might alter the designed air flow. See figure 6-1 for data concerning surface aerodynamic smoothness. General procedures for cleaning fuselage, wings, and vertical surfaces are the same. Refer to applicable paragraphs in this section for information on the cleaning and treatment of the airplane components and materials.

2-58. SAFETY PRECAUTIONS.

Procedures should be closely followed for use of the cleaning materials listed. As some cleaning materials are toxic, their improper use will endanger personnel; others are inflammable and will create a fire hazard if used in improperly ventilated areas. Observe these safety rules:

a. Use distinctively painted, safety-type containers for cleaning fluids. The name of the cleaning material should be clearly marked on each container.

b. Provide adequate fire-fighting equipment while cleaning the airplane.

c. Ground the airplane and cleaning machines to prevent the accumulation of static charges.

d. Cover electrical equipment to prevent wetting during cleaning operations. Be sure such equipment is thoroughly dry before use.

e. Prohibit the operation of any electrical equipment that may emit sparks. Also prohibit all smoking or use of open flames in the vicinity of the airplane to be cleaned.

f. Keep steam away from fuel tank areas of the wing. Avoid overheating of lubricated equipment, windshields, antenna covers, windows, and the radome.

g. Use coarse spray nozzles with the lowest possible air pressure. Fine sprays are wasteful of material and the fumes are more inflammable. Stay on the windward side of the airplane as much as possible to avoid breathing vapors and mist.

h. Use rubber gloves and protective clothing to avoid exposing hands and other parts of the body to toxic solvents.

i. Ventilate all compartments of the airplane when solvents and toxic cleaning materials are used while the airplane is in a closed hangar, or in the open if near buildings or other aircraft.

j. Use safe work ladders, stands, and equipment. Wear protective covering over shoes, and walk only on approved walkway areas of the airplane.

2-59. LIST OF CLEANING MATERIALS.

CAUTION

Do not allow any of the following materials or their fumes to contact plexiglas canopy windows: gasoline, alcohol, benzene, toluene, hexane, kerosene, sylene, ketones including acetone, carbon tetrachloride, fire extinguisher or de-icing fluids, dope or lacquer thinners, window cleaning sprays, trichlorethylene, perchlorethylene, paint stripping compounds, degreasing compounds, or other than specifically authorized cleaning and polishing compounds. This is mandatory as plexiglas absorbs solvent fumes which destroy its structural strength and optical quality. Pure aromatic solvents, or those of high aromatic content, should not be used on this aircraft due to detrimental effect on some of the sealant materials and corrosion preventive finishes of the aircraft.

CLEANING MATERIAL	DESCRIPTION	PURPOSE
Alkaline-water base cleaning mixture.	Aircraft cleaning compound, Specification MIL-C-25769, 1 part; water, 3 to 7 parts.	Material for cleaning the exterior surfaces of fuselage, wings, tail, and landing gear. (Suitable for painted or unpainted surfaces.)
Alkaline-water base cleaning mixture.	Aircraft cleaning compound, Specification MIL-C-25769, 1 part; water, 3 parts.	Material for cleaning missile bays. (Suitable for painted and unpainted surfaces.)

2-59. LIST OF CLEANING MATERIALS (CONT).

CLEANING MATERIAL	DESCRIPTION	PURPOSE
Steam cleaning mixture.	Cleaning compound Federal Specification P-S-751, 10 ounces; hot water, 1 gallon. (Add compound to water; not vice versa.)	Material for cleaning metal surfaces when used in a standard steam cleaning machine. (Detrimental to painted surfaces.)
Dry cleaning solvent.	Federal Specification P-S-661b.	To remove grease, oil, tar and carbon from metal parts and surfaces. (Detrimental to enamel.)
Detergent solution.	Orvus, stock No. 7300-297300, 1 ounce; water, 1 gallon.	To clean fabrics, glass and plastics.
Castile or commercial "Ivory" soap.	Castile soap (10 per cent solution) made by Hockwald Chemical Co., Los Angeles 22, Calif. Commercial "Ivory" soap (10 per cent solution) made by Proctor and Gamble Co., or equivalent.	To clean plexiglass canopy windows, and to clean missile bay area and fuselage of missile smoke deposits.
Cleaning and polishing compound.	Federal Specification MIL-C-18767.	To clean and polish plexiglas canopy windows.
Kerosene.	Federal Specification VV-K-211.	To remove grease, tar and wax from metal surfaces; to aid in cleaning tailpipe and afterburner areas.
All-purpose wax.	Stock No. 7300-987900.	To provide a protective polish for exterior surfaces.
Vinegar or diluted hydrochloric acid.	Weak acid solution. (1 part hydrochloric acid to 30 parts water.)	Used to neutralize battery alkaline electrolyte.

2-60. CLEANING EXTERIOR OF FUSELAGE, WINGS, AND VERTICAL SURFACES.

Clean the exterior surfaces of the wings, fuselage, and vertical surfaces as follows:

2-61. Preparation.

a. Close and lock canopy. Cover the exterior of canopy windows with Protex #20V adhesive paper or equivalent. Protex #20V paper is manufactured by the Maskoff Company of Monrovia, California.

b. Install covers on pitot-static head and artificial feel system intake tubes. Install shields in boundary layer ducts, engine air intake ducts, heat exchanger exhaust duct, tailpipe, and drag chute cannister. Cover with oiled paper, the radome, antennas, landing gear tires, exposed rubber door seals, and all openings which would permit entry of cleaning mixture. Attach oiled paper with masking tape.

2-62. Procedure.

Start cleaning procedure on upper surface of wing tip and work inboard, proceed to lower wing surface, then to the vertical surfaces and finally to the fuselage. Confine working area to a section that can be cleaned and rinsed before the cleaning mixture drys.

a. Apply cleaning mixture, referenced in paragraph 2-59, to the surface by low-pressure coarse spray, mops, or soft fiber brushes. Do not apply cleaning mixture to large areas, shutoff spray nozzle when not in use.

CAUTION

Do not apply cleaning mixture to control surface actuators or control surface hinge bearings. Do not allow cleaning mixture to enter ducts, louvres, scoops or other natural entrapments.

b. Allow cleaning mixture to remain on surface from 5 to 10 minutes; do not allow mixture to dry. Scrub the surface lightly with a soft fiber brush or mop. This action aids in removing foreign matter.

c. Thoroughly rinse the cleaning mixture from the surface with water; adjust water hose nozzle for coarse spray and use water at a temperature of 120°F to 140°F if available. Brush surface lightly with soft fiber brush, during latter part of this operation, to aid in removing cleaning mixture and foreign matter.

d. Repeat steps "a" through "c" until surface is clean.

NOTE

The ratio of water to cleaning compound, Specification MIL-C-25769 given in paragraph 2-59, may be altered if foreign matter is difficult to remove. The surface may be either wet or dry when the cleaning mixture is applied.

e. Remove masking materials, covers, and shields after all surfaces are clean. Check interiors of all openings for presence of cleaning mixture or water. Remove cleaning mixture and/or water.

f. Clean and wax canopy windows; refer to paragraphs 2-71 and 2-72 for procedures.

g. Clean windshield; refer to paragraph 2-70 for procedure.

h. Clean radome and other antenna covers, refer to paragraph 2-74 for procedure.

i. Lubricate components that have been subjected to contamination during cleaning procedure. Refer to Section III of this manual for lubrication procedures.

2-63. CLEANING ENGINE.

Engine cleaning requires removal of the engine from the aircraft. Overall washdown, or cleaning by the spray method, is not recommended and will not be necessary if engine is operating properly. The engine and its components may be wiped clean with cloths moistened in kerosene or dry cleaning solvent, Federal Specification P-S-661b. Carbon or other deposits, which may occur in afterburner and tailpipe areas, may be removed by using a wire brush dipped in kerosene or dry cleaning solvent. Complete carbon removal will be accomplished at overhaul depots where hot bath immersion facilities are available. For procedure on cleaning the engine internal air passages, refer to T.O. 1F-106A-2-4.

2-64. CLEANING FUSELAGE INTERIOR.

Remove engine, and wipe engine intake ducts and fuselage interior with cloths moistened in dry cleaning solvent, Federal Specification P-S-661b. To clean the more complex hydraulic units of the control system, a coarse spray of dry cleaning solvent may be used. This spray should be used only for short periods of time and be directed only on the unit to be cleaned. The spray fumes are injurious to personnel and damaging to electrical equipment.

CAUTION

Cleaning solvent trapped adjacent to beltframes in the belly of the airplane will create a fire hazard. Carefully wipe these areas dry before reinstallation of shrouds and engine. Any hydraulic leaks noted during cleaning should be promptly repaired. Keep the drain holes in lower fuselage skin open at all times.

2-65. CLEANING LANDING GEAR.

Clean the landing gear as follows:

a. Cover the wheel assembly and tire, and exposed rubber door seals with oiled paper; attach paper with masking tape.

b. Remove heavy deposits of tar or asphalt by scrubbing with fiber brush that has been dipped in kerosene or dry cleaning solvent, Federal Specification P-S-661b. Do not allow kerosene or cleaning solvent to contact enameled surfaces as finish will be damaged.

c. Perform steps "a" through "c" of paragraph 2-62.

NOTE

Remove mud by applying stream of water and scrubbing with stiff fiber hand brush. Do not scrape off mud as the surface will be damaged.

d. Remove oiled paper after landing gear is clean. Hand clean wheel assembly. Flush wheel assembly and tire with water.

e. Dry the polished surface of shock strut piston with clean cloth. Moisten cloth with hydraulic fluid, Specification, MIL-H-5606 and wipe polished surface.

f. Lubricate components that have been subjected to contamination during cleaning procedure. Refer to Section III of this manual for lubrication procedures.

2-66. CLEANING BALL AND ROLLER BEARINGS.

Bearings may be cleaned by either the brush or spray method.

a. Brush method: clean bearings by using a stiff bristle brush and either kerosene or dry cleaning solvent, Federal Specification P-S-661b. Wire brushes must not be used under any condition.

b. Spray method: use a very coarse spray with a minimum of air pressure. Either kerosene or dry cleaning solvent may be used. The bearing should not be allowed to spin in the hand as the bearing surfaces may be marred.

c. Inspect the bearings for cracks or excessive wear. Dry the bearings by permitting them to drain. Repack immediately with the specified grease to prevent rust damage.

2-67. CLEANING PRELUBRICATED BEARINGS.

Clean sealed-in, prelubricated bearings by wiping away excess grease with a clean cloth that has been slightly dampened with dry cleaning solvent, Federal Specification P-S-661b. Solvent must not be allowed to enter the bearing races.

2-68. CLEANING ALUMINUM ALLOY PARTS AND SURFACES.

Use applicable cleaning compound as listed in paragraph 2-59 to clean aluminum alloy parts and surfaces. Apply with a mop, clean cloth, spray, or soft brush. Rinse freely with clean water. Use spray equipment where convenient, but avoid contamination of rubber or plastic surfaces.

2-69. CLEANING STEEL AND TITANIUM.

Steel and titanium parts in the engine compartment will not require special cleaning procedures. Methods and materials outlined for use in this area of the airplane will apply also to these metals.

2-70. CLEANING GLASS PANELS.

The glass windshield panels may be cleaned by using a sponge or soft brush and detergent solution. Refer to paragraph 2-59 for applicable cleaning solution. Rinse with clean water and dry with damp chamois. Be careful not to wet electrical equipment in the cockpit when cleaning the inside surfaces. Polish all surfaces with clean tissue.

2-71. CLEANING OF PLEXIGLAS CANOPY WINDOWS.

Clean the exterior surfaces of the canopy windows as outlined in the following steps "a" through "e" then clean the interior surfaces as outlined in steps "f" through "h."

a. Flush with plenty of clean fresh water, using the bare hand gently to dislodge dirt or mud particles.

CAUTION

Remove rings or other hard objects from hand before washing transparent plastics.

b. Wash gently with Castile or "Ivory" soap, referenced in paragraph 2-59, and water only. The water must be free of dirt or abrasive materials. Go over the surface with the bare hand only, to seek out and carefully dislodge dirt or particles. A *clean* sponge may be used to carry the soap and water to the plastic, but not for scrubbing or washing.

c. Dry with a *clean* damp chamois, Specification KK-C-300. Blot to dry. Do not rub.

d. Remove oil and grease residues by applying cleaning and polishing compound, Specification MIL-C-18767, with a clean damp piece of outing flannel, Specification CCC-F-466 Type I.

e. If after removing dirt and grease, the plastic surface is marred by light scratches, polish the windows by the procedure given in paragraph 2-73.

f. Dust the interior plastic surfaces with a clean piece of outing flannel, Specification CCC-F-466 Type I, that has been saturated with clean water.

g. Wipe surfaces carefully with a clean damp piece of outing flannel or sponge. Keep the flannel or sponge free from dirt or grit by rinsing it frequently in clean water.

h. Perform step "d."

2-72. WAXING PLEXIGLAS CANOPY WINDOWS.

After the canopy windows have been cleaned by the procedure outlined in paragraph 2-71, proceed as follows:

a. Wax and polish the interior and exterior of the canopy windows with Mac's Wax, manufactured by Mac's Super Gloss Polish Company of Los Angeles, California, using a clean piece of outing flannel Specification CCC-F-466 Type I.

b. Blot or pat the waxed surfaces with a clean damp chamois, Specification KK-C-300, to remove electrostatic charge and dust created by waxing operation.

2-73. POLISHING SCRATCHED PLEXIGLAS CANOPY WINDOWS.

Light scratches in plexiglas panels may be polished out as follows:

a. Wrap a rubber block with fine wet or dry sandpaper cloth No. 600A.

b. Rub the scratched area with the block, using a circular motion approximately six inches in diameter. Use water, or a 2% soap solution as a lubricant.

c. Rinse the panel thoroughly with clean water after the scratch is removed. Dry with a clean flannel cloth,

Specification CCC-F-466, which has been wrung from clean water.

d. Remove any remaining fine hairline scratches by applying a small amount of cleaning and polishing compound, Specification MIL-C-18767, with a damp flannel cloth wrapped around a rubber block.

2-74. CLEANING PLASTIC SURFACES (EXCEPT CANOPY WINDOWS).

The radome is plastic, and various antennas on the aircraft are equipped with plastic covers. These plastics should be kept clean at all times. Great care must be taken to avoid scratching or marring the surface. Use a clean cloth or sponge moistened with detergent solution to clean these items; refer to list of cleaning materials in paragraph 2-59. Rinse with clean water or a moistened cloth.

2-75. CLEANING COCKPIT.

Use a vacuum cleaner to pick up dust and foreign matter on the floor and in otherwise inaccessible corners of the cockpit. The instrument panel, pilot's seat, and cockpit trim should be cleaned by using a cloth moistened in light duty cleaner, followed by use of a cloth moistened in plain water, and then dried. Be careful to avoid wetting of electrical equipment or saturating soundproofing material attached to the outboard side of cockpit trim panels.

2-76. CLEANING MISCELLANEOUS PARTS AND SURFACES.

Miscellaneous bronze, brass, magnesium, and steel parts may be cleaned in any safe, convenient manner with the approved solvent mixtures. Refer to paragraph 2-59 for specific cleaning agents. Do not use strong caustic solutions or abrasives. Rinse all parts and surfaces with clean water.

2-77. REMOVING SPILLED BATTERY ELECTROLYTE.

The battery electrolyte, potassium hydroxide, is a strong alkaline solution with extremely corrosive properties when in contact with metal or many other materials. To remove spilled electrolyte proceed as follows:

a. Rinse the affected area with large quantities of water to dilute and remove the electrolyte, being careful not to spread the electrolyte into the surrounding structure.

b. After the electrolyte has been removed, neutralize the area with vinegar or weak hydrochloric acid (1 part acid to 30 parts water).

c. Rinse the area thoroughly with water.

d. If the electrolyte has damaged the structure, refer to T.O. 1F-106A-3 for repair data.

WARNING

The battery electrolyte can cause severe burns. Rubber protective clothing and a suitable face mask must be worn when removing spilled electrolyte.

2-78. CLEANING MISSILE BAY AREA.

Clean rocket exhaust residues from the missile bays and adjacent areas after each missile firing mission as follows.

2-79. Preparation.

a. Open missile bay doors and extend missile launchers; refer to Section I of this manual for procedure.

b. Cover exposed rubber door seals with oiled paper. Attach oiled paper with masking tape. Cover open electrical plugs and receptacles with polyethylene sheet material. Attach polyethylene sheet material with masking tape or rubber bands.

2-80. Procedure.

Start cleaning procedure on uppermost surfaces then proceed to lower surfaces. Confine working area to a section that can be cleaned and rinsed before the cleaning mixture dries.

a. Apply cleaning mixture of Specification MIL-C-25769 as referenced in paragraph 2-59 to the surface with a mop or soft fiber brush. Do not apply cleaning mixture to large areas.

CAUTION

Do not apply cleaning mixture to missile launcher or door actuator bearings.

b. Allow cleaning mixture to remain on surface from 5 to 10 minutes; do not allow mixture to dry. Scrub the surface lightly with a mop or soft fiber brush. This action aids in removing foreign matter.

c. Thoroughly rinse the cleaning mixture from the surface with water; adjust water hose nozzle for coarse spray and use water at a temperature of 120°F (48.9°C) to 140°F (60°C) if available. Brush surface lightly with soft fiber brush during latter part of this operation to aid in removing cleaning mixture and foreign matter.

d. Repeat steps "a" through "c" until surface is clean.

NOTE

Cleaner, Specification MIL-C-25769, may be applied undiluted to metal surfaces if foreign matter is difficult to remove. The surface may be wet or dry when this cleaner is applied.

e. Dry the area with air and/or clean rags. Remove masking material from rubber door seals, electrical plugs and receptacles.

f. Lubricate missile bay doors and armament system components; refer to Section III of this manual for procedures.

2-81. CLEANING OF ELECTRICAL CABLE AND COMMUNICATIONS EQUIPMENT.

Heavy deposits of hydraulic oil or grease may be cleaned from electrical harness and communications equipment by use of the following mixture: 50 per cent by volume of solvent, Federal Specification P-S-661, and 50 per cent by volume of isopropyl alcohol. In cleaning harness, separate the individual wires so that the solvent will reach all surfaces of the wire. The cables must be wiped dry of cleaning solution.

WARNING

The use of carbon tetrachloride or trichlorethylene on electrical equipment is prohibited as such solvents corrode metal parts, deteriorate wiring insulation, and are toxic.

2-82. REPAIRING DAMAGE TO EXTERIOR FINISH.

2-83. Repairs to Exterior Painted Metallic Surfaces.

Repairs to the exterior finish of metallic surfaces fall into two general classifications, those involving damage to the finish only, and those where the finish and the metal have been damaged. When the metal has been damaged, refer to Structural Repair Manual T.O. 1F-106A-3 to determine the type of repair required. If the finish, only, has been damaged, proceed as follows:

NOTE

When finish damage is confined to small areas, use steps "b" and "k" through "o." If damage involves a large specific area, use entire procedure.

a. Very carefully remove finish in damaged area; use paint remover, Specification MIL-R-25134, and a plastic scraping tool. Take care to confine paint remover to paint being removed. Thoroughly rinse the area with water.

b. Clean area to be repaired with aliphatic naphtha, Specification TT-N-95a.

CAUTION

When touchup repair painting is to be accomplished within approximately 10 feet of the canopy, the windows shall be protected from paint fumes as outlined in steps "c" thru "j." If the touchup painting is done in a hangar or enclosed area, the paint fumes must be carried away from the canopy by forced ventilation. If painting is done in an open area, the airplane should be positioned so that the prevailing wind carries the paint fumes away from the canopy. During painting of a major portion of the airplane, the canopy should be removed from the airplane and stored in an area affording protection from all the injurious substances mentioned in paragraph 2-59.

c. Clean exterior and interior of canopy windows; refer to paragraph 2-71 for procedure.

d. Cut one thickness of flannel cloth, Specification CCC-F-456a, or two thicknesses of flannel cloth, Specification CCC-F-466, to fit both the exterior and interior surface of each canopy window.

e. Secure the flannel cloth in place with tape, Federal Specification PPP-T-60.

f. If flannel cloth is not available, cover both the exterior and interior surfaces of each canopy window with Protex #20V adhesive paper, manufactured by Maskoff Company, Monrovia, California.

g. Cut one sheet of barrier material, Specification MIL-B-131, to fit both the exterior and interior surfaces of each canopy window.

h. Secure the barrier material in place with tape, Federal Specification PPP-T-60.

i. After the paint has thoroughly dried, remove the protective covering from the canopy windows. If Protex #20V adhesive paper was used in this procedure, peel the adhesive paper slowly from the canopy panels to prevent an excessive buildup of electrostatic charge in the canopy panels.

j. After removing the protective covering, the canopy windows should be waxed, refer to paragraph 2-72 for procedure.

k. Apply a coat of wash primer, Specification MIL-C-8514. Wash primer should be confined as nearly as possible to damaged area. Allow the wash primer coat to dry not less than one hour and not more than four hours before the application of zinc chromate primer. If applied at temperatures below 80°F (26.7°C), or under high relative humidity, or both, increase the minimum drying period an additional ½ hour before applying zinc chromate primer.

l. Apply a thin coat of yellow zinc chromate primer, Specification MIL-P-8585. This should be applied thin enough to leave a wet, semi-transparent coat. A heavy yellow coat should be avoided. A wet coat is necessary to secure maximum adhesion and corrosive-inhibiting properties.

m. Lightly sand the zinc chromate primed area with No. 400 "wet or dry" sandpaper after a minimum of six hours. Use care to avoid scratching the metal surfaces. Sand the enamel edge next to the primed area to a tapered or feathered edge and remove dust resulting from sanding operation with a clean tack rag.

n. Apply a second coat of zinc chromate primer if the surface is not smooth, or bare metal is exposed. Allow primer to dry, then sand lightly as in step "m." Never apply a heavy coat of zinc chromate primer in an attempt to bring surface up flush with a single coat.

o. Spray on one coat of enamel, Specification MIL-E-7729, Color No. 1645, Federal Standard 595, after surface is smooth, flush and clean. Allow to dry 48 hours (at room temperature) prior to placing the aircraft in service.

2-84. Repairs to Finish of Exterior Plastic Surfaces (Radome and Antennas).

The process outlined in this paragraph will effectively renew or repair the rain erosion protective coatings, Class I, applied in accordance with MIL-C-7439 on plastic exterior surfaces.

a. Remove loose, blistered, or erosion damaged sections of coating by sanding with emery cloth (180 grit), or equivalent, to a smooth tapered or feathered edge. Extend feather edge about ½ inch beyond the damaged area. Avoid sanding into the surface of the underlying plastic.

NOTE

The entire coating may be removed, if complete replacement is determined necessary, by applying cloths saturated with toluene. Between applications of the cloths, vigorously agitate the coating surface with a stiff fiber bristle brush. Continue alternate cloth applications and brushing action until coating is entirely removed. Care must be taken to prevent unnecessary exposure of the underlying plastic to the solvent effect of the toluene. If entire coat is removed, disregard steps "a" and "j" and continue with remaining steps of the procedure.

b. Wipe surface to be coated until dust free. Use a cloth moistened with toluene.

c. Mask around area to be coated to protect adjacent areas from overspray.

d. Prepare Bostick primer, No. 1007, for spray application by thinning (3 parts methyl ethyl ketone, 1 part primer).

e. Spray on first coat of Bostick primer, No. 1007. Allow to dry for 5 minutes and continue spraying until approximately 4 coats of primer have been applied with a 5-minute drying period between each coat. Total thickness buildup of primer shall be 0.001 to 0.002 inches.

f. Allow final coat of Bostick primer to dry for 20 to 30 minutes.

g. Prepare neoprene coating (Goodyear kit No. 23-56-S) for spraying by mixing Goodyear accelerator, No. 983-C, with Goodyear diluting thinner, No. 1803-C, and adding Goodyear cement, No. 1801-C, in the proportions recommended by the manufacturer. Stir thoroughly. Mix only the amount to be used within the following 8 hours.

h. Spray on a thin coating of neoprene and allow to dry for 10 to 15 minutes. Continue spraying, with a 10 to 15 minute drying period between coats, until enough spray layers (approximately 12) have been applied to produce a total thickness buildup, of primer and coating, of 0.007 to 0.012 inch.

i. Remove masking tape and feather the edge of the applied coating by sanding with emery cloth (180 grit).

j. Spray on one additional coating over entire area of repair and the original coating.

k. Allow to cure for 72 hours at 70° F (21° C), or for 2 to 3 hours at 150° F (66° C), before use.

Section III

LUBRICATION

Contents *Page*

3-1. GENERAL.

Lubrication is applied to units by hand, brush, oil can, and by the use of a pressure-type grease gun. In areas subject to high operating temperatures (above 300°F), in confined areas difficult to lubricate by conventional means, or in exposed areas subject to the accumulation of dirt or dust, lubrication is accomplished during manufacture by coating the bearing surfaces with a baked-on coat of dry film graphite. Bearing surfaces thus treated require no service lubrication. For assembly lubrication, when applicable, refer to paragraphs covering the functional systems containing the components in question. For service lubrication, refer to the lubrication charts, figures 3-1 through 3-15. These charts contain instructions for lubrication of all components of the airplane. Lubrication requirements for postflight, periodic and special inspection periods are covered. Frequency and method of application symbols are shown, along with letters indicating type of lubricant to be used at each lubrication point.

3-2. METHODS OF LUBRICATION.

Hinge points, moving surfaces, shafts, and similar points of friction, requiring lubrication under pressure, are equipped with standard, hydraulic-type lubricator fittings, Specification Nos. MS15001, MS15002, or MS15003. These fittings are serviced with push-type grease guns, operated manually or pneumatically. When applying lubricant through the fittings, first wipe off all old grease accumulations, grit, or dust. Apply pressure to the fitting until a small amount of grease is squeezed out from the assembly being lubricated. When finished, wipe all excess lubricant from exposed surfaces and from around the fitting.

a. Where lubricants are applied to exposed surfaces such as door hinges, the surfaces must be wiped clean, and the lubricants applied only to the actual working surfaces. Remove all excess lubricant.

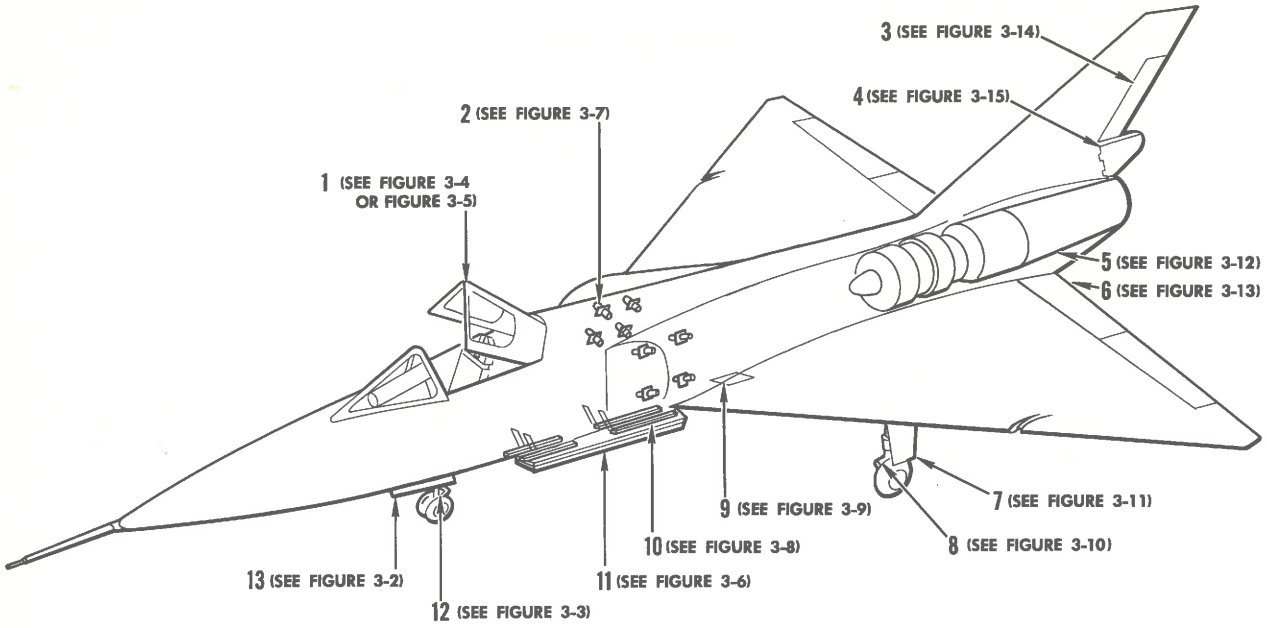
b. Bearings, such as the wheel bearings, are lubricated by working the grease into, and filling, the roller assembly. Overfilling of bearings, where the operation of the part will cause a temperature rise and consequent expansion of the grease, is not good practice. Such action forces excess grease out of the bearing where it is exposed to the accumulation of dust and dirt, which can readily work back into the bearing with detrimental effects.

3-3. FLUSH-TYPE LUBRICATOR FITTINGS.

To permit pressure lubrication in areas where standard-type fittings would interfere with operating clearances, or would structurally weaken the bearing support, small flush-type fittings, Specification NAS 516, are installed. Such fittings are serviced by the standard-type grease gun equipped with a special adapter nozzle, Stewart Warner Alemite Part No. 314150. With this type of fitting, the adapter nozzle must be pressed firmly into the lubricator hole while applying grease pressure. Finish by wiping all excess lubricant from around the fitting.

3-4. CARE AND LUBRICATION OF WHEEL BEARING GREASE SEALS.

Prior to reinstalling landing gear wheels and wheel bearings, the wheel bearing grease seals should be inspected and serviced as follows:



KEY LIST

1. COCKPIT CANOPY.
2. VARIABLE RAMP.
3. RUDDER COMPONENTS.
4. SPEED BRAKES.
5. ENGINE COMPARTMENT.
6. ELEVONS.
7. MAIN LANDING GEAR DOORS.
8. MAIN LANDING GEAR.
9. RAM AIR TURBINE
10. ARMAMENT.
11. MISSILE BAY DOORS.
12. NOSE LANDING GEAR.
13. NOSE LANDING GEAR DOOR.

TABLE OF LUBRICANTS AND KEY TO SYMBOLS

IDENTIFICATION LETTERS	BASIC SPECIFICATIONS	TYPE OF LUBRICANT
FG	MIL-G-6711	Graphite, Lubrication, Dry. (Wet mixture; 1 gallon of oil to 1 pound of graphite.)
GLT	MIL-G-3278	Grease, Aircraft and Instruments, Low and High Temperature.
GPS	MIL-L-4343	Grease, Pneumatic System.
GH	MIL-L-3545	Grease, High Temperature Lubricating.
GG	MIL-G-7187	Grease, Lubricating Graphite.
GB	MIL-G-7711	Grease, General Purpose, Aircraft.
OGP	MIL-L-7870	Oil, Lubricating, General Purpose, Low Temperature.
OHA	MIL-H-5606	Oil, Hydraulic, Petroleum Base.
SPECIAL	VV-P-236	Petrolatum.
SPECIAL	MIL-G-25760	Grease, Aircraft; Ball and Roller Bearing, Wide Temperature Range.
SPECIAL	MIL-L-7808	Oil, Lubricating, Gas Turbine, Aircraft High Temperature.
SPECIAL	MIL-M-7866	Molybdenum Disulfide Powder, Lubricant.

FREQUENCY SYMBOLS (INSPECTION PERIODS)

POSTFLIGHT (NEAREST 50 FLIGHT HOURS UNLESS OTHERWISE NOTED).

PERIODIC (100 FLIGHT HOURS)

SPECIAL

SPECIAL LUBRICATION REQUIREMENTS

BECAUSE OF THE COMPLEXITY OF THE SPECIAL LUBRICATION REQUIREMENTS OF THE AIRPLANE'S MAJOR COMPONENTS A SYSTEM OF NOTES IS USED ON EACH FIGURE. "SEE NOTE 1" ADJACENT TO THE FREQUENCY SYMBOL REFERS THE READER TO ITEM 1 OF THE "NOTES."

——→ SOLID LINE WITH ARROWHEAD INDICATES A SPECIFIC LUBRICATION POINT.

– – – –→ BROKEN LINE WITH ARROWHEAD INDICATES A SPECIFIC LUBRICATION POINT, AND THE IDENTICAL POINT ON OTHER ASSEMBLIES OR PARTS NOT ILLUSTRATED.

– – – – – – BROKEN LINE WITHOUT ARROWHEAD INDICATES LOCALIZED AREA REQUIRING LUBRICATION, THE POINT OR POINTS OF WHICH ARE NOT SPECIFICALLY SHOWN.

APPLICATION SYMBOLS

BRUSH

PRESSURE GUN

OIL CAN

HAND

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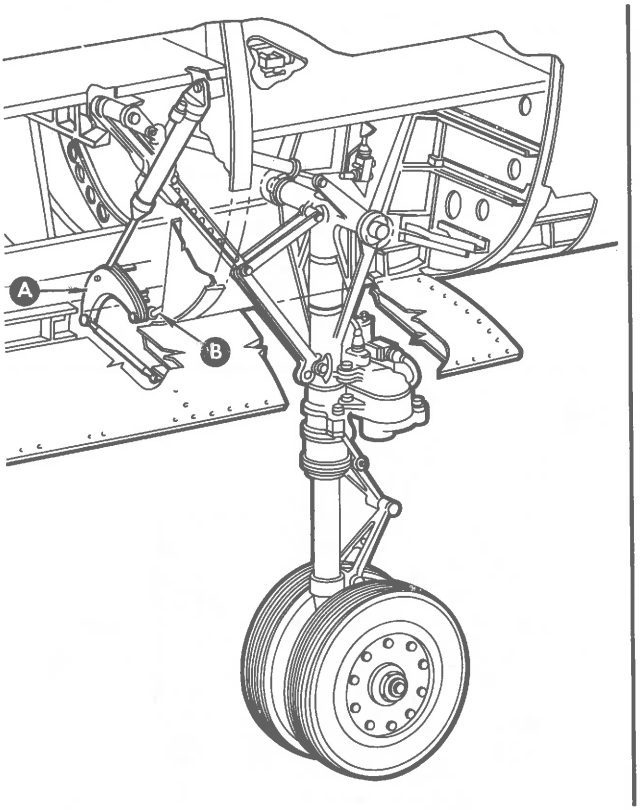
Figure 3-1. Key to Lubrication Charts

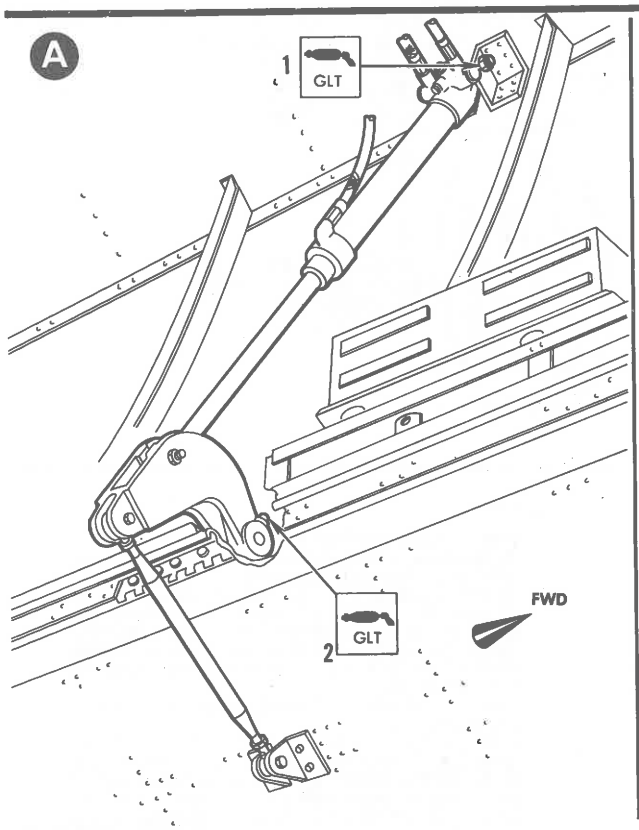


ITEM

1. ACTUATOR FIXED END BEARING (1 PLACE).
2. ARM PIVOT POINT (1 PLACE).
3. ACTUATOR ADJUSTABLE ROD END BEARING (1 PLACE).
4. RADIUS ROD BEARING, ARM ATTACH (1 PLACE).
5. RADIUS ROD BEARING, DOOR ATTACH (1 PLACE).

NOTE

USE ALEMITE GUN ADAPTER NO. 314150.



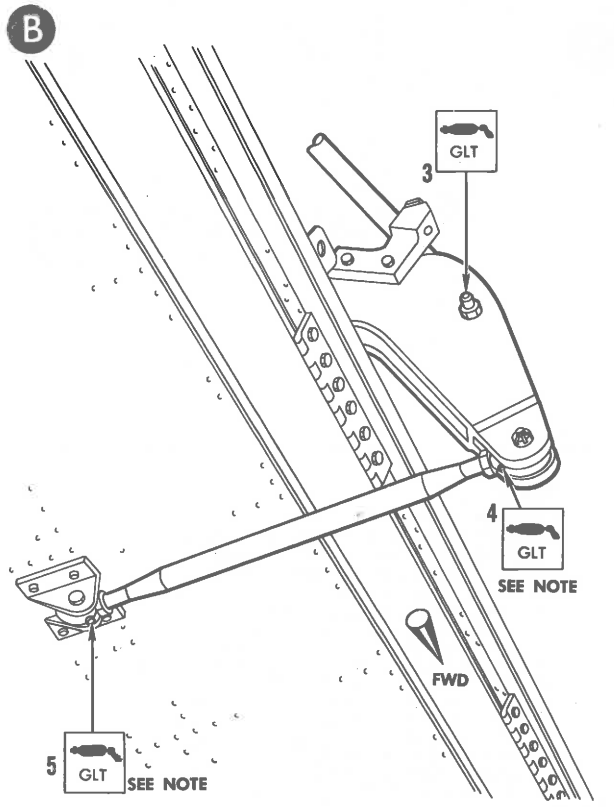


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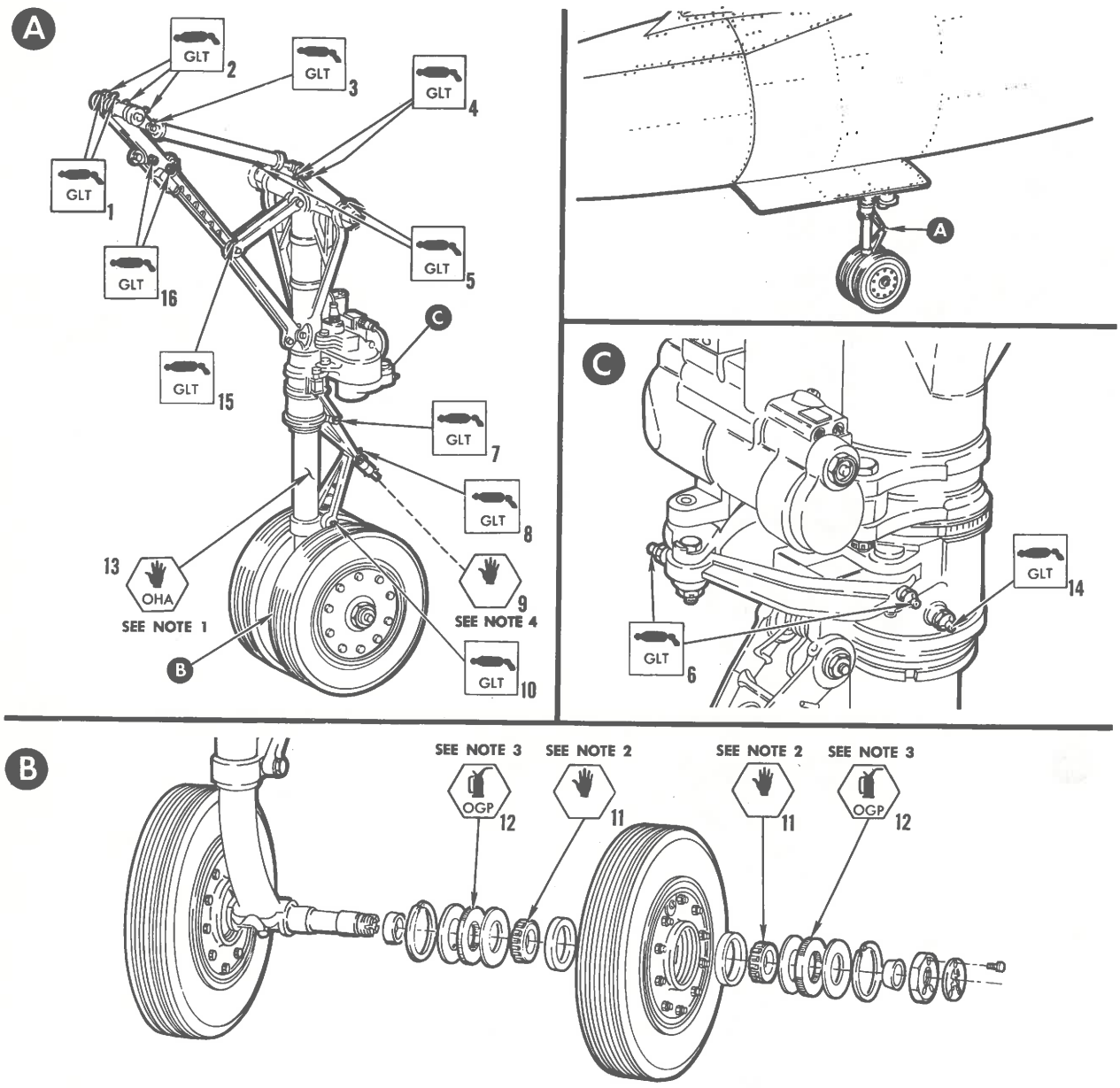
Figure 3-2. Nose Landing Gear Door Lubrication



ITEM

1. UPPER DRAG BRACE LINK (2 PLACES).
2. DRAG BRACE FITTING ASSEMBLY (3 PLACES).
3. UPPER ACTUATOR CYLINDER BEARING (1 PLACE).
4. LOWER ACTUATOR CYLINDER BEARING (2 PLACES).
5. SHOCK STRUT TRUNNION PINS (2 PLACES).
6. STEER DAMP UNIT LINK (2 PLACES).
7. UPPER TORQUE ARM BEARING (1 PLACE).
8. CENTER TORQUE ARM BEARING (1 PLACE).
9. TORQUE ARM DISCONNECT ASSEMBLY (1 PLACE).
10. LOWER TORQUE ARM BEARING (1 PLACE).
11. WHEEL BEARING (2 PLACES EACH WHEEL).
12. WHEEL BEARING GREASE SEALS (2 PLACES EACH WHEEL).
13. EXPOSED SURFACE OF SHOCK STRUT PISTON.
14. SHOCK STRUT COLLAR (1 PLACE).
15. CENTER DRAG BRACE BEARING (1 PLACE).
16. CENTER DRAG BRACE LINK (2 PLACES).

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NOTES

1. WIPE EXPOSED POLISHED SURFACE OF SHOCK STRUT PISTON DAILY WITH A LINT FREE CLEAN CLOTH THAT HAS BEEN SATURATED WITH HYDRAULIC OIL MIL-H-5606.
2. HANDPACK WHEEL BEARINGS ON ASSEMBLY AT WHEEL CHANGE, OR AT POSTFLIGHT NEAREST 50 FLIGHT HOURS, WITH GREASE, SPECIFICATION MIL-G-25760. BEARINGS WHICH ARE EXPOSED TO CLEANING SOLVENT DURING WASHING OF AIRPLANE SHALL BE REMOVED, CLEANED, AND LUBRICATED.
3. LUBRICATE GREASE SEALS CONCURRENT WITH BEARING LUBRICATION.
4. WHEN TORQUE ARM DISCONNECT ASSEMBLY BECOMES DIFFICULT TO OPERATE, REMOVE, DISASSEMBLE, AND CLEAN BY REMOVING OIL AND/OR FOREIGN MATTER. APPLY MOLYBDENUM DISULFIDE POWDER LUBRICANT, MIL-M-7866 (DRY) TO ALL PARTS. REASSEMBLE AND INSTALL.

Figure 3-3. Nose Landing Gear Lubrication

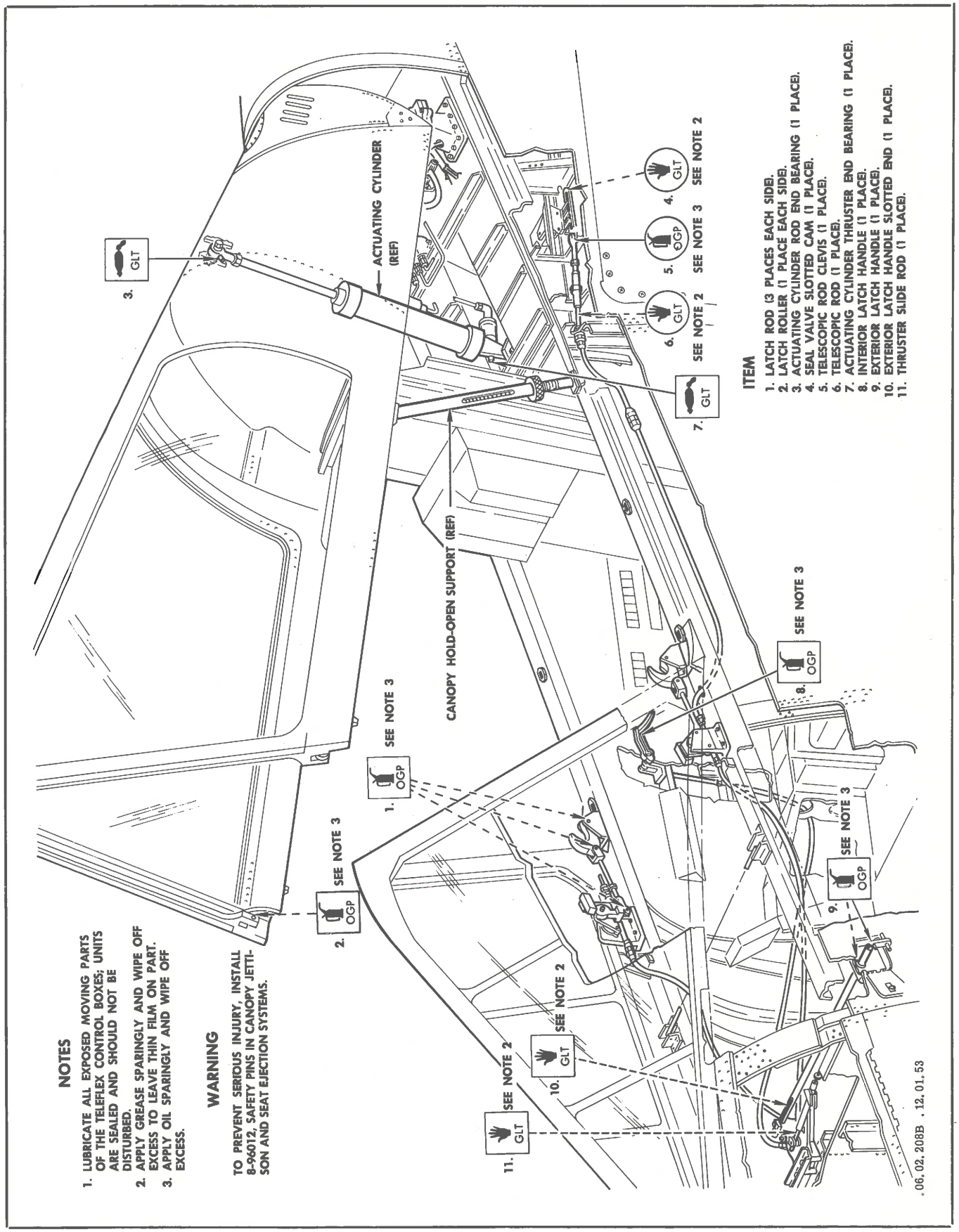


Figure 3-4. Canopy Components Lubrication, F-106A

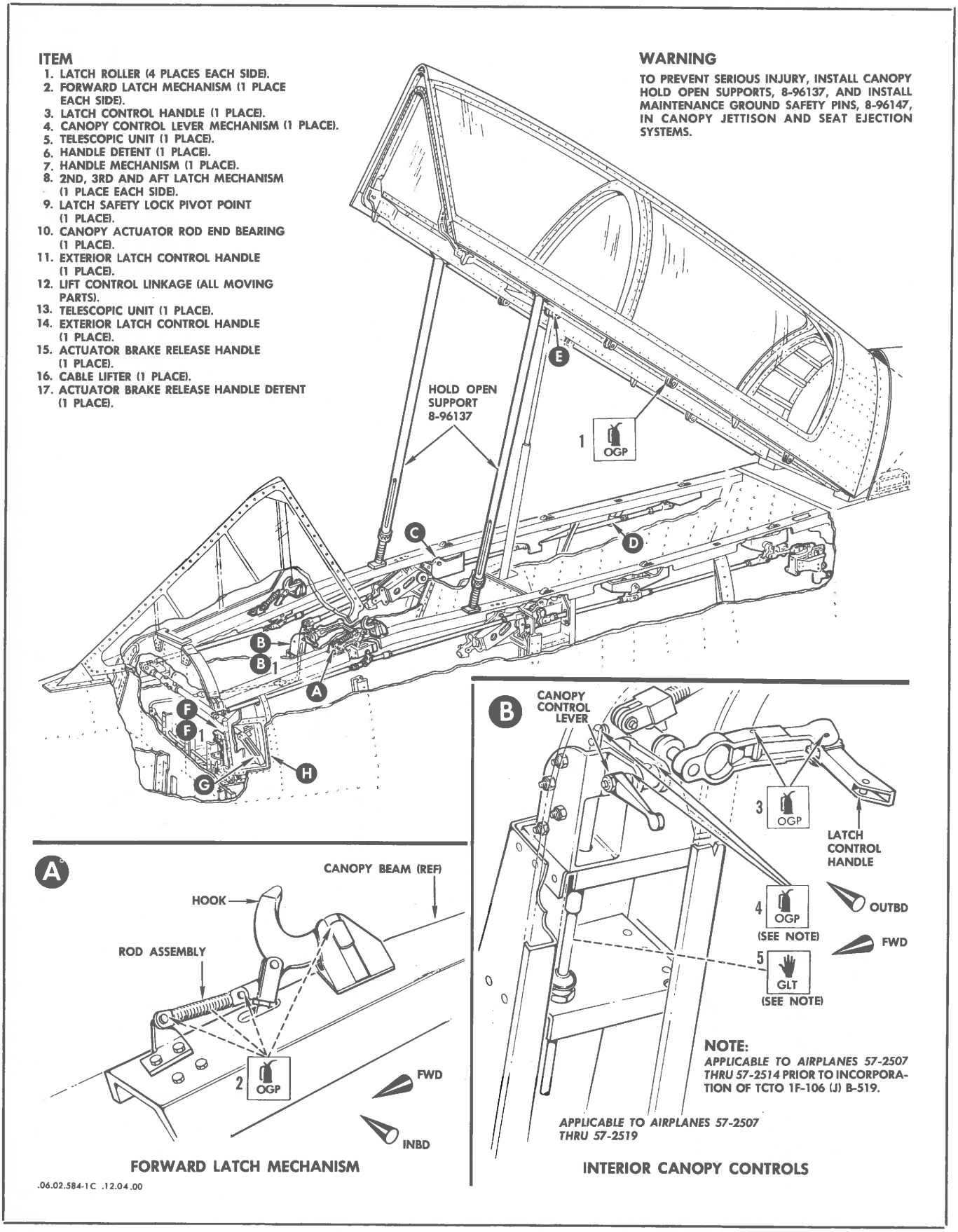


Figure 3-5. Canopy Components Lubrication, F-106B (Sheet 1 of 3)

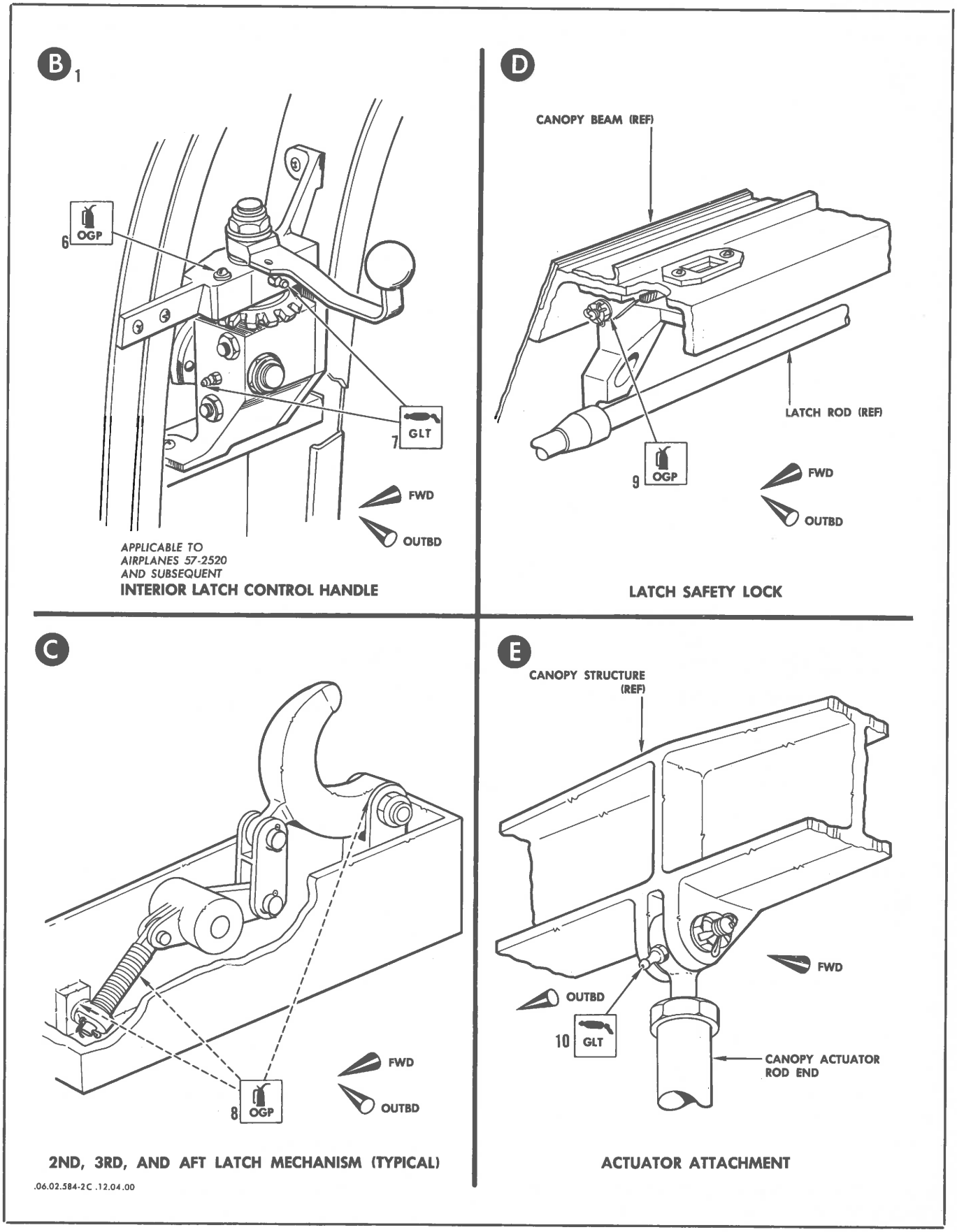


Figure 3-5. Canopy Components Lubrication, F-106B (Sheet 2 of 3)

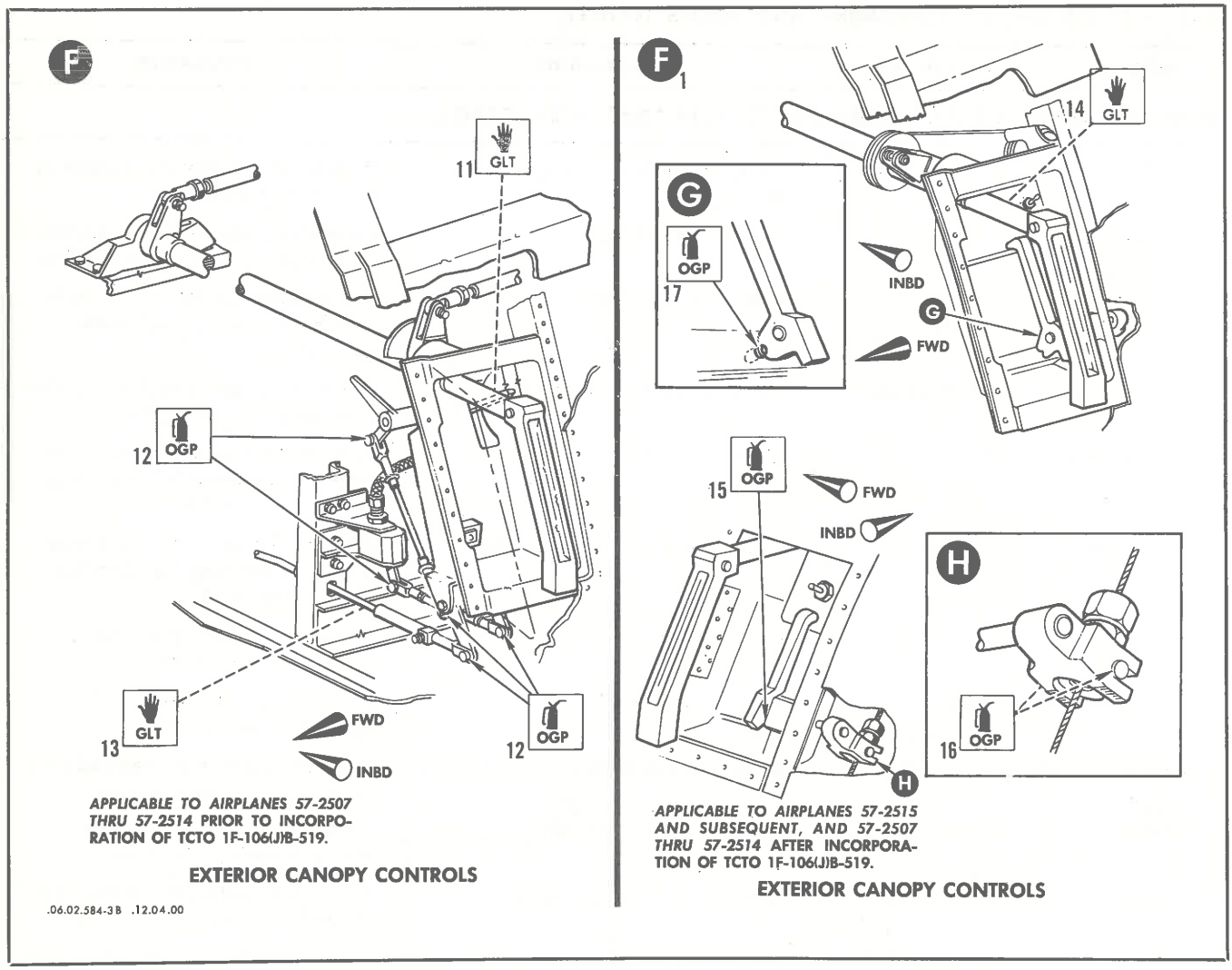


Figure 3-5. Canopy Components Lubrication, F-106B (Sheet 3 of 3)

a. Clean felt seals with a dry cleaning solvent, Specification No. P-S-661b.

b. Dry felt seals thoroughly, using moisture free air or absorbent solvent with a lint free cloth; then let dry in free air.

c. Oil seals with light machine oil No. 10, Specification MIL-L-7870, and install in wheel.

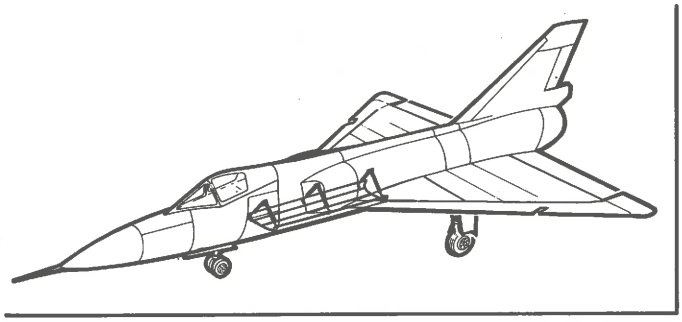
d. Replace felt seals, if, after normal cleaning, the seals are still embedded with foreign matter, if the felt material is not pliable, or if the material is broken and does not retain the necessary shape to afford proper sealing.

3-5. LUBRICATION OF O-RINGS OR SEALS IN PNEUMATIC CYLINDERS OR VALVES.

Disassembly of pneumatically operated actuating cylinders and valves such as selector valves is generally not recommended unless adequate bench facilities are available. However, should it become necessary to disassemble and reassemble a pneumatic unit, the O-rings and/or seals should be wiped clean and coated with a thin coat of grease, Specification MIL-L-4343, before reassembly.

3-6. PRELUBRICATED BEARINGS.

Sealed bearings, AN-type pulleys, and ball or roller bearing rod ends are factory-lubricated by the bearing manufacturer. These bearings are lubricated with grease, Specification MIL-G-3278, for operation under nominal operating temperatures not exceeding 149°C (300°F). Bearings operating in temperatures above 149°C (300°F) are prelubricated with a high-temperature grease and are identified by light tan fiberglas seals, or by an "H" stenciled on the face of metal seals. A red flexible composition seal indicates the bearing is prelubricated with a low-temperature grease.

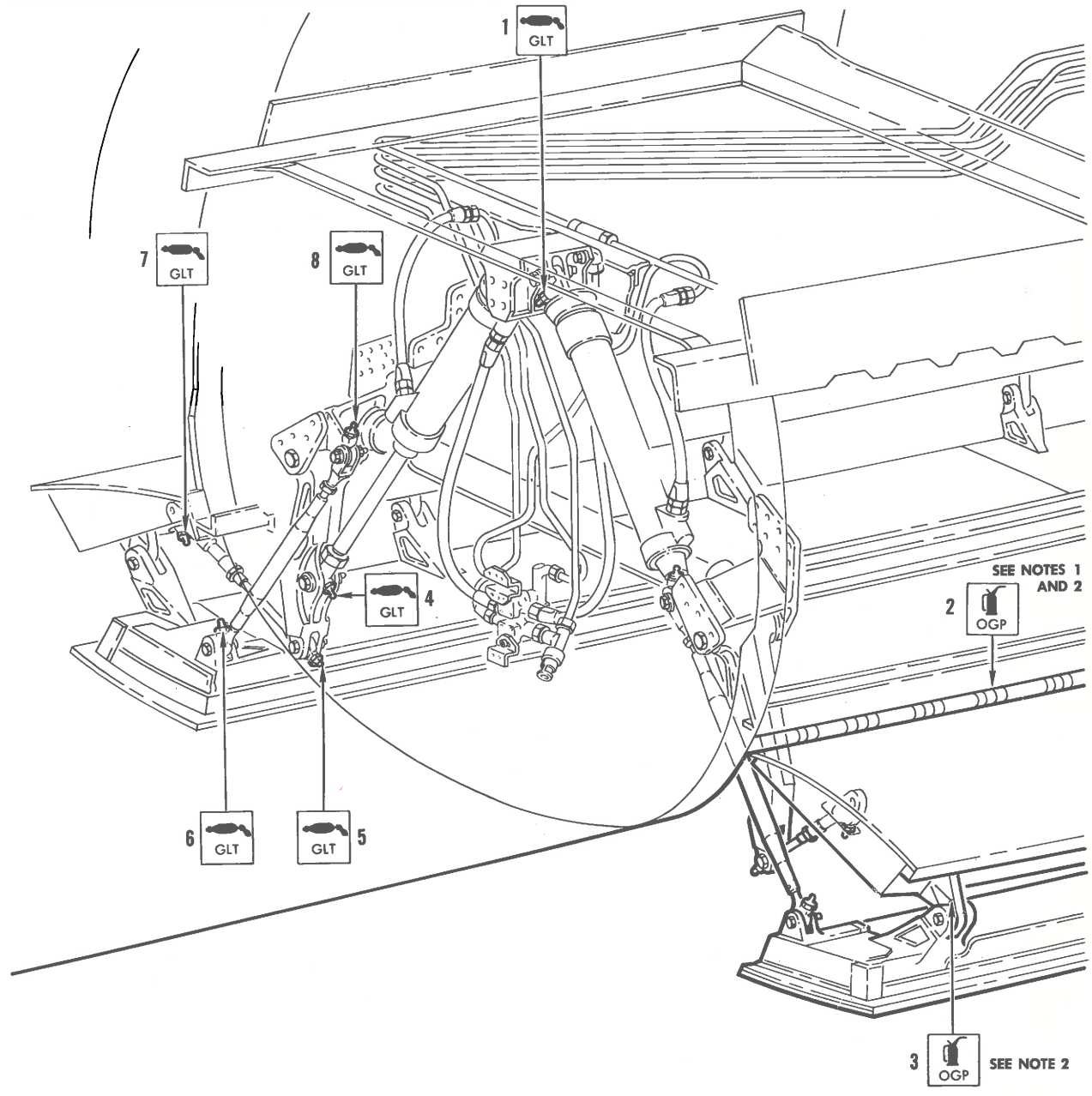


ITEM

1. ACTUATOR MOUNTING END (3 PLACES EACH DOOR).
2. DOOR HINGE POINT UPPER (ALL HINGE PINS).
3. DOOR HINGE POINT LOWER (9 PLACES EACH DOOR).
4. ACTUATOR ROD END (3 PLACES EACH DOOR).
5. LINK ASSEMBLY, IDLER ATTACH END (3 PLACES EACH DOOR).
6. ROD ASSEMBLY DOOR ATTACH END (3 PLACES EACH DOOR).
7. LINK ASSEMBLY DOOR ATTACH END (3 PLACES EACH DOOR).
8. IDLER MOUNTING END (3 PLACES EACH DOOR).

NOTES

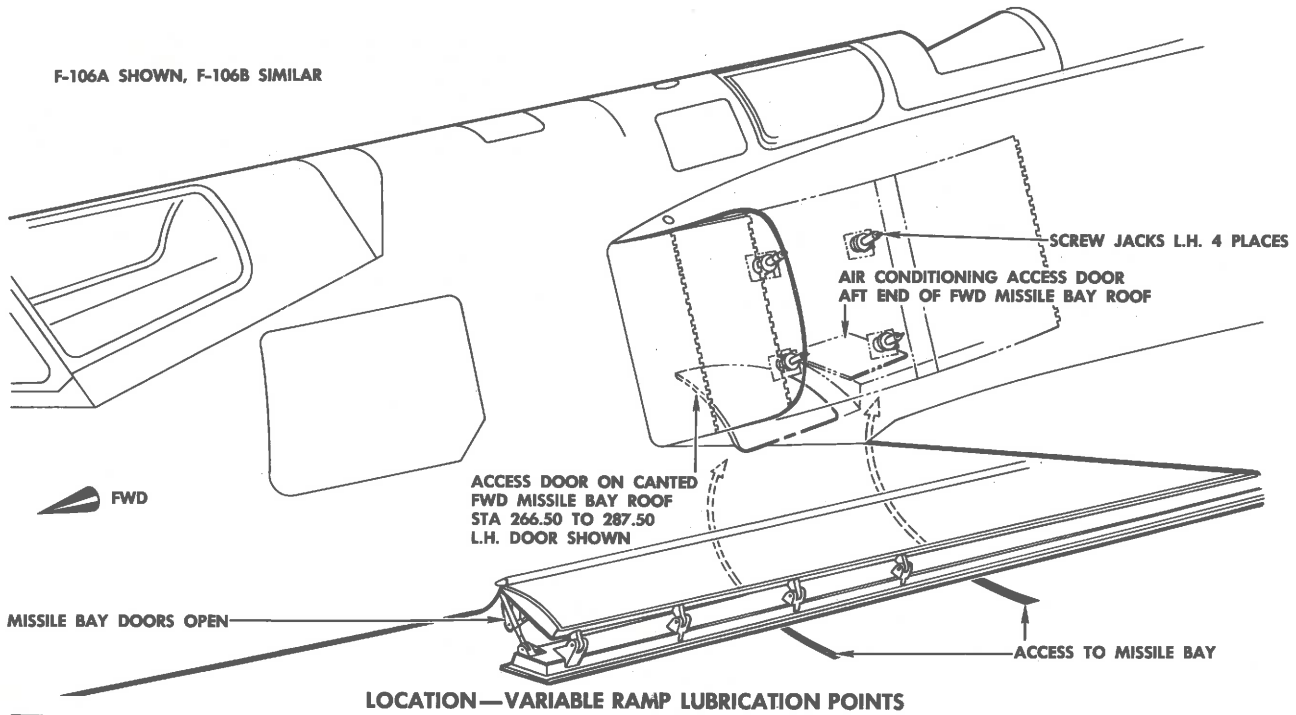
1. LUBRICATION AT THIS POINT IS *APPLICABLE TO F-106A AIRPLANES 56-453 THRU 57-2506 AND F-106B AIRPLANES 57-2507 THRU 57-2531.*
2. AFTER LUBRICATION, WIPE OFF EXCESS OIL.



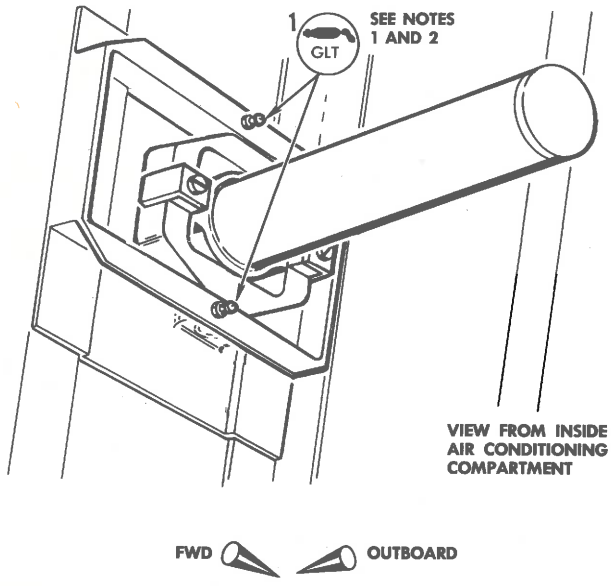
TYPICAL INSTALLATION OF DOOR ACTUATORS, LINK ASSEMBLIES, RADIUS RODS AND IDLERS (3 PLACES)

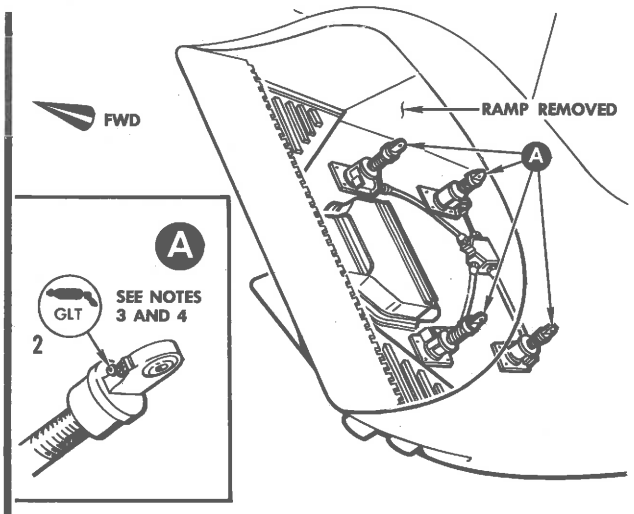
.06.02.137B .12.02.39

Figure 3-6. Missile Bay Door Lubrication



LOCATION—VARIABLE RAMP LUBRICATION POINTS





ITEM

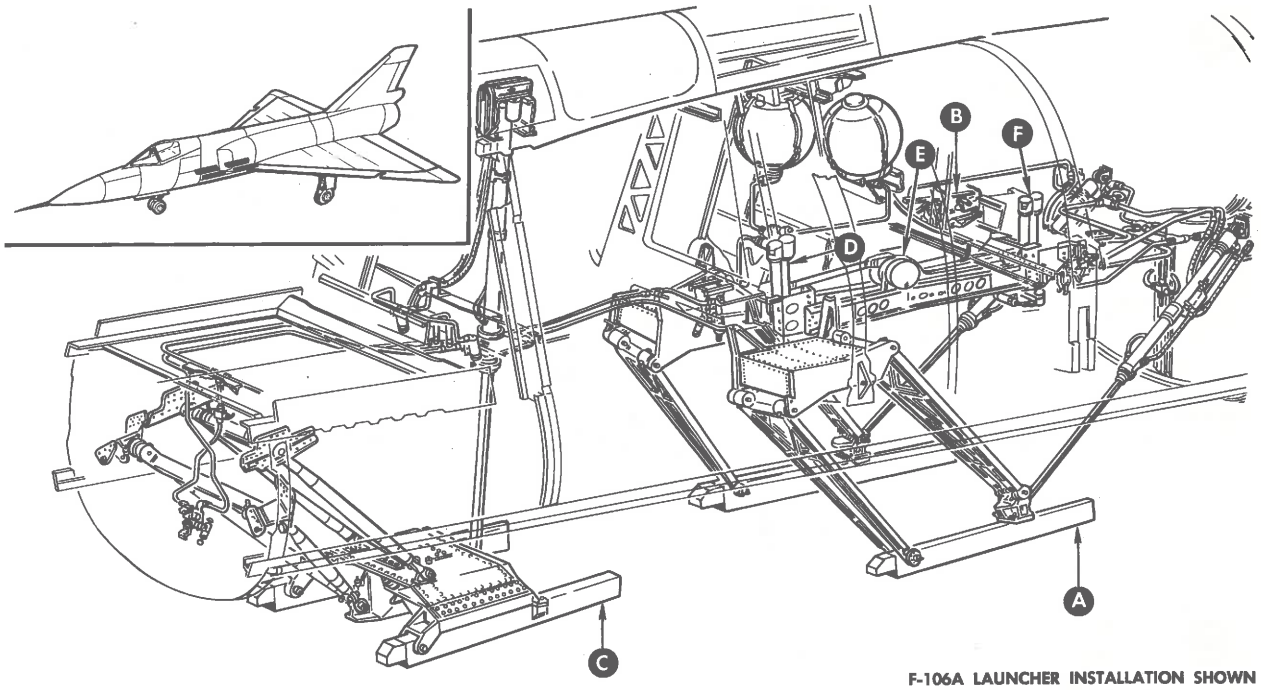
1. SCREW JACK GIMBAL PINS (8 PLACES EACH SIDE).
2. SCREW JACK ROD-END (4 PLACES EACH RAMP ASSEMBLY).

NOTES

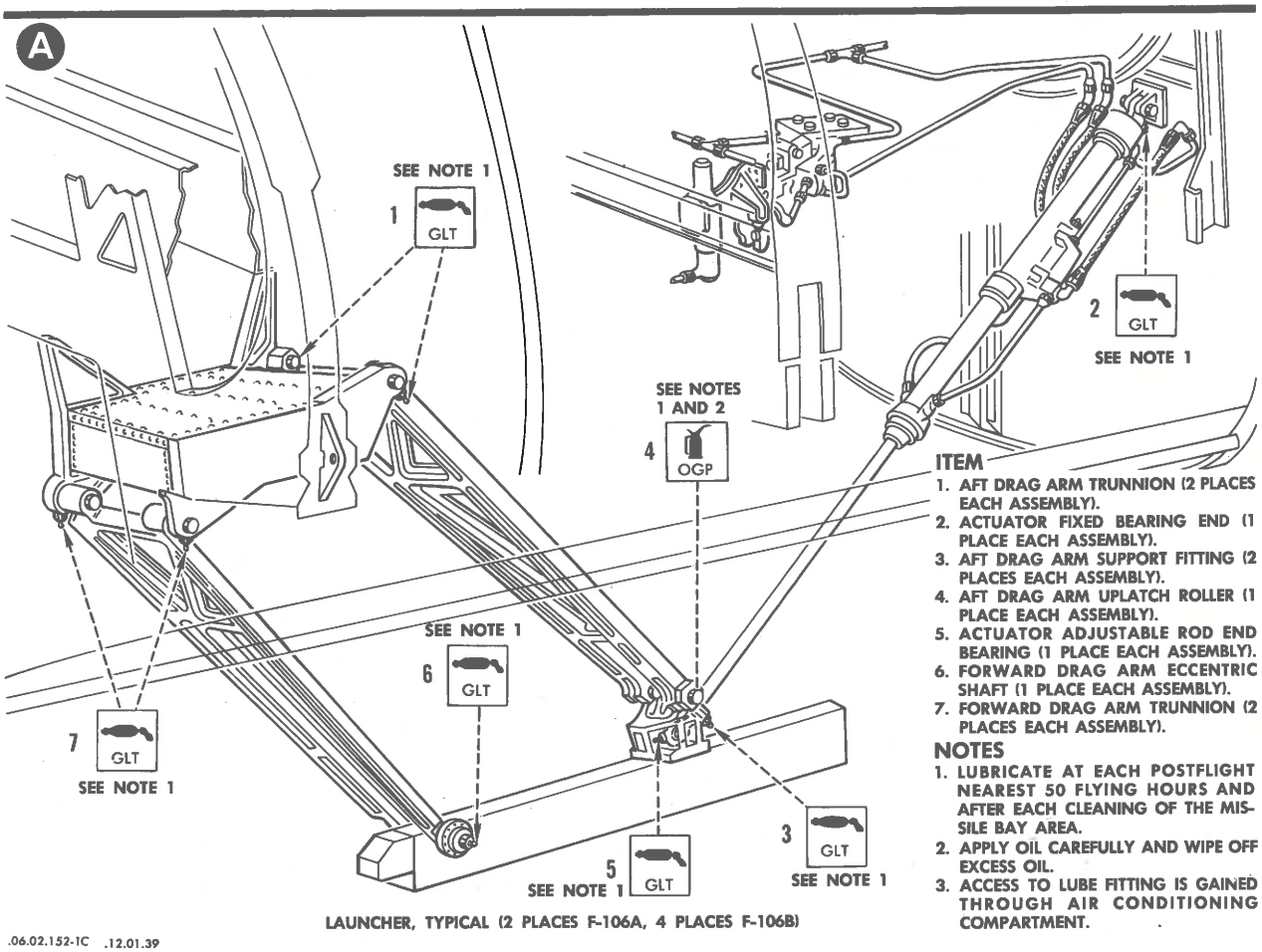
1. ACCESS TO THE UPPER AND LOWER AFT SCREW JACK GIMBAL PINS IS GAINED BY REMOVING THE AIR CONDITIONING ACCESS DOOR LOCATED TO THE LEFT OF THE CENTER LINE AT THE AFT END OF THE FORWARD MISSILE BAY ROOF.
2. ACCESS TO THE UPPER AND LOWER FORWARD SCREW JACK GIMBAL PINS IS GAINED BY REMOVING THE DOOR LOCATED ON THE CANTED PORTION OF THE FORWARD MISSILE BAY ROOF FROM STATION 266.50 TO 287.50.
3. ACCESS TO SCREW JACK ROD-END BEARING IS GAINED BY REMOVING THE RAMP. REFER TO T.O. 1F-106A-2-4 FOR RAMP REMOVAL PROCEDURE.
4. LUBRICATE SCREW JACK ROD-ENDS AT EACH PERIODIC OR AT RAMP REMOVAL WHICHEVER OCCURS FIRST.

.06.02.226B .12.05.00

Figure 3-7. Variable Ramp Lubrication



F-106A LAUNCHER INSTALLATION SHOWN



LAUNCHER, TYPICAL (2 PLACES F-106A, 4 PLACES F-106B)

ITEM

1. AFT DRAG ARM TRUNNION (2 PLACES EACH ASSEMBLY).
2. ACTUATOR FIXED BEARING END (1 PLACE EACH ASSEMBLY).
3. AFT DRAG ARM SUPPORT FITTING (2 PLACES EACH ASSEMBLY).
4. AFT DRAG ARM UPLATCH ROLLER (1 PLACE EACH ASSEMBLY).
5. ACTUATOR ADJUSTABLE ROD END BEARING (1 PLACE EACH ASSEMBLY).
6. FORWARD DRAG ARM ECCENTRIC SHAFT (1 PLACE EACH ASSEMBLY).
7. FORWARD DRAG ARM TRUNNION (2 PLACES EACH ASSEMBLY).

NOTES

1. LUBRICATE AT EACH POSTFLIGHT NEAREST 50 FLYING HOURS AND AFTER EACH CLEANING OF THE MISSILE BAY AREA.
2. APPLY OIL CAREFULLY AND WIPE OFF EXCESS OIL.
3. ACCESS TO LUBE FITTING IS GAINED THROUGH AIR CONDITIONING COMPARTMENT.

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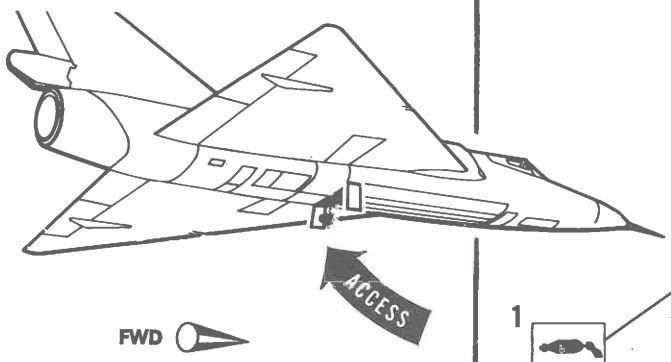
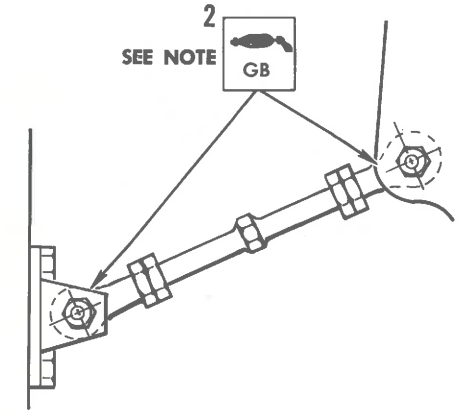
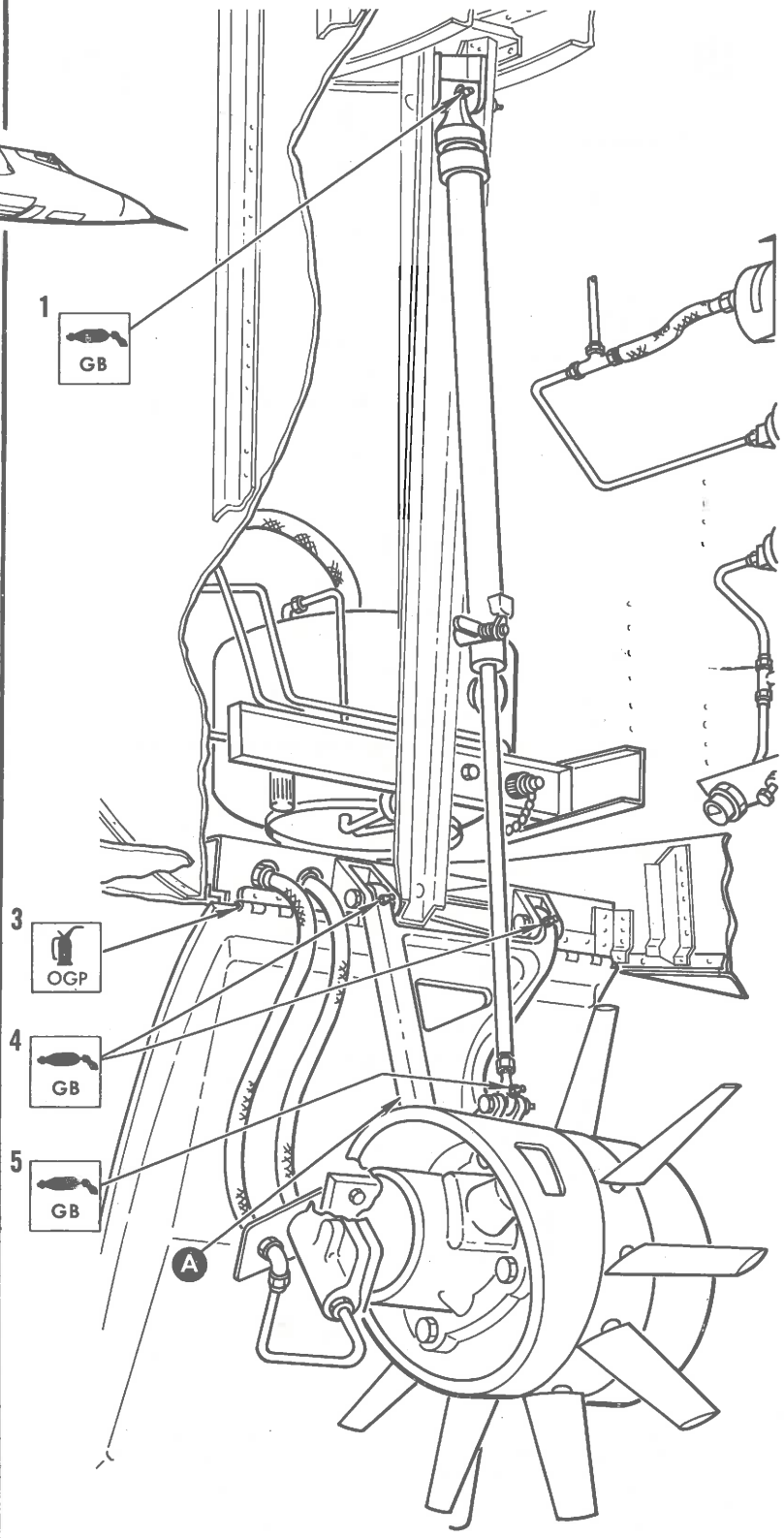
Figure 3-8. Armament System Lubrication (Sheet 1 of 3)







ITEM

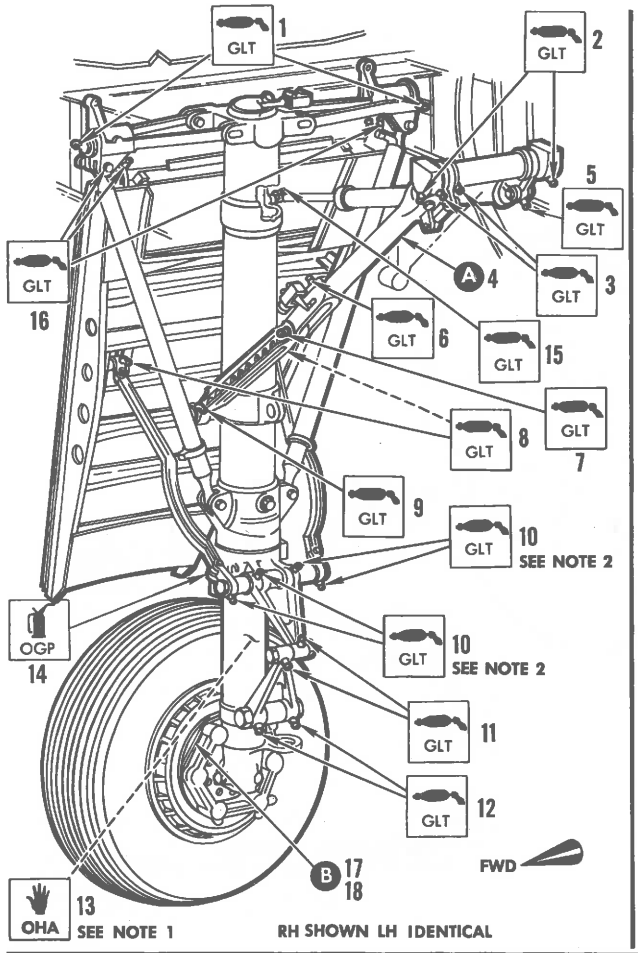
1. ACTUATOR HEAD END (1 PLACE).
2. ADJUSTABLE ROD ASSEMBLY (2 PLACES).
3. DOOR HINGE (1 PLACE).
4. TURBINE MOUNT (2 PLACES).
5. ACTUATOR ROD END (1 PLACE).

NOTE

USE ALEMITE GUN ADAPTER NO. 314150.

.06.02.111C .12.01.20

Figure 3-9. Ram Air Turbine Lubrication



ITEMS

1. PIVOT BEAM TRUNNION (2 PLACES).
2. SIDE BRACE TRUNNION PIN (2 PLACES).
3. ANCHOR PIVOT BEARING (2 PLACES).
4. SIDE BRACE UPPER LINK ASSEMBLY (8 PLACES).
5. UPPER ACTUATOR BEARING (1 PLACE).
6. UPPER LINK LATCH PIN (1 PLACE).
7. LOWER LINK LATCH PIN (1 PLACE).
8. STRUT FAIRING LINK UPPER (2 PLACES).
9. LOWER SIDE BRACE BEARING (1 PLACE).
10. UPPER TORQUE ARM AND LINK BEARINGS (4 PLACES).
11. CENTER TORQUE ARM BEARING (2 PLACES).
12. LOWER TORQUE ARM BEARING (2 PLACES).
13. EXPOSED PORTION OF SHOCK STRUT PISTON.
14. GROUND SAFETY SWITCH ROLLER (1 PLACE).
15. LOWER ACTUATOR BEARING (2 PLACES).
16. UPPER STRUT FAIRING HINGE (3 PLACES).

NOTE

1. WIPE EXPOSED POLISHED SURFACE OF SHOCK STRUT PISTON, AT DAILY POSTFLIGHT, WITH A LINT FREE CLEAN CLOTH THAT HAS BEEN SATURATED WITH HYDRAULIC OIL MIL-H-5606.
2. ON SOME AIRPLANES, THE UPPER TORQUE ARM BEARING LUBRICATION FITTING IS LOCATED ON THE END OF THE ATTACHING SHAFT.

A

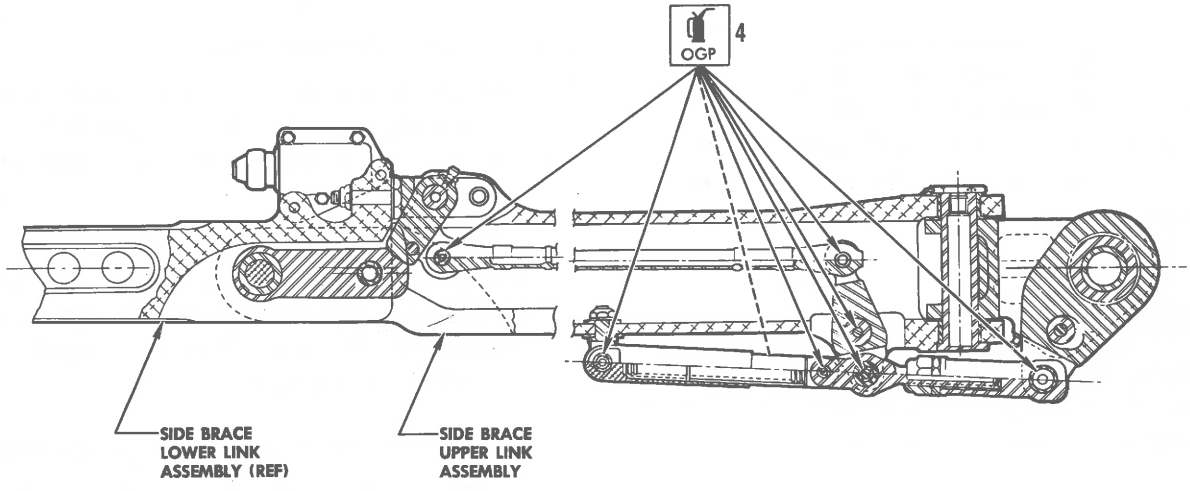


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Figure 3-10. Main Landing Gear Lubrication (Sheet 1 of 2)

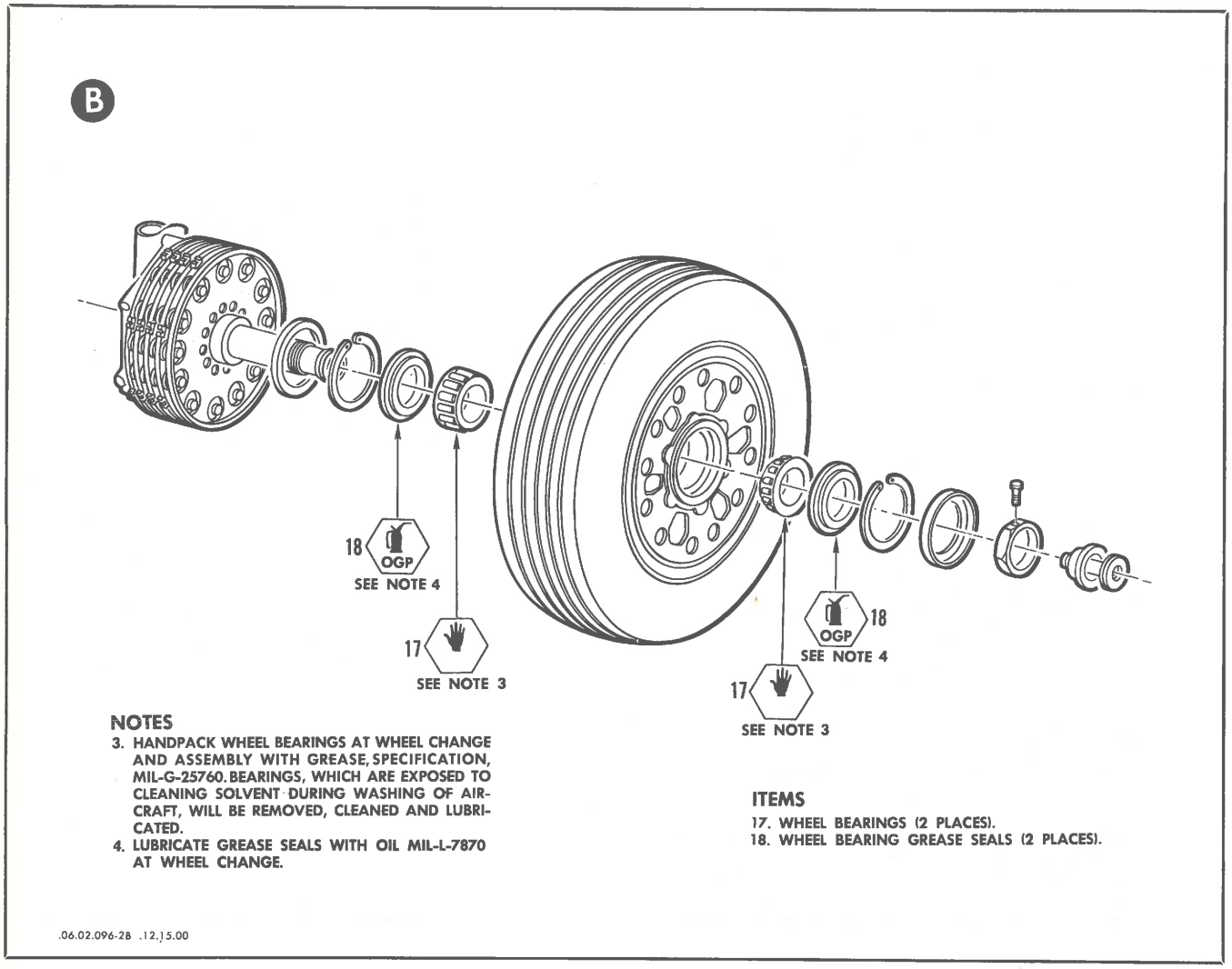


Figure 3-10. Main Landing Gear Lubrication (Sheet 2 of 2)

CAUTION

Do not use high-pressure cleaning methods in the area of sealed or shielded bearings. This practice may result in the loss or contamination of the lubricant.

3-7. BUSHINGS.

Many bushings are used on the airplane. Oil can lubrication, Specification MIL-L-7870, is applied periodically to offset losses due to evaporation and normal wear.

NOTE

When solvents are used in cleaning operations, the bushings may lose some lubricant. In order that adequate lubrication may be assured, apply oil after every cleaning operation.

3-8. FLIGHT CONTROL CABLES.

This airplane incorporates Hyco-Span control cables in the rudder control system only. All other flight control linkages are the push-pull tube type, requiring no lubrication.

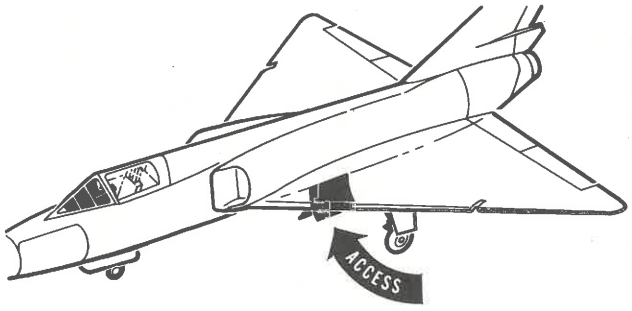
NOTE

The Hyco-Span type control cable is corrosive resistant and prelubricated. Do not apply corrosion preventive or lubricating compounds of any type to these cables.

3-9. SHEATHED CONTROL CABLE ASSEMBLIES.

Before installation of teleflex remote control cable assemblies, the cable conduit and the cable must be cleaned and lubricated by the following procedure:

a. After radius has been filed on both ends of cable, wash cable thoroughly with cleaning solvent, Federal Specification No. P-S-661, or clean by vapor degreasing



ITEM

1. ACTUATOR MOUNTING END (2 PLACES EACH DOOR).
2. ACTUATOR ROD END (2 PLACES EACH DOOR).
3. IDLER (6 PLACES EACH DOOR).
4. PUSH ROD (4 PLACES EACH DOOR).
5. SPRING LOADED TUBE ASSEMBLY SLIDING CONTACT SURFACES (2 PLACES EACH DOOR). SEE NOTE.
6. SPRING LOADED TUBE ASSEMBLY BEARINGS (4 PLACES EACH DOOR).
7. ROLLER FITTINGS (3 PLACES EACH DOOR).

NOTE

REMOVE AND DISASSEMBLE THE SPRING LOADED TUBE ASSEMBLY: CLEAN AND DRY THE SLIDING CONTACT SURFACES. APPLY MOLYBDENUM DISULFIDE LUBRICANT, MIL-M-7866 (DRY), TO THE SLIDING CONTACT SURFACES OF THE TUBE ASSEMBLY. ASSEMBLE AND INSTALL THE TUBE ASSEMBLY.

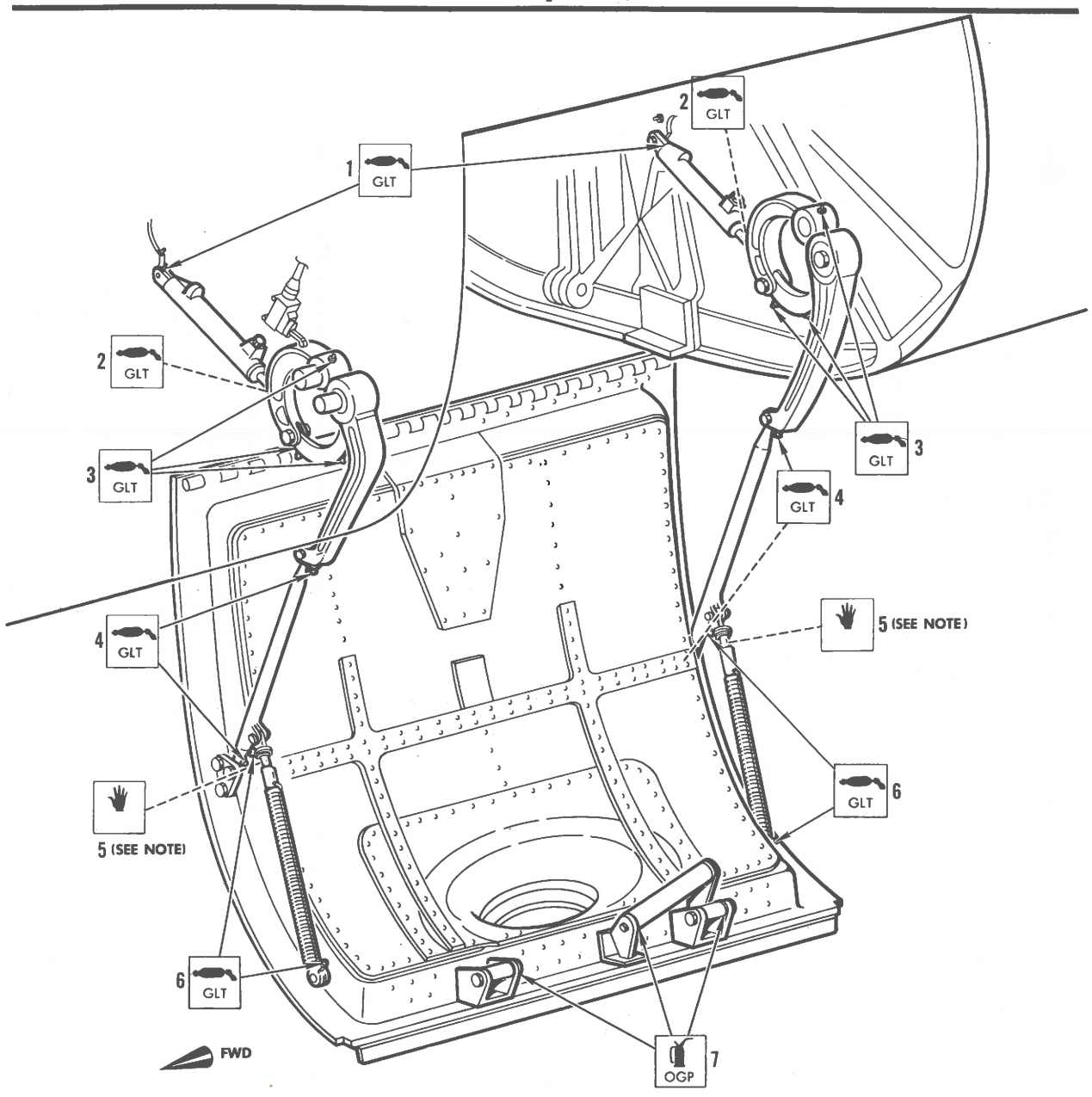


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Figure 3-11. Main Landing Gear Door Lubrication

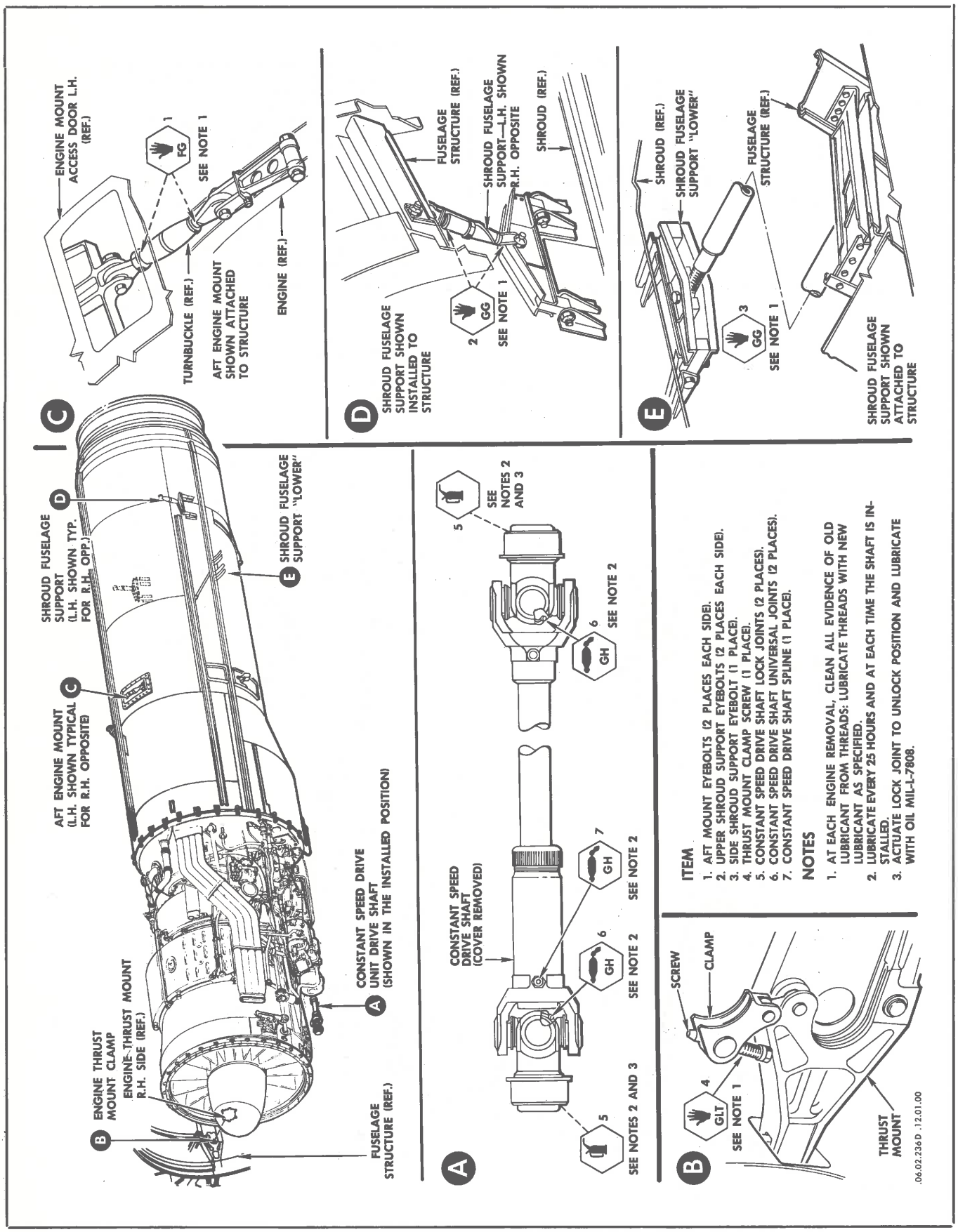


Figure 3-12. Engine Compartment Lubrication

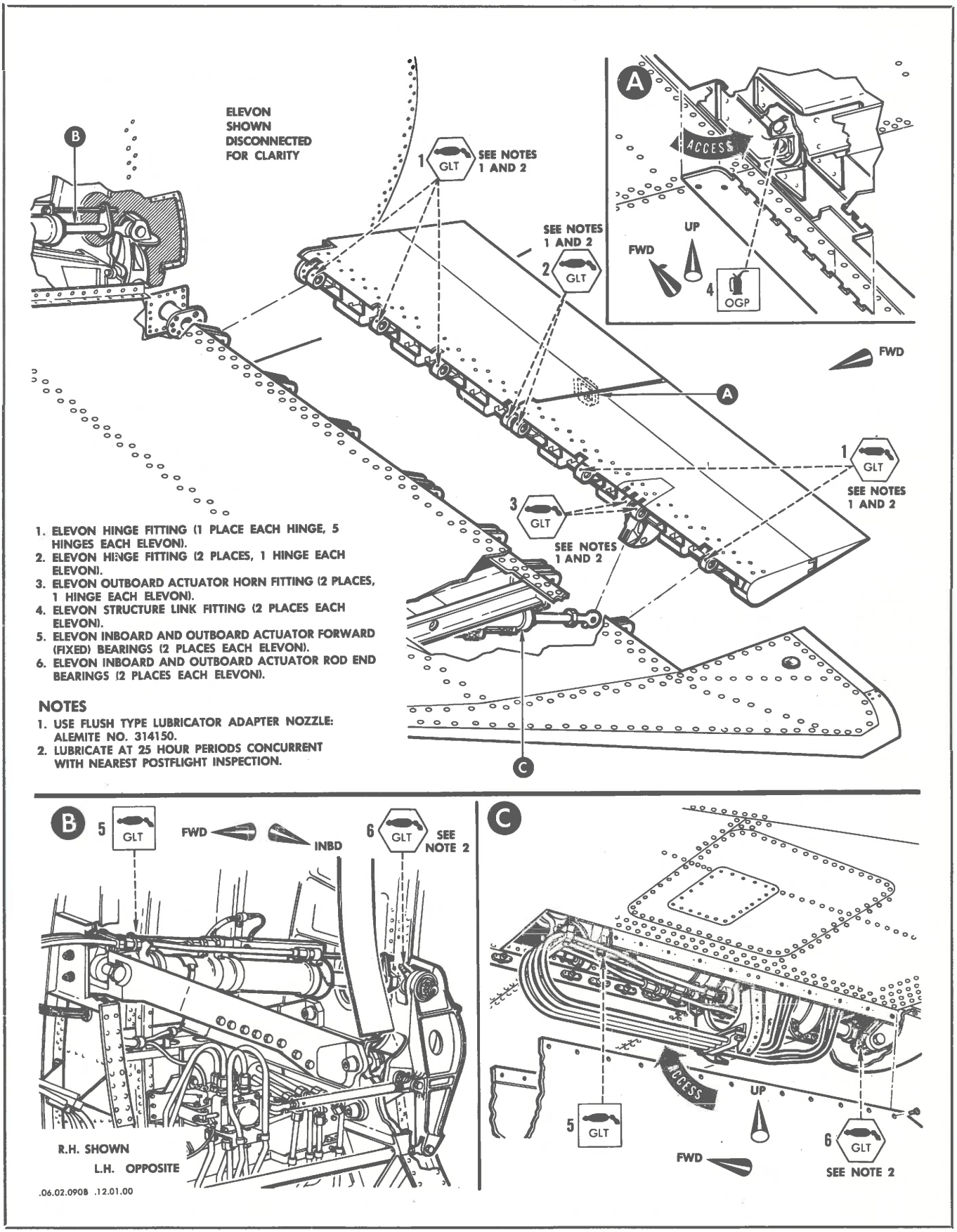


Figure 3-13. Elevon Lubrication

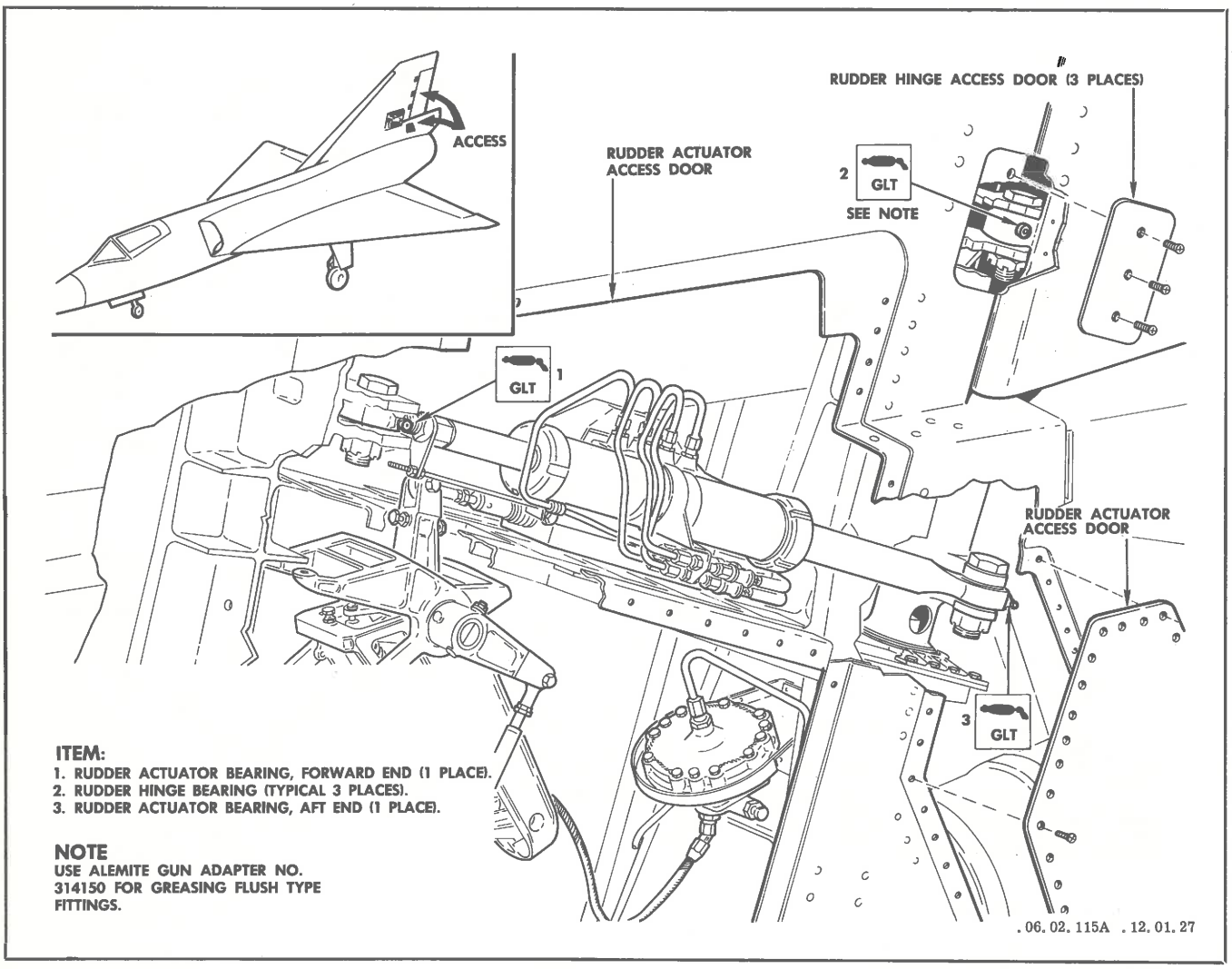


Figure 3-14. Rudder Components Lubrication

to remove all dirt or protective coating of corrosion preventive compound. Apply a light coat of grease, Specification MIL-G-3278, to cable.

NOTE

Use every precaution to prevent the cleaned cable from coming in contact with dirt and grit preceding and during assembly in the conduit.

b. Clean the conduit by drawing cable completely through conduit.

c. Clean cable per step "a"; do not lubricate cable with grease.

d. Place cable in a container, cover cable with oil, Specification MIL-L-7808 (Esso Turbo Oil #15), and allow cable to soak for a minimum of 30 minutes. Remove cable from container and hang to drain for a minimum of 10 minutes.

e. Install cable in conduit; no further lubrication is required.

3-10. FLEXIBLE COUPLINGS IN FUEL LINES.

On installation, apply a light coat of petrolatum, Specification VV-P-236, to the internal coupling surfaces and to the first three threads of the inner sleeve.

3-11. TEMPERATURE RANGE.

In general, lubricants are selected to provide for a normal operating temperature range of −54°C (−65°F) to 116°C (240°F). Exceptions to this temperature range will be found in the power plant areas aft of the compressor section where such areas are subjected to temperatures of 177°C (350°F) and higher. Selection of lubricants for these areas is based on their capacity to withstand these high temperatures.

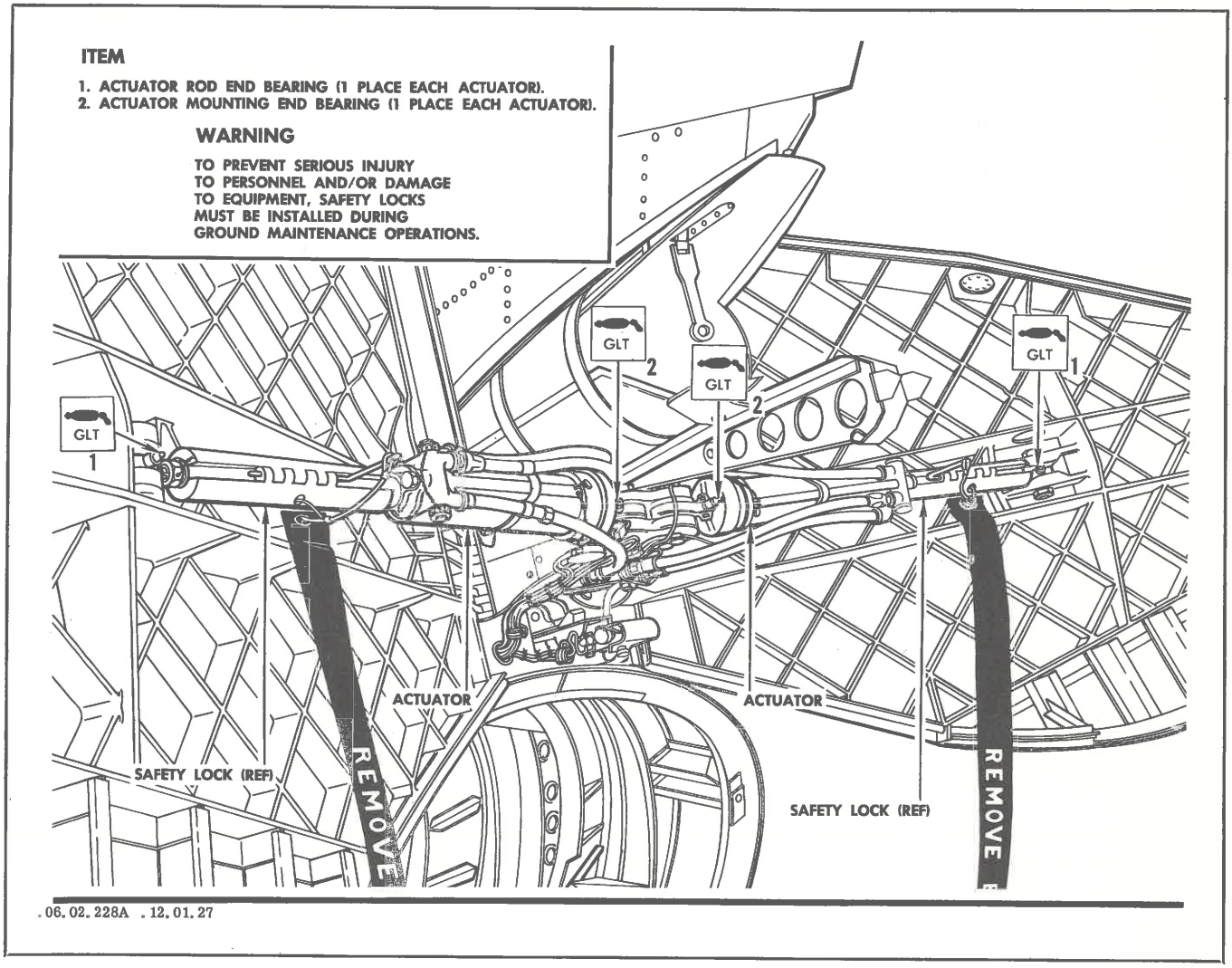


Figure 3-15. Speed Brake Door Lubrication

Section IV

SPECIAL TOOLS

Contents *Page*

TOOL LIST

4-1. GENERAL.

Detailed information on the operation and hookup of the more complex special equipment concerned with ground handling and maintenance is provided in this section. Figure 4-1 illustrates the Alert Status Ground Support Equipment. For additional information concerning the operation of other special equipment, refer to the manual applicable to the system in work.

4-2. LIST OF SPECIAL EQUIPMENT AND TOOLS.

The following list of special equipment and tools is restricted to those items required for organizational level maintenance of F-106A/B airplanes. Future revisions of this list will include additional items as they become available. Items are listed by the systems to which they apply; refer to applicable manual for specific use.

PART NO.	STOCK NO.	NOMENCLATURE	APPLICATION
GROUND HANDLING AND AIRFRAME (T.O. 1F-106A-2-2).			
SE 0580-7	1730-640-7155	Adapter—Wing and Nose Attachment—Jack Pad	Provides a bearing surface for USAF B-6 jacks during jacking operation.
8-96011	1730-534-0563	Bar—Nose Wheel Steering	Used to manually steer the airplane during ground handling.
SE 1089-801	1730-631-6464	Cable Assembly—Emergency Tow	Connects towing vehicle to main landing gear.
8-99904-805		Check Gage-Cockpit Seat Ejection Components	Provides means for performing operational check on cockpit seat ejection components (seat removed).
8-96208		Cover Assembly—Canopy and Radome	Protects the canopy and radome of *F-106A airplanes 57-239 and 57-240.*
8-96007	8340-698-9441	Cover Assembly—Canopy and Radome	Protects the canopy and radome of *F-106A airplanes.*

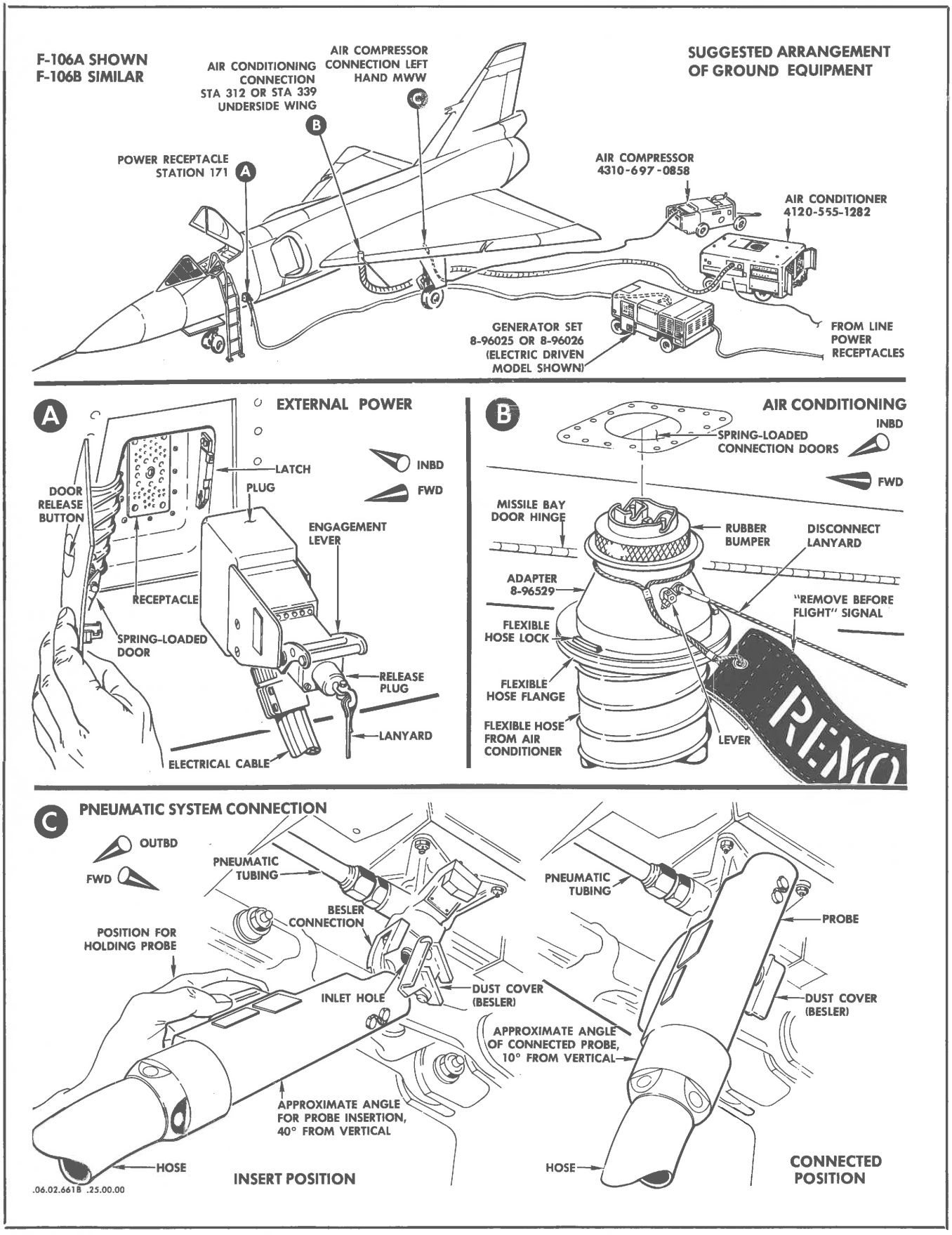


Figure 4-1. Alert Status Ground Support Equipment

4-2. LIST OF SPECIAL EQUIPMENT AND TOOLS (CONT).

PART NO.	STOCK NO.	NOMENCLATURE	APPLICATION
GROUND HANDLING AND AIRFRAME (T.O. 1F-106A-2-2) (CONT).			
8-96141	8340-621-5896	Cover Assembly—Canopy & Radome	Protects the canopy and radome of *F-106B airplanes.*
8-96094		Cover—Drag Chute	Prevents foreign matter or moisture from entering drag chute cannister.
8-96205		Cover—Drag Chute	Prevents foreign matter and moisture from entering drag chute cannister.
SE 0959-801	8340-035-4586	Cover Assembly—Pitot Tube	Prevents foreign matter or moisture from entering pitot tube.
SE 0844-803		Cover Assembly—"Q" Intake	Prevents foreign matter and moisture from entering "Q" (artificial feel) system intakes.
SE 0844-801	2000-572-1758	Cover Assembly—"Q" Intake	Prevents foreign matter and moisture from entering "Q" (artificial feel) system intakes.
8-96202-1	8340-652-9445	Cover-Wing	Protects the wing, particularly, from frost, ice, or snow.
8-96202-2	8340-652-9446	Cover-Wing	Protects the wing, particularly, from frost, ice, or snow.
8-96497	1730-711-2837	Dolly-Seat Handling	Provides means for handling rotational upward ejection seats.
8-96060	1730-522-2735	Eye Bolt—Nose Mooring	Attaches to fuselage structure during mooring operation.
8-96103	1730-219-5712	Eye Bolt—Wing Mooring	Attaches to wing structure during mooring operation.
8-96196	1730-632-8437	Guard-Bailout Switch Probe	Protects bailout switch probe during aft seat replacement procedure of *F-106B airplanes* equipped with upward ejection seats.
8-96098		Guard—Transducer Vane	Protects transducer vane from damage and also prevents personnel injury during maintenance.
ST 00559	1730-566-3435	Handle—"Q" Intake Cover Installation or Removal	Used to install or remove "Q" (artificial feel) system cover.
8-96009	1730-204-0856	Ladder—Cockpit Entrance	Used to enter, or exit from, the F-106A cockpit.
8-96009-801		Ladder-Cockpit Entrance	Used to enter, or exit from, the F-106B cockpit.
8-96250	1730-650-1422	Ladder—Cockpit Entrance	Used to enter, or exit from, the cockpit.
8-96012	1730-522-2743	Lock Pin Assembly—Canopy and Seat Maintenance	Prevents inadvertent operation of F-106A canopy jettison and upward seat ejection systems during maintenance.
8-96012-801	1730-FSC	Lock Pin Assembly – Canopy and Seat Maintenance	Prevents inadvertent operation of F-106A canopy jettison and rotational upward seat ejection systems.

4-2. LIST OF SPECIAL EQUIPMENT AND TOOLS (CONT).

PART NO.	STOCK NO.	NOMENCLATURE	APPLICATION
GROUND HANDLING AND AIRFRAME (T.O. 1F-106A-2-2) (CONT).			
8-96147-803	1730-713-3272	Lock Pin Assembly – Canopy and Seat Maintenance	Prevents inadvertent operation of F-106B canopy jettison and rotational upward seat ejection systems.
8-96147	1730-594-8400	Lock Pin Assembly—Canopy and Seat Maintenance	Prevents inadvertent operation of F-106B canopy jettison and upward seat ejection systems.
8-96147-801	1730-652-8862	Lock Pin Assembly—Canopy and Seat Maintenance	Prevents inadvertent operation of F-106B canopy jettison and upward seat ejection systems during maintenance.
8-96115	1730-586-4847	Pad—Refrigeration Area Protective	Protects F-106A fuselage skin adjacent to air conditioning compartment during maintenance.
8-96139	1730-594-8399	Pad—Refrigeration Area Protective	Protects F-106B fuselage skin adjacent to air conditioning compartment during maintenance.
8-96514		Pin-Tail Hook Safety	Prevents inadvertent extension of tail hook when airplane is parked.
8-96006	8340-560-9978	Plug-Boundary Layer Duct	Prevents entrance of foreign material into the boundary layer ducts.
8-96407-1		Shield Assembly—Air Intake Bleed Ducts	Prevents foreign matter and/or moisture from entering air intake bleed duct.
8-96407-2		Shield Assembly—Air Intake Bleed Ducts	Prevents foreign matter and/or moisture from entering ramp bleed air duct.
8-96154		Shield—Exhaust Tailpipe	Prevents foreign matter and/or moisture from entering tailpipe.
8-96002-801	1730-589-9142	Shield Assembly—Exhaust Tailpipe	Prevents foreign matter and/or moisture from entering tailpipe.
8-96140	8340-621-5895	Shield Assembly—Heat	Prevents foreign matter and/or moisture from entering heat exchanger duct.
8-96179	1730-632-0062	Shield—Air Intake Duct	Prevents foreign matter and/or moisture from entering engine air intake duct.
8-96066	1730-555-4592	Sling Assembly—Canopy Hoist	Connects hoist or crane to F-106A canopy during removal or installation.
8-96153	1730-540-7744	Sling Assembly—Canopy Hoisting	Connects crane or hoist to F-106B canopy during removal or installation.
SE 1131	1730-709-9023	Sling Assembly—Nose Hoisting	Provides means for hoisting nose of airplane in order to extend nose landing gear.
8-96495	1730-726-6085	Sling Assembly—Seat Hoisting	Provides means for hoisting rotational upward ejection seats during maintenance.
8-96081	8340-589-8479	Shield-Heat Exchanger Duct	To prevent inclement weather or foreign material from entering the duct opening.

4-2. LIST OF SPECIAL EQUIPMENT AND TOOLS (CONT).

PART NO.	STOCK NO.	NOMENCLATURE	APPLICATION
GROUND HANDLING AND AIRFRAME (T.O. 1F-106A-2-2) (CONT).			
8-96013	1730-522-2745	Support-Radar Door	To hold the radar door open during maintenance.
8-96038-801	1730-624-9396	Support Assembly—Canopy Hold Open	Prevents inadvertent closing of F-106A canopy during maintenance.
8-96137	1730-629-3151	Support Assembly—Canopy Hold Open	Prevents inadvertent closing of F-106B canopy during maintenance.
SE 0918	1730-691-9835	Support—Radome Storage	Supports and also protects radome when it is removed from airplane.
8-96496	4920-710-7363	Test Kit—Ejection Seat	Provides means for performing operational check on rotational upward ejection seats (seat removed).
8-96574	4920-710-6215	Tool-Tail Hook Installation	Used during installation and/or removal procedures to hold the tail hook in a straightened position.
8-96515	1730-710-6172	Tool-Tail Hook Retraction	Provides a means for raising the tail hook to the retracted position and engaging the tail hook latch mechanism.
SE 0932	1730-294-3025	Tow Bar—Nose Wheel	Connects towing vehicle to nose wheel.
HYDRAULIC AND PNEUMATIC (T.O. 1F-106A-2-3).			
8-96080	4920-566-8882	Adapters (2 each)	Used with SE 0567 or SE 0567-801 to connect test stand hoses to airplane quick disconnect fittings.
SE 1093		Adapter Kit	Used with SE 1051 or SE 0976 to connect test stand hoses to airplane quick disconnect fittings.
SE 1085	4130-574-9334	Adapter-Quick Disconnect (Manual Disengagement)	To adapt compressor service hose to airplanes equipped with Besler manual quick disconnects.
56150-15 (Besler)	4720-630-3552	Adapter—Quick Disconnect (Automatic Disengagement)	To adapt compressor hose to airplanes equipped with Besler automatic quick-disconnects.
SE 0704-801	4310-697-0858	Compressor-High Pressure Air (Refer to T.O. 34Y1-56-31)	To pressurize high pressure pneumatic system.
SE 0917	1730-331-9445	Guard—Ram Air Turbine	Prevents damage to turbine blades and also protects personnel during maintenance.
SE 0917-801		Guard—Ram Air Turbine	Prevents damage to turbine blades and also protects personnel during maintenance.
8-96193	4920-621-3011	Support—Hydraulic Hose	Used in conjunction with SE 1093. Supports return hoses of hydraulic test stand.

4-2. LIST OF SPECIAL EQUIPMENT AND TOOLS (CONT).

PART NO.	STOCK NO.	NOMENCLATURE	APPLICATION
HYDRAULIC AND PNEUMATIC (T. O. 1F-106A-2-3) (CONT).			
8-96149	4920-600-5068	Test Assembly Kit—Ram Air Turbine (Refer to T. O. 33D4-4-2-1)	Used in operational check of ram air turbine during flight.
SE 0976	4920-204-3115	Test Stand—Aircraft Hydraulic System (EMD) Type MK-3 (Refer to T.O. 33A2-2-22-1)	Flushes, fills, bleeds and/or pressurizes the airplane's hydraulic system during maintenance.
SE 0976-801	4920-675-4258	Test Stand-Portable Hydraulic (EMD) (Refer to T.O. 33A2-2-22-11)	To supply pressure to hydraulic system for ground test.
SE 1061	4920-517-1028	Test Stand-Portable Hydraulic (gas) (Refer to T.O. 33A2-2-24-1)	To supply pressure to hydraulic systems for ground test.
SE 1061-801	4920-670-9415	Test Stand-Portable Hydraulic (GED) (Refer to T.O. 33A2-2-24-21)	To supply pressure to hydraulic system for ground test.
SE 0567-801	4920-204-2462	Test Stand-Portable Hydraulic (gas) (Refer to T.O. 33A2-2-18-11)	To supply pressure to hydraulic systems for ground test.
POWER PLANT (T.O. 1F-106A-2-4).			
8-96253	1740-657-1185	Adapter Assembly—Constant Speed Drive	To adapt remote gearbox to retractable stand.
8-96167	1730-632-0058	Adapter Kit—Engine	Used during removal and/or installation of J-75 engine shroud.
8-96165	1730-632-0059	Adapter Kit—Aircraft Engine Removal Stand (Rollover Type)	Used during removal and/or installation of J-75 engine.
8-96398-1 8-96398-3 8-96398-5	1730-676-6848 1730-676-6849 1730-676-6850	Adapter Kit—Aircraft Engine Removal Stand (Non-Rollover Type)	Used during removal and/or installation of J-75 engine.
8-96041-1	1730-563-5327	Bracket Assembly—Forward Engine Roller	Used during engine removal and/or installation.
8-96041-2	1730-565-5322	Bracket Assembly—Forward Engine Roller	Used during engine removal and/or installation.
8-96041-803	1730-710-7308	Bracket Assembly—Engine Roller	Used during engine removal and/or installation.
8-96041-804	1730-710-7309	Bracket Assembly—Engine Roller	Used during engine removal and/or installation.
8-96047	4920-570-7634	Bracket Set—Cannular Shroud Roller	Used during removal, installation, overhaul and/or storage of cannular shroud.
8-96047-803	4920-632-8591	Bracket Set—Cannular Shroud Roller	Used during removal, installation, overhaul, and/or storage of cannular shroud.
SE 0583-801	1730-651-0315	Bridle Assembly—Aircraft Restraining	Restrains airplane during engine ground runup.
8-96186	1730-632-8436	Cover—Flight Controls Mixer Assembly	To cover flight controls mixer assembly when engine is removed from airplane.

4-2. LIST OF SPECIAL EQUIPMENT AND TOOLS (CONT).

PART NO.	STOCK NO.	NOMENCLATURE	APPLICATION
POWER PLANT (T.O. 1F-106A-2-4) (CONT).			
8-96183	1730-625-5344	Door—Ramp Dummy	To aid positioning of ramp center section.
8-96201	4920-649-5313	Gage—Engine to Fuselage Locating	Used in conjunction with 8-96200. Adjusts position of engine to fuselage prior to installation of tailcone.
8-96095	5220-591-8562	Gage—Power Control Rigging	Used to set pilot's throttle in direct relationship to engine fuel control.
8-96090	5220-601-9973	Gage—Sundstrand Drive Alignment	Aligns constant speed system drive shaft.
8-96044	1730-589-9469	Hoist Assembly—Constant Speed Drive	Used during removal or installation of constant speed drive unit.
817D-1200 (U. S. Accessory Products)	1560-690-8092	Kit – Engine Trim	Used to measure turbine discharge pressure during engine trim procedure.
SE 1122	4920-565-4927	Kit – Engine Trim	Used to measure turbine discharge pressure during engine trim procedure.
8-96043	5120-525-7017	Puller Assembly—Variable Ramp Hinge Pin	Used to remove variable ramp door hinge pins during door removal.
8-96163	1730-612-9258	Puller Assembly—Variable Ramp Hinge Pin	Withdraws or installs variable ramp door hinge pins during removal or installation of doors.
8-96017-803	1730-654-8392	Rail Set – Engine Removal	Used during engine removal and/or installation.
8-96017-805	1730-676-6856	Rail Set—Engine Removal	Used during engine removal and/or installation.
8-96212	1730-632-8432	Rod—Variable Ramp Positioning	Used during rigging procedure of variable ramps.
8-96014-5	1730-612-9259	Screen—Protective Ground Runup	Prevents foreign matter from entering engine air intake duct.
8-96014-6	1730-612-9261	Screen—Protective Ground Runup	Prevents foreign matter from entering engine air intake duct.
8-96176-1	1730-650-1413	Screen—Engine Inlet Duct	To prevent foreign material from entering ducts during engine ground run.
8-96176-2	1730-646-8903	Screen—Engine Inlet Duct	To prevent foreign material from entering ducts during engine ground run.
SE 0945	1730-660-0992	Sling—Engine Suspension	For hoist attachment.
8-96116	1730-619-6576	Sling Assembly—Constant Speed Drive	Used during removal and/or installation of constant speed drive unit.
SE 0867-803	4920-565-4944	Stand—Engine Compartment Mobile Work	Supports maintenance personnel working inside fuselage after engine removal.
8-96010	1730-571-9010	Stand—Tail Cone Adapter	To support tail cone.

4-2. LIST OF SPECIAL EQUIPMENT AND TOOLS (CONT).

PART NO.	STOCK NO.	NOMENCLATURE	APPLICATION
POWER PLANT (T.O. 1F-106A-2-4) (CONT).			
8-96010-801	1730-710-7306	Stand—Tail Cone Adapter	To support tail cone.
8-96178	1730-613-6610	Support Assembly—Forward Ramp Hold Open	Prevents inadvertent closing of forward variable ramp door during maintenance.
8-96051-801	4920-623-2177	Tester—Variable Ramp Control (Refer to T.O. 33D3-4-96-1)	To check operation of variable ramp system.
8-96051-803	1730-710-7310	Tester—Variable Ramp Control (Refer to T. O. 33D3-4-96-1)	To check operation of variable ramp system.
8-96264	4920-705-0190	Tool—Constant Speed Shaft Release	To aid release of shaft locking collars.
8-96184-803	5120-675-9229	Tool—Variable Ramp Rigging	For ramp positioning during rigging procedure.
8-96198	1730-632-8434	Tool—Ramp Stop Rigging	To establish position for stop adjustment.
8-96174	4920-611-9695	Wedge—Shroud Positioning	To support and position aft end of shroud. To be used with shroud Part Number 8-22679 basic, -3 or -5.
8-96200	IABK-1560-679-4482	Wedge—Shroud Positioning	To support and position aft end of shroud. To be used with shroud Part Number 8-22679-801, -803, -805, or -811.
8-96488	5120-701-2010	Wrench—Nut Holding, Fire Seal Adapter	Used during removal or installation of fire seal adapter.
PWA-3095	9APW-PWA-3095	Guide	Fuel pump drive shaft gear oil seal guide (large shaft).
PWA-3626	5120-095-3000	Wrench	Main oil screen check valve removal.
PWA-6580	1730-696-6592	Sling	Compressor motor chamber outer case lifting.
PWA-6676	5120-398-2911	Drift	Starter drive and hydraulic pump drive face oil seal replacement.
PWA-7025-2	5120-303-0904	Wrench	Exhaust nozzle actuating cylinder rod end nut adjusting.
PWA-7146	5120-212-2474	Puller	N_1 gear box oil seal housing, removal.
PWA-7355		Stand	Afterburner duct and nozzle support stand.
HS-7355		Adapter	Power assembly remote control adapter.
PWA-7356	1730-294-3370	Sling	Afterburner duct and nozzle assembly maintenance.
PWA-7441	4920-300-3856	Burette Valve	Fuel manifold pressure check tool.
PWA-7728		Sling	Turbine nozzle lifting assembly.
PWA-8000	4920-305-0197	Test Stand	Main fuel nozzle and afterburner manifold leak test stand.

4-2. LIST OF SPECIAL EQUIPMENT AND TOOLS (CONT).

PART NO.	STOCK NO.	NOMENCLATURE	APPLICATION
POWER PLANT (T.O. 1F-106A-2-4) (CONT).			
PWA-8052	4920-324-9583	Bracket—A/B Nozzle Lifting	Afterburner nozzle replacement.
PWA-8076	4920-563-1347	Indicator	Turbine exhaust temperature test indicator.
PWA-9045	4920-510-1234	Cover	Main fuel nozzle cluster cover.
PWA-10008	5120-511-1478	Puller	Accessory drive oil seal housing replacement.
PWA-10010	1730-249-3188	Sling	Engine lifting sling.
PWA-10011	1730-294-3141	Bracket	Afterburner duct and nozzle lifting brackets.
PWA-10012	4920-693-8153	Guide	Fuel control oil seal (small shaft) replacement.
PWA-10013	5120-693-8154	Puller	Afterburner flame holder tie rod replacement.
PWA-10014	5120-596-1196	Wrench	Main oil screen and spacer retaining nut replacement.
PWA-10015	5120-693-8155	Wrench	Oil pressure relief valve replacement.
PWA-10016	4920-693-8156	Guide	N_1 and N_2 tachometer shaft oil seal replacement.
PWA-10017	5120-693-8157	Drift	Fuel pump and fuel control oil seal replacement.
PWA-10018	4920-326-2011	Base	Fuel pump and fuel control oil seal replacement.
PWA-10030	5120-693-8158	Wrench	Fuel nozzle replacement.
PWA-10031	5120-693-8159	Crimper	Fuel nozzle tab lock installation.
PWA-10034	4920-506-3777	Base	N_2 tachometer drive oil seal replacement.
PWA-10035	5120-511-1481	Drift	N_2 tachometer drive oil seal replacement.
PWA-10063	4920-570-9001	Bracket	Diffuser case attachment.
PWA-10064	4920-570-9002	Bracket	Diffuser case attachment.
PWA-10065	4920-570-9003	Bracket	Diffuser case attachment.
PWA-10066	4920-570-9004	Bracket	Diffuser case attachment.
PWA-10067	4920-570-9005	Clamp	Fuel nozzle sealing replacement.
PWA-10067-D12		Seal	Neoprene seal for use with PWA No. 10067 (Excello fuel nozzle).
PWA-10067-D13	4920-623-2830	Seal	Neoprene seal for use with PWA No. 10067 (Delevan fuel nozzle).
PWA-10068	4920-570-9006	Adapter	Fuel manifold pressure check at engine.

4-2. LIST OF SPECIAL EQUIPMENT AND TOOLS (CONT).

PART NO.	STOCK NO.	NOMENCLATURE	APPLICATION
POWER PLANT (T.O. 1F-106A-2-4) (CONT).			
PWA-10069	4920-570-7384	Stand	Afterburner nozzle actuation test stand.
PWA-10077	5120-570-7416	Spreader	Combustion chamber outlet duct clamp removal.
PWA-10080	1730-555-4588	Collar	Combustion chamber outer case lifting collar.
PWA-10130	4920-570-7643	Support	Front air inlet case support.
PWA-10131	4920-570-7644	Mount	Front air inlet case mount.
PWA-10133	4920-570-7645	Mount	Diffuser case, right mount.
PWA-10134	4920-570-9007	Mount	Diffuser case, left mount.
PWA-10135	4920-570-7647	Support	Diffuser case support.
PWA-10136	4920-570-7648	Mount	Turbine exhaust case mount.
PWA-10137	4920-570-7649	Support	Turbine exhaust case support.
PWA-10157	5120-534-0705	Pin	Combustion chamber inner front and rear case alignment pin.
PWA-10180	5210-607-6097	Gage	First stage turbine blade stretch check gage.
PWA-10193	5120-534-0113	Puller	No. 6 bearing oil suction pump drive gear puller.
PWA-10226	5120-534-0724	Drift	Starter oil seal drift.
PWA-10228	5120-534-0722	Drift	Starter and hydraulic pump oil seal drift.
PWA-10229	1730-554-4809	Bracket	Afterburner front duct lift and trunnion bracket.
PWA-10237	5120-534-0719	Wrench	Anti-icing air tube retaining nut wrench.
PWA-10290	5120-592-6325	Puller	Combustion chamber positioning pin puller.
PWA-10318	5120-541-6836	Wrench	Fuel manifold inlet adapter retaining nut wrench.
PWA-10319	5120-593-3564	Support	Fuel manifold inlet adapter retaining nut support.
PWA-10332	5120-592-9079	Puller	Main oil pump puller.
PWA-10347	4920-593-4099	Fixture	Main oil screen assembly fixture.
PWA-10375	5120-601-1164	Drift	N_1 tachometer generator drive oil seal drift.
PWA-10376		Base	N_1 governor and tachometer oil seal housing base.
PWA-10381		Drift	Main oil pump seal drift.

4-2. LIST OF SPECIAL EQUIPMENT AND TOOLS (CONT).

PART NO.	STOCK NO.	NOMENCLATURE	APPLICATION
POWER PLANT (T.O. 1F-106A-2-4) (CONT).			
PWA-10389		Guide	Main oil pump seal guide.
PWA-10392	5120-593-9211	Puller	Afterburner bypass fuel screen weldment puller.
PWA-10412		Clamp	Afterburner front duct lift and trunning clamp.
PWA-10462	1730-555-6228	Bracket	Afterburner front duct lift and trunnion bracket (P-9 only).
PWA-10480		Wrench	Tube connecting nut spanner wrench.
PWA-10484	1730-555-4232	Adapter	Engine front lifting adapter.
PWA-10518	4920-611-2208	Adapter	Fuel manifold pressure test in diffuser case.
PWA-10572		Adapter	Fuel manifold pressure test in diffuser case.
PWA-10602		Stand	Fuel manifold pressure test in diffuser case.
PWA-10628		Cap	Fuel manifold pressure test in diffuser case.
PWA-10718		Hose and Valve Assembly	Fuel manifold pressure test in diffuser case.
PWA-10719		Adapter	Fuel manifold pressure test in diffuser case.
PWA-10722		Adapter	Fuel manifold pressure test in diffuser case.
PWA-10723		Adapter	Fuel manifold pressure test in diffuser case.
PWA-15180	4920-589-9624	Power Assembly	Fuel control remote trimmer power assembly.
PWA-15198		Adapter	Power source cart adapter.
FUEL SUPPLY (T.O. 1F-106A-2-5).			
SE 0896	4920-330-4095	Adapter Assembly—Defueling	Connects airplane defueling valve to defueling truck hose.
8-96252	1730-674-0015	Adapter—External Fuel Tank Handling	To adapt external fuel tank to maintenance trailer for transportation and storage.
SE 0787	4930-693-1242	Funnel—Fuel Tank Sump Drain	Used to drain fuel tank sumps.
SE 0787-801		Funnel-Fuel Tank Sump Drain	Used to drain fuel tank sump drains.

4-2. LIST OF SPECIAL EQUIPMENT AND TOOLS (CONT).

PART NO.	STOCK NO.	NOMENCLATURE	APPLICATION
FUEL SUPPLY (T.O. 1F-106A-2-5) (CONT).			
SE 0787-803		Funnel—Fuel Tank Sump Drain	Used to drain fuel tank sump drains.
8-96372-1		Kit—Fuel Tank Vent Plugs	To plug vent outlets during fuel system check procedure.
8-96109		Pin Assembly—External Fuel Tank Safety	Prevents inadvertent operation of tank jettison system.
8-96168		Pin, Safety—External Fuel Tank Mechanism	Prevents inadvertent operation of external fuel tank jettison system during maintenance.
8-96199	4920-659-6372	Test Stand—Fuel System (Refer to T.O. 33D2-3-11-1)	To check fuel system.
AIR CONDITIONING, ANTI-ICING AND OXYGEN (T.O. 1F-106A-2-6).			
8-96162	4130-611-1499	Adapter—Air Conditioner Quick Disconnect	Connects air conditioner or heater to alert status airplane.
8-96151	4130-611-1493	Adapter—Manual Disconnect	To connect portable air conditioner to airplane ducting.
8-96215	4920-649-5484	Adapter, Pitot-Static	Used on ice detector probe to apply regulated air pressure during operational check of surface and engine air anti-ice system.
8-96118	4120-555-1282	Air Conditioner—Electric Driven (Refer to T.O. 35E9-9-21)	Air conditions the cockpit, electronic compartments and missile bays during maintenance.
8-96213	4730-628-3835	Disconnect—Manual	To connect portable air conditioner to airplane ducting.
SE 0973	4520-509-0740	Heater—Portable Gas Engine Driven (Refer to T.O. 35E7-2-5-1)	Heats cockpit, electronic compartments and missile bay during maintenance.
SE 1055	4520-509-0741	Heater—Portable Electric Motor Driven (Refer to T.O. 35E7-2-5-1)	Heats cockpit, electronic compartments and missile bays during maintenance.
8-96155		Support Assembly—Dorsal Door	Holds dorsal and air conditioning compartment doors open during maintenance.
20600 (Scott)		Tester—Scott Portable (Refer to T.O. 33D2-10-16-1)	For operational checkout of survival kit oxygen regulator.
8-96054	4920-594-0166	Tester—Cabin Temperature Control (Refer to T.O. 33D-14-20-1)	Used during operational check of cabin temperature control system.
8-96054-801		Tester—Cabin Temperature Control (Refer to T. O. 33D2-14-20-1)	Used during operational check of cabin temperature control system.
SE 1001	4920-565-4927	Tester—Electric Heated Windshield Control (Refer to T. O. 33D2-14-18-11)	Used to bench check components of the windshield and/or canopy electrical anti-ice systems.

4-2. LIST OF SPECIAL EQUIPMENT AND TOOLS (CONT).

PART NO.	STOCK NO.	NOMENCLATURE	APPLICATION
AIR CONDITIONING, ANTI-ICING AND OXYGEN (T.O. 1F-106A-2-6) (CONT).			
SE 1001-801		Tester—Electric Heated Windshield Control (Refer to T. O. 33D2-14-18-11)	Used to bench check components of the windshield and/or canopy electrical anti-ice systems.
SE 1002	4920-573-2974	Tester—Electric Heated Windshield	Used in operational check of windshield heating system.
SE 1002-801	4920-670-9414	Tester—Electric Heated Windshield (Refer to T.O. 33D2-14-18-1)	Used in operational check of windshield heating system.
FLIGHT CONTROLS (T.O. 1F-106A-2-7).			
8-96182	4920-632-8569	Adapter—Elevon Actuator Bolt Extractor	Used during elevon actuator replacement.
8-96112	5120-592-2705	Adapter—Elevon Bolts Attaching	Used during elevon installation.
8-96170	4920-627-2826	Adapter—Rudder Actuator Attach Bolt	Used during installation of rudder actuator.
8-96133	5140-600-2658	Container—Elevon and Rudder Protractor	For storage of elevon and rudder protractors.
8-96486-805		Fixture – Angle of Attack Transmitter, Calibration Check	Used to calibrate the angle of attack system.
8-96197	1730-632-8433	Gage—Pilot's Stick Centering	Used to hold pilot's stick in neutral position while rigging the elevons.
8-96108	5220-588-6035	Gage—Drag Chute Overcenter Mechanism	Used during adjustment procedure of drag chute overcenter mechanism.
8-96101-1	5220-589-9510	Gage Set—Elevon Angle Rigging	Used to check various positions of elevon during rigging procedure.
8-96110	5220-589-9512	Gage—Rudder Angle Rigging	Used during rudder rigging procedure.
8-96101-2	5220-589-9511	Gage Set—Elevon Angle Rigging	Used to check various positions of elevon during rigging procedure.
8-96005	1730-522-2742	Lock Assembly Speed Brake	Prevents inadvertent closing of speed brakes during maintenance.
8-96005-801	1ABK-1560-614-1324	Lock Assembly—Speed Brake	Prevents inadvertent closing of speed brakes during maintenance.
8-96069	1730-657-6936	Pin Set—Rudder Control System Rigging	Holds rudder controls in neutral position during rigging procedure.
8-96069-801	1730-612-9260	Pin Set—Rudder Control System Rigging	Holds rudder controls in neutral position during rigging procedure.
8-96076	5180-600-2659	Rigging Set—Elevon Control System	Holds elevon controls in neutral position during rigging procedure.
8-96076-801	5180-608-8245	Rigging Set—Elevon Control System	Used in conjunction with 8-96076 to hold F-106B elevon controls in neutral position during rigging procedure.
8-96089	4920-546-6504	Tester-Calibrator Stability Augmentation (Refer to T.O. 33D3-2-34-11)	Tests and calibrates flight control damper amplifier in shop (Minneapolis-Honeywell).

4-2. LIST OF SPECIAL EQUIPMENT AND TOOLS (CONT).

PART NO.	STOCK NO.	NOMENCLATURE	APPLICATION
FLIGHT CONTROLS (T. O. 1F-106A-2-7) (CONT).			
8-96089-801	4920-624-7924	Tester-Calibrator Stability Augmentation (Refer to T.O. 33D3-2-34-21)	Tests and calibrates flight control damper amplifier in shop (Robertshaw-Fulton).
8-96123	4920-602-5464	Tester-Automatic Flight Control System (Refer to T.O. 33D3-2-34-1)	For checking operation of the Automatic Flight Control System in the airplane. (Systems with Minneapolis-Honeywell stability augmentation amplifiers.)
8-96123-801	4920-632-8574	Tester-Automatic Flight Control System (Refer to T.O. 33D3-2-34-1)	For checking operation of the Automatic Flight Control System in the airplane. (Systems with Robertshaw-Fulton stability augmentation amplifiers.)
SE 0985	4920-565-0192	Tester—Elevon and Rudder Feel System (Refer to T.O. 33D2-6-78-1)	Checks pressure and operation of artificial feel system.
8-96171	5120-613-3708	Wrench—Rudder Actuator Bolt Extractor	Used during rudder actuator removal.
8-96114	5120-601-9382	Wrench Torque—Elevon Horn Attach	Used during elevon installation.
LANDING GEAR (T.O. 1F-106A-2-8).			
8-96296	1730-657-9638	Clamp—MLG Strut Restraining	Prevents main landing gear shock strut(s) from extending during maintenance.
8-96175	1730-631-6467	Clamp—NLG Strut Restraining	Prevents nose landing gear shock strut from extending during maintenance.
8-96082	1730-545-6014	Pin Assembly—Nose Landing Gear Strut Restraining	Locks nose wheel steering unit in neutral position during maintenance.
8-96020	5120-545-6091	Puller Assembly—Main Landing Gear Trunnion Pin	Withdraws trunnion pin from trunnion pin housing during landing gear removal.
8-96019-801	5120-587-3964	Puller Assembly—Nose Landing Gear Trunnion Pin	Withdraws trunnion pin from trunnion pin housing during landing gear removal.
8-96084	5120-567-5417	Rigging Tool—Main Landing Gear Door Mechanism	Used during main landing gear door adjustment procedure.
ST 00520	5120-028-3622	Wrench—Main and Nose Landing Gear Wheel	Used during removal or installation of main and/or nose landing gear wheels.

4-2. LIST OF SPECIAL EQUIPMENT AND TOOLS (CONT).

PART NO.	STOCK NO.	NOMENCLATURE	APPLICATION
INSTRUMENTS (T.O. 1F-106A-2-9).			
UG292B-4 (Minneapolis-Honeywell)	4920-610-8872	Adapter	Connects the airplane fuel quantity system circuit to MD-1 tester on airplanes having 9,600 pounds indicator range.
UG292B-6 (Minneapolis-Honeywell)	4920-701-7880	Adapter	Connects the airplane fuel quantity system circuit to MD-1 tester on airplanes having 11,200 pounds indicator range.
UG724A-1 (Minneapolis-Honeywell)	4920-701-3177	Adapter	Used in conjunction with MD-2 tester for operational check of the airplane fuel quantity system components.
UG390A-3 (Minneapolis-Honeywell)	4920-607-6713	Adapter – Cable Assembly	Used in conjunction with UG316A-1 tester for bench check of fuel quantity system components.
UG390A-1 (Minneapolis-Honeywell)	6625-519-0392	Cable Assembly	Used in conjunction with UG316A-1 tester for bench check of fuel quantity system components.
UG390F-1 (Minneapolis-Honeywell)	4920-705-4586	Cable Assembly	Used in conjunction with UG316A-1 tester for bench check of fuel quantity system components.
UG531A-1 (Minneapolis-Honeywell)	4920-601-3177	Cable Assembly	Used in conjunction with UG316A-1 tester for bench check of fuel quantity system components.
UG781A-1 (Minneapolis-Honeywell)	4920-602-5722	Cable Assembly	Used in conjunction with UG316A-1 tester for bench check of fuel quantity system components.
UG389A-1 (Minneapolis-Honeywell)	4920-570-9120	Harness	Connects the airplane fuel quantity system components to MD-2 tester for operational check.
UG33A-1 (Minneapolis-Honeywell)	5120-398-4550	Stretcher	Used to install steel band that secures connector case to tank capacitance unit.
UG316A-1 (Minneapolis-Honeywell)	4920-507-8064	Tester—Transistorized Indicator (Refer to T. O. 33D1-3-10-1)	Used for bench check of transistorized fuel quantity indicators.
ST 00561	5120-525-7014	Wrench—Boom Attach	Used during removal and/or installation of nose boom.
ELECTRICAL (T.O. 1F-106A-2-10).			
8-96052-801	6115-690-4050	Adapter Cable—Electrical Ground Power	Used to connect MC-1 or MD-3 ground power units to AWCIS airplanes when AWCIS ground power units are not available.
8-96026	6115-617-1417	Generator Set—Gasoline Engine Trailer Mounted (USAF Type AF/M32-2) (Refer to T.O. 35C2-3-265-11)	Provides power for airplane's electrical and electronic systems during maintenance.

4-2. LIST OF SPECIAL EQUIPMENT AND TOOLS (CONT).

PART NO.	STOCK NO.	NOMENCLATURE	APPLICATION
ELECTRICAL (T. O. 1F-106A-2-10) (CONT).			
8-96026-801	6115-583-9365	Generator Set—Gasoline Engine Trailer Mounted (USAF Type AF/M32A-13) (Refer to T.O. 35C2-3-265-21)	Provides power for airplane's electrical and electronic systems during maintenance.
8-96025	6125-620-6468	Motor Generator—Portable (USAF Type AF/M24M-1) (Refer to T.O. 35C2-2-25-31)	Provides power for airplane's electrical and electronics systems during maintenance.
8-96025-803	6125-583-3225	Motor Generator—Portable (USAF Type AF/ECU-10/M) (Refer to T.O. 35C2-2-25-41)	Provides power for airplane's electrical and electronics systems during maintenance.
8-96025-805		Motor Generator—Portable (USAF Type A/24M-2) (Refer to T.O. 35C2-2-25-21)	Provides power for airplane's electrical and electronics systems during maintenance.
8-96016-801		Test Set—Electrical Power (Type MA-1) (Refer to T.O. 33D2-4-18-1)	Measures performance of airplane electrical power supply systems.
8-96016-803	4920-650-6275	Test Set—Electrical Power (Type A/E 24T-12) (Refer to T.O. 33D2-4-18-11)	Measures performance of airplane electrical power supply systems.
8-96016-805		Test Set—Electrical Power (Type MA-1) (Refer to T.O. 33D2-4-18-1)	Measures performance of airplane electrical power supply systems.
SE 0997	4920-546-6506	Tester—Control Cable Fire Detector (Refer to T.O. 33D2-2-6-1)	Used during operational check of fire detection system.
8-96057 8-96057-801	4920-567-5140 4920-567-5140	Tester—Master Warning Box (Refer to T.O. 33D2-19-2-1)	Used during operational check of master warning system.
8-96142	4920-633-5784	Tester—Silver-Zinc Battery	Determines state of charge of battery electrolyte.
ARMAMENT (T.O. 1F-106A-2-12).			
8-96456	5120-600-2652	Adapter—Forward Launcher Snubber, Lower Locknut Wrench	Used to torque forward launcher snubber, lower locknut.
8-96457	5120-677-5715	Adapter—Forward Launcher Snubber, Upper Locknut Wrench	Used to torque forward launcher snubber, upper locknut.
SE 0996	1730-511-5438	Bar Assembly—Missile Handling	Used to unload missiles from storage container and to load missiles into handling frame.
SE 1084	4920-614-6670	Control—Pneumatic Launcher Rigging	Used on armament system's pneumatic cylinders during system rigging.
8-96092	1730-601-2253	Cord Assembly—Armament Control	Used for remote operation of missile bay doors and missile launchers during maintenance.
SE 0967-805		Frame—Missile Loading and Handling	To load GAR-3 missiles on launcher rails.

4-2. LIST OF SPECIAL EQUIPMENT AND TOOLS (CONT).

PART NO.	STOCK NO.	NOMENCLATURE	APPLICATION
ARMAMENT (T.O. 1F-106A-2-12) (CONT).			
SE 0967-809		Frame—Missile Loading and Handling	To load GAR-3A/4A missile on launcher rails.
8-96450		Gage—Special Weapon Switch Adjustment	To adjust the special-weapon-aboard and rocket gone switch.
8-96091	5220-590-2096	Gage—Armament Door Adjustment	Used during installation and adjustment of missile bay doors.
8-96061-801	1730-629-3150	Lock Assembly—Missile Bay Doors	Prevents inadvertent closing of missile bay doors on F-106A airplanes during maintenance.
8-96061-803		Lock Assembly—Missile Bay Doors	Prevents inadvertent closing of missile bay doors on F-106A or F-106B airplanes during maintenance.
8-96030	8200-625047-65	Safety Lock Assembly—Aft	Locks aft missile launchers of F-106A/B airplanes in extended position during maintenance.
8-96029	1730-591-8553	Safety Lock Assembly—Forward	Locks forward missile launchers of F-106A airplanes in extended position during maintenance.
8-96152		Safety Lock Assembly—Forward Missile Launcher	Locks forward missile launchers of F-106B airplanes in extended position during maintenance.
8-96135		Pin—Armament Control Valve Safety	Prevents inadvertent closing of missile bay doors during maintenance.
8-96261		Pin—Armament Lock	To pin the armament lock valve in the "LOCK" position.
8-57268		Pin—Safety	To lock ejector shackle mechanism in closed position.
8-96042	5180-594-0181	Set—Boresighting and Harmonizing	Used during boresighting operation of armament system.
8-96042-803	5180-608-6978	Set—Boresighting and Harmonizing	Used during boresighting operation of armament system.
8-96042-805		Set—Boresighting and Harmonizing	Used during boresighting operation of armament system.
8-96288	4920-674-0201	Tester—Armament Squib Circuit	To check fire pulse and stray voltage at missile umbilical disconnect.
8-96293	5120-656-2624	Tester—Armament Rocket Gone Switch (Refer to T.O. 33D3-11-2-1)	To test operation of the special-weapon-aboard and rocket gone switch.
8-96191	4920-632-8571	Tester—Ejector (Refer to T.O. 33D3-11-2-1)	To restrain and absorb the force of pistons activated by ejector cartridges.

4-2. LIST OF SPECIAL EQUIPMENT AND TOOLS (CONT).

PART NO.	STOCK NO.	NOMENCLATURE	APPLICATION
ARMAMENT (T. O. 1F-106A-2-12) (CONT).			
8-96190	4920-674-0203	Tester—Synchronization (Refer to T.O. 33D3-11-2-1)	For indicating time lapse between forward and aft shackle opening.
8-96134	4920-608-4721	Tester—Armament Control Relay Box (Refer to T.O. 33D5-16-5-1)	Used in operational check of armament system.
8-96072	4920-602-5413	Tester—Armament System (Refer to T.O. 33D5-12-37-1)	Used during operational check of armament system.
SE 0992-801	1450-605-3758	Trailer—Missile and Rocket Transport (Refer to T.O. 35D3-11-5-1)	Transports missiles and rockets from storage area to flight line.
ELECTRONIC (T. O. 1F-106A-2-15).			
486148-100 (Hughes)		Hand Truck—Radar Maintenance	Used to transport radar antenna and radar receiver-transmitter.
486122-100 (Hughes)		Hand Truck—Test Equipment	Used for transporting and handling test equipment and system units.
8-96015	1730-554-6695	Hoist Assembly—MA-1 AWCIS Transmitter and Modulator	Used during removal and installation of MA-1 AWCIS transmitter-receiver unit.
8-96145		Support Assembly—Electronic Rack Door	*On F-106B airplanes,* holds lower aft-electronic door open during maintenance.
8-96145-801		Support Assembly—Electronic Rack Door	*On F-106B airplanes,* holds lower aft-electronic door open during maintenance.
8-96027	1730-534-0562	Support Assembly – Intermediate Radar Door	Holds door open during maintenance.
486057 (Hughes)		Test Data Storage—Magnetic Drum	Provides test programs for periodic checkout. Consists of data storage magnetic drum (057 unit) with test routines recorded by means of special test tape.
486109-100 (Hughes)		Test Set—Air Data Computer	Provides for operation of air data computer group of FC&M subsystem.
486117-100 (Hughes)		Test Set—Armament	Used to check operation of armament control group.
486106-100 (Hughes)		Test Set—Radio Beacon Simulator	Provides for operation of TACAN group of CN&L subsystem.
486118-110 (Hughes)		Test Set—Stabilization Data Generator	Provides for operation of stable reference group of FC&M subsystem.
8-96156	5120-600-2652	Wrench Assembly—Electronic Rack Shock Mount	Used during removal and installation of electronic rack shock mounts.

PORTABLE HYDRAULIC TEST STAND

4-3. GENERAL.

Portable hydraulic test stands are used as sources of external hydraulic power for the airplane primary and secondary hydraulic systems during ground test operations. The various test stands that may be used with the F-106A and F-106B airplanes are described in succeeding paragraphs of this handbook section.

4-4. CONNECTING HYDRAULIC TEST STAND.

Quick-disconnect couplings, in the engine accessory and hydraulic accessory compartments, are provided to connect the hydraulic test stand to the airplane's hydraulic system. Figure 4-2 illustrates the quick-disconnect couplings before and after connection. Figure 4-3 illustrates the test stand to airplane connecting points.

CAUTION

Inspect lock teeth on lock spring assembly for damage before making a connection. Quick-disconnect couplings require hand tightening only. Over-torquing may result in permanent damage to the lock teeth on the lock spring assembly. Couplings should be covered when disconnected to prevent contamination by foreign matter.

When systems are to be operated by means of the hydraulic test stand, the stand must be connected to both the airplane primary and secondary hydraulic systems.

4-5. PORTABLE HYDRAULIC TEST STAND, SE 1061 (4920-517-1028).

The gasoline operated hydraulic test stand SE 1061 (4920-517-1028) is illustrated in figure 4-4. Refer to T.O. 33A-2-24-1 for operating instructions on this test stand.

4-6. PORTABLE HYDRAULIC TEST STAND, SE 0976 (4920-204-3115).

Refer to T.O. 33A2-2-22-1 for operating instructions on the electrically operated hydraulic test stand, SE 0976 (4920-204-3115).

4-7. ALTERNATE PORTABLE HYDRAULIC TEST STAND SE 0567-801 (4920-204-2462).

Instructions for operating the portable hydraulic test stand are listed in T.O. 33A2-2-18-11. See figure 4-5 for an illustration of this stand.

HIGH-PRESSURE AIR COMPRESSOR

4-8. DESCRIPTION.

The high-pressure ground air compressor unit, SE 0704-801 (4310-697-0858), is used to charge the airplane high-pressure pneumatic system to full operating pressure. The air compressor is a four-stage, air-cooled, single-acting, reciprocating unit designed for continuous operation. It has a standard operating pressure range of 900 to 3500 psi, while delivering a rated output capacity of 15 cubic feet of commercial standard air per minute. A heavy-duty four-cycle engine drives the compressor through a V-belt. The entire assembly is mounted on a four-wheel trailer equipped with hand brakes on the rear wheels. The principle of the compressor operation is that of multistage compression. In this unit, air is compressed to 3500 psi in four distinct stages with each stage requiring one-fourth of the total air horsepower. Air is drawn through the oil bath filter into the first-stage cylinder by action of the first stage piston. Upon discharge from the fourth-stage cylinder, the air passes to and through the aftercooler. From the aftercooler the air passes to the air receivers for storage and ultimate use. Before the air enters the service line it passes through two dehydrator cylinders which insure dry air for the high-pressure pneumatic system. High-pressure air to the unit service line is controlled by a priority valve which does not permit air flow into the service line until the pressure has built up to 2400 psi. When pressure in the system reaches 3500 psi, the compressor controls will automatically load and unload the system to maintain constant pressure. See figure 4-6 for an illustration of this compressor unit.

4-9. STARTING AND OPERATING INSTRUCTIONS FOR HIGH-PRESSURE AIR COMPRESSOR SE 0704-801 (4310-697-0858).

Refer to T.O. 34Y1-56-31 for starting and operating instructions for this compressor unit.

CAUTION

INSPECT LOCK TEETH ON LOCK SPRING FOR EVIDENCE OF DAMAGE BEFORE MAKING A CONNECTION. COUPLINGS SHOULD ALWAYS BE COVERED WHEN DISCONNECTED TO PREVENT CONTAMINATION BY FOREIGN MATTER.

QUICK DISCONNECT COUPLING TORQUE VALUES

COUPLING DASH NO.	COUPLING SIZE	FOOT LBS.
-4	1/4	10
-5	5/16	10
-6	3/8	15
-8	1/2	15
-10	5/8	20
-12	3/4	20
-16	1	30
-20	1-1/4	30
-24	1-1/2	30

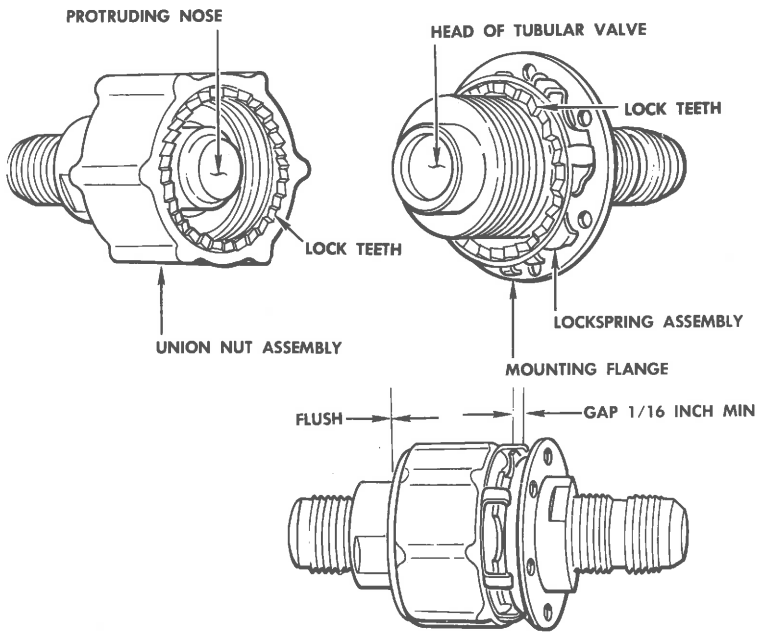


Figure 4-2. Quick-Disconnect Couplings

PORTABLE GAS TURBINE COMPRESSOR

4-10. DESCRIPTION.

The gas turbine ground compressor unit, MA-1A (8200-161024), is an item of service equipment designed to provide a large volume of low-pressure compressed air for the starting of the airplane engines equipped with air starters. This unit consists of a trailer upon which is mounted a gas turbine unit complete with fuel tank, batteries, control panel, and sufficient hose for connection to the airplane. Instructions for operating the compressor are on a placard attached to the control panel. The unit is used on airplanes equipped with the pneumatic type starter.

4-11. STARTING ENGINE WITH GAS TURBINE COMPRESSOR.

The engine pneumatic starter (on some airplanes) is operated by a large volume of low-pressure air supplied by a gas turbine compressor. A flow of 110 pounds per minute at a pressure of 30.3 psi is necessary to start engine. Hook up compressor as follows:

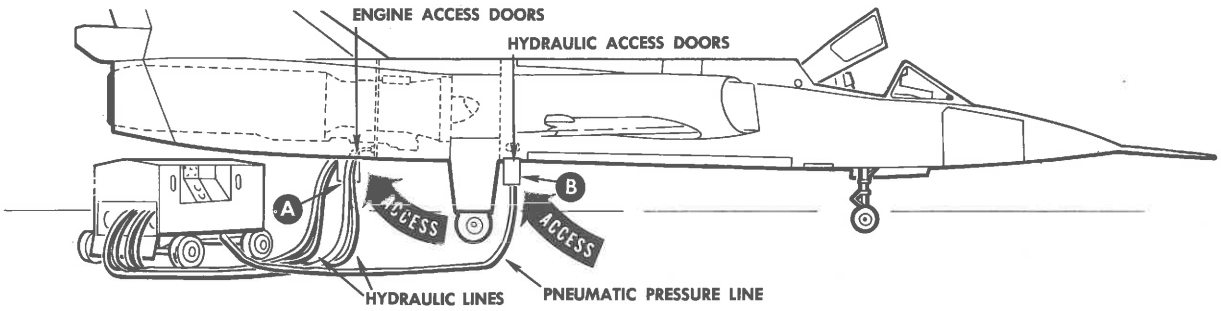
a. Open access door at Station 511 on the bottom of the fuselage.

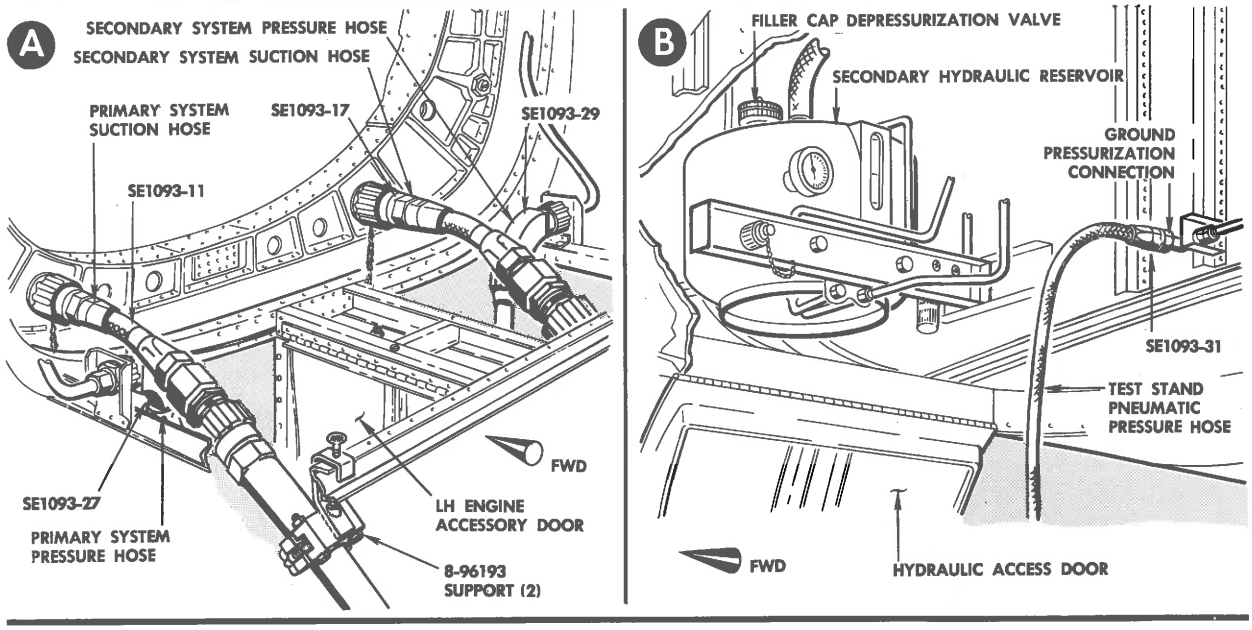
b. Connect compressor flexible hose to starter connection, and plug in start valve electrical connector.

c. Start compressor by following instructions on plate attached to compressor.

d. When required volume and pressure of air are attained, signal cockpit that engine is ready to start.

e. Stop compressor, disconnect flexible hose from airplane ground connection, disconnect electrical connection, and close access door after engine is started.





INSTRUCTIONS FOR TEST STAND AND AIRPLANE CONNECTIONS

CAUTION

BE SURE HOSE ENDS AND ADAPTERS ARE THOROUGHLY CLEAN BEFORE CONNECTING TO TEST STAND AND AIRPLANE. EVEN A SMALL AMOUNT OF DIRT CAN CAUSE MALFUNCTIONS.

a. Open hydraulic Access and Ram Air Turbine doors.

NOTE

WHEN USING THE SE 1061-801 (4920-670-9415) OR SE 0976-801 (4920-204-3115) HYDRAULIC TEST STANDS, SUBSTITUTE ADAPTER 8-96467-1 FOR SE 1093-27 AND SE 1093-29 ADAPTERS, AND ADAPTER 8-96467-3 FOR SE 1093-11 AND SE 1093-17. HYDRAULIC HOSE SUPPORT AND ADAPTER FOR GROUND PRESSURIZATION ARE NOT REQUIRED.

b. Relieve pressure in primary and secondary hydraulic system by operating elevons.
c. Relieve air pressure primary and secondary hydraulic system reservoirs by depressing valve on top of manual filler cap.
d. Open engine accessory compartment door.
e. Disconnect primary system suction hose from quick disconnect fitting and connect test stand suction hose using SE1093-11 adapter.
f. Disconnect primary system pressure hose at quick disconnect fitting and connect test stand pressure hose using SE1093-27 adapter.
g. Repeat steps "d" through "f" for secondary hydraulic system using SE1093-17 and SE1093-29 adapters, see detail A.
h. Connect test stand pneumatic pressure hose to reservoir ground pressurization connection using SE1093-31 adapter.

NOTE

TEST STAND PNEUMATIC PRESSURE HOSE IS CONNECTED TO AIRPLANE ONLY WHEN OPERATING TEST STAND IN THE "SHIP RESERVOIR" POSITION.

i. After hydraulic test stand operations are completed, disconnect test stand hoses, connect primary and secondary hydraulic system hoses, and cap reservoir ground pressurization fitting.

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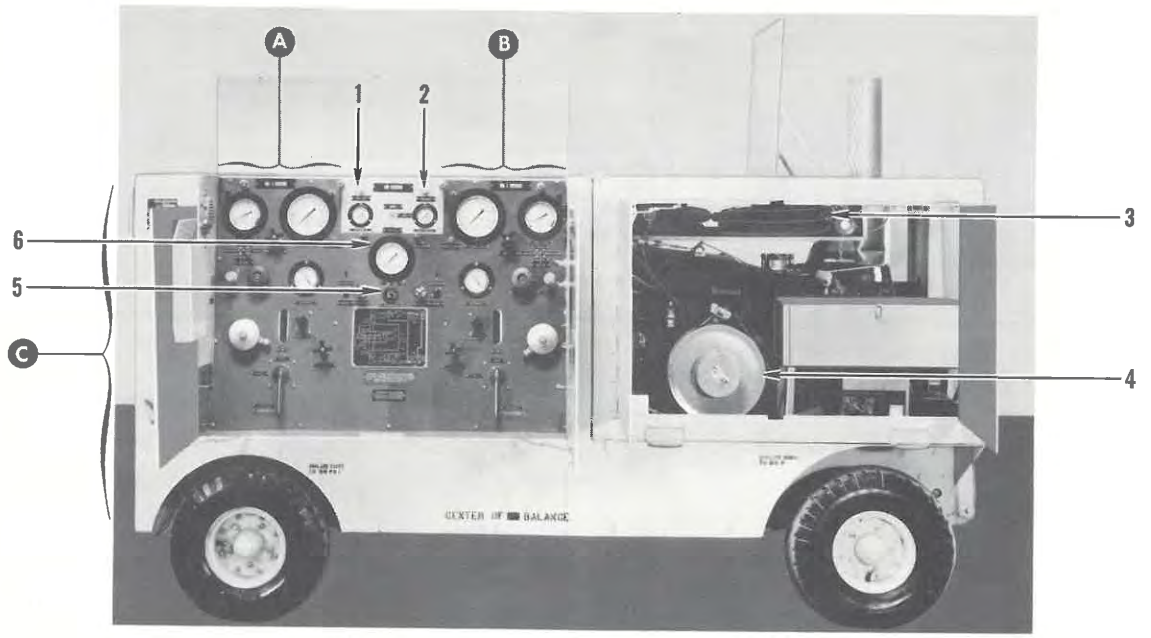
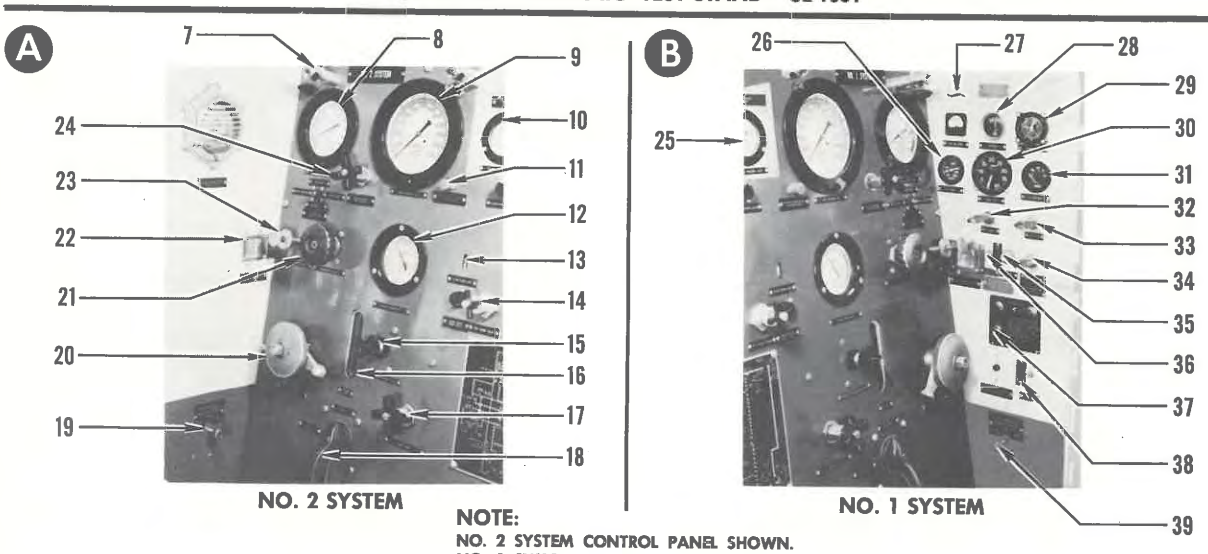
Figure 4-3. Hydraulic Test Stand and Airplane Connections



PORTABLE HYDRAULIC TEST STAND—SE 1061



NOTE:
NO. 2 SYSTEM CONTROL PANEL SHOWN.
NO. 1 SYSTEM CONTROL PANEL SIMILAR.

1. STAND RESERVOIR REGULATOR
2. EXTERNAL PRESSURE REGULATOR
3. SERVICING HOSE STOWAGE
4. CABLE REEL
5. STAND RESERVOIR LEVEL INDICATOR
6. FILL SYSTEM FILTER PRESSURE DROP
7. PANEL LIGHTS
8. LOW PRESSURE GAGE
9. HIGH PRESSURE GAGE
10. STAND PRESSURE GAGE
11. HIGH PRESSURE FILTER WARNING LIGHT
12. FLUID TEMPERATURE GAGE
13. FILTER BLEED LINE
14. FILL RELIEF VALVE
15. HIGH PRESSURE RELIEF VALVE
16. RETURN LINE (SIGHT TUBE)
17. DUMP VALVE
18. RESERVOIR SELECTOR
19. BOOST PRESSURE INTERLOCK SWITCH
20. VOLUME CONTROL
21. FLOW CONTROL VALVE
22. VOLUME INDICATOR
23. PRESSURE COMPENSATOR
24. HIGH PRESSURE GAGE SHUTOFF
25. EXTERNAL PRESSURE GAGE
26. ENGINE OIL TEMPERATURE
27. TEST STAND ENGINE CONTROL PANEL
28. ENGINE AMMETER GAGE
29. ENGINE HOURMETER
30. ENGINE RPM
31. ENGINE OIL PRESSURE
32. CHOKE
33. THROTTLE
34. DETENT (MANUAL ENGINE STARTER)
35. STARTER BUTTON
36. IGNITION SWITCH
37. HEATER SWITCH
38. PANEL LIGHT SWITCH
39. BOOST PRESSURE INTERLOCK SWITCH

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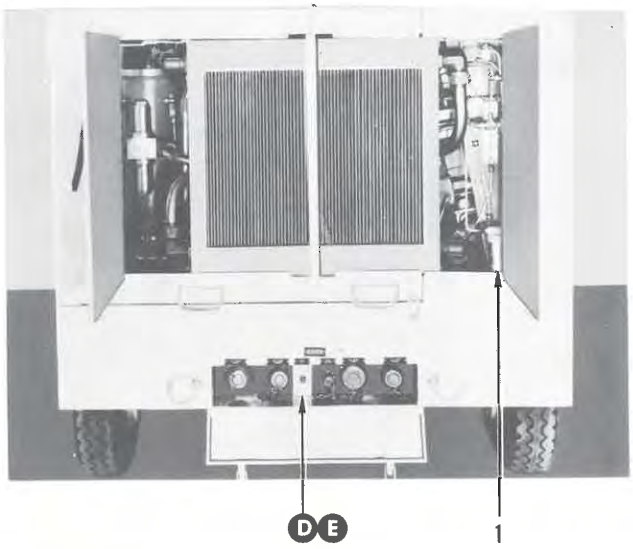
Figure 4-4. Hydraulic Test Stand, SE1061 (4920-517-1028) (Sheet 1 of 2)

1. AIR COMPRESSOR WATER SEPARATOR
2. AIR OUTLET AND SHUTOFF VALVE
3. PNEUMATIC PRESSURE OUTLET
4. NO. 2 SYSTEM PRESSURE OUTLET
5. NO. 2 SYSTEM RETURN (SUCTION)
6. NO. 1 SYSTEM PRESSURE OUTLET
7. NO. 1 SYSTEM RETURN (SUCTION)
8. SERVICING HOSES
9. SE 1093-27 (NO. 1 PRESSURE)
10. SE 1093-29 (NO. 2 PRESSURE)
11. SE 1093-11 (NO. 1 SUCTION)
12. SE 1093-17 (NO. 2 SUCTION)
13. SE 1093-31 PNEUMATIC

C



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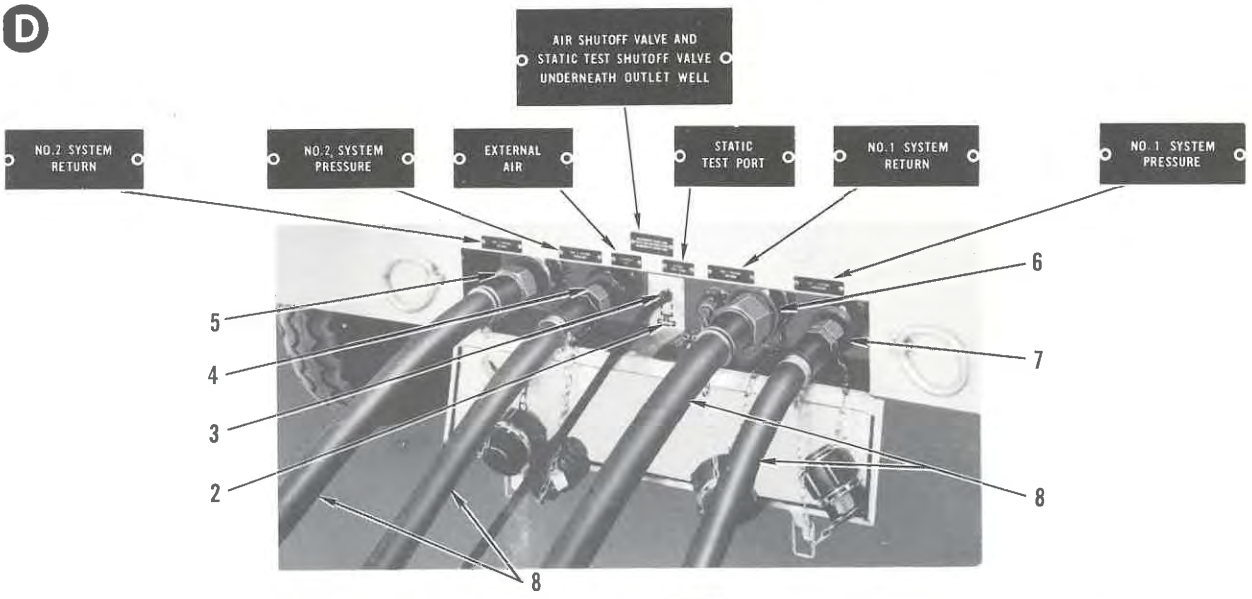
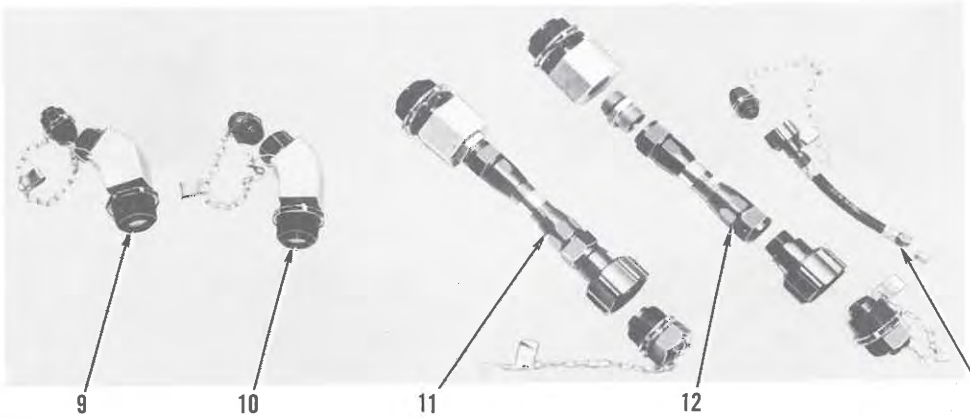


E



ADAPTERS USED TO CONNECT HOSES TO AIRPLANE

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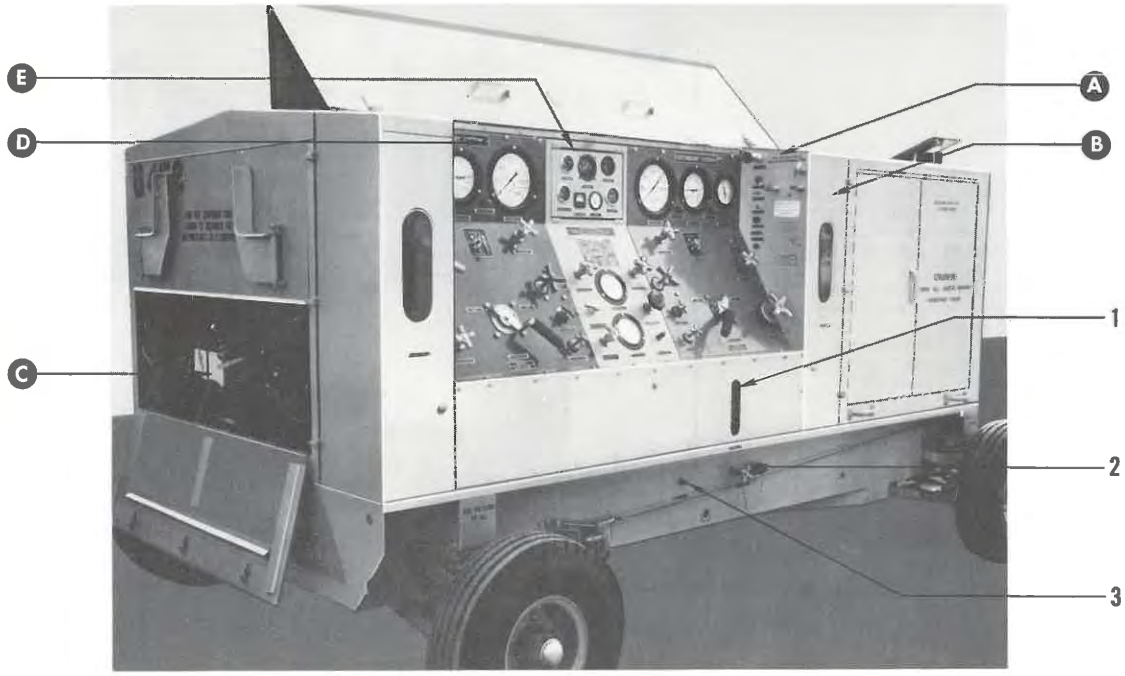
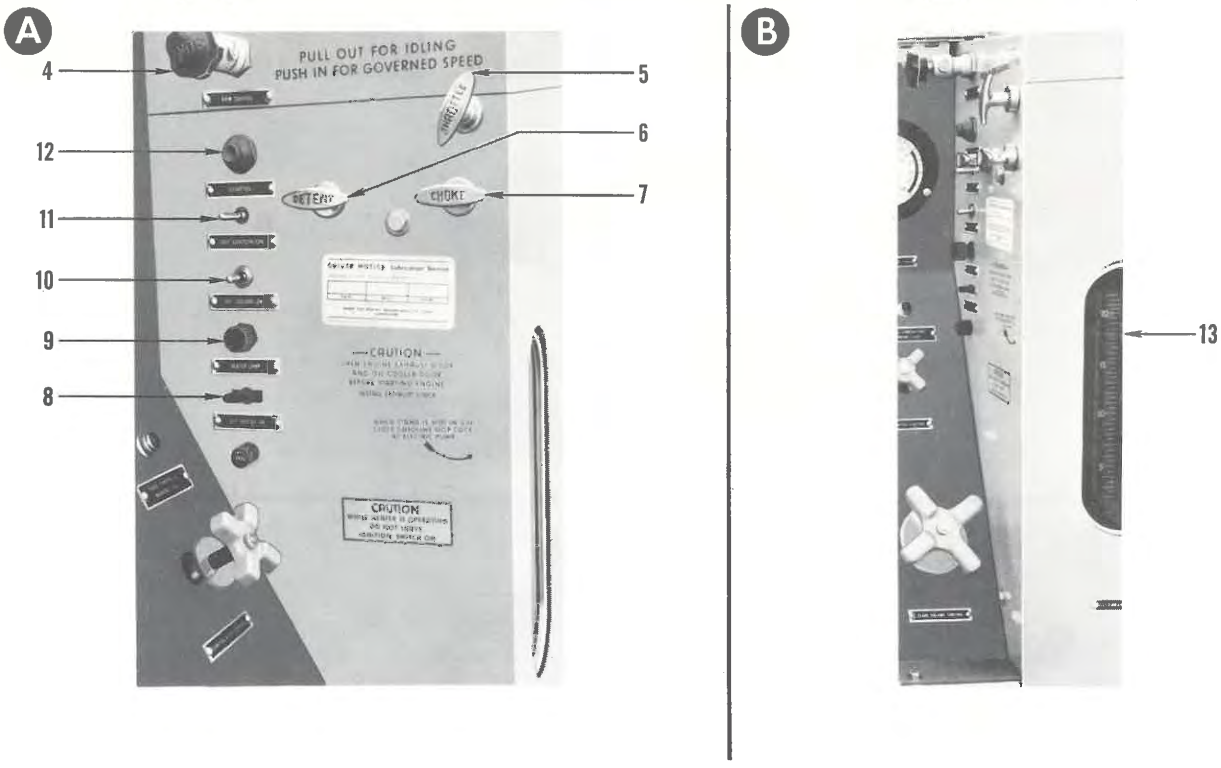
Figure 4-4. Hydraulic Test Stand, SE1061 (4920-517-1028) (Sheet 2 of 2)





1. HAND PUMP RECEPTACLE.
2. AIR OUTLET AND SHUTOFF VALVE.
3. HAND PUMP OUTLET.
4. RPM CONTROL.
5. THROTTLE.
6. DETENT (MANUAL ENGINE STARTER).
7. CHOKE.
8. HEATER SWITCH.
9. HEAT INDICATOR LIGHT.
10. COOLER SWITCH.
11. IGNITION SWITCH.
12. STARTER BUTTON.
13. FLOW GAGE.

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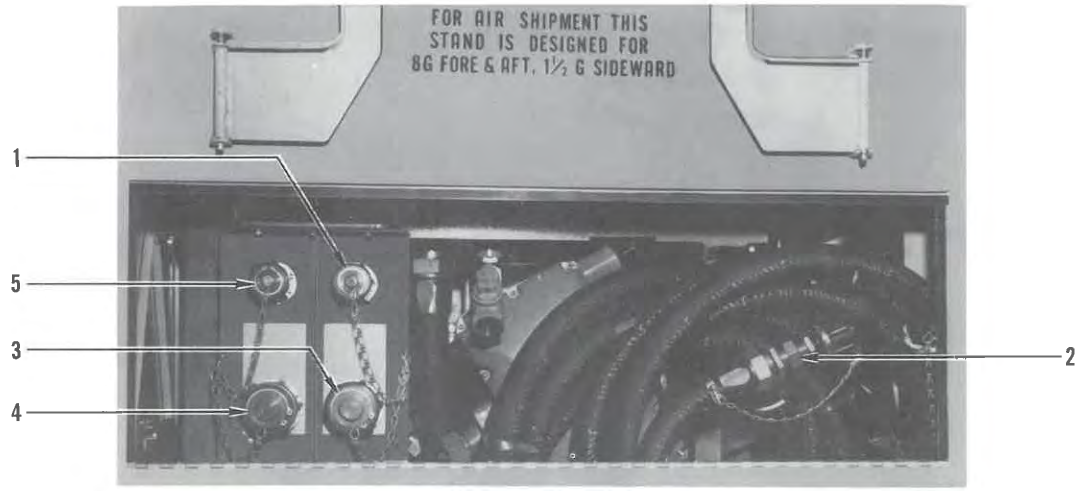
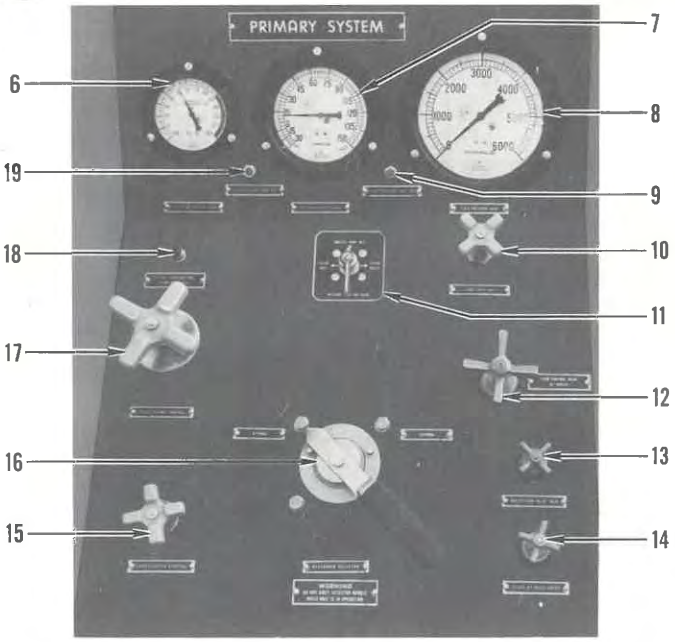
Figure 4-5. Alternate Hydraulic Test Stand SE0567-801 (4920-204-2462) (Sheet 1 of 2)

C



D NOTE PRIMARY SYSTEM CONTROL PANEL SHOWN: SECONDARY SYSTEM CONTROL PANEL SIMILAR.



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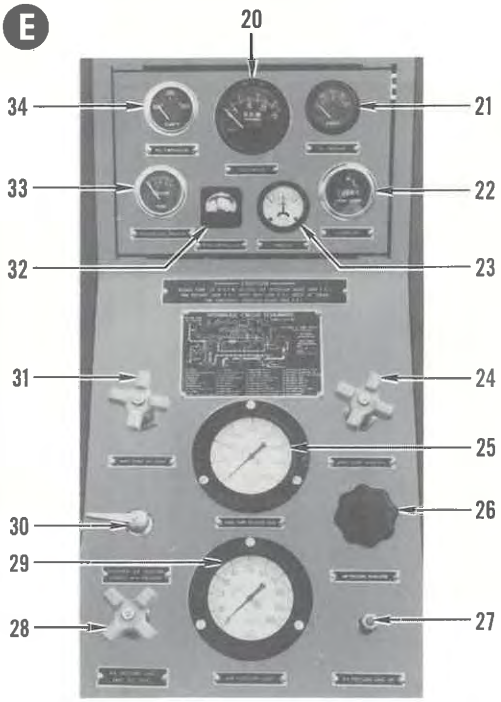

1. SECONDARY SYSTEM HIGH PRESSURE OUTLET.
2. SERVICING HOSES.
3. SECONDARY SYSTEM RETURN (SUCTION).
4. PRIMARY SYSTEM RETURN (SUCTION).
5. PRIMARY SYSTEM HIGH PRESSURE OUTLET.
6. FLUID TEMPERATURE GAGE.
7. FILTER PRESSURE GAGE.
8. FLUID PRESSURE GAGE.
9. FLUID PRESSURE GAGE TAP.
10. GAGE SHUT-OFF.
11. PRESSURE SELECTOR VALVE.
12. FLOW CONTROL VALVE ¾" OUTLET.
13. HIGH PRESSURE RELIEF VALVE.
14. FLUID BY-PASS VALVE.
15. COMPENSATOR CONTROL.
16. RESERVOIR SELECTOR.
17. FLUID VOLUME CONTROL.
18. FLUID TEMPERATURE WARNING LIGHT.
19. FILTER PRESSURE GAGE TAP.
20. TEST STAND ENGINE TACHOMETER.
21. TEST STAND ENGINE OIL PRESSURE GAGE.
22. TEST STAND ENGINE HOURMETER.
23. TEST STAND ENGINE AMMETER GAGE.
24. HAND PUMP SHUTOFF VALVE.
25. HAND PUMP PRESSURE GAGE.
26. AIR PRESSURE REGULATOR.
27. AIR PRESSURE GAGE TAP.
28. AIR PRESSURE GAGE SHUTOFF VALVE.
29. AIR PRESSURE GAGE.
30. RESERVOIR AIR PRESSURE SELECTOR.
31. HAND PUMP BY-PASS VALVE.
32. TEST STAND ENGINE HEAD TEMPERATURE GAGE
33. TEST STAND RESERVOIR LEVEL INDICATOR.
34. TEST STAND ENGINE OIL TEMPERATURE GAGE.

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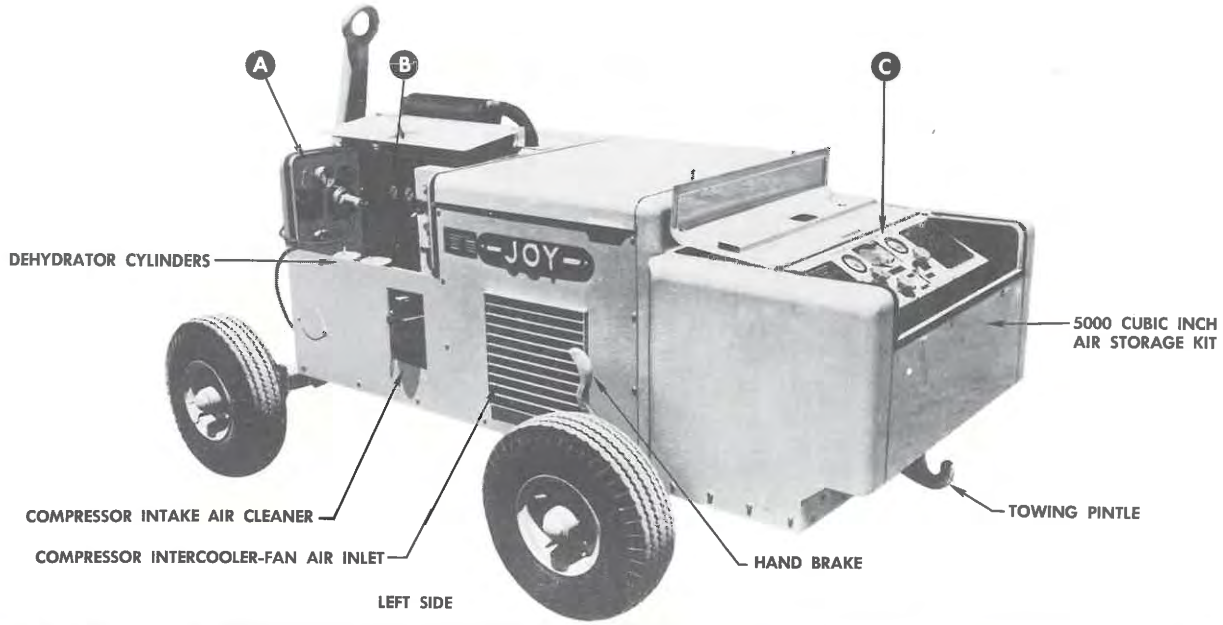
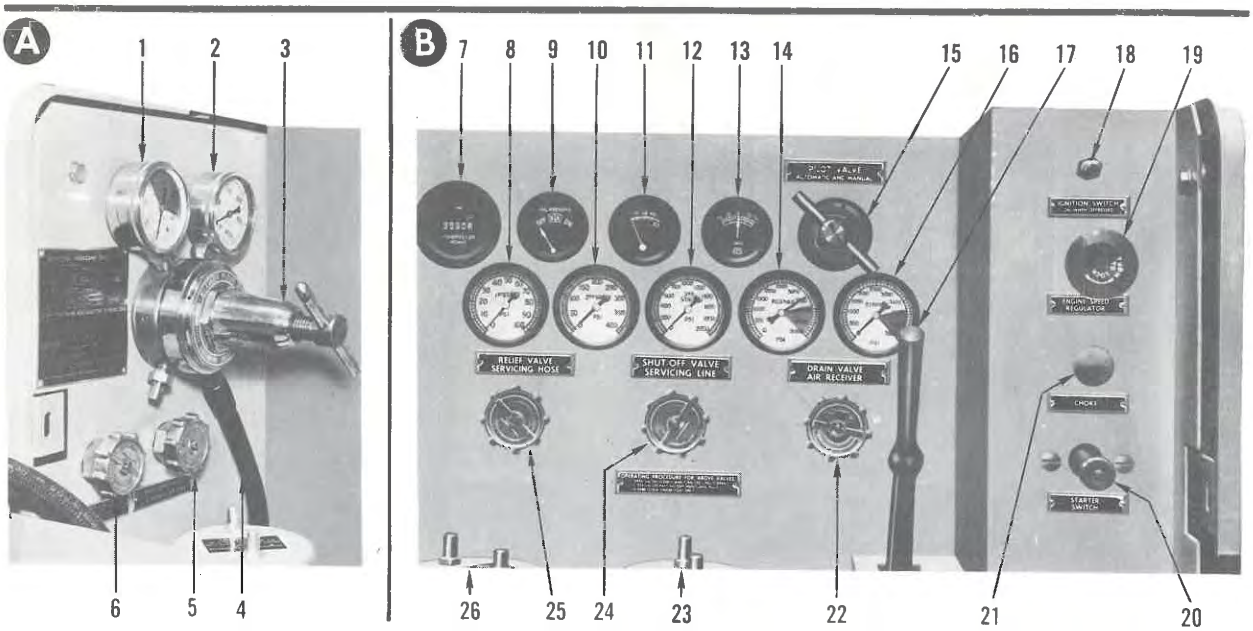
Figure 4-5. Alternate Hydraulic Test Stand SE0567-801 (4920-204-2462) (Sheet 2 of 2)





COMPRESSOR CONTROL PANEL

1. OUTLET PRESSURE GAGE.
2. INLET PRESSURE GAGE.
3. LOW PRESSURE REGULATOR.
4. LOW PRESSURE SERVICE HOSE.
5. SHUTOFF VALVE, L.P. SERVICING LINE.
6. RELIEF VALVE.
7. HOURMETER.
8. FIRST STAGE INTERCOOLER PRESSURE GAGE.
9. ENGINE OIL PRESSURE GAGE.
10. SECOND STAGE INTERCOOLER PRESSURE GAGE.
11. COMPRESSOR OIL PRESSURE GAGE.
12. THIRD STAGE INTERCOOLER PRESSURE GAGE.
13. AMMETER.
14. AIR RECEIVER PRESSURE GAGE.
15. PILOT VALVE.
16. SERVICING LINE PRESSURE GAGE.
17. CLUTCH LEVER.
18. IGNITION SWITCH.
19. ENGINE SPEED REGULATOR.
20. STARTER SWITCH.
21. CHOKE CONTROL.
22. AIR RECEIVER DRAIN VALVE.
23. DEHYDRATOR CYLINDER NO. 1.
24. SERVICING LINE SHUTOFF VALVE.
25. SERVICING HOSE RELIEF VALVE.
26. DEHYDRATOR CYLINDER NO. 2.

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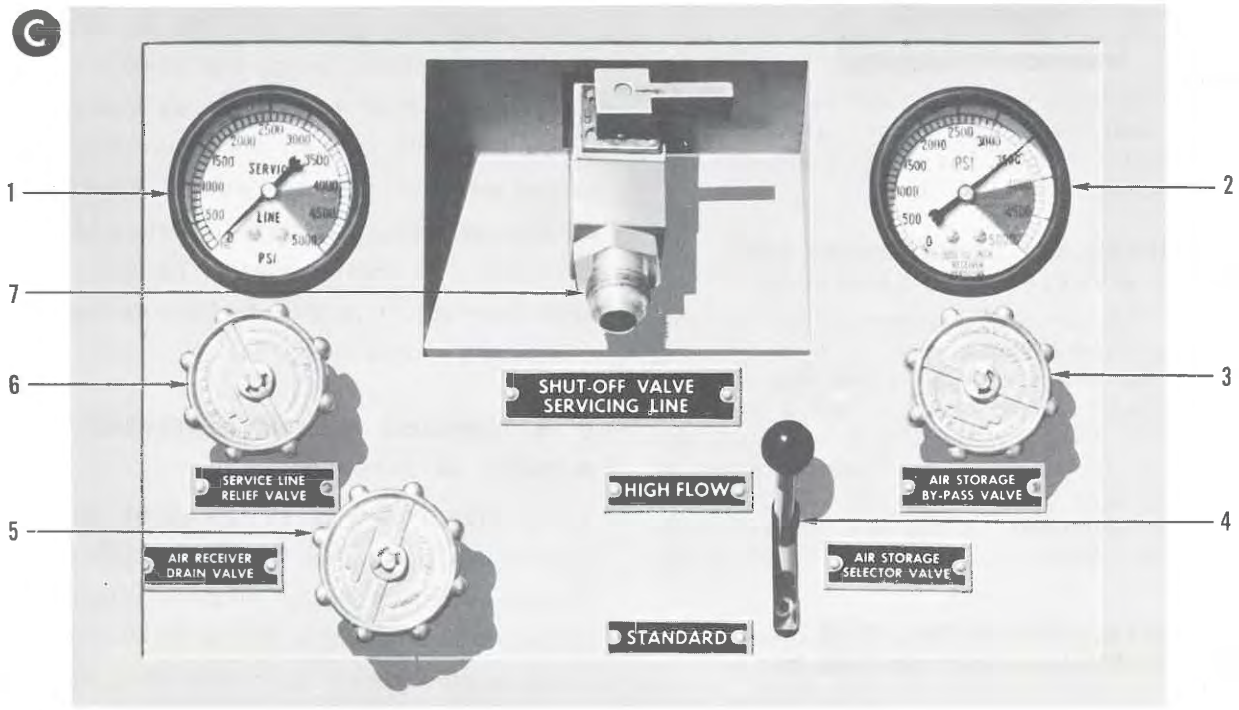
Figure 4-6. High Pressure Air Compressor SE0704-801 (4310-697-0858) (Sheet 1 of 2)



1. SERVICING LINE PRESSURE GAGE.
2. AIR RECEIVER PRESSURE GAGE.
3. AIR STORAGE BY-PASS VALVE.
4. AIR STORAGE SELECTOR VALVE.
5. AIR RECEIVER DRAIN VALVE.
6. SERVICE LINE RELIEF VALVE.
7. SERVICING LINE SHUTOFF VALVE.

5000 CUBIC INCH AIR STORAGE KIT CONTROL PANEL

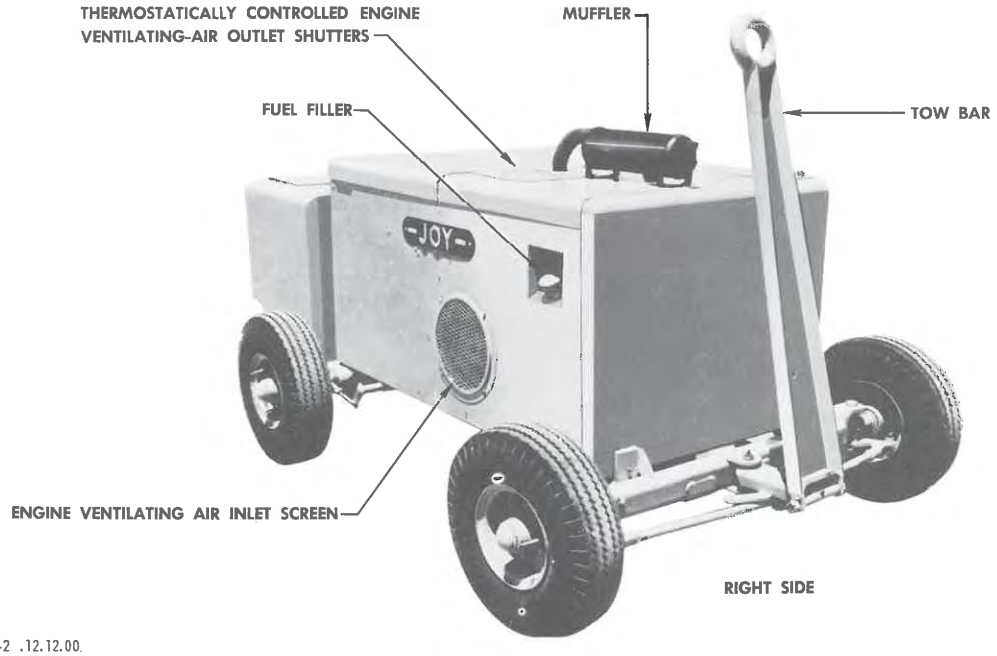


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Figure 4-6. High Pressure Air Compressor SE0704-801 (4310-697-0858) (Sheet 2 of 2)

WARNING

To prevent burns when disconnecting the gas turbine compressor, wear gloves of asbestos or other suitable material. The hose and connector will become hot during operation.

4-12. PORTABLE AIR CONDITIONING UNIT TYPE MA-3 8-96118 (4120-555-1282).

The portable MA-3 air-conditioning unit, 8-96118 (4120-555-1282), provides ground cooling for the cockpit, the electronic compartment, and the missile bay compartment. Provisions are incorporated to receive the unit's adapter 8-96151, 8-96162 or 8-96123, at Station 312 and Station 330 on the left side of the fuselage adjacent to the lower surface of the wing. Refer to T. O. 35E9-9-21 for operating instructions on this unit. Refer to T. O. 1F-106A-2-6 for detailed information on the use of this unit.

4-13. PORTABLE HEATER UNIT. TYPE MC-1, SE-0973 (4520-509-0740) OR TYPE MD-1, SE-1055.

The portable, SE-0973 or SE-1055, heater unit when used with adapter 8-96151, 8-96162, or 8-96213 provides a means for ventilating or heating the cockpit, the electronic compartments, and the missile bay compartment. The units are similar except that SE-0973 unit is gas engine driven while the SE-1055 unit is electric motor driven. Provisions are incorporated to receive the unit's adapter at Station 312 and Station 330 on the left side of the fuselage adjacent to the lower surface of the wing. T. O. 35E7-2-5-1 contains operating instructions for both units. Refer to T. O. 1F-106A-2-6 for more detailed information on the use of these units.

4-14. PORTABLE ELECTRIC GENERATOR SET 8-96025 or 8-96026.

The portable, 8-96025 or 8-96026, electric generator set provides electrical power for ground operation of the airplane's electrical and/or electronic equipment. Provisions are incorporated to receive the plug of the generator set at Station 171 on the left side of the fuselage. Refer to T.O. 1F-106A-2-10 for detailed information on the use of these units.

Section IV

SPECIAL TOOLS

Contents *Page*

TOOL LIST

4-1. GENERAL.

Detailed information on the operation and hookup of the more complex special equipment concerned with ground handling and maintenance is provided in this section. Figure 4-1 illustrates the Alert Status Ground Support Equipment. For additional information concerning the operation of other special equipment, refer to the manual applicable to the system in work.

4-2. LIST OF SPECIAL EQUIPMENT AND TOOLS.

The following list of special equipment and tools is restricted to those items required for organizational level maintenance of F-106A/B airplanes. Future revisions of this list will include additional items as they become available. Items are listed by the systems to which they apply; refer to applicable manual for specific use.

PART NO.	STOCK NO.	NOMENCLATURE	APPLICATION
GROUND HANDLING AND AIRFRAME (T.O. 1F-106A-2-2).			
SE 0580-7	1730-640-7155	Adapter—Wing and Nose Attachment—Jack Pad	Provides a bearing surface for USAF B-6 jacks during jacking operation.
8-96011	1730-534-0563	Bar—Nose Wheel Steering	Used to manually steer the airplane during ground handling.
SE 1089-801	1730-631-6464	Cable Assembly—Emergency Tow	Connects towing vehicle to main landing gear.
8-99904-805		Check Gage-Cockpit Seat Ejection Components	Provides means for performing operational check on cockpit seat ejection components (seat removed).
8-96208		Cover Assembly—Canopy and Radome	Protects the canopy and radome of *F-106A airplanes 57-239 and 57-240.*
8-96007	8340-698-9441	Cover Assembly—Canopy and Radome	Protects the canopy and radome of *F-106A airplanes.*

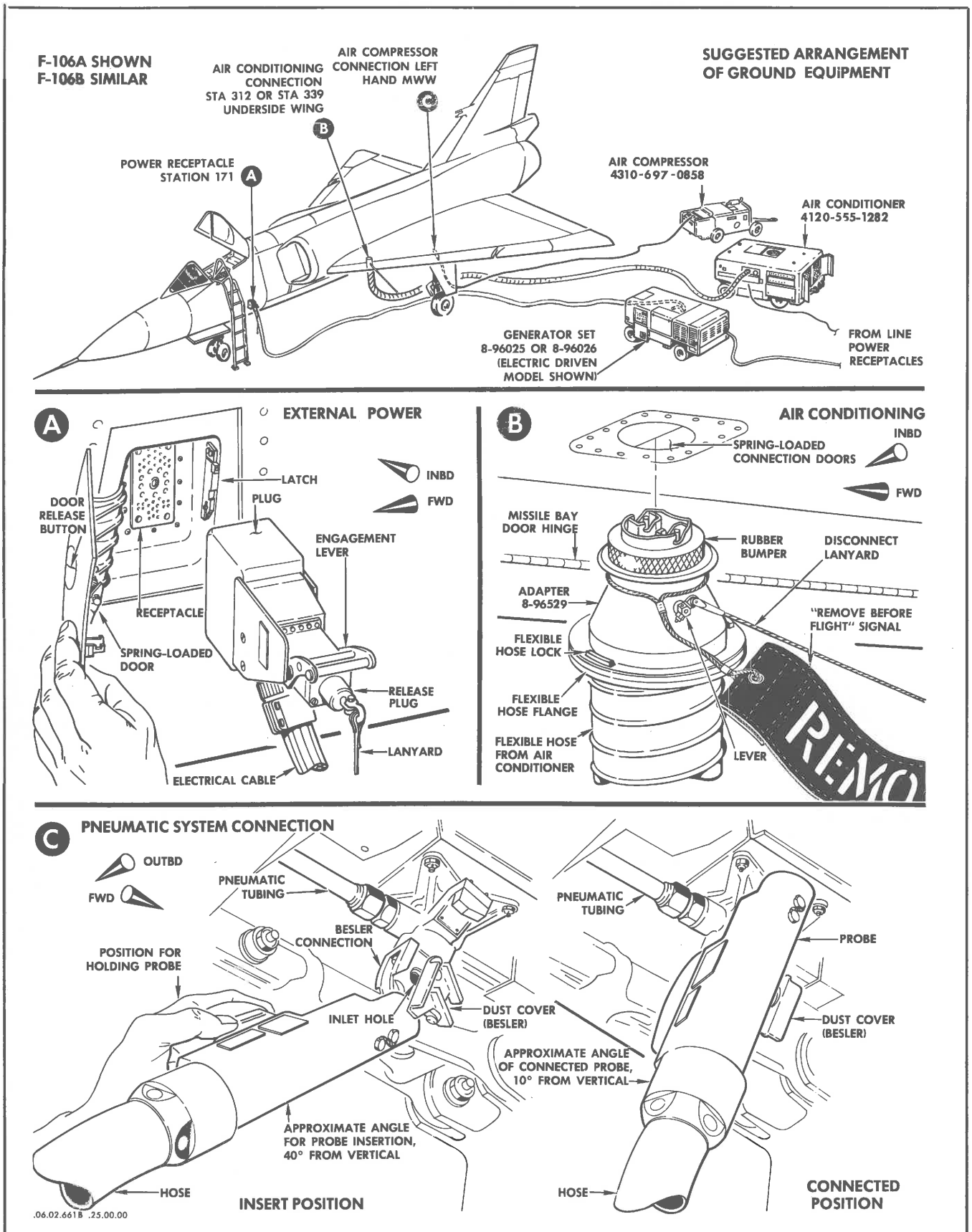


Figure 4-1. Alert Status Ground Support Equipment

4-2. LIST OF SPECIAL EQUIPMENT AND TOOLS (CONT).

PART NO.	STOCK NO.	NOMENCLATURE	APPLICATION
GROUND HANDLING AND AIRFRAME (T.O. 1F-106A-2-2) (CONT).			
8-96141	8340-621-5896	Cover Assembly—Canopy & Radome	Protects the canopy and radome of *F-106B airplanes.*
8-96094		Cover—Drag Chute	Prevents foreign matter or moisture from entering drag chute cannister.
8-96205		Cover—Drag Chute	Prevents foreign matter and moisture from entering drag chute cannister.
SE 0959-801	8340-035-4586	Cover Assembly—Pitot Tube	Prevents foreign matter or moisture from entering pitot tube.
SE 0844-803		Cover Assembly—"Q" Intake	Prevents foreign matter and moisture from entering "Q" (artificial feel) system intakes.
SE 0844-801	2000-572-1758	Cover Assembly—"Q" Intake	Prevents foreign matter and moisture from entering "Q" (artificial feel) system intakes.
8-96202-1	8340-652-9445	Cover-Wing	Protects the wing, particularly, from frost, ice, or snow.
8-96202-2	8340-652-9446	Cover-Wing	Protects the wing, particularly, from frost, ice, or snow.
8-96497	1730-711-2837	Dolly-Seat Handling	Provides means for handling rotational upward ejection seats.
8-96060	1730-522-2735	Eye Bolt—Nose Mooring	Attaches to fuselage structure during mooring operation.
8-96103	1730-219-5712	Eye Bolt—Wing Mooring	Attaches to wing structure during mooring operation.
8-96196	1730-632-8437	Guard-Bailout Switch Probe	Protects bailout switch probe during aft seat replacement procedure of *F-106B airplanes* equipped with upward ejection seats.
8-96098		Guard—Transducer Vane	Protects transducer vane from damage and also prevents personnel injury during maintenance.
ST 00559	1730-566-3435	Handle—"Q" Intake Cover Installation or Removal	Used to install or remove "Q" (artificial feel) system cover.
8-96009	1730-204-0856	Ladder—Cockpit Entrance	Used to enter, or exit from, the F-106A cockpit.
8-96009-801		Ladder-Cockpit Entrance	Used to enter, or exit from, the F-106B cockpit.
8-96250	1730-650-1422	Ladder—Cockpit Entrance	Used to enter, or exit from, the cockpit.
8-96012	1730-522-2743	Lock Pin Assembly—Canopy and Seat Maintenance	Prevents inadvertent operation of F-106A canopy jettison and upward seat ejection systems during maintenance.
8-96012-801	1730-FSC	Lock Pin Assembly—Canopy and Seat Maintenance	Prevents inadvertent operation of F-106A canopy jettison and rotational upward seat ejection systems.

4-2. LIST OF SPECIAL EQUIPMENT AND TOOLS (CONT).

PART NO.	STOCK NO.	NOMENCLATURE	APPLICATION
GROUND HANDLING AND AIRFRAME (T.O. 1F-106A-2-2) (CONT).			
8-96147-803	1730-713-3272	Lock Pin Assembly – Canopy and Seat Maintenance	Prevents inadvertent operation of F-106B canopy jettison and rotational upward seat ejection systems.
8-96147	1730-594-8400	Lock Pin Assembly—Canopy and Seat Maintenance	Prevents inadvertent operation of F-106B canopy jettison and upward seat ejection systems.
8-96147-801	1730-652-8862	Lock Pin Assembly—Canopy and Seat Maintenance	Prevents inadvertent operation of F-106B canopy jettison and upward seat ejection systems during maintenance.
8-96115	1730-586-4847	Pad—Refrigeration Area Protective	Protects F-106A fuselage skin adjacent to air conditioning compartment during maintenance.
8-96139	1730-594-8399	Pad—Refrigeration Area Protective	Protects F-106B fuselage skin adjacent to air conditioning compartment during maintenance.
8-96514		Pin-Tail Hook Safety	Prevents inadvertent extension of tail hook when airplane is parked.
8-96006	8340-560-9978	Plug-Boundary Layer Duct	Prevents entrance of foreign material into the boundary layer ducts.
8-96407-1		Shield Assembly—Air Intake Bleed Ducts	Prevents foreign matter and/or moisture from entering air intake bleed duct.
8-96407-2		Shield Assembly—Air Intake Bleed Ducts	Prevents foreign matter and/or moisture from entering ramp bleed air duct.
8-96154		Shield—Exhaust Tailpipe	Prevents foreign matter and/or moisture from entering tailpipe.
8-96002-801	1730-589-9142	Shield Assembly—Exhaust Tailpipe	Prevents foreign matter and/or moisture from entering tailpipe.
8-96140	8340-621-5895	Shield Assembly—Heat	Prevents foreign matter and/or moisture from entering heat exchanger duct.
8-96179	1730-632-0062	Shield—Air Intake Duct	Prevents foreign matter and/or moisture from entering engine air intake duct.
8-96066	1730-555-4592	Sling Assembly—Canopy Hoist	Connects hoist or crane to F-106A canopy during removal or installation.
8-96153	1730-540-7744	Sling Assembly—Canopy Hoisting	Connects crane or hoist to F-106B canopy during removal or installation.
SE 1131	1730-709-9023	Sling Assembly—Nose Hoisting	Provides means for hoisting nose of airplane in order to extend nose landing gear.
8-96495	1730-726-6085	Sling Assembly—Seat Hoisting	Provides means for hoisting rotational upward ejection seats during maintenance.
8-96081	8340-589-8479	Shield-Heat Exchanger Duct	To prevent inclement weather or foreign material from entering the duct opening.

4-2. LIST OF SPECIAL EQUIPMENT AND TOOLS (CONT).

PART NO.	STOCK NO.	NOMENCLATURE	APPLICATION
GROUND HANDLING AND AIRFRAME (T.O. 1F-106A-2-2) (CONT).			
8-96013	1730-522-2745	Support-Radar Door	To hold the radar door open during maintenance.
8-96038-801	1730-624-9396	Support Assembly—Canopy Hold Open	Prevents inadvertent closing of F-106A canopy during maintenance.
8-96137	1730-629-3151	Support Assembly—Canopy Hold Open	Prevents inadvertent closing of F-106B canopy during maintenance.
SE 0918	1730-691-9835	Support—Radome Storage	Supports and also protects radome when it is removed from airplane.
8-96496	4920-710-7363	Test Kit—Ejection Seat	Provides means for performing operational check on rotational upward ejection seats (seat removed).
8-96574	4920-710-6215	Tool-Tail Hook Installation	Used during installation and/or removal procedures to hold the tail hook in a straightened position.
8-96515	1730-710-6172	Tool-Tail Hook Retraction	Provides a means for raising the tail hook to the retracted position and engaging the tail hook latch mechanism.
SE 0932	1730-294-3025	Tow Bar—Nose Wheel	Connects towing vehicle to nose wheel.
HYDRAULIC AND PNEUMATIC (T.O. 1F-106A-2-3).			
8-96080	4920-566-8882	Adapters (2 each)	Used with SE 0567 or SE 0567-801 to connect test stand hoses to airplane quick disconnect fittings.
SE 1093		Adapter Kit	Used with SE 1051 or SE 0976 to connect test stand hoses to airplane quick disconnect fittings.
SE 1085	4130-574-9334	Adapter-Quick Disconnect (Manual Disengagement)	To adapt compressor service hose to airplanes equipped with Besler manual quick disconnects.
56150-15 (Besler)	4720-630-3552	Adapter—Quick Disconnect (Automatic Disengagement)	To adapt compressor hose to airplanes equipped with Besler automatic quick-disconnects.
SE 0704-801	4310-697-0858	Compressor-High Pressure Air (Refer to T.O. 34Y1-56-31)	To pressurize high pressure pneumatic system.
SE 0917	1730-331-9445	Guard—Ram Air Turbine	Prevents damage to turbine blades and also protects personnel during maintenance.
SE 0917-801		Guard—Ram Air Turbine	Prevents damage to turbine blades and also protects personnel during maintenance.
8-96193	4920-621-3011	Support—Hydraulic Hose	Used in conjunction with SE 1093. Supports return hoses of hydraulic test stand.

4-2. LIST OF SPECIAL EQUIPMENT AND TOOLS (CONT).

PART NO.	STOCK NO.	NOMENCLATURE	APPLICATION
HYDRAULIC AND PNEUMATIC (T. O. 1F-106A-2-3) (CONT).			
8-96149	4920-600-5068	Test Assembly Kit—Ram Air Turbine (Refer to T. O. 33D4-4-2-1)	Used in operational check of ram air turbine during flight.
SE 0976	4920-204-3115	Test Stand—Aircraft Hydraulic System (EMD) Type MK-3 (Refer to T.O. 33A2-2-22-1)	Flushes, fills, bleeds and/or pressurizes the airplane's hydraulic system during maintenance.
SE 0976-801	4920-675-4258	Test Stand-Portable Hydraulic (EMD) (Refer to T.O. 33A2-2-22-11)	To supply pressure to hydraulic system for ground test.
SE 1061	4920-517-1028	Test Stand-Portable Hydraulic (gas) (Refer to T.O. 33A2-2-24-1)	To supply pressure to hydraulic systems for ground test.
SE 1061-801	4920-670-9415	Test Stand-Portable Hydraulic (GED) (Refer to T.O. 33A2-2-24-21)	To supply pressure to hydraulic system for ground test.
SE 0567-801	4920-204-2462	Test Stand-Portable Hydraulic (gas) (Refer to T.O. 33A2-2-18-11)	To supply pressure to hydraulic systems for ground test.
POWER PLANT (T.O. 1F-106A-2-4).			
8-96253	1740-657-1185	Adapter Assembly—Constant Speed Drive	To adapt remote gearbox to retractable stand.
8-96167	1730-632-0058	Adapter Kit—Engine	Used during removal and/or installation of J-75 engine shroud.
8-96165	1730-632-0059	Adapter Kit—Aircraft Engine Removal Stand (Rollover Type)	Used during removal and/or installation of J-75 engine.
8-96398-1 8-96398-3 8-96398-5	1730-676-6848 1730-676-6849 1730-676-6850	Adapter Kit—Aircraft Engine Removal Stand (Non-Rollover Type)	Used during removal and/or installation of J-75 engine.
8-96041-1	1730-563-5327	Bracket Assembly—Forward Engine Roller	Used during engine removal and/or installation.
8-96041-2	1730-565-5322	Bracket Assembly—Forward Engine Roller	Used during engine removal and/or installation.
8-96041-803	1730-710-7308	Bracket Assembly—Engine Roller	Used during engine removal and/or installation.
8-96041-804	1730-710-7309	Bracket Assembly—Engine Roller	Used during engine removal and/or installation.
8-96047	4920-570-7634	Bracket Set—Cannular Shroud Roller	Used during removal, installation, overhaul and/or storage of cannular shroud.
8-96047-803	4920-632-8591	Bracket Set—Cannular Shroud Roller	Used during removal, installation, overhaul, and/or storage of cannular shroud.
SE 0583-801	1730-651-0315	Bridle Assembly—Aircraft Restraining	Restrains airplane during engine ground runup.
8-96186	1730-632-8436	Cover—Flight Controls Mixer Assembly	To cover flight controls mixer assembly when engine is removed from airplane.

4-2. LIST OF SPECIAL EQUIPMENT AND TOOLS (CONT).

PART NO.	STOCK NO.	NOMENCLATURE	APPLICATION
POWER PLANT (T.O. 1F-106A-2-4) (CONT).			
8-96183	1730-625-5344	Door—Ramp Dummy	To aid positioning of ramp center section.
8-96201	4920-649-5313	Gage—Engine to Fuselage Locating	Used in conjunction with 8-96200. Adjusts position of engine to fuselage prior to installation of tailcone.
8-96095	5220-591-8562	Gage—Power Control Rigging	Used to set pilot's throttle in direct relationship to engine fuel control.
8-96090	5220-601-9973	Gage—Sundstrand Drive Alignment	Aligns constant speed system drive shaft.
8-96044	1730-589-9469	Hoist Assembly—Constant Speed Drive	Used during removal or installation of constant speed drive unit.
817D-1200 (U. S. Accessory Products)	1560-690-8092	Kit – Engine Trim	Used to measure turbine discharge pressure during engine trim procedure.
SE 1122	4920-565-4927	Kit – Engine Trim	Used to measure turbine discharge pressure during engine trim procedure.
8-96043	5120-525-7017	Puller Assembly—Variable Ramp Hinge Pin	Used to remove variable ramp door hinge pins during door removal.
8-96163	1730-612-9258	Puller Assembly—Variable Ramp Hinge Pin	Withdraws or installs variable ramp door hinge pins during removal or installation of doors.
8-96017-803	1730-654-8392	Rail Set – Engine Removal	Used during engine removal and/or installation.
8-96017-805	1730-676-6856	Rail Set—Engine Removal	Used during engine removal and/or installation.
8-96212	1730-632-8432	Rod—Variable Ramp Positioning	Used during rigging procedure of variable ramps.
8-96014-5	1730-612-9259	Screen—Protective Ground Runup	Prevents foreign matter from entering engine air intake duct.
8-96014-6	1730-612-9261	Screen—Protective Ground Runup	Prevents foreign matter from entering engine air intake duct.
8-96176-1	1730-650-1413	Screen—Engine Inlet Duct	To prevent foreign material from entering ducts during engine ground run.
8-96176-2	1730-646-8903	Screen—Engine Inlet Duct	To prevent foreign material from entering ducts during engine ground run.
SE 0945	1730-660-0992	Sling—Engine Suspension	For hoist attachment.
8-96116	1730-619-6576	Sling Assembly—Constant Speed Drive	Used during removal and/or installation of constant speed drive unit.
SE 0867-803	4920-565-4944	Stand—Engine Compartment Mobile Work	Supports maintenance personnel working inside fuselage after engine removal.
8-96010	1730-571-9010	Stand—Tail Cone Adapter	To support tail cone.

4-2. LIST OF SPECIAL EQUIPMENT AND TOOLS (CONT).

PART NO.	STOCK NO.	NOMENCLATURE	APPLICATION
POWER PLANT (T.O. 1F-106A-2-4) (CONT).			
8-96010-801	1730-710-7306	Stand—Tail Cone Adapter	To support tail cone.
8-96178	1730-613-6610	Support Assembly—Forward Ramp Hold Open	Prevents inadvertent closing of forward variable ramp door during maintenance.
8-96051-801	4920-623-2177	Tester—Variable Ramp Control (Refer to T.O. 33D3-4-96-1)	To check operation of variable ramp system.
8-96051-803	1730-710-7310	Tester—Variable Ramp Control (Refer to T. O. 33D3-4-96-1)	To check operation of variable ramp system.
8-96264	4920-705-0190	Tool—Constant Speed Shaft Release	To aid release of shaft locking collars.
8-96184-803	5120-675-9229	Tool—Variable Ramp Rigging	For ramp positioning during rigging procedure.
8-96198	1730-632-8434	Tool—Ramp Stop Rigging	To establish position for stop adjustment.
8-96174	4920-611-9695	Wedge—Shroud Positioning	To support and position aft end of shroud. To be used with shroud Part Number 8-22679 basic, -3 or -5.
8-96200	IABK-1560-679-4482	Wedge—Shroud Positioning	To support and position aft end of shroud. To be used with shroud Part Number 8-22679-801, -803, -805, or -811.
8-96488	5120-701-2010	Wrench—Nut Holding, Fire Seal Adapter	Used during removal or installation of fire seal adapter.
PWA-3095	9APW-PWA-3095	Guide	Fuel pump drive shaft gear oil seal guide (large shaft).
PWA-3626	5120-095-3000	Wrench	Main oil screen check valve removal.
PWA-6580	1730-696-6592	Sling	Compressor motor chamber outer case lifting.
PWA-6676	5120-398-2911	Drift	Starter drive and hydraulic pump drive face oil seal replacement.
PWA-7025-2	5120-303-0904	Wrench	Exhaust nozzle actuating cylinder rod end nut adjusting.
PWA-7146	5120-212-2474	Puller	N_1 gear box oil seal housing, removal.
PWA-7355		Stand	Afterburner duct and nozzle support stand.
HS-7355		Adapter	Power assembly remote control adapter.
PWA-7356	1730-294-3370	Sling	Afterburner duct and nozzle assembly maintenance.
PWA-7441	4920-300-3856	Burette Valve	Fuel manifold pressure check tool.
PWA-7728		Sling	Turbine nozzle lifting assembly.
PWA-8000	4920-305-0197	Test Stand	Main fuel nozzle and afterburner manifold leak test stand.

4-2. LIST OF SPECIAL EQUIPMENT AND TOOLS (CONT).

PART NO.	STOCK NO.	NOMENCLATURE	APPLICATION
POWER PLANT (T.O. 1F-106A-2-4) (CONT).			
PWA-8052	4920-324-9583	Bracket—A/B Nozzle Lifting	Afterburner nozzle replacement.
PWA-8076	4920-563-1347	Indicator	Turbine exhaust temperature test indicator.
PWA-9045	4920-510-1234	Cover	Main fuel nozzle cluster cover.
PWA-10008	5120-511-1478	Puller	Accessory drive oil seal housing replacement.
PWA-10010	1730-249-3188	Sling	Engine lifting sling.
PWA-10011	1730-294-3141	Bracket	Afterburner duct and nozzle lifting brackets.
PWA-10012	4920-693-8153	Guide	Fuel control oil seal (small shaft) replacement.
PWA-10013	5120-693-8154	Puller	Afterburner flame holder tie rod replacement.
PWA-10014	5120-596-1196	Wrench	Main oil screen and spacer retaining nut replacement.
PWA-10015	5120-693-8155	Wrench	Oil pressure relief valve replacement.
PWA-10016	4920-693-8156	Guide	N_1 and N_2 tachometer shaft oil seal replacement.
PWA-10017	5120-693-8157	Drift	Fuel pump and fuel control oil seal replacement.
PWA-10018	4920-326-2011	Base	Fuel pump and fuel control oil seal replacement.
PWA-10030	5120-693-8158	Wrench	Fuel nozzle replacement.
PWA-10031	5120-693-8159	Crimper	Fuel nozzle tab lock installation.
PWA-10034	4920-506-3777	Base	N_2 tachometer drive oil seal replacement.
PWA-10035	5120-511-1481	Drift	N_2 tachometer drive oil seal replacement.
PWA-10063	4920-570-9001	Bracket	Diffuser case attachment.
PWA-10064	4920-570-9002	Bracket	Diffuser case attachment.
PWA-10065	4920-570-9003	Bracket	Diffuser case attachment.
PWA-10066	4920-570-9004	Bracket	Diffuser case attachment.
PWA-10067	4920-570-9005	Clamp	Fuel nozzle sealing replacement.
PWA-10067-D12		Seal	Neoprene seal for use with PWA No. 10067 (Excello fuel nozzle).
PWA-10067-D13	4920-623-2830	Seal	Neoprene seal for use with PWA No. 10067 (Delevan fuel nozzle).
PWA-10068	4920-570-9006	Adapter	Fuel manifold pressure check at engine.

4-2. LIST OF SPECIAL EQUIPMENT AND TOOLS (CONT).

PART NO.	STOCK NO.	NOMENCLATURE	APPLICATION
POWER PLANT (T.O. 1F-106A-2-4) (CONT).			
PWA-10069	4920-570-7384	Stand	Afterburner nozzle actuation test stand.
PWA-10077	5120-570-7416	Spreader	Combustion chamber outlet duct clamp removal.
PWA-10080	1730-555-4588	Collar	Combustion chamber outer case lifting collar.
PWA-10130	4920-570-7643	Support	Front air inlet case support.
PWA-10131	4920-570-7644	Mount	Front air inlet case mount.
PWA-10133	4920-570-7645	Mount	Diffuser case, right mount.
PWA-10134	4920-570-9007	Mount	Diffuser case, left mount.
PWA-10135	4920-570-7647	Support	Diffuser case support.
PWA-10136	4920-570-7648	Mount	Turbine exhaust case mount.
PWA-10137	4920-570-7649	Support	Turbine exhaust case support.
PWA-10157	5120-534-0705	Pin	Combustion chamber inner front and rear case alignment pin.
PWA-10180	5210-607-6097	Gage	First stage turbine blade stretch check gage.
PWA-10193	5120-534-0113	Puller	No. 6 bearing oil suction pump drive gear puller.
PWA-10226	5120-534-0724	Drift	Starter oil seal drift.
PWA-10228	5120-534-0722	Drift	Starter and hydraulic pump oil seal drift.
PWA-10229	1730-554-4809	Bracket	Afterburner front duct lift and trunnion bracket.
PWA-10237	5120-534-0719	Wrench	Anti-icing air tube retaining nut wrench.
PWA-10290	5120-592-6325	Puller	Combustion chamber positioning pin puller.
PWA-10318	5120-541-6836	Wrench	Fuel manifold inlet adapter retaining nut wrench.
PWA-10319	5120-593-3564	Support	Fuel manifold inlet adapter retaining nut support.
PWA-10332	5120-592-9079	Puller	Main oil pump puller.
PWA-10347	4920-593-4099	Fixture	Main oil screen assembly fixture.
PWA-10375	5120-601-1164	Drift	N_1 tachometer generator drive oil seal drift.
PWA-10376		Base	N_1 governor and tachometer oil seal housing base.
PWA-10381		Drift	Main oil pump seal drift.

4-2. LIST OF SPECIAL EQUIPMENT AND TOOLS (CONT).

PART NO.	STOCK NO.	NOMENCLATURE	APPLICATION
POWER PLANT (T.O. 1F-106A-2-4) (CONT).			
PWA-10389		Guide	Main oil pump seal guide.
PWA-10392	5120-593-9211	Puller	Afterburner bypass fuel screen weldment puller.
PWA-10412		Clamp	Afterburner front duct lift and trunning clamp.
PWA-10462	1730-555-6228	Bracket	Afterburner front duct lift and trunnion bracket (P-9 only).
PWA-10480		Wrench	Tube connecting nut spanner wrench.
PWA-10484	1730-555-4232	Adapter	Engine front lifting adapter.
PWA-10518	4920-611-2208	Adapter	Fuel manifold pressure test in diffuser case.
PWA-10572		Adapter	Fuel manifold pressure test in diffuser case.
PWA-10602		Stand	Fuel manifold pressure test in diffuser case.
PWA-10628		Cap	Fuel manifold pressure test in diffuser case.
PWA-10718		Hose and Valve Assembly	Fuel manifold pressure test in diffuser case.
PWA-10719		Adapter	Fuel manifold pressure test in diffuser case.
PWA-10722		Adapter	Fuel manifold pressure test in diffuser case.
PWA-10723		Adapter	Fuel manifold pressure test in diffuser case.
PWA-15180	4920-589-9624	Power Assembly	Fuel control remote trimmer power assembly.
PWA-15198		Adapter	Power source cart adapter.
FUEL SUPPLY (T.O. 1F-106A-2-5).			
SE 0896	4920-330-4095	Adapter Assembly—Defueling	Connects airplane defueling valve to defueling truck hose.
8-96252	1730-674-0015	Adapter—External Fuel Tank Handling	To adapt external fuel tank to maintenance trailer for transportation and storage.
SE 0787	4930-693-1242	Funnel—Fuel Tank Sump Drain	Used to drain fuel tank sumps.
SE 0787-801		Funnel-Fuel Tank Sump Drain	Used to drain fuel tank sump drains.

4-2. LIST OF SPECIAL EQUIPMENT AND TOOLS (CONT).

PART NO.	STOCK NO.	NOMENCLATURE	APPLICATION
FUEL SUPPLY (T.O. 1F-106A-2-5) (CONT).			
SE 0787-803		Funnel—Fuel Tank Sump Drain	Used to drain fuel tank sump drains.
8-96372-1		Kit—Fuel Tank Vent Plugs	To plug vent outlets during fuel system check procedure.
8-96109		Pin Assembly—External Fuel Tank Safety	Prevents inadvertent operation of tank jettison system.
8-96168		Pin, Safety—External Fuel Tank Mechanism	Prevents inadvertent operation of external fuel tank jettison system during maintenance.
8-96199	4920-659-6372	Test Stand—Fuel System (Refer to T.O. 33D2-3-11-1)	To check fuel system.
AIR CONDITIONING, ANTI-ICING AND OXYGEN (T.O. 1F-106A-2-6).			
8-96162	4130-611-1499	Adapter—Air Conditioner Quick Disconnect	Connects air conditioner or heater to alert status airplane.
8-96151	4130-611-1493	Adapter—Manual Disconnect	To connect portable air conditioner to airplane ducting.
8-96215	4920-649-5484	Adapter, Pitot-Static	Used on ice detector probe to apply regulated air pressure during operational check of surface and engine air anti-ice system.
8-96118	4120-555-1282	Air Conditioner—Electric Driven (Refer to T.O. 35E9-9-21)	Air conditions the cockpit, electronic compartments and missile bays during maintenance.
8-96213	4730-628-3835	Disconnect—Manual	To connect portable air conditioner to airplane ducting.
SE 0973	4520-509-0740	Heater—Portable Gas Engine Driven (Refer to T.O. 35E7-2-5-1)	Heats cockpit, electronic compartments and missile bay during maintenance.
SE 1055	4520-509-0741	Heater—Portable Electric Motor Driven (Refer to T.O. 35E7-2-5-1)	Heats cockpit, electronic compartments and missile bays during maintenance.
8-96155		Support Assembly—Dorsal Door	Holds dorsal and air conditioning compartment doors open during maintenance.
20600 (Scott)		Tester—Scott Portable (Refer to T.O. 33D2-10-16-1)	For operational checkout of survival kit oxygen regulator.
8-96054	4920-594-0166	Tester—Cabin Temperature Control (Refer to T.O. 33D-14-20-1)	Used during operational check of cabin temperature control system.
8-96054-801		Tester—Cabin Temperature Control (Refer to T. O. 33D2-14-20-1)	Used during operational check of cabin temperature control system.
SE 1001	4920-565-4927	Tester—Electric Heated Windshield Control (Refer to T. O. 33D2-14-18-11)	Used to bench check components of the windshield and/or canopy electrical anti-ice systems.

4-2. LIST OF SPECIAL EQUIPMENT AND TOOLS (CONT).

PART NO.	STOCK NO.	NOMENCLATURE	APPLICATION
AIR CONDITIONING, ANTI-ICING AND OXYGEN (T.O. 1F-106A-2-6) (CONT).			
SE 1001-801		Tester—Electric Heated Windshield Control (Refer to T. O. 33D2-14-18-11)	Used to bench check components of the windshield and/or canopy electrical anti-ice systems.
SE 1002	4920-573-2974	Tester—Electric Heated Windshield	Used in operational check of windshield heating system.
SE 1002-801	4920-670-9414	Tester—Electric Heated Windshield (Refer to T.O. 33D2-14-18-1)	Used in operational check of windshield heating system.
FLIGHT CONTROLS (T.O. 1F-106A-2-7).			
8-96182	4920-632-8569	Adapter—Elevon Actuator Bolt Extractor	Used during elevon actuator replacement.
8-96112	5120-592-2705	Adapter—Elevon Bolts Attaching	Used during elevon installation.
8-96170	4920-627-2826	Adapter—Rudder Actuator Attach Bolt	Used during installation of rudder actuator.
8-96133	5140-600-2658	Container—Elevon and Rudder Protractor	For storage of elevon and rudder protractors.
8-96486-805		Fixture – Angle of Attack Transmitter, Calibration Check	Used to calibrate the angle of attack system.
8-96197	1730-632-8433	Gage—Pilot's Stick Centering	Used to hold pilot's stick in neutral position while rigging the elevons.
8-96108	5220-588-6035	Gage—Drag Chute Overcenter Mechanism	Used during adjustment procedure of drag chute overcenter mechanism.
8-96101-1	5220-589-9510	Gage Set—Elevon Angle Rigging	Used to check various positions of elevon during rigging procedure.
8-96110	5220-589-9512	Gage—Rudder Angle Rigging	Used during rudder rigging procedure.
8-96101-2	5220-589-9511	Gage Set—Elevon Angle Rigging	Used to check various positions of elevon during rigging procedure.
8-96005	1730-522-2742	Lock Assembly Speed Brake	Prevents inadvertent closing of speed brakes during maintenance.
8-96005-801	1ABK-1560-614-1324	Lock Assembly—Speed Brake	Prevents inadvertent closing of speed brakes during maintenance.
8-96069	1730-657-6936	Pin Set—Rudder Control System Rigging	Holds rudder controls in neutral position during rigging procedure.
8-96069-801	1730-612-9260	Pin Set—Rudder Control System Rigging	Holds rudder controls in neutral position during rigging procedure.
8-96076	5180-600-2659	Rigging Set—Elevon Control System	Holds elevon controls in neutral position during rigging procedure.
8-96076-801	5180-608-8245	Rigging Set—Elevon Control System	Used in conjunction with 8-96076 to hold F-106B elevon controls in neutral position during rigging procedure.
8-96089	4920-546-6504	Tester-Calibrator Stability Augmentation (Refer to T.O. 33D3-2-34-11)	Tests and calibrates flight control damper amplifier in shop (Minneapolis-Honeywell).

4-2. LIST OF SPECIAL EQUIPMENT AND TOOLS (CONT).

PART NO.	STOCK NO.	NOMENCLATURE	APPLICATION
FLIGHT CONTROLS (T. O. 1F-106A-2-7) (CONT).			
8-96089-801	4920-624-7924	Tester-Calibrator Stability Augmentation (Refer to T.O. 33D3-2-34-21)	Tests and calibrates flight control damper amplifier in shop (Robertshaw-Fulton).
8-96123	4920-602-5464	Tester-Automatic Flight Control System (Refer to T.O. 33D3-2-34-1)	For checking operation of the Automatic Flight Control System in the airplane. (Systems with Minneapolis-Honeywell stability augmentation amplifiers.)
8-96123-801	4920-632-8574	Tester-Automatic Flight Control System (Refer to T.O. 33D3-2-34-1)	For checking operation of the Automatic Flight Control System in the airplane. (Systems with Robertshaw-Fulton stability augmentation amplifiers.)
SE 0985	4920-565-0192	Tester—Elevon and Rudder Feel System (Refer to T.O. 33D2-6-78-1)	Checks pressure and operation of artificial feel system.
8-96171	5120-613-3708	Wrench—Rudder Actuator Bolt Extractor	Used during rudder actuator removal.
8-96114	5120-601-9382	Wrench Torque—Elevon Horn Attach	Used during elevon installation.
LANDING GEAR (T.O. 1F-106A-2-8).			
8-96296	1730-657-9638	Clamp—MLG Strut Restraining	Prevents main landing gear shock strut(s) from extending during maintenance.
8-96175	1730-631-6467	Clamp—NLG Strut Restraining	Prevents nose landing gear shock strut from extending during maintenance.
8-96082	1730-545-6014	Pin Assembly—Nose Landing Gear Strut Restraining	Locks nose wheel steering unit in neutral position during maintenance.
8-96020	5120-545-6091	Puller Assembly—Main Landing Gear Trunnion Pin	Withdraws trunnion pin from trunnion pin housing during landing gear removal.
8-96019-801	5120-587-3964	Puller Assembly—Nose Landing Gear Trunnion Pin	Withdraws trunnion pin from trunnion pin housing during landing gear removal.
8-96084	5120-567-5417	Rigging Tool—Main Landing Gear Door Mechanism	Used during main landing gear door adjustment procedure.
ST 00520	5120-028-3622	Wrench—Main and Nose Landing Gear Wheel	Used during removal or installation of main and/or nose landing gear wheels.

4-2. LIST OF SPECIAL EQUIPMENT AND TOOLS (CONT).

PART NO.	STOCK NO.	NOMENCLATURE	APPLICATION
INSTRUMENTS (T.O. 1F-106A-2-9).			
UG292B-4 (Minneapolis-Honeywell)	4920-610-8872	Adapter	Connects the airplane fuel quantity system circuit to MD-1 tester on airplanes having 9,600 pounds indicator range.
UG292B-6 (Minneapolis-Honeywell)	4920-701-7880	Adapter	Connects the airplane fuel quantity system circuit to MD-1 tester on airplanes having 11,200 pounds indicator range.
UG724A-1 (Minneapolis-Honeywell)	4920-701-3177	Adapter	Used in conjunction with MD-2 tester for operational check of the airplane fuel quantity system components.
UG390A-3 (Minneapolis-Honeywell)	4920-607-6713	Adapter – Cable Assembly	Used in conjunction with UG316A-1 tester for bench check of fuel quantity system components.
UG390A-1 (Minneapolis-Honeywell)	6625-519-0392	Cable Assembly	Used in conjunction with UG316A-1 tester for bench check of fuel quantity system components.
UG390F-1 (Minneapolis-Honeywell)	4920-705-4586	Cable Assembly	Used in conjunction with UG316A-1 tester for bench check of fuel quantity system components.
UG531A-1 (Minneapolis-Honeywell)	4920-601-3177	Cable Assembly	Used in conjunction with UG316A-1 tester for bench check of fuel quantity system components.
UG781A-1 (Minneapolis-Honeywell)	4920-602-5722	Cable Assembly	Used in conjunction with UG316A-1 tester for bench check of fuel quantity system components.
UG389A-1 (Minneapolis-Honeywell)	4920-570-9120	Harness	Connects the airplane fuel quantity system components to MD-2 tester for operational check.
UG33A-1 (Minneapolis-Honeywell)	5120-398-4550	Stretcher	Used to install steel band that secures connector case to tank capacitance unit.
UG316A-1 (Minneapolis-Honeywell)	4920-507-8064	Tester—Transistorized Indicator (Refer to T. O. 33D1-3-10-1)	Used for bench check of transistorized fuel quantity indicators.
ST 00561	5120-525-7014	Wrench—Boom Attach	Used during removal and/or installation of nose boom.
ELECTRICAL (T.O. 1F-106A-2-10).			
8-96052-801	6115-690-4050	Adapter Cable—Electrical Ground Power	Used to connect MC-1 or MD-3 ground power units to AWCIS airplanes when AWCIS ground power units are not available.
8-96026	6115-617-1417	Generator Set—Gasoline Engine Trailer Mounted (USAF Type AF/M32-2) (Refer to T.O. 35C2-3-265-11)	Provides power for airplane's electrical and electronic systems during maintenance.

4-2. LIST OF SPECIAL EQUIPMENT AND TOOLS (CONT).

PART NO.	STOCK NO.	NOMENCLATURE	APPLICATION
ELECTRICAL (T. O. 1F-106A-2-10) (CONT).			
8-96026-801	6115-583-9365	Generator Set—Gasoline Engine Trailer Mounted (USAF Type AF/M32A-13) (Refer to T.O. 35C2-3-265-21)	Provides power for airplane's electrical and electronic systems during maintenance.
8-96025	6125-620-6468	Motor Generator—Portable (USAF Type AF/M24M-1) (Refer to T.O. 35C2-2-25-31)	Provides power for airplane's electrical and electronics systems during maintenance.
8-96025-803	6125-583-3225	Motor Generator—Portable (USAF Type AF/ECU-10/M) (Refer to T.O. 35C2-2-25-41)	Provides power for airplane's electrical and electronics systems during maintenance.
8-96025-805		Motor Generator—Portable (USAF Type A/24M-2) (Refer to T.O. 35C2-2-25-21)	Provides power for airplane's electrical and electronics systems during maintenance.
8-96016-801		Test Set—Electrical Power (Type MA-1) (Refer to T.O. 33D2-4-18-1)	Measures performance of airplane electrical power supply systems.
8-96016-803	4920-650-6275	Test Set—Electrical Power (Type A/E 24T-12) (Refer to T.O. 33D2-4-18-11)	Measures performance of airplane electrical power supply systems.
8-96016-805		Test Set—Electrical Power (Type MA-1) (Refer to T.O. 33D2-4-18-1)	Measures performance of airplane electrical power supply systems.
SE 0997	4920-546-6506	Tester—Control Cable Fire Detector (Refer to T.O. 33D2-2-6-1)	Used during operational check of fire detection system.
8-96057 8-96057-801	4920-567-5140 4920-567-5140	Tester—Master Warning Box (Refer to T.O. 33D2-19-2-1)	Used during operational check of master warning system.
8-96142	4920-633-5784	Tester—Silver-Zinc Battery	Determines state of charge of battery electrolyte.
ARMAMENT (T.O. 1F-106A-2-12).			
8-96456	5120-600-2652	Adapter—Forward Launcher Snubber, Lower Locknut Wrench	Used to torque forward launcher snubber, lower locknut.
8-96457	5120-677-5715	Adapter—Forward Launcher Snubber, Upper Locknut Wrench	Used to torque forward launcher snubber, upper locknut.
SE 0996	1730-511-5438	Bar Assembly—Missile Handling	Used to unload missiles from storage container and to load missiles into handling frame.
SE 1084	4920-614-6670	Control—Pneumatic Launcher Rigging	Used on armament system's pneumatic cylinders during system rigging.
8-96092	1730-601-2253	Cord Assembly—Armament Control	Used for remote operation of missile bay doors and missile launchers during maintenance.
SE 0967-805		Frame—Missile Loading and Handling	To load GAR-3 missiles on launcher rails.

4-2. LIST OF SPECIAL EQUIPMENT AND TOOLS (CONT).

PART NO.	STOCK NO.	NOMENCLATURE	APPLICATION
ARMAMENT (T.O. 1F-106A-2-12) (CONT).			
SE 0967-809		Frame—Missile Loading and Handling	To load GAR-3A/4A missile on launcher rails.
8-96450		Gage—Special Weapon Switch Adjustment	To adjust the special-weapon-aboard and rocket gone switch.
8-96091	5220-590-2096	Gage—Armament Door Adjustment	Used during installation and adjustment of missile bay doors.
8-96061-801	1730-629-3150	Lock Assembly—Missile Bay Doors	Prevents inadvertent closing of missile bay doors on F-106A airplanes during maintenance.
8-96061-803		Lock Assembly—Missile Bay Doors	Prevents inadvertent closing of missile bay doors on F-106A or F-106B airplanes during maintenance.
8-96030	8200-625047-65	Safety Lock Assembly—Aft	Locks aft missile launchers of F-106A/B airplanes in extended position during maintenance.
8-96029	1730-591-8553	Safety Lock Assembly—Forward	Locks forward missile launchers of F-106A airplanes in extended position during maintenance.
8-96152		Safety Lock Assembly—Forward Missile Launcher	Locks forward missile launchers of F-106B airplanes in extended position during maintenance.
8-96135		Pin—Armament Control Valve Safety	Prevents inadvertent closing of missile bay doors during maintenance.
8-96261		Pin—Armament Lock	To pin the armament lock valve in the "LOCK" position.
8-57268		Pin—Safety	To lock ejector shackle mechanism in closed position.
8-96042	5180-594-0181	Set—Boresighting and Harmonizing	Used during boresighting operation of armament system.
8-96042-803	5180-608-6978	Set—Boresighting and Harmonizing	Used during boresighting operation of armament system.
8-96042-805		Set—Boresighting and Harmonizing	Used during boresighting operation of armament system.
8-96288	4920-674-0201	Tester—Armament Squib Circuit	To check fire pulse and stray voltage at missile umbilical disconnect.
8-96293	5120-656-2624	Tester—Armament Rocket Gone Switch (Refer to T.O. 33D3-11-2-1)	To test operation of the special-weapon-aboard and rocket gone switch.
8-96191	4920-632-8571	Tester—Ejector (Refer to T.O. 33D3-11-2-1)	To restrain and absorb the force of pistons activated by ejector cartridges.

4-2. LIST OF SPECIAL EQUIPMENT AND TOOLS (CONT).

PART NO.	STOCK NO.	NOMENCLATURE	APPLICATION
ARMAMENT (T. O. 1F-106A-2-12) (CONT).			
8-96190	4920-674-0203	Tester—Synchronization (Refer to T.O. 33D3-11-2-1)	For indicating time lapse between forward and aft shackle opening.
8-96134	4920-608-4721	Tester—Armament Control Relay Box (Refer to T.O. 33D5-16-5-1)	Used in operational check of armament system.
8-96072	4920-602-5413	Tester—Armament System (Refer to T.O. 33D5-12-37-1)	Used during operational check of armament system.
SE 0992-801	1450-605-3758	Trailer—Missile and Rocket Transport (Refer to T.O. 35D3-11-5-1)	Transports missiles and rockets from storage area to flight line.
ELECTRONIC (T. O. 1F-106A-2-15).			
486148-100 (Hughes)		Hand Truck—Radar Maintenance	Used to transport radar antenna and radar receiver-transmitter.
486122-100 (Hughes)		Hand Truck—Test Equipment	Used for transporting and handling test equipment and system units.
8-96015	1730-554-6695	Hoist Assembly—MA-1 AWCIS Transmitter and Modulator	Used during removal and installation of MA-1 AWCIS transmitter-receiver unit.
8-96145		Support Assembly—Electronic Rack Door	*On F-106B airplanes,* holds lower aft-electronic door open during maintenance.
8-96145-801		Support Assembly—Electronic Rack Door	*On F-106B airplanes,* holds lower aft-electronic door open during maintenance.
8-96027	1730-534-0562	Support Assembly – Intermediate Radar Door	Holds door open during maintenance.
486057 (Hughes)		Test Data Storage—Magnetic Drum	Provides test programs for periodic checkout. Consists of data storage magnetic drum (057 unit) with test routines recorded by means of special test tape.
486109-100 (Hughes)		Test Set—Air Data Computer	Provides for operation of air data computer group of FC&M subsystem.
486117-100 (Hughes)		Test Set—Armament	Used to check operation of armament control group.
486106-100 (Hughes)		Test Set—Radio Beacon Simulator	Provides for operation of TACAN group of CN&L subsystem.
486118-110 (Hughes)		Test Set—Stabilization Data Generator	Provides for operation of stable reference group of FC&M subsystem.
8-96156	5120-600-2652	Wrench Assembly—Electronic Rack Shock Mount	Used during removal and installation of electronic rack shock mounts.

PORTABLE HYDRAULIC TEST STAND

4-3. GENERAL.

Portable hydraulic test stands are used as sources of external hydraulic power for the airplane primary and secondary hydraulic systems during ground test operations. The various test stands that may be used with the F-106A and F-106B airplanes are described in succeeding paragraphs of this handbook section.

4-4. CONNECTING HYDRAULIC TEST STAND.

Quick-disconnect couplings, in the engine accessory and hydraulic accessory compartments, are provided to connect the hydraulic test stand to the airplane's hydraulic system. Figure 4-2 illustrates the quick-disconnect couplings before and after connection. Figure 4-3 illustrates the test stand to airplane connecting points.

CAUTION

Inspect lock teeth on lock spring assembly for damage before making a connection. Quick-disconnect couplings require hand tightening only. Over-torquing may result in permanent damage to the lock teeth on the lock spring assembly. Couplings should be covered when disconnected to prevent contamination by foreign matter.

When systems are to be operated by means of the hydraulic test stand, the stand must be connected to both the airplane primary and secondary hydraulic systems.

4-5. PORTABLE HYDRAULIC TEST STAND, SE 1061 (4920-517-1028).

The gasoline operated hydraulic test stand SE 1061 (4920-517-1028) is illustrated in figure 4-4. Refer to T.O. 33A-2-24-1 for operating instructions on this test stand.

4-6. PORTABLE HYDRAULIC TEST STAND, SE 0976 (4920-204-3115).

Refer to T.O. 33A2-2-22-1 for operating instructions on the electrically operated hydraulic test stand, SE 0976 (4920-204-3115).

4-7. ALTERNATE PORTABLE HYDRAULIC TEST STAND SE 0567-801 (4920-204-2462).

Instructions for operating the portable hydraulic test stand are listed in T.O. 33A2-2-18-11. See figure 4-5 for an illustration of this stand.

HIGH-PRESSURE AIR COMPRESSOR

4-8. DESCRIPTION.

The high-pressure ground air compressor unit, SE 0704-801 (4310-697-0858), is used to charge the airplane high-pressure pneumatic system to full operating pressure. The air compressor is a four-stage, air-cooled, single-acting, reciprocating unit designed for continuous operation. It has a standard operating pressure range of 900 to 3500 psi, while delivering a rated output capacity of 15 cubic feet of commercial standard air per minute. A heavy-duty four-cycle engine drives the compressor through a V-belt. The entire assembly is mounted on a four-wheel trailer equipped with hand brakes on the rear wheels. The principle of the compressor operation is that of multistage compression. In this unit, air is compressed to 3500 psi in four distinct stages with each stage requiring one-fourth of the total air horsepower. Air is drawn through the oil bath filter into the first-stage cylinder by action of the first stage piston. Upon discharge from the fourth-stage cylinder, the air passes to and through the aftercooler. From the aftercooler the air passes to the air receivers for storage and ultimate use. Before the air enters the service line it passes through two dehydrator cylinders which insure dry air for the high-pressure pneumatic system. High-pressure air to the unit service line is controlled by a priority valve which does not permit air flow into the service line until the pressure has built up to 2400 psi. When pressure in the system reaches 3500 psi, the compressor controls will automatically load and unload the system to maintain constant pressure. See figure 4-6 for an illustration of this compressor unit.

4-9. STARTING AND OPERATING INSTRUCTIONS FOR HIGH-PRESSURE AIR COMPRESSOR SE 0704-801 (4310-697-0858).

Refer to T.O. 34Y1-56-31 for starting and operating instructions for this compressor unit.

CAUTION

INSPECT LOCK TEETH ON LOCK SPRING FOR EVIDENCE OF DAMAGE BEFORE MAKING A CONNECTION. COUPLINGS SHOULD ALWAYS BE COVERED WHEN DISCONNECTED TO PREVENT CONTAMINATION BY FOREIGN MATTER.

QUICK DISCONNECT COUPLING TORQUE VALUES

COUPLING DASH NO.	COUPLING SIZE	FOOT LBS.
-4	1/4	10
-5	5/16	10
-6	3/8	15
-8	1/2	15
-10	5/8	20
-12	3/4	20
-16	1	30
-20	1-1/4	30
-24	1-1/2	30

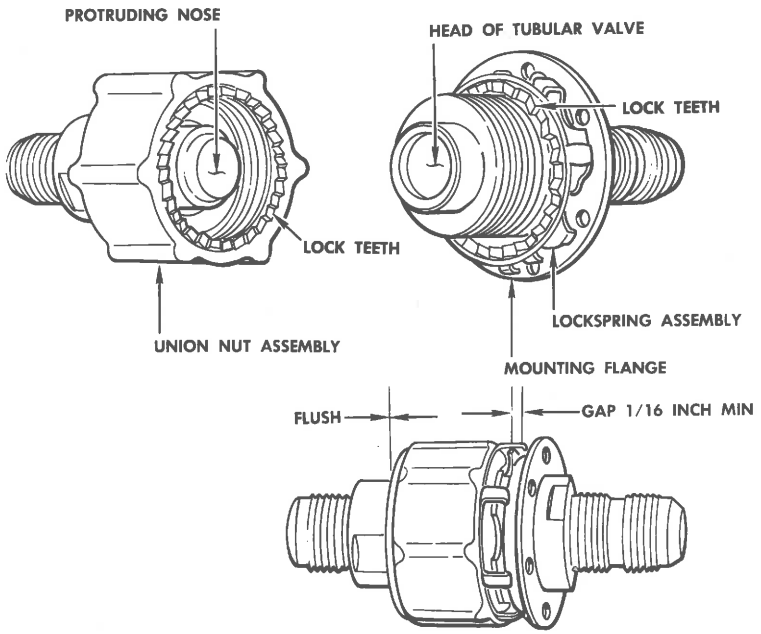


Figure 4-2. Quick-Disconnect Couplings

PORTABLE GAS TURBINE COMPRESSOR

4-10. DESCRIPTION.

The gas turbine ground compressor unit, MA-1A (8200-161024), is an item of service equipment designed to provide a large volume of low-pressure compressed air for the starting of the airplane engines equipped with air starters. This unit consists of a trailer upon which is mounted a gas turbine unit complete with fuel tank, batteries, control panel, and sufficient hose for connection to the airplane. Instructions for operating the compressor are on a placard attached to the control panel. The unit is used on airplanes equipped with the pneumatic type starter.

4-11. STARTING ENGINE WITH GAS TURBINE COMPRESSOR.

The engine pneumatic starter (on some airplanes) is operated by a large volume of low-pressure air supplied by a gas turbine compressor. A flow of 110 pounds per minute at a pressure of 30.3 psi is necessary to start engine. Hook up compressor as follows:

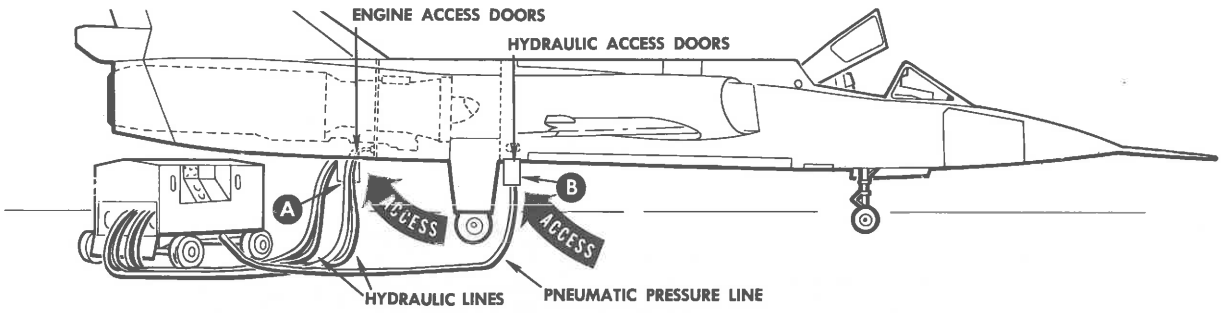
a. Open access door at Station 511 on the bottom of the fuselage.

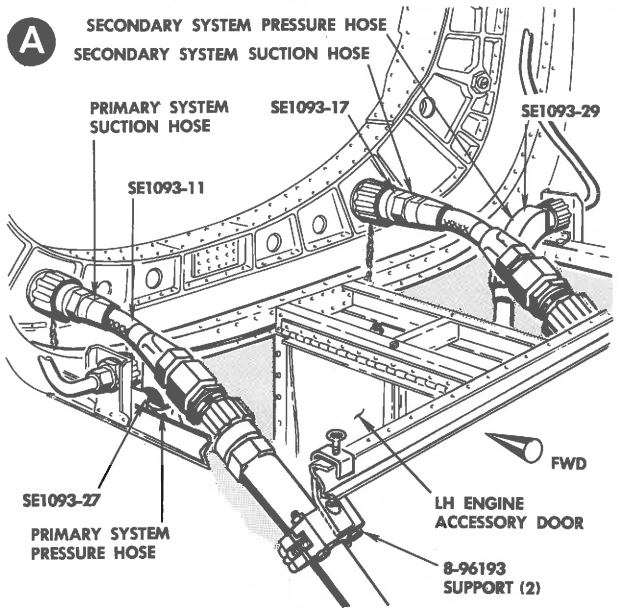
b. Connect compressor flexible hose to starter connection, and plug in start valve electrical connector.

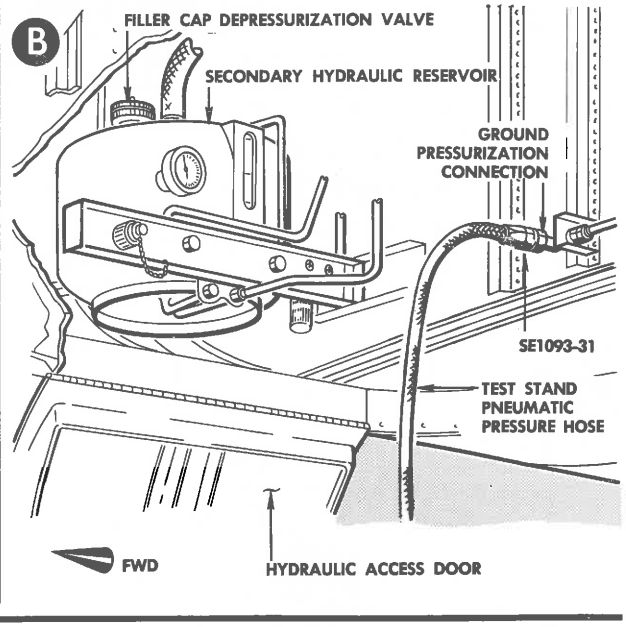
c. Start compressor by following instructions on plate attached to compressor.

d. When required volume and pressure of air are attained, signal cockpit that engine is ready to start.

e. Stop compressor, disconnect flexible hose from airplane ground connection, disconnect electrical connection, and close access door after engine is started.







INSTRUCTIONS FOR TEST STAND AND AIRPLANE CONNECTIONS

CAUTION

BE SURE HOSE ENDS AND ADAPTERS ARE THOROUGHLY CLEAN BEFORE CONNECTING TO TEST STAND AND AIRPLANE. EVEN A SMALL AMOUNT OF DIRT CAN CAUSE MALFUNCTIONS.

a. Open hydraulic Access and Ram Air Turbine doors.

NOTE

WHEN USING THE SE 1061-801 (4920-670-9415) OR SE 0976-801 (4920-204-3115) HYDRAULIC TEST STANDS, SUBSTITUTE ADAPTER 8-96467-1 FOR SE 1093-27 AND SE 1093-29 ADAPTERS, AND ADAPTER 8-96467-3 FOR SE 1093-11 AND SE 1093-17. HYDRAULIC HOSE SUPPORT AND ADAPTER FOR GROUND PRESSURIZATION ARE NOT REQUIRED.

b. Relieve pressure in primary and secondary hydraulic system by operating elevons.
c. Relieve air pressure primary and secondary hydraulic system reservoirs by depressing valve on top of manual filler cap.
d. Open engine accessory compartment door.
e. Disconnect primary system suction hose from quick disconnect fitting and connect test stand suction hose using SE1093-11 adapter.
f. Disconnect primary system pressure hose at quick disconnect fitting and connect test stand pressure hose using SE1093-27 adapter.
g. Repeat steps "d" through "f" for secondary hydraulic system using SE1093-17 and SE1093-29 adapters, see detail A.
h. Connect test stand pneumatic pressure hose to reservoir ground pressurization connection using SE1093-31 adapter.

NOTE

TEST STAND PNEUMATIC PRESSURE HOSE IS CONNECTED TO AIRPLANE ONLY WHEN OPERATING TEST STAND IN THE "SHIP RESERVOIR" POSITION.

i. After hydraulic test stand operations are completed, disconnect test stand hoses, connect primary and secondary hydraulic system hoses, and cap reservoir ground pressurization fitting.

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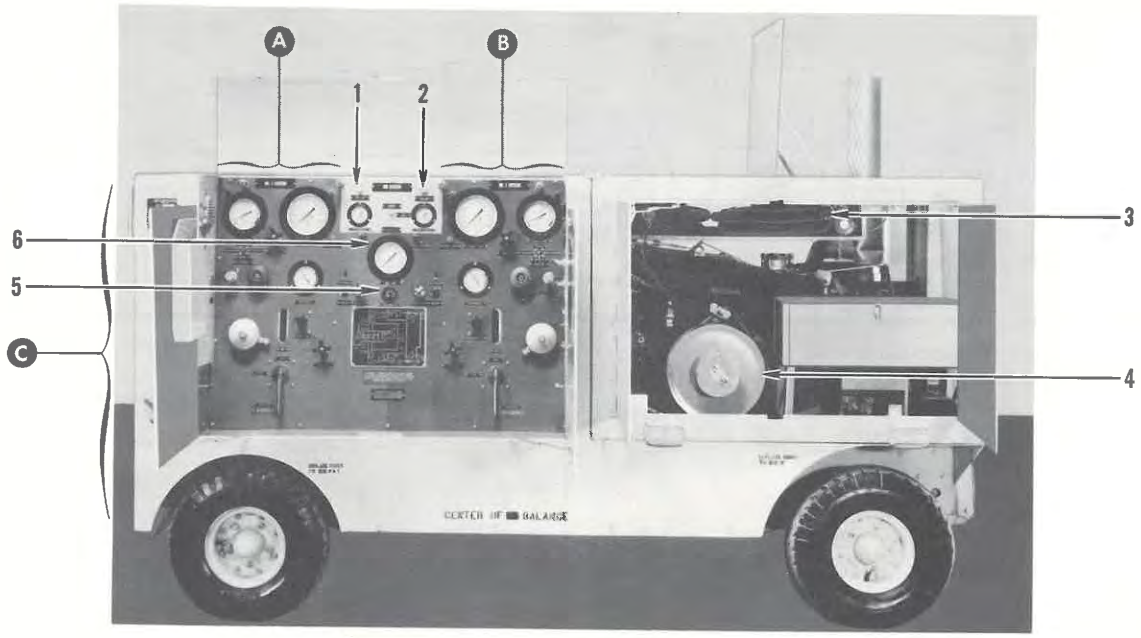
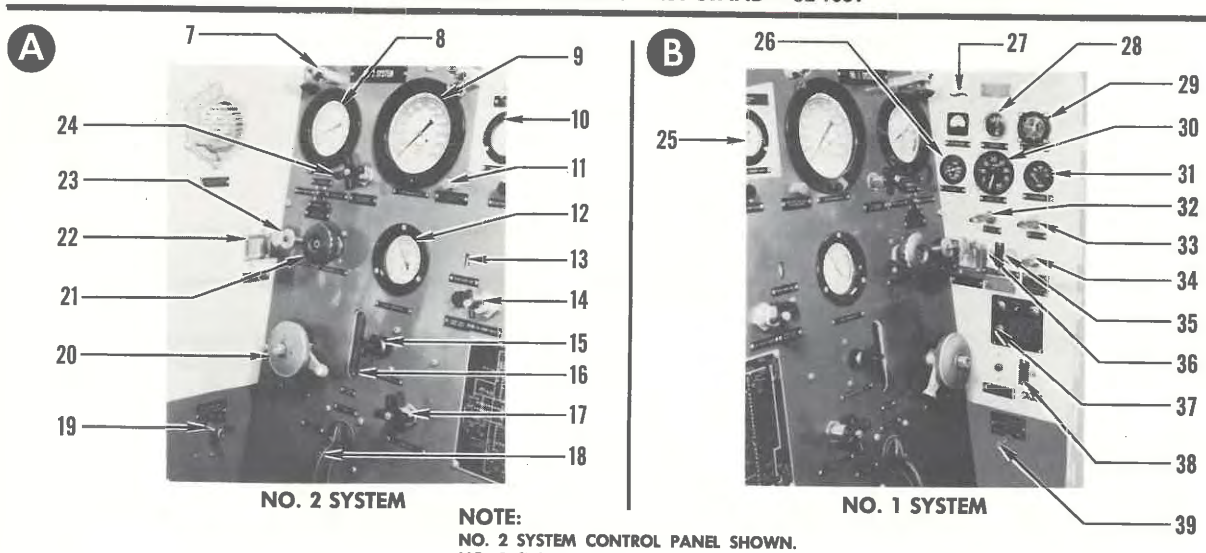
Figure 4-3. Hydraulic Test Stand and Airplane Connections



PORTABLE HYDRAULIC TEST STAND—SE 1061



NO. 2 SYSTEM

NO. 1 SYSTEM

NOTE:
NO. 2 SYSTEM CONTROL PANEL SHOWN.
NO. 1 SYSTEM CONTROL PANEL SIMILAR.

1. STAND RESERVOIR REGULATOR
2. EXTERNAL PRESSURE REGULATOR
3. SERVICING HOSE STOWAGE
4. CABLE REEL
5. STAND RESERVOIR LEVEL INDICATOR
6. FILL SYSTEM FILTER PRESSURE DROP
7. PANEL LIGHTS
8. LOW PRESSURE GAGE
9. HIGH PRESSURE GAGE
10. STAND PRESSURE GAGE
11. HIGH PRESSURE FILTER WARNING LIGHT
12. FLUID TEMPERATURE GAGE
13. FILTER BLEED LINE
14. FILL RELIEF VALVE
15. HIGH PRESSURE RELIEF VALVE
16. RETURN LINE (SIGHT TUBE)
17. DUMP VALVE
18. RESERVOIR SELECTOR
19. BOOST PRESSURE INTERLOCK SWITCH
20. VOLUME CONTROL
21. FLOW CONTROL VALVE
22. VOLUME INDICATOR
23. PRESSURE COMPENSATOR
24. HIGH PRESSURE GAGE SHUTOFF
25. EXTERNAL PRESSURE GAGE
26. ENGINE OIL TEMPERATURE
27. TEST STAND ENGINE CONTROL PANEL
28. ENGINE AMMETER GAGE
29. ENGINE HOURMETER
30. ENGINE RPM
31. ENGINE OIL PRESSURE
32. CHOKE
33. THROTTLE
34. DETENT (MANUAL ENGINE STARTER)
35. STARTER BUTTON
36. IGNITION SWITCH
37. HEATER SWITCH
38. PANEL LIGHT SWITCH
39. BOOST PRESSURE INTERLOCK SWITCH

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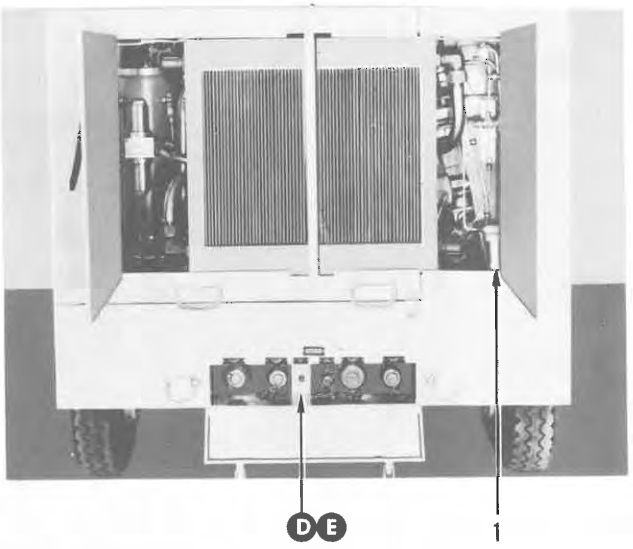
Figure 4-4. Hydraulic Test Stand, SE1061 (4920-517-1028) (Sheet 1 of 2)

1. AIR COMPRESSOR WATER SEPARATOR
2. AIR OUTLET AND SHUTOFF VALVE
3. PNEUMATIC PRESSURE OUTLET
4. NO. 2 SYSTEM PRESSURE OUTLET
5. NO. 2 SYSTEM RETURN (SUCTION)
6. NO. 1 SYSTEM PRESSURE OUTLET
7. NO. 1 SYSTEM RETURN (SUCTION)
8. SERVICING HOSES
9. SE 1093-27 (NO. 1 PRESSURE)
10. SE 1093-29 (NO. 2 PRESSURE)
11. SE 1093-11 (NO. 1 SUCTION)
12. SE 1093-17 (NO. 2 SUCTION)
13. SE 1093-31 PNEUMATIC

C



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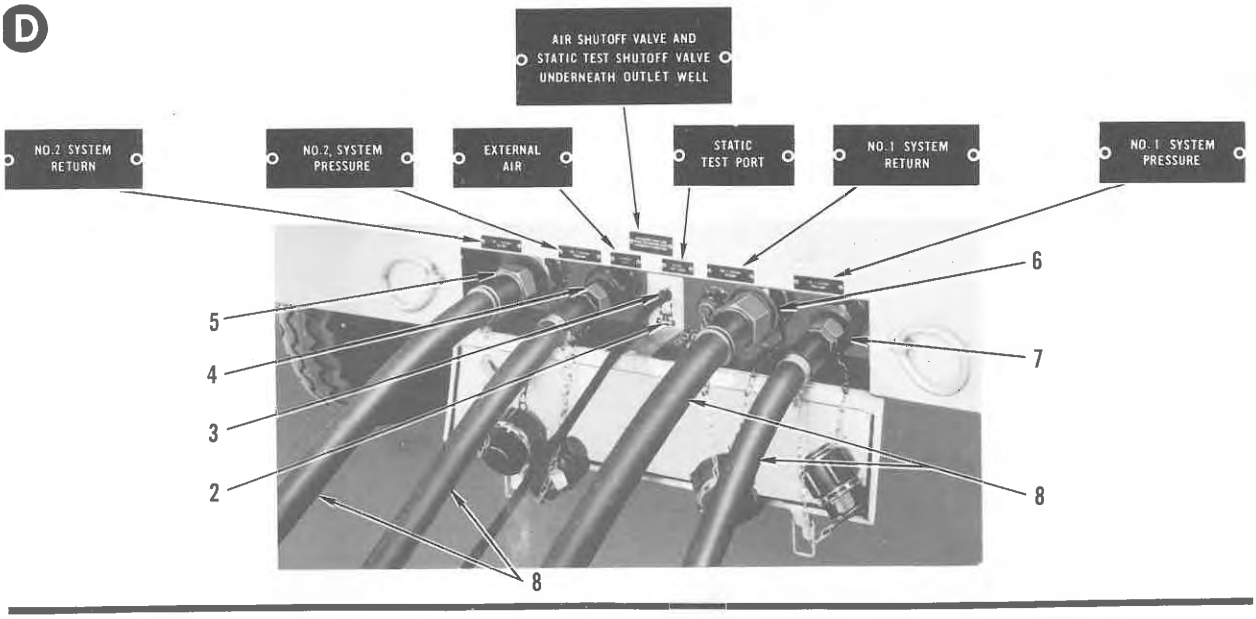

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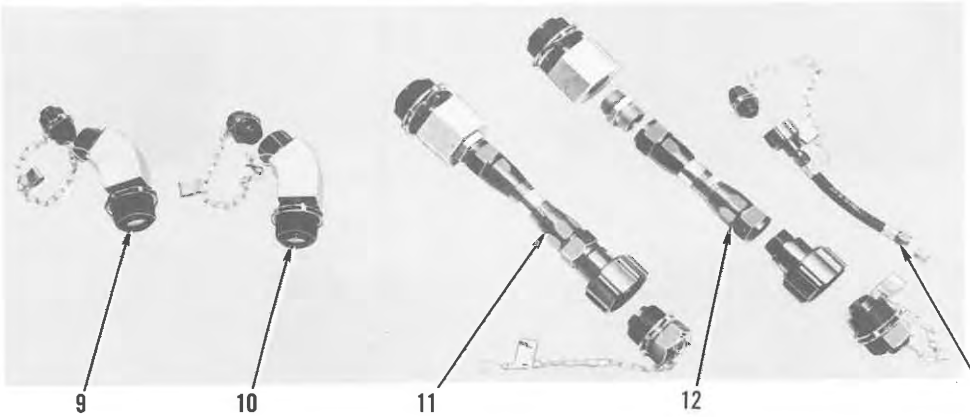

ADAPTERS USED TO CONNECT HOSES TO AIRPLANE

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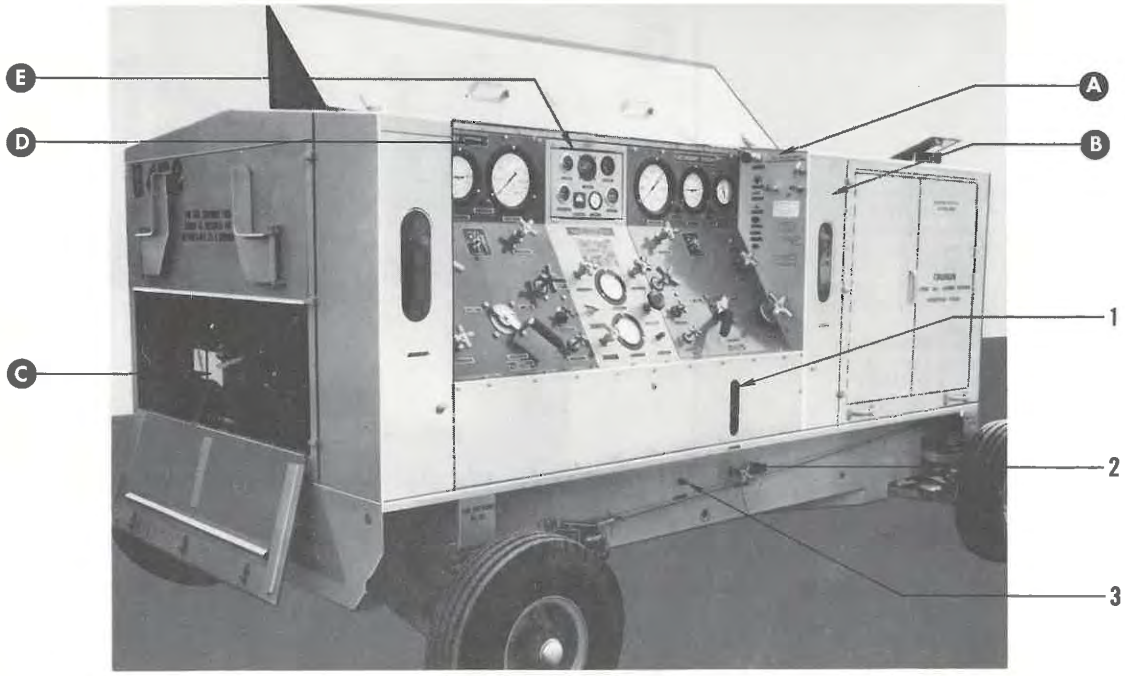
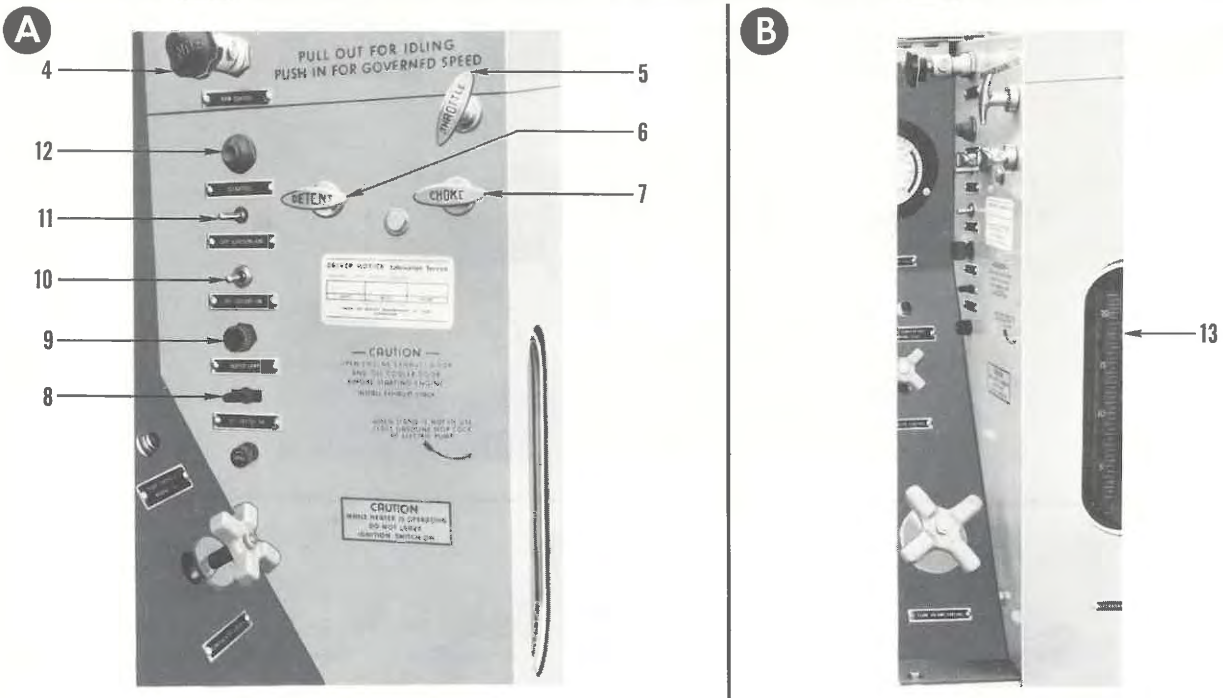
Figure 4-4. Hydraulic Test Stand, SE1061 (4920-517-1028) (Sheet 2 of 2)





1. HAND PUMP RECEPTACLE.
2. AIR OUTLET AND SHUTOFF VALVE.
3. HAND PUMP OUTLET.
4. RPM CONTROL.
5. THROTTLE.
6. DETENT (MANUAL ENGINE STARTER).
7. CHOKE.
8. HEATER SWITCH.
9. HEAT INDICATOR LIGHT.
10. COOLER SWITCH.
11. IGNITION SWITCH.
12. STARTER BUTTON.
13. FLOW GAGE.

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Figure 4-5. Alternate Hydraulic Test Stand SE0567-801 (4920-204-2462) (Sheet 1 of 2)

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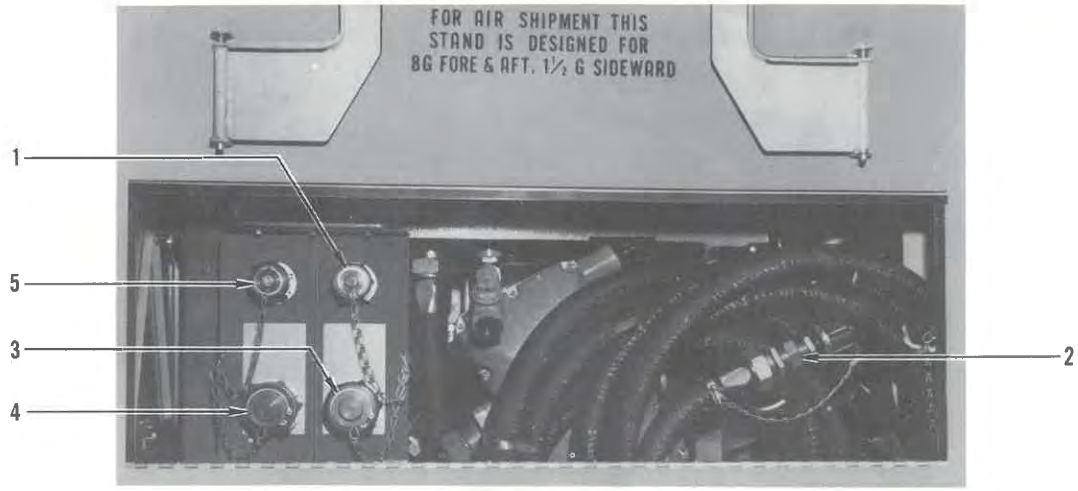
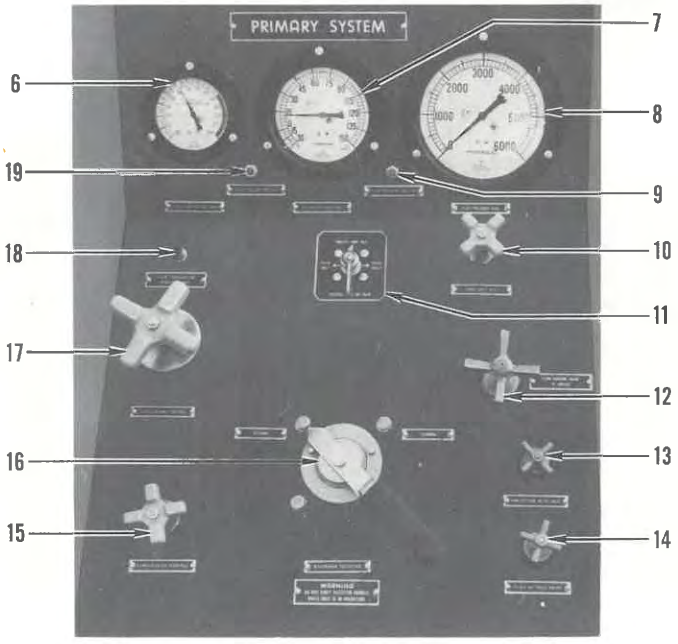


D NOTE PRIMARY SYSTEM CONTROL PANEL SHOWN: SECONDARY SYSTEM CONTROL PANEL SIMILAR.



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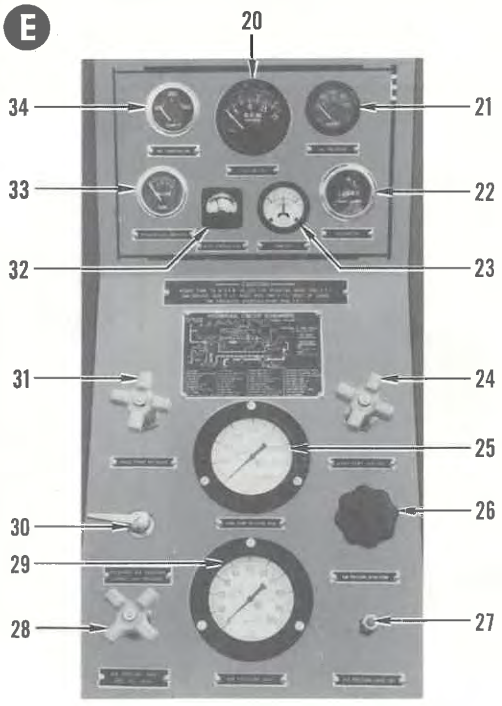

1. SECONDARY SYSTEM HIGH PRESSURE OUTLET.
2. SERVICING HOSES.
3. SECONDARY SYSTEM RETURN (SUCTION).
4. PRIMARY SYSTEM RETURN (SUCTION).
5. PRIMARY SYSTEM HIGH PRESSURE OUTLET.
6. FLUID TEMPERATURE GAGE.
7. FILTER PRESSURE GAGE.
8. FLUID PRESSURE GAGE.
9. FLUID PRESSURE GAGE TAP.
10. GAGE SHUT-OFF.
11. PRESSURE SELECTOR VALVE.
12. FLOW CONTROL VALVE ¾" OUTLET.
13. HIGH PRESSURE RELIEF VALVE.
14. FLUID BY-PASS VALVE.
15. COMPENSATOR CONTROL.
16. RESERVOIR SELECTOR.
17. FLUID VOLUME CONTROL.
18. FLUID TEMPERATURE WARNING LIGHT.
19. FILTER PRESSURE GAGE TAP.
20. TEST STAND ENGINE TACHOMETER.
21. TEST STAND ENGINE OIL PRESSURE GAGE.
22. TEST STAND ENGINE HOURMETER.
23. TEST STAND ENGINE AMMETER GAGE.
24. HAND PUMP SHUTOFF VALVE.
25. HAND PUMP PRESSURE GAGE.
26. AIR PRESSURE REGULATOR.
27. AIR PRESSURE GAGE TAP.
28. AIR PRESSURE GAGE SHUTOFF VALVE.
29. AIR PRESSURE GAGE.
30. RESERVOIR AIR PRESSURE SELECTOR.
31. HAND PUMP BY-PASS VALVE.
32. TEST STAND ENGINE HEAD TEMPERATURE GAGE
33. TEST STAND RESERVOIR LEVEL INDICATOR.
34. TEST STAND ENGINE OIL TEMPERATURE GAGE.

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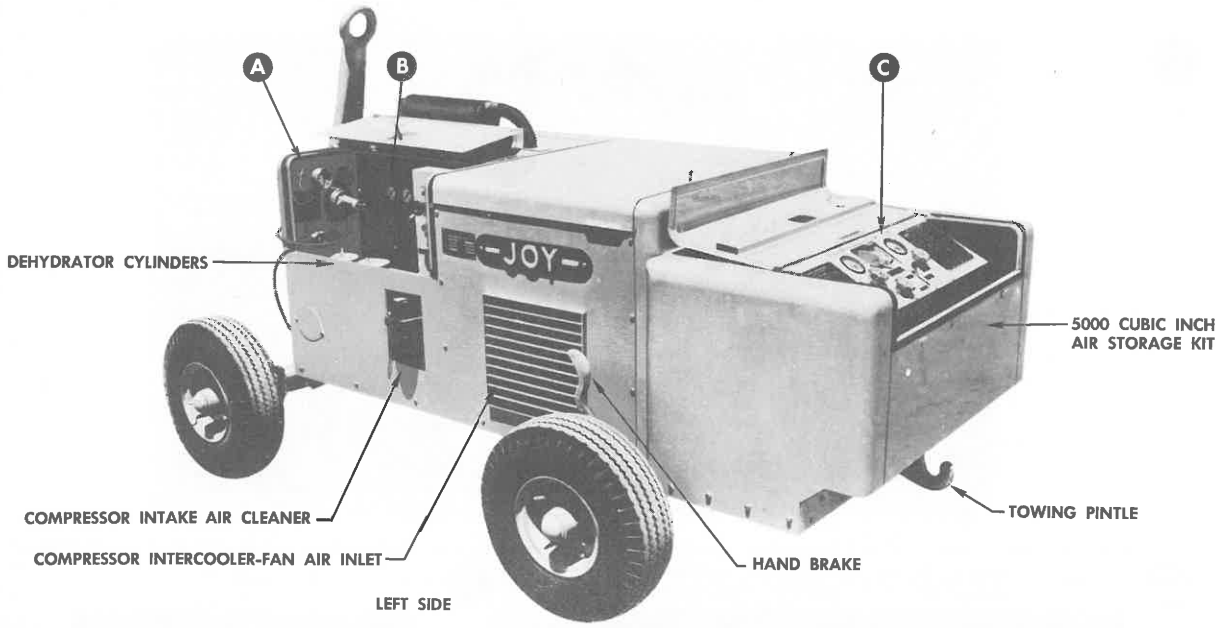
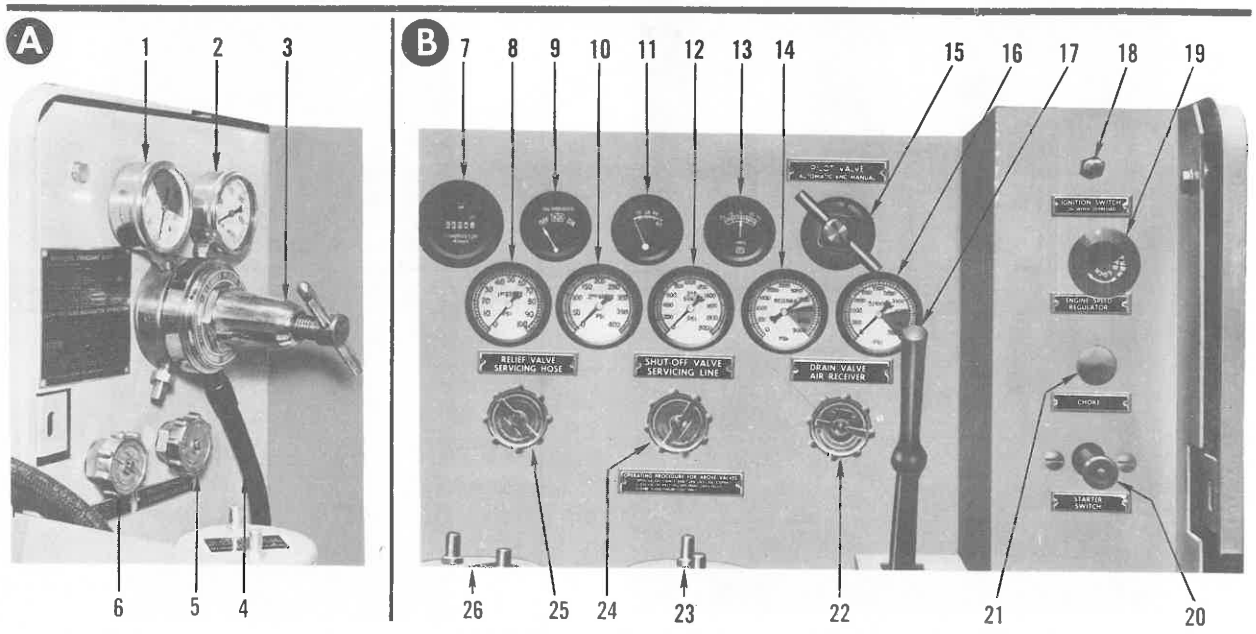
Figure 4-5. Alternate Hydraulic Test Stand SE0567-801 (4920-204-2462) (Sheet 2 of 2)





COMPRESSOR CONTROL PANEL

1. OUTLET PRESSURE GAGE.
2. INLET PRESSURE GAGE.
3. LOW PRESSURE REGULATOR.
4. LOW PRESSURE SERVICE HOSE.
5. SHUTOFF VALVE, L.P. SERVICING LINE.
6. RELIEF VALVE.
7. HOURMETER.
8. FIRST STAGE INTERCOOLER PRESSURE GAGE.
9. ENGINE OIL PRESSURE GAGE.
10. SECOND STAGE INTERCOOLER PRESSURE GAGE.
11. COMPRESSOR OIL PRESSURE GAGE.
12. THIRD STAGE INTERCOOLER PRESSURE GAGE.
13. AMMETER.
14. AIR RECEIVER PRESSURE GAGE.
15. PILOT VALVE.
16. SERVICING LINE PRESSURE GAGE.
17. CLUTCH LEVER.
18. IGNITION SWITCH.
19. ENGINE SPEED REGULATOR.
20. STARTER SWITCH.
21. CHOKE CONTROL.
22. AIR RECEIVER DRAIN VALVE.
23. DEHYDRATOR CYLINDER NO. 1.
24. SERVICING LINE SHUTOFF VALVE.
25. SERVICING HOSE RELIEF VALVE.
26. DEHYDRATOR CYLINDER NO. 2.

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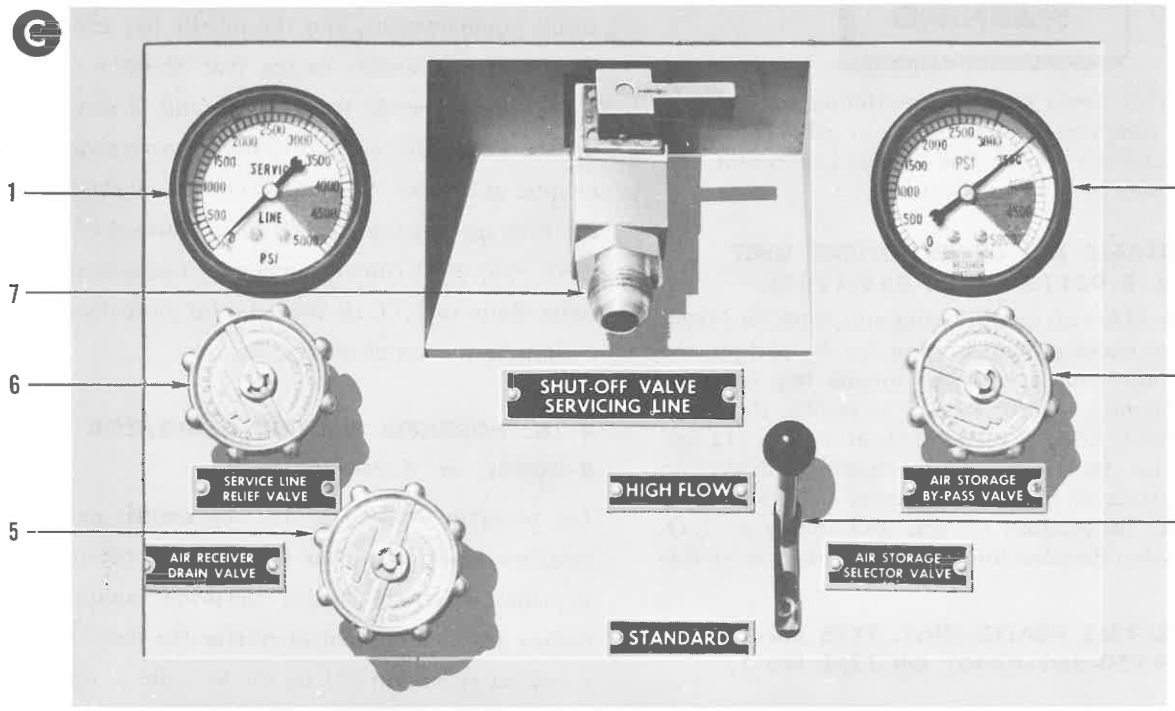
Figure 4-6. High Pressure Air Compressor SE0704-801 (4310-697-0858) (Sheet 1 of 2)



1. SERVICING LINE PRESSURE GAGE.
2. AIR RECEIVER PRESSURE GAGE.
3. AIR STORAGE BY-PASS VALVE.
4. AIR STORAGE SELECTOR VALVE.
5. AIR RECEIVER DRAIN VALVE.
6. SERVICE LINE RELIEF VALVE.
7. SERVICING LINE SHUTOFF VALVE.

5000 CUBIC INCH AIR STORAGE KIT CONTROL PANEL

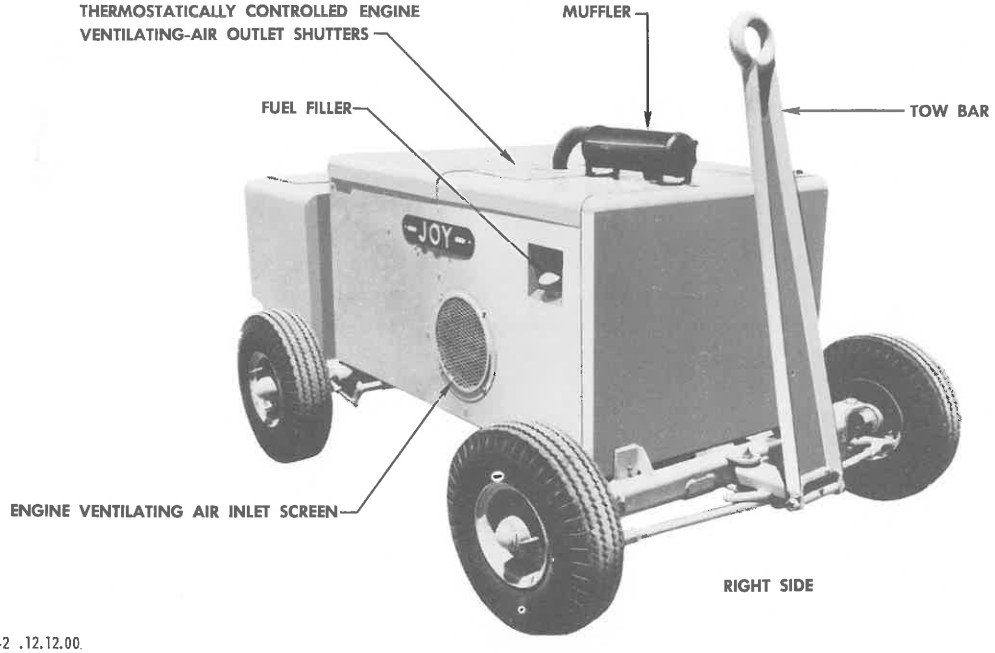


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Figure 4-6. High Pressure Air Compressor SE0704-801 (4310-697-0858) (Sheet 2 of 2)

WARNING

To prevent burns when disconnecting the gas turbine compressor, wear gloves of asbestos or other suitable material. The hose and connector will become hot during operation.

4-12. PORTABLE AIR CONDITIONING UNIT TYPE MA-3 8-96118 (4120-555-1282).

The portable MA-3 air-conditioning unit, 8-96118 (4120-555-1282), provides ground cooling for the cockpit, the electronic compartment, and the missile bay compartment. Provisions are incorporated to receive the unit's adapter 8-96151, 8-96162 or 8-96123, at Station 312 and Station 330 on the left side of the fuselage adjacent to the lower surface of the wing. Refer to T.O. 35E9-9-21 for operating instructions on this unit. Refer to T.O. 1F-106A-2-6 for detailed information on the use of this unit.

4-13. PORTABLE HEATER UNIT. TYPE MC-1, SE-0973 (4520-509-0740) OR TYPE MD-1, SE-1055.

The portable, SE-0973 or SE-1055, heater unit when used with adapter 8-96151, 8-96162, or 8-96213 provides a means for ventilating or heating the cockpit, the electronic compartments, and the missile bay compartment. The units are similar except that SE-0973 unit is gas engine driven while the SE-1055 unit is electric motor driven. Provisions are incorporated to receive the unit's adapter at Station 312 and Station 330 on the left side of the fuselage adjacent to the lower surface of the wing. T.O. 35E7-2-5-1 contains operating instructions for both units. Refer to T.O. 1F-106A-2-6 for more detailed information on the use of these units.

4-14. PORTABLE ELECTRIC GENERATOR SET 8-96025 or 8-96026.

The portable, 8-96025 or 8-96026, electric generator set provides electrical power for ground operation of the airplane's electrical and/or electronic equipment. Provisions are incorporated to receive the plug of the generator set at Station 171 on the left side of the fuselage. Refer to T.O. 1F-106A-2-10 for detailed information on the use of these units.

Section V

FUSELAGE

Contents *Page*

FUSELAGE COMPARTMENTS

DESCRIPTION

5-1. GENERAL.

Applicable to F-106A airplanes. The fuselage is a semi-monocoque type structure consisting of beltframes, bulkheads, longerons and stressed skin. Aluminum alloy, stainless steel, chrome-molybdenum steel, and titanium are the principal metals used in fuselage construction. Exercise care when making any structural repairs to assure that the same type of metal is used as in the original manufacture. Refer to T.O. 1F-106A-3 for information on structural repair of the airplane. The three major sections which make up the fuselage are the radome, the main fuselage section, and the tail cone. The radome and tail cone are attached with bolts and are readily detachable. The main fuselage sections include the cockpit with its jettisonable canopy, nose and main wheel wells, forward electronics compartment, upper aft electronics compartment, lower aft electronics compartment, the missile bays, the hydraulic accessories compartment, the engine, and engine accessories compartments. The fuselage is distinguished by an external engine air intake duct on each side aft of the cockpit and by the pinched waist fuselage. The 55-degree delta-shaped vertical stabilizer is permanently attached to the fuselage, while the dorsal fairing aft of the heat exchanger exhaust is in removable sections. The fuselage is pressure sealed and weatherproofed during fabrication. Access and compartment doors are also sealed. See figure 1-1 for an illustration of fuselage compartments.

5-2. *Applicable to F-106B airplanes.* The fuselage is similar in construction to that of the F-106A airplanes. The interior arrangement is also the same except that the electronic and fuel equipment are relocated to provide space for a second pilot. See figure 1-2 for an illustration of fuselage compartments.

5-3. RADOME.

The radome is a plastic, cone-shaped structure, installed on the forward face of the forward electronics compartment with four bolts. The radome provides an enclosure

for a radar antenna. A pitot-static boom is installed at the forward end of the radome. At the base of the pitot-static boom, a sintered steel ring is installed, which passes pressurized anti-ice fluid for radome anti-icing. Pitot-static and anti-icing tubing is fabricated from a plastic material to minimize refraction of radar beams. Lightning protection for the radome is provided by a wire running longitudinally along the bottom of the interior of the structure. The base of the radome is equipped with a diaphragm-type, self-energizing rubber seal retained in grooves by plastic retaining strips. The radome should be kept clean at all times to prevent distortion of the radar signals. Care should be taken to avoid scratching or marring the plastic surface in any way. See figure 5-1 for details of radome installation.

5-4. FORWARD ELECTRONICS COMPARTMENT.

The forward electronics compartment is a ventilated and air-conditioned section, attached by bolts and rivets to the fuselage forward of the cockpit. High heat treat, high-tension bolts are used at attachment points. This compartment houses electronic equipment mounted on racks that are accessible from a door on each side of the fuselage. See figure 6-6 for an illustration of these doors.

5-5. NOSE WHEEL WELL.

The nose wheel well houses the nose landing gear, the canopy battery, the main electrical system battery, fuse panels, test fittings for the canopy seal and cabin pressurization systems, the oxygen system filler valve and converter assembly, and the nose wheel door mechanism. For information on the nose wheel well door and its mechanism, refer to T.O. 1F-106A-2-8.

5-6. COCKPIT.

Applicable to F-106A airplanes. The cockpit is a pressurized area, containing the pilot's seat, controls, and instruments. A jettisonable canopy provides for entry or exit. The canopy is actuated by either a pneumatic or an electric actuating cylinder. The cylinder supports the weight of the canopy for normal operation, and also provides the force for emergency jettisoning of the canopy. Refer to Section VIII of this manual for a detailed description of the canopy and seat actuating systems. The pilot's seat is adjustable through a control switch on the forward right side of the pilot's seat. The cockpit structure is pressure-sealed during fabrication.

5-7. *Applicable to F-106B airplanes.* The pressurized cockpit is arranged to seat two pilots in tandem. Each pilot is provided a complete set of controls and a complete set of instruments. Entrance to, or exit from, the cockpit is gained by unlocking and raising the canopy. The canopy may be operated from the interior or exterior of the cockpit and is raised or lowered by either a pneumatic or an electric actuating cylinder during normal operation. Provisions are incorporated to ballistically jettison the canopy in an emergency. Refer to Section VIII of this manual for detailed information on canopy and seat operating systems.

5-8. The pilot's cockpit is trimmed on both sides from the canopy sill longeron to the console. The trim consists of two panels on each side, installed with screws. The trim panels are made of 0.025 inch fiberglass.

5-9. UPPER-AFT ELECTRONICS COMPARTMENT.

Applicable to F-106A airplanes. The upper-aft electronics compartment is air-conditioned and pressurized, and is located in the upper section of the fuselage aft of the cockpit. This compartment houses electronic equipment of various systems including the navigational and armament systems. The compartment is accessible through a hinged door on each side of the fuselage. See figure 6-7 for information on the upper aft electronics compartment access doors.

5-10. *Applicable to F-106B airplanes.* The pressurized and air-conditioned upper-aft electronics compartment is located in the dorsal area of the fuselage aft of the cockpit. Access to the navigational electronic equipment housed within the compartment is gained by opening the hinged door.

5-11. LOWER-AFT ELECTRONICS COMPARTMENT.

Applicable to F-106A airplanes. The lower-aft electronics compartment is located just aft of the nose wheel well. This compartment houses the data link antenna, stable element, pitch and yaw amplifier, and other electronic equipment. The compartment is air-conditioned and pressurized, and is accessible through a hinged door located at the bottom of the fuselage and secured with Camloc fasteners. See figure 6-8 for an illustration of this door.

5-12. *Applicable to F-106B airplanes.* The pressurized and air-conditioned lower-aft electronics compartment is located in the center forward portion of the missile bay. This compartment houses AWCIS power subsystem units; communication, navigation, and landing (C, N, & L) subsystem; and armament control units of the radar subsystem. This electronic equipment is accessible through a hinged door at the bottom of the compartment.

5-13. LOWER-MID ELECTRONICS COMPARTMENT.

Applicable to F-106B airplanes. The lower-mid electronics compartment is similar to the lower-aft electronics compartment of F-106A airplanes. Refer to paragraph 5-11.

5-14. MISSILE BAYS.

Applicable to F-106A airplanes. The missile bay extends from Station 216 to Station 412 in the lower portion of the fuselage. The forward section contains a mechanical linkage to which two missile launchers are attached. The

mechanical linkage is operated by a pneumatic actuator. The aft section of the missile bay contains two separate mechanical linkages, to each of which is attached a single missile launcher. Each mechanical linkage is operated by a separate pneumatic actuator. Provisions are also incorporated to carry and eject one special weapon between the separated missile launchers of the aft bay section. Two hinged missile bay doors provide an aerodynamic enclosure for the bay and are attached along their outboard edges by hinge pins to hinges attached to the airplane structure. Each door consists of two panels with an interconnecting hinge that permits the panels to fold when opened. Three pneumatic actuators are provided to operate each door. For detailed information on the missile bay actuating systems refer to T. O. 1F-106A-2-12.

5-15. *Applicable to F-106B airplanes.* The missile bays extend from Station 216 to Station 412 in the lower portion of the fuselage. Both the forward and aft bays contain two separated and pneumatically actuated mechanical linkages to each of which is attached a missile launcher. Provisions are also incorporated to carry and eject one special weapon between the separated missile launchers of the aft bay. Two hinged missile bay doors provide an aerodynamic enclosure for the missile bays and are attached along their outboard edges by hinge pins to hinges attached to the airplane's structure. Each door consists of two panels with an interconnecting hinge that permits the panels to fold when opened. The inboard panel of each door is approximately 70 inches shorter than the outboard panels because of the electronic equipment compartment located in the forward portion of the forward missile bay. Three pneumatic actuators are provided to operate each door. For detailed information on the missile bay actuating systems refer to T.O. 1F-106A-2-12.

5-16. AIR-CONDITIONING COMPARTMENT.

Applicable to F-106A airplanes. The air-conditioning compartment is located in the upper portion of the fuselage from Station 280 to Station 316. This compartment houses the refrigeration unit and a portion of its ducting, the radome anti-icing, fluid tank, and the storage flasks for the high-pressure pneumatic system. The compartment is accessible through a removable two-piece door at the top of the fuselage. The door is hinged along the airplane's centerline and fastened with stressed panel type Camloc fasteners. A second access door is located to the left of the airplane's centerline at the aft end of the forward missile bay roof.

5-17. *Applicable to F-106B airplanes. The air-*conditioning compartment is located from Station 280 to Station 316, in that area of the fuselage between the missile bay roof and the upper-aft electronics compartment. Equipment housed within the compartment is essentially the same as that of F-106A airplanes except for a 20% larger heat exchanger necessary to provide the increased airflow required by the additional pilot. Access to the compartment is gained by removing a door at the aft end of the forward missile bay roof or by opening the hinged upper-aft electronics door and then opening a second hinged door.

5-18. HYDRAULIC ACCESSORY COMPARTMENT.

The hydraulic accessory compartment is located in the lower portion of the fuselage, forward of the main wheel wells. This compartment houses major components of the primary and secondary hydraulic power systems. The accumulators, reservoirs, reservoir pressure regulators, and the ground servicing connections are accessible when the ram air turbine door and the hydraulic accessory compartment door are open. The ram air turbine door on the left side overlaps the hydraulic accessory compartment door on the right side in the closed position. The ram air turbine door also mounts the ram air turbine on the inner surface of the door. For detailed information on the two doors refer to paragraph 6-11 and 6-12. For further information on the ram air turbine and emergency hydraulic pump, refer to T. O. 1F-106A-2-3.

5-19. MAIN WHEEL WELL.

The main wheel well houses the main landing gears, the flight control system turn rate transmitter, high-pressure pneumatic gage and ground charging connection, emergency ac generator, main wheel well fuse panel, ac emergency power disconnect relay, ac emergency test switch, frequency controller, wing tank pressure regulator, and components and tubing for various systems of the airplane. When the main landing gears are retracted within the wheel wells, the gear doors close on the gear fairings and provide a proper closure for aerodynamic smoothness.

5-20. ENGINE COMPARTMENT.

The engine compartment occupies the entire fuselage aft of the air-conditioning compartment and the main wheel well. The engine is suspended and attached in the fuselage by four suspension points. Two are located on the aft section of the engine and two are located on the forward section of the engine. The compartment is equipped with a fumetight bulkhead, located forward of the engine. The engine air intake ducts, which form a "y," occupy most of the space forward of the fumetight bulkhead. The upper half of the fuselage area between Station 530 and Station 558 is protected from excessive engine heat by heat insulation blankets which are attached to the airplane structure. Fuselage members and flight control system components aft of this area are protected from excessive heat by a cylindrical shroud, around the engine combustion and turbine sections.

5-21. DORSAL FAIRING.

The dorsal fairing houses the low-pressure pneumatic system bleed air duct and extends along the top of the fuselage from the vertical stabilizer to a point just aft of

the heat exchanger exhaust outlet. Riveted fairing extends from this point forward to the canopy. The dorsal fairing is removable, and is in six sections, each of which attaches to the fuselage with flush screws along each side. Each section is a spotwelded assembly, joined to the adjacent section by means of a slip-joint type connection. The sections must be installed or removed in progressive order; the forward section is installed first and removed last. The "formed gasket" method of sealing is used at the forward end of the forward section and the aft end of the aft section. See figure 5-2 for an illustration of the dorsal fairing.

5-22. TAIL CONE.

The tail cone, illustrated on figure 5-3, is constructed of aluminum and titanium and is attached to the fuselage with four latching mechanisms in the fuselage structure. The tail cone houses the afterburner tail pipe and the variable-area exhaust nozzle and its operating mechanism. Approximately two inches concentric clearance is provided between the engine shroud and the aft edge of the tail cone. This opening provides an exhaust outlet for engine cooling air. To prevent loss of cooling air, a silicone rubber seal is installed between the mating flange of tail cone and fuselage beltframes.

REPLACEMENT

5-23. REPLACEMENT, RADOME.

Radome removal and installation procedures are shown on figure 5-1.

5-24. REPLACEMENT, DORSAL FAIRING.

Removal and installation procedures for the dorsal fairing are shown on figure 5-2.

5-25. REPLACEMENT, TAIL CONE.

Removal and installation procedures are shown on figures 5-3.

SERVICING

5-26. CLEANING EXTERIOR OF FUSELAGE.

For information on cleaning the fuselage exterior, refer to paragraphs 2-60 through 2-62. Section II also contains information on cleaning other areas of the fuselage, such as the cockpit, missile bays, etc.

5-27. REPAIRING DAMAGE TO EXTERIOR FINISH.

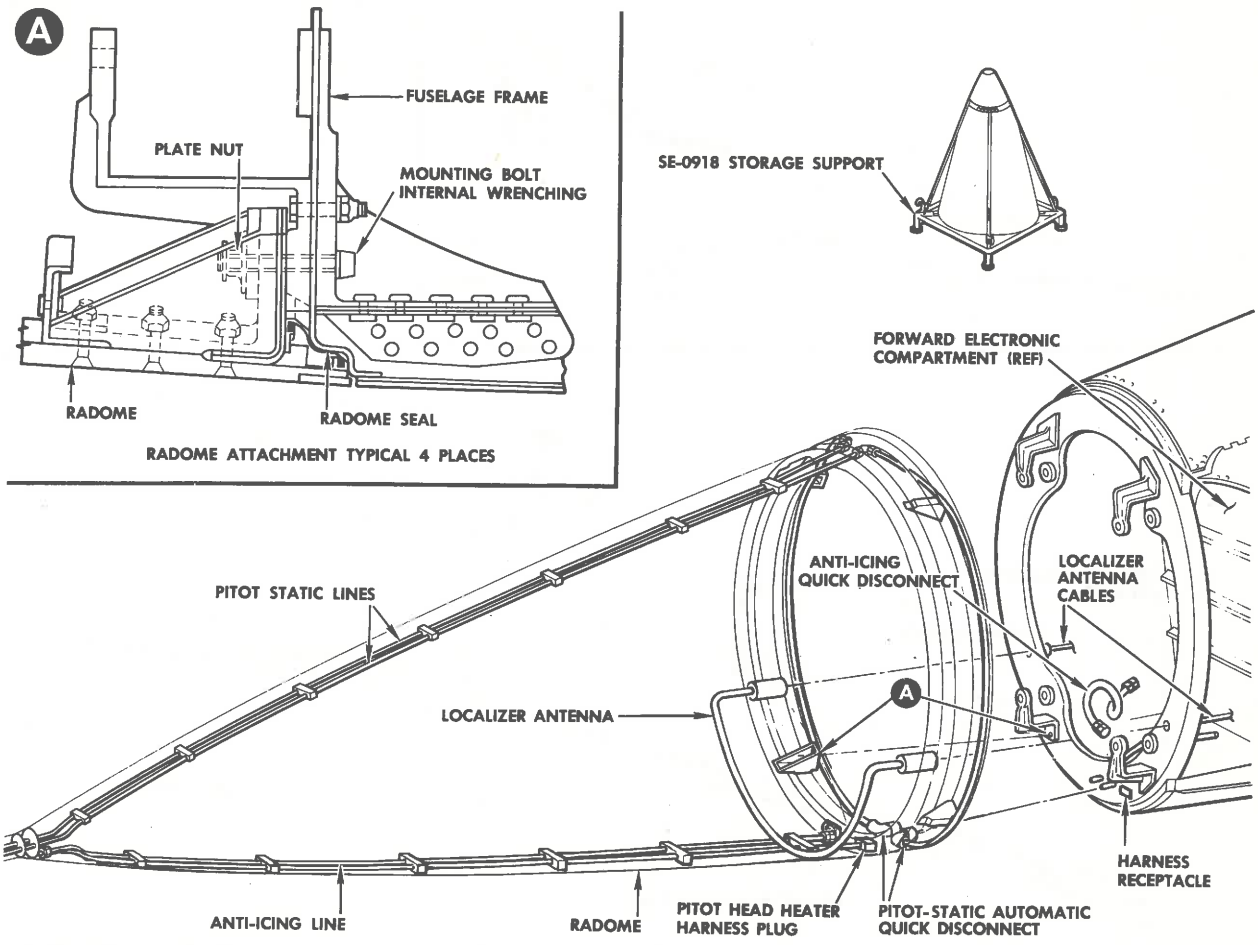
For information on repairing damage to the exterior finish, refer to paragraphs 2-82 through 2-84.

VERTICAL STABILIZER

DESCRIPTION

5-28. GENERAL.

The vertical stabilizer (fin) is of conventional spar, rib, and stressed skin construction and is permanently attached to the fuselage section of the airplane. The rear spar incorporates provisions for attachment of the rudder, the speed brake doors, and the speed brake door actuators. The leading edge, the tip, the rudder, the speed brake doors and their actuators, the access doors and the system components housed within the structure are removable. System components housed within the stabi-



REMOVAL

a. Open forward electronic doors and install door hold open supports.
b. Disconnect anti-icing line at quick-disconnect fitting.
c. Disconnect pitot head heater harness at aft end of radome.
d. Disconnect localizer antenna cable at each side.
e. With Universal Adapter, 1740-534-0570, used in conjunction with Standard Trailer, 1740-294-3397, position trailer and support radome.
f. Remove four radome mounting bolts, pull trailer straight forward until radome is clear.

CAUTION

RADOME WEIGHS APPROXIMATELY 145 POUNDS, AND MUST NOT BE SUPPORTED BY PITOT BOOM DURING REMOVAL. BE CAREFUL NOT TO DAMAGE RADOME COATING. COATING REPAIRS USED ON RADOME SHALL CONFORM TO SPECIFICATION MIL-C-7439A.

g. Place radome on SE-0918 (1730-691-9835) storage support.

INSTALLATION

a. Place radome on Universal Adapter, 1740-534-0570, which has been installed on Standard Trailer 1740-294-3397.
b. Position trailer to align radome mounting holes. Check that radome seal makes contact with periphery of seal angle on fuselage frame.
c. Install four mounting bolts; tighten to torque value of 225 to 250 inch-pounds.
d. Check gap and mismatch between radome and fuselage for conformance with aerodynamic smoothness requirements.
e. Connect anti-icing line at quick-disconnect fitting.
f. Connect pitot head heater harness at aft end of radome.
g. Connect localizer antenna cables at each side.
h. Remove door hold-open supports; close and secure doors.
i. Pull trailer clear of airplane.

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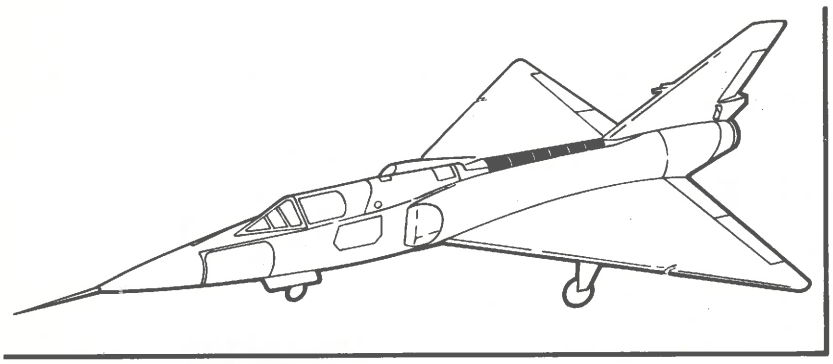
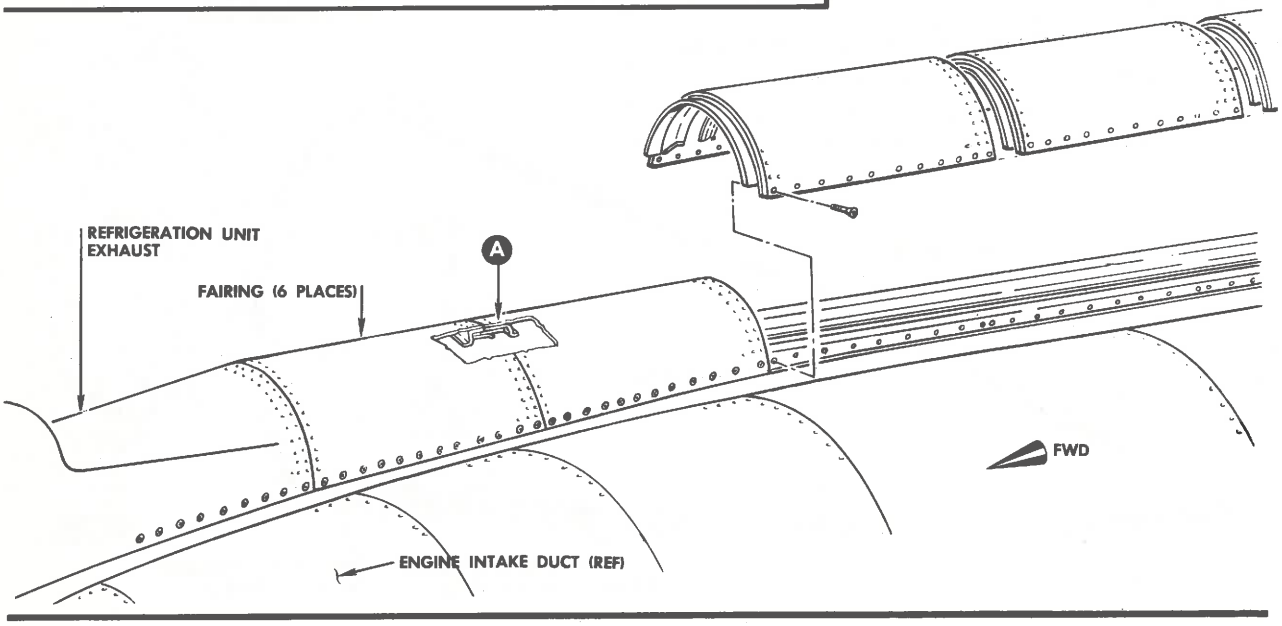
Figure 5-1. Radome Replacement



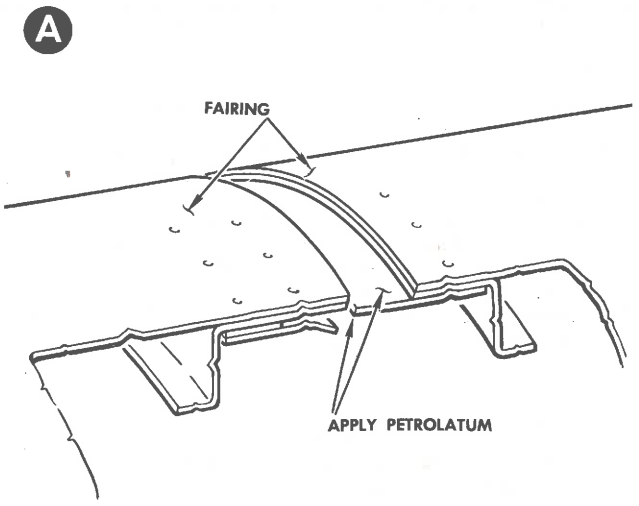


REMOVAL

Remove aft section of fairing first and proceed in order with remaining sections.

INSTALLATION

a. Check condition of "Formed Gasket" between mating surfaces of fairing and fuselage, and repair if necessary. If a new section of fairing is being installed, the "Formed Gasket" should be renewed to fit the new fairing.
b. Prior to installing fairing, apply petrolatum VV-P-236 liberally to all splices as shown.
c. Position forward section of fairing and install screws.
d. Join next fairing section by engaging splice and pushing fairing forward. Use care to prevent fairing corners from damaging "Formed Gasket," while joining splice. Install screws.
e. Install remaining sections in the same manner.
f. Check installation for conformance with aerodynamic smoothness requirements.



CUTAWAY OF TYPICAL SPLICE

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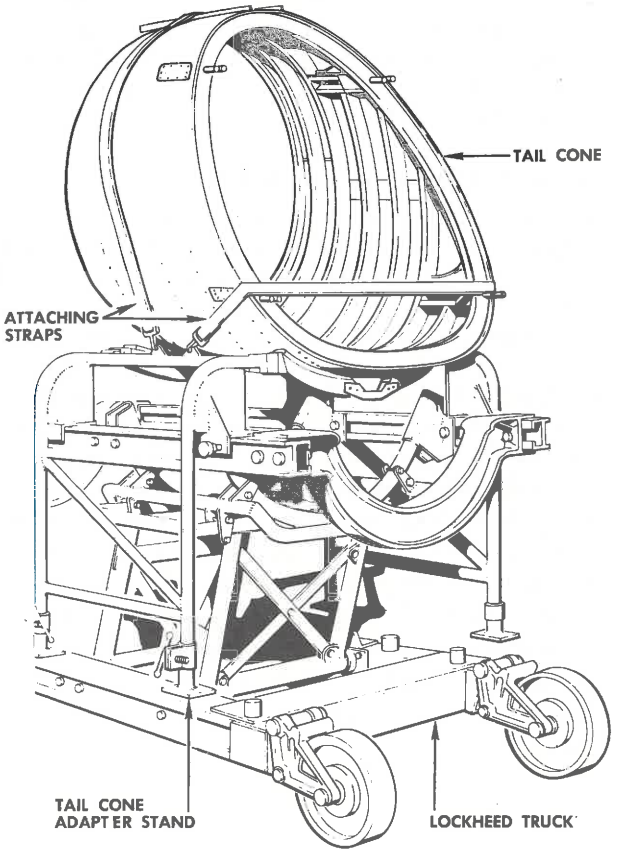
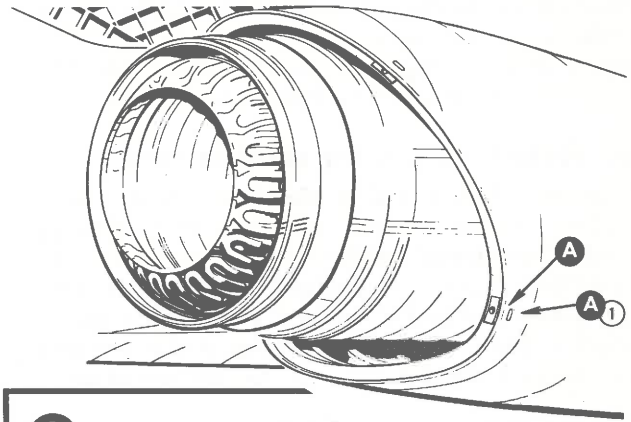
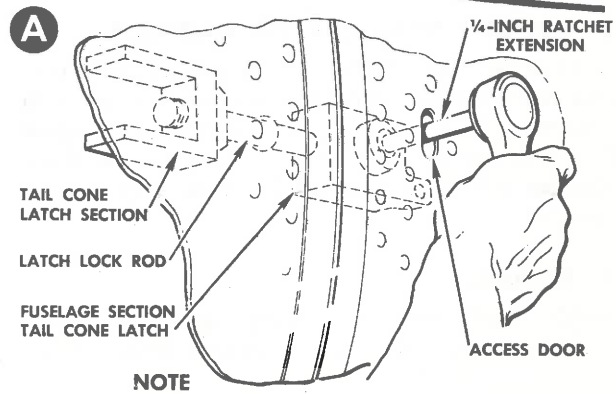
Figure 5-2. Dorsal Fairing Replacement

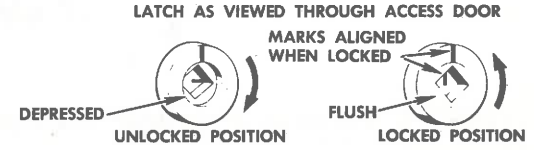




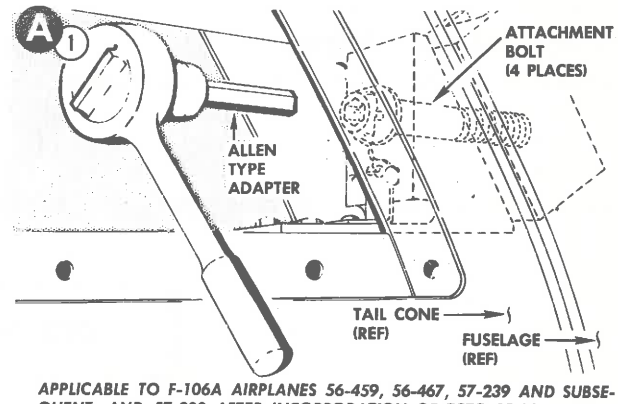


NOTE

TORQUE REQUIRED TO LOCK OR UNLOCK TAIL CONE LATCHES SHALL NOT BE LESS THAN 85 INCH-POUNDS OR MORE THAN 160 INCH-POUNDS. IF PROPER TORQUE CANNOT BE OBTAINED, REMOVE TAIL CONE AND ADJUST LATCH LOCK RODS.



APPLICABLE TO F-106A AIRPLANES 56-453 THRU -458, -460 THRU 56-466, 57-229, -231 THRU 57-238; AND 57-230 PRIOR TO INCORPORATION OF TCTO 1F-106(J)A-566. APPLICABLE TO F-106B AIRPLANES 57-2507, -2508, -2510 THRU 57-2519.



APPLICABLE TO F-106A AIRPLANES 56-459, 56-467, 57-239 AND SUBSEQUENT; AND 57-230 AFTER INCORPORATION OF TCTO 1F-106(J)A-566. APPLICABLE TO F-106B AIRPLANES 57-2509, 57-2520 AND SUBSEQUENT.

TAIL CONE REMOVAL

a. Open speed brake doors; install door lock.
b. Position Lockheed truck No. 205226, with adapter stand 8-96010 or -801 installed under tail cone. Adapter stand 8-96010-801 is to be used on airplanes having the tail hook installation.

CAUTION

THE AIRPLANE MUST BE STABILIZED BY USE OF WING AND NOSE JACKS WHEN POSITIONING THE TRUCK UNDER THE TAIL CONE.

c. On airplanes with tail hook installed, remove screws (8) attaching hook fairing to fuselage. Release tail cone attachments (4) as shown in details A or A_1.
d. Rest tail cone on adapter stand and truck and move aft.
e. Install straps to hold tail cone to support stand.

TAIL CONE INSTALLATION

a. Installation of the fuselage tail cone is essentially the reverse of removal.
b. For bolt type tail cone attachment, torque bolts 100 to 140 inch-pounds; lock-wire bolts using MS20995-NC51 wire.

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Figure 5-3. Tail Cone Replacement

lizer structure are the intake tubes for the flight control artificial feel system, the rudder cables, the rudder control hydraulic units, the rudder control linkages, the AAI equipment and the drag chute and its mechanism. The vertical stabilizer tip assembly houses two antennas.

5-29. VERTICAL STABILIZER LEADING EDGE.

The vertical stabilizer leading edge is of formed aluminum alloy, and is divided into three main sections, attached to the vertical stabilizer with flush screws. The center section of the leading edge incorporates the electrically heated intake tubes for the flight control artificial feel system. The leading edge is sealed by the "formed gasket" method. See figure 6-4 for sealing procedure.

5-30. VERTICAL STABILIZER TIP ASSEMBLY.

The vertical stabilizer tip assembly is of honeycomb construction and is attached to the vertical stabilizer with flush screws. The tip assembly houses the dual purpose UHF communications and TACAN navigation antenna. For detailed information on the antennas, refer to T. O. 1F-106A-2-11.

5-31. RUDDER.

The rudder is attached to the trailing edge of the vertical stabilizer by hinge fittings and a support fitting, which serves as a hinge point. It is of honeycomb construction and incorporates a spar and two ribs, one at the top and one at the bottom of the rudder. The hinges, support fitting, and a control horn are attached to this spar. The control horn connects the rudder to its hydraulic control actuator in the vertical stabilizer.

5-32. SPEED BRAKE DOORS.

The major portion of the two hinged speed brake doors structure is a machined magnesium casting. The exterior of the casting presents a smooth surface to the airflow while the interior has integral grid type stiffeners. A titanium cap assembly is riveted to the lower aft portion of each door. The doors are replaceable but not interchangeable because the trailing edge cap plate, the seals, and the seal retainers are fitted and assembled to the doors upon installation. Hinge pins attach the doors to the hinges attached to the lower portion of the vertical stabilizer trailing edge structure. A hydraulic actuator, attached to each door, simultaneously opens or closes both doors at the pilot's discretion. When the doors are closed, they fair in the drag chute canister and the drag chute mechanism with the lower portion of the vertical stabilizer trailing edge. Refer to T.O. 1F-106A-2-7 for detailed information on the speed brake and drag chute systems.

REPLACEMENT

5-33. REPLACEMENT, VERTICAL STABILIZER LEADING EDGE.

Procedures for removal and installation of the vertical stabilizer leading edge are shown on figure 5-4.

5-34. REPLACEMENT, VERTICAL STABILIZER TIP ASSEMBLY.

Procedures for removal and installation of the vertical stabilizer tip assembly are shown on figure 5-5 or 5-6.

5-35. REPLACEMENT, RUDDER.

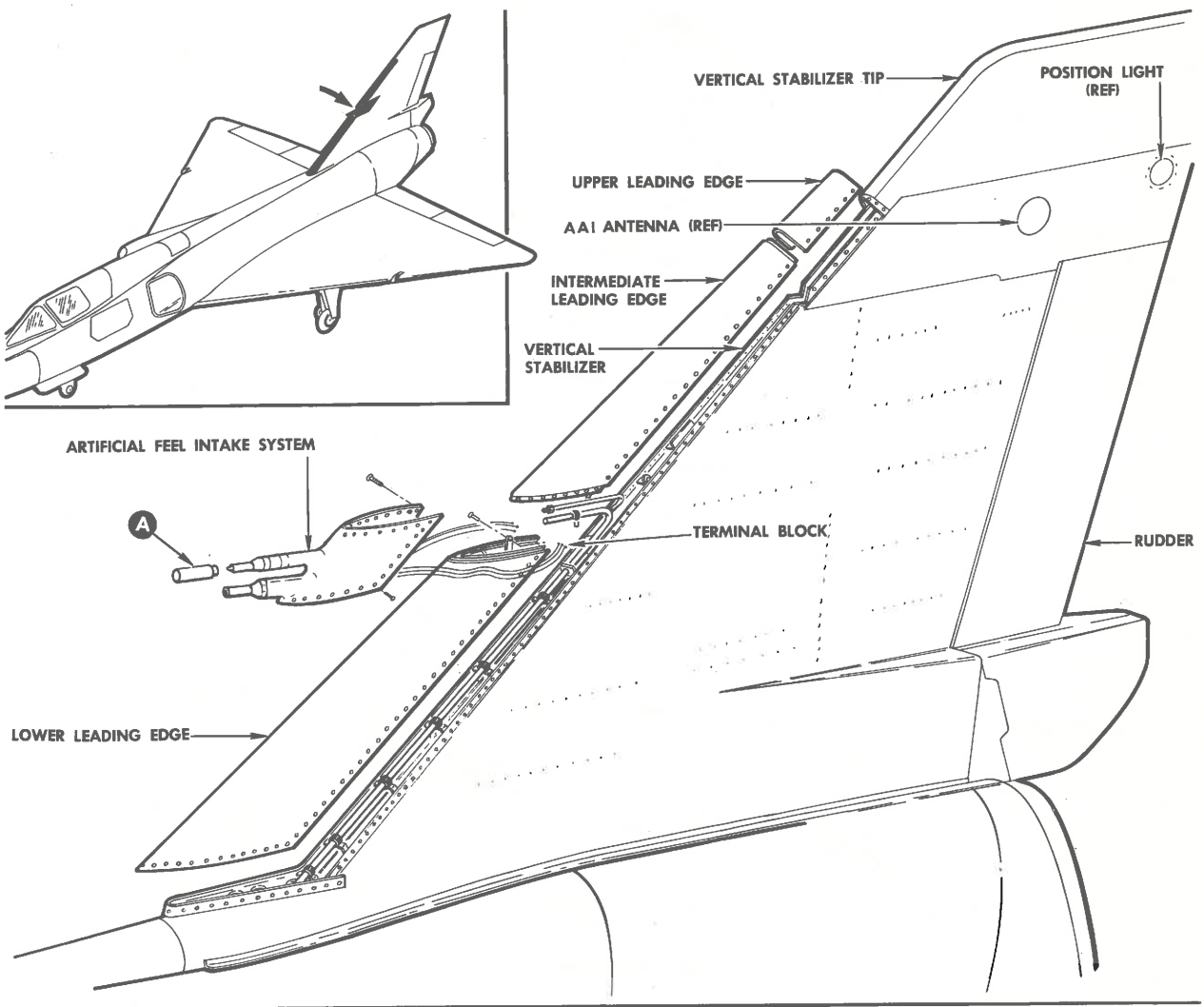
Procedures for removal and installation of the rudder are shown on figure 5-7.

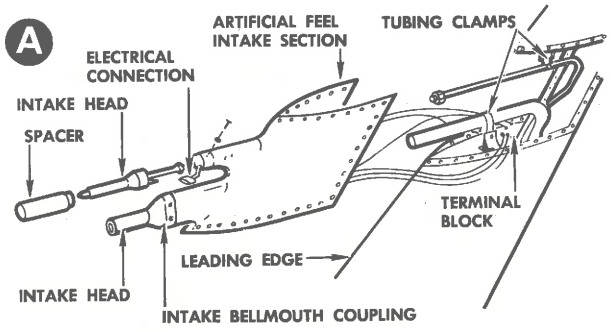
WINDSHIELD AND CANOPY PANELS

DESCRIPTION

5-36. WINDSHIELD GLASS PANELS.

The windshield consists of a single glass panel on each side of a center post "V" and other necessary supporting structure. Each glass panel is of three-ply laminated construction. The center ply is of vinyl plastic, (polyvinyl/butryl) and the others are of glass. A one-piece metal insert is bonded into the vinyl ply. A metal insert extends around the periphery and is projected across the panel





LEADING EDGE REMOVAL

a. Remove screws from both ends of spacer; slide spacer forward to expose tube coupling and electrical connector.
b. Disconnect tube coupling and cap the openings; disconnect electrical connector and remove intake head.
c. Remove screws attaching artificial feel intake section to vertical stabilizer; slide artificial feel intake section forward to expose terminal block and ground stud.
d. Remove electrical harness from terminal block and ground stud; remove artificial feel intake leading edge assembly.
e. Remove screws attaching upper leading edge to vertical stabilizer and remove leading edge.
f. Remove tubing clamps from lower and intermediate leading edges, remove screws attaching lower and intermediate leading edges to vertical stabilizer, and remove leading edges.

LEADING EDGE INSTALLATION

a. Installation is essentially the reverse of removal.
b. Exercise care to insure that artificial feel intake tube bellmouth is properly engaged when installing the artificial feel intake leading edge assembly.
c. Repair seal at mating surfaces of leading edges and vertical stabilizer.

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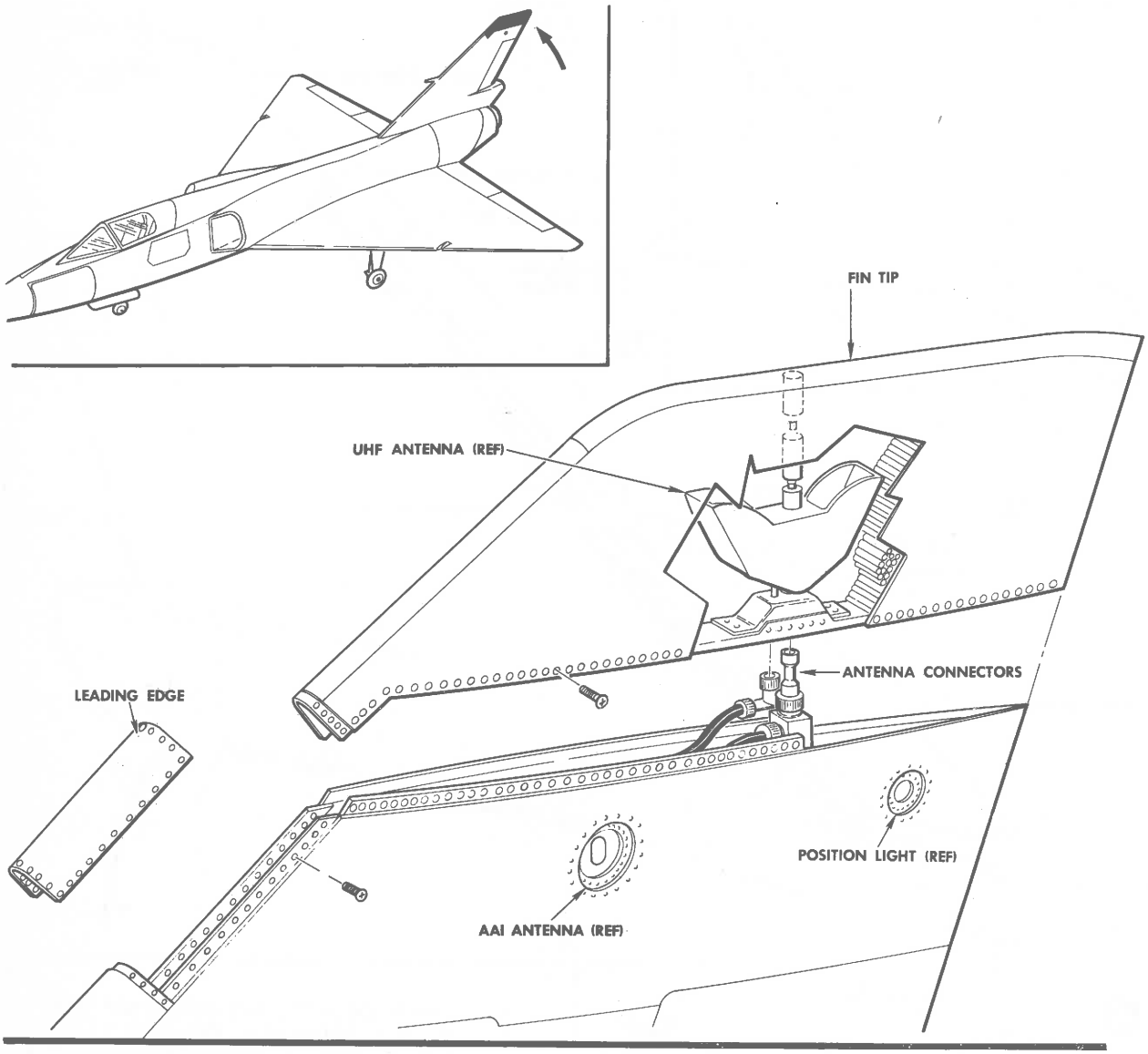
Figure 5-4. Vertical Stabilizer Leading Edge Replacement



REMOVAL, TIP ASSEMBLY

a. Remove uppermost portion of leading edge.
b. Remove tip attaching screws.
c. Pull tip up and forward just enough to gain access to the antenna connections.
d. Disconnect antennas and remove tip.

INSTALLATION, TIP ASSEMBLY

To install tip follow sealant procedure and reverse order or removal procedure.

FIN LEADING EDGE SEALING PROCEDURE.

a. Scrape off defective sealant with a plastic scraper.
b. Clean surfaces thoroughly with a cloth dampened with naphtha, Federal Specifications TT-N-95.
c. Apply sealant EC-1293 or EC-1291, Minneapolis Mining & Manufacturing Company Product. Apply sealantto faying surface of fin structure in a continuous pattern 1/8 inch wide and 1/32 inch thick.
d. Apply a thin coat of Petrolatum VV-P-236, to the faying surface of the leading edge to prevent adhesion of the leading edge to the sealant.
e. Reinstall the leading edge and tighten fasteners. Wipe off excess sealant with a cloth dampened in naphtha, Federal Specification TT-N-95.
f. Check for gaps and mismatch according to aerodynamic smoothness requirements.
g. Allow sealant to cure for 24 hours.

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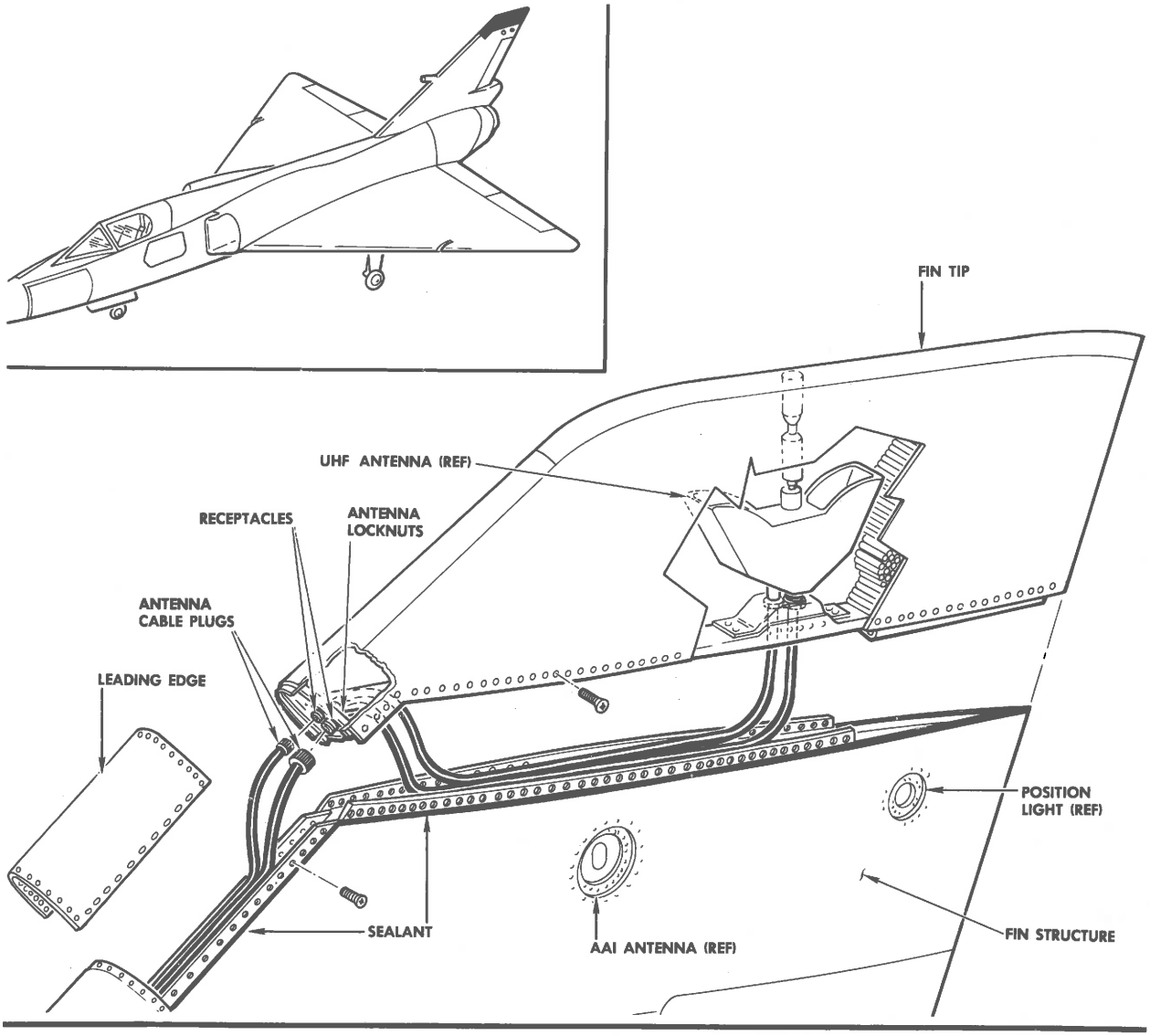
Figure 5-5. Vertical Stabilizer Tip Replacement
Applicable to F-106A airplane 56-453 thru 56-462 and F-106B airplane 57-2507



REMOVAL, TIP ASSEMBLY

a. Remove uppermost portion of leading edge.
b. Disconnect antenna cable plugs (2) from fin tip receptacles.
c. Remove tip attaching screws.
d. Remove upper fin tip.

PREPARATION (INSTALLATION)

a. Check that locknuts which secure antenna cables (2) to fin tip receptacles are torqued to 14 foot pounds.
b. Scrape off defective sealant with a plastic scraper.
c. Clean surfaces thoroughly with a cloth dampened with naphtha, Federal Specification TT-N-95.
d. Apply sealant EC-1293 or EC-1291, Minneapolis Mining & Manufacturing Company. Apply sealant to faying surface of fin structure in a continuous pattern 1/8-inch wide and 1/32-inch thick.
e. Apply a thin coat of petrolatum VV-P-236, to the inner faying surface of the leading edge and fin tip to prevent adhesion to the sealant.

INSTALLATION, TIP ASSEMBLY

a. Position the fin tip on the fin structure and install attaching screws.
b. Connect antenna cable plugs (2) to fin tip receptacles; tighten coupling nuts to finger tightness then tighten an additional 1/8 turn with a strap wrench.
c. Reinstall the leading edge and tighten fasteners. Wipe off excess sealant with a cloth dampened in naphtha, Federal Specification TT-N-95.
d. Check for gaps and mismatch according to aerodynamic smoothness requirements.
e. Allow sealant to cure for 24 hours.

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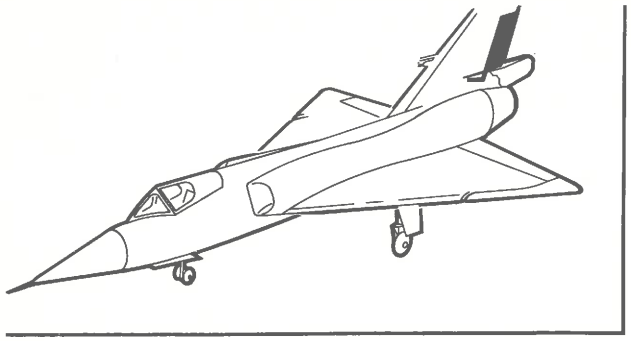
Figure 5-6. Vertical Stabilizer Tip Replacement
Applicable to F-106A airplanes 56-463 and subsequent; and F-106B airplanes 57-2508 and subsequent



PREPARATION

a. Remove drag chute.
b. Remove screws securing drag chute canister and remove canister.
c. Remove access door from right side drag chute canister support fairing.
d. Disconnect pneumatic line to drag chute deploy valve and cap line.
e. Disconnect bonding jumpers on upper speed brake hinges, and the speed brake position switch linkage on the left speed brake door. See Detail A.
f. Remove screws securing speed brake position switch to drag chute canister support fairing structure.
g. Remove bolts and screws securing drag chute canister support and fairing to speed brake door support structure; remove fairing.

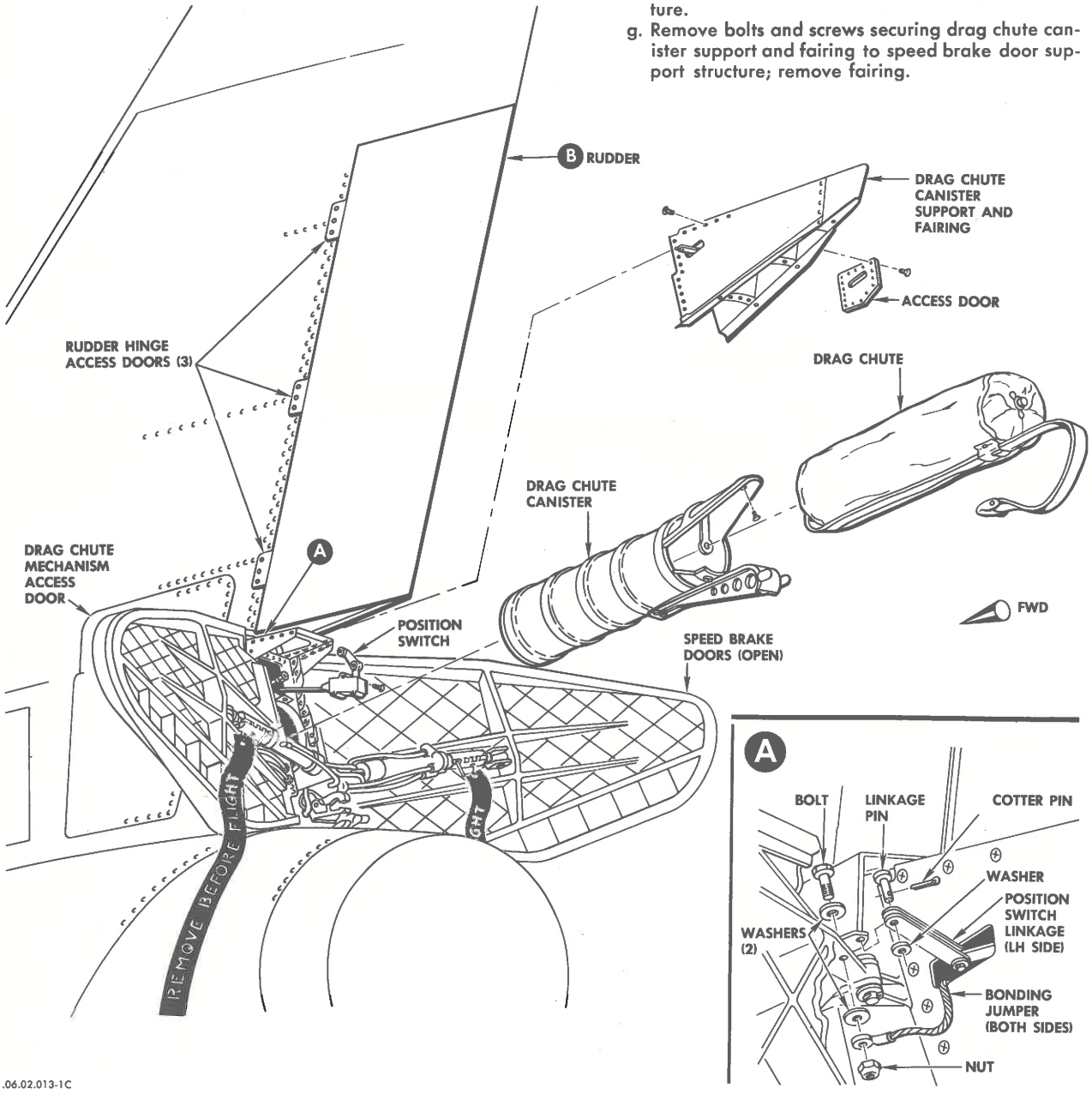


Figure 5-7. Rudder Replacement (Sheet 1 of 4)

B

RUDDER REMOVAL

a. Check to insure that electrical power is removed from airplane.
b. Open access doors.
c. Remove nut from aft actuator retaining bolt.
d. Move rudder to the right and insert block 8-96171-9 between rudder horn and spar.
e. Insert block 8-96171-11 under -9 block so that pins engage in upper block.
f. Move rudder to left until -9 block is held firmly in position.
g. Place wrench 8-96171-19 over bolt head and apply pressure in a forward direction only to free bolt from bushings.
h. Remove bolt and split cone bushings attaching actuating cylinder to rudder horn.
i. Remove bolt at lower hinge fitting.
j. Remove nuts and washers at three upper hinge fittings and remove bolts attaching bonding jumpers to rudder.
k. Support rudder and remove hinge bolts and washers; remove rudder.
l. Remove split-cone bushings from stabilizer spar hinge fittings and remove shim from lower spar fitting.

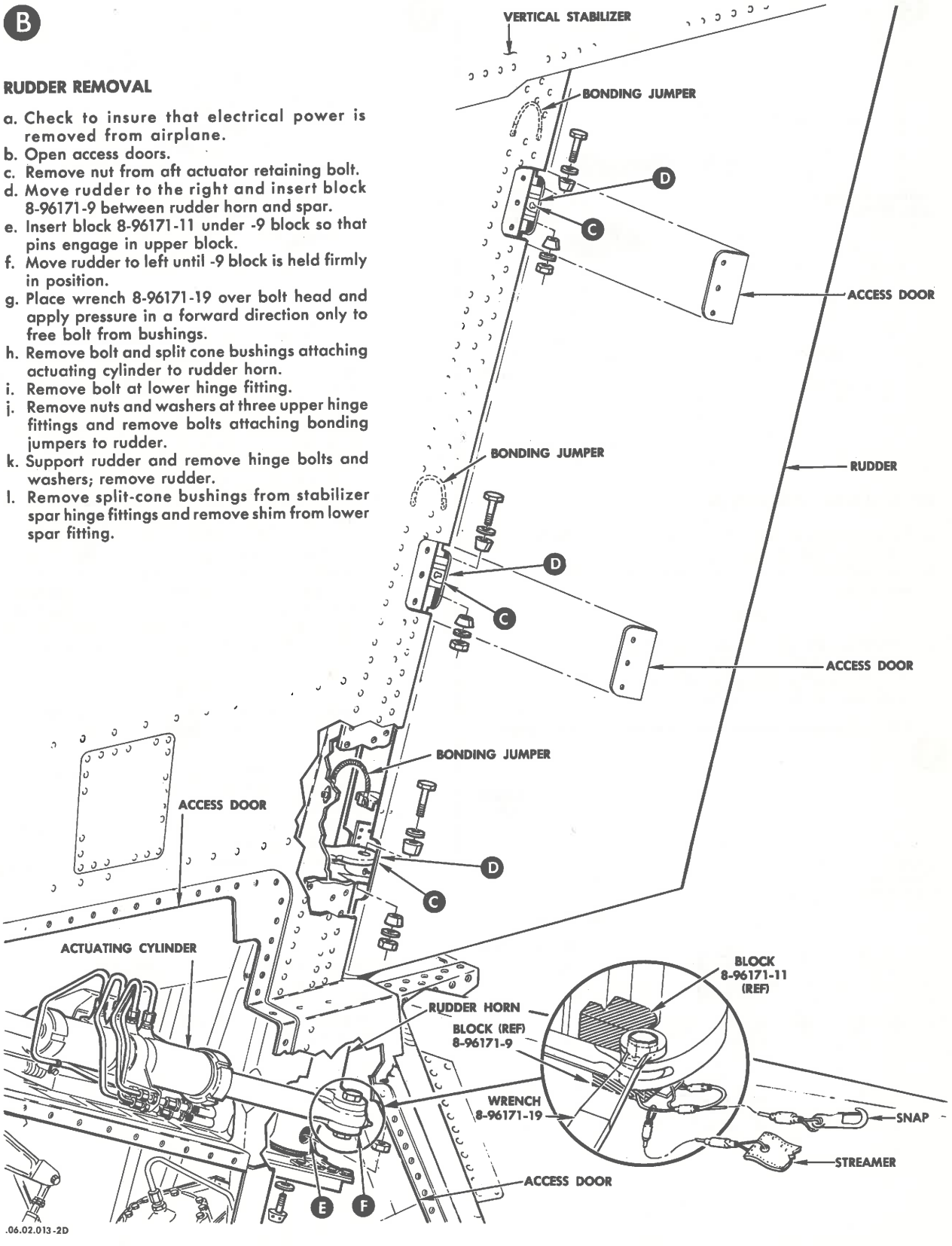
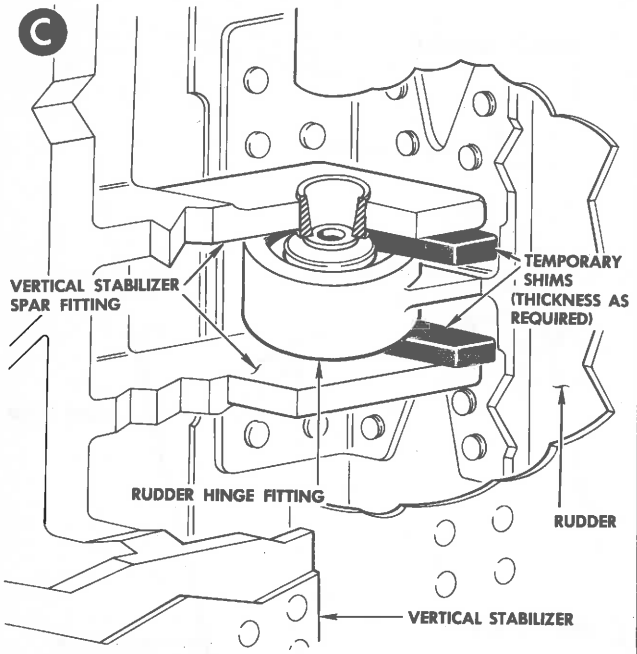


Figure 5-7. Rudder Replacement (Sheet 2 of 4)

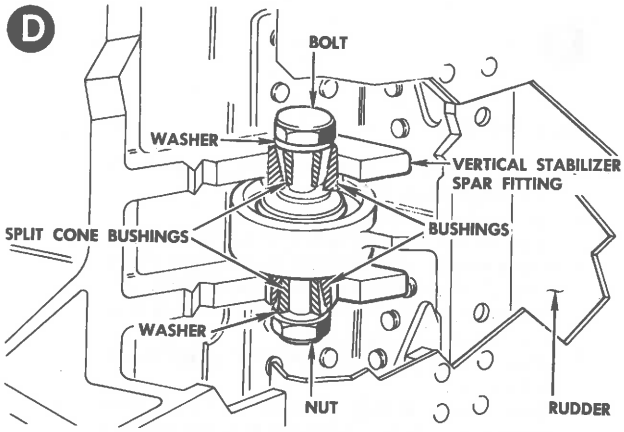


INSTALLATION, NEW RUDDER

a. Press bushings in spar fittings out to a position flush with inner face of each lug.
b. Place permanent shim in position on lower stabilizer spar fitting.

NOTE

TEMPORARY SHIMS PREVENT DEFORMATION OF VERTICAL STABILIZER SPAR FITTINGS WHILE BUSHINGS ARE BEING DRAWN INTO POSITION.

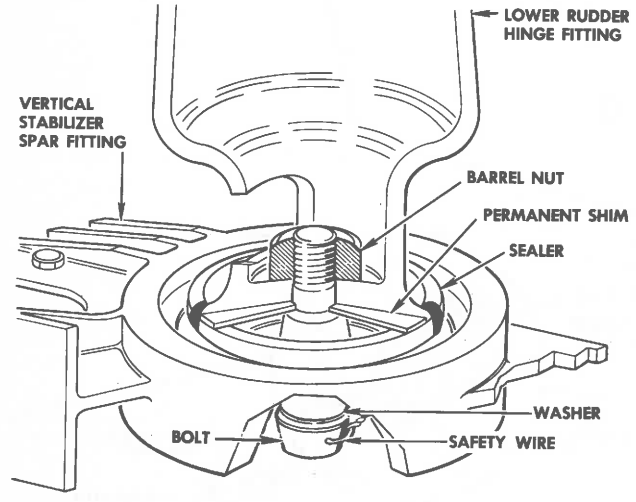


c. Place rudder in position and temporarily install split bushings and hinge bolts. Install bolt through lower spar fitting; see detail E. Tighten all nuts fingertight.
d. With weight of rudder resting on lower spar fitting, check that hinge fittings on rudder are centered (approximately) between lugs of vertical stabilizer spar fittings. If necessary, peel off additional layers of the permanent shim or replace shim (maximum shim thickness to be 0.032 inch).
e. When rudder fittings are properly located between stabilizer spar fitting lugs, torque barrel nut on lower spar fitting 3450 to 3750 inch-pounds.
f. Remove split bushings from upper spar fitting.
g. Install temporary shims and use temporary 7/16 inch bolt, nut and washers to draw inner faces of bushings against inner race of rudder hinge bearing.
h. Apply a light coat of graphite grease, Specification MIL-G-7187, to outside surfaces of split cone bushings.

NOTE

BOLT AND INNER SURFACES OF BUSHINGS MUST BE FREE OF GREASE OR LUBRICANT.

i. Install split bushings, permanent bolt, washers and nut; torque nut 270 to 300 inch-pounds. Remove temporary shims.
j. Repeat steps "f," "g," "h," and "i" for the remaining two hinge points.



k. Apply sealer EC 1291, Minneapolis Mining and Manufacturing Co., St. Paul, Minn. to outer edge of permanent shim; safety-wire bolt head.
l. Swing rudder to right and connect the three bonding jumpers.

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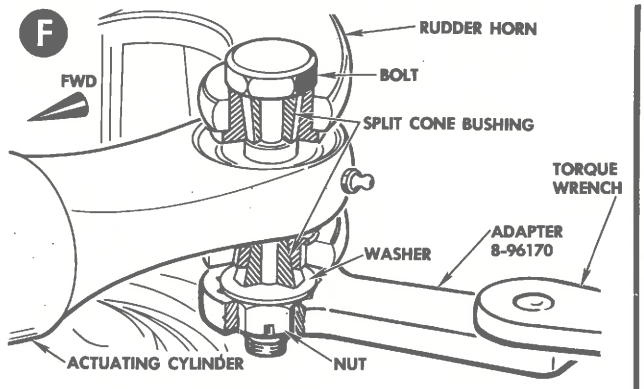
Figure 5-7. Rudder Replacement (Sheet 3 of 4)



m. Apply a light film of graphite grease, Specification MIL-G-7187, to outer surface of split cone bushings and insert bushings into horn fitting (see NOTE following step "h").
n. Install drag chute canister support and fairing.
o. Connect pneumatic line to drag chute deploy valve.
p. Secure speed brake position switch to drag chute canister support fairing structure.
q. Secure bonding jumpers and speed brake position switch linkage to speed brake door.
r. Install drag chute canister. Secure fairing door.
s. Install drag chute.
t. Install rudder protractor.
u. Swing rudder carefully back into neutral position as shown on protractor; connect aft end of actuating cylinder to rudder horn with bolt, washer, and nut; do not use washer under head of bolt. Using 8-96170 adapter, torque nut 1700 to 2000 inch-pounds and install cotter pin.

.06.02.013-4A

v. Lubricate pressure fitting in rod end of rudder actuator with grease, Specifaction MIL-G-3278.
w. Close all access doors.
x. Pressurize primary and secondary hydraulic systems of airplane; refer to T.O. 1F-106A-2-3.
y. Perform rudder control system operational check.
z. Perform operational checkout of drag chute system.

REINSTALLATION, ORIGINAL RUDDER.

a. Place original permanent shim in position on lower stabilizer spar fitting.
b. Place rudder in position and temporarily install split cone bushings, bolts and nuts in three upper hinge fittings. Tighten nuts fingertight.
c. Check that shim in lower spar fitting fills gap, then install bolt and nut. Torque nut 3450 to 3750 inch-pounds.
d. Remove split cone bushings from upper spar fitting and apply a light film of graphite grease, Specification MIL-G-7187, to the outside of the bushings.

NOTE
BOLT AND INNER SURFACES OF BUSHINGS MUST BE FREE OF GREASE OR LUBRICANT.

e. Install temporary shims in upper stabilizer spar fitting.
f. Install split bushings, bolt, washers and nut in upper hinge fitting; torque bolt 270 to 300 inch-pounds.
g. Repeat steps "d," "e," and "f" at the two remaining rudder hinge points.
h. Perform steps "k" through "z" of the preceding procedure "INSTALLATION, NEW RUDDER."

Figure 5-7. Rudder Replacement (Sheet 4 of 4)

at two places. The inner surface of the outer glass panel is coated with a very thin semiconductive material for electrical anti-icing purposes. This material is connected to terminals for power and ground connections. Temperature sensing elements are imbedded in the vinyl plastic layer and are connected to terminals at the edge of the panels. A windshield rainclearing system uses hot bleed air, from the low-pressure pneumatic system, to form a layer of air over the exterior surface of the left windshield panel. This prevents rain from reaching the panel. *Applicable to F-106A airplanes 56-459, 56-463 and subsequent*, the forward portions of the two windshield panels are defogged by partially cooled low-pressure pneumatic air from the heat exchanger. Refer to T.O. 1F-106A-2-6 for information on the windshield anti-icing, rainclearing, and defogging systems.

5-37. Windshield Glass Panels, Allowable Damage.

Allowable damage to windshield glass panels is restricted to cracks, sleeks, scratches, flaked chips, and delamination. Delamination is discussed in paragraph 5-38. The outer ply of the windshield panel is non-structural and thus the allowable damage is greater than that allowed for the structural inner ply. Allowable limits for damage, other than delamination, are as follows:

a. Cracks in outer ply; any number providing that pilot's vision and the windshield anti-ice anti-fog system are not affected.

b. Cracks in inner ply; none.

c. Sleeks (fine scratchlike marks having smooth boundaries, usually caused by a foreign particle during the polishing operation) in inner or outer plies; any number providing that the pilot's vision is not affected.

d. Scratches in outer ply; any number providing that the pilot's vision is not affected.

CAUTION

Exercise care to avoid scratching windshield glass panels. Refer to Section II for cleaning procedure.

e. Scratches less than 0.001 inch deep in inner ply; not more than 3, none of which can be of greater length than 2 inches.

f. Flaked chips along edge of outer ply; any number providing that the width of any chip (measured from the edge of the panel towards the center of the panel) does not exceed 0.256 inch and that the depth of any chip does not exceed 0.051 inch.

g. Flaked chips along edge of inner ply; not more than 8 providing that the width of any chip (measured from the edge of the panel towards the center of the panel) does not exceed 0.171 inch and the depth of any chip does not exceed 0.068 inch.

CAUTION

Chips of any type are not allowable on the face of the inner or outer plies of the windshield glass panel. "V" chips are not allowable along the edge of either ply of the windshield panel.

5-38. Windshield Glass Panel Delamination.

Delamination (separation of the glass laminates from the vinyl) is usually identified by a bubble-like appearance between the glass and the vinyl. The presence of delaminated areas does not impair the structural integrity of the glass panel. Therefore, panels showing delamination need not be replaced until delamination is extensive enough to impair vision during flight. See figure 5-8 for delamination limits.

5-39. CANOPY PANELS.

Applicable to F-106A airplanes, the canopy panels consist of a stretched plexiglas panel on each side of the canopy structure. Each panel is of three-ply laminated construction. The center ply is of vinyl plastic and the other two are plexiglas. The inner surface of the outer ply is coated with a very thin semiconductive material for electrical defogging purposes. This material is connected to terminals for power and ground connections. Temperature sensing elements are imbedded in the vinyl plastic layer and are connected to terminals at the edge of the panels. Refer to T.O. 1F-106A-2-6 for information on the canopy defog system. The periphery of the panel includes an orlon-acrylic doubler through which pass the attachment screws. Two shear-carrying impregnated strips running along the top and bottom sides of the panel are bonded to the inside faces of the orlon-laminated edges. Attachment screw holes in the canopy structure are slotted to allow for contraction and expansion of the plexiglas assembly with temperature changes.

CAUTION

Gasoline, kerosene, lacquer thinner, ether ketones, xylene, or other solvents must not be used in the vicinity of these plexiglas panels.

5-40. *Applicable to F-106B airplanes.* The canopy panels are of the same material, construction, and are attached as those described above for the F-106A airplanes. They differ in that four panels, one forward and one aft on each side, are required because of the increased length of the canopy. Refer to T.O. 1F-106A-2-6 for information on the canopy defog system.

5-41. Canopy Panel, Scratch Limitations.

Utmost care must be exercised to prevent scratches in canopy panels. It is realized, however, that some scratches will occur due to unusual conditions or incidents. The following data furnishes allowable depth limits of scratches and will serve as a guide in determining replacement of damaged panels.

a. Maximum allowable depth of scratches in the critical vision area shall be 0.031 inch.

b. Maximum allowable depth of scratches in the non-critical vision area shall be 0.047 inch.

NOTE

The critical vision area, as used here, shall mean the portion of the canopy panel forward of the pilot's head rest. The non-critical vision area is the portion of the panel aft of the pilot's head rest.

c. Waxing of the panel should eliminate, visually, most of the scratches. Waxing shall be accomplished in accordance with T.O. 1-1A-12. However, if power buffing of the wax is utilized, extreme care should be exercised not to heat the plexiglas, as this could cause relaxation of the stretched acrylic. Relaxation of stretched acrylic affects both the visual and structural properties and is cause for rejection.

d. Panels having scratches which are within allowable depth limits, but which cause objectionable patterns or distort vision should be rejected. It is suggested that pilots be consulted when determining serviceability of panels having these defects.

e. Damage to the fabric edge laminate may be repaired but should only be done at depot level.

f. Nicks, dents, and chips at the edge of the panel that do not extend beyond the projection of the edge laminate on the opposite surface may be permitted as follows: The maximum depth should not exceed 0.125 inch, or extend over a radius of 0.500 inch to a feathered edge.

5-42. Canopy Panel Delamination.

Delamination of canopy panels occurs when either or both plexiglas plys separate from the vinyl ply. When delamination exceeds the limits shown in figure 5-9, the canopy panels must be replaced.

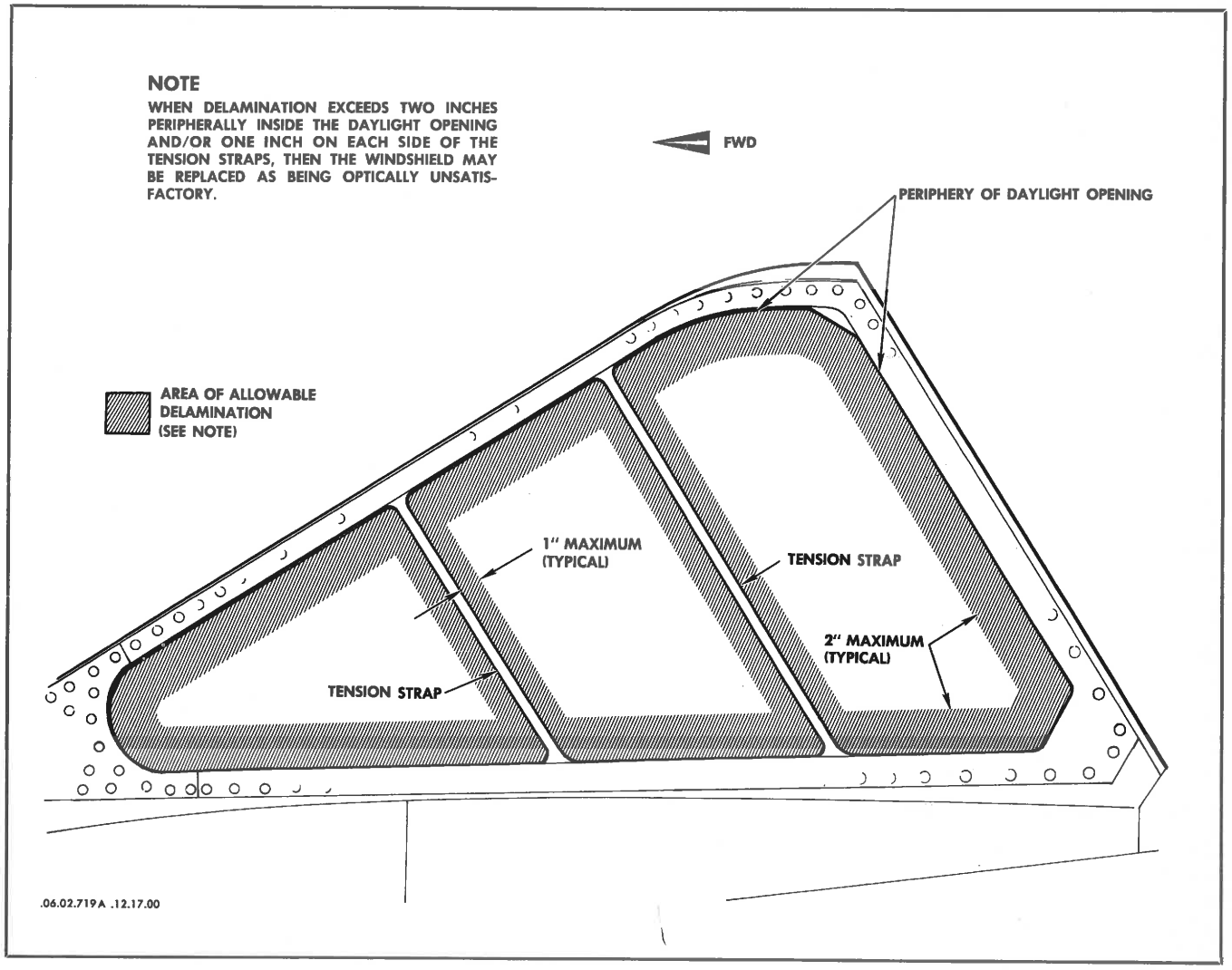


Figure 5-8. Windshield Glass Panel Delamination

REPLACEMENT

5-43. REMOVAL, WINDSHIELD GLASS PANELS.

a. Disconnect heating and sensing electrical wires from windshield.

b. Remove attachment screws. Remove attaching parts and remove windshield glass panel.

c. Remove bumper strip and seals from windshield structure.

5-44. INSTALLATION, WINDSHIELD GLASS PANELS.

Detailed views of the windshield glass panel installation are illustrated in figure 5-10 and must be referred to when accomplishing the following procedures.

5-45. Preparation.

a. Remove old sealer from windshield structure and attaching parts with a plastic scraper.

b. Remove dirt and/or foreign matter from helicoil inserts and tapped holes in windshield structure; use compressed air if necessary.

c. Check that helicoil inserts are from ¼ to ½ turn below the surface of the windshield structure; inserts shall not protrude.

d. Clean structure and attaching parts with a clean cloth that has been dampened with aliphatic naphtha, Specification TT-N-95.

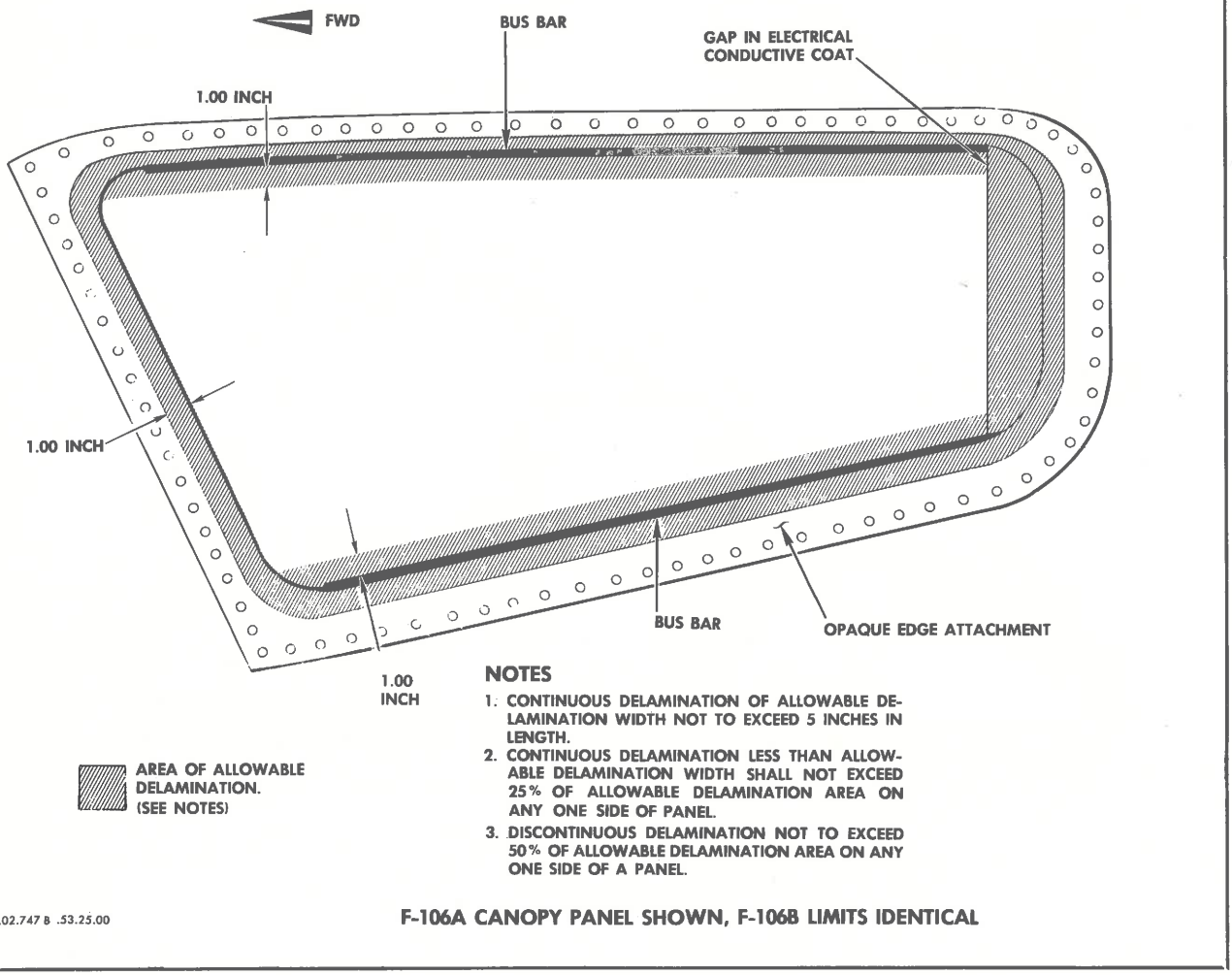


Figure 5-9. Canopy Panel Delamination

e. Apply Silastic Primer A4004 (6210-099-8620) to outboard attaching ledge of glass assembly in the areas of silicone sealer contact as shown in details A through E of figure 5-10. Allow primer to dry a minimum of 30 minutes before installing glass assembly.

NOTE

Primer A4004 is provided in Kit-Sealant, Windshield Installation, Convair P/N 8-77832.

CAUTION

Do not apply silicone primer to face of glass assembly as discoloration will result.

f. *Applicable to left side of F-106A airplanes 58-759 and subsequent and F-106B airplanes 59-149 and subsequent,* apply a light brush coat of EC1662 primer to both sides of insulator B. Allow primer to dry a minimum of 30 minutes.

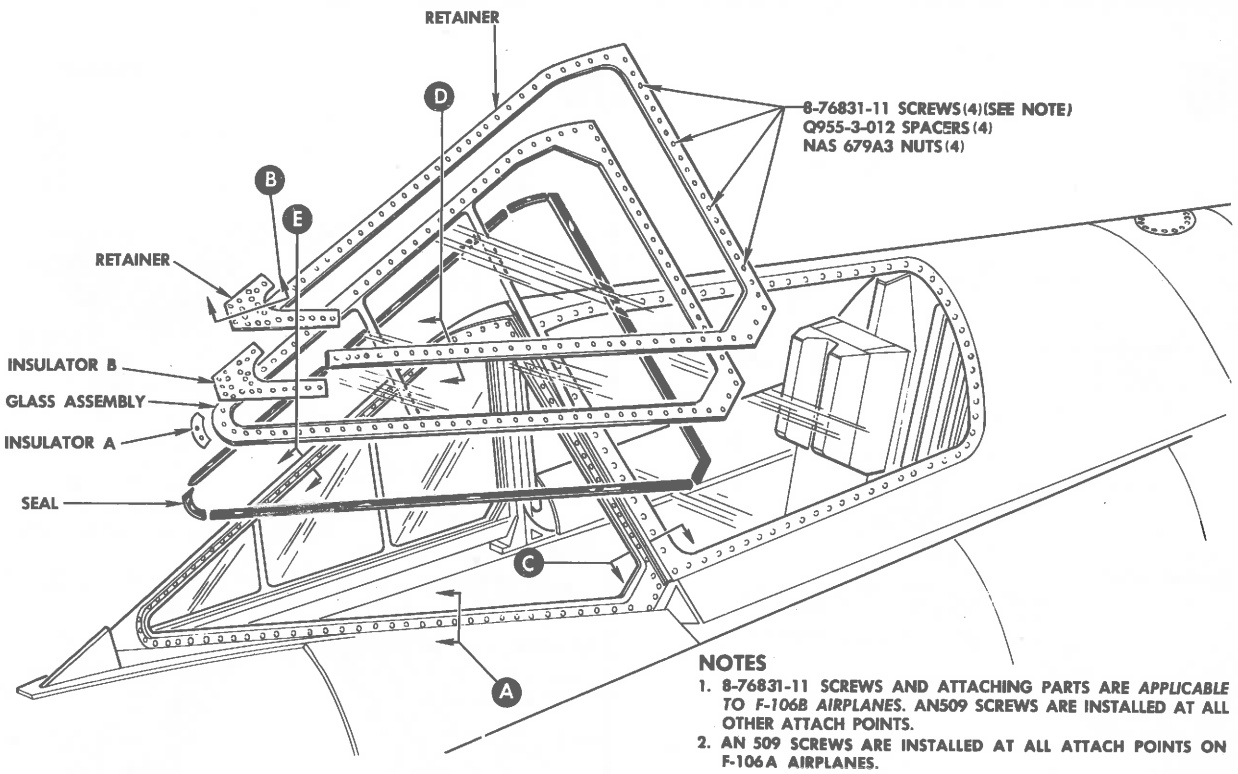
5-46. Procedure.

a. Cement bumper strip to windshield structure with EC524 as shown in detail A of figure 5-10.

NOTE

EC524 (8040-281-1972), EC870 (8040-266-0839), EC1662, EC1663, EC1667A, EC1667B, and VBB-22 are manufactured by 3M Co., St. Paul 6, Minn. EC1662, EC1663, EC1667A, and EC1667B are provided in Kit-Sealant, Windshield Installation, Convair P/N 8-77832. When cementing one component to another, apply cement to mating surface of each component; allow cement to dry a short time until it becomes tacky then correctly position and press mating surfaces together.

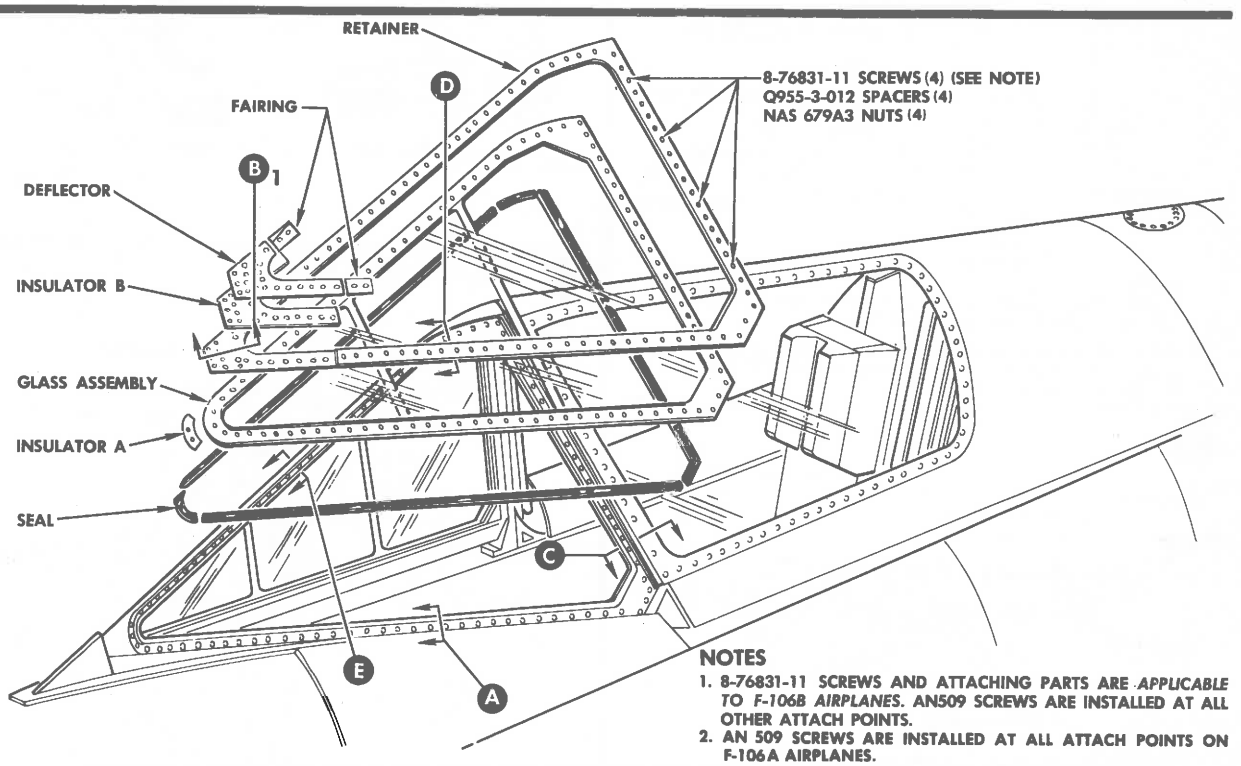
b. Cement seals all around windshield structure with EC524 as shown in details A through E of figure 5-10. Trim ends of seals so that seals butt against each other.



NOTES

1. 8-76831-11 SCREWS AND ATTACHING PARTS ARE *APPLICABLE TO F-106B AIRPLANES*. AN509 SCREWS ARE INSTALLED AT ALL OTHER ATTACH POINTS.
2. AN 509 SCREWS ARE INSTALLED AT ALL ATTACH POINTS ON F-106A AIRPLANES.

APPLICABLE TO F-106A AIRPLANES 56-453 THRU 57-2464, 57-2466 THRU 57-2506 AND F-106B AIRPLANES 57-2507 THRU 57-2522, 57-2524 THRU 58-904.



NOTES

1. 8-76831-11 SCREWS AND ATTACHING PARTS ARE *APPLICABLE TO F-106B AIRPLANES*. AN509 SCREWS ARE INSTALLED AT ALL OTHER ATTACH POINTS.
2. AN 509 SCREWS ARE INSTALLED AT ALL ATTACH POINTS ON F-106A AIRPLANES.

APPLICABLE TO F-106A AIRPLANES 57-2465, 58-759 AND SUBSEQUENT AND F-106B AIRPLANES 57-2523, 59-149 AND SUBSEQUENT.

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Figure 5-10. Windshield Glass Installation (Sheet 1 of 2)

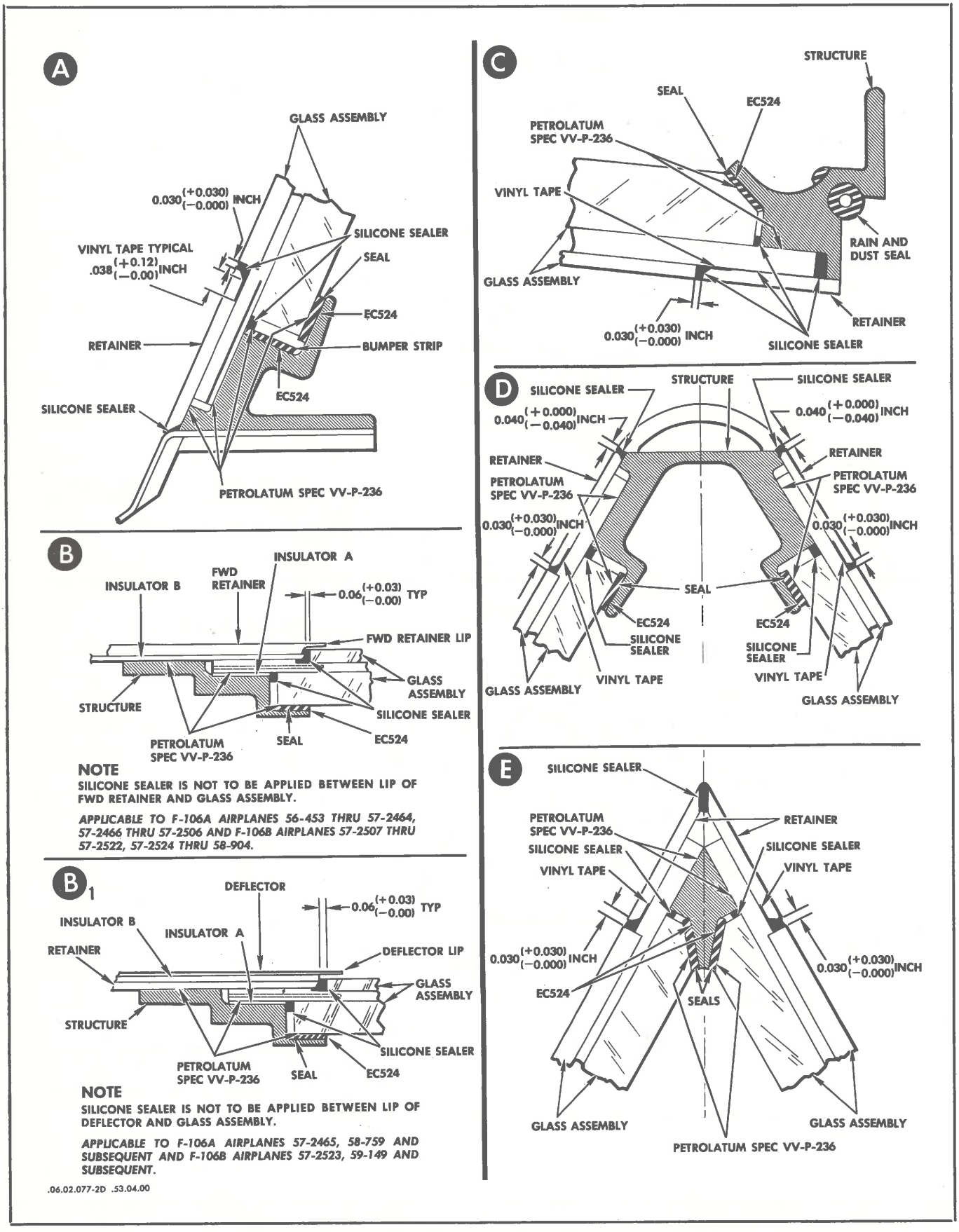


Figure 5-10. Windshield Glass Installation (Sheet 2 of 2)

Check that seal installation presents a flat surface; build up low points by adding 1/32 inch thick seals as required.

c. Cement insulator A to windshield structure with EC524 as shown in detail B or B1 of figure 5-10.

d. Apply a thin film of petrolatum, Specification VV-P-236, to mating surface of windshield structure bumper strip, seals, and insulator A. See details A through E of figure 5-10.

e. Apply a bead of silicone sealer to windshield glass assembly at intersection of vinyl and edge of inner glass; see details A through E of figure 5-10.

NOTE

Silicone sealer is a mixture of 1 part EC1667A to 10 parts EC1667B by weight and must be used within 2 hours after mixing.

CAUTION

Exercise care to eliminate air bubbles when mixing or applying silicone sealer. This precaution will prevent moisture collecting in air bubbles, which can result in shorting out the windshield anti-ice system and causing windshield damage.

f. Position glass assembly on windshield structure and temporarily install a few screws to hold glass in position.

g. Apply a heavy coat of silicone sealer to glass assembly and structure as shown in details A through E of figure 5-10. Exercise care to prevent sealer from entering inserts and/or tapped holes.

h. *Applicable to left side of F-106A airplanes 56-453 thru 57-2506 and F-106B airplanes 57-2507 thru 58-904.* Apply a coat of silicone sealer to both sides of insulator B and position insulator on glass assembly.

i. *Applicable to left side of F-106A airplanes 57-2466 thru 57-2506 and F-106B airplanes 57-2532 thru 58-904.* Install special washers 8-77769 (13 places) in holes of insulator B.

j. Cement black vinyl tape VBB-22 to inner edge of large retainer with cement EC870. See details A, C, D, and E of figure 5-10.

k. Remove temporarily installed attach screws; position large retainer, and install but do not tighten attach screws through countersunk holes. *Applicable to left side of F-106A airplanes 56-453 thru 57-2506 and F-106B airplanes 57-2507 thru 58-904,* position forward retainer and install but not tighten attach screws.

l. *Applicable to left side of F-106A airplanes 58-759 and subsequent and F-106B airplanes 59-149 and subsequent.* Cement insulator B to retainer with EC1663 (silicone rubber cement); see sheet 1 of figure 5-10. Cement deflector to insulator B with EC1663; install but do not tighten attach screws. Install fairings.

m. Tighten all attach screws to torque value of 25 to 30 inch pounds.

n. Fill all voids between edge of glass and retainers with silicone sealer until sealer is flush with glass except as shown in details B and B1 of figure 5-10 where excess sealer must be wiped out.

o. Check retainer for clearances as shown in details A, C, D, and E of figure 5-10.

p. Connect heating and sensing electrical wires to windshield glass assembly.

q. Perform an operational test of the windshield electrical anti-ice system; refer to T.O. 1F-106A-2-6 for procedure.

r. Allow silicone sealer to cure a minimum of 24 hours at 21.1°C(70°F).

NOTE

Curing time of sealant may be reduced to approximately 4 hours if a locally manufactured sheet metal windshield cover hood is used in conjunction with the SE 0973 heater. Air from the heater at approximately 150°F (65.5°C) enters the forward portion of the hood at approximately 110° to 130°F (43.3° to 54.4°C) to reduce sealant curing time. Build the forward portion of the hood to incorporate a duct that will mate with the heater's flexible duct. Build the aft portion of the hood approximately 2 inches larger than the windshield with the aft edge flanged down to fit over the windshield's aft edge. The bottom edge of the hood shall be contoured to fit the fuselage and provided with a soft rubber seal to protect the fuselage skin and insure an airtight enclosure.

s. Clean windshield panels.

5-47. REMOVAL, CANOPY PANELS.

a. Disconnect heating and sensing electrical wires from canopy panel.

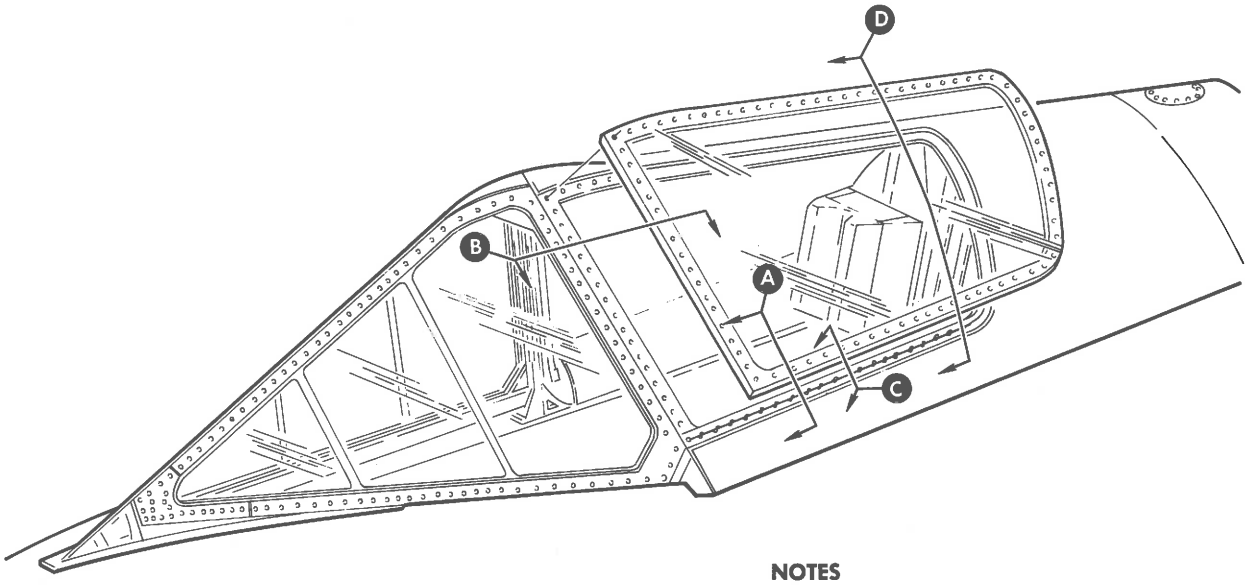
b. Remove attachment screws. Remove panel.

c. Remove old sealer from mating surface of canopy structure with a plastic scraper.

d. Clean mating surface of canopy structure with a clean cloth that has been dampened with aliphatic naphtha, Specification TT-N-95.

5-48. INSTALLATION, CANOPY PANELS.

Procedure for installation of canopy panels is shown on figure 5-11.



CAUTION

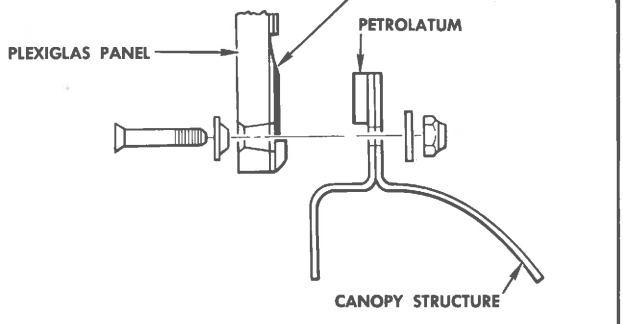
IF CANOPY REQUIRES PAINTING, THIS SHALL BE PERFORMED PRIOR TO INSTALLATION OF PANEL. IT IS IMPERATIVE THAT PLEXIGLAS PANEL BE PROTECTED FROM INJURIOUS FUMES AND SOLVENTS.

NOTES

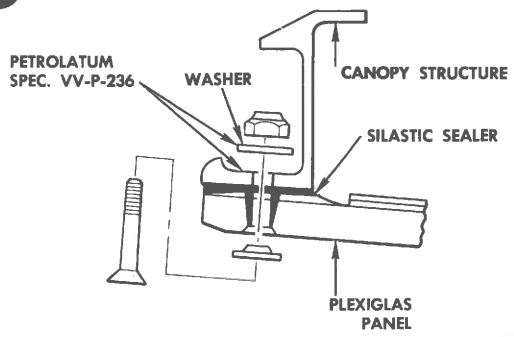
1. SILASTIC PRIMER NO. A4004 IS MANUFACTURED BY THE DOW CORNING CORPORATION, MIDLAND, MICHIGAN.
2. SILASTIC SEALER IS A MIXTURE OF EQUAL PROPORTIONS BY WEIGHT OF RTV SILASTIC S-5302 (RED COLOR) AND RTV SILASTIC S-5303 (WHITE COLOR). THESE PRODUCTS ARE MANUFACTURED BY DOW CORNING CORPORATION. THE TWO ARE MIXED JUST PRIOR TO USING AND MUST BE USED TWO HOURS AFTER MIXING.

F-106A SHOWN, F-106B INSTALLATION PROCEDURE IDENTICAL

A



B



INSTALLATION

a. Apply a coat of Silastic primer (No. 4004) to mating surface of panel edges. Allow to air dry 30 minutes. See note 1.
b. Apply a ⅛ inch thick coat of Silastic sealer to mating surface of plexiglas panel edges. See note 2.
c. Apply a light film of petrolatum, Spec. VV-P-236, to mating surface of canopy structure.
d. Position plexiglas panel in place on canopy structure.
e. Align screw holes in plexiglas panel and structure at forward end; then install attaching screws, washers, and nuts at forward end only. Apply a thin coat of petrolatum, Spec. VV-P-236, to mating surfaces of washers and canopy structure.

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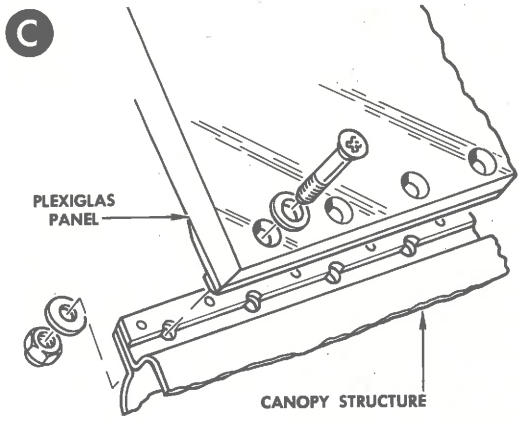
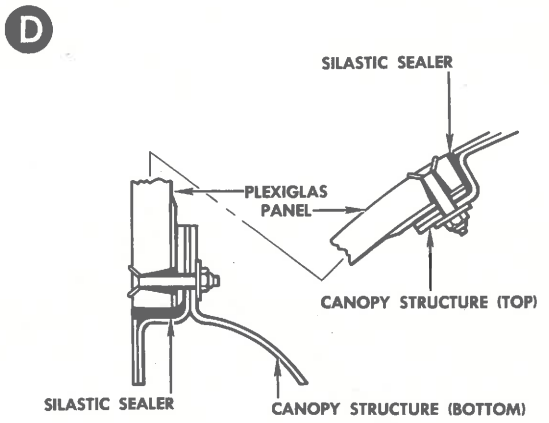
Figure 5-11. Canopy Panel Installation (Sheet 1 of 2)





f. Install attaching screws, washers and nuts in top, bottom and aft ends of plexiglas panel. Apply a thin coat of petrolatum, Spec. VV-P-236, to mating surfaces of washers and canopy structure.
g. Torque attaching screws as follows:
   1. Tighten 7 screws at lower forward corner (forward panel only on F-106B airplanes) until screws seat and resistance is felt. Do not deflect corner of panel.
   2. Tighten remaining screws (all screws of aft panel of F-106B airplanes) to 10 inch pounds at this time.
h. Fill gap at plexiglas panel edges with Silastic sealer until flush and smooth.
i. Connect heating and sensing electrical wires to panel. Perform an operational check of the panel anti-ice system; refer to T.O. 1F-106A-2-6 for procedure.
j. Allow Silastic sealer to cure at least 4 hours at approximately 70°F (21.1°C).
k. Torque attaching screws as follows:
   1. Tighten 7 screws at lower forward corner (forward panel only of F-106B airplanes) until screws seat and resistance is felt. Do not deflect corner of panel.
   2. Tighten remaining screws (all screws of aft panel of F-106B airplanes) to 13 inch pounds.
l. Check installation for conformance with aerodynamic smoothness requirements.
m. Clean panel.
n. Perform a cockpit pressure leak test; refer to T.O. 1F-106A-2-6 for procedure.

.06.02.091-2C .53.25.00

Figure 5-11. Canopy Panel Installation (Sheet 2 of 2)

SERVICING

5-49. CARE OF PLEXIGLAS WINDOWS.

Take care to avoid use of solvents and to eliminate solvent fumes where the plexiglas canopy windows are stored, installed, or used. This is mandatory as plexiglas absorbs these fumes, which destroy its structural strength and optical quality. All known protective coatings against abrasion do not protect against solvent fumes. Prohibited solvents include gasoline, kerosene, benzene, xylene, ketones, including acetone, carbon tetrachloride, fire extinguisher or de-icing fluids, lacquer thinners, aromatic hydrocarbons, ethers, or other solvents not approved for canopy cleaning purposes. None of these solvents is to be used near the plexiglas windows. Methylethyl ketone and other solvents that evaporate at a high rate must not be used in the same enclosed area, building, or hangar, unless the fumes are carried off, to prevent any possibility of their coming in contact with the plexiglas. During touchup painting, which should be done in circulating air, the transparent area of the canopy windows must be masked off; refer to paragraph 2-83 for procedure. Plexiglas has a property of absorbing selectively the heat-producing rays of the sun. At a temperature of 80°F (26.7°C) the enclosure should be opened sufficiently to permit free circulation of air within the canopy area. At ground temperatures above 120°F (48.8°C), the enclosure must be opened and shaded from the direct rays of the sun. Dark colored covers should not be used if this cover is in direct contact with the plexiglas.

5-50. CLEANING GLASS PANELS AND PLEXIGLAS PANELS.

For information on cleaning windshield glass panels and canopy plexiglas panels, refer to paragraphs 2-70 and 2-71.

FUSELAGE EQUIPMENT

DESCRIPTION

5-51. PILOT'S ANTI-G SUIT PRESSURIZATION SYSTEM.

The pilot's anti-G suit is pressurized by engine bleed air that has been cooled by passage through the refrigeration unit heat exchanger. Air pressure to the suit is controlled by a regulator mounted on the left side of the cockpit. The suit is unpressurized except during maneuvers that exceed 1½ to 2 G's. When higher "G" loads are imposed, the regulator functions automatically to increase suit pressure. See figure 5-12 for a perspective illustration of the system.

5-52. Anti-G Suit Pressure Regulator.

The anti-G suit pressure regulator is an inertia type that senses "G" loads and increases suit pressure as the "G" loads increase. This action of the regulator is automatic. The regulator also incorporates a manually operated push button. When the button is depressed, unregulated engine bleed air pressurizes the anti-G suit. When the button is released, the suit is depressurized. This feature, of the regulator, may be used by the pilot during extended flights to prevent fatigue as it creates a massaging effect on his body. Operation of the push button does not test the automatic feature of the regulator. If the regulator is suspected of being defective, it is necessary to remove it from the airplane for a bench test, as it cannot be tested otherwise.

5-53. GLARE AND REFLECTION PROTECTION.

Applicable to F-106A airplanes. The pilot is protected from glare and reflections by a glare shield located above the instrument panel, a horizontal anti-glare curtain installed at each side on the top forward section of the instrument panel, a vertical anti-glare curtain installed on top of the instrument panel centerline. All these devices are black, as is all exposed hardware, to provide maximum glare and reflection protection.

5-54. *Applicable to F-106B airplanes.* Glare and reflection protection for the pilot in the forward seat is essentially the same as that provided for the pilot of F-106A airplanes. Provisions for the pilot in the aft seat consist of a two-piece glare shield assembly bolted to the canopy structure. All components of the shield assembly are painted with flat black lacquer to afford maximum glare protection.

5-55. Instrument Panel Glare Shield.

Applicable to F-106A airplanes. The instrument panel glare shield is formed of a semirigid black plastic. The entire lower side is covered by a thin sheet of black fiberglass, as is most of the upper side. The shield extends several inches aft from the top of the instrument panel, curving downward and inward. A cushioned bumper strip is attached to the cockpit structure by means of screws and snap fasteners. Six lights are mounted within the glare shield, two red floodlights and one white thunderstorm light on each side. The red lights are controlled by the instrument floodlight powerstat on the light control panel. The white lights are operated by a switch at the right of the instrument panel. See figure 5-13 or 5-14 for an illustration of the instrument panel glare shield.

5-56. *Applicable to F-106B airplanes.* The forward instrument panel glare shield is essentially the same as that provided for F-106A airplanes. Major components of the aft instrument glare shield are the fixed, or lower, shield attached to the canopy structure and the movable, or upper, shield which slides within a track of the lower shield. Both shields are of molded fiberglas construction. The fixed shield covers the top of the instrument panel and the forward portion of the radar scope, and extends aft thirteen inches from the upper quarters and each side of the panel. Two red floodlights and one white thunderstorm light are attached at each side to that portion of the fixed shield extending aft from the instrument panel. When the movable shield is extended aft, it fairs in with the aft portion of the radar scope and shields that section of the instrument panel not protected by the fixed shield.

5-57. VERTICAL ANTI-GLARE CURTAIN.

The vertical anti-glare curtain eliminates windshield reflections due to either runway glare during day operations or runway lights during night operations. *Applicable to F-106A airplanes 56-453 thru -462 and 56-467 and F-106B airplanes 57-2507 and 57-2509.* The single piece curtain is held in place by a spring loaded clamp at the forward edge, a groove along the upper edge, and by machine screws along the lower edge. *Applicable to F-106A airplanes 56-463 thru 56-466, 57-229 and subsequent and F-106B airplanes 57-2508, 57-2510 and subsequent.* The forward section of the two piece curtain is held in place by machine screws. The aft section slides into grooves and is held in place by a latch assembly at the upper aft edge and a machine screw at the lower aft edge. See figures 5-13 thru 5-15 for illustrations of the curtain.

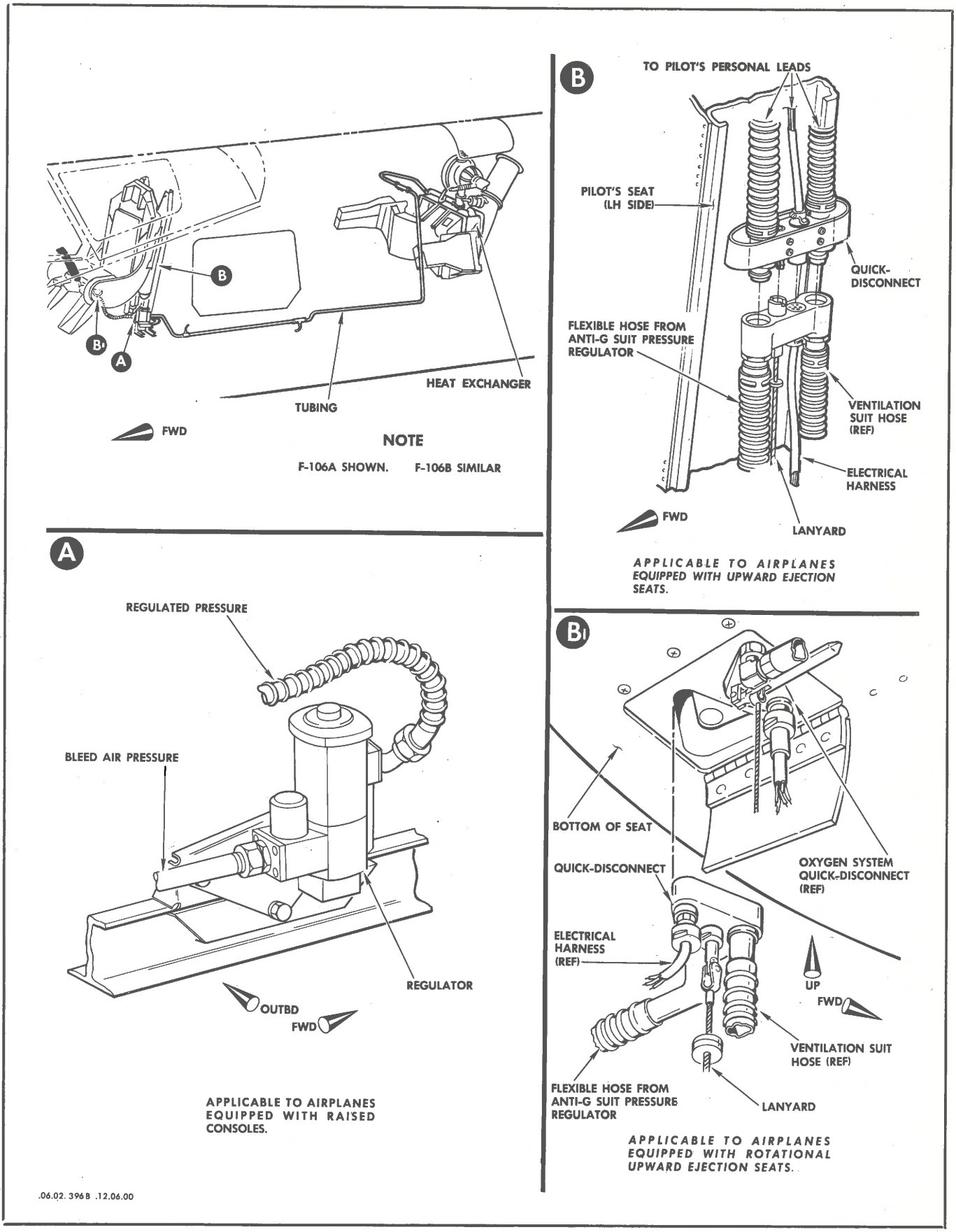


Figure 5-12. Pilot's Anti-G Suit Pressurization System, Perspective

5-58. HORIZONTAL ANTI-GLARE CURTAIN.

Applicable to F-106A airplanes. Black fabric curtains are installed on the top forward section of the instrument panel. The aft end of each of these two triangular-shaped curtains are snap-fastened to the forward part of the glare shield. The outboard edges are attached to the fuselage below the windshield. The inboard edges contact the radar scope, when installed, but are not attached to it. See figures 5-13 thru 5-15 for illustrations of these reflection curtains.

5-59. *Applicable to F-106B airplanes.* The curtains for the forward instrument panel are identical to those provided for F-106A airplanes. No curtains are required for the aft instrument panel because of the air blast shield and the aft glare shield design.

5-59A. AIR BLAST SHIELD, F-106B.

The air blast shield is constructed of an aluminum alloy core and fiberglass laminated skin. This shield is installed just forward of the aft cockpit instrument panel to provide the pilot in the aft seat with protection from the air blast when the canopy is jettisoned. The blast shield is mechanically actuated to the extended (open) position when the canopy is opened and is mechanically actuated to the retracted (closed) position when the canopy is closed.

5-60. STOWAGE PROVISIONS.

5-61. Shoulder Harness and Personal Leads.

The shoulder harness and personal leads are stowed, in an easy-to-reach position, on each side of the seat by means of bundling straps and tabs. This provision reduces the time needed to strap in the pilot during a "scramble" and protects the equipment from unnecessary wear.

5-62. Spare Lamp Stowage.

Applicable to F-106A airplanes 56-453 thru 57-2465. Spare cockpit lamp stowage is provided on the left-hand console, inboard of the fuel control panel. The spare lamps are retained in a grommet-type holder.

5-63. *Applicable to F-106B airplanes 57-2507 thru 57-2531.* Spare lamp stowage provisions for both the forward and aft cockpits are identical to those provided for F-106A airplanes.

5-64. Pilot's Map and Data Case.

Applicable to F-106A airplanes. The pilot's map and data case is located aft on the right-hand console, inboard of the right-hand console fuse panel. The case and cover are made of fiberglas laminate. A simple spring latch holds the cover closed.

5-65. *Applicable to F-106B airplanes.* A map and data case, similar to that provided for F-106A airplanes, is provided for each pilot.

5-66. Canopy and Seat Safety Pin Stowage.

Applicable to F-106A airplanes. The canopy and seat ejection system is provided with a ground safety pin assembly mounted above the right-hand console. The pin is inserted in the seat when the airplane is on the ground. When the pin is removed from the ejection control handle (just prior to flight), the pin portion of the assembly is stored in a mounting on the console. No stowage provisions are incorporated for the additional safety pins required when maintenance work is performed within the cockpit.

5-67. *Applicable to F-106B airplanes.* Canopy and seat safety pin stowage, identical to that provided for F-106A airplanes, is provided for each cockpit.

5-68. Landing Gear Downlock Pin Stowage.

The landing gear downlock stop pins and the nose wheel steer damp unit lock pin are stowed in a fabric bag attached to a beam at the bottom center line of the airplane in the main wheel well. The steer damp unit lock pin is used when jacking the nose wheel or locking the steering unit for other reasons. The fabric bag is installed with retaining straps.

5-69. Luggage and Clothing Container.

The luggage and clothing container assembly consists of a welded tubular frame and a fire-resistant canvas container which is riveted to the frame. The 43 inch long, 20 inch wide, and 13.5 inch deep canvas container provides space for stowing the pilot's clothing and/or luggage on cross country flights. When the assembly is installed, it is connected to the MB-1 ejection rack in the aft missile bay.

REPLACEMENT

5-70. REPLACEMENT, INSTRUMENT PANEL GLARE SHIELD.

Applicable to F-106A airplanes. Glare shield installation procedure is shown on figures 5-13 thru 5-15.

5-71. *Applicable to F-106B airplanes.* The forward instrument panel glare shield replacement procedure is shown on figure 5-14. To replace the aft instrument panel glare shield proceed as follows:

a. Remove flight command indicator and flight command indicator rack by procedure given in T.O. 1F-106A-2-14.

b. Disconnect flood and thunderstorm light assemblies from glare shield.

c. Remove eight glare shield attach bolts from each side of canopy structure and remove glare shield.

d. Install glare shield by reversing removal procedure.

5-72. REPLACEMENT, ANTI-G SUIT PRESSURE REGULATOR.

Procedures for removal and installation of the anti-G suit pressure regulator are shown on figure 5-16.

5-73. REMOVAL, AIR BLAST SHIELD, F-106B.

a. Open canopy and install canopy hold-open supports. Install maintenance safety pins in canopy jettison and seat ejection system as specified in figures 8-43 or 8-53.

b. Disconnect cables (2) from blast shield. Lower blast shield to retracted position.

c. Disconnect springs (2) from fittings located on top of blast shield.

d. Disconnect blast shield from support arms (2) by removing bolts. Remove blast shield.

5-74. INSTALLATION, AIR BLAST SHIELD, F-106B.

a. Position and connect air blast shield to support arms (2) by installing bolts.

b. Connect springs (2) to fittings on top of blast shield.

c. Raise blast shield to extended position and connect cables (2) to blast shield.

d. Remove canopy hold-open supports and lower canopy to point where roller bearings attached to canopy structure are in contact with blast shield tracks. Check alignment of bearings to tracks.

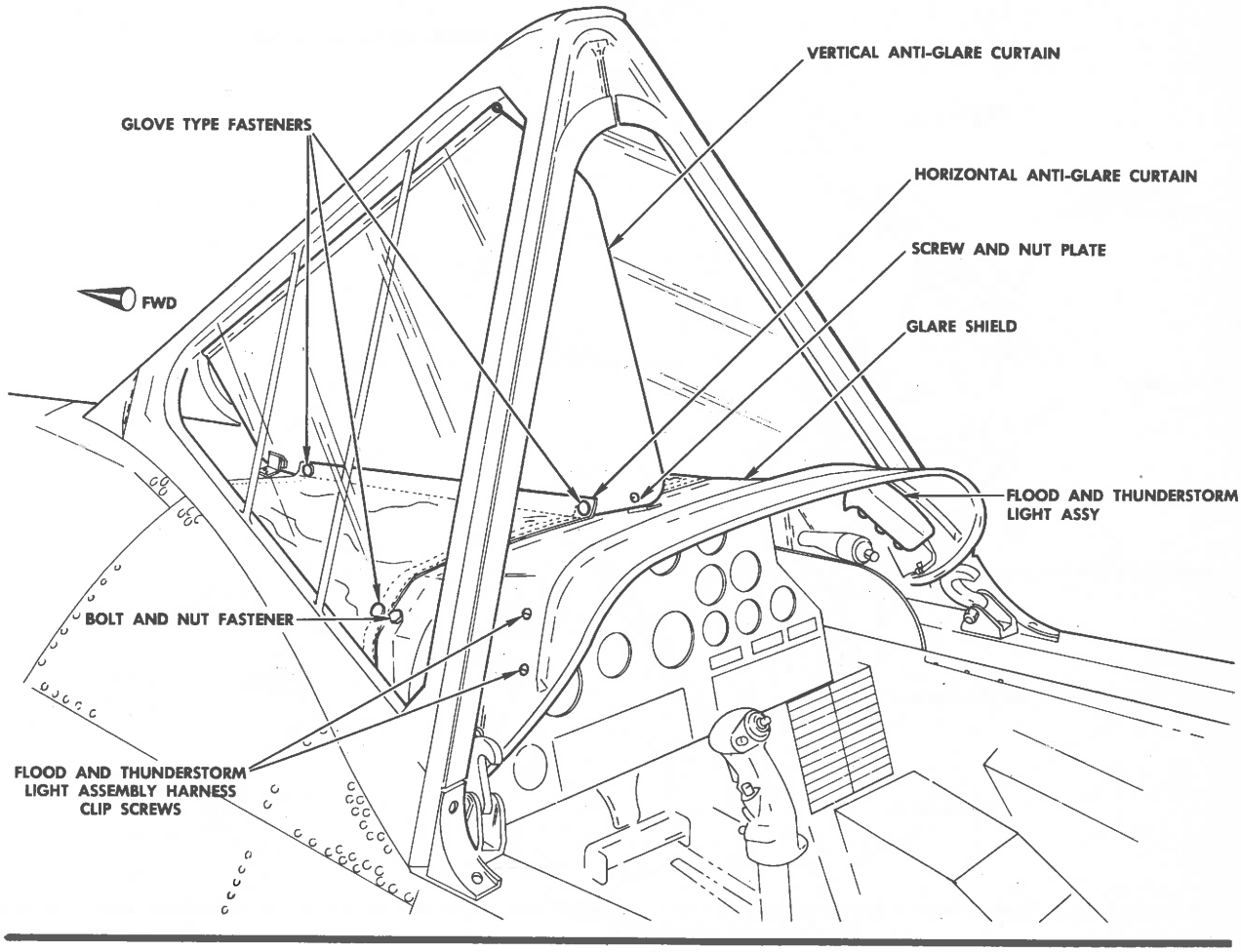
NOTE

Lateral alignment of bearings is controlled by washer type shim installed adjacent to bearing.

e. Continue to lower canopy. The roller bearings attached to the canopy structure shall engage the blast shield tracks and move the blast shield to the retracted (closed) position. The blast shield lift fittings (located at the forward edge of blast shield) shall engage the spacer of the blast shield lift bracket attached to the canopy structure.

f. Open canopy; the upward movement of the canopy shall raise the blast shield to the extended position.

g. Install canopy hold-open supports. Remove maintenance safety pins from canopy jettison and seat ejection system.



REMOVAL, GLARE SHIELD

a. Remove screw and nut plate connecting vertical anti-glare curtain to instrument panel glare shield.
b. Unsnap glove fasteners attaching left and right horizontal anti-glare curtains to instrument panel glare shield.
c. Remove left and right flood and thunderstorm light assemblies from instrument panel glare shield.
d. Remove two bolt and nut fasteners attaching instrument panel glare shield to outer edges of instrument panel.
e. Push instrument panel glare shield hooks, remove glare shield.

WARNING

TO PREVENT INJURY TO PILOT DURING BAILOUT, THE GLARE SHIELD MUST REMAIN FLEXIBLE AT ALL TIMES. DO NOT ADD RIGID STIFFENERS UNDER ANY CIRCUMSTANCES. IF GLARE SHIELD IS DAMAGED, REPLACE WITH NEW ASSEMBLY.

INSTALLATION, GLARE SHIELD

Installation is essentially the reverse of removal.

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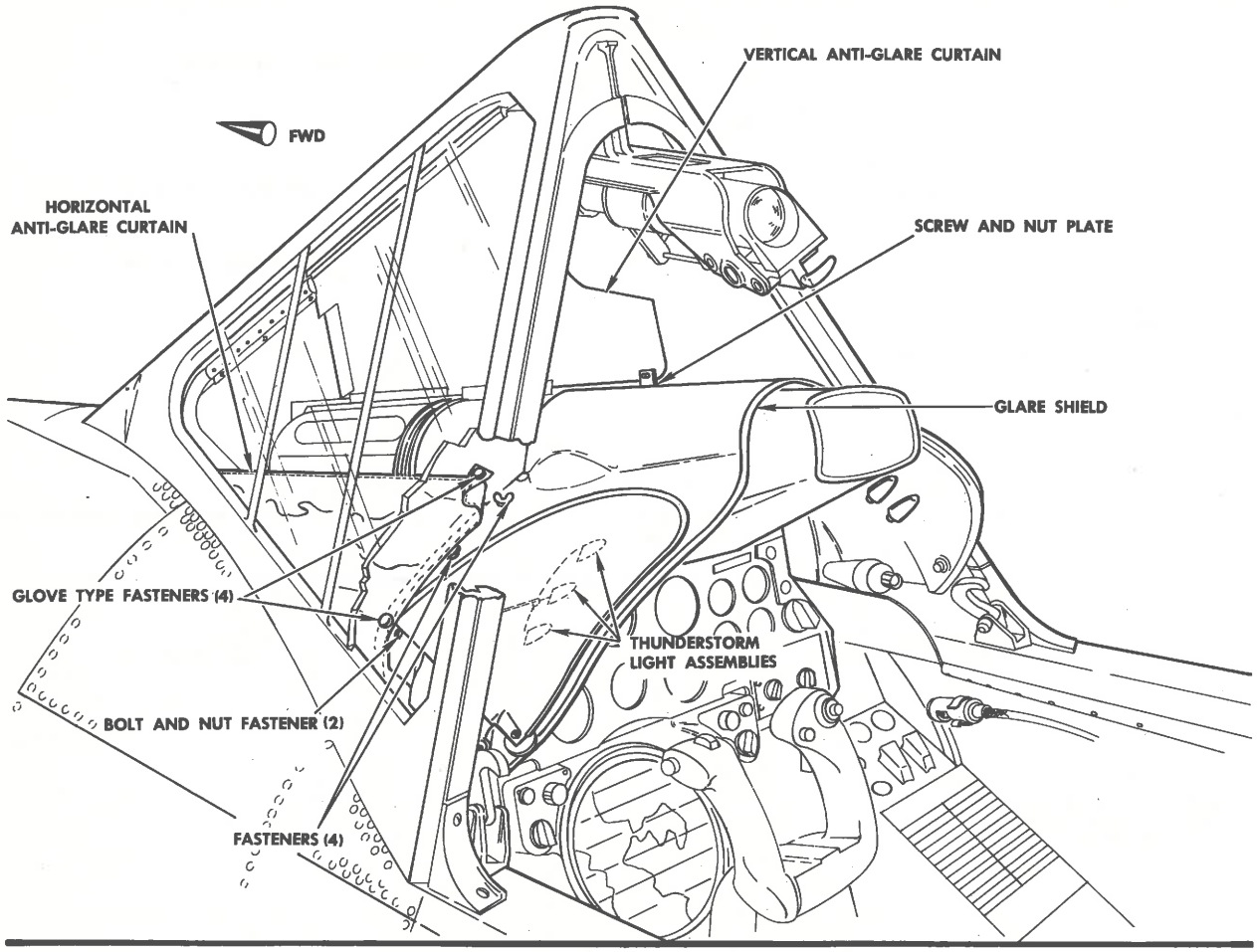
Figure 5-13. Glare Shield Replacement, F-106A
Applicable to 56-453, -455, -456, -458 thru -462 and 56-467



REMOVAL, GLARE SHIELD

a. Remove screw and nut plate connecting vertical anti-glare curtain to instrument panel glare shield.
b. Unsnap glove fasteners attaching left and right horizontal anti-glare curtains to instrument panel glare shield.
c. Disconnect left and right thunderstorm light assemblies.
d. Remove two bolt and nut fasteners attaching instrument panel glare shield to outer edges of instrument panel.
e. Disengage four fasteners on instrument panel glare shield and remove glare shield.

WARNING

TO PREVENT INJURY TO PILOT DURING BAILOUT, THE GLARE SHIELD MUST REMAIN FLEXIBLE AT ALL TIMES. DO NOT ADD RIGID STIFFENERS UNDER ANY CIRCUMSTANCES. IF GLARE SHIELD IS DAMAGED, REPLACE WITH NEW ASSEMBLY.

INSTALLATION, GLARE SHIELD

Installation is essentially the reverse of removal. Perform operational check of thunderstorm lights upon completion of installation. Refer to T.O. 1F-106A-2-10 for procedure.

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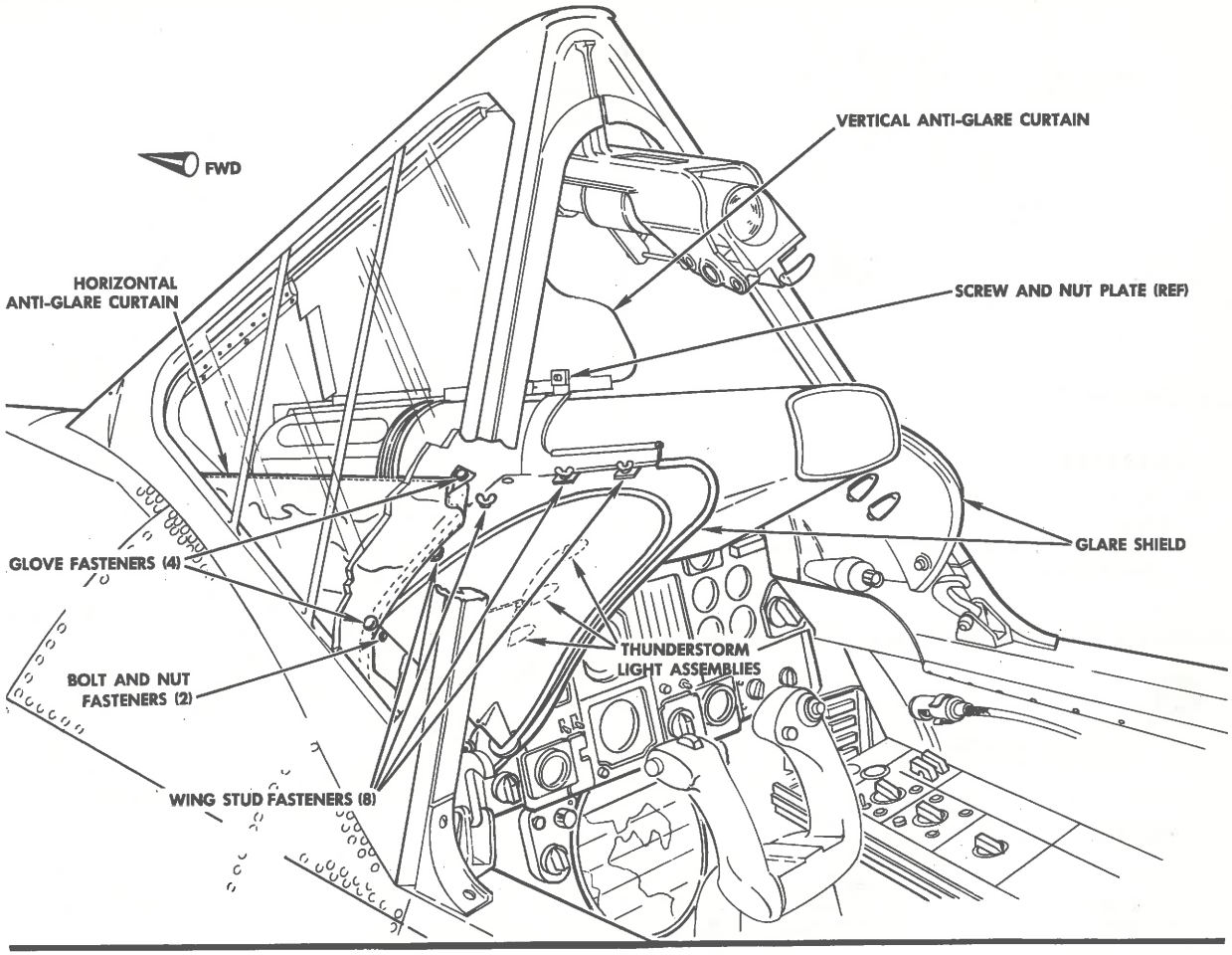
Figure 5-14. Glare Shield Replacement, F-106A
Applicable to 56-454, -457, -463 thru 56-466, 57-229 thru 57-2464



REMOVAL, GLARE SHIELD

a. Unsnap glove fasteners attaching left and right horizontal anti-glare curtains to instrument panel glare shield.
b. Disconnect left and right thunderstorm light assemblies.
c. Remove two bolt and nut fasteners attaching instrument panel glare shield to outer edges of instrument panel.
d. Disengage eight wing stud fasteners on instrument panel glare shield and remove glare shield.

WARNING

TO PREVENT INJURY TO PILOT DURING BAILOUT, THE GLARE SHIELD MUST REMAIN FLEXIBLE AT ALL TIMES. DO NOT ADD RIGID STIFFENERS UNDER ANY CIRCUMSTANCES. IF GLARE SHIELD IS DAMAGED, REPLACE WITH NEW ASSEMBLY.

INSTALLATION, GLARE SHIELD

Installation is essentially the reverse of removal. Perform operational check of thunderstorm lights upon completion of installation. Refer to T.O. 1F-106A-2-10 for procedure.

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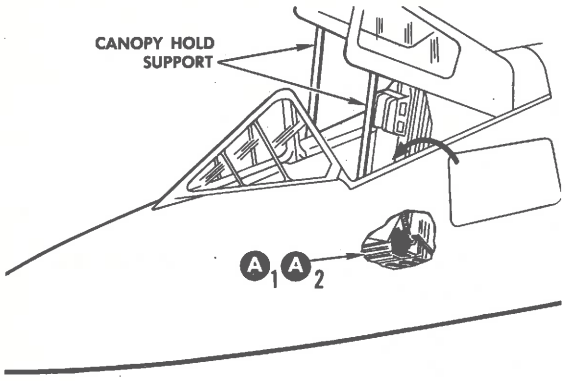
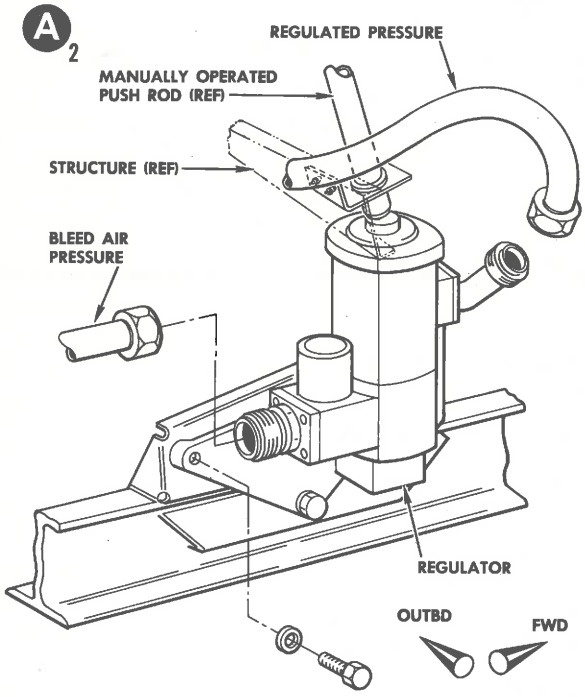
Figure 5-15. Glare Shield Replacement, F-106A
Applicable to 57-2465 and subsequent

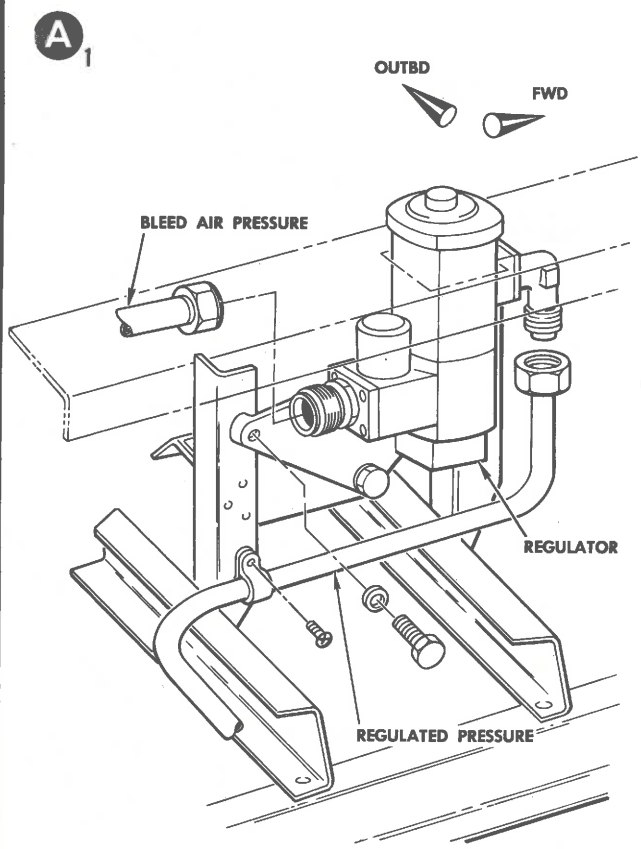


PREPARATION

a. Open canopy and install canopy hold-open support.
b. Install ground maintenance safety pins in canopy jettison and seat ejection systems.



APPLICABLE TO AIRPLANES EQUIPPED WITH RAISED CONSOLE



APPLICABLE TO AIRPLANES NOT EQUIPPED WITH RAISED CONSOLE

REMOVAL

a. Remove cockpit trim.
b. Disconnect tubing from regulator (2 places); cap tubing and regulator fittings.
c. Remove regulator mounting bolts and remove regulator.

INSTALLATION

a. Installation is essentially the reverse of removal.

NOTE

F-106A AIRPLANE SHOWN. PROCEDURES FOR F-106B AIRPLANES SIMILAR.

.06.02.395 B .21.06.00

Figure 5-16. Anti-G Suit Pressure Regulator Replacement

Section VI

FUSELAGE COMPARTMENT DOORS

Contents *Page*

DESCRIPTION

6-1. GENERAL.

The fuselage compartment doors are secured in place by latches or stressed panel fasteners to provide easy access to the compartments for servicing and maintenance. Refer to paragraph 6-16 for specific instructions on doors equipped with stressed panel fasteners. The doors discussed in the following paragraphs are: the forward electronics compartment doors, upper-aft electronics compartment doors, lower-aft electronics compartment door, hydraulic accessory compartment door, ram air turbine door, fire access door, and engine accessory compartment doors. For information on the nose and main landing gear doors, refer to T.O. 1F-106A-2-8; refer to T.O. 1F-106A-2-12 for information on the missile bay doors. Whenever a door is replaced, it must be checked for gaps and aerodynamic smoothness in accordance with figure 6-1.

6-2. FORWARD ELECTRONICS COMPARTMENT DOORS.

The forward electronics compartment incorporates two doors; one on each side. Each door is hinged to the fuselage from the top with a piano-type hinge. Both doors use two shear-type and two hook-type latches. The hook-type latches on the bottom of each door exert a downward force on the door when latched. The shear-type latches at the forward and aft ends of the door, operate by means of spring loaded handles which, when latched, are held flush with the door skin by stressed panel fasteners. The latches and their adjustment are illustrated on figure 6-6. The forward electronics compartment and nose landing gear doors incorporate a diaphragm-type seal along the edges of the door.

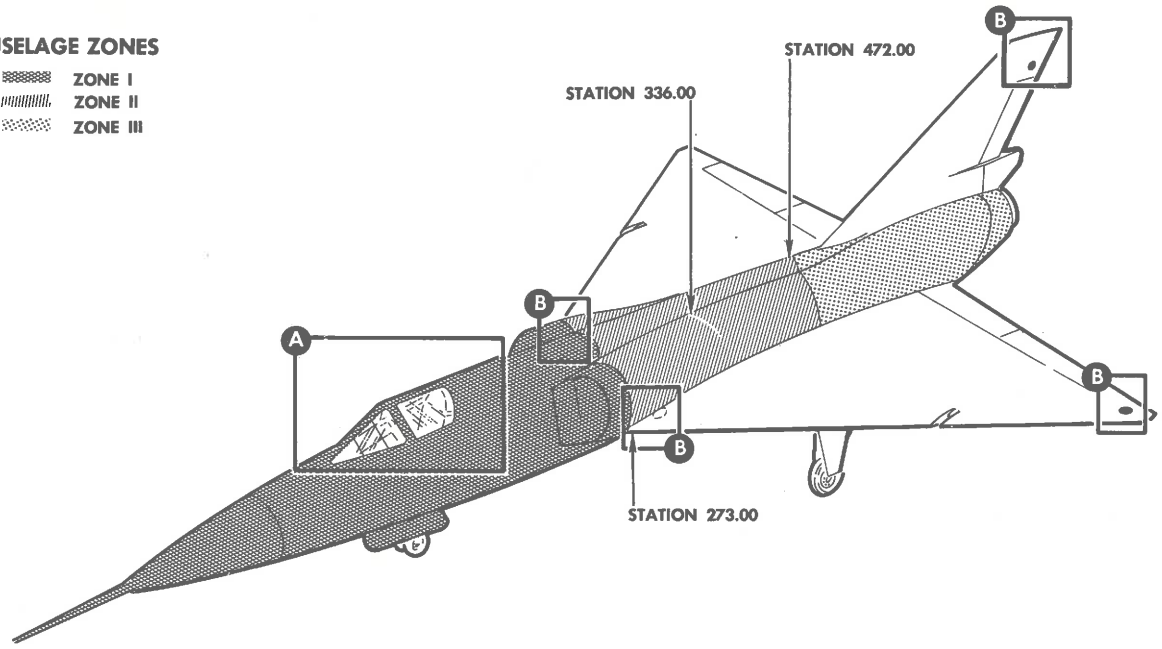
6-3. UPPER-AFT ELECTRONICS COMPARTMENT DOORS.

Applicable to F-106A airplanes, the upper-aft electronics compartment doors are located on each side of the upper section of the fuselage just aft of the cockpit. They are made of formed pan spotwelded to the skin with vertical stiffeners attached for additional strength. The doors are hinged at the upper end in two places. Hinge pins are held in place by the attaching points of the upper hinge to the structure. A tubular seal is installed around the inner door periphery of each door and is held in place by a metal strap. Stressed panel type fasteners are used for securing the doors in a closed position.

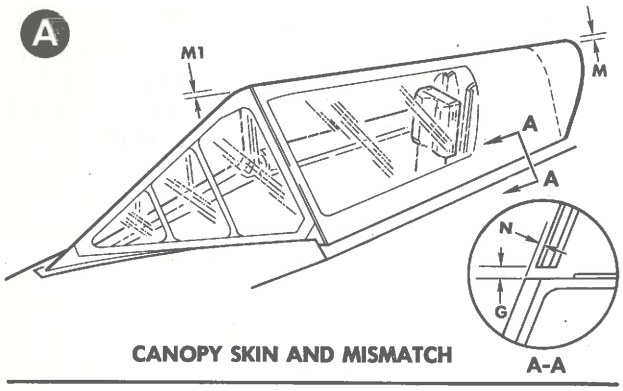
6-4. *Applicable to F-106B airplanes*, the upper aft electronics door is located immediately aft of the canopy island in the dorsal area of the fuselage. The aluminum alloy door is made of formed inner skins spotwelded to the outer skins and with vertical stiffeners attached for additional strength. A tubular type seal is attached to the inner periphery of the door by a riveted retainer strap. The lower part of the fore and aft door hinges are attached by machine screws to the upper left longeron of the airplane. Two chains attached from the airplane structure to the door structure retain the door in the open position. Machine screws are used to secure the door in the closed position.

6-5. LOWER-AFT ELECTRONICS COMPARTMENT DOOR.

The lower-aft electronics compartment door, located on the bottom of the fuselage just aft of the nose wheel door, is of stamped box-type construction. The door employs two hinges with bolts used as hinge pins and

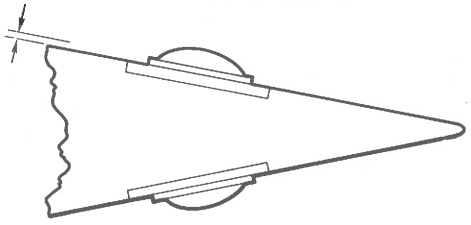


NOTE
REFER TO SHEET 3 OF THIS ILLUSTRATION FOR SYMBOL DEFINITION AND GAP AND MISMATCH TOLERANCES.



CANOPY SKIN AND MISMATCH A-A

B 0.000 INCH MIN. TO 0.090 INCH MAX. PERMISSIBLE PROJECTION OF HOUSINGS



TYPICAL CLEARANCE FOR ALL RECOGNITION LIGHTS

RIVET HEAD PROTRUSION TOLERANCES	
AREA	MAXIMUM HEAD HEIGHT
INSIDE ENGINE AIR INLET DUCT, FROM INLET LIP AFT TO STA 336, FLAT SURFACE, TOP AND BOTTOM.	FLUSH TO 0.004" BELOW SURFACE
FUSELAGE ZONE I.	0.002"
WING LEADING EDGE.	
FIN LEADING EDGE.	
INSIDE ENGINE AIR INLET DUCT, FROM WEDGE LEADING EDGE AFT TO STA 336, FLAT SURFACE, SIDE.	
FUSELAGE ZONE II AND III.	0.004"
FIN AREA, AFT OF LEADING EDGE.	
WING AREA, AFT OF LEADING EDGE.	
INSIDE ENGINE AIR INLET DUCT, AFT OF STA 336, FLAT SURFACE, SIDE.	
INSIDE ENGINE AIR INLET DUCT, FROM INLET LIP AFT TO STA 336, CURVED SURFACE, SIDE, NO MILLING PERMITTED.	
INSIDE ENGINE AIR INLET DUCT, FROM STA 336 AFT TO STA 472, CURVED SURFACE, SIDE, NO MILLING PERMITTED.	0.008"

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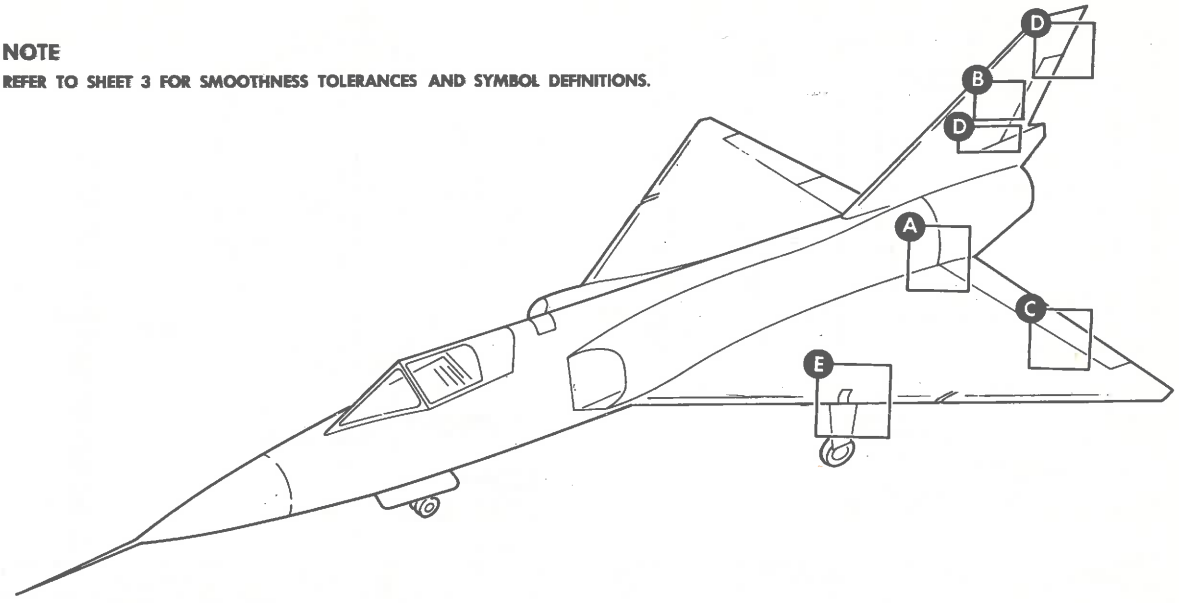
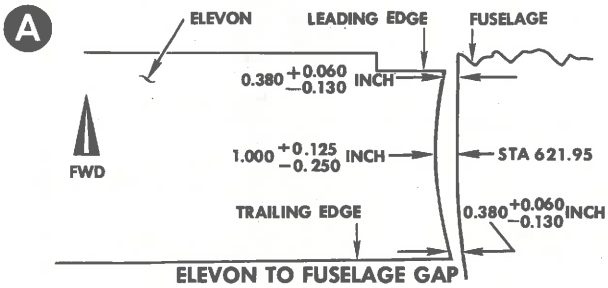
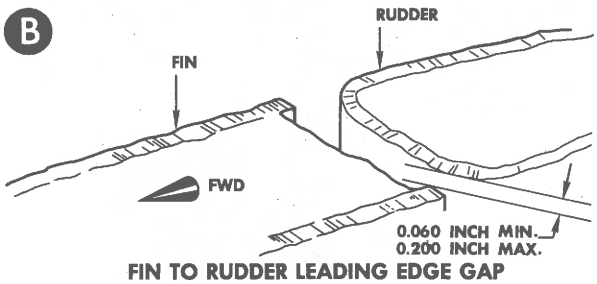
Figure 6-1. Aerodynamic Smoothness Requirements (Sheet 1 of 3)

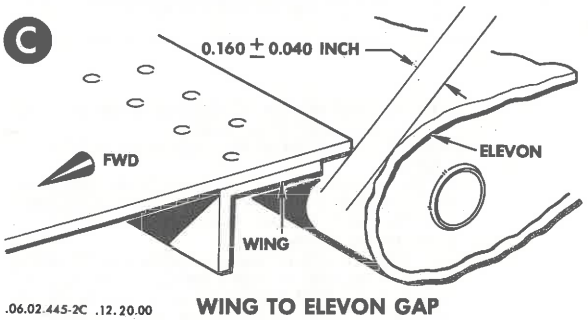
NOTE

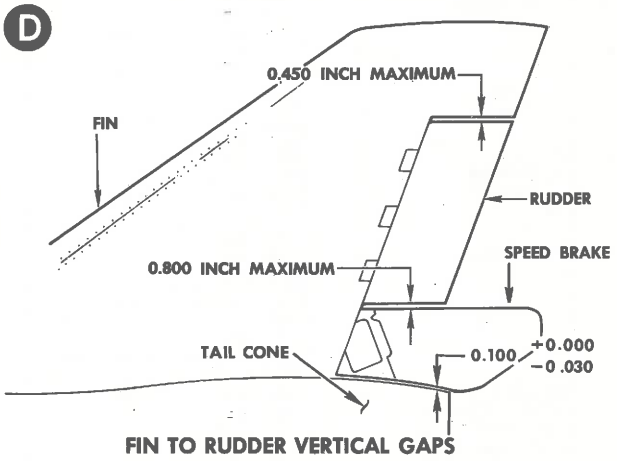
REFER TO SHEET 3 FOR SMOOTHNESS TOLERANCES AND SYMBOL DEFINITIONS.











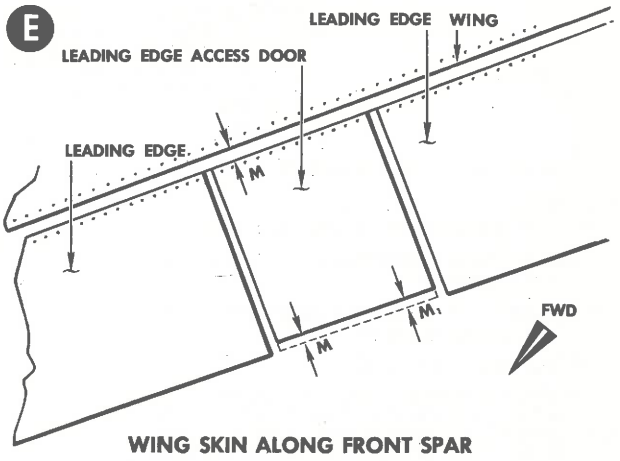


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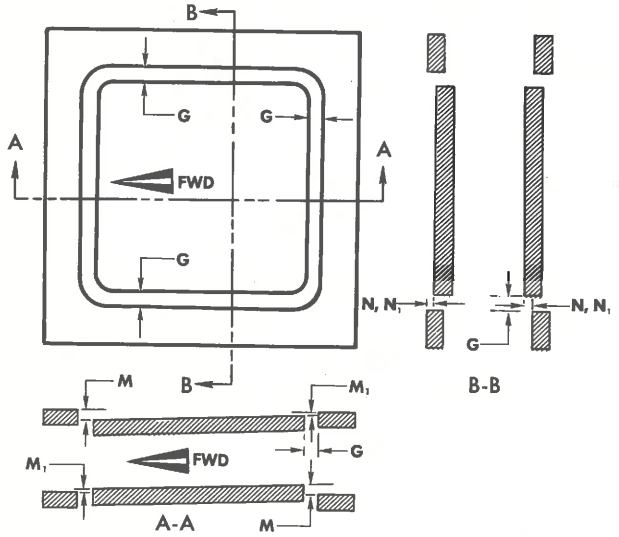
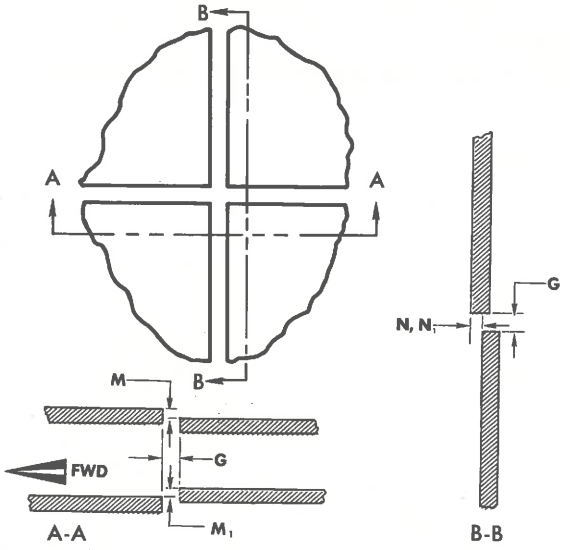
Figure 6-1. Aerodynamic Smoothness Requirements (Sheet 2 of 3)





AREA	SYMBOL	BUTT JOINTS	
		DOOR	SKIN
FUSELAGE ZONE I	G	0.040" MAX	SAME
	M	0.008" MAX	
	M_1	0.004" MAX	
	N	0.015" MAX	
FUSELAGE ZONE II	G	0.040" MAX	SAME
	M	0.012" MAX	
	M_1	0.006" MAX	
	N	0.015" MAX	
FUSELAGE ZONE III	G	0.040" MAX	SAME
	M	0.015" MAX	
	M	0.007" MAX	
	N	0.015" MAX	
RADOME	G	0.040" MAX	
	M	0.030" MAX	
	M_1	0.015" MAX	
CANOPY	G	0.030" MIN—0.090" MAX	
	M	0.030" MAX	
	M_1	0.015" MAX	
	N	FLUSH TO 0.060" BELOW FUSELAGE SURFACE	
FORWARD ELECTRONICS COMPARTMENT DOORS AND NOSE GEAR DOORS	G	0.030" MIN—0.090" MAX	
	M	0.030" MAX	
	M_1	0.015" MAX	
	N	0.030" MAX	
MISSILE BAY DOORS	G	0.030" MIN—0.090" MAX (LONGITUDINAL GAP)	
	G	0.31" MAX FROM BL 0 TO DOOR SPLIT LINE, TAPERING TO 0.06" MAX AT UPPER HINGE LINE (TRANSVERSE GAPS, BOTH ENDS)	
	M	0.030" MAX	
	M_1	0.015" MAX	
	N	0.030" MAX	
	N_1	0.045" MAX	

AREA	SYMBOL	BUTT JOINTS	
MAIN LANDING GEAR DOOR	G	0.030" MIN—0.90" MAX	
	M	0.030" MAX	
	M_1	0.015" MAX	
	N	0.030" MAX	
TAIL CONE	G	0.040" MAX	
	M	0.030" MAX	
	M_1	0.030" MAX	
SPEED BRAKES	G	0.030" MIN—0.090" MAX	
	M	0.030" MAX	
	M_1	0.015" MAX	
	N	0.030" MAX	
		DOOR	SKIN
WING LEADING EDGE (SEE NOTE 2)	G	0.020" MAX	SAME
	M	0.010" MAX (ALONG FRONT SPAR)	
	M	0.004" MAX	
	M_1	0.004" MAX	
WING AFT OF LEADING EDGE	G	0.040" MAX	0.030" MAX
	M	0.010" MAX	0.010" MAX
	M_1	0.010" MAX	FLUSH
	N	0.010" MAX	0.010" MAX
WING LANDING GEAR FAIRING	G	0.080" MAX	
	M	0.010" MAX	
	M_1	0.010" MAX	
FIN	G	0.020" MAX (LEADING EDGE AND VERTICAL SPLICES)	
	G	0.030" MAX (DOORS AND HORIZONTAL SPLICES AFT OF LEADING EDGE)	
	M & M_1	0.010" MAX (TYPICAL)	
	N	0.010" MAX (FWD OF SPAR 5)	
	N	0.040" MAX (AFT OF SPAR 5)	
	N	0.060" MAX (FINTIP AND TOP OF STREAMLINED RUDDER)	

NOTES:

1. G=GAPS BETWEEN SKINS OR SKINS AND DOORS.

   M=MISMATCH AT TRANSVERSE JOINTS, PROTRUDING SKIN FACING AFT.

   M_1=MISMATCH AT TRANSVERSE JOINTS, PROTRUDING SKIN FACING FORWARD.

   N=MISMATCH AT LONGITUDINAL JOINTS.

   N_1=MISMATCH BETWEEN MISSILE BAY DOORS ALONG BL 0, EXCEPT AT FORWARD AND AFT ENDS OF DOORS.
2. A CHAMFER (0.5" WIDE) IS PERMISSIBLE FOR WING LEADING EDGE DOORS WHICH ARE UP TO 0.016" MAXIMUM IN EXCESS OF THE 0.004" MAXIMUM MISMATCH TOLERANCE.
3. LEADING EDGE OF RAM AIR TURBINE DOOR MAY PROTRUDE A MAXIMUM OF 0.020 INCH.
4. SCREW HEAD MAXIMUM PROTRUSION IS 0.004" IN ALL AREAS.
5. EXCEPT AS NOTED IN RIVET PROTRUSION TABLE, ALL DRIVEN RIVETS MUST PROTRUDE A MEASURABLE AMOUNT ABOVE THE SKIN SURFACE UP TO 0.008" MAXIMUM BEFORE MILLING.
6. ALL FUSELAGE DOORS WHICH HAVE METAL TO METAL CONTACT REQUIRE "FORMED GASKET" TYPE SEAL.
7. ALL GAPS IN NON-REMOVABLE BUTT JOINTS OF THE AIRPLANE EXTERIOR SURFACE ARE FILLED WITH AERODYNAMIC SMOOTHING COMPOUND. REFER TO SECTION XI OF T.O. 1F-106A-3 FOR DETAILED INFORMATION.

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Figure 6-1. Aerodynamic Smoothness Requirements (Sheet 3 of 3)

secured with nuts and cotter keyed. The door incorporates a tubular seal, held in place by a metal strap. The door houses the data link antenna, and the antenna's plastic shielding forms the door's outer surface.

6-6. AIR-CONDITIONING COMPARTMENT DOORS.

Applicable to F-106A airplanes. The air-conditioning compartment access door is a two-piece unit located on top of the fuselage at station 305. Each door section is attached by a piano-type hinge to an "I" beam along the airplane centerline, and to the door frame by stressed panel fasteners. The "I" beam is bolted to the door frame so that the two-piece door may be removed as a unit. Tubular-type seals are installed along the hinge line and around the door frame to seal each door section.

6-7. *Applicable to F-106B airplanes,* the upper air-conditioning compartment access door is located immediately below the upper aft electronics door. The aluminum alloy door is a simple construction with a hinge attached to the forward end of the door. A tubular type seal is bonded to the periphery of the door by cement. In addition to providing access to the air-conditioning compartment, the door mounts electronic equipment on its upper surface. The door is secured in the closed position by machine screws.

6-8. Additional access to the air-conditioning compartment is provided by removing a door located to the left of the airplane's centerline at the aft end of the forward missile bay overhead structure. When the door is installed, the upper surface of the door becomes part of the air-conditioning compartment floor.

6-9. MISSILE BAY DOORS.

The missile bay doors are of conventional rib and stressed skin construction. The two hinged doors, which provide an aerodynamic enclosure for the missile bays when closed, are attached along their outboard edges by hinge pins to hinges attached to the airplane structure. Each door consists of two panels with an interconnecting hinge which permits the panels to fold when the door is opened. Three pneumatic actuators are provided to operate each door. For detailed information on the doors and missile launching systems refer to T.O. 1F-106A-2-12.

6-10. *Applicable to F-106B airplanes.* These doors are identical to those of the F-106A airplanes except that the inboard panel of each door is approximately 70 inches shorter.

6-11. RAM AIR TURBINE DOOR.

The ram air turbine door is of formed sandwich type construction; the aluminum alloy honeycomb is bonded to the inner and outer skins to provide strength. The door is attached to the ram air turbine support assembly by an adjustable rod assembly, and is on the bottom left side of the fuselage forward of the main wheel well. Access to hydraulic system components in this area is provided when the door is opened. When the door and turbine assembly is extended into the slipstream during flight the ram air turbine operates a hydraulic pump to supply emergency pressure for the primary hydraulic system. A schematic of the turbine extension system is shown on figures 6-2 and 6-3. The door is extended by means of a pneumatic actuator controlled from the cockpit. The actuator operates in one direction only, therefore the door can be closed (manually) only when the aircraft is on the ground. Ground opening and closing procedures are shown on figure 6-10. The actuator incorporates integral uplatch and downlock mechanisms. Adjustment procedures for door and actuator are shown on figure 6-10. For further information on the ram air turbine and emergency hydraulic pump, refer to T.O. 1F-106A-2-3.

6-12. HYDRAULIC ACCESSORY COMPARTMENT DOOR.

The hydraulic accessory compartment door is similar in construction to the ram air turbine door. It is located opposite and to the right of the ram air turbine door. The door is attached at the right side with piano-type hinges and secured with stress panel type fasteners. When closed the door is overlapped by the ram air turbine door and cannot be opened until the ram air turbine door is opened. When the door is opened it provides access to several components of the hydraulic system including accumulators, reservoirs and ground charging connections. The hydraulic accessory compartment door incorporates a retractable beacon light; for further information on this light, refer to T.O. 1F-106A-2-10.

6-13. ENGINE ACCESSORY COMPARTMENT DOORS.

Two engine accessory compartment doors are located at the bottom of the fuselage, one on each side of the airplane centerline, just aft of the main wheel well. The doors are attached to the fuselage with piano-type hinges, and are secured in place by stressed panel fasteners. The doors are sealed by the "formed gasket" method as illustrated on figure 6-4. The sealant is applied along the longeron, to which the hinge is attached, and on the three sides of the door frame. A spring-type seal strip, attached to the door hinge, contacts the seal along the longeron. The doors are removed by unlocking the Camloc fasteners and removing the hinge pins.

6-14. FIRE ACCESS DOOR.

The fire access door is located in the lower left side of the fuselage, just aft of the engine accessory compartment doors. The door is held in the closed position by a torsion

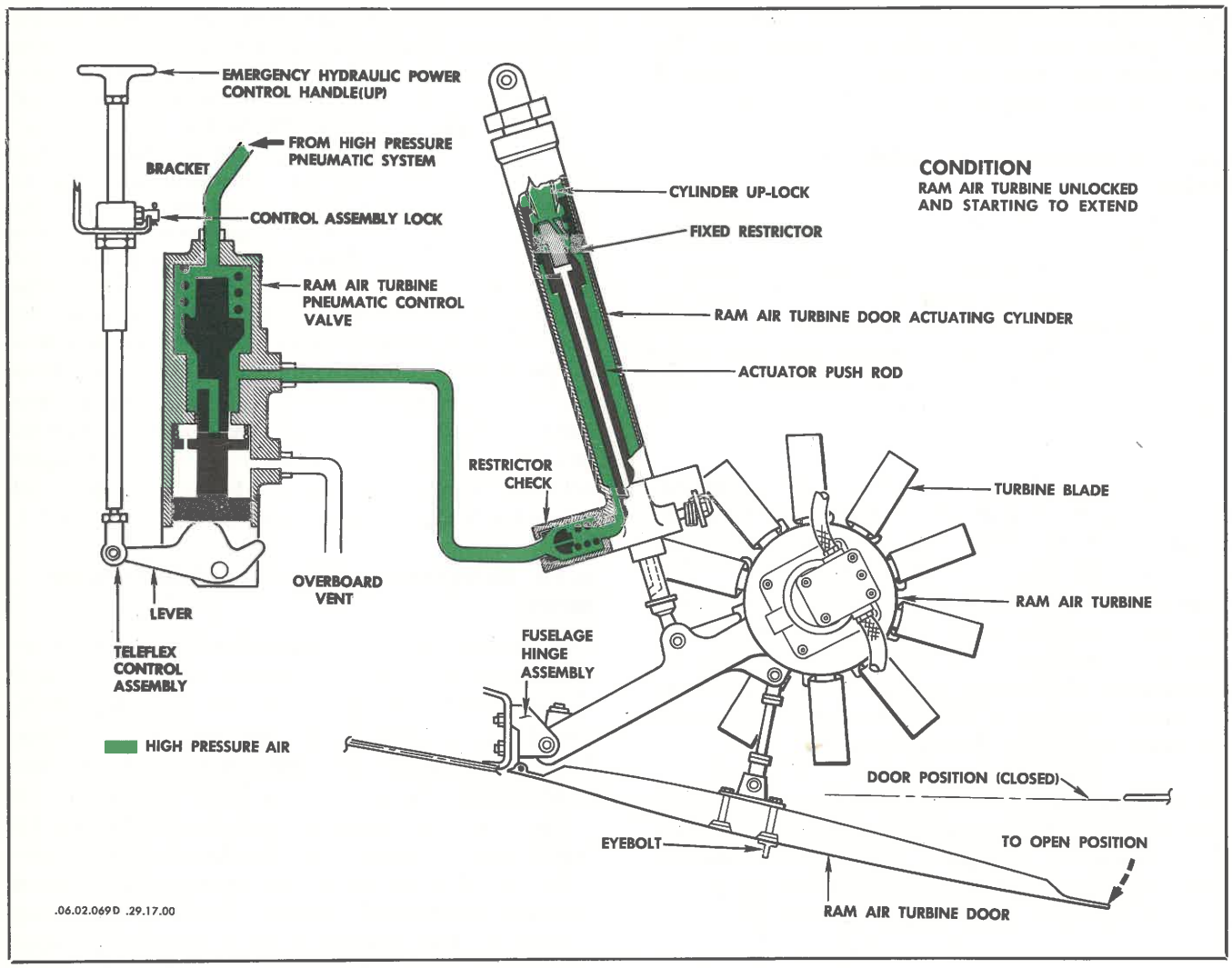


Figure 6-2. Ram Air Turbine Extension System, Schematic
Applicable to F-106A airplanes 56-453 thru 57-243 and F-106B airplanes 57-2507 thru 57-2519

spring-type latch, and is opened by applying pressure against its outer surface. The torsion spring produces a latching effect by means of a leg that pushes against a block on the door. When the door is pushed from the exterior, the block slides past the spring leg, releasing tension on the door. If the door if replaced, it will be necessary to trim the replacement door to fit the fuselage opening. Check door for operation by thrusting a padded object against the exterior surface and determining that door can be opened.

6-15. SEALING OF FUSELAGE DOORS.

A large majority of fuselage doors, that are not sealed by tubular or diaphragm type seals, are sealed by the "formed gasket" method. Replacement of seals may be necessary when doors are removed and/or replaced. Figure 6-4 illustrates the "formed gasket" method, and the diaphragm type seal is shown in figure 6-5.

6-16. DOORS EQUIPPED WITH STRESSED PANEL FASTENERS.

Stressed panel fasteners are employed to secure access doors that must be opened frequently. The doors and the fasteners carry considerable structural loads. The airplane shall not be flown unless all stressed panel fasteners are installed and properly secured. This type of fastener will release when the stud is rotated ¼ turn to the left. However, if this method of stud release is used, the receptacle inserts will remain in the secured position and reinstallation of the studs will be difficult. When opening or closing doors equipped with this type of fastener, the following procedures are recommended.

6-17. Procedure, Opening Doors.

a. *Applicable to doors not equipped with hinges.* Release fasteners by applying pressure to studs and rotating studs to left until receptacle inserts engage stops. Remove door.

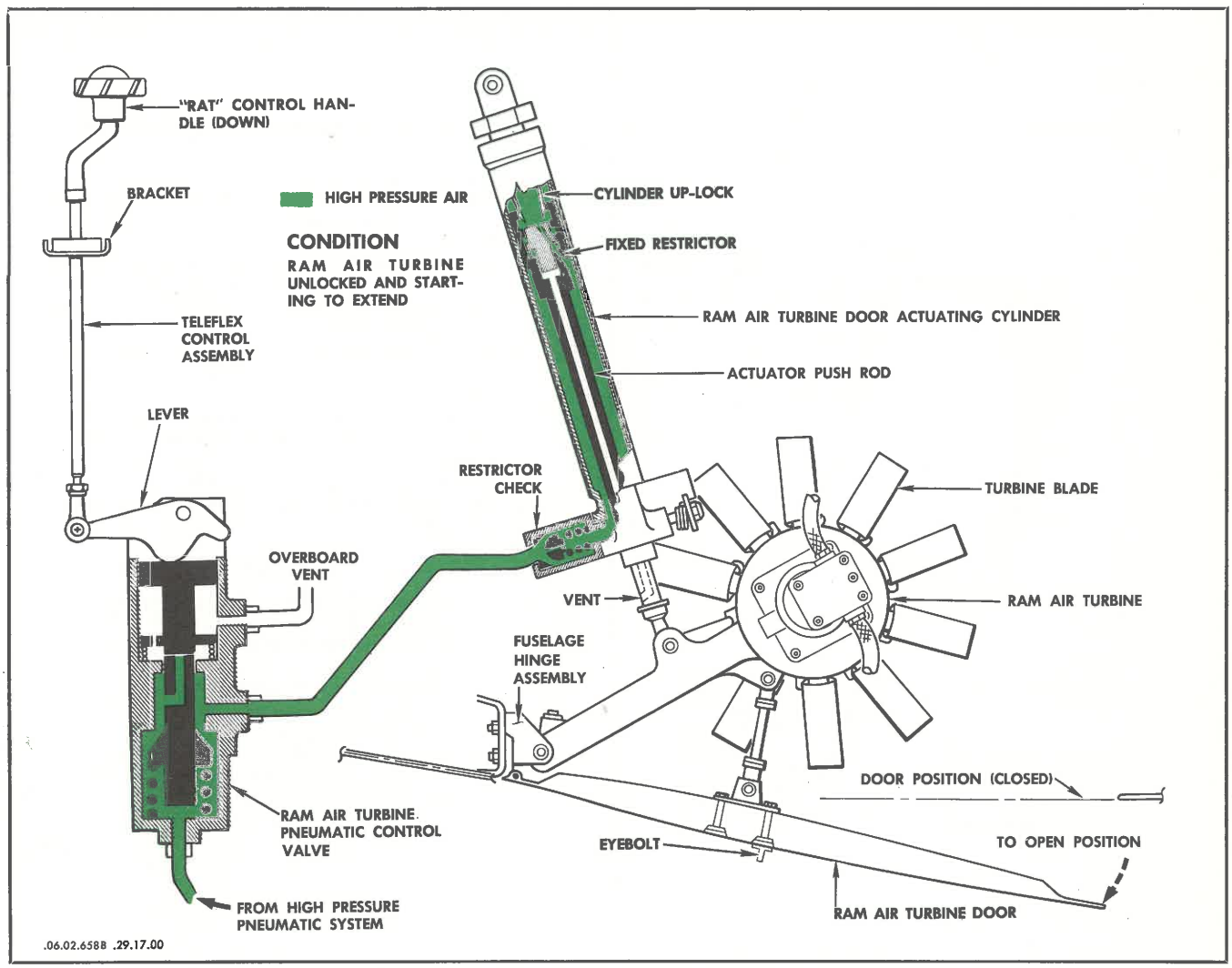


Figure 6-3. Ram Air Turbine Extension System, Schematic
Applicable to F-106A airplanes 57-244 and subsequent; and F-106B airplanes 57-2520 and subsequent

CAUTION

To prevent damage to fastener assemblies, do not exceed a torque of 35 inch pounds when rotating studs to left. Do not use power driven screwdriver.

b. *Applicable to doors equipped with stressed panel fasteners at hinge side.* Release fasteners securing the hinge side by method given in step "a."

c. Withdraw stud barrels of released fasteners as far as barrel retaining rings will permit.

CAUTION

If stud barrels are not fully withdrawn, damage to the structure will result when the door is opened.

d. *Applicable to doors equipped with hinges.* Release fasteners securing forward and aft sides of door by method given in step "a." Perform step "c."

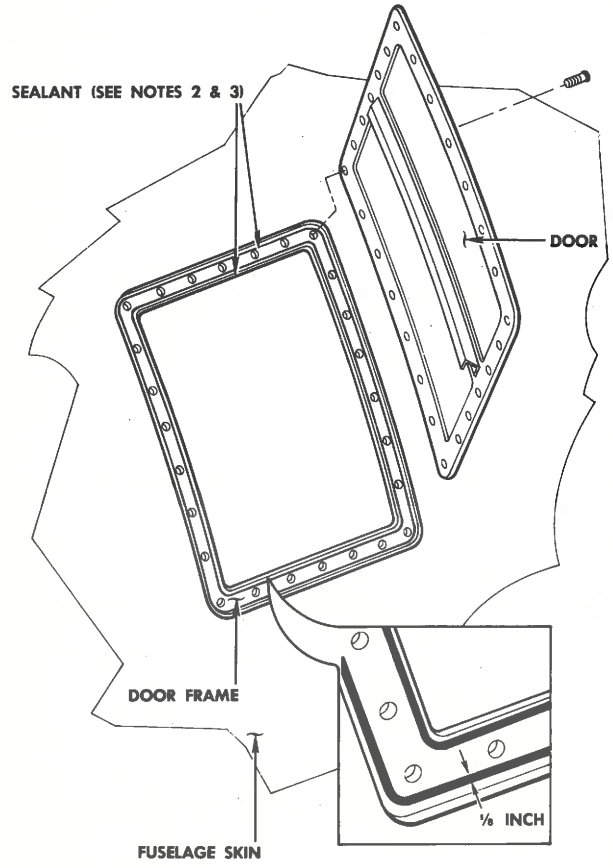
e. *Applicable to doors equipped with hinges.* Support weight of door and release fasteners securing side of door opposite the hinge by method given in step "a." Open door slowly.

6-18. Procedure, Closing Doors.

a. *Applicable to doors not equipped with hinges.* Position door so that stud barrels are engaged in receptacles. Push stud in as far as possible, rotate stud to left until resistance is felt (when resistance is felt, the stud has engaged the receptacle insert) then rotate stud to right until the fastener is secured.

CAUTION

To prevent damage to fastener assemblies, do not exceed a torque of 35 inch pounds when



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FUSELAGE ACCESS DOORS SEALING PROCEDURE

a. Scrape off defective sealant with a plastic scraper.
b. Clean surfaces thoroughly with a cloth dampened with aliphatic naphtha, Federal Specification TT-N-95A.
c. Apply sealant EC1293, Minnesota Mining and Mfg. Co. Specification MIL-S-7124. Apply sealant to fuselage opening in a continuous pattern, 1/8 inch wide and 1/32 inch thick.
d. Apply a thin coat of Petrolatum, VV-P-236, to the under surface of access door to prevent adhesion of door to sealant.
e. Reinstall door and tighten fasteners. Wipe off excess sealant with a cloth dampened in aliphatic naphtha, Federal Specification, TT-N-95A.
f. Check door for gap and mismatch.
g. Allow sealant to cure according to manufacturer's instructions.

NOTES

1. Spot repairs may be made to slightly damaged seals by removing the defective part of seal and applying sealant as outlined above.
2. Doors secured with screws or bolts require a single bead of sealant around outer edge of door frame.
3. Doors secured with spring type fasteners require a bead of sealant around outer and inner edges of door frame.

Figure 6-4. Sealing Fuselage Access Doors

rotating studs to left or right. Do not use power driven screwdriver.

b. *Applicable to doors equipped with hinges.* Close door slowly. As door contacts the door frame, engage the stud barrels in the receptacle and secure the fasteners by method given in step "a." Begin at the hinge side then alternately secure the fasteners on the forward and aft sides and finally the fasteners on the side opposite the hinge.

REPLACEMENT

6-19. REPLACEMENT, FORWARD ELECTRONICS COMPARTMENT DOOR.

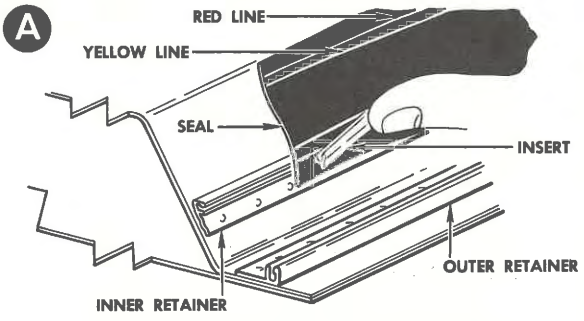
For information on the removal and installation of forward electronics compartment doors, see figure 6-6.

6-20. REPLACEMENT, UPPER-AFT ELECTRONICS COMPARTMENT DOORS.

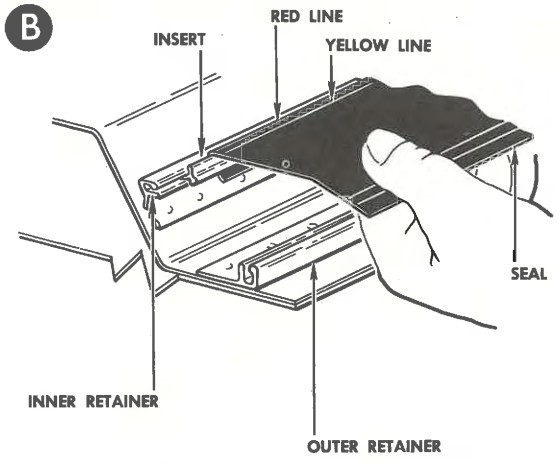
Applicable to F-106A airplanes. For information on the removal and installation of the upper-aft electronics compartment doors, see figure 6-7.

INSTALLATION, DOOR SEAL

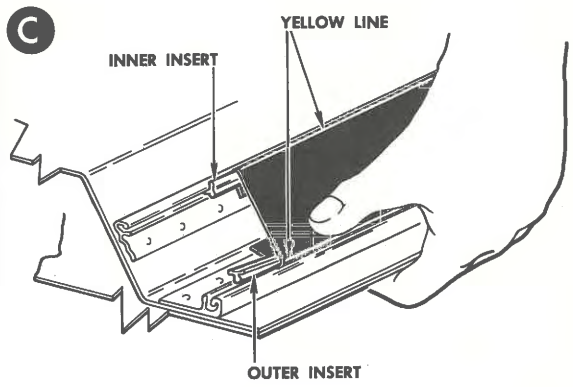
a. Check that retainers are clean and free of oil, grease, dirt, chips, etc.
b. Check that retainers are not damaged. Cuts, burrs, sharp edges, etc., will damage the seal.
c. Check that retainer slots are of constant width (0.136 inch) around perimeter of door. Straighten if necessary.
d. Check that seal is clean and free of all powder to prevent slipping after installation.
e. Stretch seal around perimeter of door.



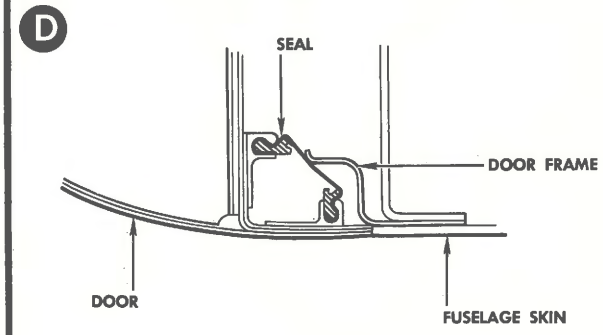
f. Starting at inner retainer, align knife-edge of the plastic insert so that when insert is pressed into the retainer, the yellow guide line on the seal will be visible along the edge of the retainer. Continue to install insert over seal and press into retainer completely around door.



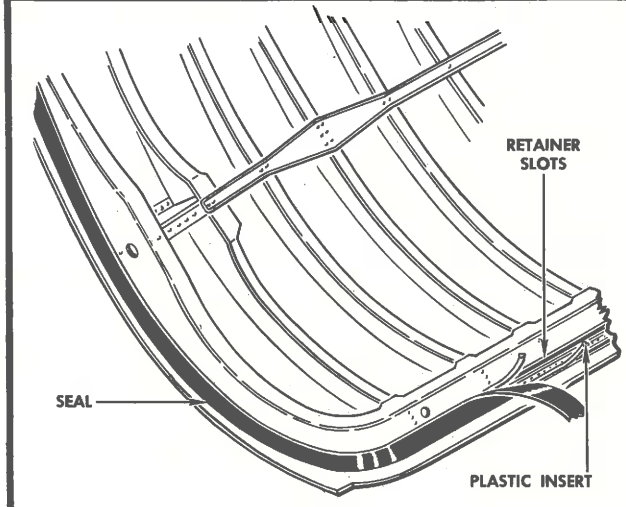
g. If red line on seal is visible, the seal has pulled out from under the insert and is incorrectly installed. Reposition seal and insert as necessary.



h. Fold seal over outer insert. Press insert and seal into retainer slot, taking care to avoid shearing seal. Check yellow line for proper installation.



CUTAWAY VIEW SHOWING DOOR CLOSED



REMOVAL DOOR SEAL

a. Carefully pry plastic-insert strips from retainer slots, and remove seal.

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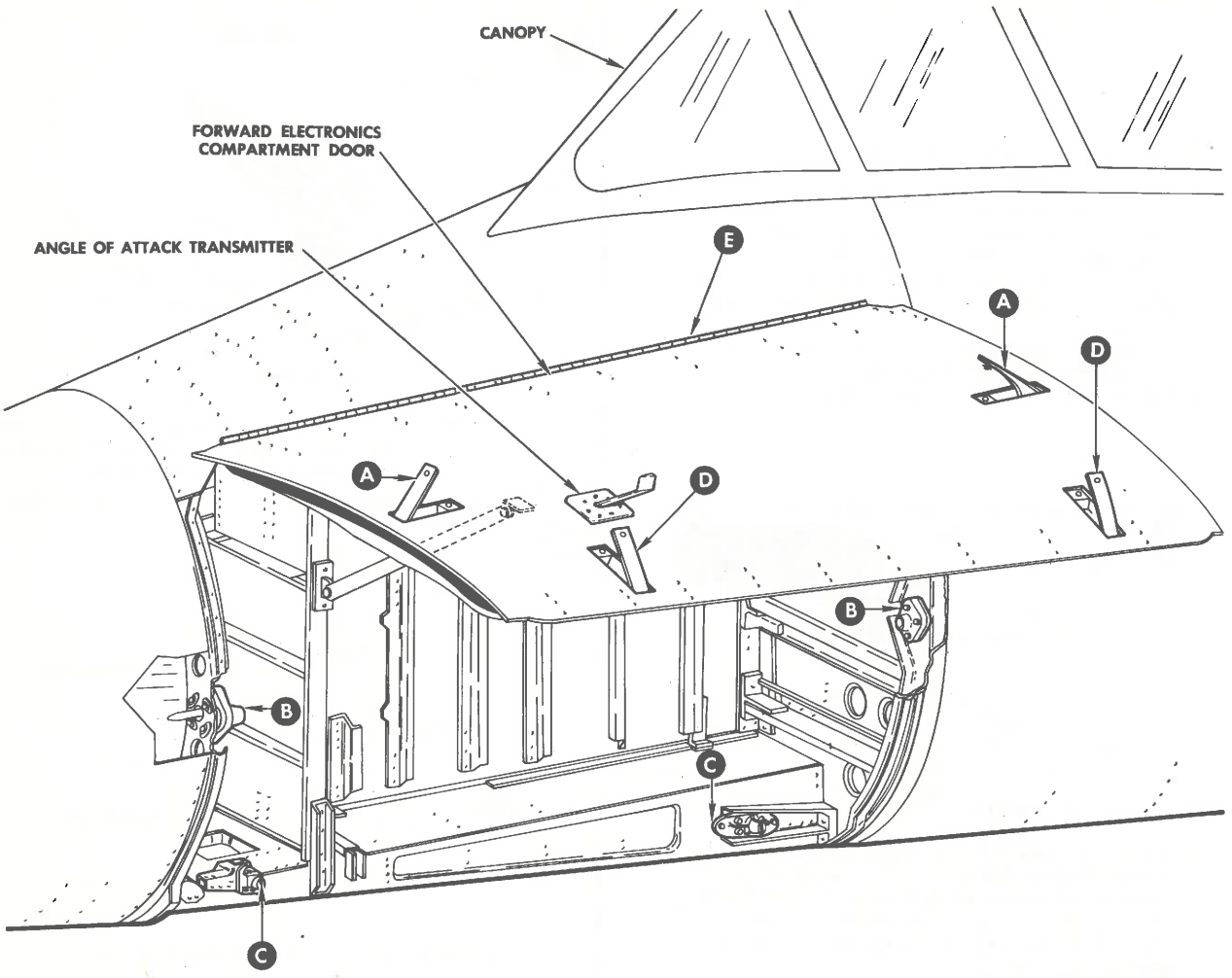
Figure 6-5. Diaphragm Type Door Seal, Typical

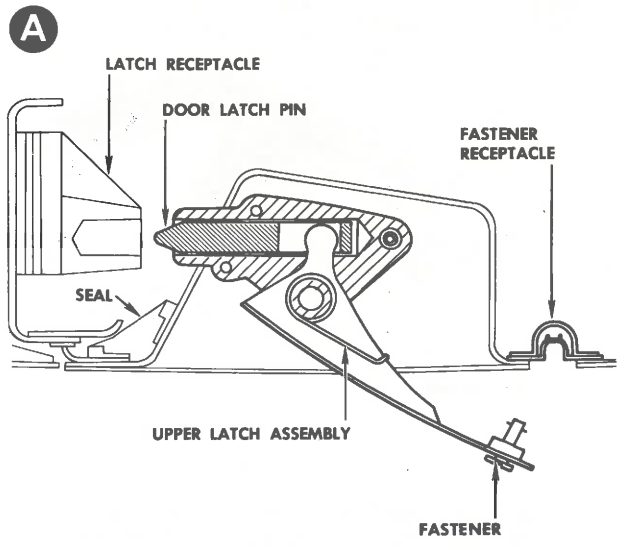


DOOR REMOVAL

a. Unlock the two end latches, then unlock the lower latches and open door.
b. *Applicable to left hand door.* Disconnect electrical harness for angle of attack transmitter.
c. Remove hinge pin retaining rivet (2) one at the aft end of forward hinge pin and one at forward end of aft hinge pin.
d. While supporting door, remove hinge pins and remove door.

DOOR INSTALLATION AND ADJUSTMENT

a. Place door in open position and insert dry film lubricated hinge pins, one from center forward and one from center aft.
b. Check condition of seal; if necessary, replace seal.



TYPICAL DOOR LATCH ASSEMBLY, UPPER

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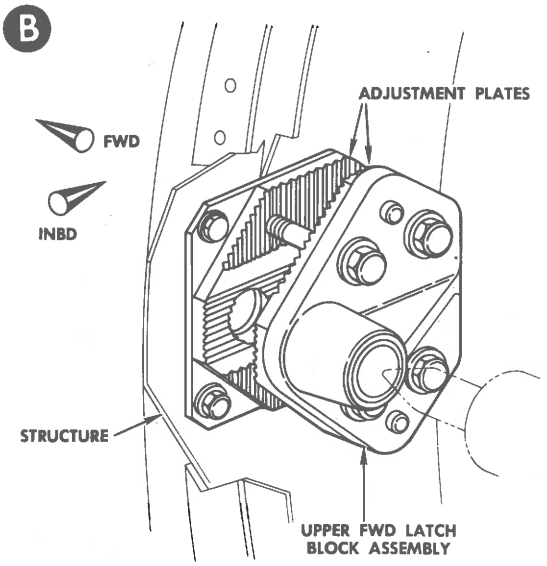
Figure 6-6. Forward Electronics Compartment Door Replacement (Sheet 1 of 2)

B

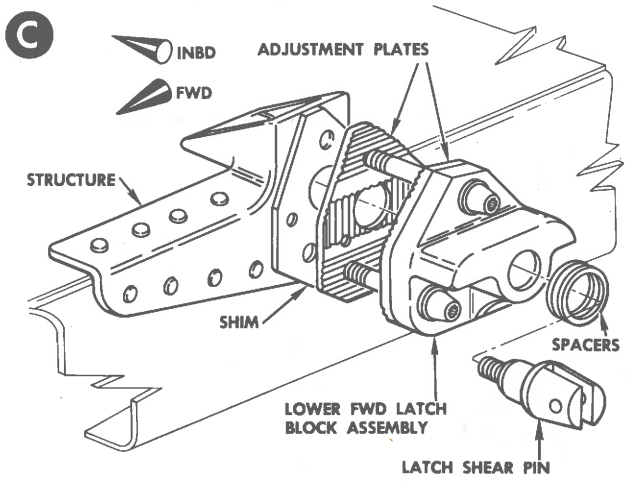


c. Mount adjustment plates on upper latch assemblies laterally and vertically as required so that door latch pins properly engage.

d. Open door and torque mounting bolts to standard value, 12-15 inch-pounds.

TYPICAL INSTALLATION, UPPER LATCH BLOCK ASSEMBLY

C



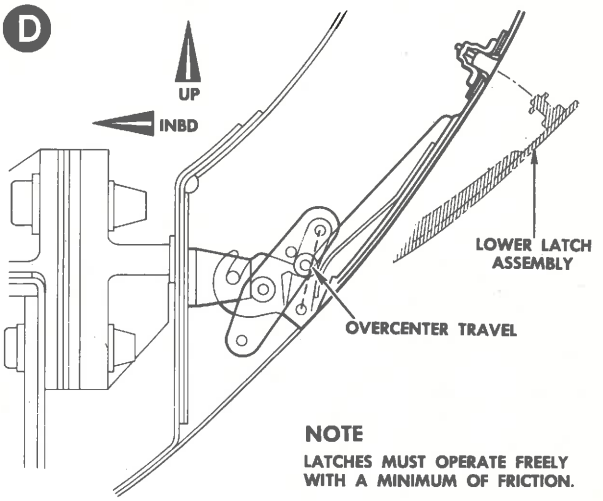
e. Adjust shims for proper clearance (3 shims maximum); mount adjustment plates on lower latch assemblies laterally and vertically as required so that door latch assembly engages shear pin.

f. Adjust latch shear pin by adding spacers as required (0.125 in. max.) to arrive at overcenter travel as shown in detail D; slot of shear pin must be vertical.

g. Open door and torque mounting bolts to standard value, 70-90 inch-pounds.

TYPICAL INSTALLATION, LOWER LATCH BLOCK ASSEMBLY

D



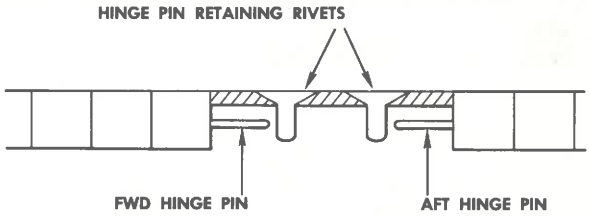
NOTE

LATCHES MUST OPERATE FREELY WITH A MINIMUM OF FRICTION.

h. Check gap between door and fuselage skin and door contour in accordance with aerodynamic smoothness requirements; readjust latch blocks and shear pins as necessary.

TYPICAL DOOR LATCH ASSEMBLY, LOWER

E



i. After completion of door installation, install hinge pin retaining rivets (one at aft end of forward hinge pin; one at forward end of aft hinge pin).

j. *Applicable to left hand door.* Install and align angle of attack transmitter; refer to T.O. 1F-106A-2-15 for procedure.

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Figure 6-6. Forward Electronics Compartment Door Replacement (Sheet 2 of 2)

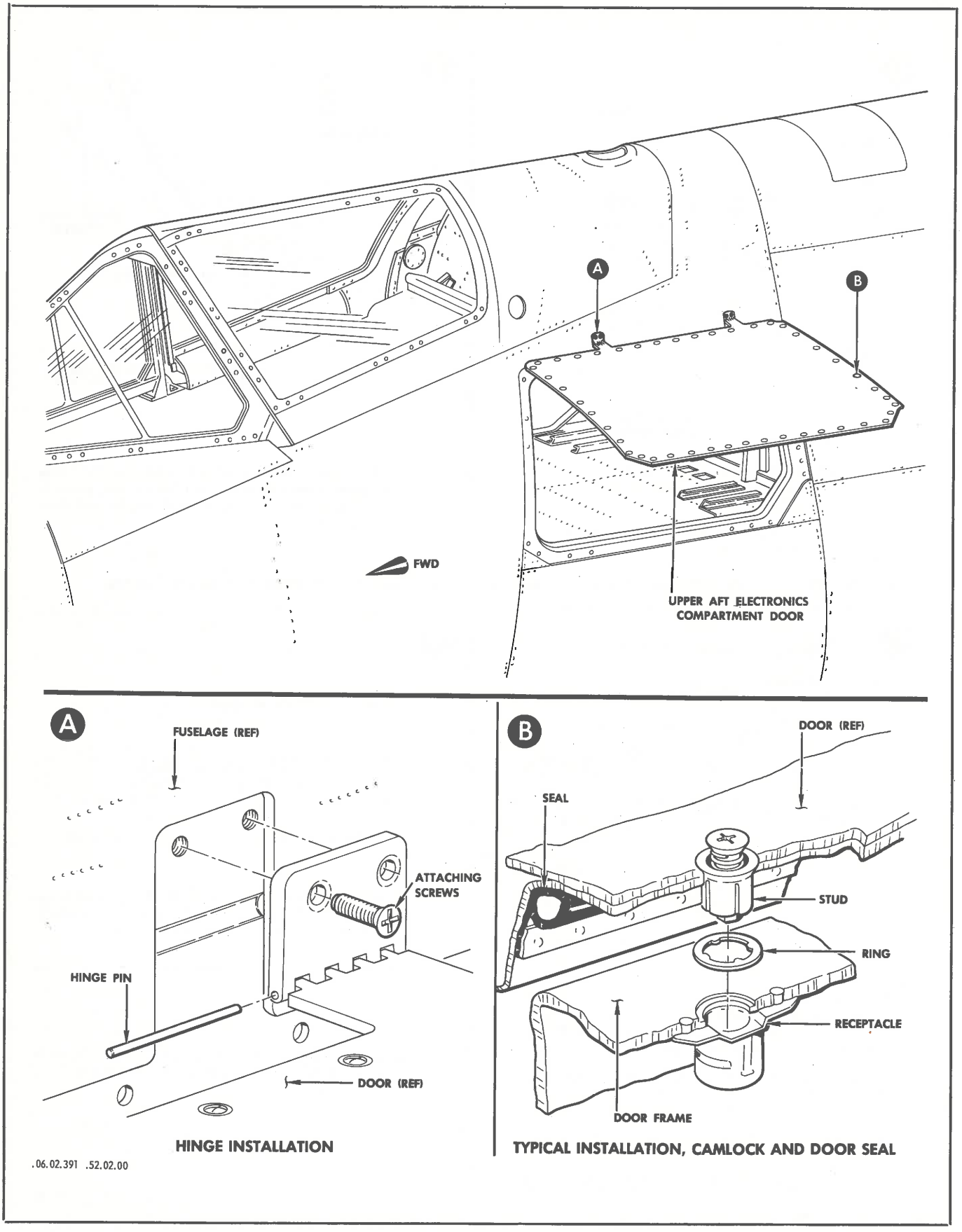
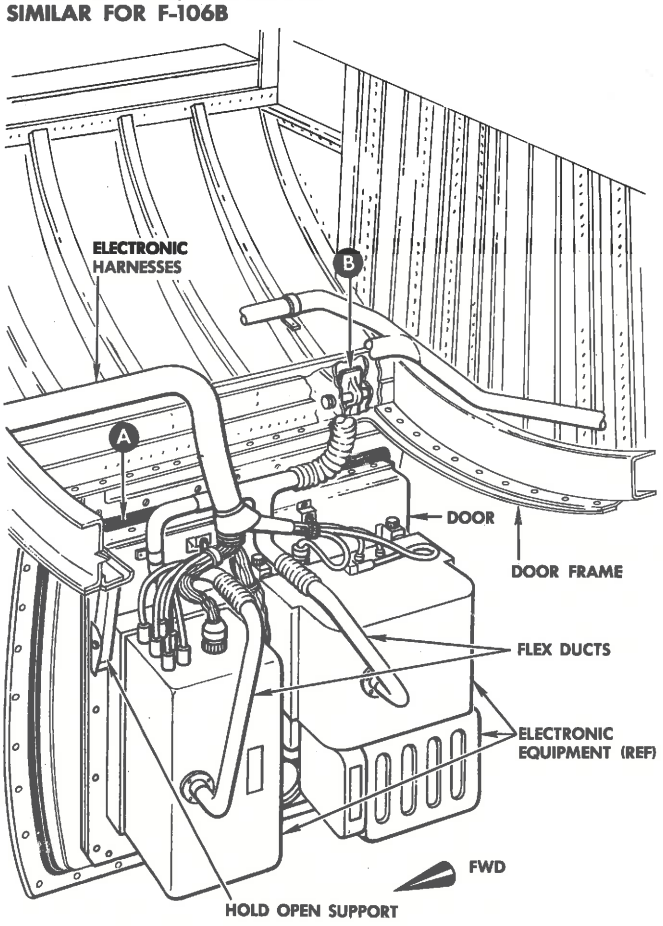
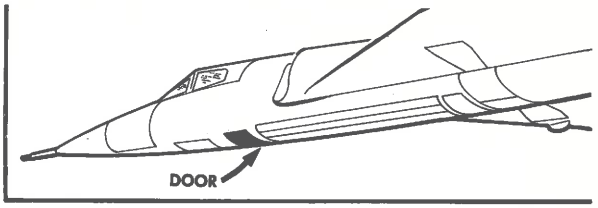


Figure 6-7. Upper-Aft Electronics Compartment Door Replacement, F-106A

F-106A SHOWN, PROCEDURE SIMILAR FOR F-106B





DOOR REMOVAL

a. Loosen fasteners on hinge side of door first then loosen fasteners on forward and aft sides of door.
b. Support door and loosen fasteners on left side of door.

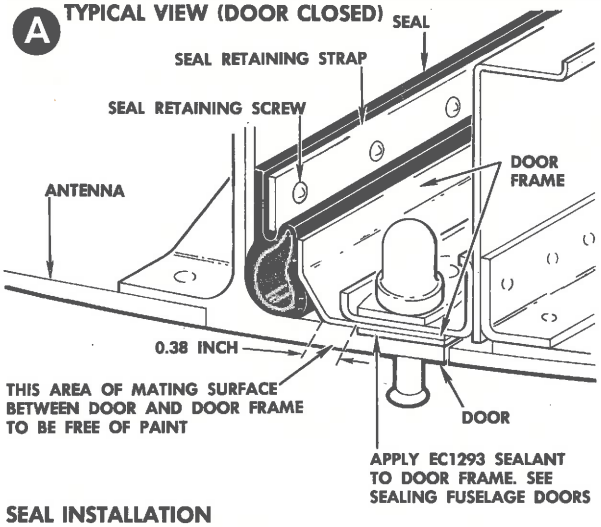
CAUTION

TO PREVENT DAMAGE, BECAUSE OF THE WEIGHT OF ELECTRONIC EQUIPMENT, STEPS "a" AND "b" MUST BE FOLLOWED IN ORDER.

c. Lower door carefully to open position. Connect hold-open support. Remove electronic equipment from door; disconnect flex ducts and electronic harnesses from door.
d. Disconnect hold-open support. Support door, remove hinge bolts, spacers, and remove door. See detail B. Place door on padded surface to prevent damaging antenna.

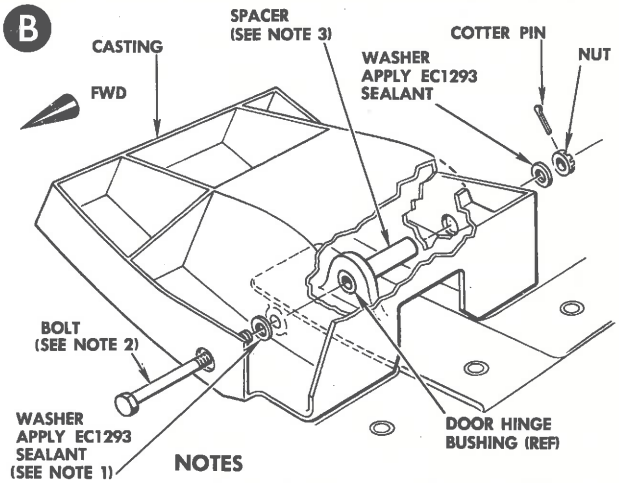
DOOR INSTALLATION

a. Check door seal, check door and door frame for paint free bonding area and check door frame sealant as shown in detail A.
b. Position door and install hinge bolts, spacers, washers, nuts and cotter pins as shown in detail B. Connect hold-open support.
c. Install electronics equipment on door. Connect flex ducts and electronic harnesses to door and equipment. Disconnect hold-open support.
d. Close door carefully and tighten fasteners.
e. Check installation for conformance with aerodynamic smoothness requirements.



SEAL INSTALLATION

a. Seal is tubular type, attached by means of strap. To install place seal around edge of door, hold in position with straps and fasten down with screws.



NOTES

1. APPLY LIBERAL COAT OF EC1293 BETWEEN WASHER FACE AND CASTING (4 PLACES).
2. INSTALL AFT BOLT WITH HEAD FORWARD. INSTALL FORWARD BOLT WITH HEAD AFT.
3. SPACER IS *APPLICABLE TO F-106A AIRPLANES 56-453 THRU 57-2506 AND F-106B AIRPLANES.*

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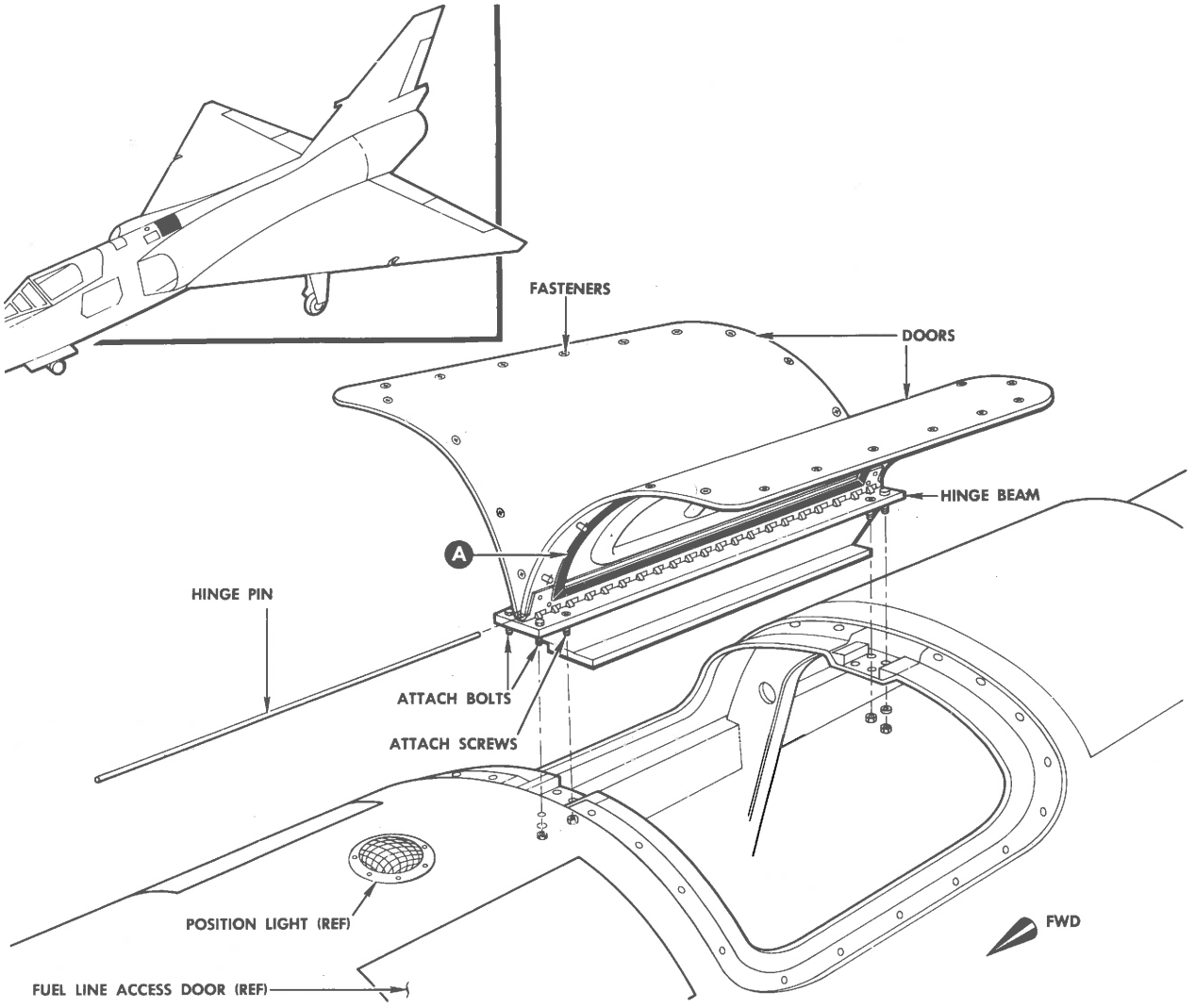
Figure 6-8. Lower-Aft Electronics Compartment Door Replacement



REMOVAL

a. Open doors and remove attach bolts and screws from each end of hinge beam.

b. Remove both doors and hinge beam as one unit.

c. Remove hinge pin.

INSTALLATION

a. Check door seal. If seal replacement is necessary, install new seal as shown in detail A.

b. Attach doors to hinge beam with hinge pin.

c. Position assembled unit and install attachment bolts and screws in each end of hinge beam.

d. Close doors, tighten fasteners and check installation for conformance with aerodynamic smoothness requirements.

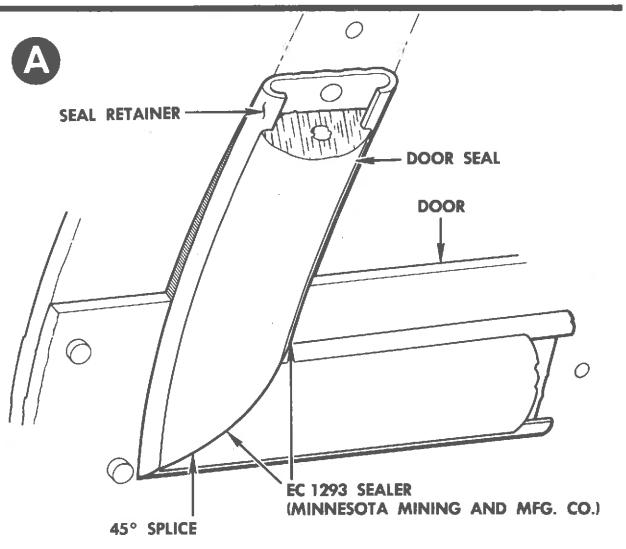


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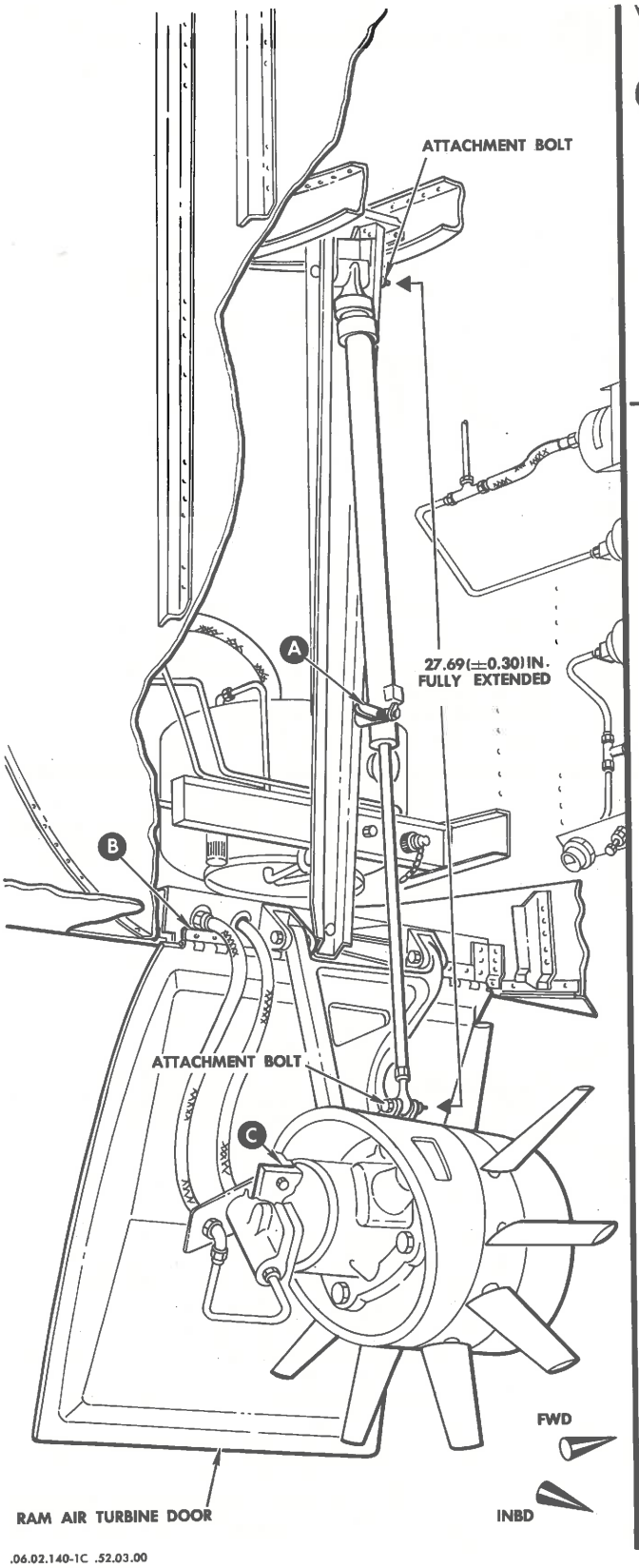
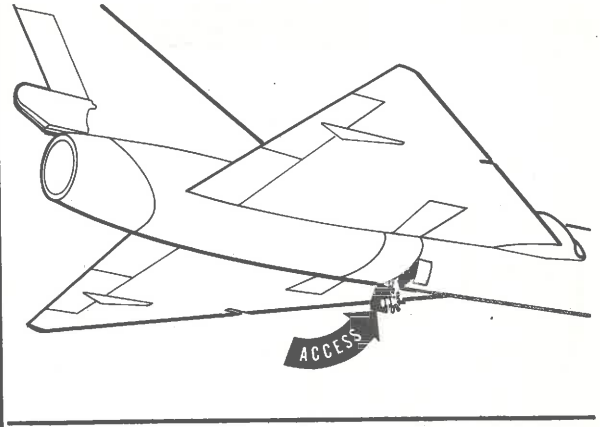
Figure 6-9. Air Conditioning Compartment Door Replacement, F-106A





PREPARATION

a. Check pneumatic system pressure; if necessary, charge system.

b. Extend turbine by actuating ram air turbine control handle in cockpit. Leave handle in actuated position a minimum of 4 seconds to insure a properly snubbed extension. Return handle to normal position, to vent air pressure trapped in actuating cylinder.

WARNING

CLEAR PERSONNEL FROM AREA OF RAM AIR TURBINE DOOR BEFORE EXTENSION. DO NOT ACTUATE CONTROL HANDLE IN COCKPIT UNLESS TURBINE IS FIRMLY LATCHED IN EITHER RETRACTED OR EXTENDED POSITION.

REMOVAL

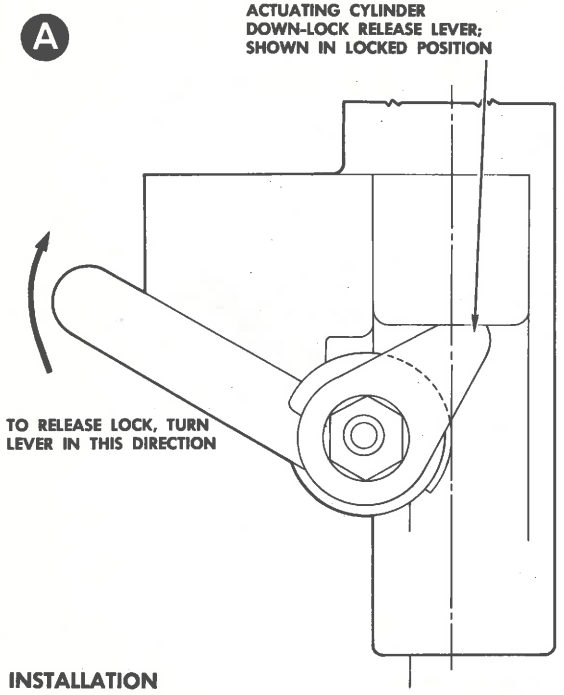
a. Remove rod to door attach bolt shown in detail C.

b. Remove hinge seal.

c. Remove hinge pins (2) shown in detail B.

Figure 6-10. Ram Air Turbine Door, Replacement (Sheet 1 of 2)

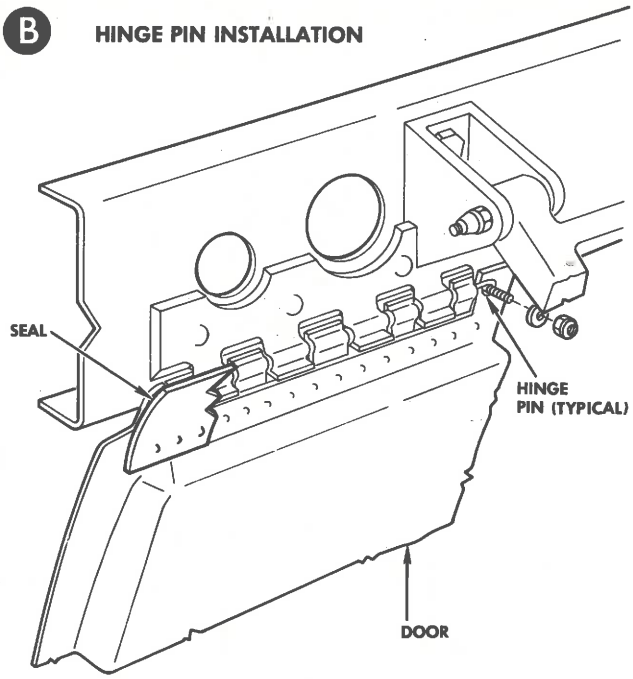
A



INSTALLATION

a. With turbine actuator in the fully entended and locked position, the actuator length should be 27.69(±0.03)inches, measured between centers of the two attaching bolts. See sheet 1 of this art.

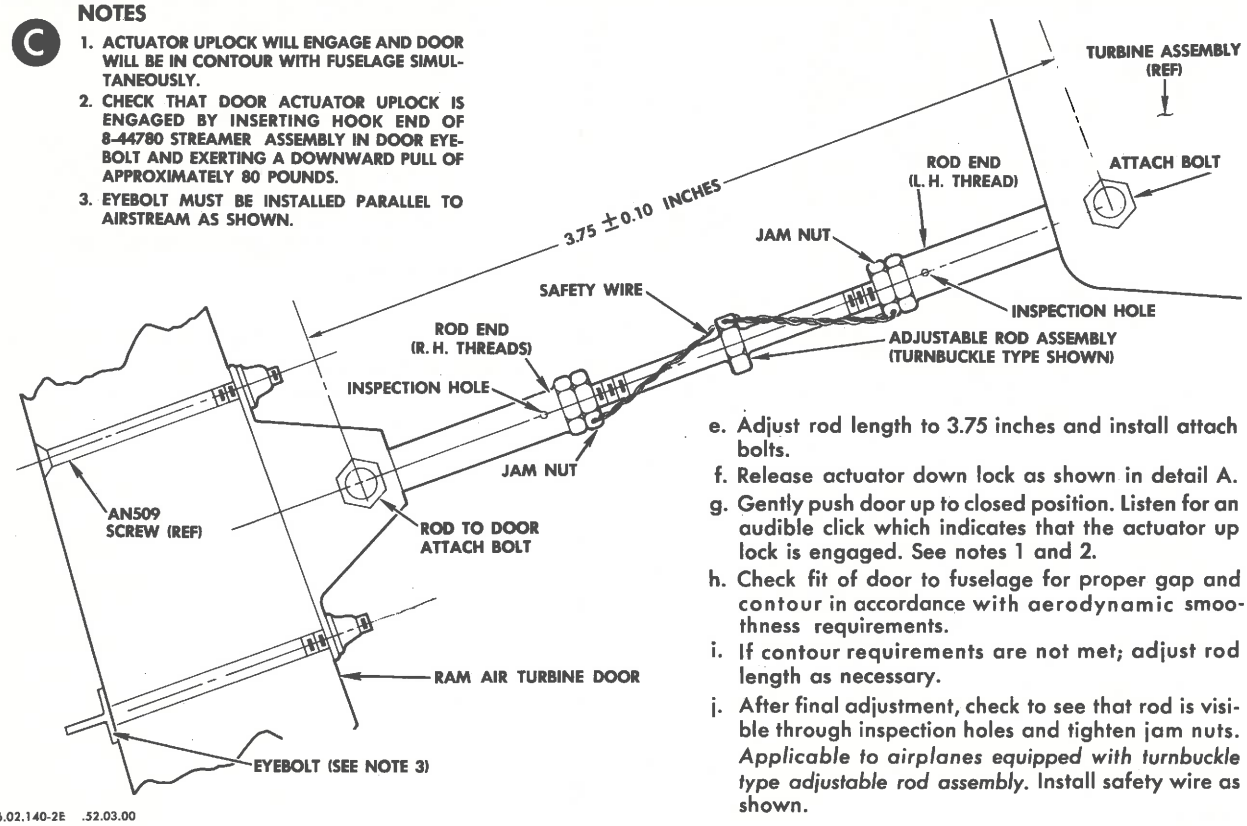
B **HINGE PIN INSTALLATION**



b. Hand butter hinge pins with MIL-L-7711 grease before installation.
c. Position door and install hinge pins.
d. Cement seal to hinge with EC 711.

C **NOTES**

1. ACTUATOR UPLOCK WILL ENGAGE AND DOOR WILL BE IN CONTOUR WITH FUSELAGE SIMULTANEOUSLY.
2. CHECK THAT DOOR ACTUATOR UPLOCK IS ENGAGED BY INSERTING HOOK END OF 8-44780 STREAMER ASSEMBLY IN DOOR EYEBOLT AND EXERTING A DOWNWARD PULL OF APPROXIMATELY 80 POUNDS.
3. EYEBOLT MUST BE INSTALLED PARALLEL TO AIRSTREAM AS SHOWN.



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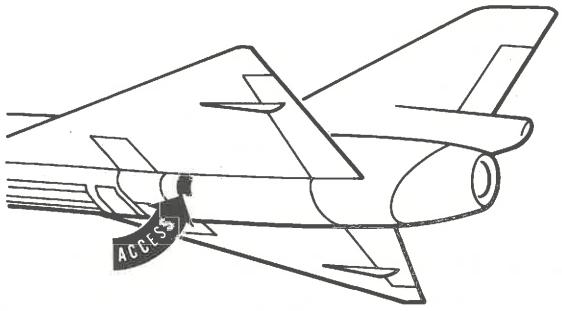
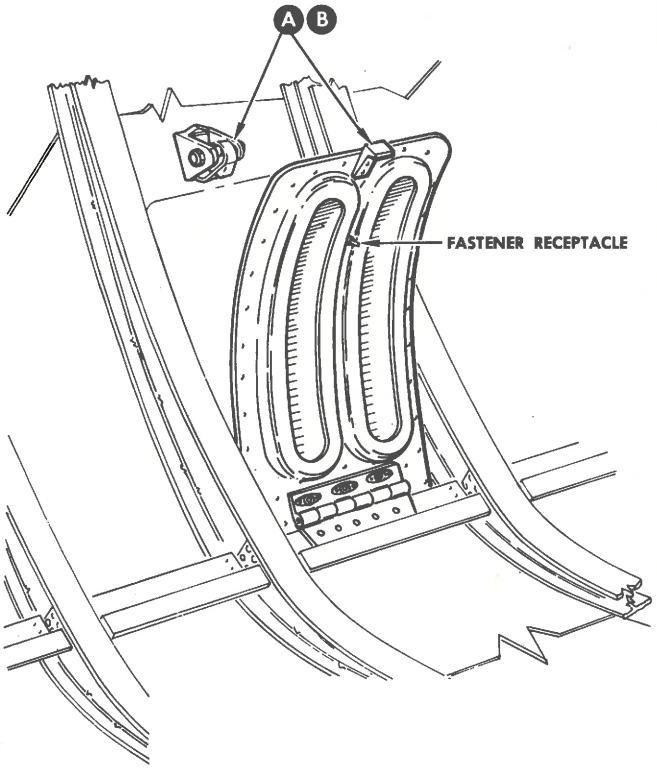
e. Adjust rod length to 3.75 inches and install attach bolts.
f. Release actuator down lock as shown in detail A.
g. Gently push door up to closed position. Listen for an audible click which indicates that the actuator up lock is engaged. See notes 1 and 2.
h. Check fit of door to fuselage for proper gap and contour in accordance with aerodynamic smoothness requirements.
i. If contour requirements are not met; adjust rod length as necessary.
j. After final adjustment, check to see that rod is visible through inspection holes and tighten jam nuts. *Applicable to airplanes equipped with turnbuckle type adjustable rod assembly.* Install safety wire as shown.

Figure 6-10. Ram Air Turbine Door, Replacement (Sheet 2 of 2)



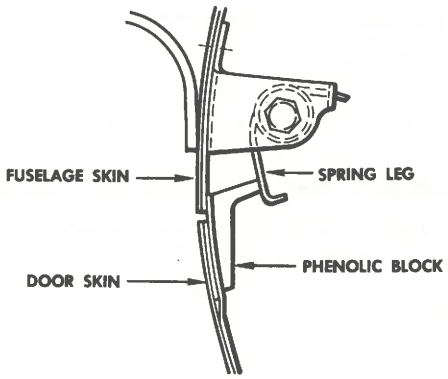


TO OPEN DOOR

Push door inboard.

A **DOOR NOT EQUIPPED WITH FASTENER**

DOOR CLOSED POSITION

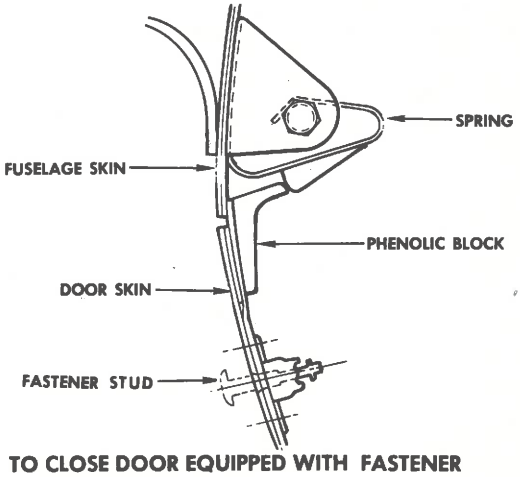


TO CLOSE DOOR NOT EQUIPPED WITH FASTENER

a. Open engine accessory compartment door.
b. Pull spring leg inboard, push door outboard until door is closed, and release spring leg to engage phenolic block.

B **DOOR EQUIPPED WITH FASTENER**

DOOR CLOSED POSITION



TO CLOSE DOOR EQUIPPED WITH FASTENER

a. Release fastener.
b. Grasp fastener stud and pull outboard until door locks.
c. Tighten fastener stud.

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Figure 6-11. Fire Access Door

6-21. REPLACEMENT, LOWER-AFT ELECTRONICS COMPARTMENT DOOR.

For information on the removal and installation of the lower-aft electronics compartment door, see figure 6-8.

6-22. REPLACEMENT, AIR-CONDITIONING COMPARTMENT DOOR.

For information on the removal and installation of the air-conditioning compartment door, see figure 6-9.

6-23. REPLACEMENT, RAM AIR TURBINE DOOR.

For information on the removal and installation of the ram air turbine door, see figure 6-10.

CAUTION

After ram air turbine door is closed, check that door actuator up-lock is engaged. This is accomplished by inserting hook end of 8-44780 streamer assembly in door eyebolt and exerting a downward pull of approximately 80 pounds. See figure 6-10 for an illustration of the ram air turbine door.

6-24. REPLACEMENT, FIRE ACCESS DOOR.

For information on removal and installation of the fire access door, see figure 6-11.

Section VII

WING

Contents *Page*

DESCRIPTION

7-1. GENERAL.

The wing is of full cantilever construction with a delta configuration, and consists of a right and left panel, removable cambered leading edges, wing tips, integral fuel tanks, and integral trailing edges. The wing panels are bolted to the fuselage by means of forged fittings on the wing spars and fuselage frames. The wing skins are machined and have greater thickness at rib attachment areas. Stiffeners built as integral parts of the skin are also included in the wing construction. Elevons, which combine aileron and elevator actions, are installed at the trailing edge of each wing panel. The elevon outboard hydraulic actuator is housed in a fairing on the underside of the wing. The main landing gear is attached to the underside of the wing and retracts into the wheel well in the fuselage. Fuel tank access doors are provided in the lower surface of each wing panel. These doors have greater thickness in the areas of the attaching screws. The wing tips incorporate a position light, visible from above or below the wing. Wing panels are replaceable; refer to T.O. 1F-106A-3 for procedure.

7-2. WALKWAYS.

The wing is of strong ribbed construction with most of the access doors on its lower surface. There are no marked walkways. Care must be taken when it is necessary to be on the wing for cleaning or maintenance.

CAUTION

Wing skins are easily scratched or damaged. Careless placement of tools, or walking on the wing without protective covers, may result in serious damage to the nonclad skin below the painted surface. Protective pads must be placed on the wing surface, or suitable cloth shoe moccasins must be worn, whenever it is necessary to be on the wing.

Do not step near the leading edge, elevon, or wing tip. Walk along spars or ribs, which can be identified by lateral or longitudinal rivet patterns in skin. Avoid placing feet between ribs. Areas alongside the fuselage may be walked on, but do not step on or crawl over the bleed air duct dorsal fairing on top of the fuselage.

7-3. WING LEADING EDGE.

Each wing panel cambered leading edge consists of five aluminum alloy, nonclad sections, joined together by splice panels. The leading edge attaches to the front (No. 1) spar of the wing panel by means of flush screws in gang nut channels. Leading edge smoothness requirements are shown on figure 6-1.

7-4. WING TIPS.

Each wing panel has a removable wing tip. The tips are attached by flush screws to the outer edge of the wing panel at the closing rib between spars 6 and 7. A position light is mounted in each tip and extends through the structure, so as to be visible from above and below the tip. The wing tips are constructed of machined spars and formed ribs, and are covered by stiffened milled skins.

7-5. ELEVONS.

The elevons, which combine aileron and elevator actions, are stressed skin aluminum alloy structures having a front spar and full and half ribs. The elevons are attached to the wing trailing edge by means of seven hinge fitting assemblies incorporating self-aligning bearings. Each elevon is operated by two hydraulic actuators; one inboard, inside the fuselage, and the other outboard, on the wing lower surface. Elevons are designed to flex at approximately midspan to conform to wing flexing due to imposed air loads.

7-6. ELEVON ACTUATOR FAIRING.

The elevon outboard actuator is housed in an aluminum fairing on the underside of the wing. The fairing extends onto the elevon and is constructed in two parts jointed at the elevon hinge line. The fairings are attached to the wing surface and the elevon by flush screws.

REPLACEMENT

7-7. REPLACEMENT, WING.

Refer to Structural Repair Manual, T.O. 1F-106A-3, for wing removal and installation procedures.

7-8. REPLACEMENT, WING LEADING EDGE.

Procedures for removal and installation of the wing leading edge are shown on figure 7-1.

7-9. REPLACEMENT, WING TIP.

Procedures for removal and installation of the wing tip are shown on figure 7-2.

7-10. REPLACEMENT, ELEVON.

See figure 7-3 for elevon removal and installation procedures.

7-11. REPLACEMENT, ELEVON ACTUATOR FAIRING.

Elevon actuator fairing removal and installation procedures are shown on figure 7-3.

7-12. SEALING OF WING ACCESS DOORS.

Wing fuel tank access doors are sealed with fairprene gaskets, as illustrated on figure 7-4. Wing access doors not in contact with fuel are sealed by the "formed gasket" method, as illustrated on figure 6-4.

SERVICING

7-13. CLEANING WING EXTERIOR SURFACES.

For information on procedures and materials for cleaning the wing exterior surfaces, refer to paragraphs 2-60 through 2-62.

7-14. REPAIRING DAMAGE TO EXTERIOR FINISH.

For information on repairing damage to the exterior finish of the wing, refer to paragraph 2-83.

REMOVAL

a. Remove splice panel attach screws; remove splice panels.
b. Remove leading edge attach screws; remove leading edge sections.

PREPARATION (INSTALLATION)

a. Remove old sealant from upper and lower faying surfaces of wing structure and leading edges with plastic scraper.
b. Clean surfaces thoroughly with a cloth dampened with aliphatic naphtha, Federal Specification TT-N-95.
c. Apply sealant, EC 1293 or EC 1291, to upper and lower faying surfaces of wing structure in a continuous pattern approximately 1/8-inch wide and 1/32-inch thick. See detail A.

NOTE

SEALANTS EC 1293 AND EC 1291 ARE MANUFACTURED BY 3M CO., ST. PAUL 6, MINN.

d. Apply a thin coat of petrolatum, Federal Specification VV-P-236, to the inner faying surfaces of the leading edge sections to prevent sealant adhesion.

INSTALLATION

a. Position the leading edge sections so that screw holes in edge section are aligned with those in wing structure.
b. Install leading edge attach screws.
c. Apply sealant, EC 1293 or EC 1291, to leading edge sections at splice panel faying surfaces in a continuous pattern approximately 1/8-inch wide and 1/32-inch thick. See detail C.
d. Apply a thin coat of petrolatum, Federal Specification VV-P-236, to inner faying surfaces of splice panels to prevent sealant adhesion.
e. Install splice panels with attach screws.
f. Remove excess sealant so that sealant presents a smooth flush surface; use a plastic scraper and a cloth dampened with aliphatic naphtha, Federal Specification TT-N-95.
g. Check that installation conforms to aerodynamics smoothness requirements.
h. Allow sealant to cure for 24 hours.

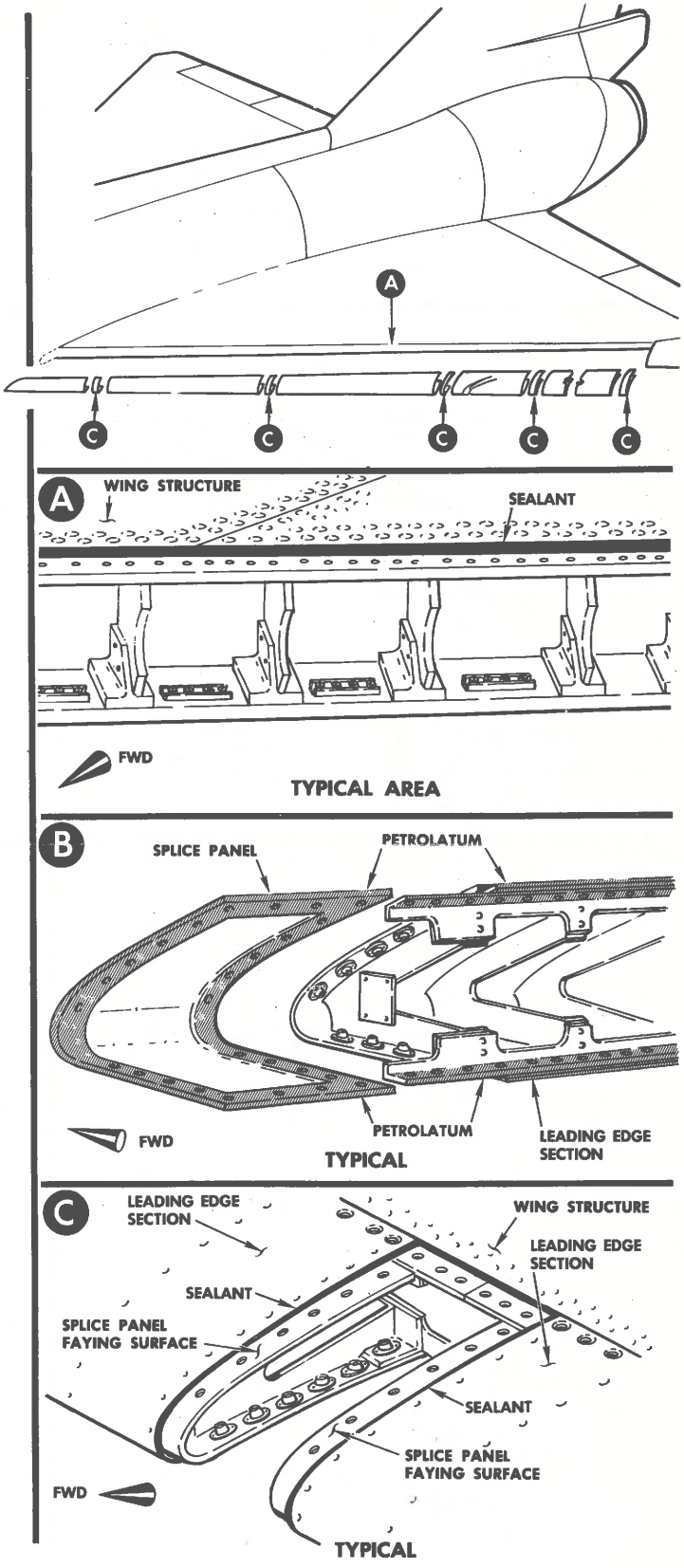

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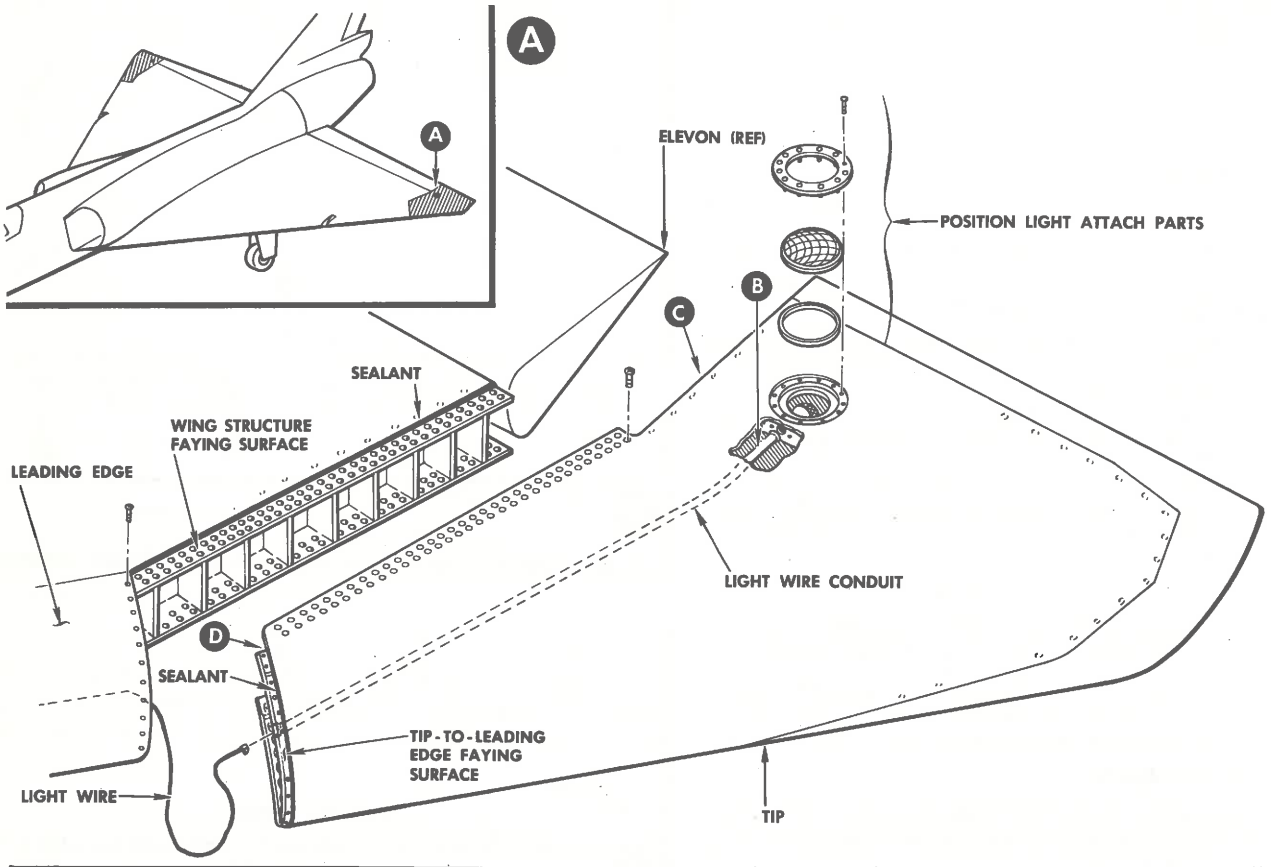
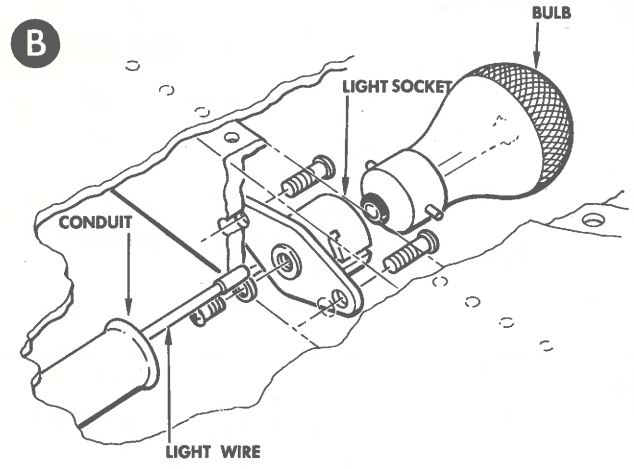
Figure 7-1. Wing Leading Edge Replacement





REMOVAL (PREFERRED METHOD)

a. Remove position light attach screws and attaching parts to gain access to position light bulb.
b. Remove bulb from socket, remove socket attach screws, pull socket aft and disconnect light wire from socket.
c. Remove tip attach screws, feed light wire into conduit, and remove tip.

REMOVAL (ALTERNATE METHOD)

NOTE

THIS METHOD TO BE USED ONLY WHEN THE SAME TIP IS TO BE REINSTALLED.

a. Remove tip attach screws and slowly pull tip clear until slack is out of light wire.
b. Cut light wire at mid point between wing and tip.

PREPARATION (INSTALLATION)

a. Remove old sealant from upper and lower faying surfaces of wing structure and tip to leading edge faying surface with a plastic scraper. See detail A.
b. Clean faying surfaces thoroughly with a cloth dampened with aliphatic naphtha, Federal Specification TT-N-95.
c. Seal all tooling holes, relief cuts, and joggle cavities of wing tip with sealant EC 1293. Seal the wing tip inboard closing rib by adding a bead of EC 1293 at intersection of rib to skin. See detail C.

NOTE

SEALANT EC 1293 IS MANUFACTURED BY 3M CO., ST. PAUL 6, MINN.

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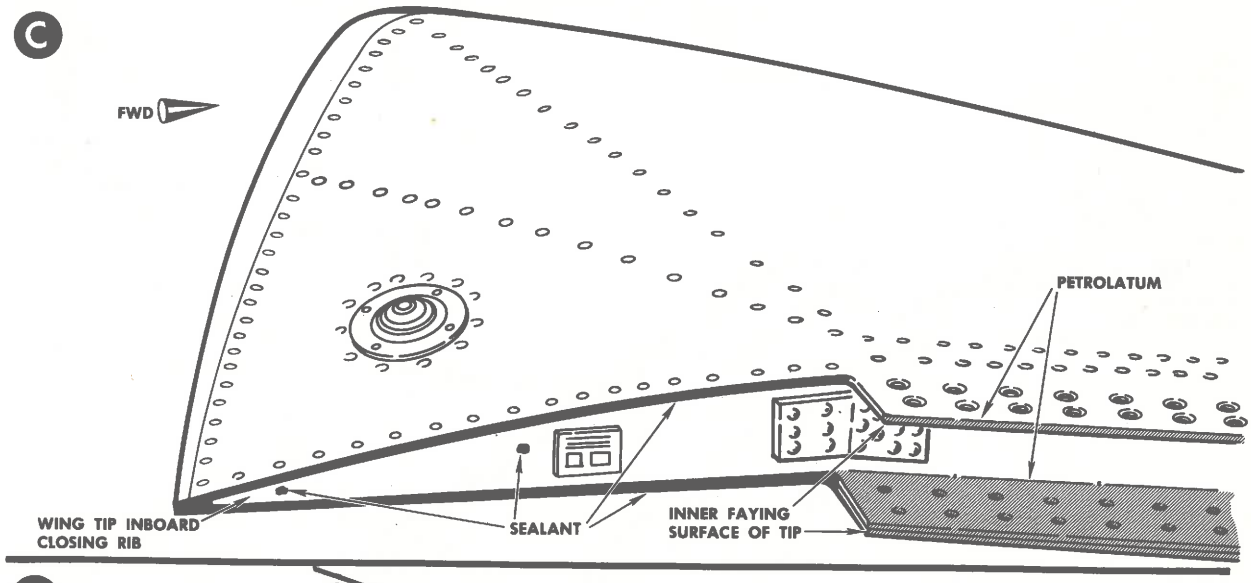
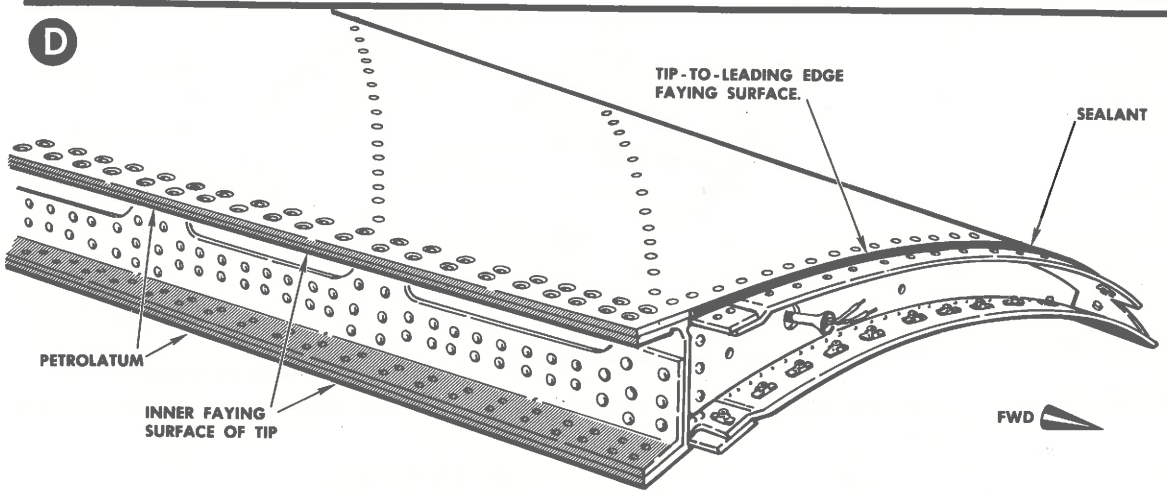
Figure 7-2. Wing Tip Replacement (Sheet 1 of 2)





d. Apply sealant, EC 1293, to upper and lower faying surfaces of wing structure in a continuous pattern approximately 1/8-inch wide and 1/32-inch thick. Apply sealant to tip-to-leading edge faying surface by foregoing method. See details A and D.
e. Apply a thin coat of petrolatum, Federal Specification VV-P-236, to inner faying surfaces of tip and leading edge to prevent sealant adhesion. See detail D.

INSTALLATION (PREFERRED METHOD)

a. Position and support tip to feed light wire through conduit. See detail A.
b. Position tip and install attach screws.
c. Install light wire in socket, install socket, and install bulb. See detail B.
d. Install position light attach parts; see detail A.
e. Remove excess sealant so that sealant presents a smooth flush surface; use a plastic scraper and a cloth dampened with aliphatic naphtha, Federal Specification TT-N-95.
f. Check tip and position light installations for conformance with aerodynamic smoothness requirements.
g. Allow sealant to cure for 24 hours.

INSTALLATION (ALTERNATE METHOD)

NOTE

THIS METHOD TO BE USED ONLY AFTER ALTERNATE REMOVAL PROCEDURE HAS BEEN USED.

a. Position and support tip to install permanent splice in light wire. Refer to T. O. 1F-106A-2-10 for procedure.
b. Position tip and install attach screws.
c. Remove excess sealant so that sealant presents a smooth flush surface; use a plastic scraper and a cloth dampened with aliphatic naphtha, Federal specification TT-N-95.
d. Allow sealant to cure for 24 hours.

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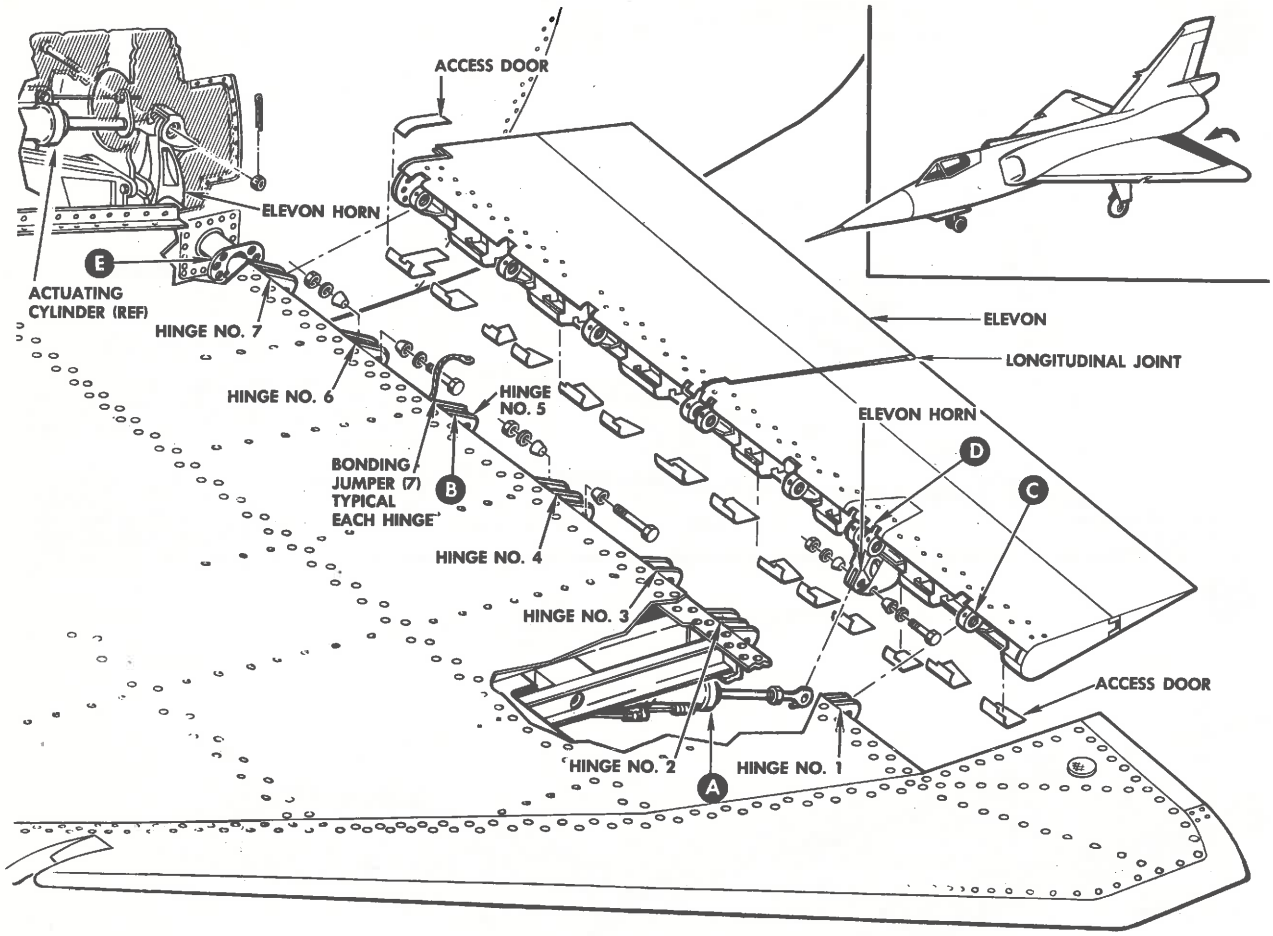
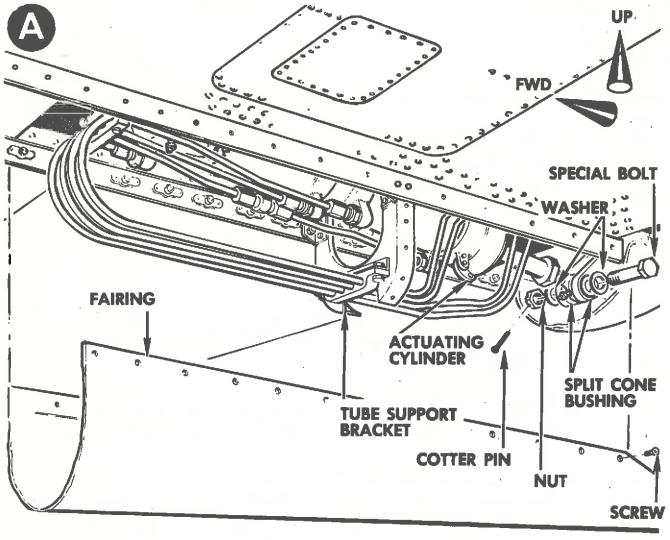
Figure 7-2. Wing Tip Replacement (Sheet 2 of 2)





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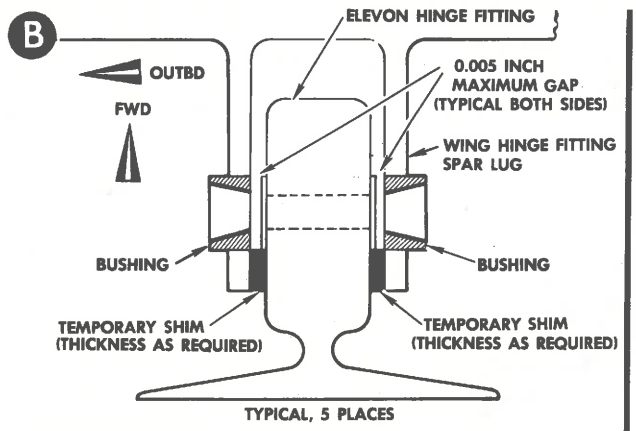
REMOVING ELEVON

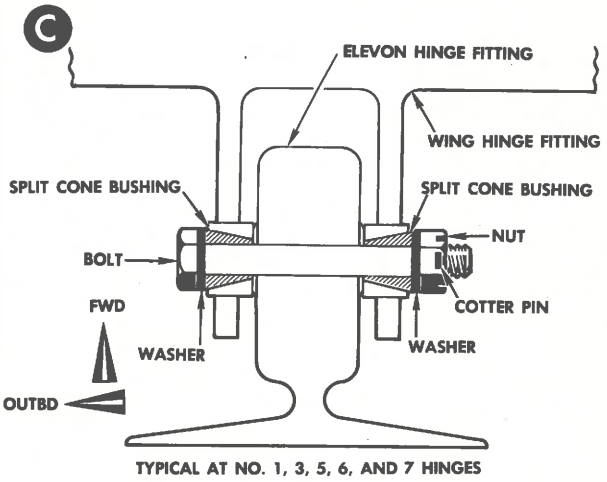
a. Remove outboard elevon actuator fairing from lower wing surface; support elevon and disconnect actuator from elevon horn.
b. Remove upper and lower access doors from inboard end of elevon for access to elevon horn attach bolts.
c. Remove access doors at elevon hinge fittings.
d. Remove seven bolts attaching inboard horn to elevon; see note 2 and detail E.
e. Disconnect bonding jumpers at each elevon hinge fitting.
f. Support elevon and remove elevon hinge bolts; see details A, B, C and D.
g. Remove elevon. Elevon weighs approximately 170 pounds.

CAUTION

SUPPORT ELEVON AT CENTER AS WELL AS AT ENDS DURING REMOVAL.

Figure 7-3. Elevon Replacement (Sheet 1 of 3)





INSTALLING ELEVON

a. Press bushings in wing hinge fitting spar lugs out to a position flush with inner faces of each lug.
b. Place elevon in position so that elevon hinge fittings are between lugs of fittings on wing trailing edge.
c. Install temporary ⅜ inch diameter bolts in all hinge fittings except the No. 2 hinge.
d. Install temporary shims between the elevon hinge fittings and spar lugs; tighten temporary bolts so that bushings are pressed against bearing races. Loosen bolts and check that gap between bushing and bearing race does not exceed 0.005 inch maximum after spring back of lugs.

NOTE

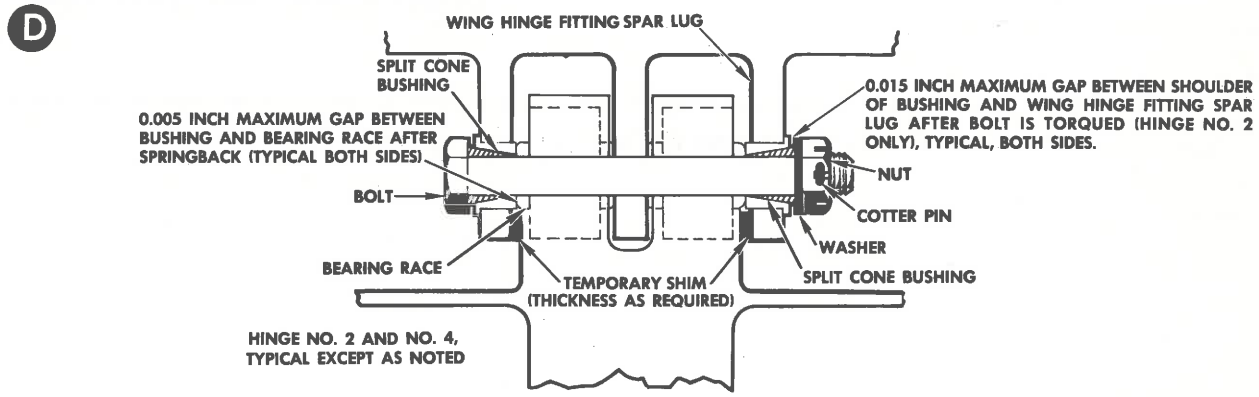
PURPOSE OF SHIMS IS TO PREVENT DEFORMATION OF WING HINGE FITTING SPAR LUGS WHILE THE BUSHINGS ARE BEING DRAWN INTO POSITION.

e. Remove temporary bolts and temporary shims as each permanent bolt is installed.
f. Coat outer surface of split-cone bushings with thin coat of graphite grease, Specification MIL-G-7187, and insert bushings into spar lug fitting bushings.

NOTE

DO NOT APPLY GREASE TO INNER SURFACE OF BUSHINGS OR TO HINGE BOLTS.

g. Install and hand-tighten elevon hinge bolts.



h. Coat outer surface of bushings with thin coat of graphite grease, Specification MIL-G-7187, and insert split cone bushings into spar lug fittings; refer to note following step "e".
i. Install bolt, washer, and nut finger tight.
j. Install temporary wedges between the elevon hinge fittings and spar fitting lugs and tighten hinge bolts so that bushings are pressed against bearing races; loosen hinge bolts and remove wedges; check that gap between bushings and bearing races does not exceed 0.005 inch maximum.
k. Torque No. 2 hinge bolt to 660-780 inch-pounds and secure with cotter pin; torque No. 4 hinge bolt to 95-110 inch-pounds and secure wth cotter pin.
l. Check that gap between shoulder of bushing and each lug does not exceed 0.015 inch maximum with hinge bolt torqued (No. 2 hinge only).
m. Torque elevon hinge bolts previously hand-tightened (step f) to 95-110 inch-pounds and secure with cotter pin.
n. Connect bonding jumpers at all hinges.

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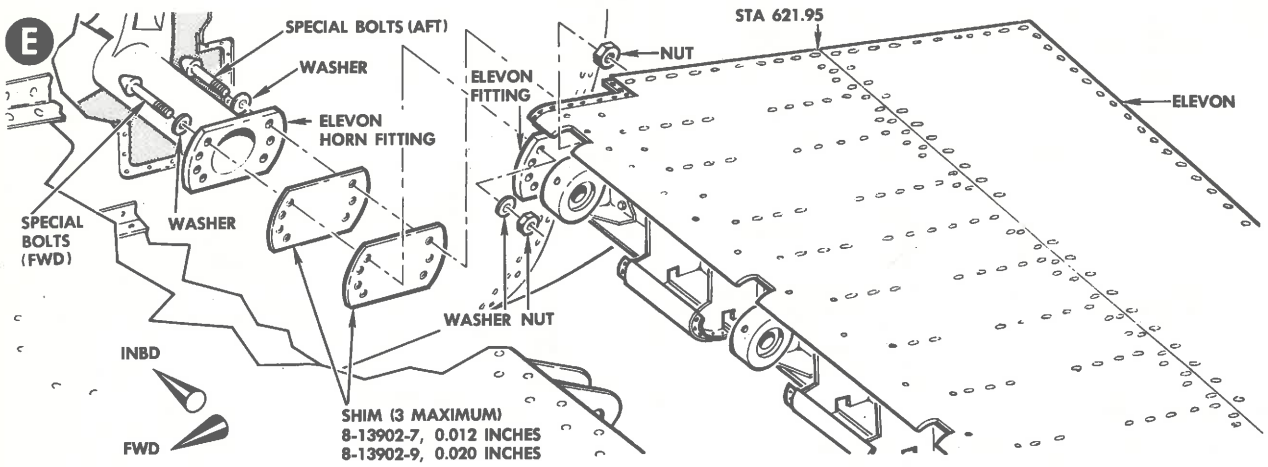
Figure 7-3. Elevon Replacement (Sheet 2 of 3)



n. Install shims as required (up to a maximum of three shims) to fill gap between elevon horn fitting and inboard end of elevon fitting.
o. Install attaching bolts through fittings and shims with bolt heads inboard. Torque four forward bolts to 675-750 inch-pounds and three aft bolts to 1650-1950 inch-pounds; see notes.
p. Install inboard and outboard elevon actuating cylinders to elevon horns; refer to Section III, this manual.
q. Install all access doors and outboard actuator fairing.
r. Perform elevon control system operational check.

NOTES:

1. *APPLICABLE TO F-106A AIRPLANES 57-229, 57-235 AND SUBSEQUENT; AND 56-453 THRU 56-467, 57-230 THRU 57-234 AFTER INCORPORATION OF TCTO 1F-106(J)-576. APPLICABLE TO F-106B AIRPLANES 57-2508, 57-2510 AND SUBSEQUENT; AND 57-2507, 57-2509 AFTER INCORPORATION OF TCTO 1F-106(J)-576.* CLEARANCE AT STA. 621.95 MUST BE 1.00 (+0.125, —0.25) INCH.

   APPLICABLE TO F-106A AIRPLANES 56-453 THRU 56-467; 57-230 THRU 57-234 PRIOR TO INCORPORATION OF TCTO 1F-106(J)-576. APPLICABLE TO F-106B AIRPLANES 57-2507 AND 57-2509 PRIOR TO INCORPORATION OF TCTO 1F-106(J)-576. WITH ELEVONS IN STREAMLINE, CLEARANCE BETWEEN INBOARD EDGE OF ELEVON AND FUSELAGE MUST BE 0.38 (+0.06, —0.13) INCH AT ELEVON HINGE LINE AND AT ELEVON TRAILING EDGE. CLEARANCE AT STA. 621.95 MUST BE 1.00 (+0.125, —0.25) INCH.
2. USE ELEVON HORN WRENCH 8-96112 TO TORQUE OR REMOVE THE THREE AFT BOLTS. USE ELEVON HORN WRENCH 8-96114 TO TORQUE OR REMOVE THE FOUR FORWARD BOLTS.

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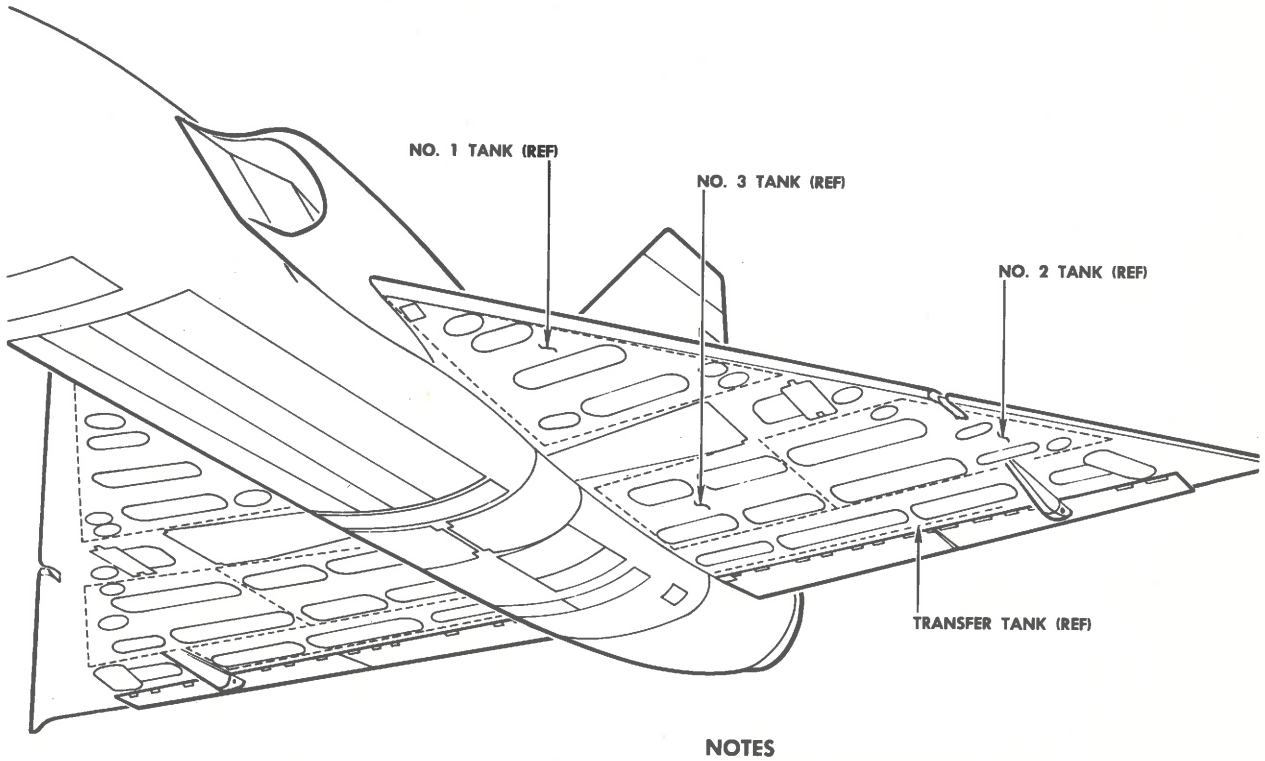
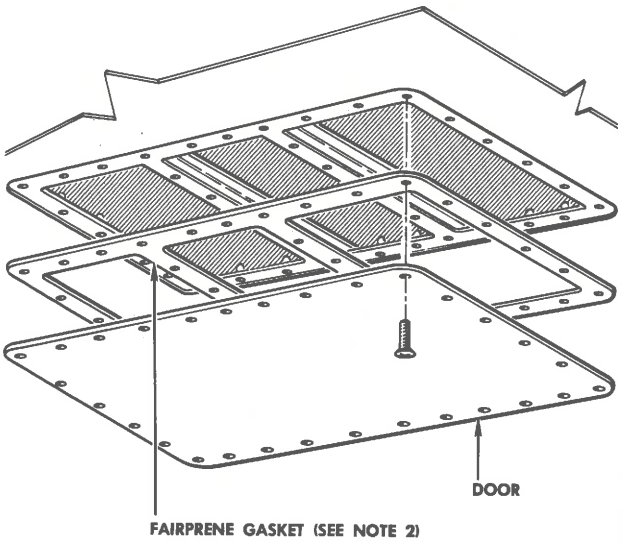
Figure 7-3. Elevon Replacement (Sheet 3 of 3)

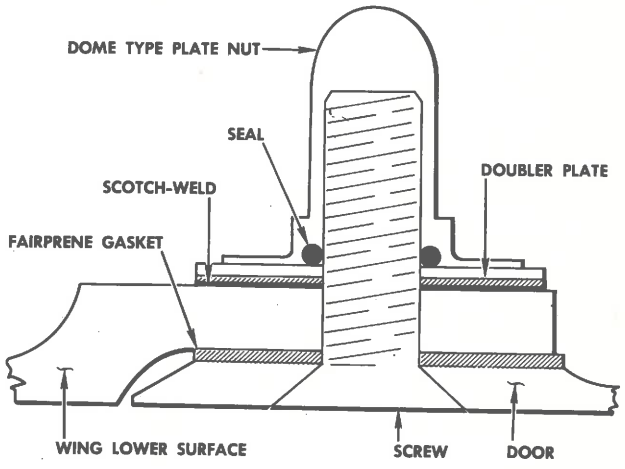


NOTES

1. DOORS NOT IN CONTACT WITH FUEL ARE ATTACHED WITH FLUSH SCREWS AND NO GASKETS.
2. FABRICATE GASKET FROM 0.032 INCH THICK FAIRPRENE SHEET, MANUFACTURED BY E. I. DUPONT, WILMINGTON, DEL. USE MIL-S-4383A TYPE 1 SEALER ON DOOR SIDE OF GASKET.



TYPICAL FUEL TANK DOOR ATTACHMENT



CAUTION

TO PREVENT DAMAGE TO DOME TYPE PLATE NUTS AND SUBSEQUENT FUEL LEAKS, INSTALL PROPER LENGTH SCREWS AS STENCILED ON RESPECTIVE DOORS.

TYPICAL FUEL TANK DOOR INSTALLATION

.06.02.145A .52.00.00

Figure 7-4. Fuel Tank and Wing Structural Doors

Section VIII

CANOPY AND SEAT OPERATING SYSTEMS

Contents *Page*

PILOT'S ESCAPE SYSTEM (ROTATIONAL UPWARD EJECTION)

Applicable to F-106A airplanes 59-060 and subsequent; and 56-453 thru 59-059 after incorporation of TCTO 1F-106-569. Applicable to F-106B airplanes 59-149 and subsequent; and 57-2507 thru 58-904 after incorporation of TCTO 1F-106-569.

DESCRIPTION

8-1. GENERAL.

The F-106A and F-106B airplanes are equipped with jettisonable canopies which permit both normal and emergency exit. In normal operation the canopy is raised and lowered with the aid of a combination pneumatic-ballistic (or an electric-ballistic) actuating cylinder. The canopy seal system provides a means for sealing the cockpit so that it may be pressurized. Either an upward ejection or a rotational upward ejection type seat may be installed in the airplane. The pilot escape system, while accomplishing the same end result, varies in accordance with the type of seat. The following sub-sections contain complete information on the canopy normal operating systems, the canopy seal systems, both types of seats, and both types of the pilot escape systems.

CANOPY NORMAL OPERATING SYSTEMS

DESCRIPTION

8-2. GENERAL.

Applicable to F-106A airplanes 56-453 thru 57-243 prior to incorporation of TCTO 1F-106-J-525. The cockpit canopy is raised or lowered, manually, with the assistance of a combination pneumatic-ballistic cylinder supplied with air pressure from the high pressure pneumatic system. The cylinder acts as a counter-balance to neutralize the weight of the canopy and thus reduces the force required for operation. See figure 8-1 for a schematic illustration of this system. *Applicable to F-106A airplanes 57-244 and subsequent and 56-453 thru 57-243 after incorporation of TCTO 1F-106A-J-525.* The canopy is normally raised or lowered by electrical operation of the combination electric-ballistic actuating cylinder. Electrical power may be furnished from the airplane's generating system, from an external ground unit, or from the silver-zinc battery which is a component of the canopy power package. The canopy power package is incorporated solely for canopy operation and all sources of power flow through one or more of the package's components. Battery power is sufficient for approximately twenty opening and closing operations without recharging. The canopy may be operated electrically from within the cockpit by a momentary toggle switch mounted adjacent to the pilot's canopy latch control handle or from an identical switch mounted adjacent to the exterior canopy latch control handle. The canopy can be raised manually from the full closed position to the full open position. See figure 8-2 for a schematic illustration of this system. *Applicable to F-106B airplanes 57-2507 thru 57-2514 prior to incorporation of TCTO 1F-106(J)B-519 and TCTO 1F-106(J)B-525.* The canopy

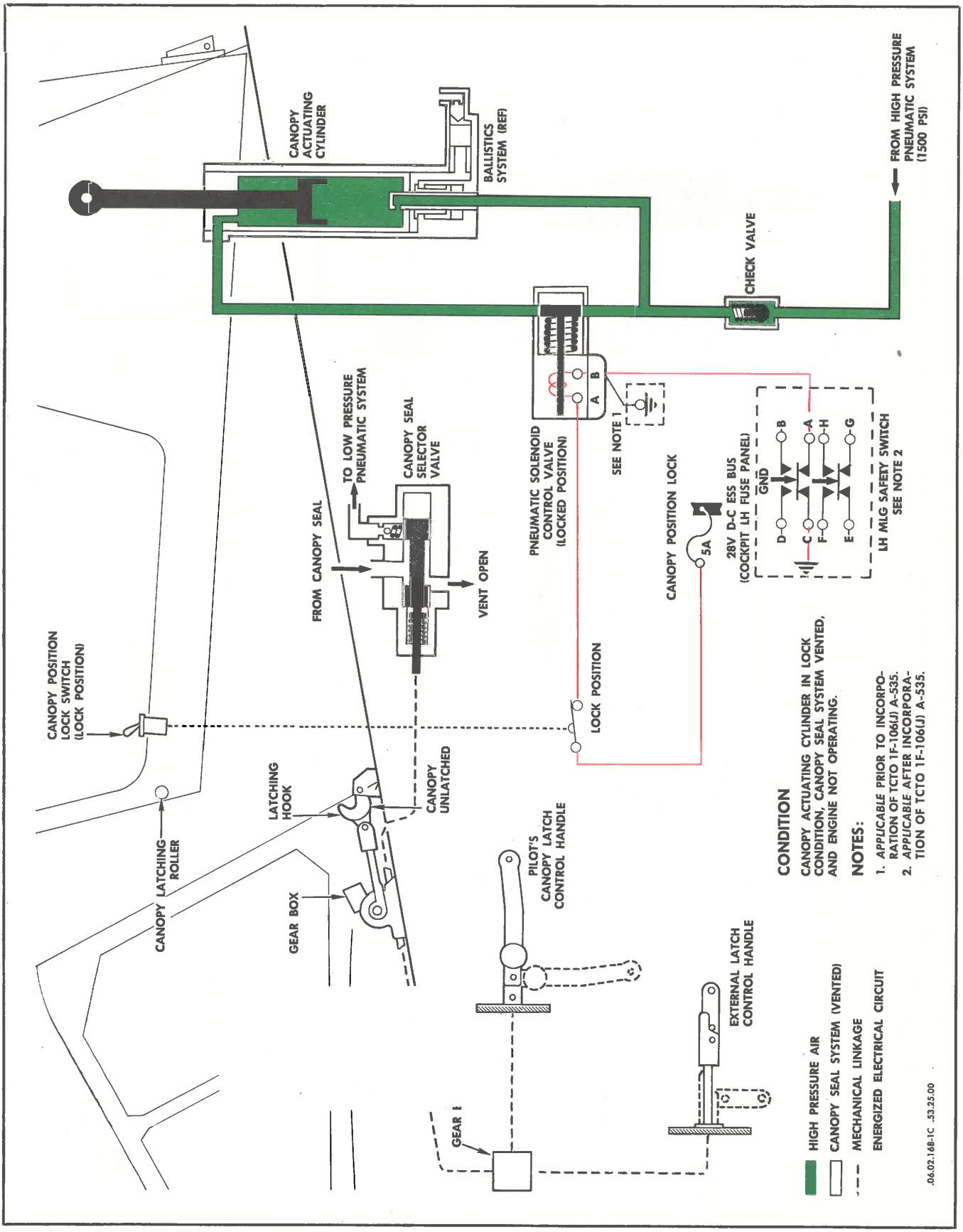


Figure 8-1. Pneumatic Canopy Actuating System Schematic, F-106A (Sheet 1 of 2)
Applicable to 56-453 thru 57-243 prior to incorporation of TCTO 1F-106J-525

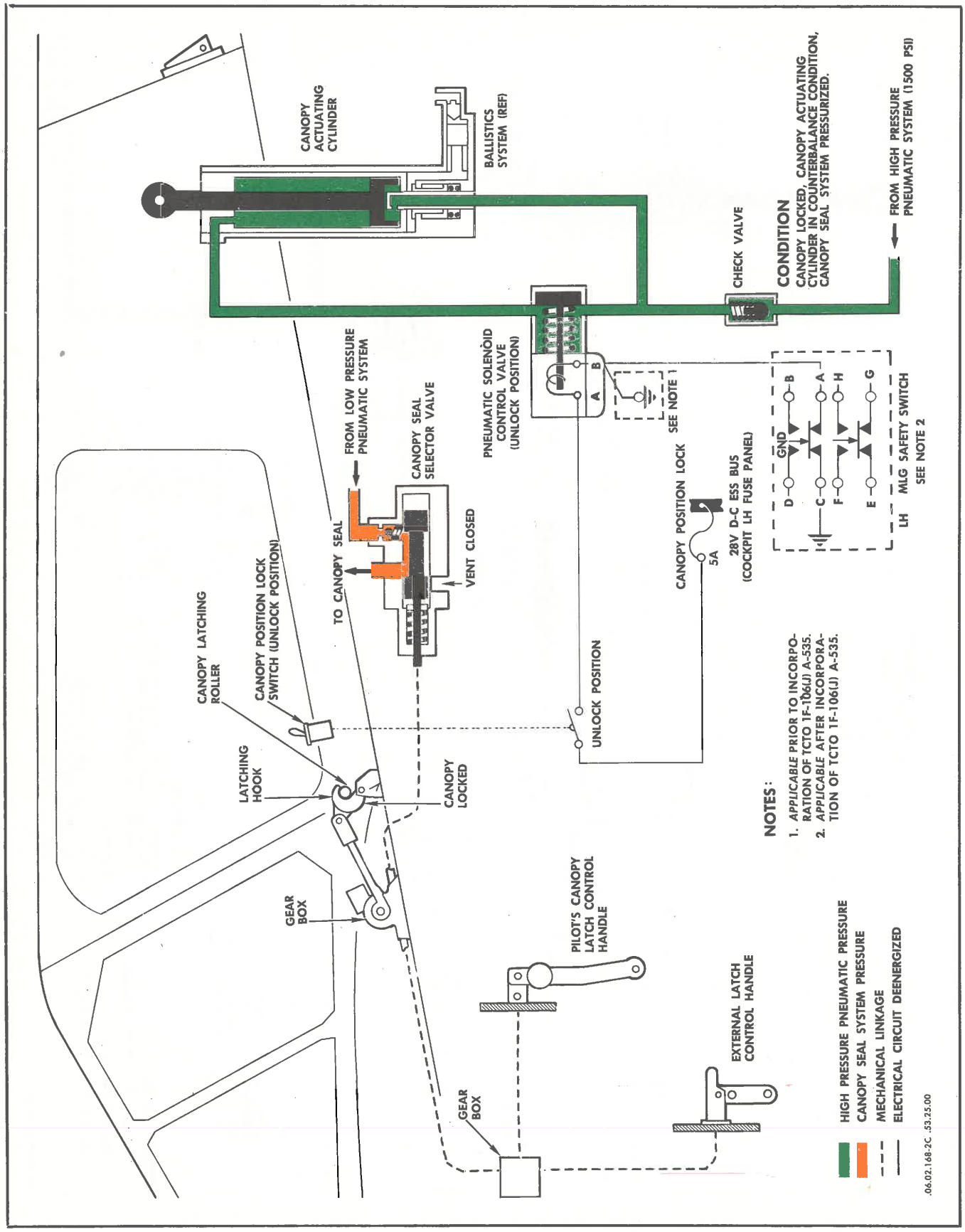


Figure 8-1. Pneumatic Canopy Actuating System Schematic, F-106A (Sheet 2 of 2)
Applicable to 56-453 thru 57-243 prior to incorporation of TCTO 1F-106J-525

is raised and lowered pneumatically. When pneumatic pressure is admitted to the lower side of its actuator piston, the pneumatic-ballistic cylinder raises the canopy. When the pressure in the cylinder is relieved, the canopy slowly closes by its own weight. Pneumatic pressure within the cylinder is governed by the position of the canopy control valve. The valve is actuated to the desired position by movement of either the interior or exterior lift control lever. See figure 8-3 for a schematic illustration of the system. *Applicable to F-106B airplanes 57-2515 and subsequent and 57-2507 thru 57-2514 after incorporation of TCTO 1F-106(J)B-519 and TCTO 1F-106(J)B-525.* The canopy is normally raised or lowered by electrical operation of the combination electric-ballistic actuating cylinder. Electrical power may be furnished from the airplane's generating system, from an external ground unit, or from the silver-zinc battery which is a component of the canopy power package. The canopy power package is incorporated solely for canopy operation and all sources of power flow through one or more of the package's components. The canopy may be operated electrically by a momentary toggle switch mounted adjacent to the pilot's canopy latch control handle or from an identical switch mounted adjacent to the exterior canopy latch control handle. The canopy may be operated manually, by operating the canopy actuator clutch release handle mounted adjacent to the canopy exterior latch control handle. See figure 8-4 for a schematic illustration of this system. *Applicable to all airplanes,* a position-lock system allows the canopy to be locked in any position during ground operations. When closed, the canopy is locked in place by latching hooks on each side of the cockpit. The cockpit latches are operated by a control handle inside the cockpit or by a second handle externally mounted beneath the left windshield. A "CANOPY UNLOCKED" warning light illuminates when the canopy is not firmly latched in the closed position. See figures 8-5, 8-6, 8-7, or 8-8 for applicable operating procedures of the canopy normal system.

8-3. COCKPIT CANOPY.

The cockpit canopy is an aluminum frame structure incorporating plexiglas window panels. The panels are of three-ply construction and are completely discussed in paragraph 5-39. An inflatable seal installed around the edges of the canopy, seals the cockpit against pressure loss when the canopy is closed. Refer to paragraphs 8-52 through 8-65 for information on the canopy seal system. Latching hooks hold the canopy in the closed position. Side-load fittings on each side take the side component of the canopy pressure load. Canopy hinges at the aft end of the canopy are secured with two shear bolts that shear when the canopy is jettisoned.

8-4. CANOPY LATCH MECHANISM.

Applicable to F-106A airplanes, the canopy latch mechanism consists of mechanical linkage connected to a latching hook on each side of the cockpit, two crank handles, Teleflex cables, gear boxes, and a crank assembly. The hooks are installed on the cockpit sill and engage roller fittings in the canopy when the canopy is closed. The latching hooks are controlled by either of the two crank handles. One crank handle is installed at the right-hand forward side of the cockpit. The hooks are in the locked position when the handle is rotated 100 degrees clockwise. A 100-degree counterclockwise rotation of the crank handle causes the hooks to move to the unlocked position. The second crank handle is installed externally on the left side of the fuselage below the windshield. To lock the canopy from the outside, pull the external handle all the way out, rotate it 90 degrees clockwise, then push it all the way in. The canopy may be unlocked from the outside by pulling the external handle all the way out. The canopy seal selector valve is controlled by the crank handles, through a Teleflex cable, and is open whenever the canopy is locked closed. Refer to paragraphs 8-52 through 8-65 for further information on the canopy seal system.

8-5. *Applicable to F-106B airplanes,* the canopy latch system includes eight hook mechanisms, two thrusters, an interior control handle, push rods, a crossover torque tube, and an exterior control handle. Four hook mechanisms and a thruster are mounted adjacent to the upper longeron at each side of the cockpit. The hook mechanisms and the thrusters are interconnected and synchronized by adjustable push rods. The interior control handle is mounted on the right side of the forward cockpit and is connected by push rods to the right hook mechanisms and the right side of the crossover torque tube. The crossover torque tube connects to the left hook mechanisms and provides a means for engaging the exterior control handle which is mounted within a recessed casting on the left side of the fuselage below the windshield. The latch system may be actuated to the lock or unlock positions by manually rotating either the interior control handle or the exterior control handle. When operating the system from the exterior, it is necessary to pull the handle outboard to engage the system. After exterior operation is completed, push the handle inboard to disengage it from the system and place the handle in the stowed position. The canopy seal selector valve is mechanically linked to the latch system and is actuated to the open position when the canopy is locked. Refer to paragraphs 8-52 through 8-65 for detailed information on the canopy seal system.

8-6. CANOPY UNLOCKED WARNING SYSTEM.

Applicable to F-106A airplanes. A canopy unlocked warning system is installed in the airplane to warn the pilot when the canopy is not fully locked. The system consists of two limit switches and a dual-bulb warning light. One switch is under the windshield sill on the right longeron and the second is under the sill on the left

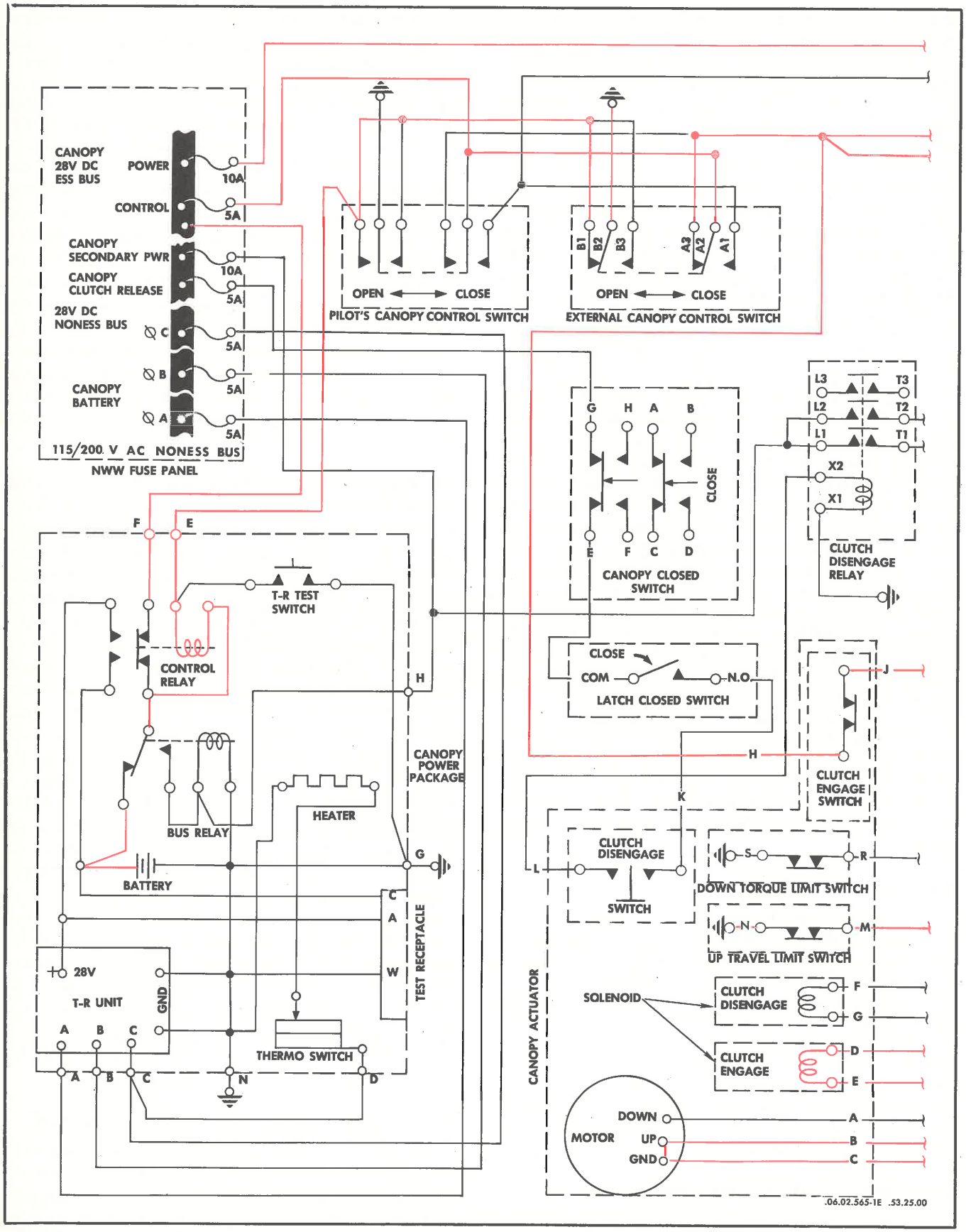


Figure 8-2. Electric Canopy Actuating System Schematic, F-106A (Sheet 1 of 2)
Applicable to 57-244 and subsequent; and 56-453 thru 57-243 after incorporation of TCTO 1F-106J-525

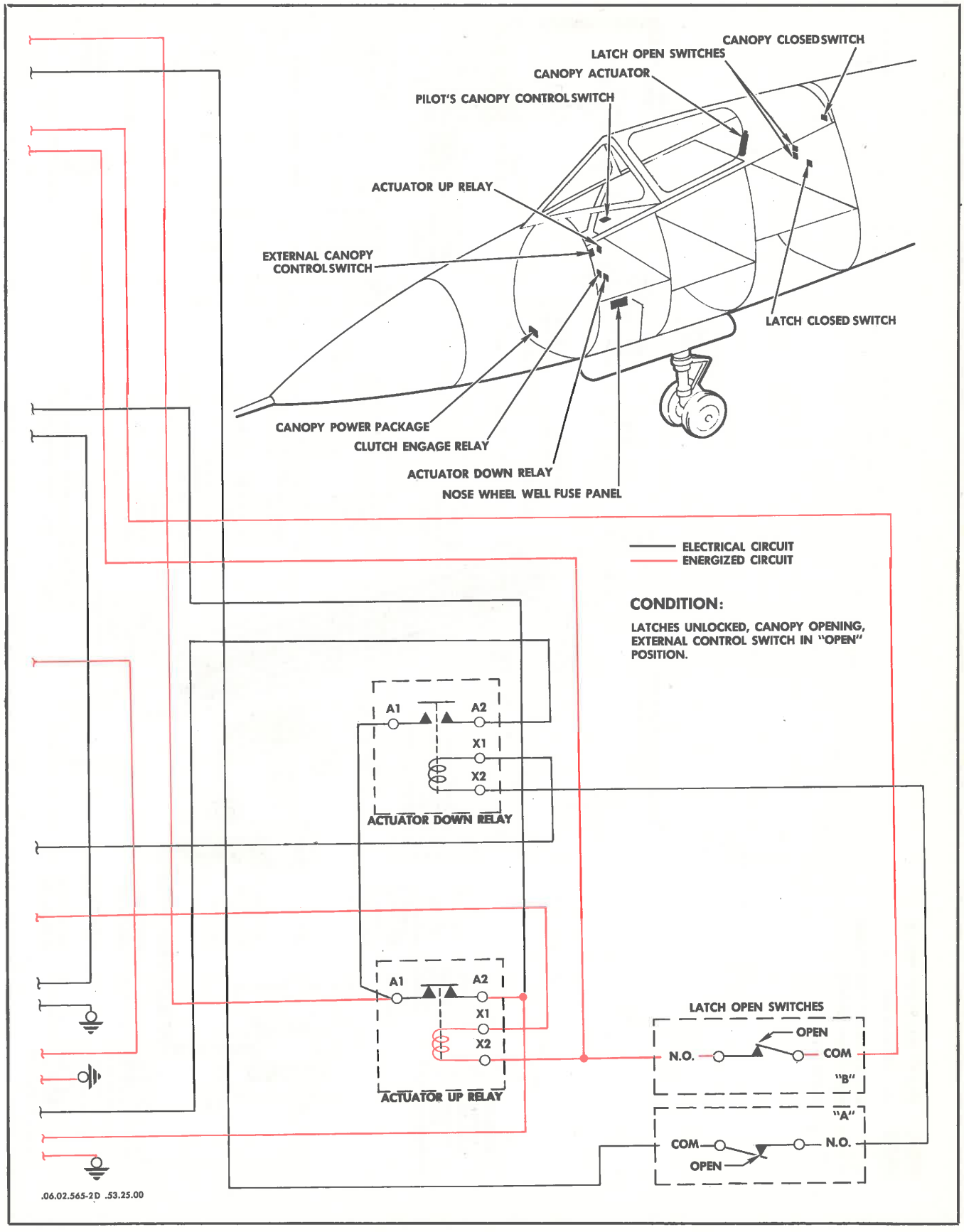


Figure 8-2. Electric Canopy Actuating System Schematic, F-106A (Sheet 2 of 2)
Applicable to 57-244 and subsequent; and 56-453 thru 57-243 after incorporation of TCTO 1F-106J-525

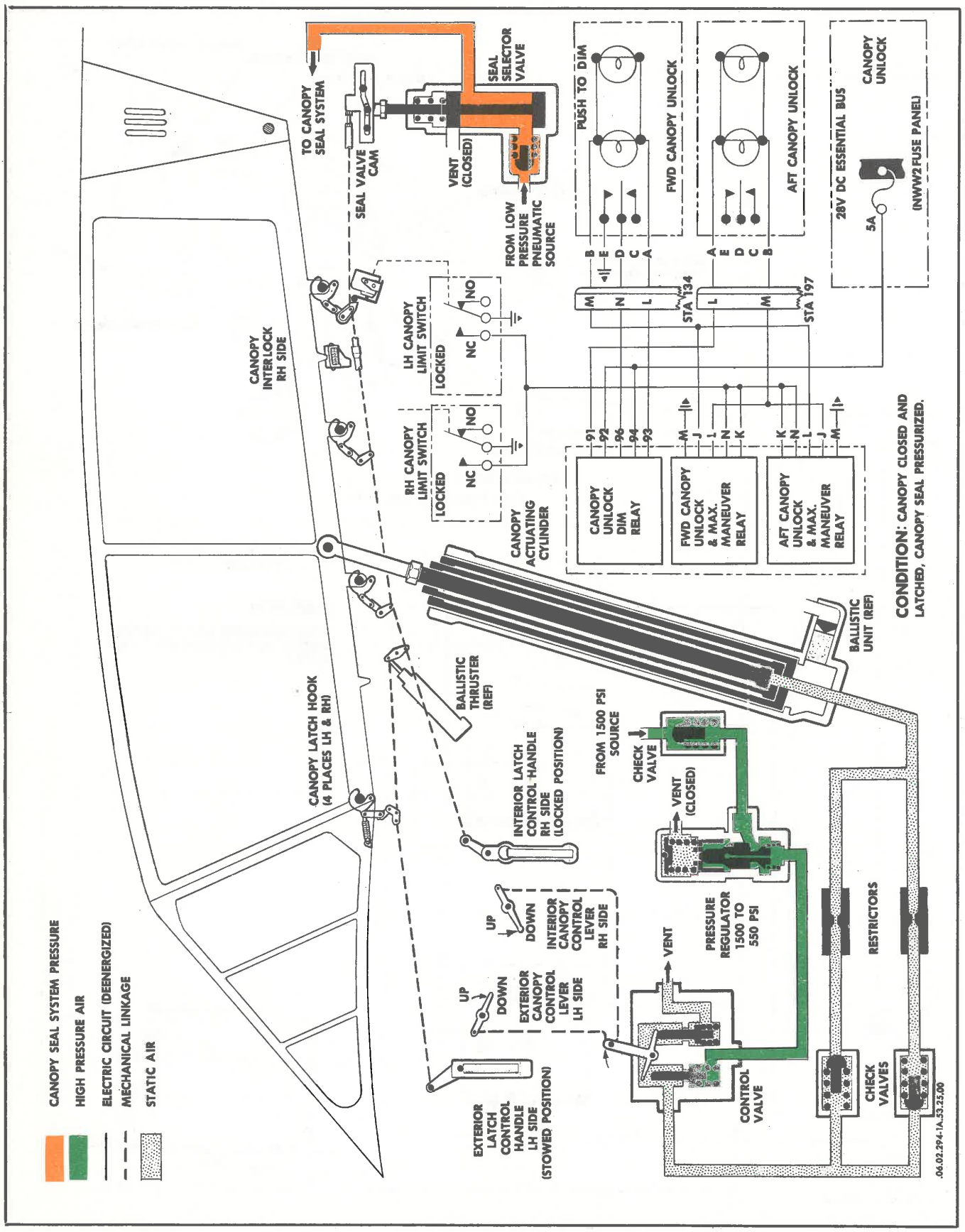


Figure 8-3. Pneumatic Canopy Actuating System Schematic, F-106B (Sheet 1 of 2)
Applicable to 57-2507 thru 57-2514 prior to incorporation of TCTO 1F-106(J)B-519 and TCTO 1F-106(J)B-525

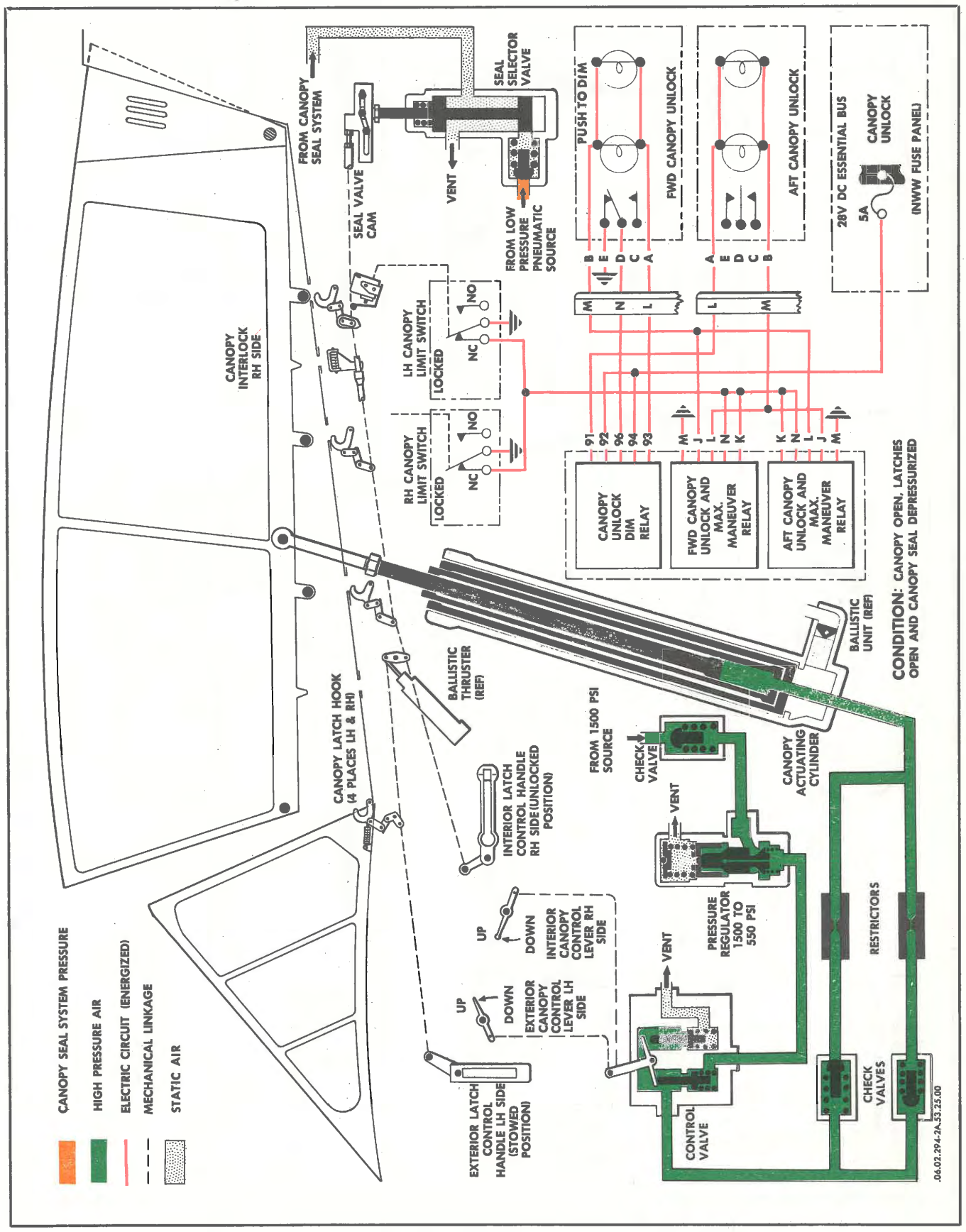


Figure 8-3. Pneumatic Canopy Actuating System Schematic, F-106B (Sheet 2 of 2)
Applicable to 57-2507 thru 57-2514 prior to incorporation of TCTO 1F-106(J)B-519 and TCTO 1F-106(J)B-525

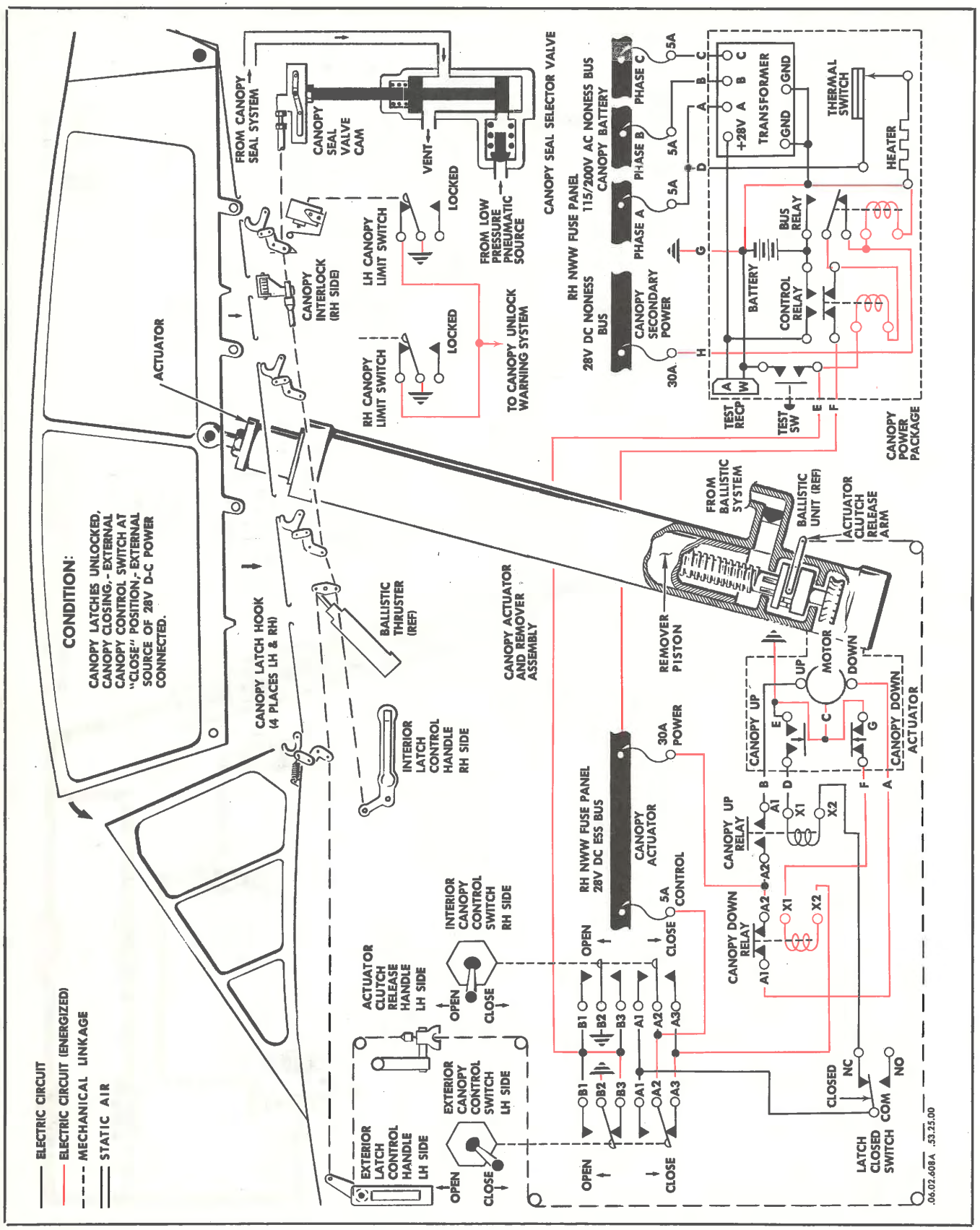
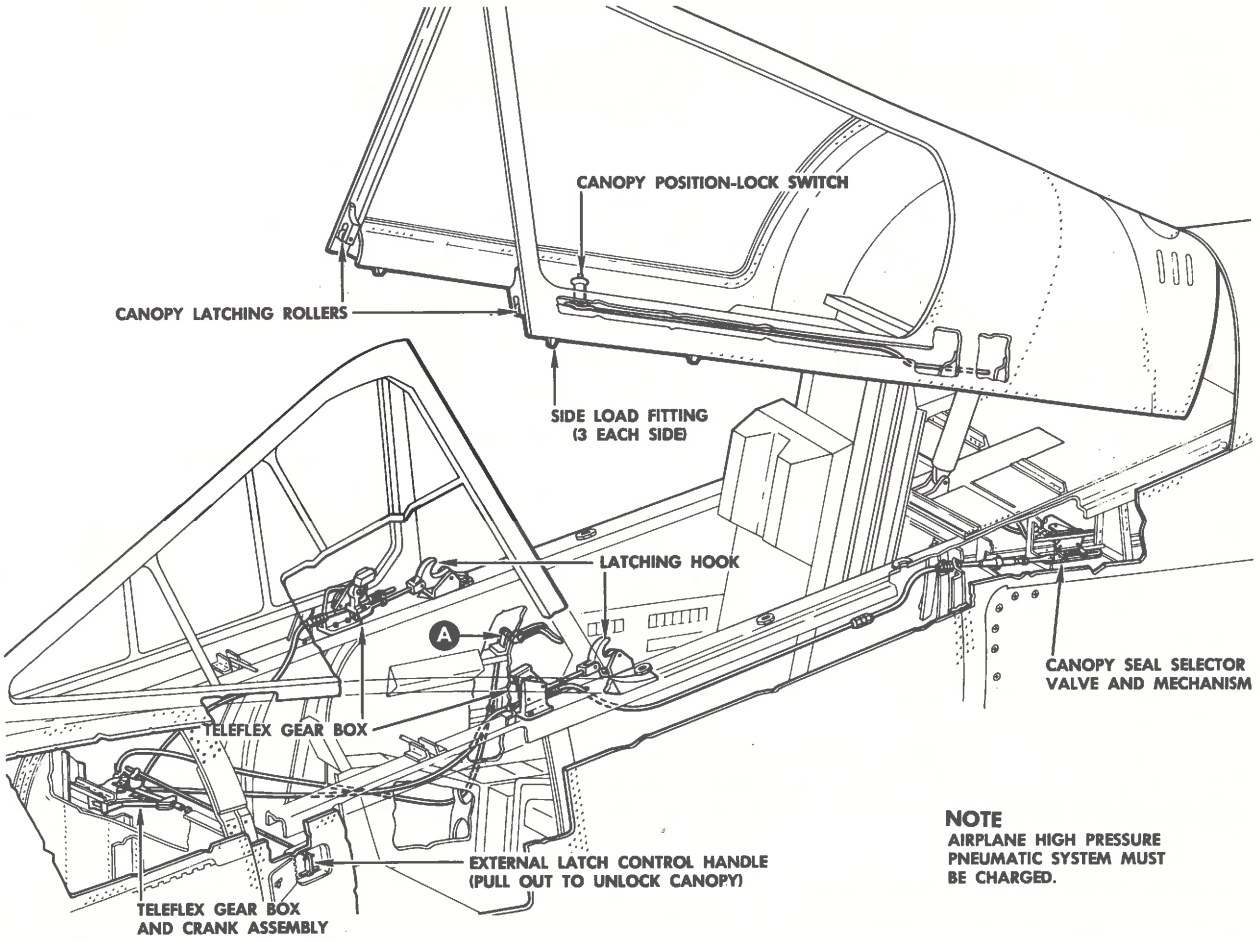


Figure 8-4. Electric Canopy Actuating System Schematic, F-106B
Applicable to 57-2515 and subsequent; and 57-2507 thru 57-2514 after incorporation of TCTO 1F-106(J)B-519 and TCTO 1F-106(J)B-525



TO OPEN CANOPY FROM OUTSIDE COCKPIT

a. Open access door beneath left windshield and pull external latch control handle all way out to unlock canopy.
b. Manually raise canopy to open position and place canopy position-lock switch in "lock" position.

TO CLOSE CANOPY FROM OUTSIDE COCKPIT

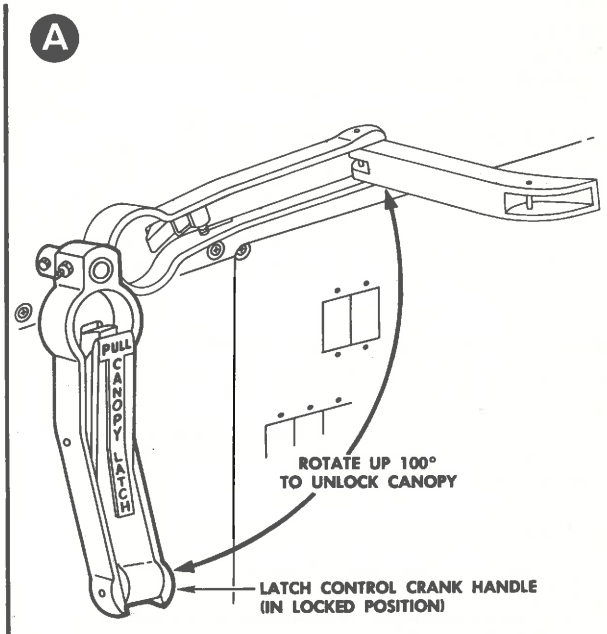
a. Manually pull canopy down to close position (canopy position-lock switch must be in "unlock" position).
b. Pull latch control handle outboard, rotate handle 90° clockwise, and push handle in until mechanism bottoms out (approximately 4 inches) to lock canopy. Rotate handle 90° counterclockwise and place handle in stowed position.

TO OPEN CANOPY FROM INSIDE COCKPIT

a. Rotate latch control crank handle 100° counterclockwise to unlock canopy.
b. Manually raise canopy to open position and place position-lock switch in "lock" position.

TO CLOSE CANOPY FROM INSIDE COCKPIT

a. Place canopy position-lock switch in "unlock" position and manually close canopy.
b. Rotate latch control handle 100° clockwise to lock canopy.



PILOTS' CANOPY LATCH CONTROL HANDLE

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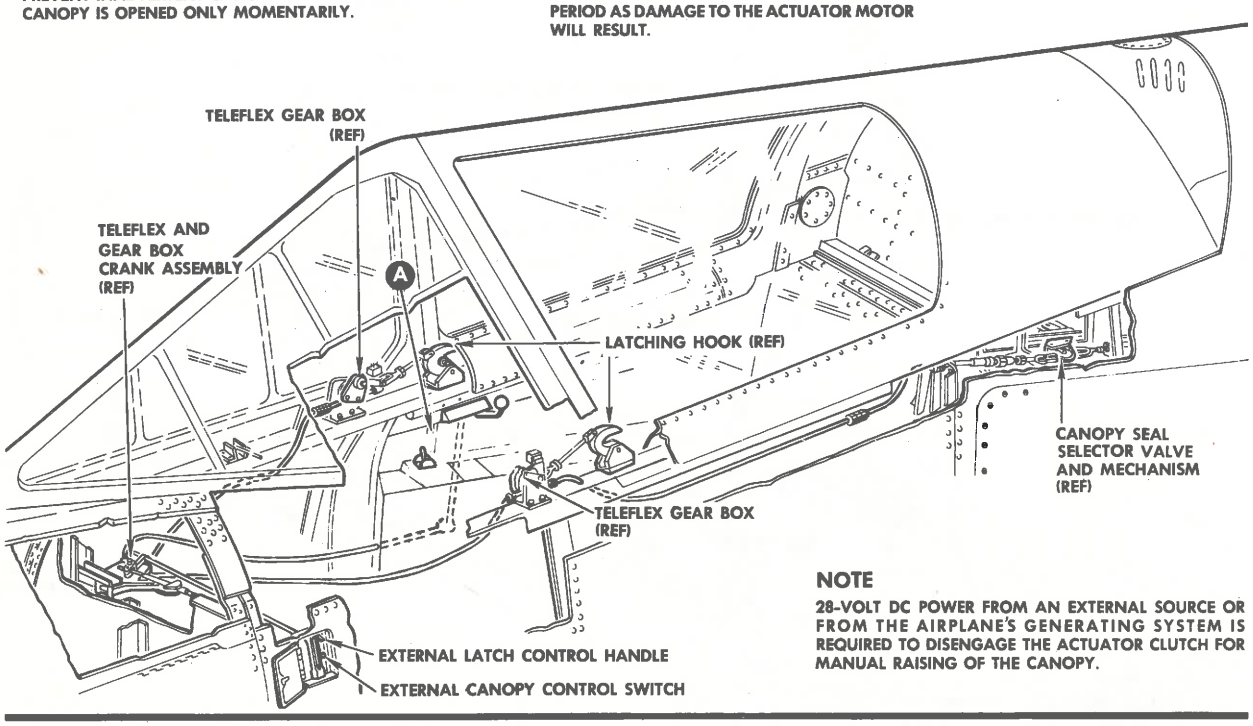
Figure 8-5. Pneumatic Canopy Actuating System Operation, F-106A
Applicable to 56-453 thru 57-243 prior to incorporation of TCTO 1F-106J-525

WARNING

CANOPY HOLD-OPEN SUPPORTS MUST BE INSTALLED TO PREVENT INADVERTENT CANOPY CLOSING UNLESS THE CANOPY IS OPENED ONLY MOMENTARILY.

CAUTION

DO NOT OPERATE CANOPY ACTUATOR FOR MORE THAN 3 MINUTES IN ANY 20 MINUTE PERIOD AS DAMAGE TO THE ACTUATOR MOTOR WILL RESULT.



NOTE

28-VOLT DC POWER FROM AN EXTERNAL SOURCE OR FROM THE AIRPLANE'S GENERATING SYSTEM IS REQUIRED TO DISENGAGE THE ACTUATOR CLUTCH FOR MANUAL RAISING OF THE CANOPY.

TO OPEN CANOPY FROM OUTSIDE COCKPIT

a. Open access door beneath left windshield and pull external latch control handle outboard to unlock canopy.
b. Manually raise canopy to full open position or hold control switch at "OPEN" position for electrical operation. See note and see caution.

TO CLOSE COCKPIT FROM OUTSIDE COCKPIT

a. Open access door beneath left windshield and hold control switch at "CLOSE" position.
b. Rotate handle 90° clockwise and push handle inboard (approximately 4 inches) to lock canopy. Rotate handle 90° counterclockwise and place in stowed position.

TO OPEN CANOPY FROM INSIDE COCKPIT

a. Pull pilot's latch control handle to extreme aft position to unlock canopy.
b. Manually raise canopy to full open position or hold pilot's canopy control switch at "OPEN" position for electrical operation.See note and see caution.

TO CLOSE CANOPY FROM INSIDE COCKPIT

a. Hold pilot's canopy control switch at "CLOSE" position.
b. Push pilot's latch control handle to forward position to lock canopy.

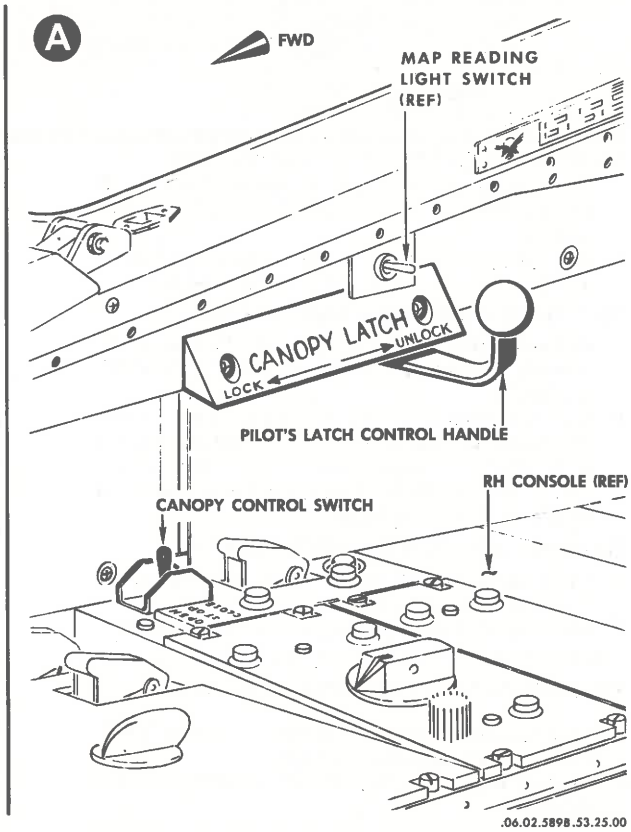
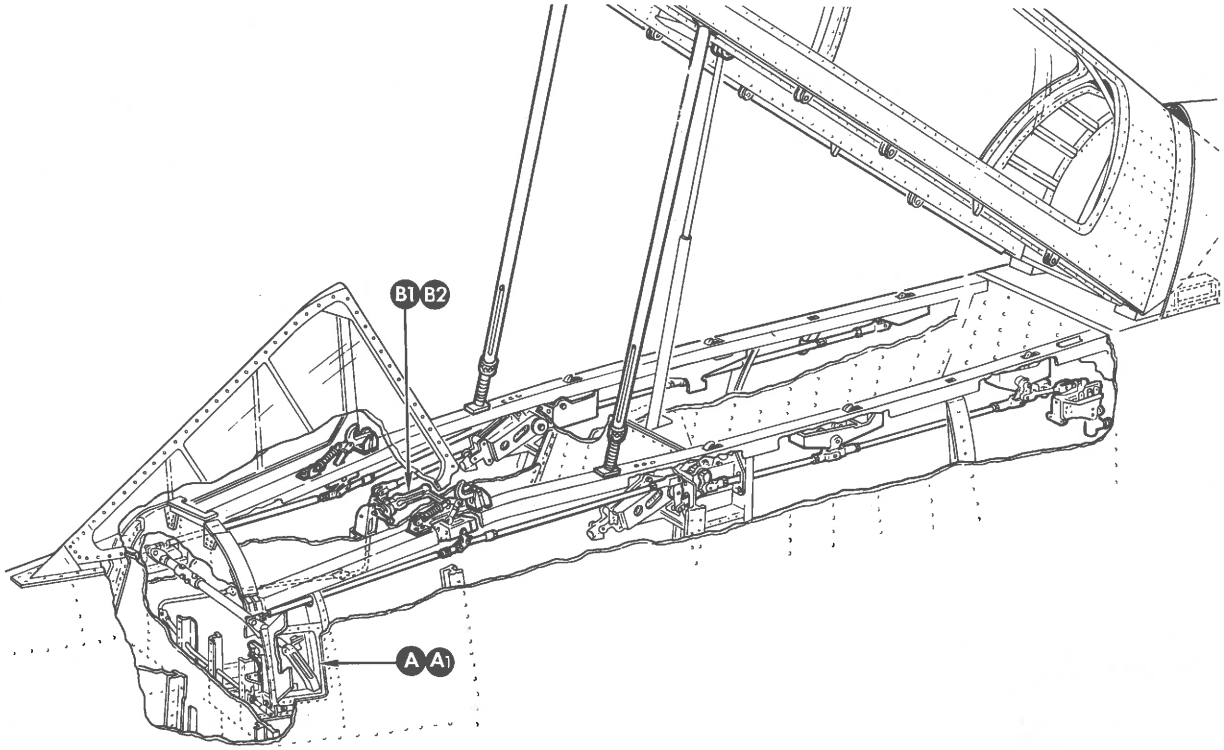
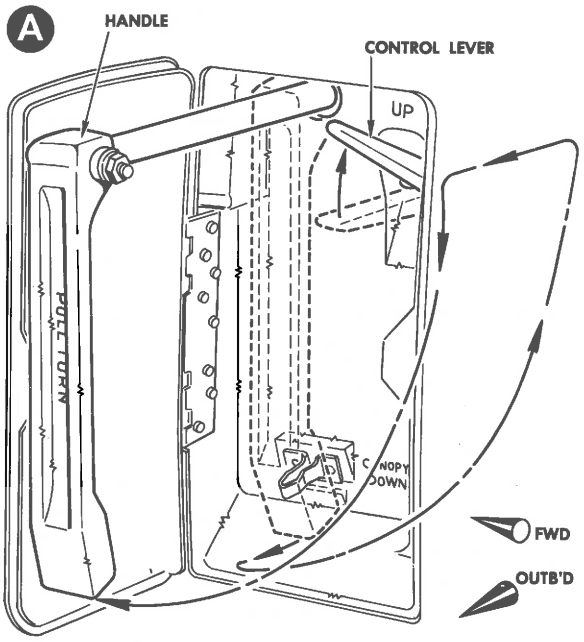


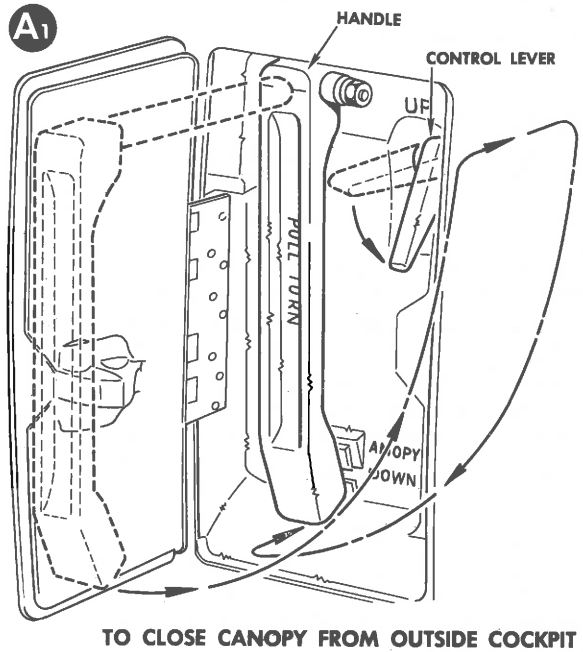
Figure 8-6. Electric Canopy Actuating System Operation, F-106A
Applicable to 57-244 and subsequent; and 56-453 thru 57-243 after incorporation of TCTO 1F-106J-525





TO OPEN CANOPY FROM OUTSIDE COCKPIT

a. Open access door below left windshield, pull handle out, rotate handle 100° counterclockwise, pull handle out again, and then rotate handle 100° clockwise to unlock latches.
b. Actuate pneumatic canopy control lever up to raise canopy.

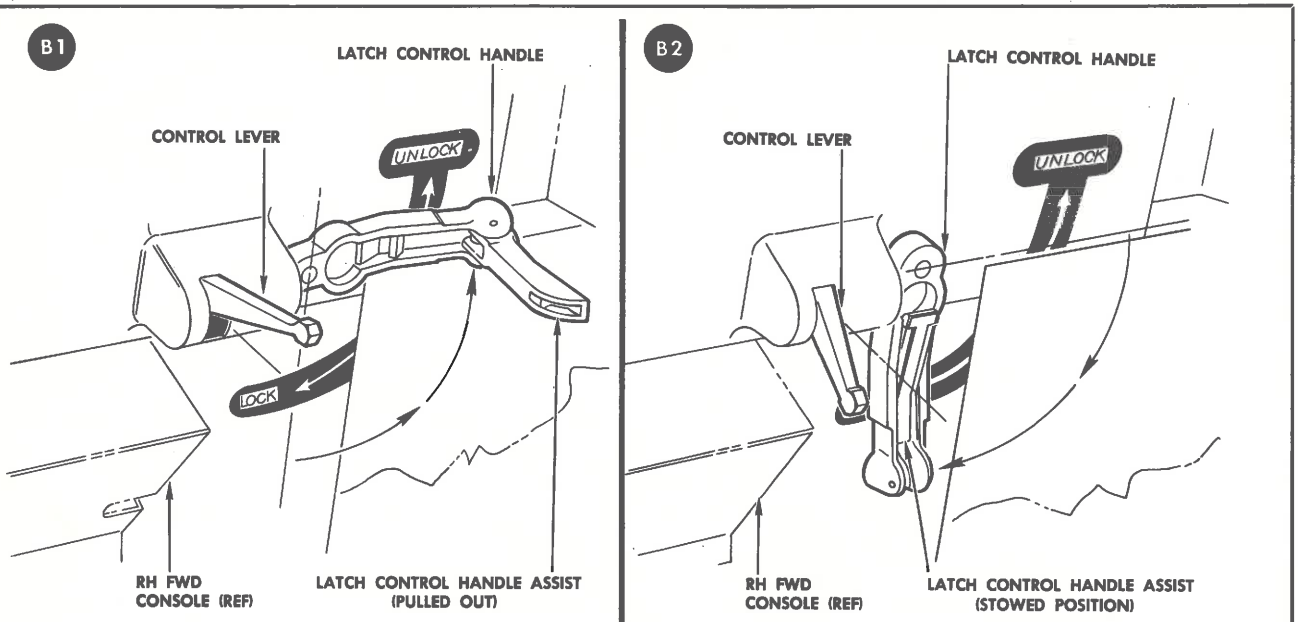


TO CLOSE CANOPY FROM OUTSIDE COCKPIT

a. Open access door below left windshield. Actuate pneumatic canopy control lever down to lower canopy.
b. Pull handle out then rotate handle 100° counterclockwise to lock latches. Push handle in 1 inch, rotate handle 100° clockwise, and place handle in stowed position.

.06.02.591-1A .53.25.00

Figure 8-7. Pneumatic Canopy Actuating System Operation, F-106B (Sheet 1 of 2)
Applicable to 57-2507 thru 57-2514 prior to incorporation of TCTO 1F-106(J)B-519



TO OPEN CANOPY FROM INSIDE COCKPIT

a. Pull out latch handle assist and rotate handle to "UNLOCK" position.
b. Actuate pneumatic canopy control lever up to raise the canopy.

TO CLOSE CANOPY FROM INSIDE COCKPIT

a. Actuate pneumatic canopy control lever down to lower canopy.
b. With latch control handle assist pulled out, rotate handle to "LOCK" position. Place latch control handle assist in stowed position.

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Figure 8-7. Pneumatic Canopy Actuating System Operation, F-106B (Sheet 2 of 2)
Applicable to 57-2507 thru 57-2514 prior to incorporation of TCTO 1F-106(J)B-519

longeron. The limit switches are actuated by the canopy latch mechanism. The warning light receives power from the 28-volt dc essential bus thru the "CANOPY UNLOCK" fuse on the nose wheel well fuse panel. *Applicable to F-106A airplanes 57-2465, 57-2478 and subsequent,* these airplanes have a canopy unlock warning system similar to that described above except that a canopy proximity switch has been added to the configuration.

NOTE

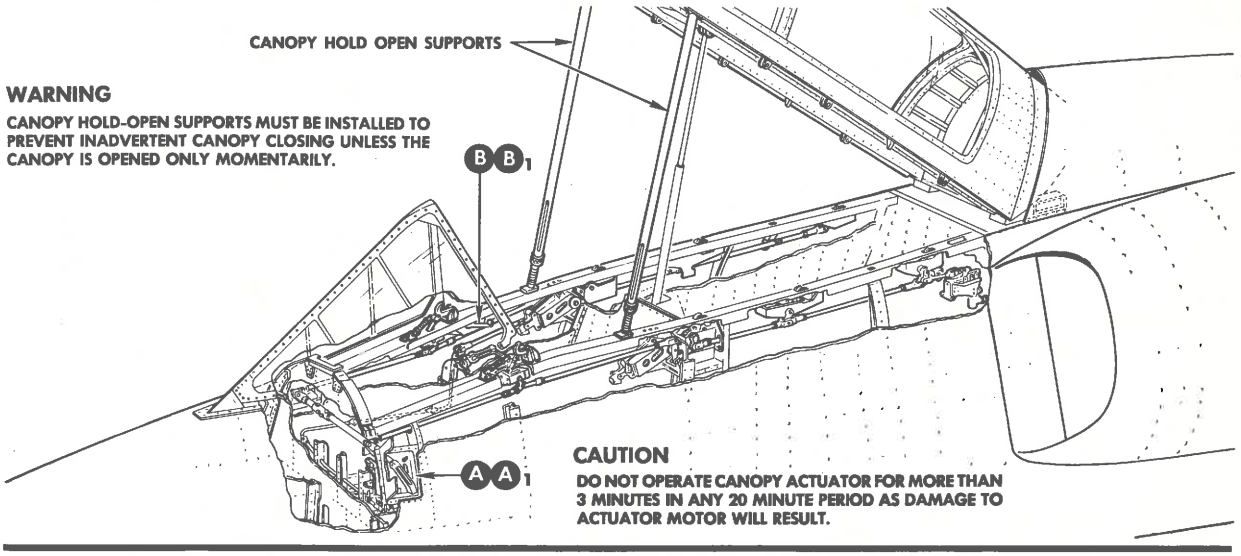
On airplanes 57-2490, 57-2493, and 57-2496 thru 59-111, the electrical wiring to the canopy proximity switch has been tied back to deactivate the switch.

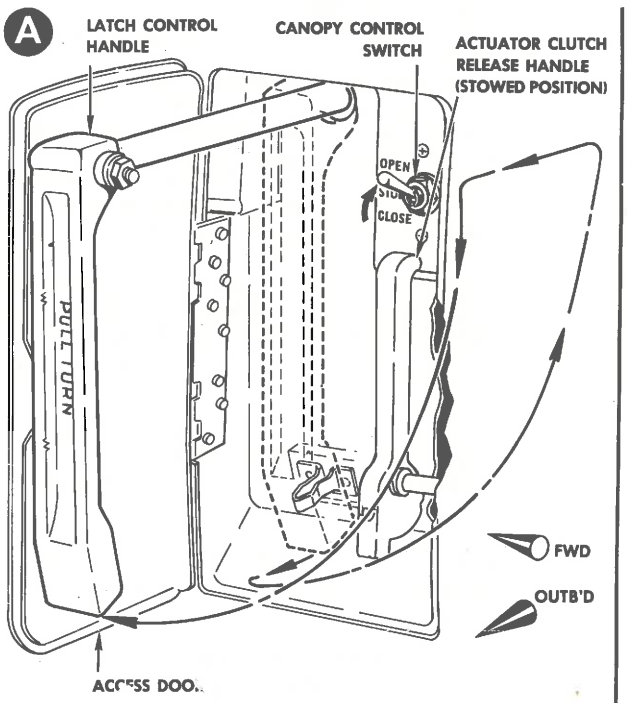
This switch is located under the left cockpit sill at Station 141 and is actuated by the canopy dagger fitting when the canopy reaches the full closed position. The canopy proximity switch eliminates the possibility of a false (canopy unlock warning light extinguished) indication if the canopy latches are operated to the locked position before the canopy is fully closed. See figure 8-9 for schematic illustrations of both systems.

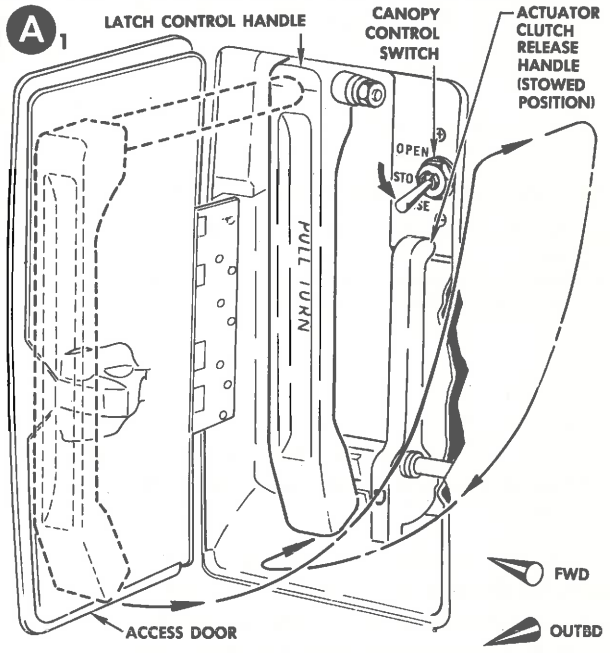
8-7. *Applicable to F-106B airplanes.* A canopy unlock warning system is installed in the airplane to warn both pilots when the canopy is not fully locked. The system consists of two limit switches, three relays, and a dual-bulb warning light for each pilot. A limit switch is mounted under each upper longeron adjacent to each aft hook latching mechanism. The position of the limit switches is controlled by the position of the canopy latch mechanism. The warning system receives power from the 28-volt dc essential bus through the "CANOPY UNLOCK" fuse of the nose wheel well fuse panel. See figure 8-3 or 8-4 for a schematic illustration of the system.

8-8. PNEUMATIC CANOPY ACTUATING SYSTEM, F-106A.

Applicable to 56-453 thru 57-243 prior to incorporation of TCTO 1F-106-J-525. The canopy pneumatic system counterbalances the weight of the canopy and provides a positive pressure-force for locking the canopy in any position during ground operations. The system consists of the combination pneumatic-ballistic cylinder, a check







OPENING CANOPY FROM OUTSIDE COCKPIT

a. Open access door below left windshield, pull latch control handle out, rotate handle 100° counterclockwise, pull handle out again, and then rotate handle 100° clockwise to unlock latches.

b. Hold canopy control switch at "OPEN" position for electrical operation. Install canopy hold-open supports. For manual operation, pull actuator clutch release handle down to release clutch, hold handle in this position, raise canopy manually, place handle in stowed position to engage clutch and hold canopy open. Install canopy hold-open supports.

CLOSING CANOPY FROM OUTSIDE COCKPIT

a. Remove canopy hold-open supports. Open access door below left windshield. Hold canopy control switch at "CLOSE" position until forward end of canopy reaches a point approximately 2 inches from full closed; release switch, wait until canopy movement stops, then reactuate switch and operate canopy to full closed position.

CAUTION

DO NOT OPERATE CANOPY TO FULL CLOSED POSITION WITHOUT STOPPING; DAMAGE TO ACTUATOR WILL RESULT.

b. Pull latch control handle out then rotate handle 100° counterclockwise to lock latches. Push handle in 1 inch, rotate handle 100° clockwise, and place handle in stowed position. Close access door.

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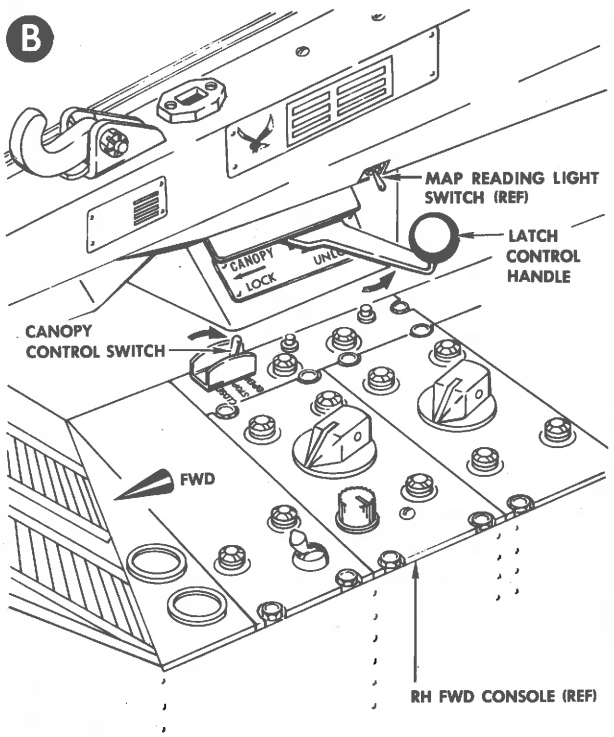
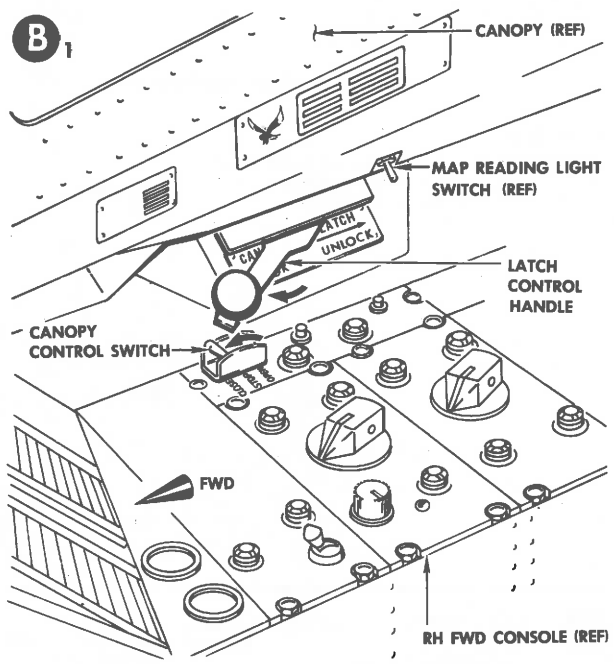
Figure 8-8. Electric Canopy Actuating System Operation, F-106B (Sheet 1 of 2)
Applicable to 57-2515 and subsequent; and 57-2507 thru 57-2514 after incorporation of TCTO 1F-106(J)B-519



OPENING CANOPY FROM INSIDE COCKPIT

a. Operate latch control handle to "UNLOCK" position.
b. Hold canopy control switch at "OPEN" position. Install canopy hold-open supports.



CLOSING CANOPY FROM INSIDE COCKPIT

a. Remove canopy hold-open supports. Hold canopy control switch at "Close" position until forward end of canopy reaches a point approximately 2 inches from full closed position; release switch, wait until canopy movement stops, then reactuate switch and operate canopy to full closed position.

CAUTION

DO NOT OPERATE CANOPY TO FULL CLOSED POSITION WITHOUT STOPPING; DAMAGE TO ACTUATOR WILL RESULT.

b. Operate latch control handle to "LOCK" position.

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Figure 8-8. Electric Canopy Actuating System Operation, F-106B (Sheet 2 of 2)
Applicable to 57-2515 and subsequent; and 57-2507 thru 57-2514 after incorporation of TCTO 1F-106(J)B-519

valve, and the canopy-lock solenoid valve. Operating pressure for the system is supplied by 1500 psi regulated air pressure from the high-presure pneumatic system. For counterbalance operations, air pressure is supplied to both sides of the cylinder piston. The larger force area on the lower side of the piston head approximately balances the weight of the canopy and permits easy raising by the pilot. The canopy-lock valve is in the pneumatic line leading to the upper side of the cylinder piston. For normal operation, the valve is open. When it is closed there is no pneumatic connection between the two ends of the cylinder. Air pressure trapped in the cylinder thus prevents further piston movement and locks the canopy in place. The canopy-lock valve is solenoid actuated and is controlled electrically by the canopy position-lock switch on the forward lower left edge of the canopy. The valve is open if there is no electrical power or if the switch is at its "unlock" position. The canopy-lock valve solenoid receives power from the 28-volt dc essential bus through the "CANOPY POSITION LOCK" fuse on the cockpit left-hand fuse panel. See figure 8-1 for a schematic illustration of the canopy pneumatic system.

CAUTION

If the airplane is taxied with the canopy open, the "CANOPY POSITION LOCK" switch must be in "LOCK" position. During extended ground maintenance periods and/or if the airplane is to be towed with the canopy open, the canopy hold-open support (8-96038-801) will be installed and the "CANOPY POSITION LOCK" switch placed in "UNLOCK" position.

8-9. PNEUMATIC CANOPY ACTUATING SYSTEM, F-106B.

Applicable to 57-2507 thru 57-2514 prior to incorporation of TCTO 1F-106(J)B-519 and TCTO 1F-106(J)B-525. The canopy pneumatic system provides pressure for

raising the canopy during ground operations. The system consists of three check valves, a pressure regulator-and-relief valve, a control valve, two restrictors, and the combination pneumatic-ballistic actuating cylinder. The system is supplied with 1500-psi regulated air pressure from the high pressure pneumatic system. The pressure regulator-and-relief valve reduces the pressure to 550 psi and relieves excessive pressure if the regulating portion of the valve malfunctions. Air pressure to the cylinder is controlled by a manually operated, 2-position valve located in the forward part of the cockpit and controlled by the pilot in the forward seat. When the valve is at the "open" position, pressure is admitted to the lower side of the cylinder piston and the canopy opens. Moving the valve to the "vent" position vents the pressure from the cylinder through a restrictor and the canopy slowly closes because of its own weight. A section of oversized tubing between the check valve and the 550-psi regulator acts as an accumulator and will store sufficient air for one canopy operation in case of supply pressure failure. Fixed restrictors in the lines near the actuating cylinder prevent pressure surges and resultant excessive opening and closing rates. See figure 8-3 for a schematic illustration of the canopy pneumatic system.

8-10. PNEUMATIC CANOPY ACTUATING CYLINDER, F-106A.

Applicable to 56-453 thru 57-243 prior to incorporation of TCTO 1F-106-J-525. The canopy actuating cylinder functions as a canopy counterbalance cylinder during normal operations and as an ejection cylinder to jettison the canopy during emergencies. For counterbalance operations, air pressure is admitted to both sides of the cylinder piston head. The lower side of the piston head has a larger pressure area than the upper side. The extra force on the lower side provides a counterbalance to canopy weight. For emergency jettisoning of the canopy, the piston and cylinder assembly separates from the cylinder body and is jettisoned with the canopy. An explosive (ballistic) cartridge supplies power for canopy jettisoning. Refer to paragraphs 8-82 through 8-85 for information on the canopy jettisoning system. The cylinder is mounted to the airplane structure by a self-aligning bearing that permits swivel motion of the cylinder during canopy opening and closing. A cutaway view of the cylinder is shown on figure 8-10.

8-11. PNEUMATIC CANOPY ACTUATING CYLINDER, F-106B.

Applicable to 57-2507 thru 57-2514 prior to incorporation of TCTO 1F-106(J)B-519 and TCTO 1F-106(J)B-525. The canopy actuating cylinder is a single-acting cylinder normally used to raise and lower the canopy. The cylinder also acts as an ejection cylinder to jettison the canopy for emergency exit. Air pressure is used for normal canopy operation while an explosive (ballistic) cartridge supplies power for canopy jettisoning. For normal operation, air pressure is admitted to the lower side of the cylinder piston head and the canopy opens. When air pressure is vented from the cylinder, the canopy closes of its own weight. For emergency jettisoning, the piston and cylinder assembly separates from the cylinder body and is jettisoned with the canopy. Refer to paragraphs 8-82 through 8-85 for information on the canopy jettisoning system. The cylinder is mounted to the airplane structure by means of a self-aligning bearing that permits swivel motion of the cylinder during canopy opening and closing.

8-12. ELECTRIC CANOPY ACTUATING SYSTEM.

Applicable to F-106A airplanes 57-244 and subsequent and 56-453 thru 57-243 after incorporation of TCTO 1F-106-J-525. The canopy electrical system consists of a power package, a manually operated momentary toggle switch that controls the system from within the cockpit, an identical switch that controls the system from the airplane's exterior, four mechanically operated switches that maintain the proper electrical sequence, one clutch relay, two actuator relays, and the actuator.

8-13. *Applicable to F-106B airplanes 57-2515 and subsequent and 57-2507 thru 57-2514 after incorporation of TCTO 1F-106(J)B-519 and TCTO 1F-106(J)B-525.* The canopy actuating system consists of a power package, a manually operated toggle switch that controls the system from within the cockpit, an identical switch that controls the system from the airplane's exterior, a mechanically actuated switch that maintains the proper electrical sequence, two relays, the actuating cylinder and a cable system that mechanically disengages the clutch of the actuating cylinder.

8-14. Electric Canopy Operation.

Applicable to F-106A airplanes 57-244 and subsequent and 56-453 thru 57-243 after incorporation of TCTO 1F-106-J-525. When either of the toggle type control switches is held at "CLOSE" position, the control relay of the canopy power package is energized and current flows to the canopy 28-volt dc essential bus of the nose wheel well fuse panel. Current then flows through the "CLOSE" side of the control switch, through one of the closed latch-open switches, through the actuator down relay, and through the actuator down torque limit switch to ground. The actuator down relay is energized and current flows from the canopy 28-volt dc essential bus through the down side of the actuator motor. The motor brake is released and the motor causes the canopy to close. When the canopy reaches a point 6° (approximately 6 inches measured at lower forward corner) before the full-closed position, the canopy closed switch is moved to the closed position by the canopy structure and partially phases-in the clutch disengage circuit. As the canopy bottoms on the canopy sill, the actuator motor is

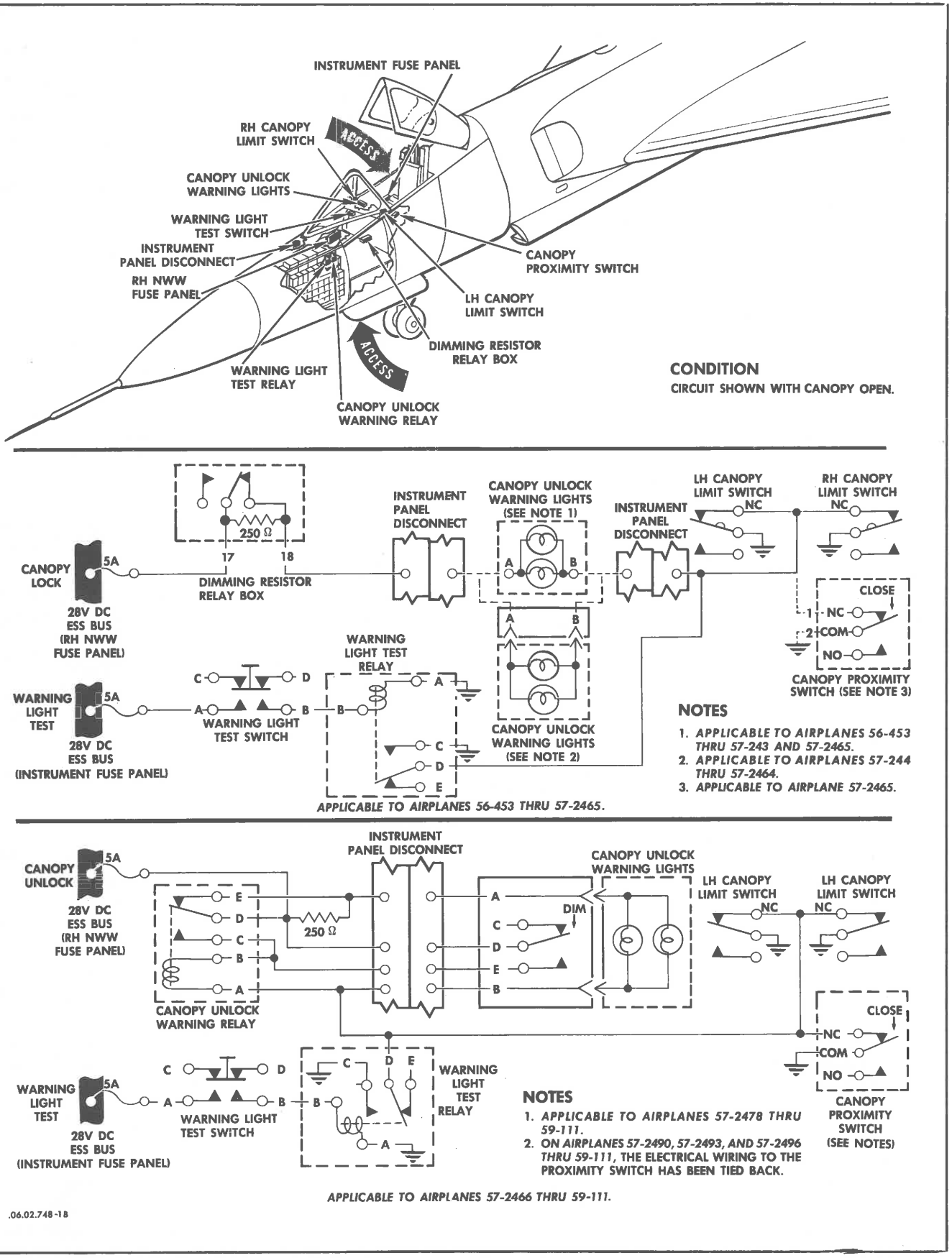


Figure 8-9. Canopy Unlock Warning System Schematic, F-106A (Sheet 1 of 2)

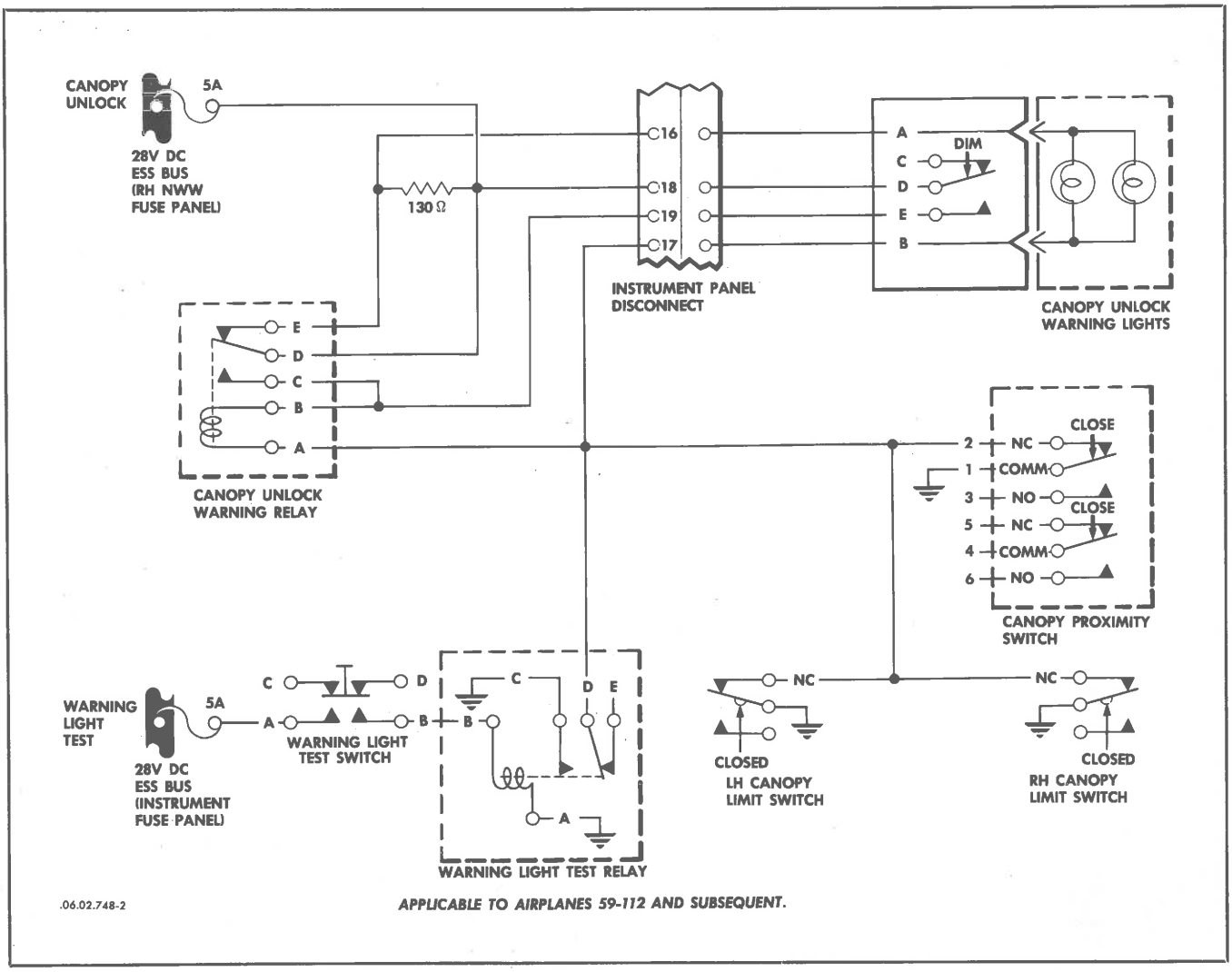


Figure 8-9. Canopy Unlock Warning System Schematic, F-106A (Sheet 2 of 2)

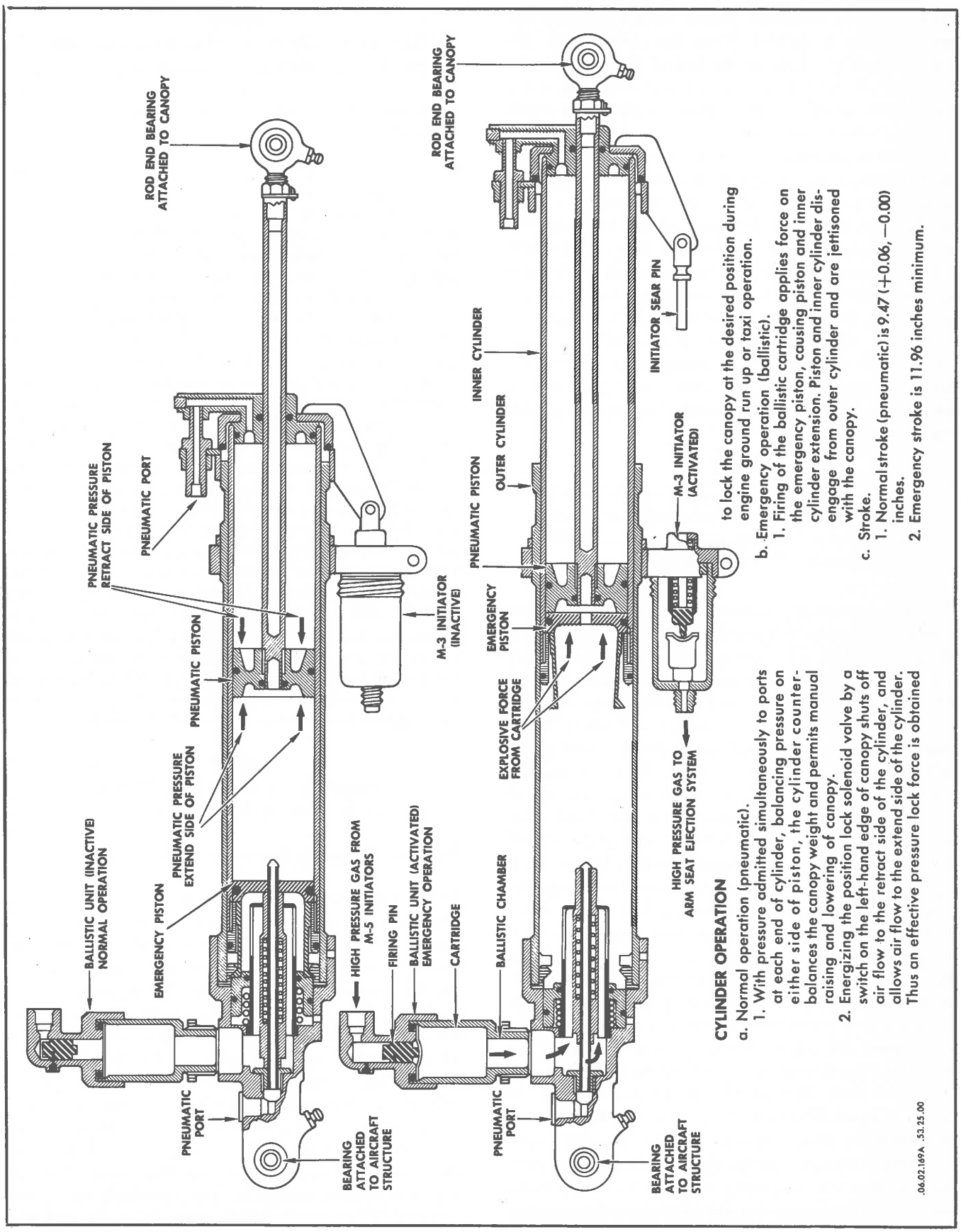


Figure 8-10. Pneumatic Canopy Actuating Cylinder, F-106A
Applicable to 56-453 thru 57-243 prior to incorporation of TCTO 1F-106J-525

de-energized by the down torque limit switch and the integral brake is applied. When the canopy latch system is manually placed at the locked position, the last increment of travel by the canopy seal valve cam closes the latch closed switch. This action completes the clutch disengage circuit, and current flows from the airplane's 28-volt dc nonessential bus, in the nose wheel well fuse panel, through the canopy closed switch, through the latch closed switch, through the clutch disengage switch, and through the clutch disengage relay. The clutch disengage relay is energized and current flows to the clutch disengage solenoid and momentarily through the actuator up relay to the up side of the actuator motor. After the motor shaft turns, the actuated solenoid disengages the clutch and the clutch remains disengaged by detent action. Final action of clutch disengagement opens the clutch disengage switch, the clutch engage switch is closed, and thus power is removed from the clutch disengage circuit.

NOTE

If the battery of the canopy power package is used as a power source for canopy operation, power for clutch disengagement is not available and the clutch will remain engaged.

To open the canopy, manually move the canopy latch system to the unlocked position. The initial movement of the canopy seal valve cam opens the latch-closed switch and breaks the clutch disengage circuit. The final movement moves a pawl that closes two latch-open switches. This action partially phases in the actuator relays. When either of the toggle type control switches is held at the "OPEN" position, the control relay of the power package is energized and current flows to the canopy 28-volt dc essential bus on the nose wheel well fuse panel. Current then flows through the "OPEN" side of the control switch, through the clutch engage switch and the clutch engage solenoid. The solenoid is actuated to engage the clutch and the clutch remains engaged by detent action as final action of clutch engagement opens the clutch engage switch. Simultaneously, current is flowing from the "OPEN" side of the control switch through the latch-open switch, through the actuator up relay, and through the actuator up travel limit switch. The actuator up relay is energized and current flows from the canopy 28-volt dc essential bus through the up side of the actuator motor. The motor brake is released and the motor causes the canopy to open. When the canopy reaches a 6° (approximately 6 inches measured at lower forward corner) open position, the canopy-close switch moves to the open position and thus acts as a safety switch in the clutch disengage circuit. The actuator travel limit switch de-energizes the motor circuit and the integral brake is applied when the canopy reaches the full open position.

NOTE

The canopy may be locked in any intermediate position by releasing the control switch.

See figure 8-2 for a schematic illustration of the canopy electrical system.

8-15. *Applicable to F-106B airplanes 57-2515 and subsequent and 57-2507 thru 57-2514 after incorporation of TCTO 1F-106(J)B-519 and TCTO 1F-106(J)B-525.* When either of the toggle type control switches is held at the "CLOSE" position, the control relay of the power package is energized and current flows through the "CLOSE" side of the control switch to the canopy 28-volt dc essential bus and to the canopy down relay. The down relay is energized and the actuator motor closes the canopy. As the canopy bottoms on the canopy sill, the actuator motor is de-energized by an integral load limit switch. When the canopy latches are manually operated to the fully locked position, the actuator clutch is mechanically released by a cable system. The last increment of travel of the latch system mechanically actuates the latch closed switch. To open the canopy, the canopy latches are operated to the unlocked position. This action allows the actuator clutch to engage and the latch closed switch to actuate. When either of the toggle type control switches is held at the "OPEN" position, the control relay of the power package is energized and current flows through the "OPEN" side of the control switch, through the latch closed switch, and through the canopy 28-volt dc essential bus to the canopy up relay. The relay is energized and the actuator motor opens the canopy. When the canopy reaches the full open position, the actuator motor is de-energized by an integral travel limit switch.

NOTE

The canopy may be locked in any intermediate position by releasing the control switch.

See figure 8-4 for an illustration of this system.

8-16. Canopy Power Package.

The canopy power package incorporates a bus relay, a control relay, a transformer-rectifier unit, a silver-zinc battery, a heater, a heater thermostatic control switch, a test receptacle, and a test switch. When power is furnished to the package from the 28-volt dc nonessential bus and the 115/200-volt ac nonessential bus of the nose wheel well fuse panel, current from the 28-volt dc nonessential bus energizes the bus relay and current is available at the deenergized control relay. Simultaneously, power from the 115/200-volt ac nonessential bus is available at the thermostatic heater control switch and at the transformer-rectifier unit. Rectified power (28-volt dc) from the transformer-rectifier is available for battery charging. When power is not furnished to the package, the bus relay is deenergized and battery power is available at the control relay.

8-17. Electric Canopy Actuating Cylinder.

Applicable to F-106A airplanes 57-244 and subsequent and 56-453 thru 57-243 after incorporation of TCTO 1F-106-J-525. The combination electric-ballistic actuating cylinder functions to raise or lower the canopy under normal conditions during ground operations. The ballistic system of the cylinder is employed to jettison the canopy in an emergency and is discussed in paragraphs 8-82 through 8-85. The screw jack type actuator is motivated by a reversible electric motor through a solenoid operated clutch. The clutch solenoid is momentarily energized and the clutch is held in the selected position by detent action. When the clutch moves to the selected position, the clutch switch for that operation is opened and the opposite switch is closed. An integral torque limit switch de-energizes the motor and the integral brake is applied to the motor when the canopy reaches the full-closed position. Operating the canopy latches to the "LOCK" position energizes the clutch disengage circuit; the actuator clutch is then disengaged.

NOTE

If the battery of the canopy power package is used as a power source for canopy operation, power for clutch disengagement is not available and the clutch will remain engaged.

After the canopy latches are operated to the "UNLOCK" position, the canopy may be opened manually or electrically. If the canopy is opened manually, the actuator clutch will mechanically engage when the canopy reaches the full open position.

NOTE

Manual full open position of the canopy may vary. Clutch engagement normally occurs prior to the full open position that is obtained by electrical operation.

If the canopy is opened electrically, the clutch is engaged. The up travel limit switch de-energizes the motor and the integral brake is applied to the motor when the canopy reaches the full open position.

8-18. *Applicable to F-106B airplanes 57-2515 and subsequent and 57-2507 thru 57-2514 after incorporation of TCTO 1F-106(J)B-519 and TCTO 1F-106(J)B-525.* The combination electric-ballistic actuating cylinder functions to raise or lower the canopy during normal ground operations. The ballistic system of the cylinder is employed to jettision the canopy in an emergency and is discussed in paragraphs 8-82 through 8-85. The screw jack type actuator is motivated by a reversible electric motor. An integral load limit switch de-energizes the motor when the canopy reaches the full closed position. When the canopy reaches the full open position, the motor is de-energized by an integral limit switch. The actuator clutch remains engaged until it is mechanically disengaged either by locking the canopy latches or by operating the clutch release handle.

8-19. CANOPY ACTUATING CYLINDER CLUTCH RELEASE SYSTEM, F-106B.

Applicable to 57-2515 and subsequent and 57-2507 thru 57-2514 after incorporation of TCTO 1F-106(J)B-519 and TCTO 1F-106(J)B-525. The actuating cylinder clutch release system consists of a cable, pulleys, a cable stop and a manual release control handle. The cable is connected to a sheave mounted on the canopy latch torque tube, routed through the pulleys, and connected to the spring-loaded (to engage) clutch arm of the canopy actuating cylinder. A cable stop is positioned on the cable so that the manual release mechanism will engage the stop and disengage the clutch when the externally mounted release handle is operated. This system is employed to perform two separate functions. The primary and automatic function is to disengage the clutch, after the canopy has been closed and locked, so that the air loads imposed on the canopy during flight will be carried by the canopy latch hooks rather than the canopy actuator rod end. The secondary function is to disengage the clutch when manual opening of the canopy is required.

WARNING

If canopy is open and canopy hold-open supports are not installed:

Do not depress canopy latch interlock and operate latches to locked position—canopy will fall.

Do not move actuator clutch release handle from stowed position—canopy will fall.

OPERATIONAL CHECKOUT

8-20. CANOPY NORMAL SYSTEM OPERATIONAL CHECK, F-106A.

The following operational checks are designed to functionally test all components of the canopy normal system except the canopy seal system outlined in paragraphs 8-52 through 8-65. If the requirements of these checks are not met, refer to applicable System Analysis for pertinent information.

8-21. Equipment Requirements.

FIGURE	NAME	TYPE	ALTERNATE	USE AND APPLICATION
1-25	Generator Set (Gas).	8-96026-801 AF/M32A-13 (6115-583-9365)	8-96026 AF/M32M-2 (6115-617-1417)	To energize electrical systems on aircraft equipped with special quick disconnect receptacle.
	Generator Set (Elec).	8-96025-803 AF/ECU-10/M (6125-583-3225)	8-96025-805 A/M24M-2	
			8-96025 AF/M24M-1 (6125-620-6468)	
1-24	Generator Set.		MC-1 (6125-500-1190)	To energize electrical systems (except AWCIS) on aircraft equipped with standard AN receptacle and on others by using adapter cable 8-96052-801.
			MD-3	
1-26	Adapter Cable.	8-96052-801 (6115-690-4050)		To connect MC-1 and MD-3 units to aircraft equipped with special quick-disconnect receptacle.
	Canopy Hold-Open Support Assembly.	8-96038-801 (for F-106A airplanes) 8-96137 (for F-106B airplanes)		To hold canopy open and prevent inadvertent closure.
	Spring Scale, 0 to 30 pounds.			To measure force required to move canopy controls.

8-22. Preparation.

a. Make sure that electrical portion of the system is properly fused; see applicable schematic illustration, in this Section, for requirements.

b. Connect external source of 28-volt dc electrical power to airplane; refer to paragraph 1-42 for procedure.

c. *Applicable to F-106A airplanes equipped with pneumatic actuating cylinders.* Check pressure of high pressure pneumatic system. If system needs charging, refer to Section II for procedure.

8-23. Procedure.

Applicable to F-106A airplanes equipped with pneumatic actuating cylinders.

a. Open access door located on left side of fuselage below windshield to gain access to canopy exterior latch control handle.

b. Pull handle out to unlock latches. Latch hooks shall rotate to the unlock position and the canopy unlock warning light shall illuminate. Place latch control handle in stowed position.

c. Open canopy to partially open position so that clearance between latch hook points and latch rollers can be checked. Minimum clearance shall be 0.12 inch; see figure 8-20 if clearance must be adjusted.

d. Continue to open canopy until half open position is reached. Canopy shall move easily under light pressure.

e. Place canopy position-lock switch in "LOCK" position. Attempt to open or close the canopy; the canopy shall not move.

f. Place position-lock switch in "UNLOCK" position. Open canopy to full open position and install canopy hold-open support.

g. Manually depress left and right unlock warning light limit switches. Canopy unlock warning light shall extinguish. Successively hold one switch and release the other switch. The canopy unlock warning shall illuminate when either switch is released. Release both switches.

h. Remove canopy hold-open support, close canopy from inside cockpit, and operate pilot's latch control handle to locked position.

i. Check latch hook-to-roller clearance. Clearances must conform to those given in figure 8-20. Check actuation point of each unlock warning light limit switch. Switch shall not actuate until arm is within 0.06 inch of end of travel.

j. Attach spring type scale to end of pilot's latch control handle and note force required to unlock and lock latches. Force required to move handle to "UNLOCK" position shall not exceed 25 pounds. Force required to move handle to "LOCK" position shall not exceed 35 pounds. Remove spring type scale.

k. Operate latches to unlock position; canopy unlock warning light shall illuminate. Open canopy and place canopy position-lock switch in "LOCK" position. The canopy shall hold in the open position.

l. Place position-lock switch in "UNLOCK" position and close canopy from outside of cockpit.

m. Operate latches to locked position by exterior latch control handle. Canopy unlock warning light shall extinguish. Place latch control handle in stowed position and close access door.

n. Disconnect source of electrical power.

8-24. *Applicable to F-106A airplanes equipped with electric actuating cylinders.*

a. Open canopy control access door located on the left side of the fuselage under the windshield.

b. Pull exterior canopy latch control handle out to unlock latches. Latch hooks shall rotate to the unlock position and the canopy unlock warning light shall illuminate. Place latch control handle in stowed position.

c. Open canopy to partially open position, by exterior control switch, so that clearance between latch hook points and latch rollers can be checked. Minimum clearance shall be 0.12 inch; see figure 8-20 if clearance must be adjusted. Continue to open canopy. When the actuator screw jack barrel has extended 9.38 (+0.18, −0.18) inches from the outer housing of the actuating cylinder, the actuator motor shall cut off and the actuator clutch shall hold the canopy open.

CAUTION

Do not operate canopy actuator for more than 3 minutes in any 20 minute period as damage to actuator motor will result.

d. *Applicable to airplanes 56-453 thru 57-2464, 57-2466 thru 57-2477, 57-2490, 57-2493, and 57-2496 thru 59-111.* Manually depress left and right canopy unlock warning light switches. Canopy unlock warning light shall extinguish. Successively hold one switch and release the other switch. Canopy unlock warning light shall illuminate when either switch is released. Release both switches.

e. *Applicable to airplanes 57-2465, 57-2478 thru 57-2489, 57-2491, 57-2492, 57-2494, 57-2495, 59-112 and subsequent.* Manually depress canopy proximity switch and left and right unlock warning light limit switches. Canopy unlock warning light shall extinguish. Successively hold two of the switches and release the other switch. Canopy unlock warning light shall illuminate when any of the three switches is released. Release all switches.

WARNING

Make sure that area between canopy and canopy sill is clear of personnel and foreign objects before performing the following step. The canopy will fall when the canopy latches are operated to locked position if the canopy closed switch malfunctions or is not properly adjusted. See figure 8-22 for switch adjustment procedure, if required.

f. Operate canopy latches to locked position using pilot's latch control handle; this action opens the two latch-open switches and closes the latch-closed switch. The clutch will remain engaged and canopy will not move since the canopy closed-switch breaks the clutch disengage circuit when the forward end of the canopy is open 6 (±1.0) inches. See figure 8-2. Hold pilot's canopy control switch at "CLOSE" position. Actuator shall not function since the latch-open switch is open. See figure 8-22 if switches require adjustment.

g. Hold pilot's canopy control switch at "CLOSE" position. Canopy shall close, bottom out, and seat firmly on structure. Actuator motor shall cut off. Release control switch. *Applicable to airplanes 57-2465, 57-2478 thru 57-2489, 57-2491, 57-2492, 57-2494, 57-2495, 59-112 and subsequent.* Check actuation point of canopy proximity switch. Switch shall actuate when the canopy dagger fitting at Station 141 reaches a point 0.09-inch to 0.06-inch from canopy fully closed position.

h. Operate latches to locked position by pilot's latch control handle; this action closes the latch-closed switch, the actuator clutch disengages, and will remain disengaged until the control switch is actuated or the canopy is opened manually to the full open position.

NOTE

If the battery of the canopy power package is used as a power source for canopy operation, power for clutch disengagement is not available and the clutch will remain engaged.

Check latch hook to roller clearances. Clearances must conform to those given in figure 8-20. Check actuation point of unlock warning light limit switches. Limit switch shall not actuate until arm is within 0.06 inch of end of travel.

i. Attach a spring type scale to end of pilot's latch control handle and note force required to unlock and lock latches. Force required to move handle to "UNLOCK" position shall not exceed 25 pounds. Force required to move handle to "LOCK" position shall not exceed 35 pounds.

j. Unlock latches and apply upward manual force to canopy. Canopy shall open and the actuator clutch shall automatically engage to hold the canopy open when the canopy reaches the full-open position. If canopy does not open, clutch disengage circuit is defective. Refer to paragraph 8-31. If canopy opens but clutch does not engage at full open position, mechanical clutch engage feature of actuator is defective and actuator should be replaced.

k. Operate canopy to close position by pilot's canopy control switch; release control switch at several intermediate points. The actuator clutch shall hold the canopy at the intermediate points.

l. Operate canopy to open position by pilot's canopy control switch; release control switch at several intermediate points. The actuator clutch shall hold the canopy at the intermediate points.

m. Operate canopy latches to locked position by exterior latch control handle. Hold exterior canopy control switch at "CLOSE" position. Canopy actuator shall not function. Release control switch and operate latches to the unlocked position.

n. Operate canopy to close position by exterior canopy control switch; release control switch at several intermediate points. The actuator clutch shall hold the canopy at the intermediate points.

o. Unlock latches and apply upward manual force to canopy. Canopy shall open and the actuator clutch shall automatically engage to hold the canopy open when the canopy reaches the full-open position.

p. Hold exterior canopy control switch at "CLOSE" position. Canopy shall close, bottom out, and seat firmly on structure. Canopy actuator motor shall cut off. Release control switch.

q. Operate latches to locked position. Canopy unlock warning light shall extinguish. Place latch control handle in stowed position and close access door.

r. Disconnect source of electrical power.

8-25. CANOPY NORMAL SYSTEM OPERATIONAL CHECK, F-106B.

The following operational checks are designed to functionally test all components of the canopy normal system except the canopy seal system which is outlined in paragraphs 8-52 through 8-65. If the requirements of these checks are not met, refer to applicable System Analysis for pertinent information.

8-26. Equipment Requirements.

Equipment requirements are identical to those listed for F-106A airplanes; refer to paragraph 8-21.

8-27. Preparation.

a. Make sure that electrical portion of system is properly fused; see applicable schematic illustration, in this Section, for requirements.

b. Connect external source of 28-volt dc electrical power to airplane; refer to paragraph 1-42 for procedure.

c. *Applicable to F-106B airplanes equipped with pneumatic actuating cylinders.* Check pressure of high pressure pneumatic system. If system needs charging, refer to Section II for procedure.

8-28. Procedure.

Applicable to F-106B airplanes equipped with pneumatic actuating cylinders.

a. Open canopy control access door located on the left side of the fuselage under the windshield.

b. Pull canopy latch handle out and rotate handle 100° counterclockwise then pull handle out again until full travel is reached and rotate handle 100° clockwise. Latch hooks shall rotate to the unlock position and canopy unlock warning light shall illuminate.

c. Move exterior canopy lift control lever up to the "OPEN" position. Canopy shall open.

d. Disengage exterior latch control handle and place in stowed position.

e. Install canopy hold-open support. Coat inside of latch hooks with clay like material.

f. Manually depress left and right canopy unlock warning light switches. Canopy unlock warning light shall extinguish.

g. Successively hold one switch and release the other switch. Canopy unlock warning light shall illuminate when either switch is released.

h. Release both switches. Canopy unlock warning light shall illuminate.

i. After removing canopy-open support, move interior canopy lift control lever down to "CLOSE" position. Canopy shall close, bottom out, and seat firmly on structure.

j. Operate pilot's latch control handle to locked position; observe actuation point, at station 232, of canopy unlock warning light limit switches. Limit switches shall not actuate until bell crank arm is within 0.06 inch of end of travel. Check that left hand latch mechanisms over-center stops (4 places) are fully engaged. Check right hand over-center stops for proper position.

NOTE

Right hand over-center stops must not engage before left hand over-center stops. Maximum clearance between right hand over-center stop and rod of forward hook is 0.020 inch. Maximum clearance between right hand over-center stops and hook links of the 2nd, 3rd, and aft latch mechanisms is 0.010 inch.

k. Operate latches to unlock position. Open canopy to a partially open position so that clearances between latch hook points and latch rollers can be checked.

Minimum clearances shall be as follows: forward hooks 0.12 inch, 2nd and 3rd hooks 0.09 inch, and aft hooks 0.06 inch.

l. After canopy is opened, install canopy hold-open support and examine clay like material on inner surface of latch hooks for roller imprint. Upper and lower clearances shall conform to clearances shown in figure 8-21.

m. Attach a spring type scale to end of pilot's canopy latch handle, remove canopy hold-open support and close canopy. Measure force required to latch and unlatch canopy. Force required to latch or unlatch canopy shall not exceed 30 pounds.

n. Detach scale, and open canopy.

o. Move exterior canopy lift control lever down to "CLOSE" position. Canopy shall close, bottom out, and seat firmly on structure.

p. Latch canopy by external latch control handle. Canopy unlock warning light shall extinguish.

q. Place external latch control handle in stowed position, close access door, and disconnect source of electrical power.

8-29. Procedure.

Applicable to F-106B airplanes equipped with electric actuating cylinders.

a. Open canopy control access door located on the left side of the fuselage under the windshield.

b. Pull canopy latch control handle out and rotate handle 100° counterclockwise then pull handle out again until full travel is reached. Rotate handle 100° clockwise; latch hooks shall rotate to unlock position and canopy unlock warning light shall illuminate. Place latch control handle in stowed position.

WARNING

If canopy is open and canopy hold-open supports are not installed:

Do not depress canopy latch interlock and operate canopy latches to locked position — canopy will fall.

Do not move actuator clutch release handle from stowed position — canopy will fall.

c. Raise canopy to a partially open position, by exterior control switch, so that clearances between latch hook points and latch rollers can be checked. Minimum clearances shall be as follows: forward hooks 0.12 inch, 2nd and 3rd hooks 0.09 inch, and aft hooks 0.06 inch. Continue to open canopy. When the actuator screw jack barrel has extended 45.62 (+0.13, −0.13) inches from the outer housing of the actuating cylinder, the actuator motor shall cut off and the actuator clutch shall hold the canopy open.

CAUTION

Do not operate canopy actuator for more than 3 minutes in any 20 minute period as damage to actuator motor will result.

d. Install canopy hold-open support. Coat inside of latch hooks with clay like material.

e. Manually depress left and right unlock warning light switches. Canopy unlock warning light shall extinguish. Successively hold one switch and release the other switch. Canopy unlock warning light shall illuminate when either switch is released. Release both switches.

f. Remove canopy hold-open support. Hold pilot's canopy control switch at "CLOSE" position until forward end of canopy reaches a point approximately 2 inches from full closed; release switch. Wait until canopy movement stops, then reactuate switch and operate canopy to full closed position. Canopy shall bottom out and seat firmly on structure. Actuator motor shall cut off; release control switch.

CAUTION

Do not operate canopy to full closed position without stopping as damage to actuator will result.

g. Operate pilot's latch control handle to locked position. Check actuation point of unlock warning light switches at station 232. Limit switches shall not actuate until bell crank arm is within 0.06 inch of end of travel.

h. Hold pilot's canopy control switch at "OPEN" position; canopy actuator shall not function. Release control switch.

i. Check that left hand latch mechanism over-center stops (4 places) are fully engaged. Check right hand latch mechanism over-center stops (4 places) for proper position.

NOTE

Right hand over-center stops must not engage before left hand over-center stops. Maximum clearance between right hand over-center stop and rod of forward hook is 0.020 inch. Maximum clearance between right hand over-center stops and hook links of the 2nd, 3rd, and aft latch mechanisms is 0.010 inch.

j. Attach a spring type scale to end of pilot's latch control handle and note force required to unlock and lock latches. Force shall not exceed 30 pounds at any point of handle travel. Remove spring type scale.

k. Operate pilot's latch handle to unlocked position. Open canopy; release control switch at several intermediate points. Actuator clutch shall hold the canopy at

the intermediate points. When the canopy reaches the full open position, the actuator motor shall cut off and the actuator clutch shall hold the canopy open.

l. Install canopy hold-open support. Examine clay like material on inner surface of latch hooks for roller imprint. Upper and lower hook to roller clearances must conform to clearances shown on figure 8-21.

m. Remove canopy hold-open support.

n. Operate canopy to closed position by external canopy control switch. Pull actuator clutch release handle down and outboard and manually open canopy. When the canopy has reached the full open position, place clutch release handle in stowed position. The actuator clutch shall hold the canopy in the open position.

o. Hold external canopy control switch at "CLOSE" position until forward end of canopy reaches a point approximately 2 inches from full closed; release switch. Wait until canopy movement stops, then reactuate switch and operate canopy to full closed position. Pull external latch control handle to full outboard position and rotate handle 100° counterclockwise to lock canopy. The canopy unlock warning light shall extinguish. Push handle inboard 1 inch, rotate handle 100° clockwise, place handle in stowed position, and close access door.

SYSTEM ANALYSIS

8-30. SYSTEM ANALYSIS, NORMAL (PNEUMATIC) CANOPY SYSTEM, F-106A.

PROBABLE CAUSE	ISOLATION PROCEDURE	REMEDY
CANOPY WILL NOT HOLD IN OPEN POSITION.		
No electrical power to canopy-lock valve solenoid.	Check that good "CANOPY POSITION LOCK" fuse is installed on cockpit left-hand fuse panel. Check continuity across posi-lock switch (when in "lock" position). If still no power at valve, check circuit wiring for continuity.	Install new fuse, replace switch, or repair wiring as necessary.
Low pressure in high-pressure pneumatic supply system.	Check pressure gage in left-hand main wheel well. If pressure is over 1500 psi, check output of supply system 1500 psi regulator. Refer to T.O. 1F-106A-2-3 for procedure. Charge supply system by procedures given in Section II or replace 1500 psi regulator in supply system. Refer to T.O. 1F-106A-2-3 for latter procedure.	
CANOPY WILL NOT LOCK OR UNLOCK PROPERLY.		
Latch mechanism out of adjustment.	Perform functional check per paragraphs 8-22 through 8-23.	Adjust mechanism per instructions in figure 8-20.
CANOPY WILL NOT RETRACT TO FULL CLOSED POSITION.		
Actuator rod end misadjusted.	Determine by visual check of canopy position. Check for structural interference.	Remove cause of interference. Adjust rod end per instructions in figure 8-13.

8-30. SYSTEM ANALYSIS, NORMAL (PNEUMATIC) CANOPY SYSTEM, F-106A (CONT).

PROBABLE CAUSE	ISOLATION PROCEDURE	REMEDY
CANOPY WILL NOT RETRACT TO FULL CLOSED POSITION (CONT).		
Canopy seal not properly seated in retainer.	Check seal for proper seating. Pull out portion of seal not seated.	Check for foreign matter in retainer, then reinstall canopy seal. See figure 8-29 for instructions.
CANOPY PNEUMATIC SYSTEM DOES NOT COUNTERBALANCE CANOPY WEIGHT.		
Low pressure in high-pressure pneumatic supply system.	Check pressure gage in left-hand main wheel well. If pressure is over 1500 psi check output of supply system 1500 psi regulator. Refer to T.O. 1F-106A-2-3 for procedure.	Check supply system per Section II of this manual or replace 1500 psi regulator in supply system. Refer to T. O. 1F-106A-2-3 for procedure.
CANOPY-UNLOCK WARNING LIGHT DOES NOT ILLUMINATE WHEN CANOPY IS UNLOCKED.		
Warning light limit switches out of adjustment or defective.	Check canopy normal system per paragraphs 8-22 through 8-23.	Adjust or replace switch or switches as required.
Defective or missing "CANOPY UNLOCK" fuse.	Inspect fuse on nose wheel well fuse panel.	Install good fuse.
Warning light bulbs burned out.	Press warning light test switch on instrument panel. All warning lights shall illuminate.	Replace defective bulbs.

8-31. SYSTEM ANALYSIS, NORMAL (ELECTRIC) CANOPY SYSTEM, F-106A.

PROBABLE CAUSE	ISOLATION PROCEDURE	REMEDY
CANOPY WILL NOT OPERATE ELECTRICALLY.		
Defective fuse.	Check fuses at canopy 28 volt dc essential bus and at 28 volt dc non-essential bus in nose wheel well.	Replace defective fuse or fuses.
Malfunction within canopy power package. Defective circuit.	Hold canopy control switch at desired position. Check for power at terminals E and F of canopy power package. If no power is indicated at E, circuit from canopy control switch is open. If power is indicated at E and no power is indicated at F, malfunction is within canopy power package. If power is indicated at F, check for power at canopy 28-volt dc essential bus. If no power is indicated at bus, circuit from power package is open.	Replace canopy power package or repair circuit.
Defective canopy control switch.	Operate canopy with other control switch, then check continuity across applicable switch. If continuity is not indicated, switch is defective.	Replace defective switch.

8-31. SYSTEM ANALYSIS, NORMAL (ELECTRIC) CANOPY SYSTEM, F-106A (CONT).

PROBABLE CAUSE	ISOLATION PROCEDURE	REMEDY
CANOPY WILL NOT OPERATE ELECTRICALLY (CONT).		
Misadjusted or defective latch open switch.	Check for continuity across applicable switch.	Adjust or replace switch.
Defective actuator up relay. Defective actuator down relay.	Hold canopy control switch at desired position. Check for power at terminals A1 and A2. If power is indicated at A1 and no power is indicated at A2, check for power at terminals X2 and X1. If power is indicated at X2 and no power is indicated at X1, release control switch and check for continuity at terminals M and N for canopy "OPEN" or at terminal R and S for canopy "CLOSE." If continuity reading is obtained, relay is defective.	Replace defective relay.
Defective up travel limit switch.	Check for continuity at terminals M and N. If continuity is not indicated, switch is defective.	Replace actuator.
Defective down torque limit switch.	Check for continuity at terminals R and S. If continuity is not indicated, switch is defective.	Replace actuator.
Defective actuator motor.	Hold canopy control switch at desired position. Check for power at terminal A, of actuator, for canopy close operation. If power is indicated but motor does not function, motor is defective. Check for power at terminal B, of actuator, for canopy open operation. If power is indicated but motor does not function, motor is defective.	Replace actuator.
Defective clutch engage switch.	Hold canopy control switch at desired position. Check for power at terminals H and J of actuator. If power is indicated at J, clutch engage switch is defective.	Replace actuator.
Defective clutch engage solenoid.	With canopy closed and with canopy latches unlocked, actuate canopy control switch to "OPEN" and check for momentary indication of power at terminal D of actuator. If momentary power is not indicated, solenoid is defective.	Replace actuator.

8-31. SYSTEM ANALYSIS, NORMAL (ELECTRIC) CANOPY SYSTEM, F-106A (CONT).

PROBABLE CAUSE	ISOLATION PROCEDURE	REMEDY
CANOPY WILL NOT OPEN MANUALLY (ACTUATOR CLUTCH ENGAGED)		
Canopy battery used as power source. Defective fuse.	Check for power at 28-volt dc nonessential bus in nose wheel well, check "CANOPY CLUTCH RELEASE" fuse.	Obtain power. Replace fuse.
Misadjusted or defective canopy closed switch.	With canopy closed, check for power at terminals G and E of switch. If power is indicated at G and no power is indicated at E, adjust switch. If no power is indicated at E after switch adjustment, switch is defective.	Adjust or replace switch.
Misadjusted or defective latch closed switch.	With canopy closed and with canopy latches locked, check for power at COM and N.O. terminals of switch. If power is indicated at COM and no power is indicated at N.O., adjust switch. If no power is indicated, switch is defective.	Adjust or replace switch.
Defective clutch disengage switch.	With canopy closed and with canopy latches locked, check for power at terminals K and L of actuator. If power is indicated at K and no power is indicated at L, switch is defective.	Replace actuator.
Defective clutch disengage relay.	With canopy closed and with canopy latches locked, check for power at terminals L1 and T1. If power is indicated at L1 and no power is indicated at T1, check for power at X2. If no power is indicated at X2, check wiring between X2 and terminal 'L of canopy actuator for continuity. If continuity reading is obtained, relay is defective. If no continuity reading is obtained actuator is open.	Replace relay.
Defective clutch disengage solenoid.	With canopy closed and with canopy latches locked, check for momentary power indication at terminal F of canopy actuator. If momentary power is not indicated, solenoid is defective.	Replace actuator.

8-31. SYSTEM ANALYSIS, NORMAL (ELECTRIC) CANOPY SYSTEM, F-106A (CONT).

PROBABLE CAUSE	ISOLATION PROCEDURE	REMEDY
ACTUATOR WILL NOT EXTEND FULLY OR HAS BOTTOMED OUT.		
Actuator up travel limit switch misadjusted.	Check for continuity at terminals M and N of canopy actuator. If continuity is obtained, screw jack barrel has bottomed out and motor has stalled. Replace actuator. If no continuity, check that screw jack barrel is extended 9.38 (±0.18) inches from the outer housing of the actuating cylinder. Adjust screw jack barrel extension.	Replace actuator. Adjust screw jack barrel to obtain proper dimension; refer to figure 8-14 for procedure.
CANOPY WILL NOT RETRACT TO FULL CLOSED POSITION.		
Defective actuator clutch and/or defective torque limit switch.	Hold canopy control switch at "CLOSE." Canopy will fully close, then open a slight amount and repeat cycle, or actuator motor will stall. Check for continuity at terminals R and S of canopy actuator. If continuity is obtained, switch and/or clutch is defective.	Replace actuator.
Canopy seal not properly seated in retainer.	Check seal for proper installation.	Pull out portion of seal not seated. Check retainer for foreign matter. Install seal properly.
Structural interference.	Determine by visual check.	Remove cause of interference.
CANOPY WILL NOT LOCK OR UNLOCK PROPERLY.		
Latch mechanism misadjusted.	Determine by operation check.	Adjust latch mechanism.
CANOPY UNLOCK WARNING LIGHT DOES NOT ILLUMINATE WHEN CANOPY IS UNLOCKED.		
Defective "CANOPY UNLOCK" fuse.	Determine by visual check.	Replace fuse.
Warning light bulbs burned out.	Press warning light test switch.	Replace bulbs.
Defective or misadjusted limit switches. Open circuit.	Determine by operation check. Check system for continuity.	Replace and/or adjust limit switches. Repair circuit.

8-32. SYSTEM ANALYSIS, NORMAL (PNEUMATIC) CANOPY SYSTEM, F-106B.

PROBABLE CAUSE	ISOLATION PROCEDURE	REMEDY
CANOPY WILL NOT OPEN TO FULL OPEN POSITION.		
Low pressure in high pressure pneumatic supply system.	Check system pressure. If system pressure is under 1500 psi; charge system.	Charge system. See figure 2-13 for procedure.

8-32. SYSTEM ANALYSIS, NORMAL (PNEUMATIC) CANOPY SYSTEM, F-106B (CONT).

PROBABLE CAUSE	ISOLATION PROCEDURE	REMEDY
CANOPY WILL NOT OPEN TO FULL OPEN POSITION (CONT).		
Defective actuating cylinder.	Check inlet pressure at actuating cylinder. If pressure is 550 psi; replace actuating cylinder.	Replace actuating cylinder. See figure 8-15 for procedure.
Defective control valve or control valve linkage not properly adjusted.	Check mechanical operation of valve. Check output pressure for 550 psi.	Adjust mechanical linkage or replace valve. See figure 8-23 for adjustment procedure.
Defective 1500 psi regulator.	Check pressure output of 1500 psi regulator. If output is under 1500 psi; replace regulator.	Replace 1500 psi regulator. Refer to T.O. 1F-106A-2-3 for procedure.
Defective 550 psi regulator.	Check output pressure of regulator. If pressure is under 550 psi; replace regulator.	Replace regulator.
CANOPY WILL NOT LOWER.		
Defective control valve or control valve linkage not properly adjusted.	Check mechanical operation of valve. Check for venting at vent port of valve.	Adjust mechanical linkage or replace valve. See figure 8-23 for adjustment procedure.
Restrictor in vent line clogged or installed with check valve in wrong direction.	See figure 8-3 for flow direction.	Remove restrictor-check valve. Clean or replace. Install properly.
CANOPY WILL NOT LOWER TO FULL CLOSED POSITION.		
Canopy seal not properly seated in retainer.	Check seal for proper installation.	Pull out portion of seal not seated. Check retainer for foreign matter. Install seal properly.
Piston of actuating cylinder bottomed out.	Disconnect actuating cylinder from canopy. If canopy lowers; adjust piston rod length.	Adjust piston rod length.
CANOPY WILL NOT LOCK OR UNLOCK PROPERLY.		
Latch mechanism improperly adjusted.	Determine by operation check.	Adjust latch mechanism. See figure 8-21 for procedure.
CANOPY UNLOCK WARNING LIGHT DOES NOT ILLUMINATE WHEN CANOPY IS UNLOCKED.		
Defective "CANOPY UNLOCK" fuse.	Determine by visual check.	Replace fuse.
Warning light bulbs burned out.	Press warning light test switch.	Replace bulbs.
Open circuit.	Check circuit for continuity.	Repair circuit. If limit switches are replaced, adjust switches as outlined in figure 8-19.
CANOPY UNLOCK WARNING LIGHT DOES NOT EXTINGUISH WHEN CANOPY IS LOCKED.		
Either or both limit switches improperly adjusted.	Determine by operating latches.	Adjust switches as outlined in figure 8-21.

8-33. SYSTEM ANALYSIS, NORMAL (ELECTRIC) CANOPY SYSTEM, F-106B.

PROBABLE CAUSE	ISOLATION PROCEDURE	REMEDY
CANOPY WILL NOT OPERATE ELECTRICALLY.		
Defective fuse or fuses.	Check fuses at canopy 28-volt dc essential bus and at 28-volt dc non-essential bus in nose wheel well.	Replace defective fuse or fuses.
Defective canopy control switch.	Check switch for continuity or operate canopy with other control switch.	Replace defective switch.
Malfunction within canopy power package.	Hold canopy control switch at desired position. Check for power at terminals E and F of canopy power package. If no power is indicated at E, circuit from canopy control switch is open. If power is indicated at E and no power is indicated at F, malfunction is within canopy power package. If power is indicated at F, check for power at canopy 28-volt dc essential bus. If no power is indicated at bus, circuit is open from power package.	Replace canopy power package.
Defective or misadjusted latch closed switch.	Hold canopy control switch at "OPEN." Check for power at COM and N.C. of switch. If power is indicated at COM and no power is indicated at N.C., adjust switch. If no power is indicated at N.C. after switch adjustment, switch is defective.	Adjust or replace switch.
Defective canopy up relay. Defective canopy down relay.	Hold canopy control switch at desired position. Power should be indicated at relay terminals A2, X2, and A1. There should be no power indicated at X1. If no power is indicated at A1 and other readings are normal, relay is defective. If power is indicated at A1 and X1, proceed to next probable cause.	Replace relay if defective.
Circuit or actuator fault.	Hold canopy control switch at desired position. Check for power at terminal D of actuator for canopy open operation. Check for power at terminal F of actuator for canopy close operation. If no power, circuit from relay to actuator is open. If power, circuit within actuator is open.	Repair circuit. Replace actuator, as necessary.

8-33. SYSTEM ANALYSIS, NORMAL (ELECTRIC) CANOPY SYSTEM, F-106B (CONT).

PROBABLE CAUSE	ISOLATION PROCEDURE	REMEDY
CANOPY WILL NOT OPERATE ELECTRICALLY (CONT).		
Defective actuator motor.	Hold canopy control switch at desired position. Check for power at terminal B of actuator for canopy open operation. Check for power at terminal A of actuator for canopy close operation. If no power, circuit from relay to actuator is open or circuit within actuator motor is faulty.	Repair circuits. Replace actuator, as necessary.
Actuator clutch release system misadjusted or defective clutch assembly.	Check adjustment of clutch release system.	Adjust system or replace actuator.
CANOPY WILL NOT OPEN MANUALLY.		
Actuator clutch release system misadjusted or defective clutch assembly.	Check adjustment of clutch release system.	Adjust system or replace actuator.
ACTUATOR WILL NOT EXTEND FULLY OR HAS BOTTOMED OUT.		
Actuator up travel limit switch misadjusted.	Check for continuity at terminals D and E of canopy actuator. If continuity is obtained, screw jack barrel has bottomed out and motor has stalled. Replace actuator. If no continuity, check that screw jack barrel is extended 45.62 ($\pm$0.13) inches from the outer housing of the actuating cylinder. Adjust screw jack barrel extension.	Replace actuator. Adjust actuator screw jack barrel to obtain proper dimension; refer to figure 8-16 for procedure.
Actuator limit switch misadjusted.	Determine by visual check of canopy position.	Replace actuator.
CANOPY WILL NOT RETRACT TO FULL CLOSED POSITION.		
Defective actuator clutch and/or defective torque limit switch.	Check that canopy actuator clutch system is adjusted per figure 8-24. Hold canopy control switch at "CLOSE." Canopy will fully close, then open a slight amount and repeat cycle, or actuator motor will stall. Check for continuity at terminals F and G of canopy actuator. If continuity is obtained, switch and/or clutch is defective.	Replace actuator.
Canopy seal not properly seated in retainer.	Check seal for proper installation.	Pull out portion of seal not seated. Check retainer for foreign matter. Install seal properly.

8-33. SYSTEM ANALYSIS, NORMAL (ELECTRIC) CANOPY SYSTEM, F-106B (CONT).

PROBABLE CAUSE	ISOLATION PROCEDURE	REMEDY
CANOPY WILL NOT RETRACT TO FULL CLOSED POSITION (CONT).		
Structural interference.	Determine by visual check of canopy position. Check for structural interference.	Remove cause of interference.
CANOPY WILL NOT LOCK OR UNLOCK PROPERLY.		
Latch mechanism misadjusted.	Determine by operation check.	Adjust latch mechanism.
CANOPY UNLOCK WARNING LIGHT DOES NOT ILLUMINATE WHEN CANOPY IS UNLOCKED.		
Defective "CANOPY UNLOCK" fuse.	Determine by visual check.	Replace fuse.
Warning light bulbs burned out.	Press warning light test switch.	Replace bulbs.
Defective or misadjusted limit switches. Open circuit.	Determine by operation check. Check system for continuity.	Replace and/or adjust limit switches. Repair circuit.

REPLACEMENT

8-34. SAFETY PRECAUTIONS, MAINTENANCE OF PNEUMATICALLY OPERATED SYSTEMS.

When replacing pneumatically operated components in the canopy operating system, or when it becomes necessary to break lines in the pneumatic system for any reason, observe the following precautions to prevent inadvertent operation of high-pressure pneumatic system components:

a. Open canopy, install canopy hold-open support 8-96038-801 for F-106A airplanes, or 8-96137 for F-106B airplanes, and install canopy and seat ejection safety pin assembly 8-96012 for F-106A airplanes, or 8-96147 for F-106B airplanes. See figure 8-42 or 8-43 for an illustration of the safety pin assembly installation.

b. Depressurize entire high-pressure pneumatic supply system. Refer to Section II of this manual for procedure.

c. Loosen "B" nut attaching tube to downstream side of check valve, to relieve trapped air pressure downstream of check valve. Access to valve is through upper aft electronics compartment door.

d. Disconnect line loosened in step "c" and cap line with an AN806-4 plug; cap check valve with an AN929-4D cap.

e. Replace canopy system component or perform necessary maintenance on system.

f. Remove cap and plug and connect line at check valve.

g. Check that all components of systems powered by high-pressure air are properly connected. Check that control valves and switches for all pneumatically operated systems are properly positioned to prevent inadvertent operation and possible injury to personnel.

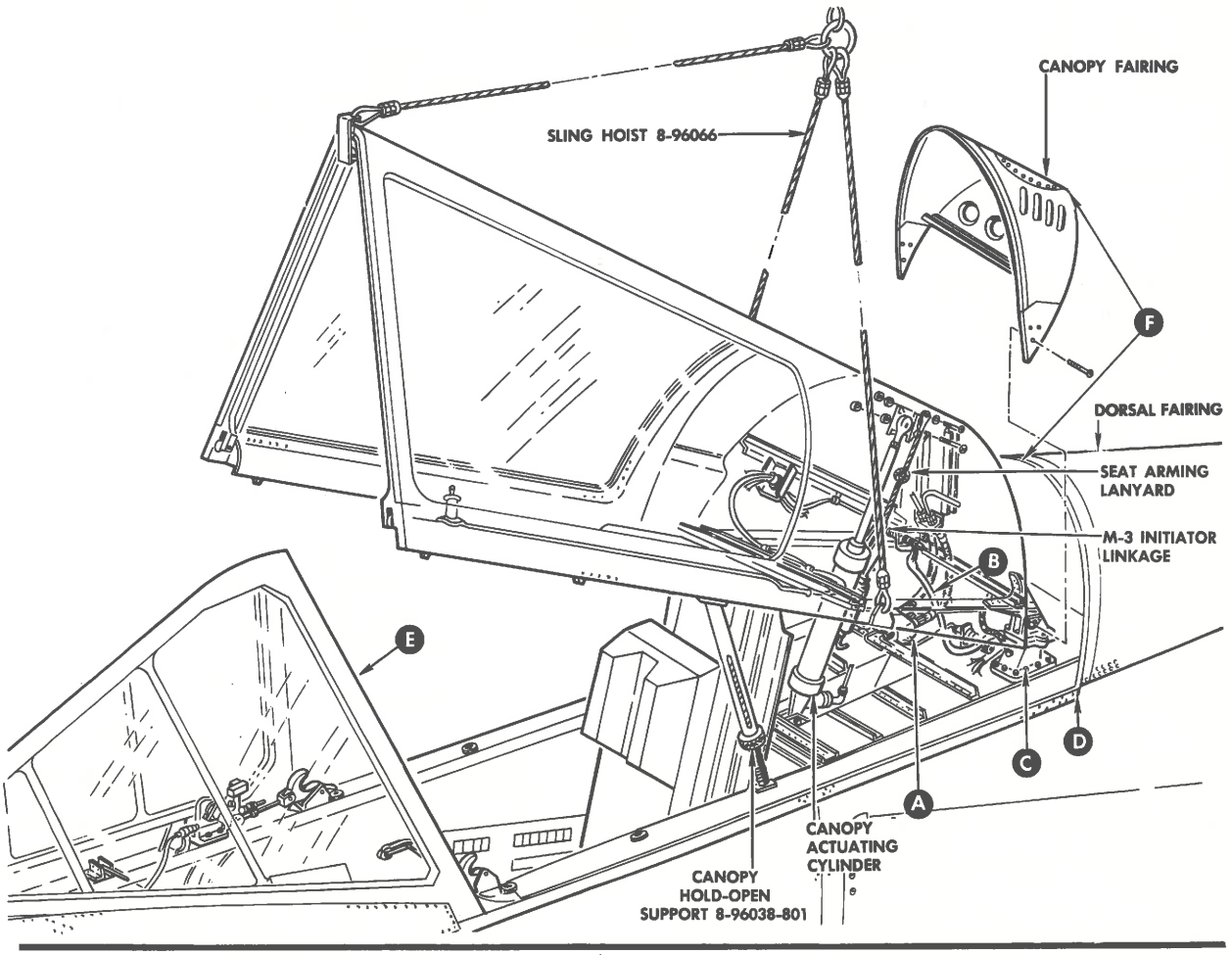
h. Charge high-pressure pneumatic system. Refer to Section II of this manual for procedure.

8-35. REPLACEMENT, ELECTRICAL COMPONENTS GENERAL.

When removing components equipped with pigtail electrical leads, always cut leads at an existing splice. This is necessary to preserve the component lead identity and to provide sufficient length for reinstallation.

8-36. REPLACEMENT, F-106A CANOPY.

Remove and install canopy as instructed in figure 8-11.



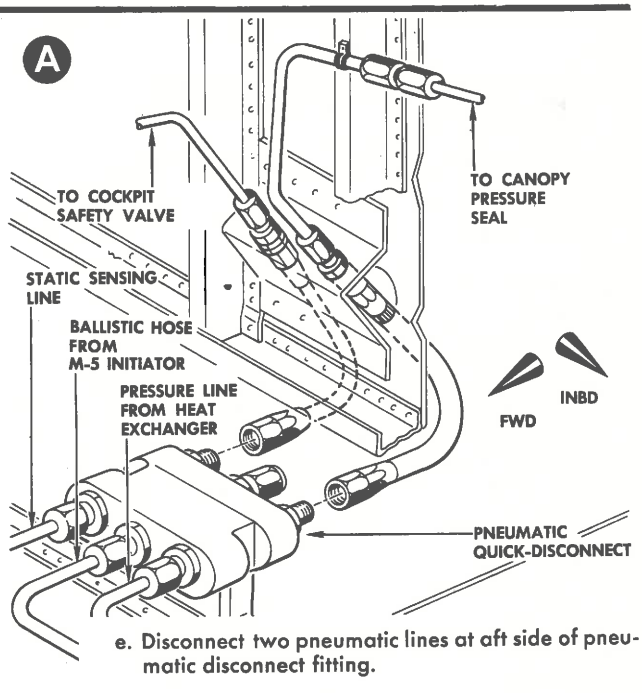
CANOPY REMOVAL

a. Remove canopy fairing by removing three screws at each side.

b. Inspect to insure that high pressure pneumatic system is charged. Open canopy and install canopy hold-open support 8-96038-801.

c. Install safety pins in canopy jettison and seat ejection systems.

d. *Applicable to airplanes equipped with pneumatic actuating cylinders.* Depressurize high pressure pneumatic system. Crack pneumatic hose connection at top of actuating cylinder to bleed air trapped in cylinder. Canopy position-lock switch must be in "UNLOCK" position at this time.



e. Disconnect two pneumatic lines at aft side of pneumatic disconnect fitting.

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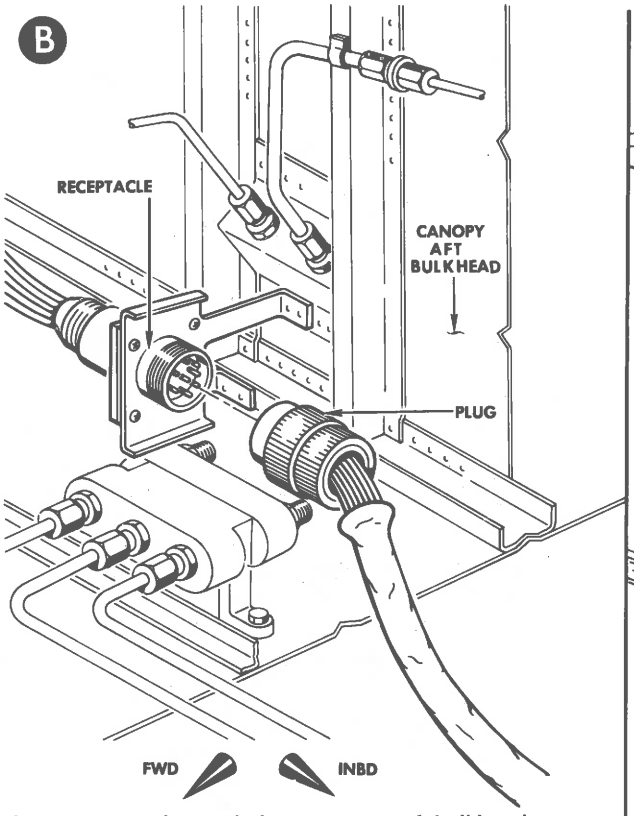
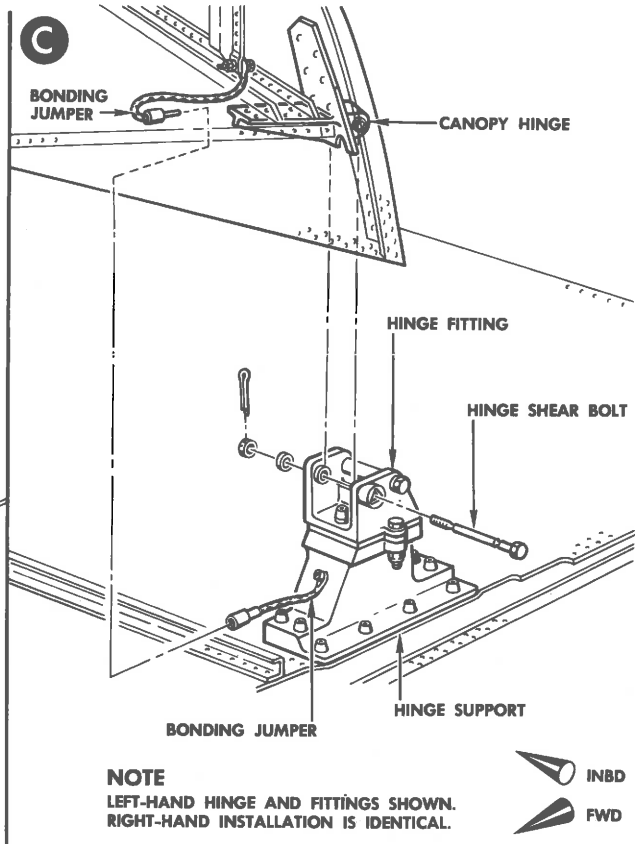
Figure 8-11. Canopy Replacement, F-106A (Sheet 1 of 3)



f. Disconnect electrical plug at canopy aft bulkhead.



NOTE
LEFT-HAND HINGE AND FITTINGS SHOWN. RIGHT-HAND INSTALLATION IS IDENTICAL.

g. Separate two halves of bonding jumper at quick disconnect as shown in detail C.
h. Attach hoisting sling 8-96066 to canopy.
i. Disconnect seat arming lanyard from canopy structure. See main view.

WARNING

TO PREVENT POSSIBLE SERIOUS INJURY THE SEAT ARMING LANYARD SHALL BE DISCONNECTED.

j. Disconnect actuating cylinder rod end from canopy structure.
k. Remove shear bolt at each canopy hinge and remove canopy.

CANOPY INSTALLATION

To install canopy that has previously been installed and aligned on same airplane, proceed as follows: See Details A, B and C.

a. Hoist canopy with sling 8-96066, and install in closed position. Install shear bolt, washer, and nut at each hinge and tighten to torque of 75 (±10) inch-pounds. Secure nut in place with cotter key.
b. Open canopy and install canopy hold-open support 8-96038.
c. Connect actuating cylinder rod end to canopy structure.
d. Connect seat arming lanyard to canopy structure.

WARNING

FAILURE TO CONNECT SEAT ARMING LANYARD WILL PREVENT SEAT EJECTION.

e. Connect two halves of bonding jumper.
f. Connect electrical plug to receptacle at canopy aft bulkhead; see detail B.
g. Connect two pneumatic lines to fittings at aft side of pneumatic disconnect. Canopy seal line must connect to left-hand fitting as shown in detail A.
h. Install canopy fairing and secure in place with three screws at each side.
i. *Applicable to airplanes equipped with pneumatic canopy actuators.* Tighten pneumatic hose connections at actuating cylinder. Charge high pressure pneumatic system.
j. Remove canopy hold-open support, close canopy, operate canopy latches to locked position, and check canopy installation for conformance with aerodynamic smoothness requirements.
k. *Applicable when new canopy is installed,* perform a complete operational check of the canopy normal system. Perform a cockpit pressure leak test; refer to T.O. 1F-106A-2-6 for procedure.
l. *Applicable when old canopy is reinstalled,* check canopy actuator and latches for proper operation.
m. Remove maintenance ground safety pins from canopy jettison and seat ejection system.

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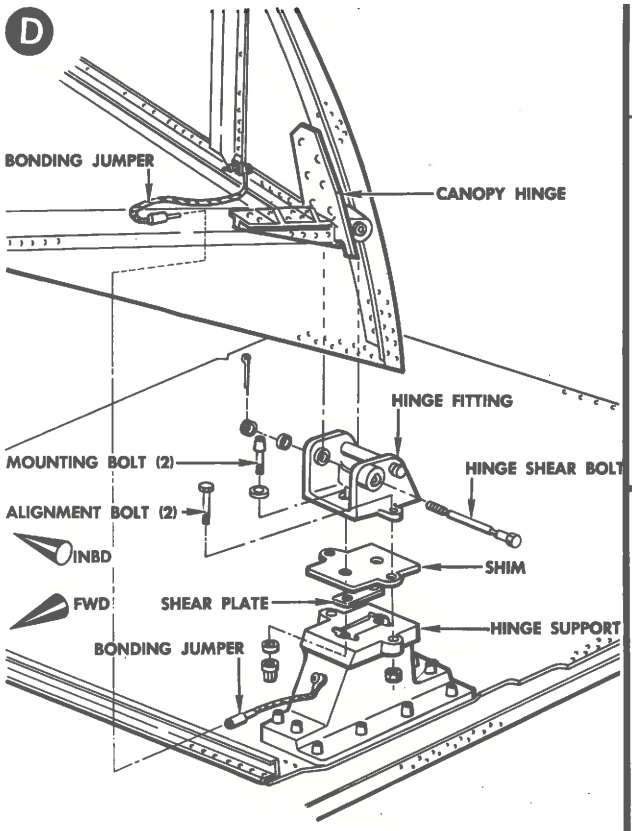
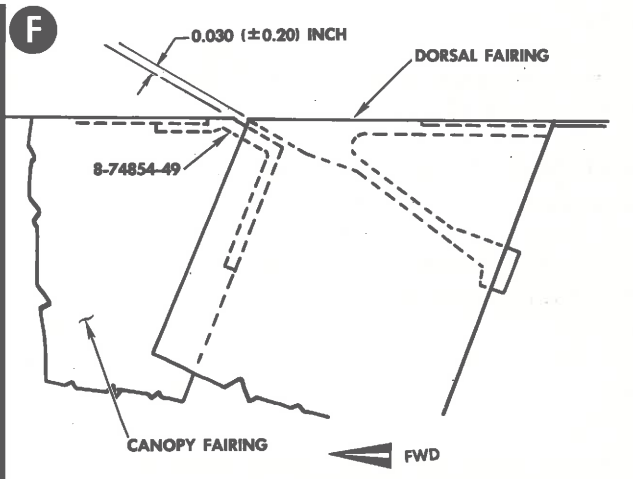
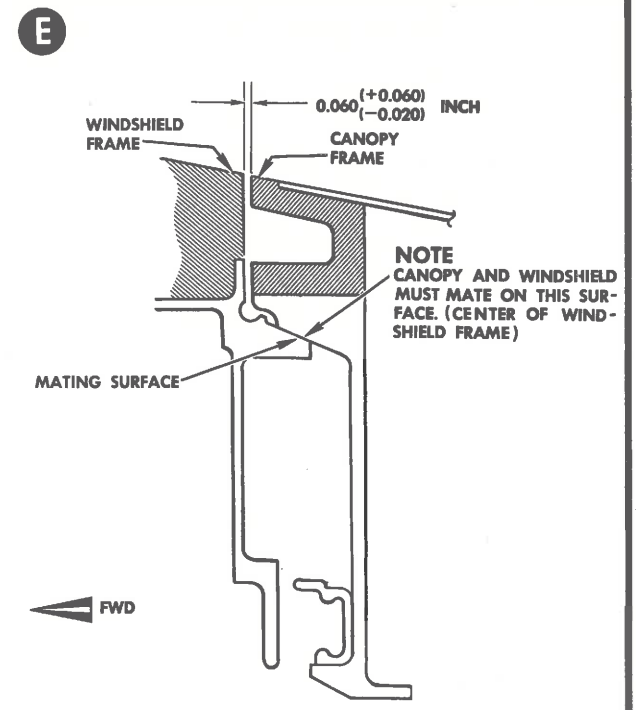
Figure 8-11. Canopy Replacement, F-106A (Sheet 2 of 3)







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CANOPY ALIGNMENT AND INSTALLATION

When installing canopy not previously installed on airplane, proceed as follows: (See Details D, E and F.)

a. Remove four bolts securing canopy hinge fitting to canopy hinge support at each side. Remove and discard shim and shear plate.
b. Place new shear plate (without holes) in recess at top of each hinge support. Install canopy hinge fitting and new shim. Install but do not tighten two aligning bolts at outer flanges. Do not install two inner mounting bolts.
c. Hoist canopy with hoisting sling 8-96066 and install in closed position. Insert shear bolt at each hinge but do not secure. Remove sling.
d. Check gap between canopy frame and windshield frame. If gap does not conform to limits at all points, adjust canopy position by shifting canopy hinge fittings on hinge supports.
e. Check to see that canopy is seated on cockpit sill at all points. Remove any gap by peeling hinge fitting shims.
f. Install canopy fairing. Check that gap between canopy fairing and dorsal fairing conforms to limits. If gap does not conform, see note for procedure.

NOTE

THESE SURFACES MAY BE SCARFED TO OBTAIN GAP: MINIMUM WALL THICKNESS FOR 8-74854-49 SHALL NOT BE LESS THAN 0.080 INCH.

g. When canopy is aligned, tighten two aligning bolts securing each fitting to the hinge supports. Use a torque of 60 (±10) inch-pounds.
h. Remove shear bolt at each hinge and remove canopy.
i. Use hinge fitting as drill jig to drill two holes, 0.376 (±0.001) inch diameter, in each shear plate.
j. Install attachment bolt, two washers, and nut at two holes in center of each hinge fitting and tighten with a torque of 120 (±30) inch-pounds.
k. Complete canopy installation; see sheet 2 of this illustration for procedure.

Figure 8-11. Canopy Replacement, F-106A (Sheet 3 of 3)

8-37. REPLACEMENT, F-106B CANOPY.

Remove and/or replace canopy as instructed in figure 8-12.

8-38. REPLACEMENT, PNEUMATIC CANOPY ACTUATING CYLINDER, F-106A.

Applicable to 56-453 thru 57-243 prior to incorporation of TCTO 1F-106-J-525. Remove and/or install actuating cylinder as shown in figure 8-13.

8-39. REPLACEMENT, ELECTRIC CANOPY ACTUATING CYLINDER, F-106A.

Applicable to 57-244 and subsequent and 56-453 thru 57-243 after incorporation of TCTO 1F-106-J-525. Remove and/or install actuating cylinder as shown in figure 8-14.

8-40. REPLACEMENT, PNEUMATIC CANOPY ACTUATING CYLINDER, F-106B.

Applicable to 57-2507 thru 57-2514 prior to incorporation of TCTO 1F-106(J)B-519 and TCTO 1F-106(J)B-525. Remove and/or replace actuating cylinder as shown in figure 8-15.

8-41. REPLACEMENT, ELECTRIC CANOPY ACTUATING CYLINDER, F-106B.

Applicable to 57-2515 and subsequent and 57-2507 thru 57-2514 after incorporation of TCTO 1F-106(J)B-519 and TCTO 1F-106(J)B-525. Remove and/or install actuating cylinder as shown in figure 8-16.

8-42. REPLACEMENT, CANOPY POWER PACKAGE.

Applicable to F-106A airplanes 57-244 and subsequent and 56-453 thru 57-243 after incorporation of TCTO 1F-106-J-519. Applicable to F-106B airplanes 57-2515 and subsequent and 57-2507 thru 57-2514 after incorporation of TCTO 1F-106(J)B-525. To remove the canopy power package proceed as follows:

a. Disconnect source of electrical power.

b. Remove cover.

c. Disconnect electrical leads at terminals.

d. Replace cover.

e. Remove 4 mounting bolts and remove power package.

Installation procedure is essentially the reverse of removal procedure; refer to T.O. 1F-106A-2-10 for wiring schematic and for detailed information concerning battery care.

8-43. REPLACEMENT, LATCH TELEFLEX CABLE, F-106A.

Applicable to 56-453 thru 57-243, remove and/or install canopy latch teleflex cable as shown in figure 8-17. *Applicable to 57-244 thru 58-798,* remove and/or install canopy latch teleflex cable as shown in figure 8-18. *Applicable to 59-001 and subsequent,* remove and/or install canopy latch teleflex cable as shown in figure 8-19.

8-43A. REMOVAL, CANOPY LATCH CONTROL HANDLE ASSEMBLY AND TELEFLEX UNIT AT STATION 140, F-106A.

Applicable to airplanes 57-244 and subsequent. Perform applicable steps "a" through "e" to remove latch handle assembly only. Perform applicable steps "a" thru "n" to remove latch handle assembly and teleflex unit.

a. Gain access to structure at upper end of latch handle shaft as follows:

1. Remove "Canopy Latch" position placard.
2. Remove cockpit trim.
3. Remove map reading light switch attach screws, pull switch clear.
4. Remove light support bracket attach screws, pull bracket clear.

b. Gain access to teleflex unit at station 140 by loosening fasteners that secure electronic panels to RH main console; reposition panels.

c. *Applicable to airplanes 57-244 thru 58-798,* disconnect latch handle shaft crank from teleflex unit by removing attach bolts.

d. *Applicable to airplanes 59-001 and subsequent,* remove nut and washer from lower end of latch handle shaft.

e. Remove mounting bolts that secure bearing support brackets at upper end of shaft to airplane structure. Remove latch handle shaft.

NOTE

If handle only is to be replaced, note relationship of crank *(57-244 thru 58-798)* or index on splined shaft *(59-001 and subsequent)* to old handle also note distance between lower end of shaft and old handle before disassembly. Assemble new handle to shaft at position identical to old handle.

f. Remove seat; see figure 8-35 or 8-48 for applicable procedure.

g. Remove all electrical and electronic panels from RH main console by loosening fasteners; reposition panels.

h. Disconnect electrical harness from console structure by removing clamps. Note routing of harness to aid in reinstallation.

i. *Applicable to airplanes 59-035 and subsequent.* Remove phenolic rub plate that covers flush head of upper outboard console attach screw at station 136; use putty knife or similar tool.

NOTE

Phenolic rub plate is cemented to structure with EC 776 (8040-664-0439).

j. Remove screws that attach console to inboard structure from station 126.90 to 169.60.

k. Remove screws that attach console to outboard structure from station 136 to 159.25; remove console.

l. Remove teleflex cable from teleflex unit; see figures 8-18 or 8-19 for applicable procedure.

m. *Applicable to airplanes 57-244 thru 58-798.* Disconnect conduit from teleflex unit and remove bulkhead type mounting nuts that secure unit to airplane structure; remove unit.

n. *Applicable to airplanes 59-001 and subsequent.* Disconnect conduit from teleflex unit and remove mounting bolts that secure unit to airplane structure; remove unit.

8-43B. INSTALLATION, CANOPY LATCH CONTROL HANDLE ASSEMBLY AND TELEFLEX UNIT AT STATION 140, F-106A.

Applicable to airplanes 57-244 and subsequent. Install latch handle assembly only by reversing procedures given in steps "a" thru "e," of paragraph 8-43A in reverse order. Install teleflex unit by reversing procedures given in steps "a" thru "n," of paragraph 8-43A, in reverse order.

ADJUSTMENT

8-44. ADJUSTMENT, CANOPY LATCH MECHANISM, F-106A.

See figure 8-20 for instructions on adjusting the canopy latch mechanism.

8-45. ADJUSTMENT, CANOPY UNLOCK WARNING LIGHT LIMIT SWITCHES, F-106A.

See figure 8-20 for instructions on adjusting the canopy unlock warning light limit switches.

8-46. ADJUSTMENT, CANOPY PROXIMITY SWITCH, F-106A.

Applicable to airplanes 57-2465, 57-2478 and subsequent. To adjust the canopy proximity switch, proceed as follows:

NOTE

On airplanes 57-2490, 57-2493, and 57-2496 thru 59-111, the electrical wiring to the canopy proximity switch has been tied back to deactivate the switch.

a. Gain access to switch located under upper left longeron at station 141 by removing cockpit trim.

b. Close canopy; check actuation point of switch. Switch shall actuate when canopy dagger fitting at station 141 reaches a point 0.09 inch to 0.06 inch from full closed position.

c. *Applicable to airplanes 57-2478 thru 59-111.* If switch actuation point is correct, proceed to step "e." If switch actuation point is incorrect, open canopy, remove screws attaching switch mounting bracket to longeron, add or remove washers between bracket and longeron to obtain correct switch actuation point, and install attach screws. Repeat step "b."

d. *Applicable to airplanes 57-2465, 59-112 and subsequent.* If switch actuation point is correct, proceed to step "e." If switch actuation point is incorrect, proceed as follows:

1. Loosen the lower mounting lock nut of the switch; tighten the upper mounting lock nut until switch plunger is bottomed out.
2. Loosen the upper mounting lock nut of the switch 3 full turns (approximately 0.12 inch); hold upper mounting lock nut and tighten lower mounting lock nut.

e. Close canopy and operate canopy latch to "LOCK" position; canopy unlock warning light shall extinguish. Operate canopy latches to "UNLOCK" position; canopy unlock warning light shall illuminate. Open canopy.

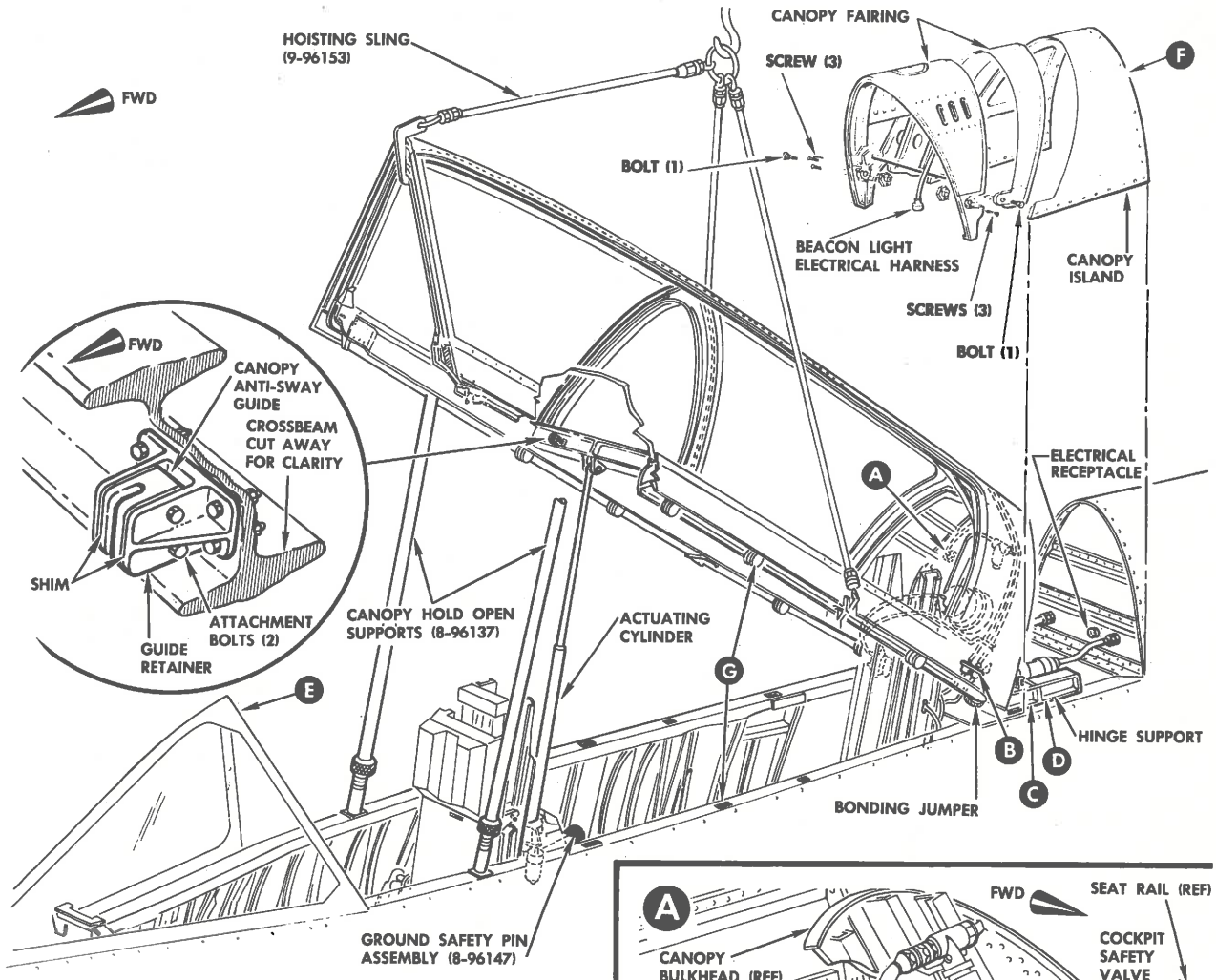
f. Replace cockpit trim.

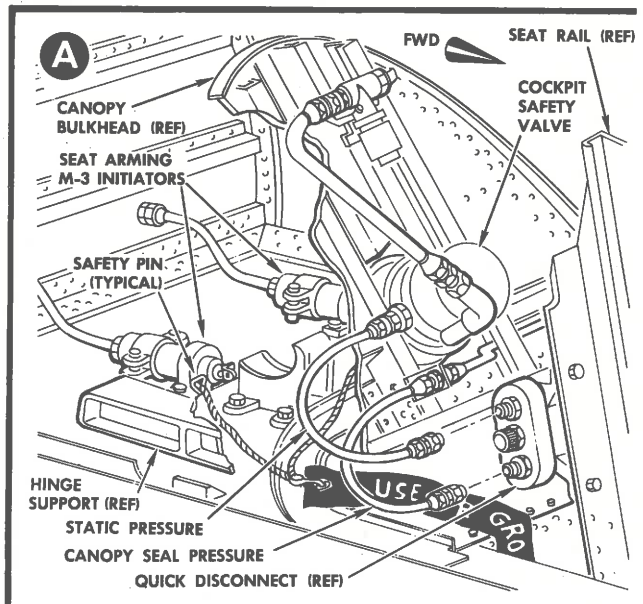
8-47. ADJUSTMENT, CANOPY LATCH MECHANISM, F-106B.

See figure 8-21 for instructions on adjusting the canopy latch mechanism.

8-48. ADJUSTMENT, CANOPY UNLOCK WARNING LIGHT LIMIT SWITCHES, F-106B.

See figure 8-21 for instructions on adjusting the canopy unlock warning light limit switches.





PREPARATION

a. *Applicable to airplanes equipped with pneumatic canopy actuating cylinders.* Check pneumatic system pressure and charge system if necessary.
b. Open canopy and install canopy hold-open support.
c. Install maintenance ground safety pins in canopy jettison and seat ejection system.

WARNING

TO PREVENT SERIOUS INJURY, MAINTENANCE GROUND SAFETY PINS SHALL BE INSTALLED DURING THIS PROCEDURE.

CANOPY REMOVAL

a. Remove canopy island.
b. Disconnect beacon light electrical harness. Cover electrical plug and receptacle.
c. Remove canopy fairing by removing 1 bolt and 3 screws at each side.

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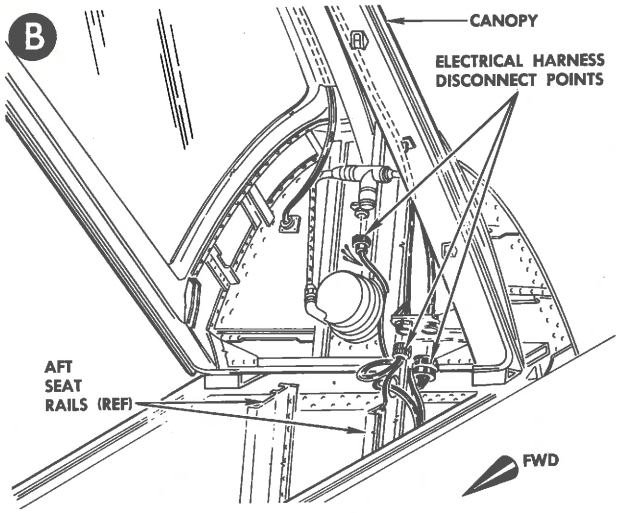
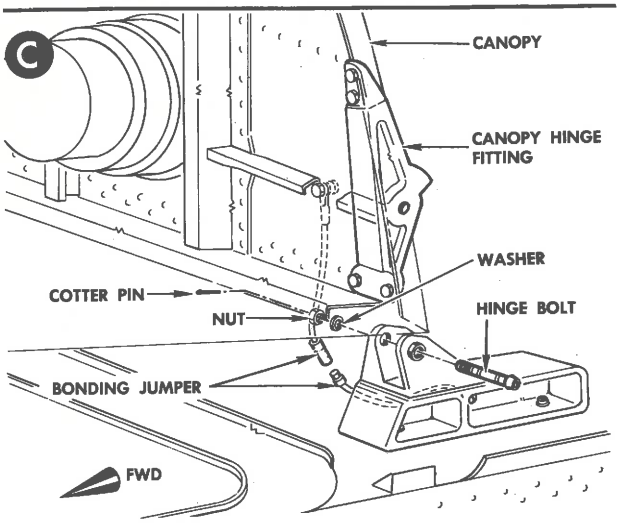
d. *Applicable to airplanes equipped with electric canopy actuating cylinders.* Install safety pin assembly in seat arming M-3 initiator(s). Disconnect seat arming straps from canopy structure.
e. Disconnect pressure tubing. Cap tubing and fittings.

Figure 8-12. Canopy Replacement, F-106B (Sheet 1 of 3)



f. Disconnect electrical harness to canopy. Cover disconnected points.

g. Station a man within the cockpit, remove canopy hold-open supports, and lower canopy.
h. Attach hoisting sling to canopy.
i. Disconnect actuating cylinder from canopy.



j. Disconnect bonding jumpers at each side. Remove hinge bolt at each side and remove canopy.

CANOPY INSTALLATION

To install canopy that has previously been installed and aligned on specific airplane, proceed as follows:

a. Perform step "a" of preparation procedure.
b. Install safety pins in seat and canopy ballistic systems.
c. Station a man within the cockpit. Attach canopy hoisting sling and hoist canopy into alignment with hinge fittings.
d. Coat hinge bolts with petrolatum, specification VV-P-236, and install with washer, nut and cotter pin. Connect bonding jumpers at each side.

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e. *Applicable to airplanes equipped with electric canopy actuating cylinders.* Connect seat arming strap(s) to canopy structure. Remove safety pin assembly from M-3 initiator(s); see detail A.

WARNING

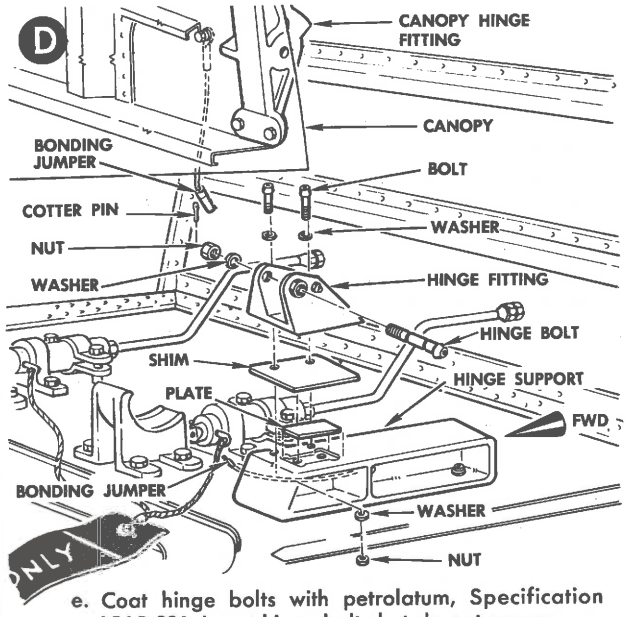
FAILURE TO CONNECT SEAT ARMING STRAP(S) AND/OR FAILURE TO REMOVE SAFETY PIN(S) FROM INITIATOR(S) WILL PREVENT SEAT EJECTION.

f. Install canopy fairing.
g. Connect beacon light electrical harness and install canopy island.
h. Connect actuating cylinder to canopy with bolt, washers, nut and cotter pin.
i. Connect pneumatic tubing as shown in detail A.
k. Connect electrical harness as shown in detail B.
l. *Applicable when new canopy is installed,* perform a complete operational check of the canopy normal system. Perform a cockpit pressure leak test; refer to T.O. 1F-106A-2-6 for procedure.
m. *Applicable when old canopy is reinstalled,* check canopy actuator and latches for proper operation.

CANOPY ALIGNMENT

Before installing a canopy that has not been previously installed on the specific airplane, proceed as follows:

a. Install safety pins in seat and canopy ballistic systems
b. *Applicable to 57-2507, -2509 thru -2511, 57-2515 and subsequent, and 57-2508, -2512 thru 57-2514* after incorporation of TCTO 1F-106(J)B-531. Remove anti-sway guide and shims by removing 2 bolts. See main view on sheet 1.
c. Remove canopy fairing from canopy by removing 1 bolt and 3 screws at each side.
d. Attach canopy hoisting sling and hoist canopy into alignment with hinge fittings.

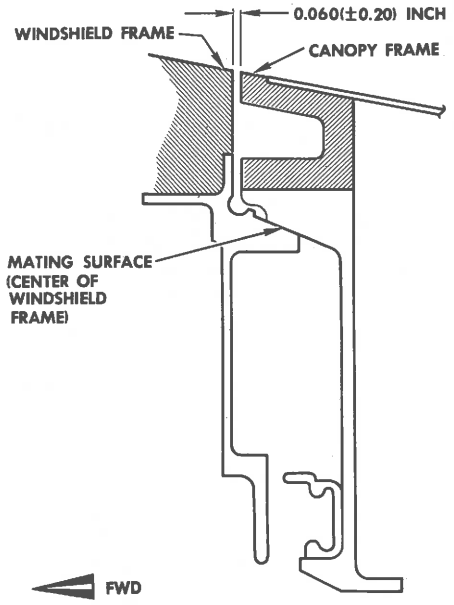


e. Coat hinge bolts with petrolatum, Specification VV-P-236. Insert hinge bolts but do not secure.

Figure 8-12. Canopy Replacement, F-106B (Sheet 2 of 3)

f. Remove hoisting sling; close and latch canopy. Check canopy for mating and alignment requirements as given in steps k through n. If canopy meets requirements, proceed with installation as given on page 2 of this figure. If canopy does not meet requirements, proceed as follows:
g. Attach hoisting sling, remove hinge bolts, and remove canopy. Remove canopy seal from canopy.
h. Remove four bolts attaching canopy hinge fitting to hinge support at each side. Remove and discard shim and shear plate. See detail D.
i. Place new shear plate (without holes) in recess of each hinge support then place new shim on top of each shear plate. Position hinge fittings and insert inboard attach bolts with washers under head; do not secure bolts. See detail D.
j. Repeat steps d and e.

E



k. Remove hoisting sling, check to see that canopy is seated on cockpit sill at all points, and that canopy to windshield mating surfaces are in contact. Vertical adjustment is obtained by peeling shims.
l. Position canopy laterally. Position canopy fore and aft to obtain 0.060 (±0.20) inch clearance at all points between the canopy frame and the windshield frame. Install washer and nut on each inboard bolt; tighten nuts.

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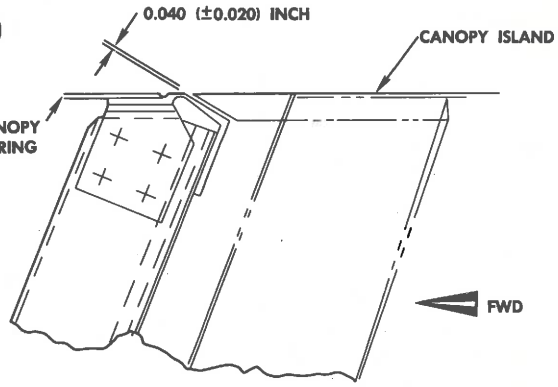
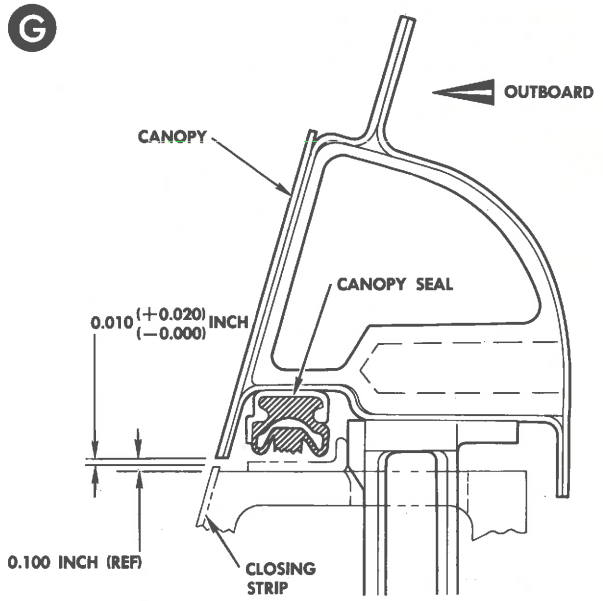


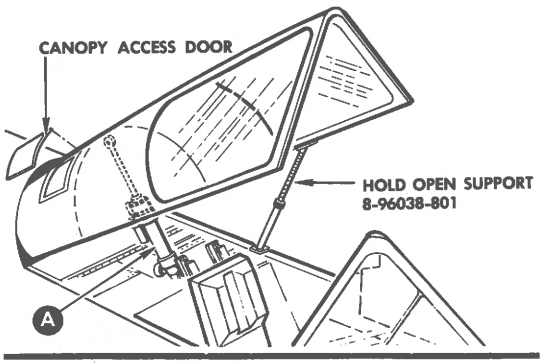
m. Install canopy fairing and partially install canopy island with enough screws to hold it in proper position. Check for 0.040 (±0.020) inch clearance between canopy fairing and canopy island. If necessary, remove canopy fairing and canopy island and obtain clearance by method given in steps "k" and "l".

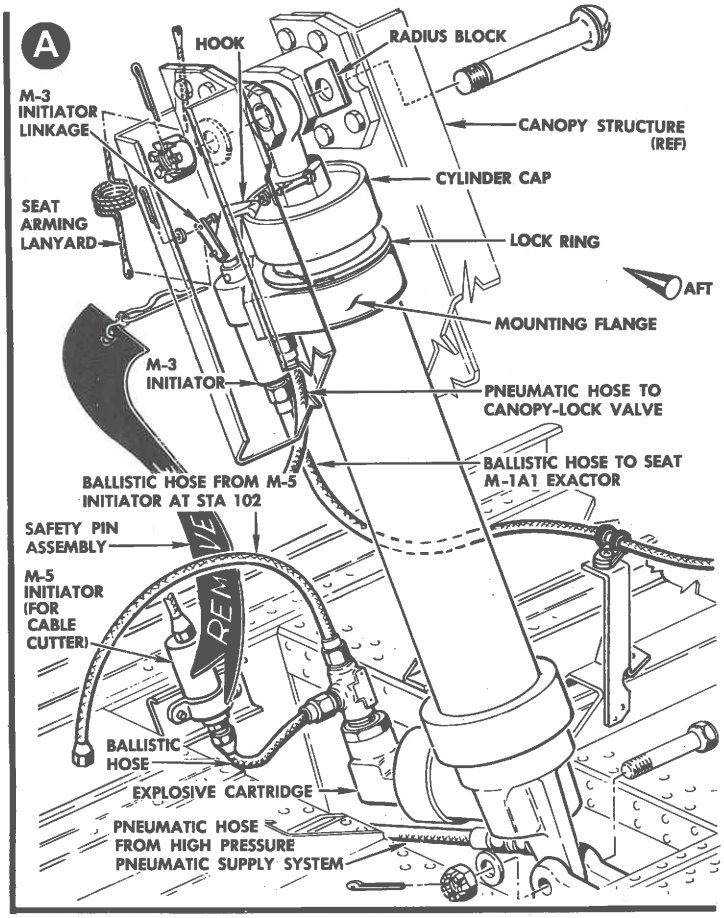
G



n. Install canopy seal in canopy. Trim closing strip at each side to obtain 0.010 (+0.020, −0.000) inch clearance between canopy and closing strip.
o. *Applicable to 57-2507, -2509 thru -2511, 57-2515 and subsequent, and 57-2508, -2512 thru 57-2514* after incorporation of TCTO 1F-106(J)B-531. Install anti-sway guide and shims; arrange shims so guide is positioned in a no side load condition.
p. Remove canopy island, remove canopy fairing, attach hoisting sling, remove hinge bolts and remove canopy.
q. Use hinge fitting as a drill jig to drill two 0.4374 (+0.002, −0.000) inch holes in each shear plate. See detail D.
r. Install hinge outboard attach bolts with washer under head and under nut; tighten nuts. See detail D.
s. Proceed with canopy installation on sheet 2 of this figure.

Figure 8-12. Canopy Replacement, F-106B (Sheet 3 of 3)





REMOVAL, CANOPY ACTUATING CYLINDER

a. Remove canopy access door from aft end of canopy.
b. Open canopy and install canopy hold-open support 8-96038-801.

NOTE

HIGH PRESSURE PNEUMATIC SYSTEM MUST BE CHARGED.

c. Install maintenance ground safety pins in canopy jettison and seat ejection systems.
d. Relieve high pressure pneumatic system pressure.
e. Bleed air pressure trapped in canopy pneumatic system by cracking pneumatic hose connection at upper cylinder port.
f. Disconnect pneumatic hoses at upper and lower cylinder ports.
g. Disconnect seat arming lanyard from M-3 initiator linkage.
h. Disconnect ballistic hose at M-3 initiator port.
i. Disconnect two ballistic hoses from explosive cartridge at base of cylinder.

NOTE

CAP ALL HOSE OPENINGS AND CYLINDER PORTS. TAG ALL HOSES TO AID IN REINSTALLATION.

j. Remove mounting bolt, nut, washer and cotter key at each end of cylinder and remove cylinder from airplane.
k. If actuating cylinder is to be returned to storage, remove M-3 initiator and explosive cartridge from cylinder. If same cylinder is to be reinstalled as is, place in suitable storage box.

INSTALLATION, CANOPY ACTUATING CYLINDER

a. Lubricate cylinder, with grease MIL-G-3278, at lubrication fitting at each end of cylinder.

WARNING

SAFETY PIN MUST BE INSTALLED IN M-3 INITIATOR BEFORE PERFORMING THE FOLLOWING STEP.

b. Install M-3 initiator on mounting flange. Engage cylinder cap with hook lip and connect hook and links to initiator pin. Adjust mounting flange to insure hook engagement without preload on initiator pin. Tighten lock ring and install safety wire.
c. Install explosive cartridge in base of actuating cylinder.
d. Align cylinder to lower mounting bracket and secure in place with mounting bolt, nut, washers; and cotter key. Torque nut to 60 to 85 inch-pounds before installing key.
e. Connect actuating cylinder to canopy structure. Do not tighten bolt.
f. Connect seat arming lanyard to M-3 initiator linkage.
g. Remove canopy hold-open support; manually lower and latch canopy.
h. Remove bolt connecting actuating cylinder to canopy structure.
i. With actuating cylinder piston rod fully retracted, adjust rod end until hole in rod end aligns with hole in canopy structure then screw rod end in 1 to 1½ turns. Tighten and secure rod end jam nut.
j. With radius block under head of bolt, connect actuating cylinder to canopy structure as shown. Install washer and nut. Torque nut to 60 to 85 inch-pounds and install cotter pin.

NOTE

THE ROD END LUBRICATION FITTING MUST FACE AFT.

k. Connect pneumatic and ballistic hoses to actuating cylinder as shown.
l. Charge high pressure pneumatic system.
m. Perform an operational check.
n. When all maintenance work within the cockpit has been completed, remove safety pins installed per step c. of removal procedure.
o. Install access door on top aft end of canopy.

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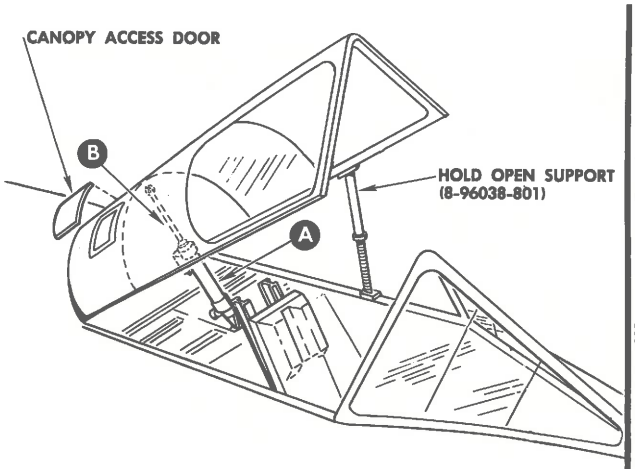
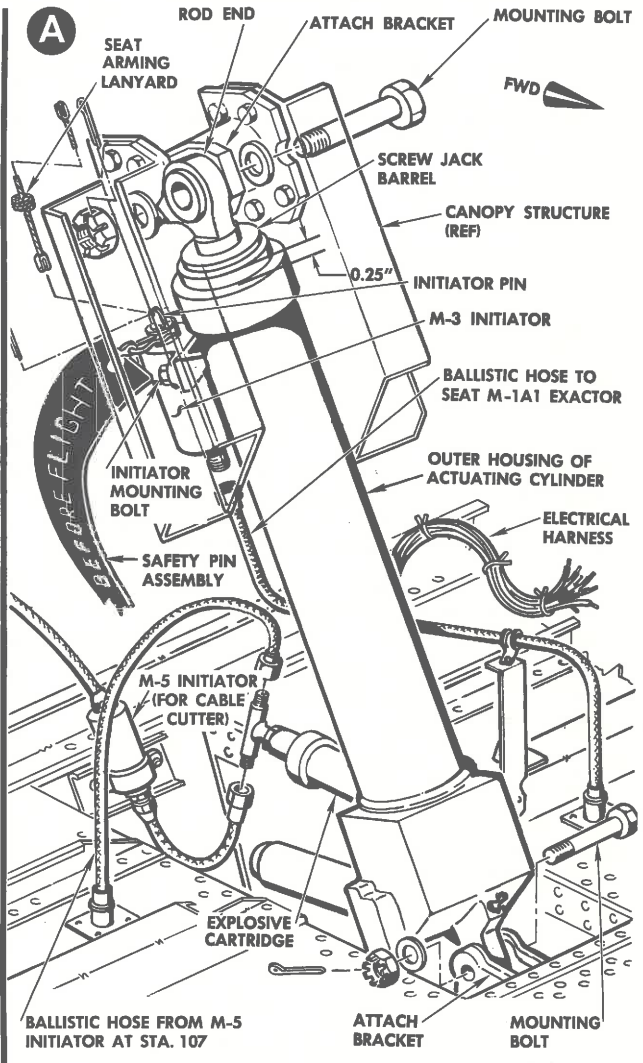
Figure 8-13. Pneumatic Canopy Actuating Cylinder Replacement, F-106A
Applicable to 56-453 thru 57-243 prior to incorporation of TCTO 1F-106J-525





CYLINDER SHOWN RETRACTED

PREPARATION

a. Connect external source of 28-volt DC power to airplane.
b. Remove access door from top aft section of canopy structure.
c. Install canopy hold-open support. Install safety pins in canopy jettison and seat ejection systems.

REMOVAL, CANOPY ACTUATING CYLINDER

a. Disconnect seat arming lanyard from initiator pin.
b. Disconnect ballistic hose from M-3 initiator.
c. Disconnect ballistic hoses from explosive cartridge.

NOTE

CAP ALL HOSE OPENINGS AND CYLINDER PORTS. TAG ALL HOSES TO AID IN REINSTALLATION.

d. Disconnect actuating cylinder from canopy structure by removing mounting bolt.
e. Grasp barrel of actuating cylinder screw jack; hold canopy control switch at "CLOSE" position until screw jack barrel lacks approximately 0.25 inch from being flush with outer housing of actuating cylinder.

CAUTION

DO NOT PERMIT ACTUATING CYLINDER SCREW JACK BARREL TO ROTATE DURING RETRACTION.

f. Disconnect electrical harness from cylinder by cutting wires at permanent splices.
g. Disconnect actuating cylinder from lower mounting bracket by removing mounting bolt. Remove actuating cylinder.
h. If actuating cylinder is to be returned to storage, remove M-3 initiator from cylinder. If same cylinder is to be reinstalled as is, place in suitable storage box.

INSTALLATION, CANOPY ACTUATING CYLINDER.

a. Lubricate cylinder with grease, MIL-G-3278, at lubrication fitting at each end of cylinder.
b. Install explosive cartridge in actuating cylinder if not already installed.
c. Align cylinder, with lower lubricating fitting forward, to lower mounting bracket and secure in place with mounting bolt, nut, washers, and cotter key. Torque nut to 60 to 85 inch-pounds before installing key.
d. Splice electrical harness to cylinder; refer to T. O. 1F-106A-2-13 for wiring diagram.
e. Grasp barrel of actuating cylinder screw jack; hold canopy control switch at "OPEN" position until up travel limit switch actuates to remove power from the motor.

NOTE

NEW ACTUATING CYLINDERS ARE EQUIPPED WITH A GUARD THAT PREVENTS ROTATION OF THE SCREW JACK BARREL. REMOVE GUARD AFTER SCREW JACK BARREL IS EXTENDED. SEE DETAIL B.

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Figure 8-14. Electric Canopy Actuating Cylinder Replacement, F-106A (Sheet 1 of 2)
Applicable to 57-244 and subsequent; and 56-453 thru 57-243 after incorporation of TCTO 1F-106J-525

CAUTION

SCREW JACK BARREL MUST NOT BOTTOM OUT; CHECK THAT A MINIMUM OF ONE FULL TURN TOWARDS EXTEND DIRECTION IS AVAILABLE AFTER UP TRAVEL LIMIT SWITCH ACTUATES.

f. Check that screw jack barrel has extended 9.38 (±0.18) inches from the outer housing of the actuating cylinder. If dimension is correct, observe caution and proceed to step "g." If dimension is incorrect, rotate screw jack barrel until correct dimension is obtained. Hold screw jack barrel, electrically operate actuator towards close, then towards open until the up travel limit switch actuates, and recheck extended length of screw jack barrel.

g. Secure rod end to attachment bracket with mounting bolt (head of bolt towards left side of airplane), nut, washer, and cotter key. Torque nut to 60 to 85 inch-pounds before installing key. See Detail A.

NOTE

THE ROD END LUBRICATION FITTING MUST FACE AFT.

h. Install M-3 initiator on actuating cylinder; safety-wire initiator mounting bolts. Connect seat arming lanyard to initiator pin.

WARNING

SAFETY PIN MUST BE INSTALLED BEFORE HANDLING M-3 INITIATOR.

i. Connect ballistic hose to M-3 initiator. Connect ballistic hoses to explosive cartridge.

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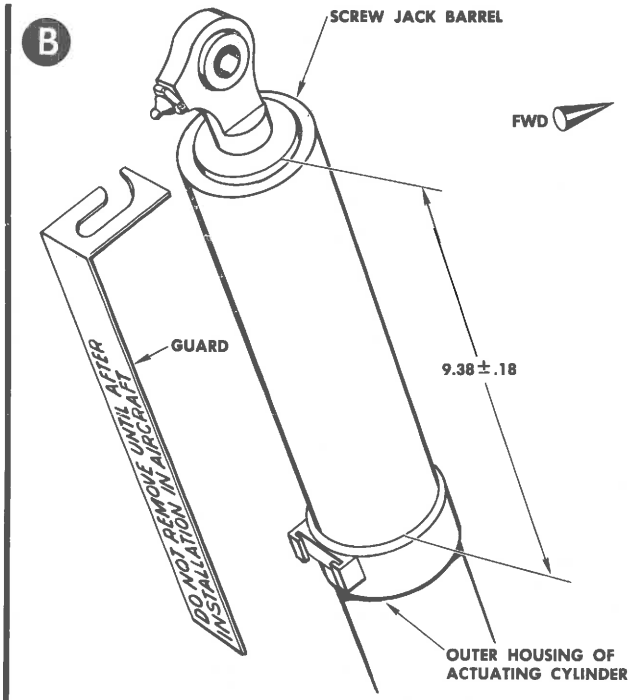


CYLINDER SHOWN EXTENDED

j. Perform an operational check.

k. Remove maintenance safety pins from canopy jettison and seat ejection systems.

l. Install access door on top aft section of canopy structure.

Figure 8-14. Electric Canopy Actuating Cylinder Replacement, F-106A (Sheet 2 of 2)
Applicable to 57-244 and subsequent; and 56-453 thru 57-243 after incorporation of TCTO 1F-106J-525

8-49. ADJUSTMENT, ELECTRIC CANOPY ACTUATING SYSTEM SWITCHES.

Applicable to F-106A airplanes equipped with electric actuating cylinders. See figure 8-22 for adjustment procedure of the electric canopy actuating system switches.

Applicable to F-106B airplanes equipped with electric actuating cylinders. To adjust the latch closed switch proceed as follows:

a. Open canopy and install canopy hold-open support.

b. Install ground maintenance safety pins as shown in figure 8-43.

WARNING

Make sure that canopy hold-open supports are installed before performing the following step. Operating canopy latches to locked position disengages the actuating cylinder clutch and the canopy will fall and may cause serious injury.

c. Depress latch safety lock through hole in right canopy sill at Station 214 and operate canopy latches to full locked position.

d. Adjust switch so that cam, of canopy seal selector valve mechanism, actuates the switch within the last 0.06 inch of travel. The switch shall not bottom out. See figure 8-31 for an illustration of the canopy seal selector valve mechanism.

8-50. ADJUSTMENT, PNEUMATIC CANOPY LIFT CONTROL LEVER.

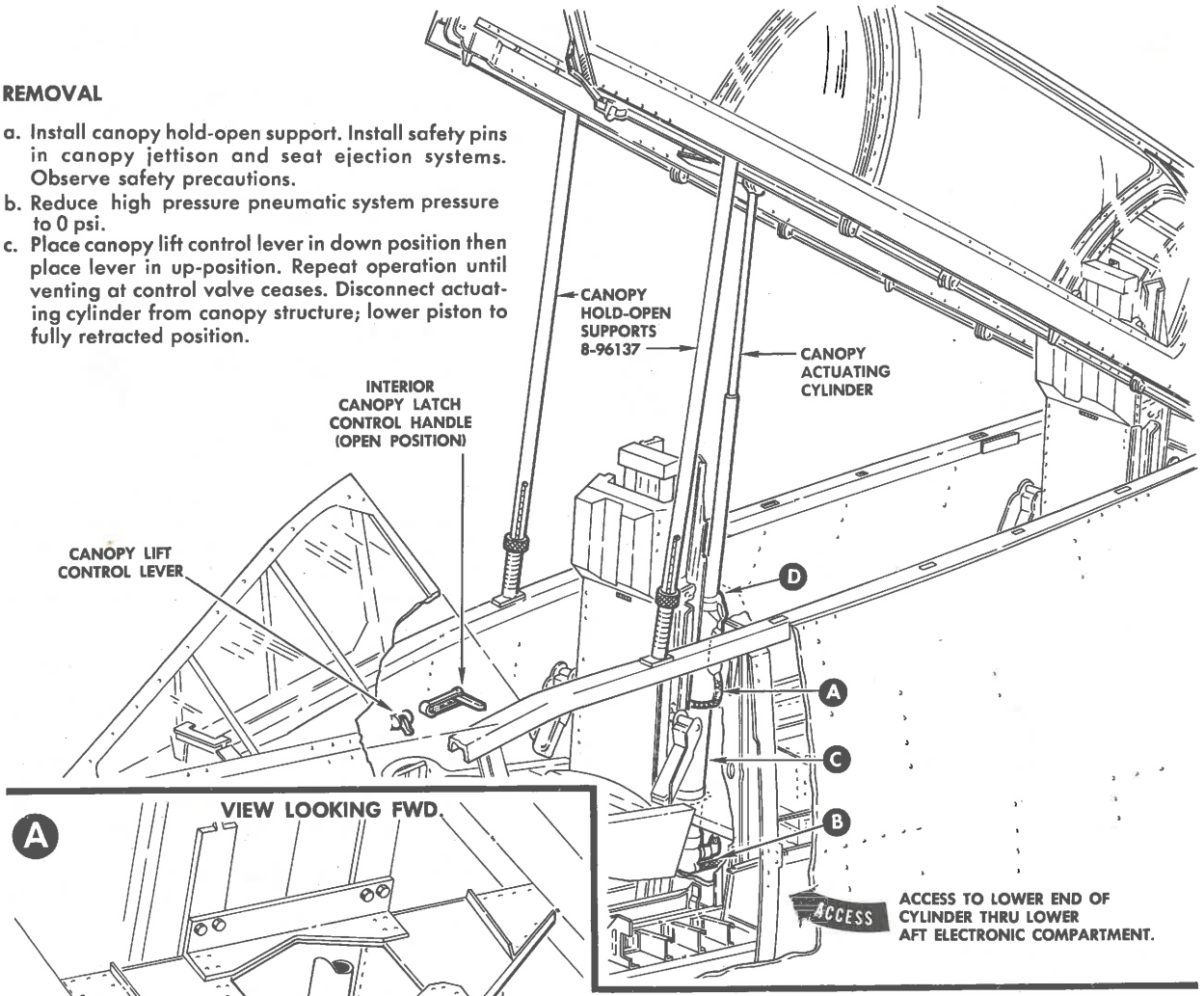
Applicable to F-106B airplanes equipped with pneumatic actuating cylinders. See figure 8-23 for adjustment procedure of the canopy lift control lever.

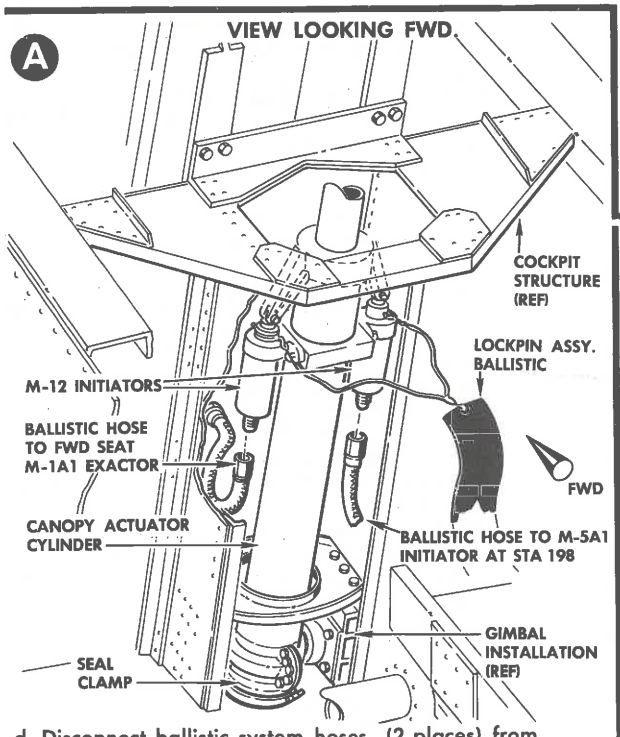
8-51. ADJUSTMENT, ELECTRIC CANOPY ACTUATOR CLUTCH SYSTEM.

Applicable to F-106B airplanes equipped with electric actuating cylinders. See figure 8-24 for adjustment procedure of the canopy actuator clutch release system.

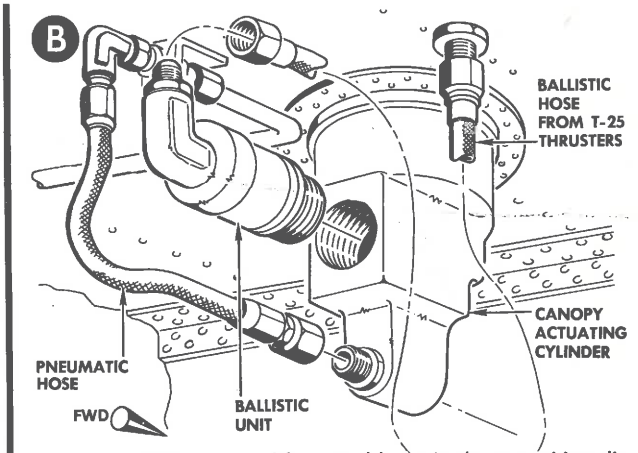
REMOVAL

a. Install canopy hold-open support. Install safety pins in canopy jettison and seat ejection systems. Observe safety precautions.
b. Reduce high pressure pneumatic system pressure to 0 psi.
c. Place canopy lift control lever in down position then place lever in up-position. Repeat operation until venting at control valve ceases. Disconnect actuating cylinder from canopy structure; lower piston to fully retracted position.





d. Disconnect ballistic system hoses (2 places) from initiators. Cap hoses and fittings. Disconnect clamp from cockpit floor seal.



e. With canopy lift control lever in down position disconnect pneumatic hose from actuating cylinder. Disconnect ballistic system hose, and remove ballistic unit. Cap hoses, ballistic unit, and actuating cylinder.

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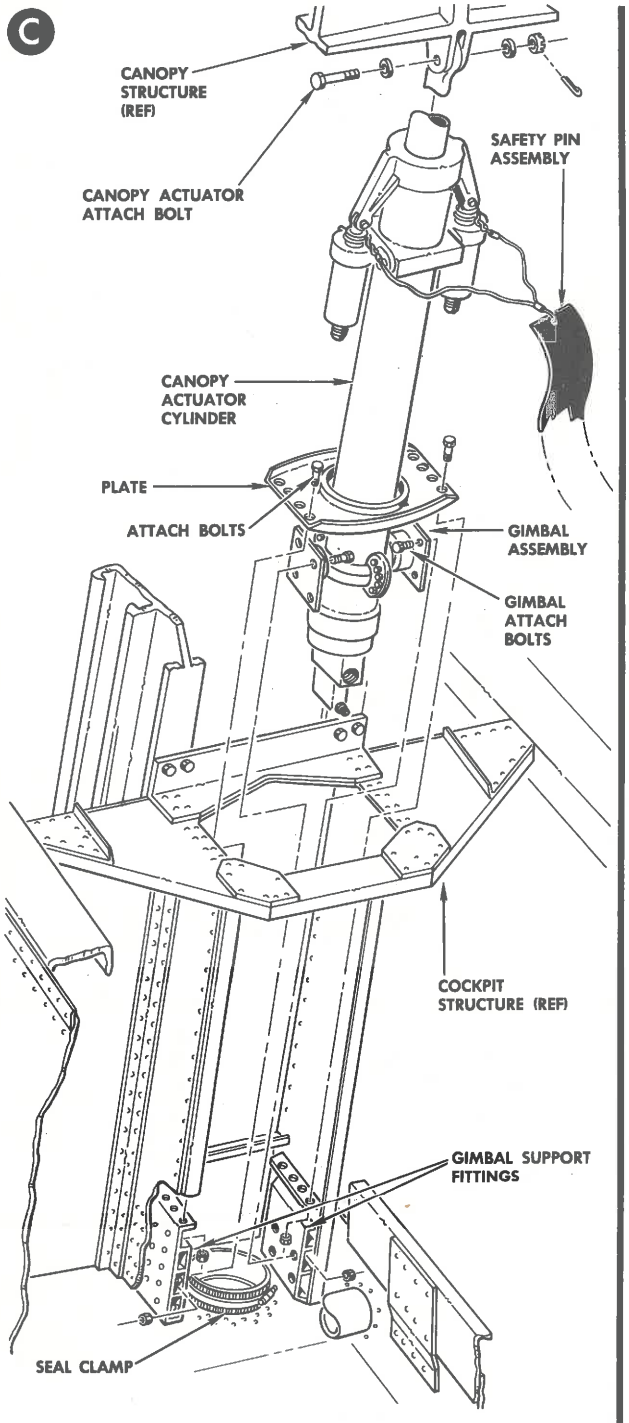
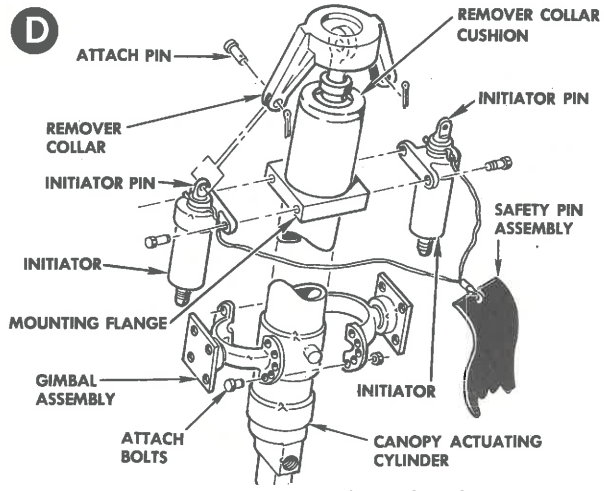
Figure 8-15. Pneumatic Canopy Actuating Cylinder Replacement, F-106B (Sheet 1 of 2)
Applicable to 57-2507 thru 57-2514 prior to incorporation of TCTO 1F-106(J)B-519 and TCTO 1F-106(J)B-525



f. Remove plate attach bolts. Support weight of actuating cylinder and remove gimbal installation attach bolts.

g. Remove actuating cylinder, plate, and gimbal installation (as one unit) from airplane.



h. If actuating cylinder is to be replaced, remove initiators, remover collar, remover collar cushion, gimbal assembly and plate from actuating cylinder. Observe safety precautions.

INSTALLATION

a. Install canopy hold-open support. Install safety pins in canopy jettison and seat ejection systems. Observe safety precautions.

b. If replacement actuating cylinder is to be installed, install parts removed by step "h" of removal procedure. Adjust mounting flange so that remover collar is in contact with but does not compress remover collar cushion when remover collar is connected to initiator pins. Safety-wire mounting flange.

c. Position actuating cylinder to align gimbal assembly with gimbal support fittings and install attach bolts. Connect and tighten floor seal clamp. Position plate and install plate attach bolts. See detail C.

d. Connect actuating cylinder to canopy by inserting attach bolt; do not secure bolt.

e. Connect ballistic hoses to initiators as shown in detail A.

f. Install ballistic unit shown in detail B. Connect ballistic hose to ballistic unit. Connect pneumatic hose to actuating cylinder. See detail-B.

g. Charge high pressure pneumatic system.

h. Remove canopy hold-open support, lower canopy, and remove bolt inserted in step d.

i. Latch canopy and adjust actuator piston rod length so that centerline of hole in rod end bearing is 0.25 inch below the centerline of the canopy mounting bracket hole.

j. Lift rod end bearing into alignment with canopy mounting bracket and connect rod end to canopy with bolt, washers, and nut. Tighten nut and install cotter pin.

k. Unlatch canopy and check pneumatic operation of canopy.

l. Perform a cockpit pressure leak test; refer to T. O. 1F-106A-2-6 for procedure.

m. Install canopy hold-open support. When all maintenance work within the cockpit has been completed, remove ground maintenance safety pins installed per step a.

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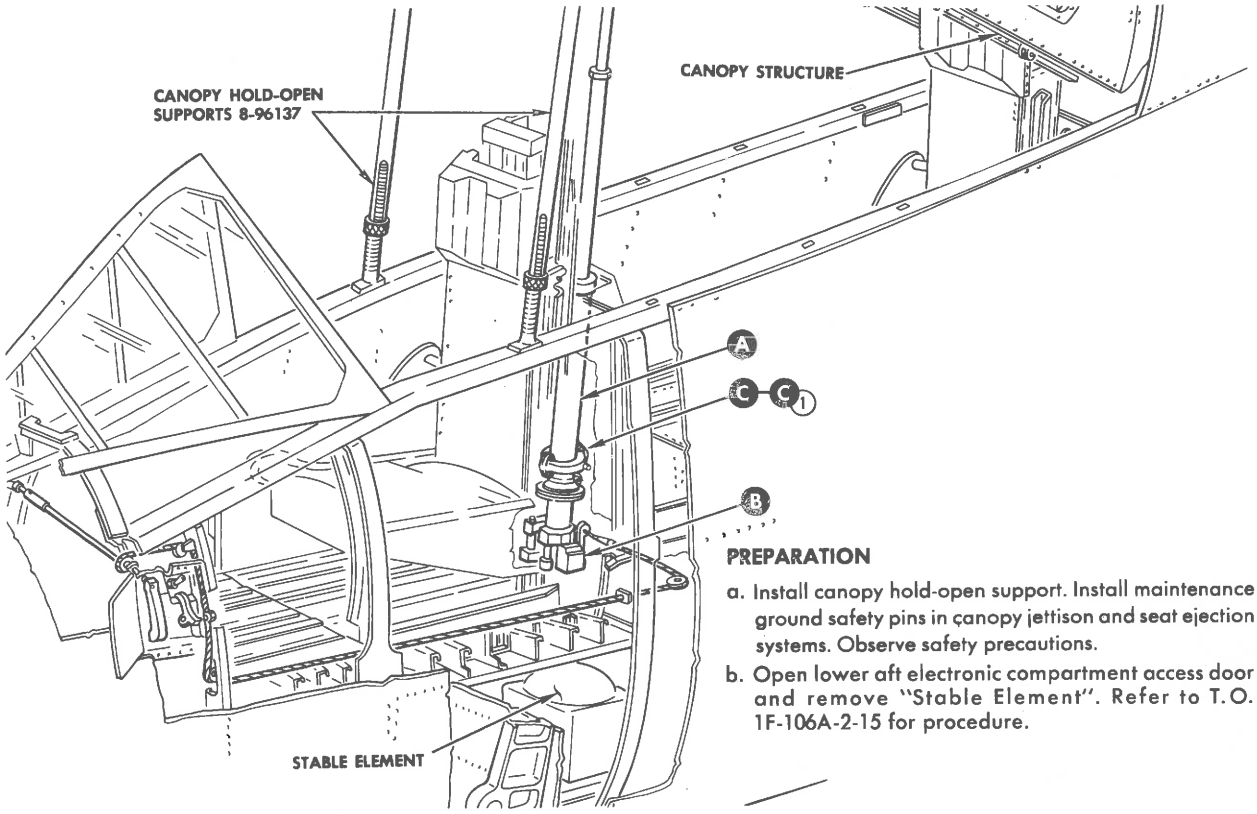
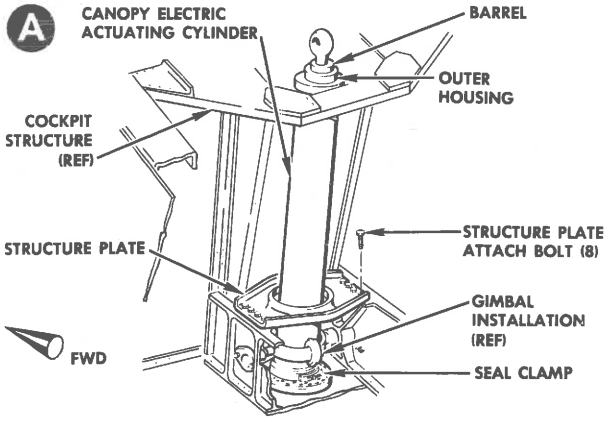
Figure 8-15. Pneumatic Canopy Actuating Cylinder Replacement, F-106B (Sheet 2 of 2)
Applicable to 57-2507 thru 57-2514 prior to incorporation of TCTO 1F-106(J)B-519 and TCTO 1F-106(J)B-525



PREPARATION

a. Install canopy hold-open support. Install maintenance ground safety pins in canopy jettison and seat ejection systems. Observe safety precautions.

b. Open lower aft electronic compartment access door and remove "Stable Element". Refer to T.O. 1F-106A-2-15 for procedure.



REMOVAL

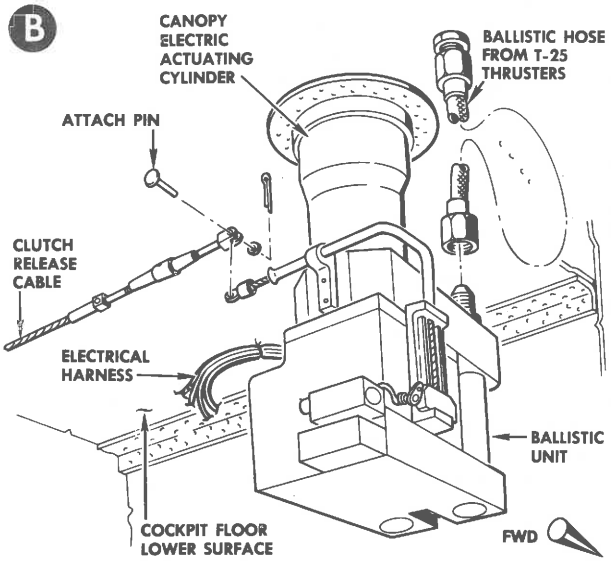
a. Disconnect actuating cylinder rod end from canopy structure.

b. Grasp barrel of actuating cylinder screw jack; hold canopy control switch at "CLOSE" position until screw jack barrel lacks 0.25 inch from being flush with outer housing of actuating cylinder.

CAUTION

DO NOT PERMIT ACTUATING CYLINDER SCREW JACK BARREL TO ROTATE DURING SCREW JACK RETRACTION.

c. Remove structure plate attach bolts.



d. Disconnect ballistic hose from ballistic unit. Plug hose and cap ballistic unit.

e. Cut actuating cylinder electrical harness at permanent splice nearest to cylinder.

f. Loosen turnbuckle, then disconnect brake (clutch) release cable from actuating cylinder.

g. Support weight (approximately 32 pounds) of actuating cylinder during steps h through k.

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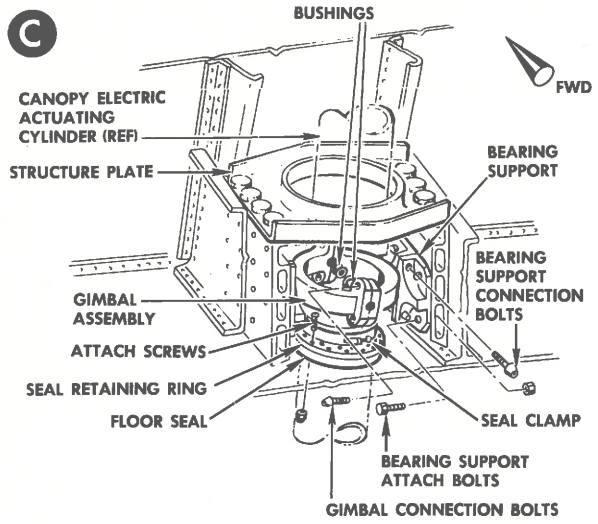
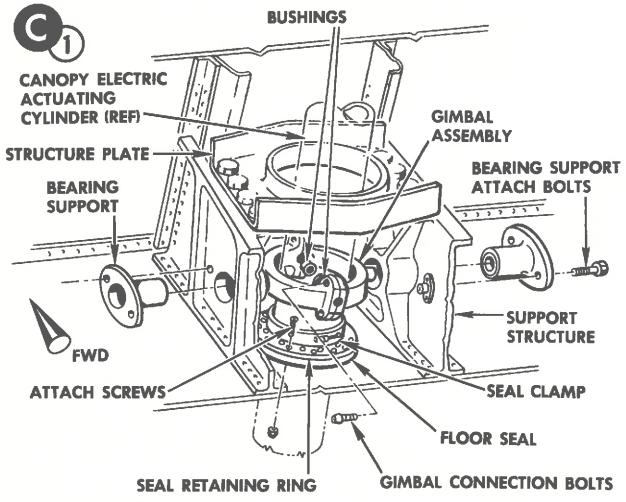
Figure 8-16. Electric Canopy Actuating Cylinder Replacement, F-106B (Sheet 1 of 2)
Applicable to 57-2515 and subsequent; and 57-2507 thru 57-2514 after incorporation of TCTO 1F-106(J)B-519 and TCTO 1F-106(J)B-525



h. *Applicable to airplanes 57-2515 thru 57-2522.* Remove bolts connecting gimbal assembly halves. Remove bolts connecting bearing support halves. Remove bolts attaching bearing supports to structure.



i. *Applicable to airplanes 57-2523 and subsequent.* Remove bolts connecting gimbal assembly halves. Remove bolts attaching bearing supports to structure.

j. Remove bearing supports and gimbal assembly from actuating cylinder; remove bushings (2).

k. Remove floor seal clamp. Mark floor seal retaining ring, seal, and floor with grease pencil. Remove floor seal retaining ring and floor seal.

l. Lower actuating cylinder down and aft through lower aft electronic access door.

m. Remove ballistic unit from actuating cylinder; cap unit and plug actuating cylinder. Observe safety precautions.

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INSTALLATION

a. Refer to PREPARATION procedure.

b. Assemble ballistic unit to actuating cylinder. Observe safety precautions.

c. With actuating cylinder facing as shown in detail B, insert cylinder through opening in floor. As the cylinder passes through the floor, slide the floor seal and floor seal retaining ring into position. Place structure plate in position.

d. Properly position and support weight (approximately 32 pounds) of actuating cylinder during steps "e" through "j."

e. Install floor seal retaining ring.

f. Apply a light coat of MIL-G-3278 grease to actuating cylinder trunnions. Install bushings on trunnions.

g. Install bearings on gimbal trunnions.

h. Assemble gimbal assembly to actuating cylinder; make sure that connecting bolt threads are engaged but do not tighten bolts.

i. *Applicable to airplanes 57-2515 thru 57-2522.* Assemble bearing support halves to gimbal bearings; do not tighten bolts. Install bolts attaching bearing supports to structure. Tighten all bolts installed in this step and in step "h." See detail C.

j. *Applicable to airplanes 57-2523 and subsequent.* Install bearing supports. Tighten bolts installed in this step and in step "h." See detail C1.

k. Install structure plate. See detail A.

l. Install floor seal clamp.

m. Connect actuating cylinder electrical harness at permanent splice; refer to T.O. 1F-106B-2-13 for wiring diagram.

n. Connect clutch release cable to actuating cylinder; see detail B. Adjust canopy actuator clutch system.

o. Connect ballistic system tubing to ballistic unit. See detail B.

p. Grasp barrel of actuating cylinder screw jack; hold canopy control switch at "OPEN" position until up travel limit switch actuates to remove power from motor.

q. Check that screw jack barrel has extended 45.62 (±0.13) inches from the outer housing of the actuating cylinder. If dimension is correct, observe caution and proceed to step "r." If dimension is incorrect, rotate screw jack barrel until correct dimension is obtained. Hold screw jack barrel, electrically operate actuator towards close, then toward open until the up travel limit switch actuates, and recheck extended length of screw jack barrel.

CAUTION

SCREW JACK BARREL MUST NOT BOTTOM OUT; CHECK THAT A MINIMUM OF ONE FULL TURN TOWARDS EXTEND DIRECTION IS AVAILABLE AFTER UP TRAVEL LIMIT SWITCH ACTUATES.

r. Connect screw jack rod end to canopy structure, lubrication fitting must face forward.

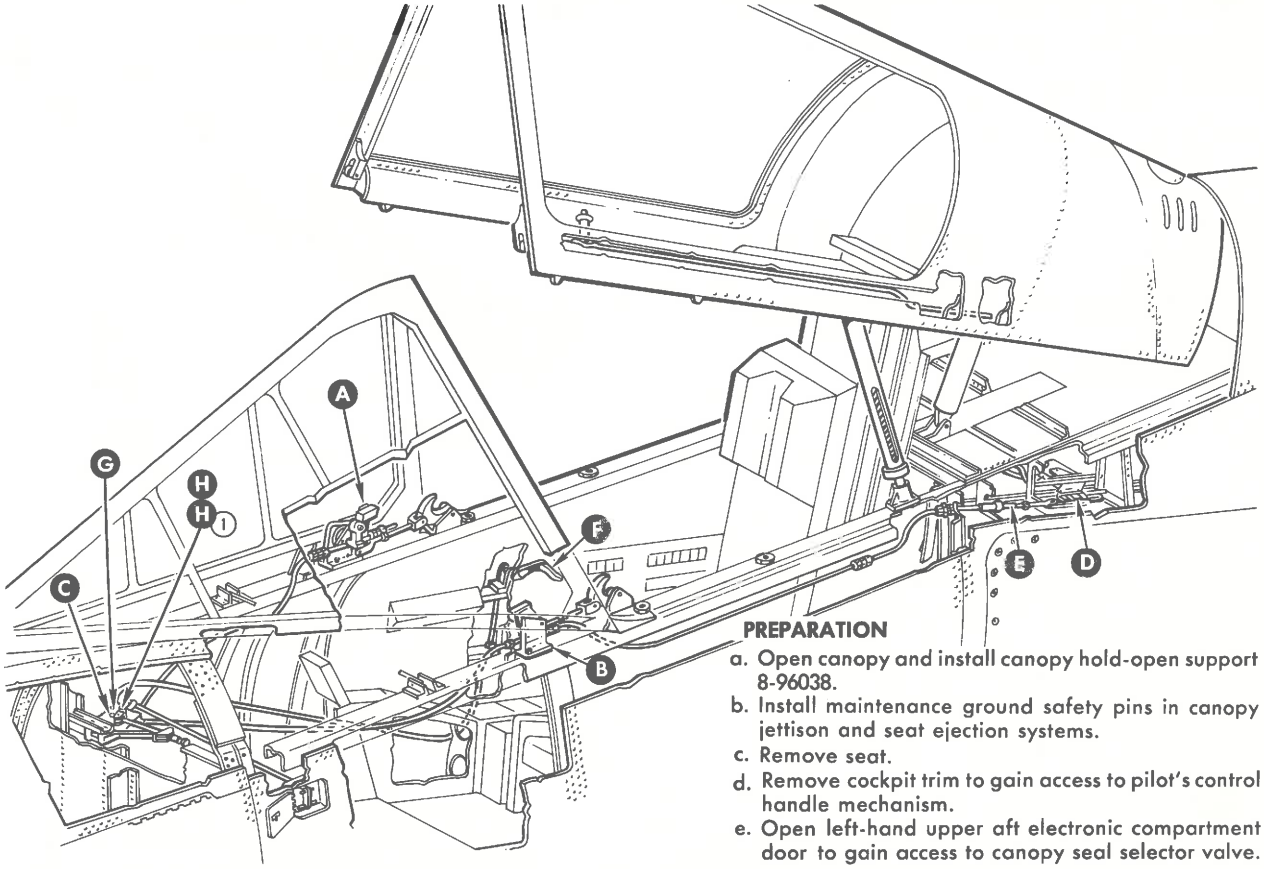
s. Perform an operational check.

t. Perform a cockpit pressure leak test; refer to T.O. 1F-106A-2-6 for procedure.

u. Install and adjust "Stable Element" by procedure given in T.O. 1F-106A-2-15.

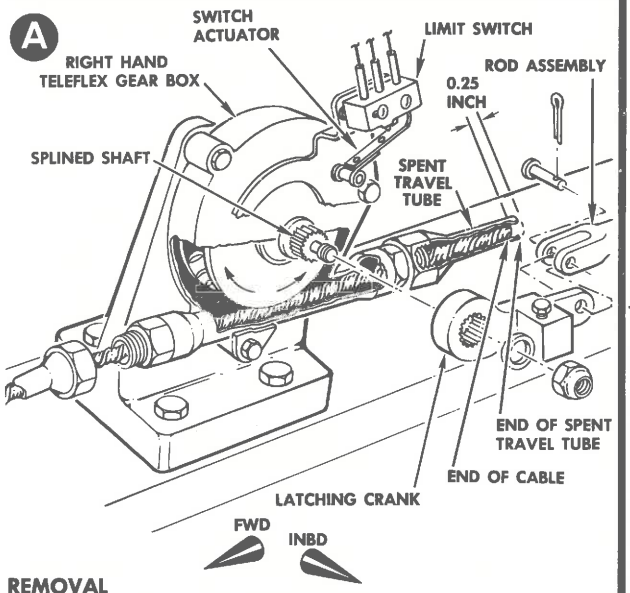
v. When all maintenance work within the cockpit has been accomplished; remove maintenance ground safety pins installed in ballistic initiators.

Figure 8-16. Electric Canopy Actuating Cylinder Replacement, F-106B (Sheet 2 of 2)
Applicable to 57-2515 and subsequent; and 57-2507 thru 57-2514 after incorporation of TCTO 1F-106(J)B-519 and TCTO 1F-106(J)B-525



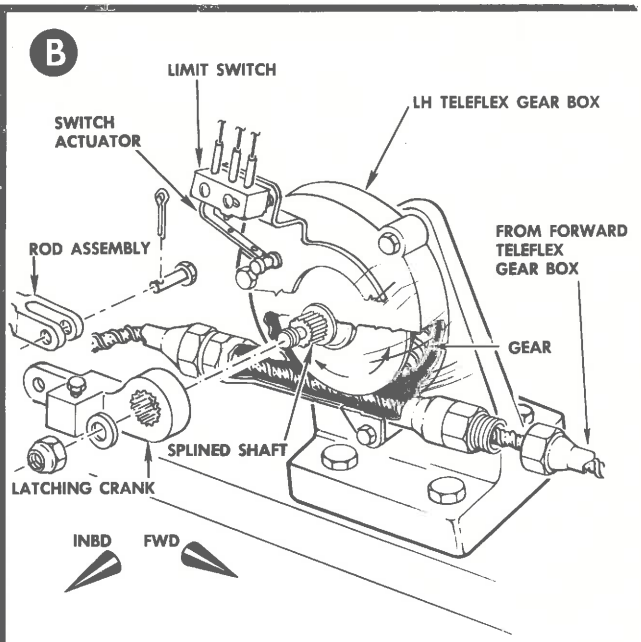
PREPARATION

a. Open canopy and install canopy hold-open support 8-96038.
b. Install maintenance ground safety pins in canopy jettison and seat ejection systems.
c. Remove seat.
d. Remove cockpit trim to gain access to pilot's control handle mechanism.
e. Open left-hand upper aft electronic compartment door to gain access to canopy seal selector valve.



REMOVAL

a. Remove spent travel tube from gear box.
b. Disconnect latching crank from rod assembly. Disconnect and remove crank from splined shaft of gear box.



c. Disconnect latching crank from rod assembly. Disconnect and remove crank from splined shaft of gear box.

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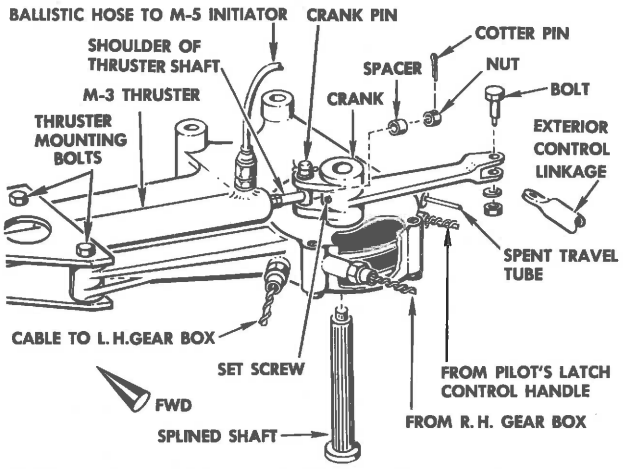
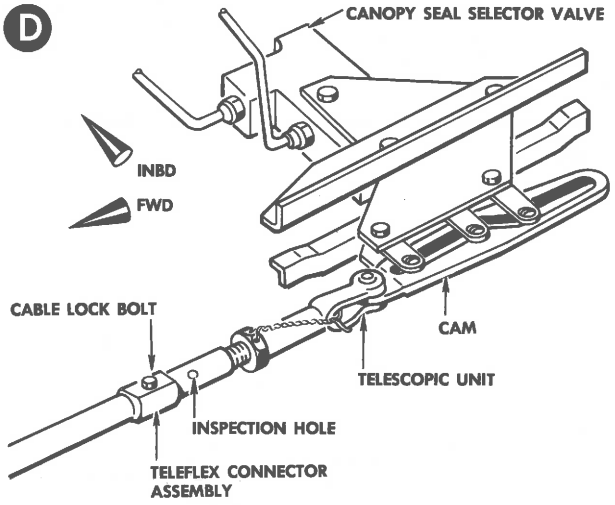
Figure 8-17. Latch Teleflex Cable Replacement, F-106A (Sheet 1 of 4)
Applicable to 56-453 thru 57-243

C GEAR BOX SHOWN IS *APPLICABLE TO 56-454, -457 AND 56-462 AND SUBSEQUENT*. PROCEDURE IS APPLICABLE TO ALL AIRPLANES.



d. Disconnect exterior control linkage from crank.
e. Remove cotter pin, nut, and spacer from thruster shaft.
f. Disconnect ballistic hose from each end of M-3 thruster, remove thruster mounting bolts, and remove thruster.
g. Remove safety wire from set screw. Insert screwdriver through hole in crank pin and loosen set screw. Remove splined shaft from gearbox.
h. Remove spent travel tube from gear box.

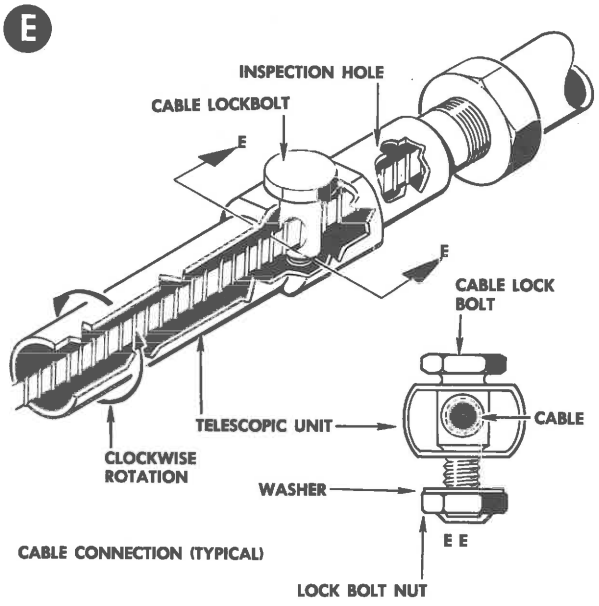
D



CAM SHOWN IN LATCHED POSITION

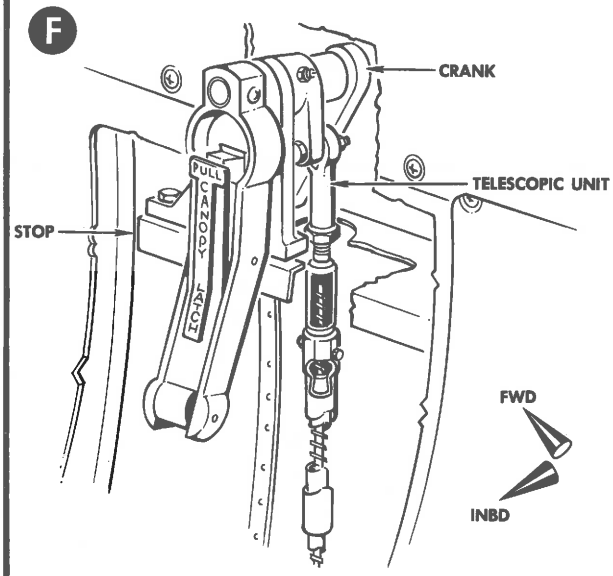
i. Disconnect telescopic unit from cam of canopy seal selector valve.

E



j. Loosen cable lock bolt nut and rotate telescopic unit clockwise until cable is disconnected.

F



PILOT'S CONTROL HANDLE IN LATCHED POSITION

k. Disconnect telescopic unit from crank of pilot's control handle mechanism and pull cable from conduit.
l. Disconnect telescopic unit from cable. See Step "j" in Detail E for procedure.
m. Pull second cable from spent travel port of right-hand gear box shown in Detail A.

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Figure 8-17. Latch Teleflex Cable Replacement, F-106A (Sheet 2 of 4)
Applicable to 56-453 thru 57-243

INSTALLATION

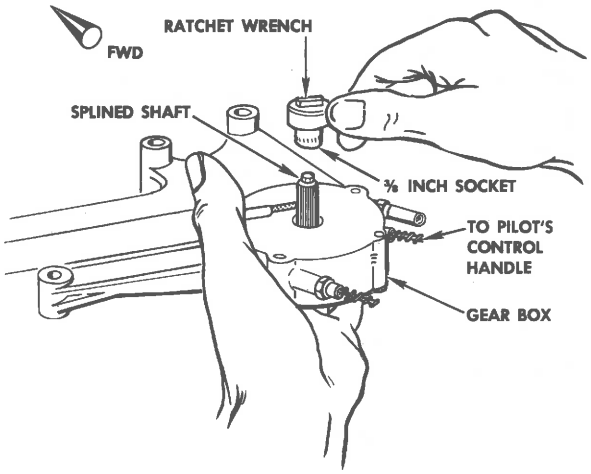
a. File radius on both ends of new cables. Clean and lubricate new cables in accordance with procedure given in Section III, of this manual.

b. Connect cable to telescopic unit, at pilot's control handle, shown in detail F by rotating telescopic unit counterclockwise until cable is visible through inspection hole as shown in detail E. Tighten lock bolt.

c. Feed cable manually into conduit until further insertion becomes difficult.

G

d. Insert and hold splined shaft in forward gear box. Engage upper end of shaft with wrench; rotate shaft until telescopic unit aligns with crank of pilot's control handle. Remove wrench and remove splined shaft.



e. Feed second cable into spent travel port of forward gear box until cable lacks 0.25 inch from reaching end of spent travel tube of right-hand gear box when tube is installed. See detail A. Install spent spent travel tube of right-hand gear box.

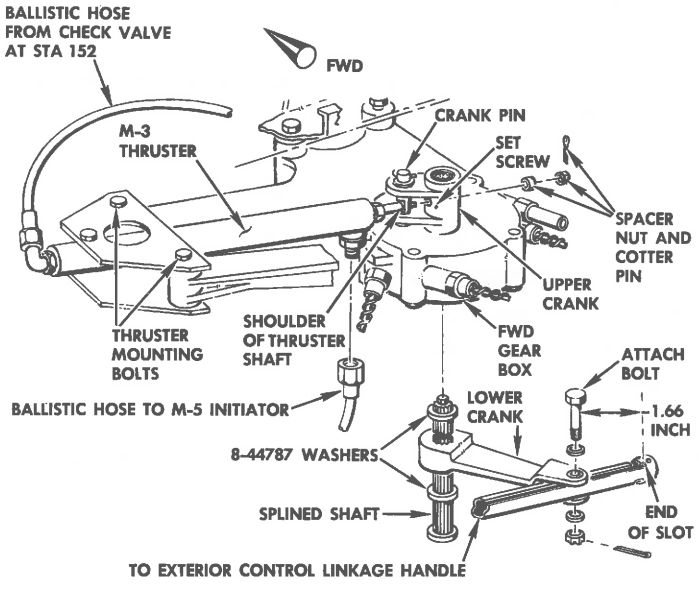
f. Connect telescopic unit to pilot's control handle. Operate control handle to unlatched position and then to latched position; the cable lock bolt and nut shall not cause interference during operation.

g. With cam of canopy seal selector valve positioned as shown in Detail D and telescopic unit temporarily attached to cam, mark cable for proper length at 0.25 inch past inspection hole of telescopic unit. Cut and file cable.

h. Connect telescopic unit to cable, tighten lock bolt, and connect unit to cam of seal selector valve as as shown in detail D.

H

i. Install thruster; do not connect ballistic hoses. Slide upper crank assembly on to thruster shaft. Connect exterior control linkage to lower crank; tighten nut to finger tightness and install cotter pin. Place exterior control handle in stowed position. Assemble lower crank and washers on splined shaft. Position and hold lower crank so that distance from shank of attach bolt is 1.66 inches from end of exterior control linkage slot. Insert splined shaft in gearbox, hold crank pin against shoulder of thruster shaft, and insert splined shaft through upper crank. Hold splined shaft in position, remove thruster, insert screwdriver through hole in crank pin, and tighten set screw. Safety-wire set screw to crank boss. Install thruster. Install spacer, nut, and cotter pin on thruster shaft.



APPLICABLE TO 56-453, -455, -456, AND -458 THRU 56-461.

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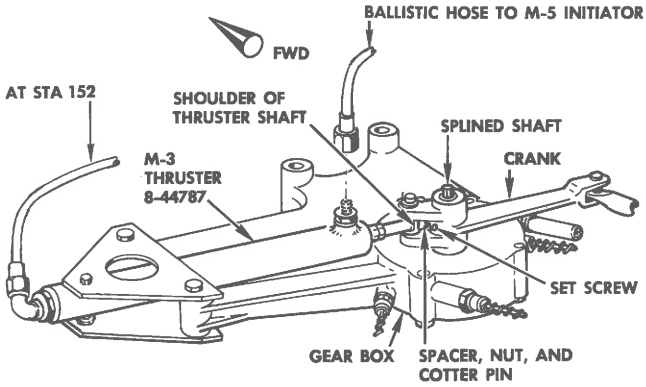
Figure 8-17. Latch Teleflex Cable Replacement, F-106A (Sheet 3 of 4)
Applicable to 56-453 thru 57-243

(H1)



j. Install thruster; do not connect ballistic hoses. Slide crank assembly on to thruster shaft until crank pin contacts shoulder of thruster shaft. Insert splined shaft through gearbox and crank. Hold splined shaft in position and remove thruster. Insert screwdriver through hole in crank pin and tighten set screw. Safety-wire set screw to crank boss. Install thruster. Install spacer, nut, and cotter pin on thruster shaft.

APPLICABLE TO 56-454, -457 AND 56-462 THRU 57-243.

k. Connect ballistic hoses to thruster as shown.

NOTE

APPLICABLE TO AIRPLANES 56-453, -455, -456, AND -458 THRU 56-461. THE M-3 THRUSTER IS MOUNTED WITH THE BALLISTIC PORT NEAREST THE GEAR BOX IN A DOWNWARD POSITION. REGARDLESS OF POSITION, THIS PORT IS CONNECTED TO THE M-5 INITIATOR.

l. Operate pilot's control handle to unlatched position. Cut and file radius on cable extending from forward gear box spent travel port so that cable lacks 0.25 inch from reaching end of spent travel tube when tube is installed. Install spent travel tube.
m. Connect exterior control linkage to crank of forward gear box.
n. Connect and adjust latch mechanisms.
o. Connect and adjust canopy seal selector valve.
p. *Applicable to airplanes equipped with electric canopy actuators,* adjust canopy actuating system switches.
q. Perform an operational check of the canopy normal system.

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Figure 8-17. Latch Teleflex Cable Replacement, F-106A (Sheet 4 of 4)
Applicable to 56-453 thru 57-243

WARNING

If canopy is open and canopy hold-open supports are not installed:

Do not depress canopy latch interlock and operate latches to locked position — canopy will fall.

Do not move actuator clutch manual release handle from stowed position — canopy will fall.

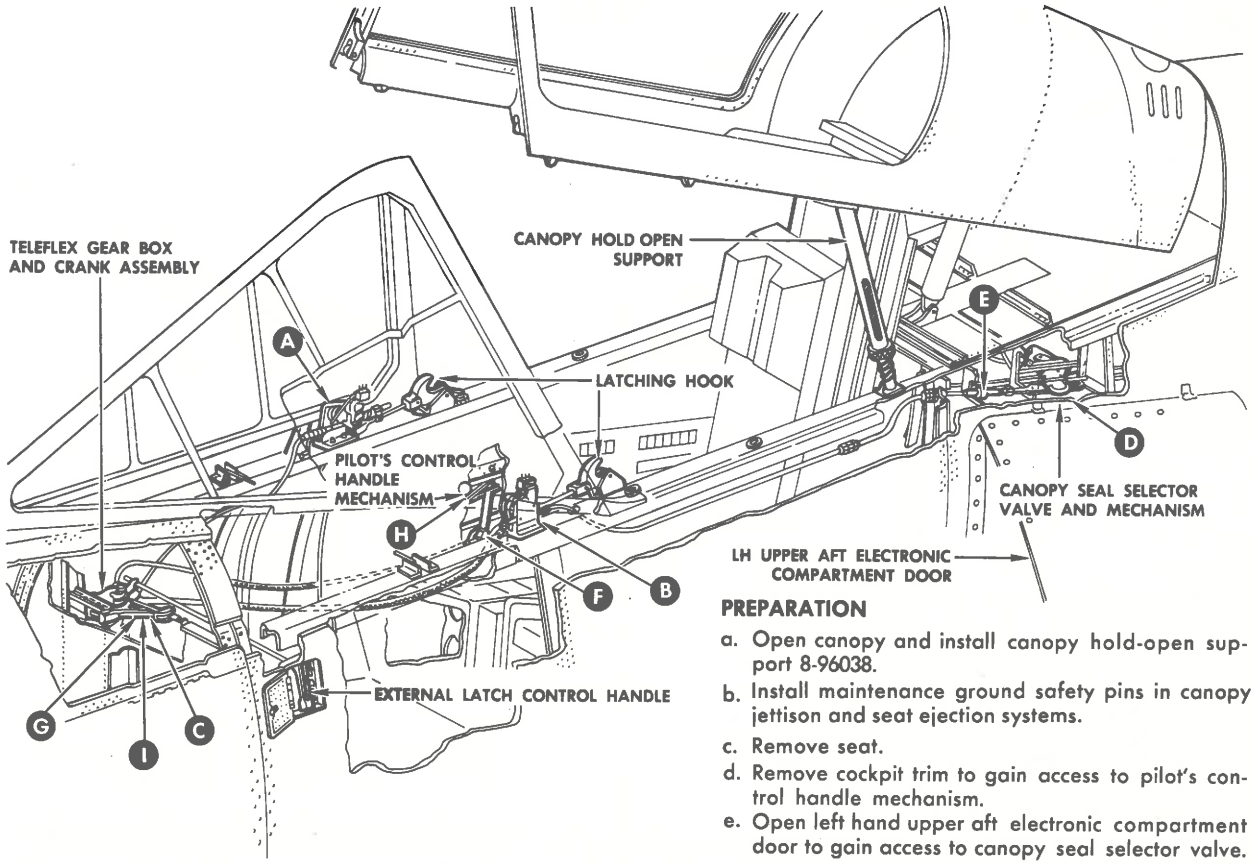
Do not pull on actuator clutch cable — canopy will fall.

CANOPY SEAL SYSTEM

DESCRIPTION

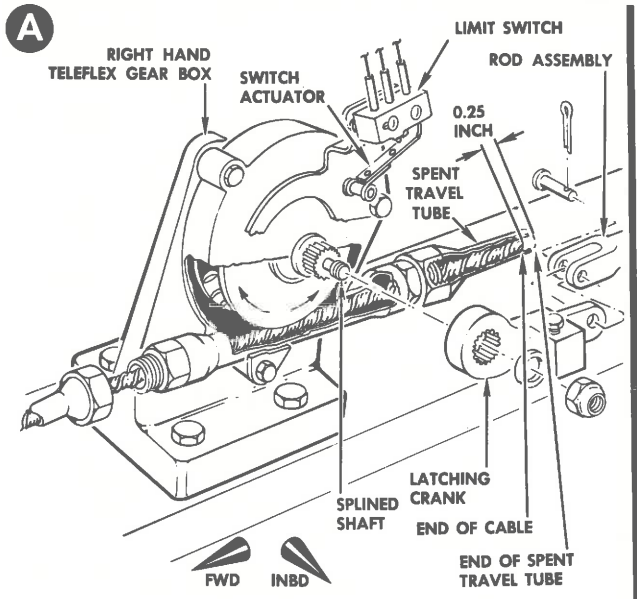
8-52. GENERAL.

The airplane canopy is sealed against rain and dust leakage and loss of cockpit pressurization by two rubber seals, one of which is inflatable. The noninflatable seal is installed on the aft edges of the windshield while the inflatable seal is installed around the edges of the can-



PREPARATION

a. Open canopy and install canopy hold-open support 8-96038.
b. Install maintenance ground safety pins in canopy jettison and seat ejection systems.
c. Remove seat.
d. Remove cockpit trim to gain access to pilot's control handle mechanism.
e. Open left hand upper aft electronic compartment door to gain access to canopy seal selector valve.



REMOVAL, TELEFLEX CABLE

a. Remove spent travel tube from RH gear box.
b. Disconnect latching crank from rod assembly. Disconnect and remove crank from splined shaft of gear box.

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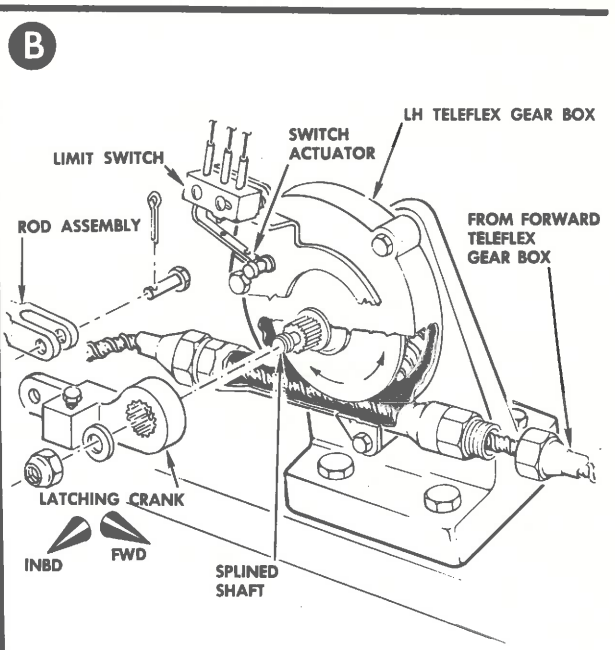
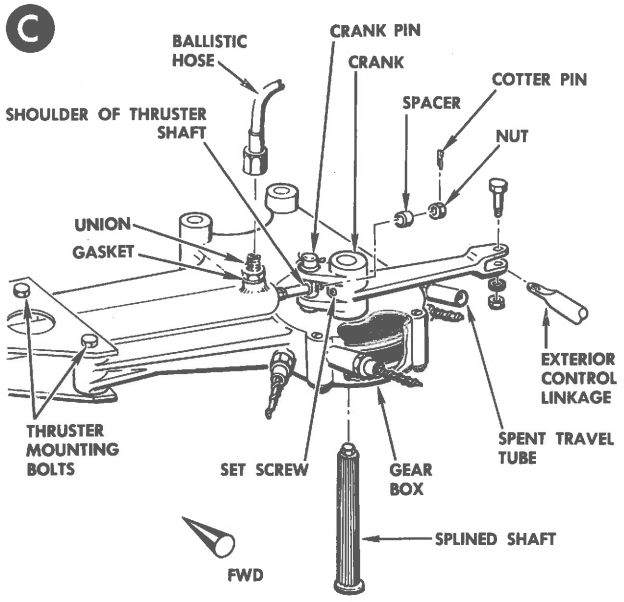


c. Disconnect latching crank from rod assembly. Disconnect and remove crank from splined shaft of LH gear box.

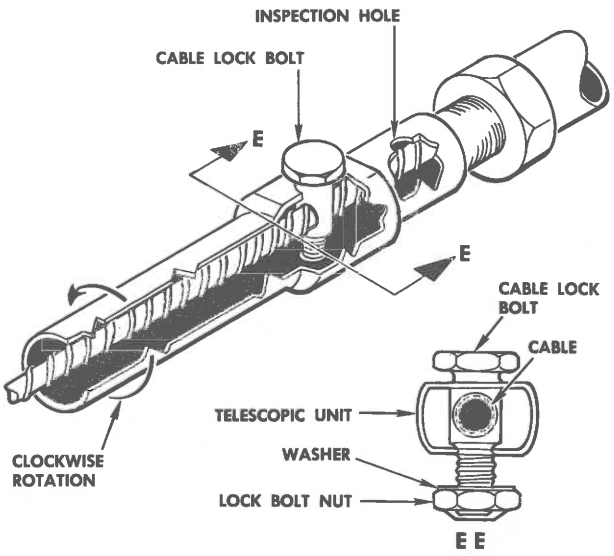
Figure 8-18. Latch Teleflex Cable Replacement, F-106A (Sheet 1 of 3)
Applicable to 57-244 thru 58-798

C



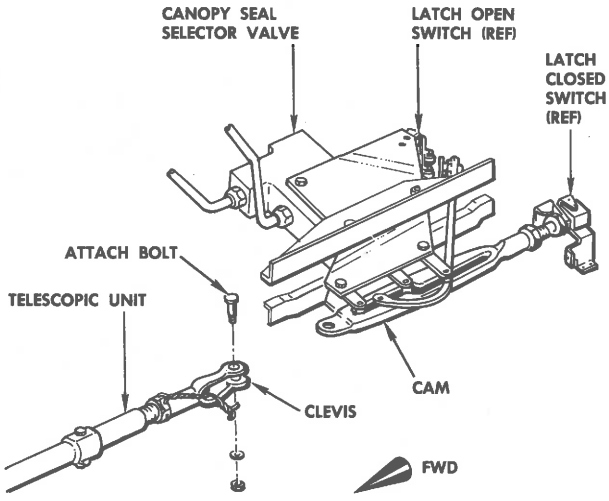
d. Disconnect exterior control linkage from crank.
e. Remove cotter pin, nut, and spacer from thruster shaft.
f. Disconnect ballistic hose from each end of M-3 thruster, remove thruster mounting bolts, and remove thruster.
g. Remove safetywire from set screw. Insert screwdriver through hole in crank pin and loosen set screw. Remove splined shaft from gearbox.
h. Remove spent travel tube from gear box.

E



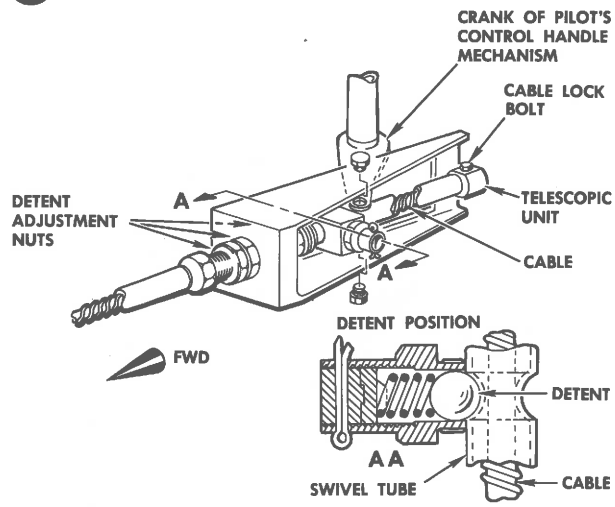
j. Loosen cable lock bolt nut and rotate telescopic unit clockwise until cable is disconnected.

D SEAL VALVE CAM (LATCHES IN LOCKED POSITION)



i. Disconnect telescopic unit from cam of canopy seal selector valve.

F



k. Disconnect telescopic unit from crank of pilot's control handle mechanism and pull cable from conduit.
l. Disconnect telescopic unit from cable.

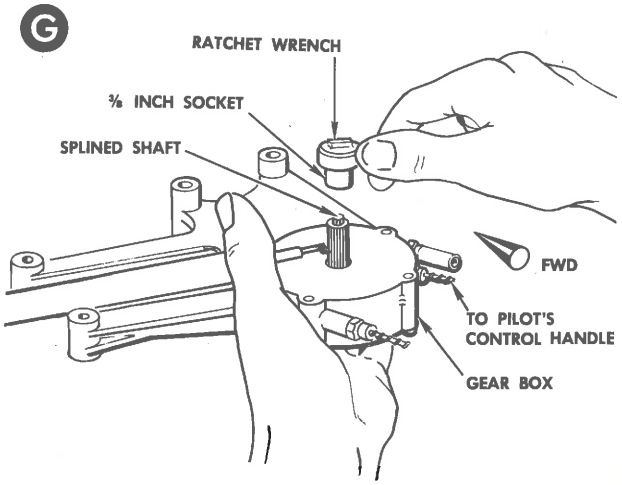
m. Pull second cable from spent travel port of right hand gear box shown in detail A.

.06.02.588-2B .53.25.00

Figure 8-18. Latch Teleflex Cable Replacement, F-106A (Sheet 2 of 3)
Applicable to 57-244 thru 58-798

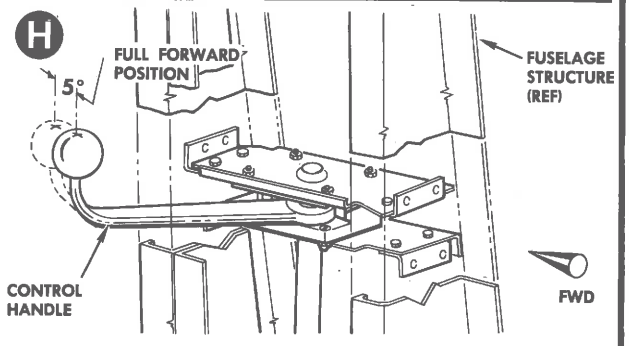
INSTALLATION AND ADJUSTMENT, TELEFLEX CABLE

a. File radius on both ends of new cables. Clean and lubricate new cables in accordance with procedure given in Section III of this manual.
b. Connect cable to telescopic unit shown in detail F.
c. Feed cable into conduit, manually until further insertion becomes difficult.



d. Insert splined shaft in forward gear box, attach socket wrench to upper end of shaft, and rotate shaft slowly until telescopic unit shown in detail F. is engaged in the detent position. Remove splined shaft.

e. Connect telescopic unit to pilot's control handle crank shown in detail F. Operate control handle to unlatched position and then to latched position; the cable lock bolt and nut shall not cause interference during operation.



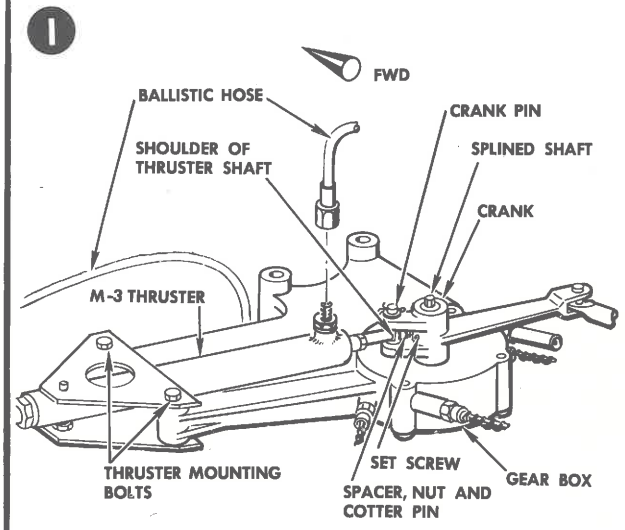
f. Check control handle for proper position (5° aft of full forward position).

NOTE

HANDLE POSITION IS CONTROLLED BY THE DETENT ADJUSTMENT NUTS SHOWN IN DETAIL F.

.06.02.588-3E .53.25.00

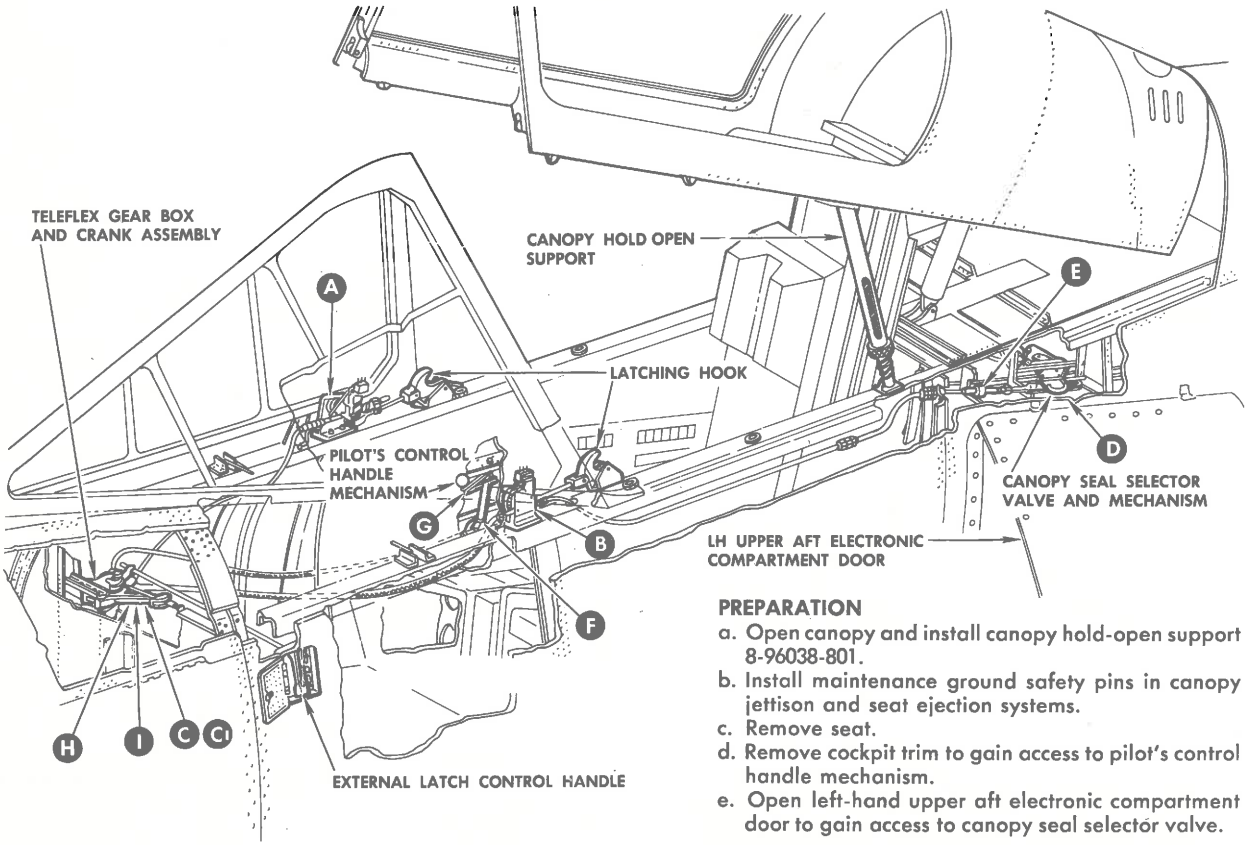
g. Position the clevis of the telescopic unit shown in detail D in the center of its adjustment range.
h. With cam of canopy seal selector valve positioned as shown in detail D and telescopic unit temporarily attached to cam, mark cable for proper length at 0.25 inch past inspection hole of telescopic unit as shown in detail E. Cut cable at mark; file radius on cable end.
i. Connect telescopic unit to cable by rotating unit counterclockwise until cable is 0.25 inch past inspection hole. Tighten cable lockbolt shown in detail E.
j. Feed second cable into spent travel port of forward gear box until cable lacks 0.25 inch from reaching end of spent travel tube of right-hand gear box when tube is installed. See detail A. Install spent travel tube of right-hand gear box.



k. Install thruster; do not connect ballistic hoses. Slide crank assembly on to thruster shaft until crank pin contacts shoulder of thruster shaft; have a man apply 10 to 15 pounds tension to the telescopic unit shown in Detail D and insert splined shaft through gearbox and crank. Hold splined shaft in position, remove thruster, insert screwdriver through hole in crank pin, and tighten set screw. Safety-wire set screw to crank boss. Install thruster; connect ballistic hoses. Install spacer, nut, and cotter pin on thruster shaft. Re-check pilot's control handle for proper position as shown in Detail H.

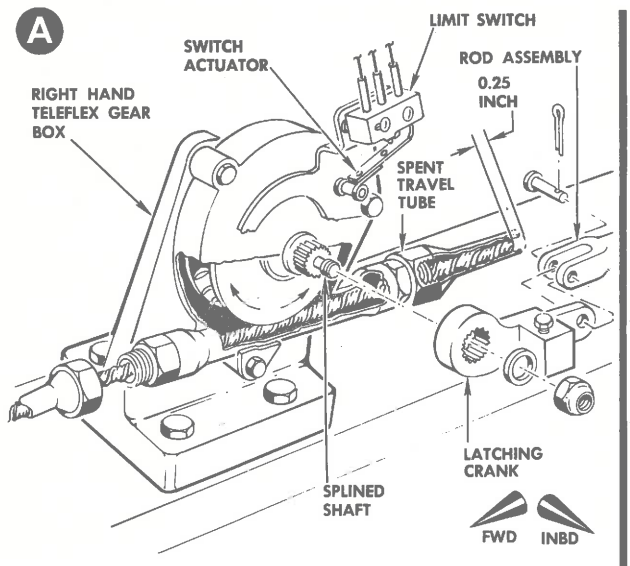
l. Operate pilot's latch control handle to unlatched position. Cut and file radius on cable extending from forward gear box spent travel port so that cable lacks 0.25 inch from reaching end of spent travel tube when tube is installed. Install spent travel tube.
m. Connect and adjust latch mechanisms.
n. Connect and adjust canopy seal selector valve.
o. Adjust canopy actuating system switches.
p. Perform an operational check of the canopy normal system.

Figure 8-18. Latch Teleflex Cable Replacement, F-106A (Sheet 3 of 3)
Applicable to 57-244 thru 58-798



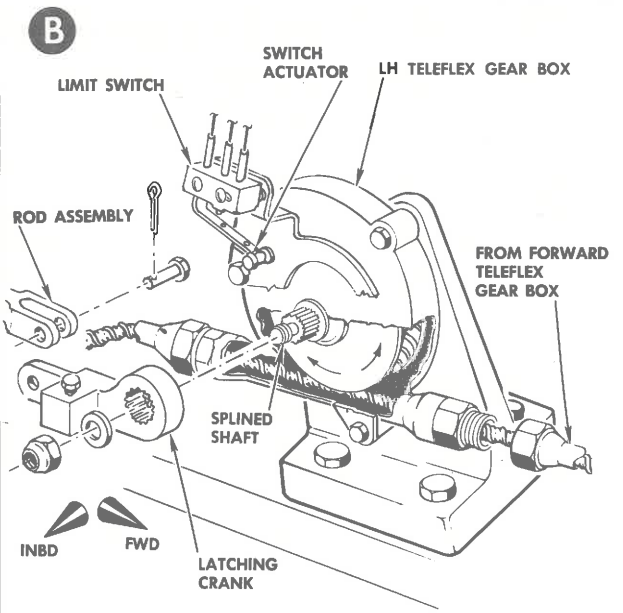
PREPARATION

a. Open canopy and install canopy hold-open support 8-96038-801.
b. Install maintenance ground safety pins in canopy jettison and seat ejection systems.
c. Remove seat.
d. Remove cockpit trim to gain access to pilot's control handle mechanism.
e. Open left-hand upper aft electronic compartment door to gain access to canopy seal selector valve.



REMOVAL, TELEFLEX CABLE

a. Remove spent travel tube from RH gear box.
b. Disconnect latching crank from rod assembly. Disconnect and remove crank from splined shaft of gear box.

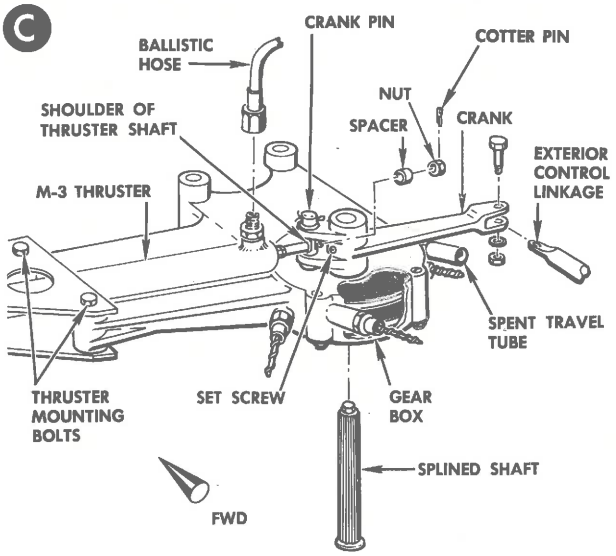


c. Disconnect latching crank from rod assembly. Disconnect and remove crank from splined shaft of LH gear box. Proceed with applicable step "d."

.06.02.1038-1

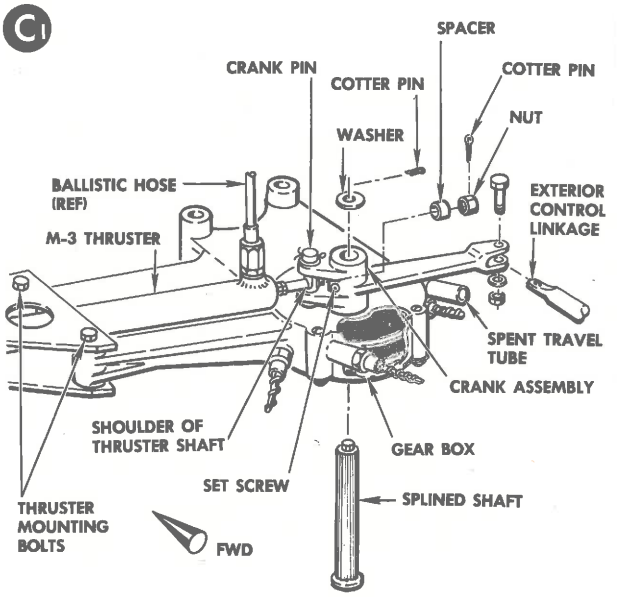
Figure 8-19. Latch Teleflex Cable Replacement, F-106A (Sheet 1 of 3)
Applicable to 59-001 and subsequent

C



APPLICABLE TO 59-001 THRU 59-030.

C1

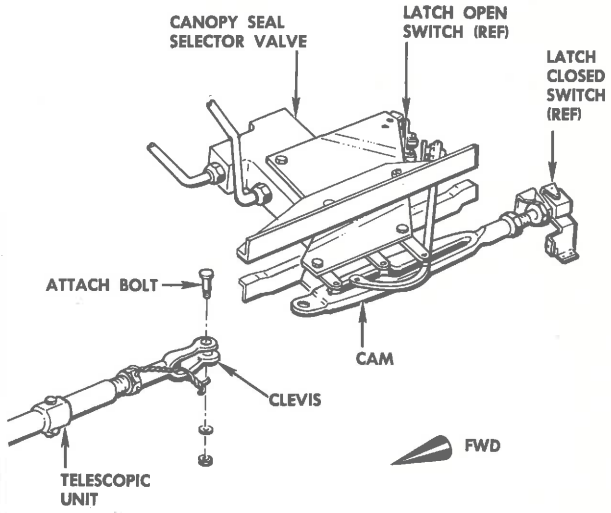


APPLICABLE TO 59-031 AND SUBSEQUENT.

d. Disconnect exterior control linkage from crank.
e. Remove cotter pin, nut, and spacer from thruster shaft.
f. Disconnect ballistic hose from each end of M-3 thruster. Remove thruster mounting bolts, and remove thruster.
g. Remove safety wire from set screw. Insert screwdriver through hole in crank pin and loosen set screw. *Applicable to airplanes 59-031 and subsequent.* Remove cotter pin and washer from top of splined shaft.
h. Remove splined shaft from gear box.
i. Remove spent travel tube from gear box.

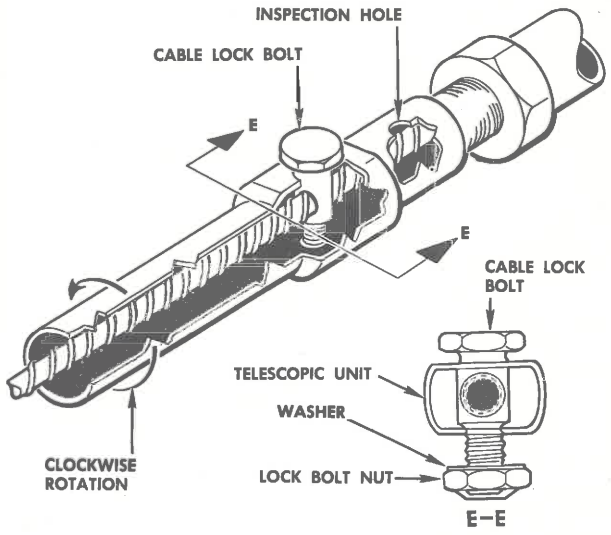
D

SEAL VALVE CAM (LATCHES IN LOCKED POSITION)



j. Disconnect telescopic unit from cam of canopy seal selector valve.

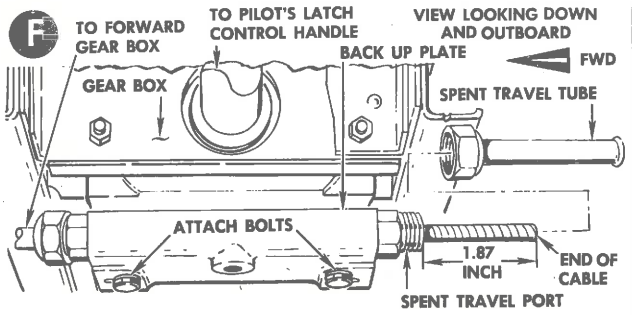
E



k. Loosen cable lock bolt nut and rotate telescopic unit clockwise until cable is disconnected.

.06.02.1038-2A

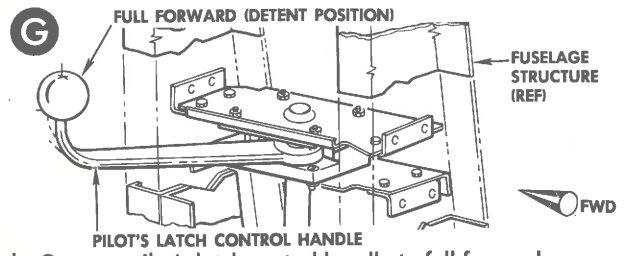
Figure 8-19. Latch Teleflex Cable Replacement, F-106A (Sheet 2 of 3)
Applicable to 59-001 and subsequent



l. Remove safety wire and loosen back-up plate attach bolts; pull back-up plate away from gear box.
m. Remove spent travel tube from gear box and pull cable from conduit.
n. Pull second cable from spent travel port of gear box shown in detail A.

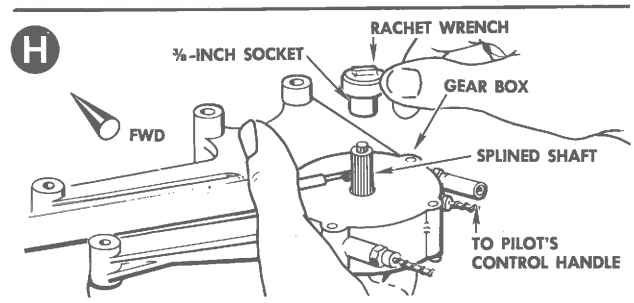
INSTALLATION AND ADJUSTMENT, TELEFLEX CABLE

a. File radius on both ends of new cables. Clean and lubricate new cables in accordance with procedure given in Section III of this manual.



b. Operate pilot's latch control handle to full forward (detent) position.

c. Feed cable, manually, into spent travel port of gear box shown in detail F until further insertion becomes difficult.

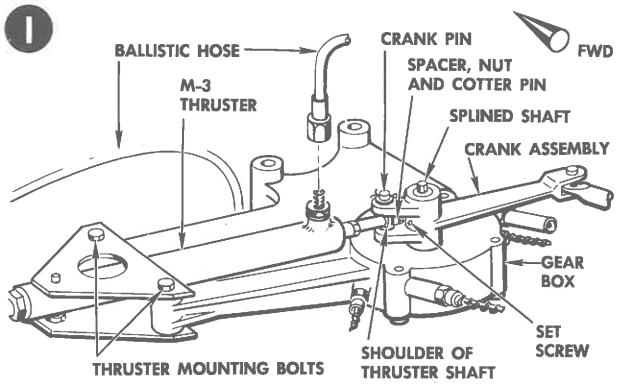


d. Insert splined shaft in forward gear box, attach socket wrench to upper end of shaft, and rotate shaft slowly until end of cable is positioned 1.87 (±0.03) inches from spent travel port as shown in detail F. Remove splined shaft.

e. Check that pilot's latch control handle is positioned as shown in detail G. Tighten gear box back-up plate attach bolts and safety-wire bolt heads; see detail F.

.06.02.1038-38

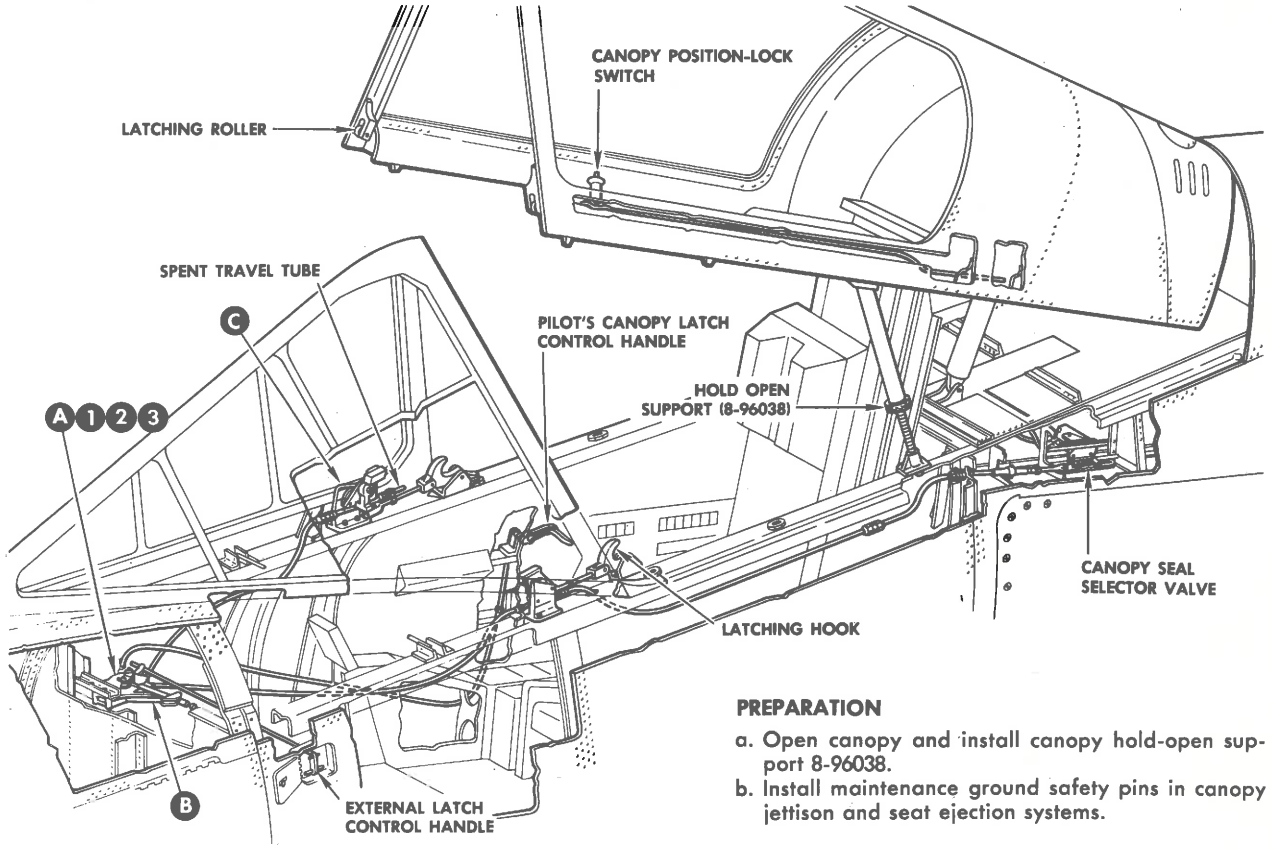
f. Position the clevis of the telescopic unit shown in detail D in the center of its adjustment range.
g. With cam of canopy seal selector valve positioned as shown in detail D and telescopic unit temporarily attached to cam, mark cable for proper length at 0.25 inch past inspection hole of telescopic unit as shown in detail E. Cut cable at mark; file radius on cable end.
h. Connect telescopic unit to cable by rotating unit counterclockwise until cable is 0.25 inch past inspection hole. Tighten cable lockbolt shown in detail E.
i. Feed second cable into spent travel port of forward gear box until cable lacks 0.25 inch from reaching end of spent travel tube of right-hand gear box when tube is installed. See detail A. Install spent travel tube of right-hand gear box.



j. Install thruster; do not connect ballistic hoses. Slide crank assembly on to thruster shaft until crank pin contacts shoulder of thruster shaft. Have a man apply 10 to 15 pounds tension to the telescopic unit shown in Detail D and insert splined shaft through gearbox and crank. Hold splined shaft in position, remove thruster, insert screwdriver through hole in crank pin, and tighten set screw. Safety-wire set screw to crank boss. Install thruster. Recheck that pilot's control handle is positioned as shown in Detail G when crank pin is contacting shoulder of thruster shaft. Install spacer, nut and cotter pin on thruster shaft. Connect ballistic hoses. *Applicable to airplanes 59-031 and subsequent,* install washer and cotter pin at top of splined shaft; see Detail C1.

k. Operate pilot's latch control handle to unlatched position. Cut and file radius on cable extending from forward gear box spent travel port so that cable lacks 0.25 inch from reaching end of spent travel tube when tube is installed. Install spent travel tube.
l. Connect and adjust latch mechanisms.
m. Connect and adjust canopy seal selector valve.
n. *Applicable to airplanes equipped with electric canopy actuators,* adjust the canopy actuating system switches.
o. Perform an operational check of the canopy normal system.

Figure 8-19. Latch Teleflex Cable Replacement, F-106A (Sheet 3 of 3)
Applicable to 59-001 and subsequent



PREPARATION

a. Open canopy and install canopy hold-open support 8-96038.
b. Install maintenance ground safety pins in canopy jettison and seat ejection systems.

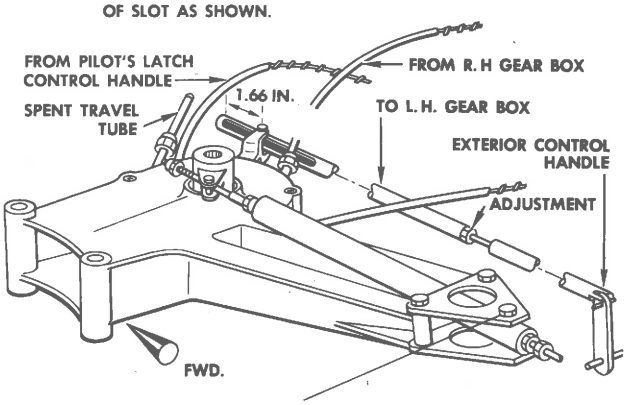
LATCH ADJUSTMENT

a. Disconnect external control linkage from forward gear box as shown in applicable detail A.
b. Disconnect and remove cranks shown in detail C, from left and right gear boxes.

A1

NOTE

AFTER ADJUSTMENT PROCEDURE STEPS A THROUGH G HAVE BEEN COMPLETED, PLACE SYSTEM IN LATCHED POSITION, PLACE EXTERIOR CONTROL HANDLE IN STOWED POSITION, AND ADJUST LINKAGE TO OBTAIN 1.66 INCH DIMENSION FROM SHANK OF BOLT TO END OF SLOT AS SHOWN.



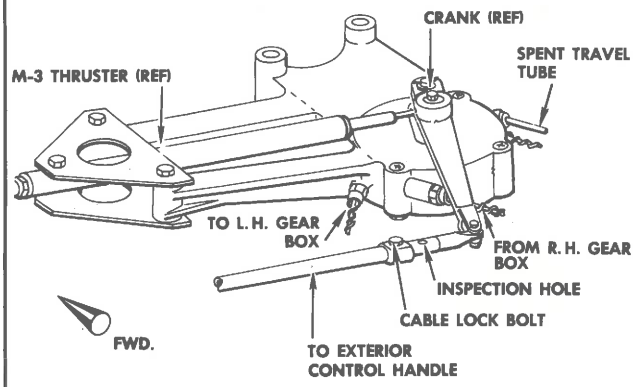
APPLICABLE TO F-106A AIRPLANES 56-453, -455, -456, -458, AND 56-459.

FORWARD GEAR BOX

A2

NOTE

AFTER ADJUSTMENT PROCEDURE STEPS A THROUGH G HAVE BEEN COMPLETED, PLACE SYSTEM IN UNLATCHED POSITION, PULL EXTERIOR CONTROL HANDLE TO EXTREME OUTBOARD POSITION, PUSH HANDLE INBOARD 0.12 INCHES, AND ADJUST LINKAGE TO PROPER LENGTH. CONNECT LINKAGE TO CRANK. AFTER ADJUSTMENT, CABLE MUST BE VISIBLE THROUGH INSPECTION HOLE.



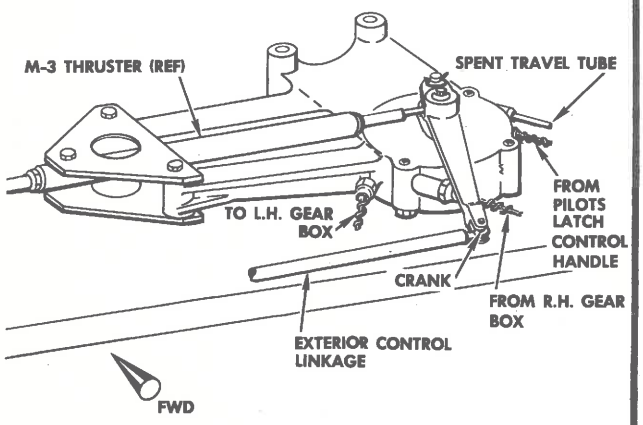
APPLICABLE TO F-106A AIRPLANES 56-454, -457, -462 THRU 56-467, AND 57-229 THRU 57-240.

FORWARD GEAR BOX

.06.02.252-1 B .53.25.00

Figure 8-20. Canopy Latch Adjustment, F-106A (Sheet 1 of 2)

A3

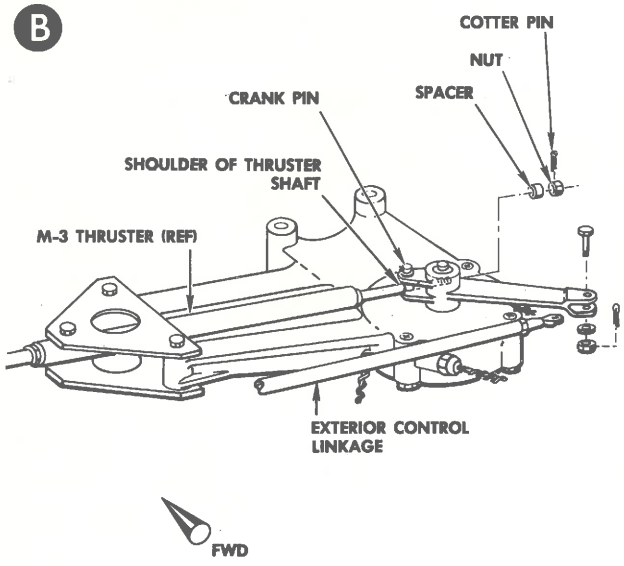


NOTE

APPLICABLE TO F-106A AIRPLANES 57-241 AND SUBSEQUENT. AFTER ADJUSTMENT PROCEDURE STEPS A THRU G HAVE BEEN COMPLETED, CONNECT EXTERIOR CONTROL LINKAGE TO CRANK.

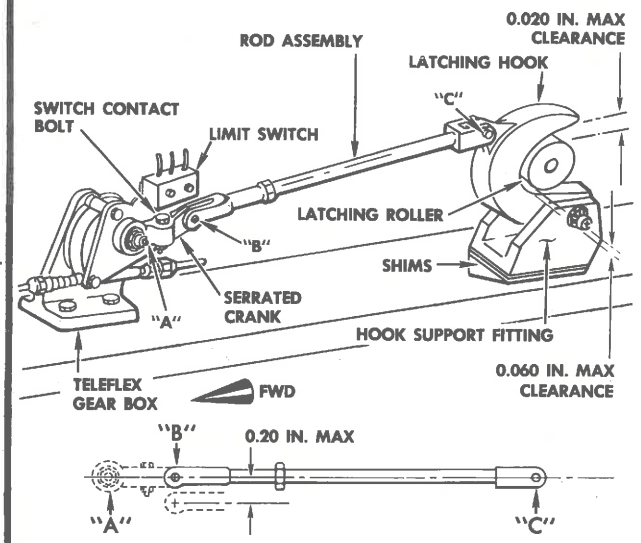
FORWARD GEAR BOX

B



c. Rotate pilot's control handle to latched position. Check that forward gear box crank pin is against shoulder of thruster shaft.

C TYPICAL (L.H. AND R.H.)



d. Close canopy. Use shims, as required, to adjust hook support fittings so that each hook may be freely hand moved over roller. Hooks may touch and rotate rollers; maximum clearance from top of roller to hook is 0.020 inch as shown.

NOTE

THE CANOPY LATCHES ARE NOT DESIGNED TO TOGGLE OR PULL THE CANOPY DOWN. THE CANOPY MUST FIT, BOTTOM OUT, AND SEAT FIRMLY ON THE FUSELAGE STRUCTURE BEFORE ANY ATTEMPT IS MADE TO ADJUST.

e. Place hook in latched position; install crank and rod assembly. Point "B" may have a misalignment of 0.20 inch below centerline between points "A" and "C." This adjustment accomplished by serrated crank.
Adjust hook clearances, as shown, by adjusting rod assembly. Maximum clearance is 0.060 inch.

f. Adjust limit switch contact bolt so that limit switch is actuated when point "B" is within 0.06 inch of its full travel.

g. Rotate pilot's control handle to unlatched position and adjust nut on end of thruster shaft, shown in detail B, to obtain 0.12 inch minimum clearance between latching hook tips and latching rollers when the canopy is opening.

h. Connect external control linkage to forward gear box by procedure given in applicable detail A.

i. Connect and adjust canopy seal selector valve.

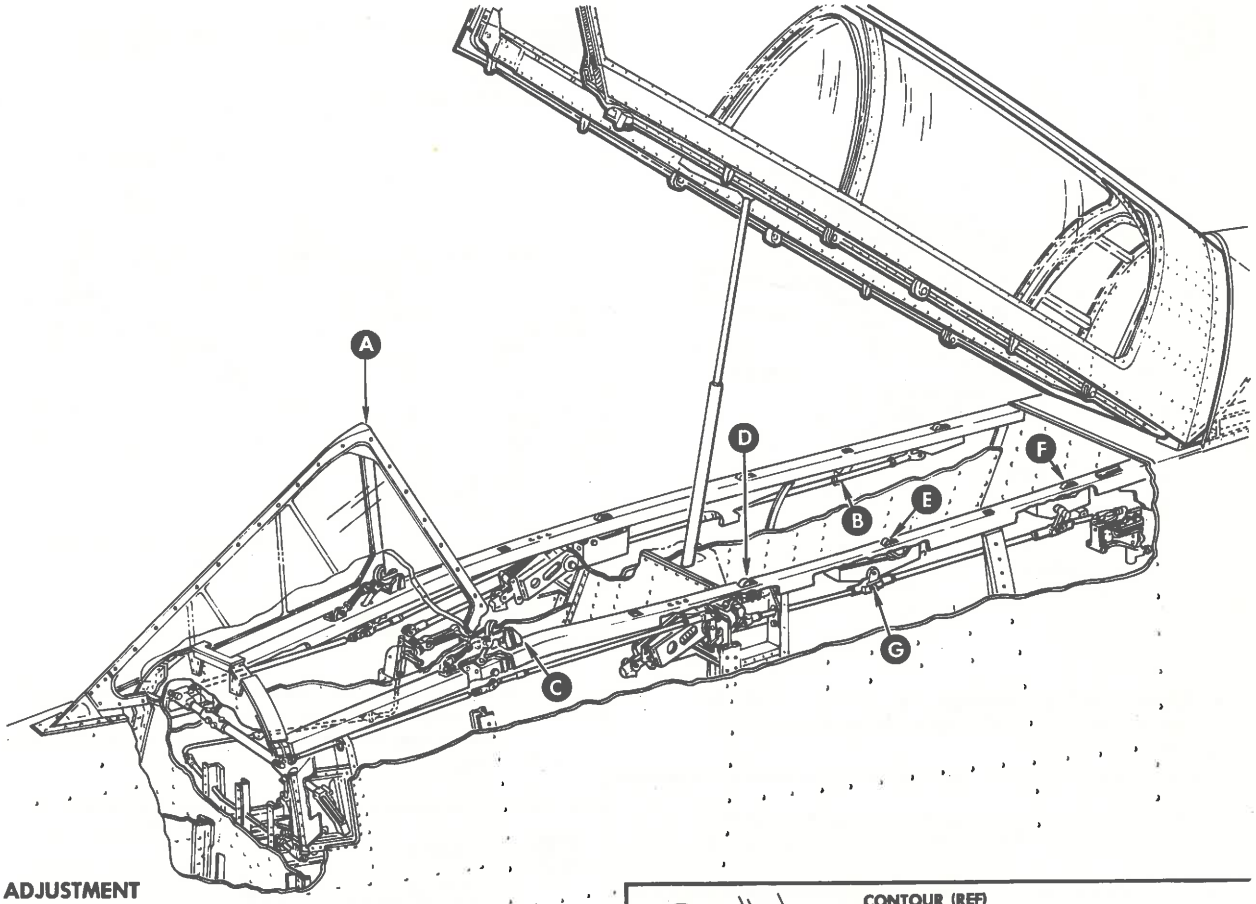
j. *Applicable to airplanes equipped with electric canopy actuators,* adjust canopy actuating system switches.

k. *Applicable to airplanes 57-2465, 57-2478 and subsequent.* Adjust canopy proximity switch located under left cockpit sill of Sta.141.

l. Perform an operational check of the canopy normal system.

.06.02.252-2 F .53.25.00

Figure 8-20. Canopy Latch Adjustment, F-106A (Sheet 2 of 2)



ADJUSTMENT

a. Open canopy and install canopy hold-open support. Install ground maintenance safety pins in canopy jettison and seat ejection systems.

WARNING

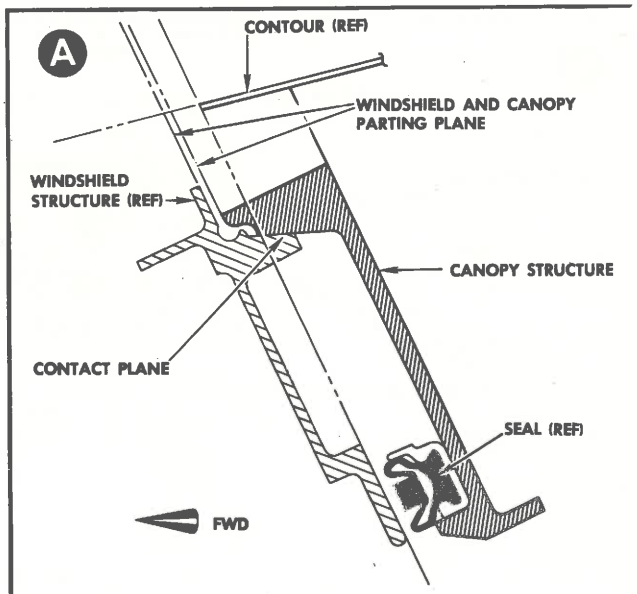
APPLICABLE TO AIRPLANES EQUIPPED WITH ELECTRIC CANOPY ACTUATORS. BEFORE PERFORMING THE FOLLOWING STEP, MAKE SURE THAT CANOPY HOLD-OPEN SUPPORTS ARE PROPERLY INSTALLED TO PREVENT THE CANOPY FROM FALLING WHEN THE CANOPY LATCHES ARE OPERATED TO THE LOCKED POSITION.

b. Depress the interlock located on right side at Station 212 and rotate pilot's control handle to full closed position; bellcrank (4 places each side) must position overcenter stops as shown in Details C, D, E, and F.

NOTE

IF BELLCRANKS ARE NOT POSITIONED CORRECTLY, IT IS NECESSARY TO REPLACE AND ADJUST THE INTER-CONNECTING PUSH RODS. AFTER COMPLETING STEP J, INSTALL AN470AD4 RIVETS IN REPLACEMENT PUSH ROD ASSEMBLIES.

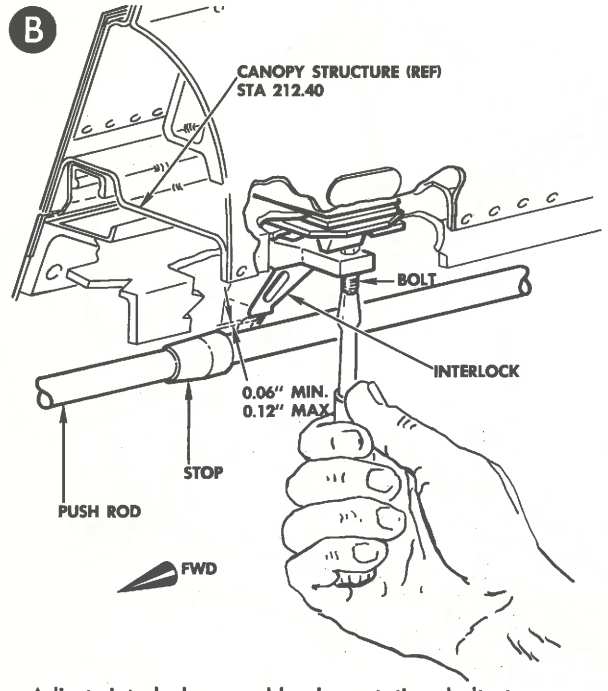
c. Rotate pilot's control handle to partially open position Coat inner surface of hooks (4 places each side) with modeling clay or like material.



d. Remove canopy hold-open support and close canopy. Rotate pilot's control handle to full closed position; canopy must contact windshield structure as shown.

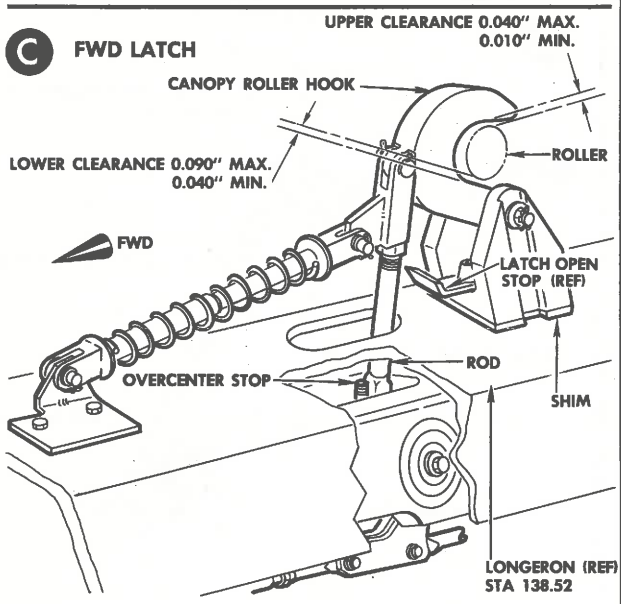
.06.02.512-1B .53.25.00

Figure 8-21. Canopy Latch Adjustment, F-106B (Sheet 1 of 3)

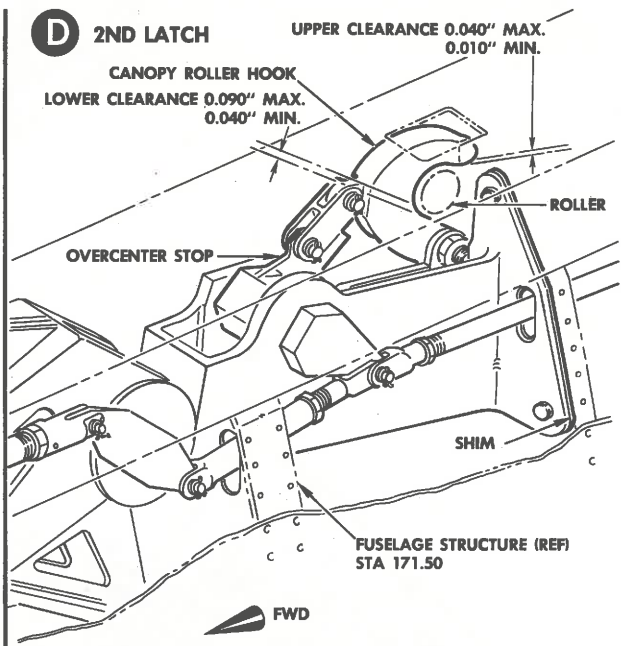


e. Adjust interlock assembly, by rotating bolt, to obtain 0.06 to 0.12 inch clearance between interlock and push rod stop.

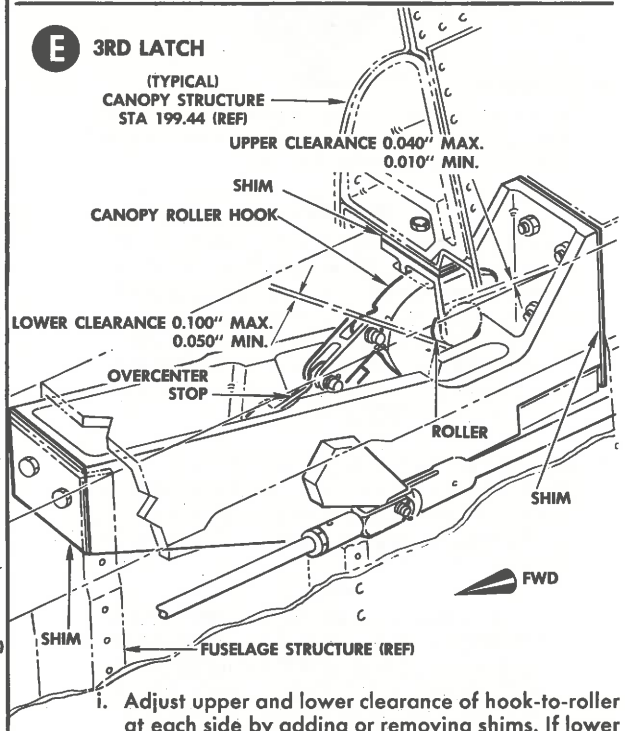
f. Open canopy; measure depth of clay like material on inner surface of hooks at canopy rollers imprint.



g. Adjust upper clearance of roller-to-hook (1 place each side) by adding or removing shims. Adjust lower clearance (1 place each side) by adjusting rod length.



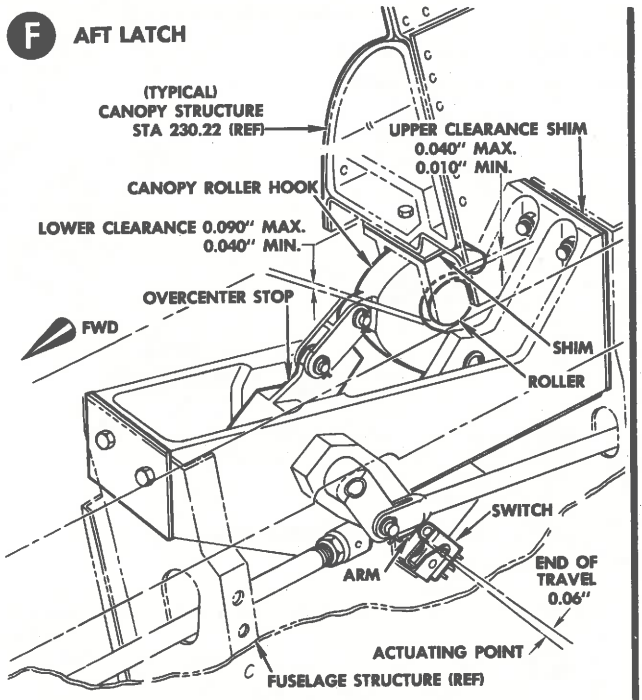
h. Adjust upper and lower clearance of hook-to-roller at each side by adding or removing shims. If lower clearance must be adjusted, refer to note following step b.



i. Adjust upper and lower clearance of hook-to-roller at each side by adding or removing shims. If lower clearance must be adjusted, refer to note following step b.

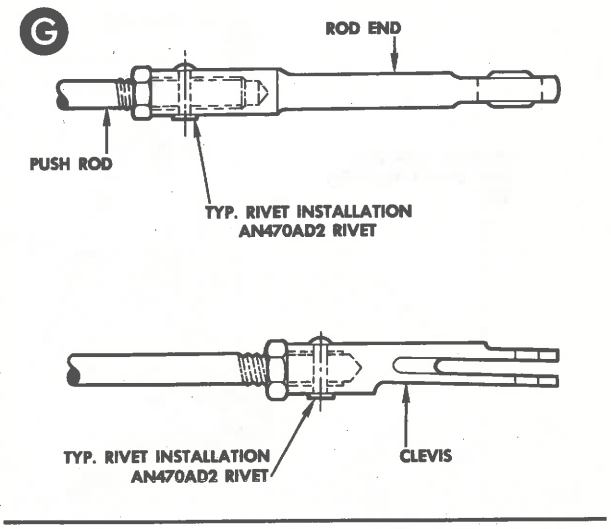
.06.02.512-2A .53.25.00

Figure 8-21. Canopy Latch Adjustment, F-106B (Sheet 2 of 3)



j. Adjust upper and lower clearance of hook-to-roller at each side by adding or removing shims. If lower clearance must be adjusted, refer to note following step "b".

k. Adjust unlock warning light switch (each side) so that switch is actuated 0.06 inch before arm reaches end of travel.



l. Install rivets in push rod assemblies as shown if interconnecting push rods were replaced.

m. Adjust canopy seal selector valve.

n. *Applicable to airplanes equipped with electric canopy actuators,* adjust the canopy actuating system latch closed switch.

o. Perform an operational check of the canopy normal system.

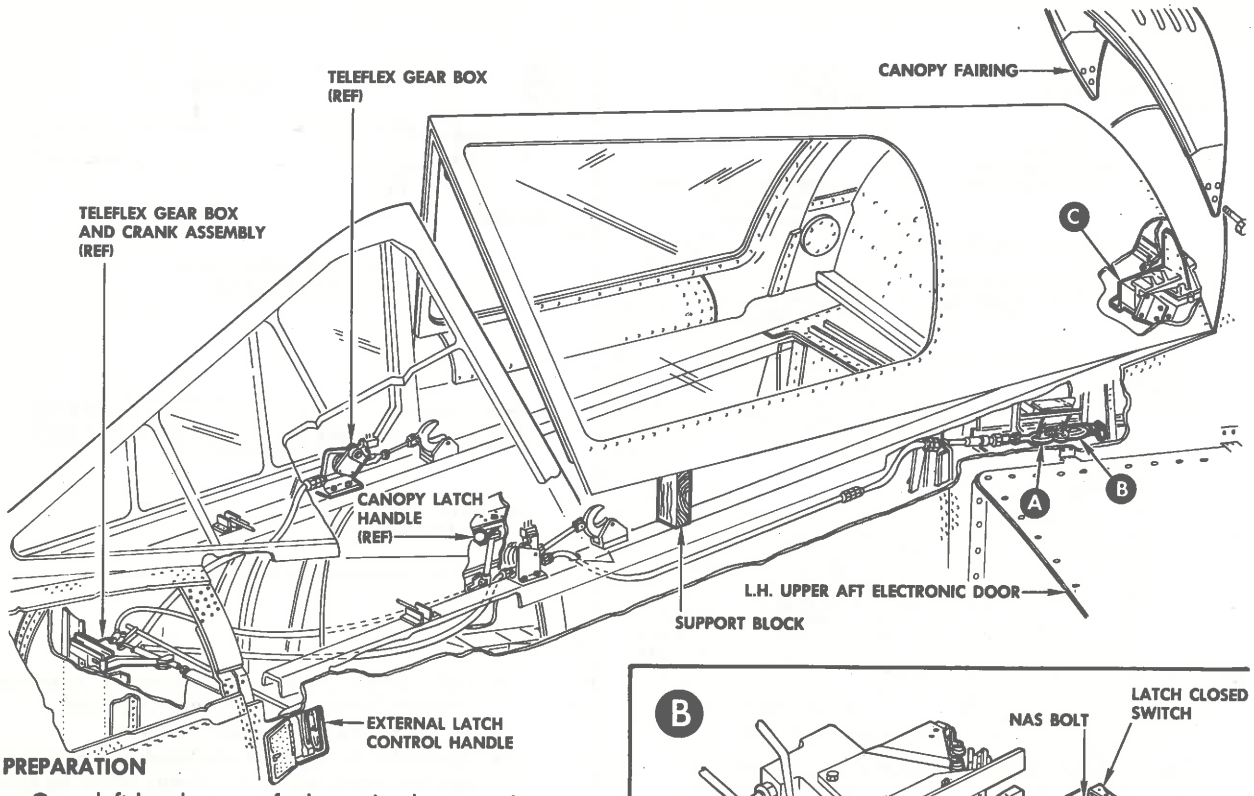
.06.02.512-3D .53.25.00

Figure 8-21. Canopy Latch Adjustment, F-106B (Sheet 3 of 3)

opy. When the canopy is closed and locked, partially-cooled low-pressure air (engine bleed air) from the heat exchanger will inflate the canopy seal. Air from the heat exchanger is routed to the canopy seal through a check valve, filtered orifice, and a selector valve. The selector valve is connected by a flexible cable to the canopy latch mechanism. The valve opens to allow the seal to inflate when the canopy latching hooks are in the locked position. A relief valve in the system relieves all pressure over 16 psi. In case of malfunction, the system safety valve will relieve all pressure in excess of 30 psi. A pressure test fitting, in the nose wheel well, provides a means of ground testing the seal pressurization system. See figures 8-25 and 8-26 for illustrations of the canopy seal system. An emergency pressurization system automatically maintains cockpit and canopy seal system pressure in case of loss of normal supply pressure at high altitudes. When cockpit pressure drops to about 4 psi (absolute) a warning light illuminates and a valve opens to admit air from the high-pressure pneumatic system (at 1500 psi) to the cockpit and canopy seal system. The valve will remain open, and the warning light will stay illuminated, until cockpit pressure increases to about 8.5 psi (absolute). See figure 8-27 or 8-28 for an illustration of the cockpit emergency pressurization and low-pressure warning system.

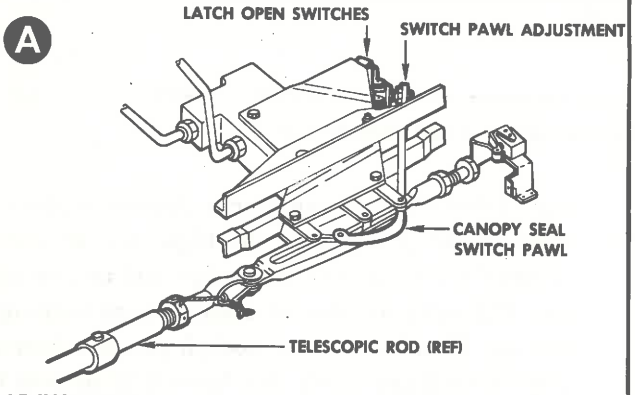
8-53. CANOPY RAIN-AND-DUST SEAL.

The canopy rain-and-dust seal consists of a tubular synthetic rubber seal attached to the aft edge of the windshield frame. The seal is noninflatable and is attached to the windshield frame by integral tabs inserted through holes in the frame. When the canopy is closed, this seal is compressed and forms a tight seal between the windshield and canopy.



PREPARATION

a. Open left-hand upper-aft electronics door to gain access to the latch open and the latch closed switches.
b. Remove canopy fairing to gain access to the canopy closed switch.

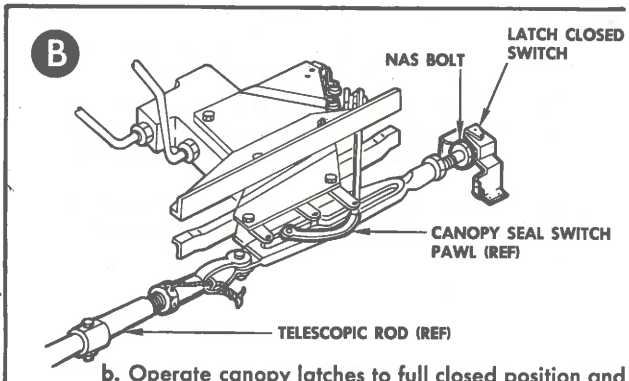


ADJUSTMENT

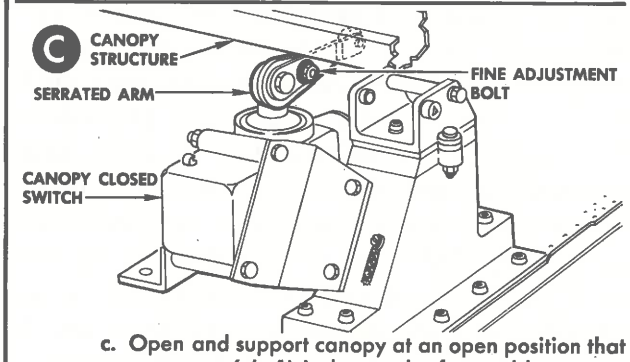
a. Operate canopy latches to full open position and adjust the canopy seal switch pawl to actuate the latch open switches. The switches shall not bottom out; provide 0.05 inch overtravel.

NOTE

THE CANOPY LATCH SYSTEM AND THE CANOPY SEAL VALVE MUST BE ADJUSTED BEFORE ANY ATTEMPT IS MADE TO ADJUST THE LATCH SWITCHES.



b. Operate canopy latches to full closed position and adjust the NAS bolt on the aft end of the canopy seal selector valve cam to actuate the latch closed switch. The switch shall not bottom out; provide 0.05 inch overtravel.



c. Open and support canopy at an open position that measures 6 (±1) inches at the forward lower corner. Adjust serrated arm and fine adjustment bolt until an audible click of the canopy closed switch is heard.
d. Perform an operational check.

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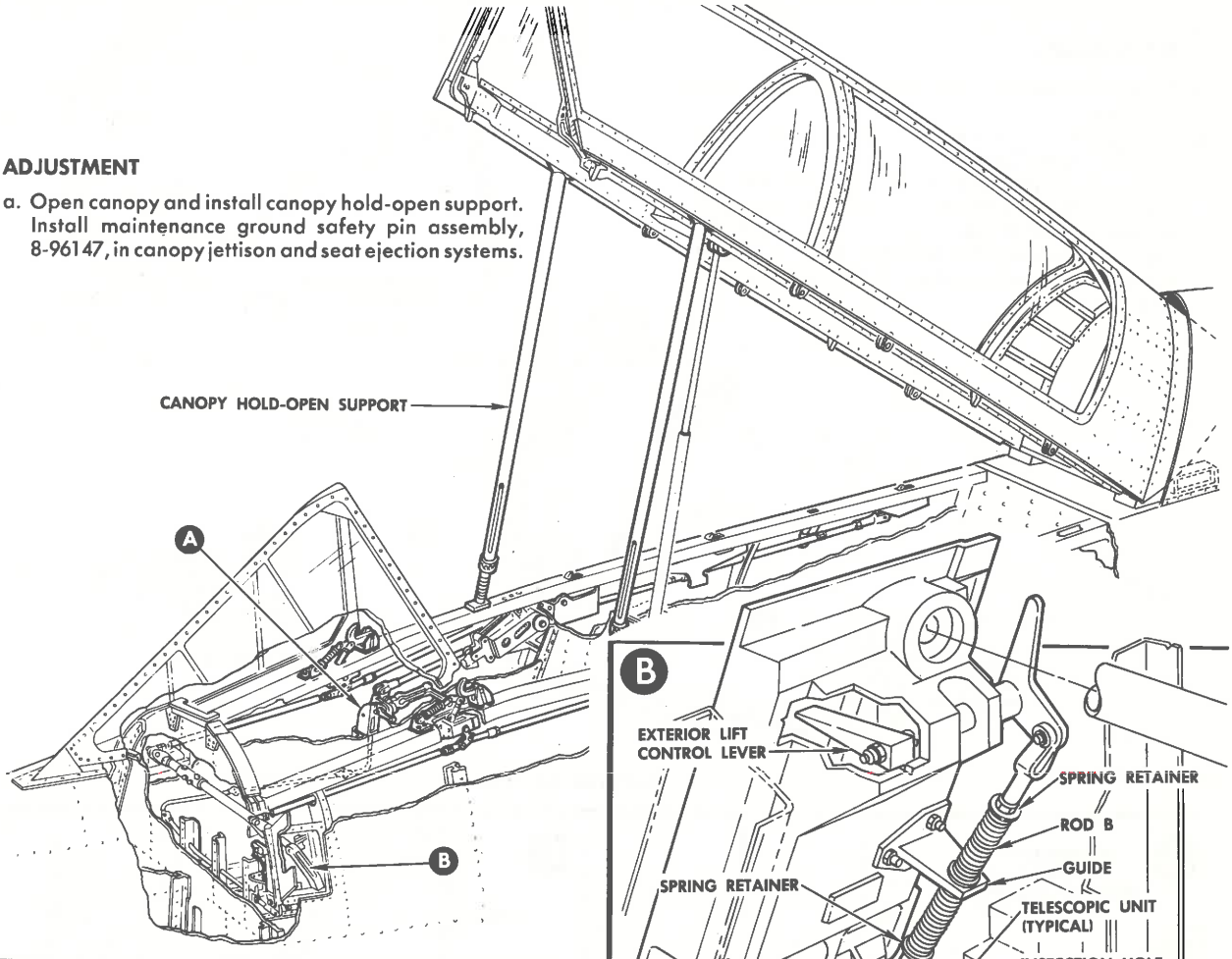
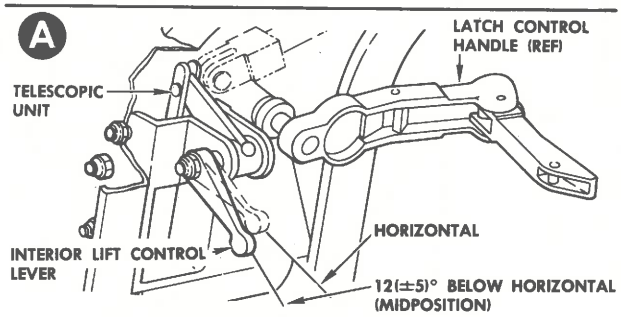
Figure 8-22. Electric Canopy Actuating System Switch Adjustment, F-106A
Applicable to 57-244 and subsequent; and 56-453 thru 57-243 after incorporation of TCTO 1F-106J-525

ADJUSTMENT

a. Open canopy and install canopy hold-open support. Install maintenance ground safety pin assembly, 8-96147, in canopy jettison and seat ejection systems.





b. Hold interior lift control lever at midposition (12° ±5° below horizontal) and adjust length of teleflex assembly to position centerline of control valve arm at 5°±1° outboard of vertical as shown in detail B.

NOTE

ADJUSTMENT MAY BE MADE, AT EITHER OR BOTH TELESCOPIC UNITS, BY LOOSENING THE CABLE LOCK BOLT NUT AND ROTATING THE TELESCOPIC UNIT. BOTH UNITS HAVE LEFT HAND THREADS. AFTER ADJUSTMENT, THE CABLE MUST BE VISIBLE THROUGH THE INSPECTION HOLES OF BOTH TELESCOPIC UNITS. TIGHTEN CABLE LOCK BOLT NUTS.

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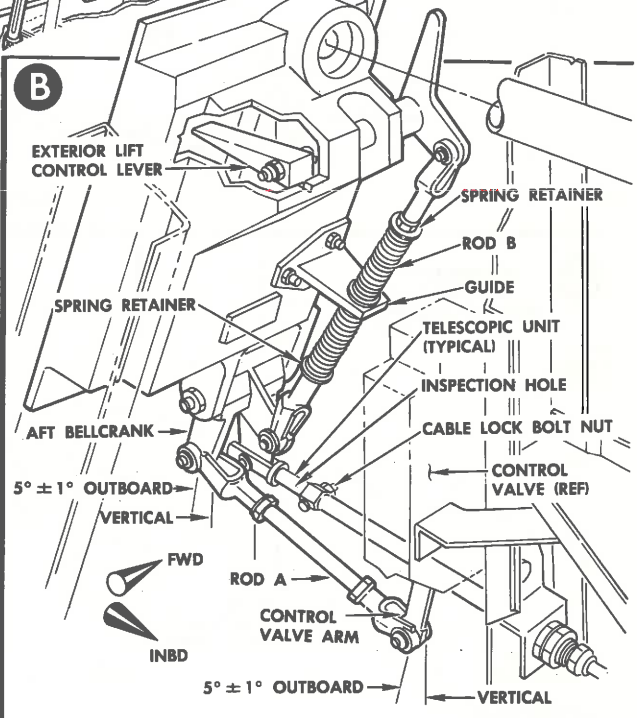


c. Adjust rod A to position centerline of control valve arm at 5° ± 1° outboard of vertical.

d. Adjust rod B to position centerline of exterior lift control lever at horizontal.

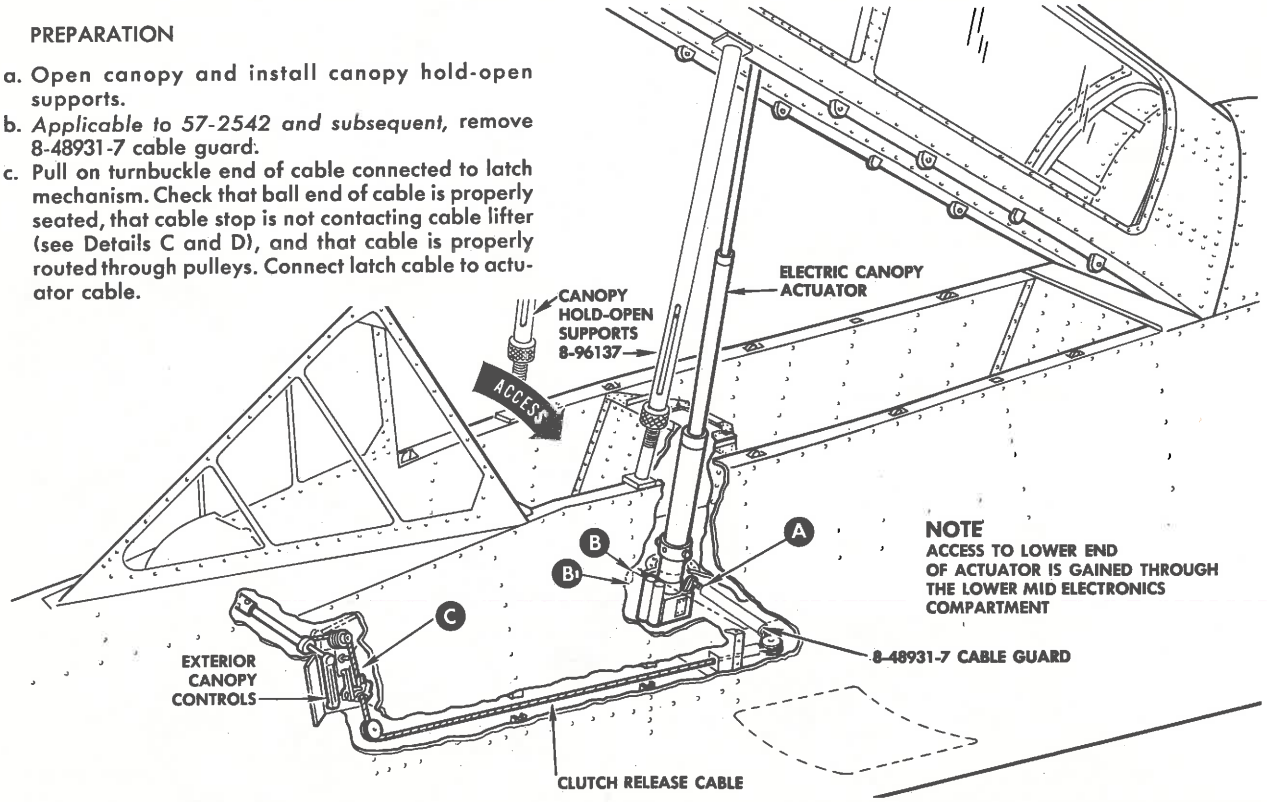
NOTE

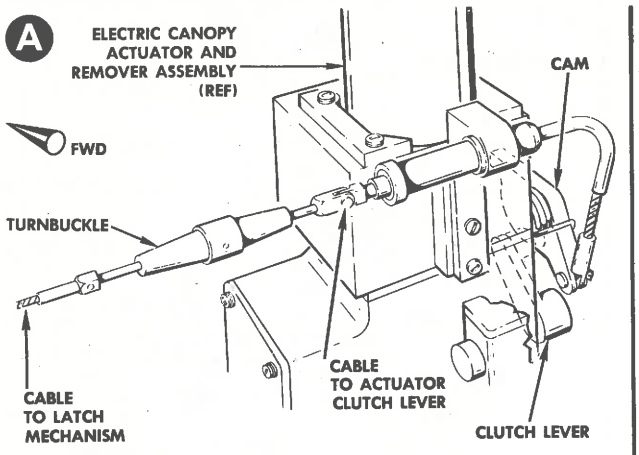
TO ASSURE EQUAL SPRING TENSION, THE DISTANCE FROM THE GUIDE TO THE SPRING RETAINERS MUST BE EQUAL.

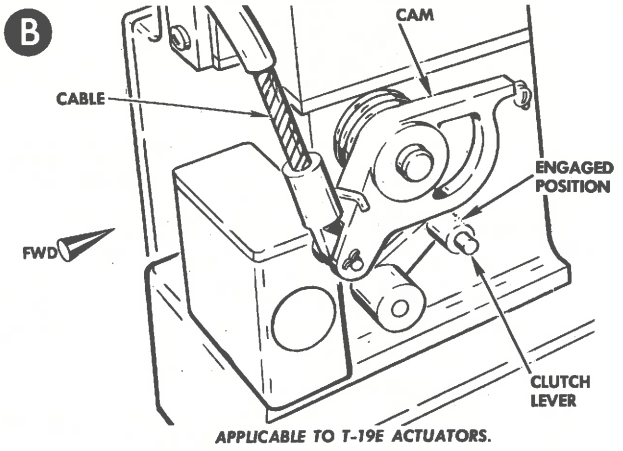
Figure 8-23. Pneumatic Canopy Lift Control Lever Adjustment, F-106B
Applicable to 57-2507 thru 57-2514 prior to incorporation of TCTO 1F-106(J)B-519 and TCTO 1F-106(J)B-525

PREPARATION

a. Open canopy and install canopy hold-open supports.
b. *Applicable to 57-2542 and subsequent,* remove 8-48931-7 cable guard.
c. Pull on turnbuckle end of cable connected to latch mechanism. Check that ball end of cable is properly seated, that cable stop is not contacting cable lifter (see Details C and D), and that cable is properly routed through pulleys. Connect latch cable to actuator cable.







ADJUSTMENT

a. With the canopy latch mechanism held in the fully unlocked position and with the actuator clutch lever in the fully engaged position, adjust cable turnbuckle to remove slack from cable.

CAUTION

THE ACTUATOR CLUTCH LEVER MUST REMAIN IN THE FULLY ENGAGED POSITION AND THE LATCH MECHANISM MUST REMAIN IN THE FULLY UNLOCKED POSITION AFTER REMOVING CABLE SLACK. SEE DETAIL B OR B1.

b. Safety-wire turnbuckle; refer to Section II of this manual for procedure.

WARNING

CHECK THAT CANOPY HOLD-OPEN SUPPORTS ARE INSTALLED BEFORE PERFORMING THE FOLLOWING STEP.

c. *Applicable to 57-2542 and subsequent,* disconnect latch cable from actuator cable at clevis fitting. Install 8-48931-7 cable guard. Connect latch cable to actuator cable.

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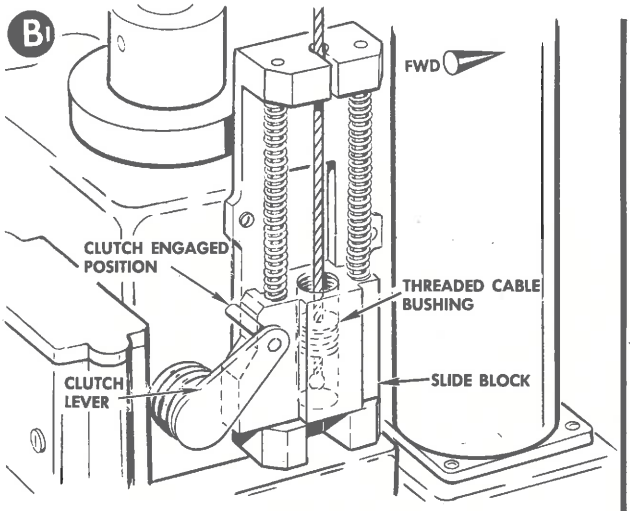
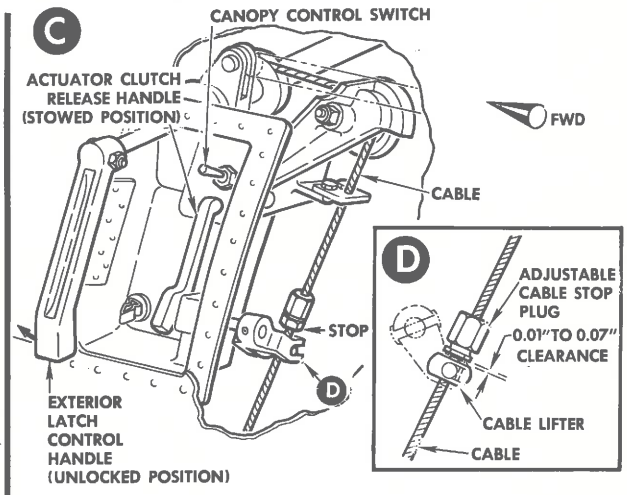
Figure 8-24. Electric Canopy Actuator Clutch System Adjustment, F-106B (Sheet 1 of 2)
Applicable to 57-2515 and subsequent; and 57-2507 thru 57-2514 after incorporation of TCTO 1F-106(J)B-519 and TCTO 1F-106(J)B-525



NOTE

IT IS POSSIBLE TO ADJUST CABLE LENGTH BY REPOSITIONING THREADED CABLE BUSHING IN SLIDE BLOCK IF NECESSARY.

APPLICABLE TO T-19 ACTUATORS



d. With clutch release handle in the stowed position adjust position of cable stop to provide 0.01 to 0.07-inch clearance between cable stop plug and cable lifter.

NOTE

THE CABLE LIFTER IS DESIGNED TO SWIVEL; POSITION LIFTER PARALLEL TO CABLE STOP PLUG WHEN MEASURING CLEARANCE.

e. Check clutch system for proper operation.

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Figure 8-24. Electric Canopy Actuator Clutch System Adjustment, F-106B (Sheet 2 of 2)
Applicable to 57-2515 and subsequent; and 57-2507 thru 57-2514 after incorporation of TCTO 1F-106(J)B-519 and TCTO 1F-106(J)B-525

8-54. INFLATABLE CANOPY SEAL.

The inflatable canopy seal consists of a continuous, molded, hollow synthetic rubber tube reinforced with knitted elastic fabric. An air pressure supply tube is vulcanized to the seal. When the canopy is closed and locked, the inflatable seal is pressurized and forms a tight seal between the canopy and the cockpit sill to prevent loss of cockpit pressurization.

8-55. CANOPY SEAL SELECTOR VALVE.

The canopy seal selector valve controls the supply of low-pressure air to the inflatable canopy seal. The valve has no electrical connection and is mechanically operated by a sliding cam connected to the canopy latch mechanism. The valve is open when the canopy is closed and locked. When the canopy is unlocked, air pressure in the canopy seal is vented through the selector valve. A spring loaded check valve is incorporated in the valve and prevents loss of seal pressure if the supply pressure should fail. The valve is installed as shown in figure 8-25 or 8-26.

8-56. CANOPY SEAL RELIEF AND SAFETY VALVES.

A relief valve and a safety valve are installed in the canopy seal pressurization line to prevent overpressurization. The two valves are exactly alike except for pressure settings. The relief valve opens at 16 (±1.5) psi while the safety valve opens (if the relief valve should malfunction) at 30 (±1.5) psi. The valves are one way types and must be installed with the port marked "OUT" facing downstream. The two valves are installed as shown in figure 8-25 or 8-26.

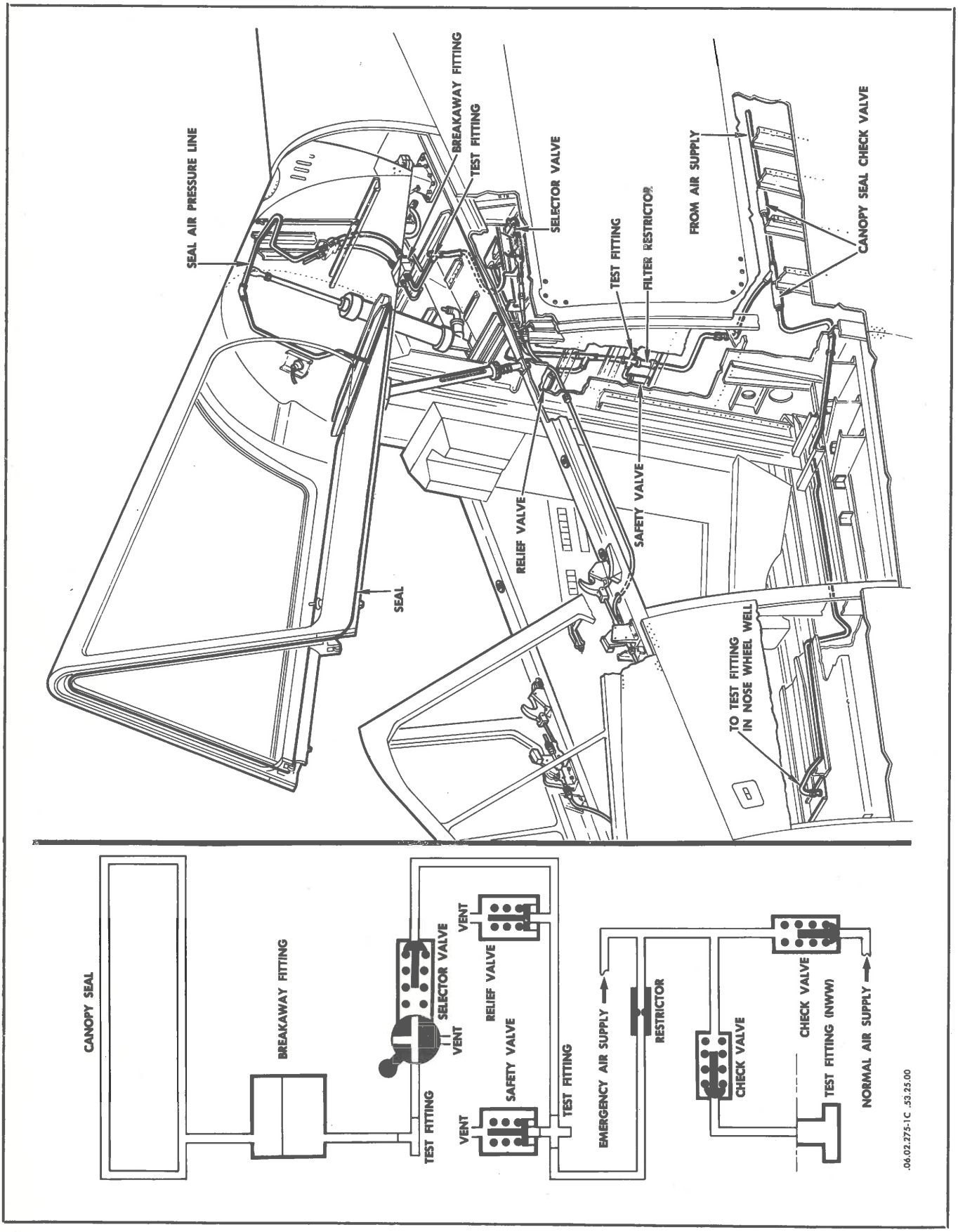


Figure 8-25. Canopy Seal System, F-106A

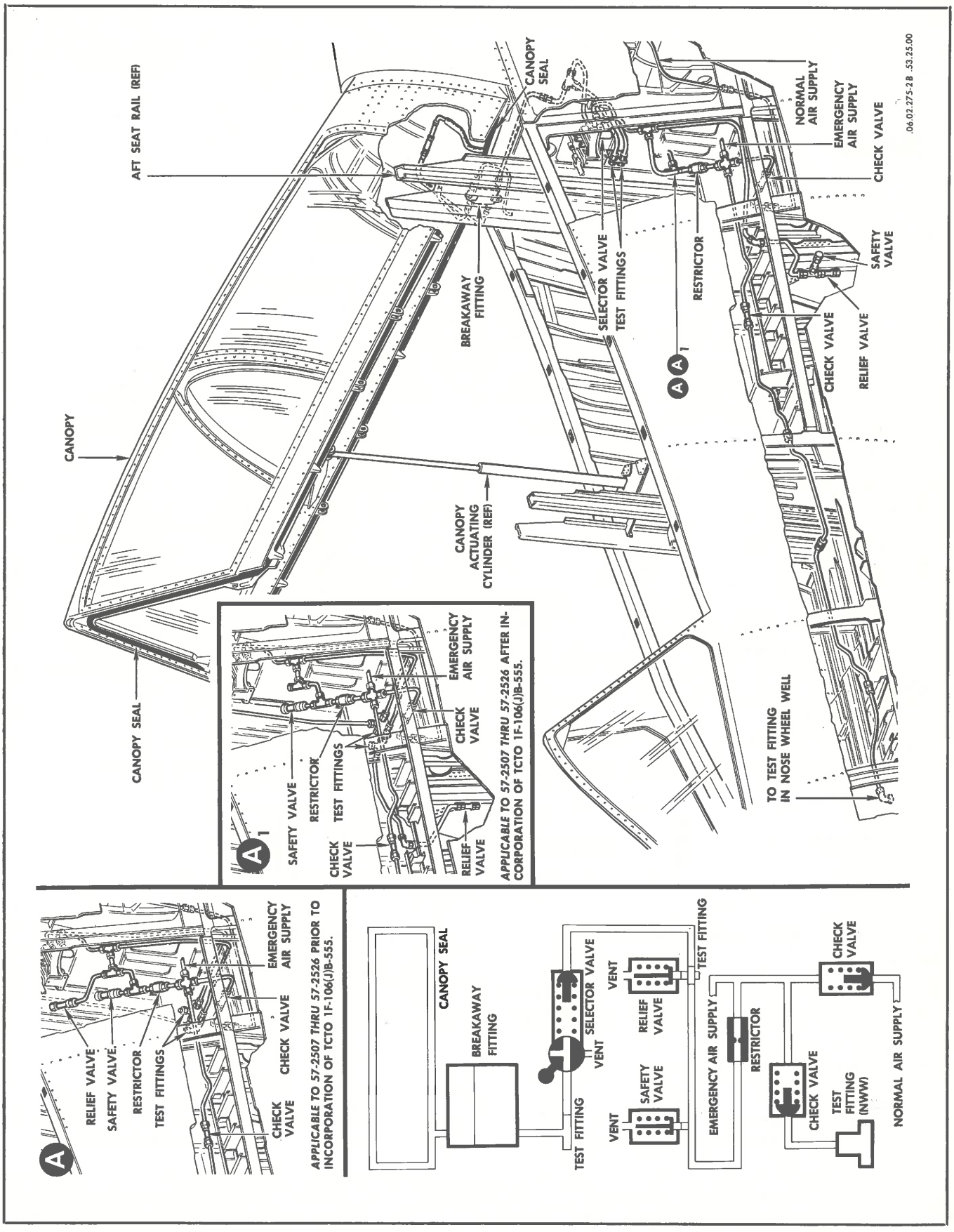


Figure 8-26. Canopy Seal System, F-106B

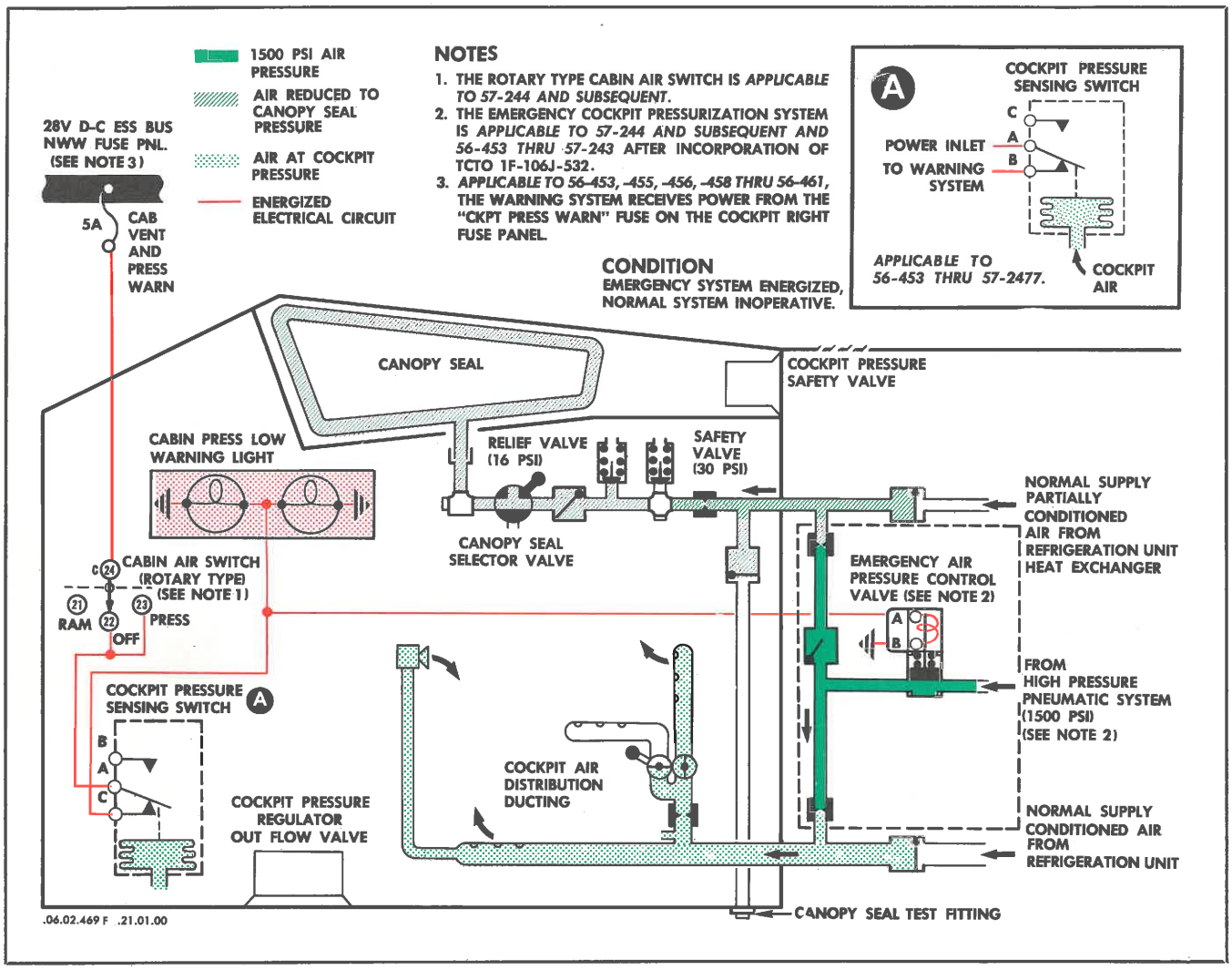


Figure 8-27. Cockpit Emergency Pressurization and Low Pressure Warning System, F-106A

OPERATIONAL CHECKOUT

8-57. CANOPY SEAL SYSTEM OPERATIONAL CHECK.

The following operational check is designed to test the operation of the various valves in the canopy seal pressurization system. The check also serves as a leak test of the canopy seal and its pressurization system. If the requirements of this test cannot be met, refer to system analysis, paragraph 8-61 for probable causes and corrective procedure.

8-58. Equipment Requirements.

FIGURE	NAME	TYPE	ALTERNATE	USE AND APPLICATION
	Compressed air source at 35 psi.			To pressurize canopy seal.
	Pressure Gages, 0 to 40 psi range (3 each).	7CAD345080		To measure pressure in various parts of canopy seal system.

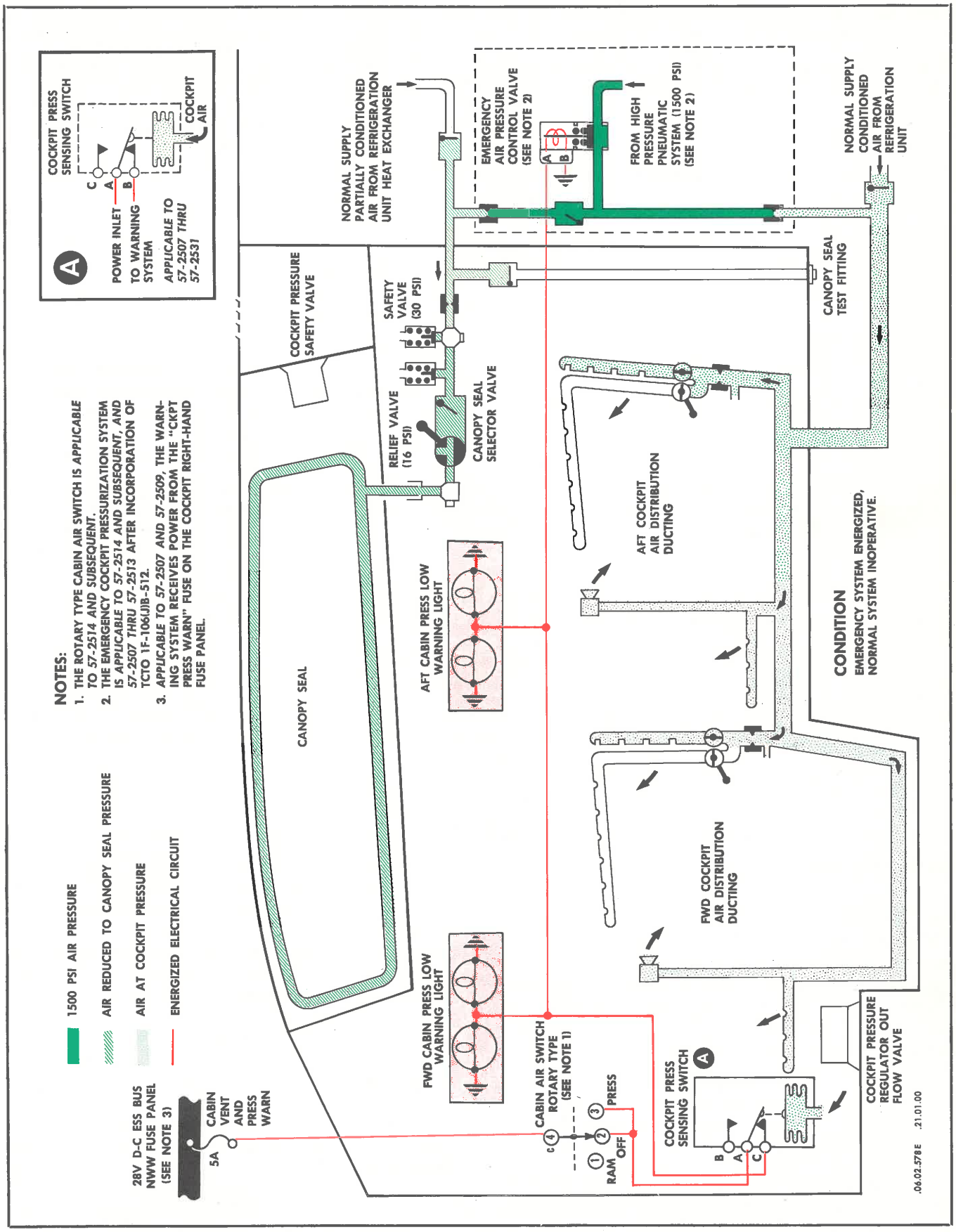


Figure 8-28. Cockpit Emergency Pressurization and Low Pressure Warning System, F-106B

8-58. Equipment Requirements (Cont).

FIGURE	NAME	TYPE	ALTERNATE	USE AND APPLICATION
1-25	Generator Set (Gas).	8-96026-801 AF/M32A-13 (6115-583-9365)	8-96026 AF/M32M-2 (6115-617-1417)	To energize electrical systems on aircraft equipped with special quick disconnect receptacle.
	Generator Set (Elec).	8-96025-803 AF/ECU-10/M (6125-583-3225)	8-96025-805 A/M24M-2	
			8-96025 AF/M24M-1 (6125-620-6468)	
1-24	Generator Set.		MC-1 (6125-500-1190)	To energize electrical systems (except AWCIS) on aircraft equipped with standard AN receptacle and on others by using adapter cable 8-96052-801.
			MD-3	
1-26	Adapter cable.	8-96052-801 (6115-690-4050)		To connect MC-1 and MD-3 units to aircraft equipped with special quick-disconnect receptacle.
	Bubble fluid. (10% Castile soap solution).	Manufactured by Atlas Chemical Co., San Diego, California	Equivalent	To check canopy seal system for leaks.
	Canopy hold-open support assembly.	8-96038-801 *(for F-106A airplanes).* 8-96137 *(for F-106B airplanes)*		To hold canopy open and prevent inadvertent closure.

8-59. Preparation.

a. Inspect to insure that high-pressure pneumatic system is charged.

b. Inspect canopy seal for proper installation, cuts, excessive wrinkles, and deterioration of rubber.

c. Inspect to insure that a good "CANOPY UNLOCK" fuse is installed on nose wheel well fuse panel and that a good "CANOPY POSITION LOCK" fuse is installed on cockpit left-hand fuse panel.

NOTE

Reference to "CANOPY POSITION LOCK" fuse applies to F-106A airplanes equipped with pneumatic canopy cylinders.

d. Disconnect and cap pressure lines at inlet ports of canopy seal safety and relief valves. Valves are installed at left-hand side of forward bulkhead in the upper aft electronics compartment.

e. Disconnect and cap pressure line at outlet port of check valve in line from heat exchanger. Valve is installed on forward bulkhead of upper aft electronics compartment.

f. Remove cap from test fitting in pressure line on canopy seal side of canopy seal selector valve. Install pressure gage at test fitting.

NOTE

Hereafter the above gage is referred to as gage A.

g. Remove cap from test fitting in pressure line on upstream side of canopy seal selector valve. Install pressure gage at test fitting.

NOTE

Hereafter the above gage is referred to as gage B.

h. Open canopy and install applicable canopy hold-open support assembly to prevent inadvertent closure.

i. Connect external source of 28-volt dc power to airplane external power receptacle. Refer to paragraph 1-42 for procedure.

j. Connect 0 to 35 psi regulated air pressure source to canopy seal test fitting in cockpit floor (left-hand forward part of nose wheel well ceiling). Install pressure gage in supply line.

8-60. Procedure.

a. Turn on external source of 28-volt dc electrical power. Canopy-unlock warning light shall illuminate.

b. Place canopy position-lock switch at its "unlock" position and remove canopy hold-open support assembly.

c. Close and lock the canopy. The canopy-unlock warning light shall extinguish.

d. Turn on source of air pressure and adjust to 28 (±1) psi, as indicated on gage A, and turn off pressure source.

e. Unlock canopy; gage A shall indicate "0" and canopy-unlock warning light shall illuminate.

NOTE

If pressure does not drop to 0, the canopy seal selector valve is not operating properly. Check adjustment per figures 8-30 or 8-31 and repeat steps "d" and "e." If valve is properly adjusted but still malfunctions, it must be replaced.

f. Lock canopy; canopy-unlock warning light shall extinguish.

g. Slowly turn on air pressure source and adjust pressure until gage A indicates 28 (−1) psi, then turn off airflow.

h. Wait five minutes and note reading on gage A. If pressure is less than 26.5 psi, use bubble fluid to check system for leaks.

i. Repair any leaks discovered and repeat test per steps "g" and "h" preceding.

j. Adjust pressure in system to 28 (±1) psi, as indicated by gage A, and turn off source. Wait 60 minutes and note reading on gages A and B. Gage A reading shall drop no more than 5 psi on F-106A airplanes, or 10 psi on F-106B airplanes. Reading on gage B shall be within one psi of gage A.

k. If pressure drop exceeds values given, use bubble fluid to check for leaks. Repair any leaks discovered. Retest until system is free from leaks.

l. Turn off source of air pressure, remove caps, and reconnect pressure lines to canopy seal safety valve, relief valve, and check valve.

m. With canopy locked, turn on source of air pressure and regulate to 30 psi.

n. Turn off source of air pressure. Indication on gage B shall drop rapidly and stabilize at 16 (+1.5, −2.9) psi. This indicates system relief valve is functioning.

o. Note pressure at which system stabilizes and wait one minute. Indication on gage B shall not drop more than two psi.

p. If pressure drop exceeds two psi, use bubble fluid to check for leaks. Repair leaks as necessary.

NOTE

Leak at vent port of relief or safety valve indicates valve must be replaced.

q. Repeat steps "m," "n," and "o" until pressure drop is within limits.

r. Cap vent port on 16 psi relief valve and adjust air pressure source to 35 psi.

s. Turn off source of air pressure. Indication on gage B shall drop rapidly and stabilize at 30 (+1.5, −4.3) psi.

NOTE

Failure of pressure to drop rapidly to 30 psi indicates malfunction of safety valve which must then be replaced.

t. Unlock canopy, and disconnect external sources of air pressure and electrical power from airplane. Remove pressure gages and cap all test fittings. Remove cap from vent port on 16 psi relief valve.

CAUTION

Failure to properly cap canopy seal test fittings may result in loss of cockpit pressure when in flight.

SYSTEM ANALYSIS

8-61. SYSTEM ANALYSIS, CANOPY SEAL SYSTEM.

PROBABLE CAUSE	ISOLATION PROCEDURE	REMEDY
COCKPIT PRESSURE CANNOT BE MAINTAINED DUE TO CANOPY SEAL SYSTEM LEAKAGE.		
Leak in inflatable seal or seal pressurization system.	Conduct leak test as instructed in paragraphs 8-57 through 8-60.	Repair leaks or replace components as necessary. If leak is in seal itself, replace as instructed on figure 8-29.

8-61. SYSTEM ANALYSIS, CANOPY SEAL SYSTEM (CONT).

PROBABLE CAUSE	ISOLATION PROCEDURE	REMEDY
COCKPIT PRESSURE CANNOT BE MAINTAINED DUE TO CANOPY SEAL SYSTEM LEAKAGE (CONT).		
Canopy seal relief or safety valve malfunction.	Test operation of relief and safety valves as instructed in paragraphs 8-57 through 8-60.	Replace defective valve.
Selector valve incorrectly mounted or defective selector valve vent piston.	With system pressurized and canopy locked, check for leak at vent port. Push vent piston inboard with finger; if leak stops, valve is incorrectly mounted. If leak does not stop, vent piston is defective and valve must be replaced.	Loosen selector valve mounting bolts, move to position where leak stops, tighten mounting bolts. If valve cannot be repositioned to stop leak, replace valve. Adjust valve per figure 8-30 or 8-31.
Malfunction of selector valve or valve improperly adjusted.	Connect pressure gage to test fitting on canopy seal side of selector valve. Connect second gage to test fitting at upstream side of selector valve. Pressurize system to 16 psi. If upstream gage reads 16 (−1.5) psi and gage on canopy seal side is under 10 psi, the valve is at fault.	Check valve adjustment per figure 8-30 or 8-31 and repeat test. If reading is still low, replace valve.

REPLACEMENT

8-62. REPLACEMENT, INFLATABLE CANOPY SEAL

Replace the inflatable canopy seal as directed on figure 8-29.

8-63. REPLACEMENT, CANOPY SEAL SELECTOR VALVE.

Procedures for replacing the canopy seal selector valve are obvious and routine except that when installing the valve, the valve should be positioned as far outboard as possible. After installing the valve, adjust its mechanical connections as instructed on figure 8-30 or 8-31.

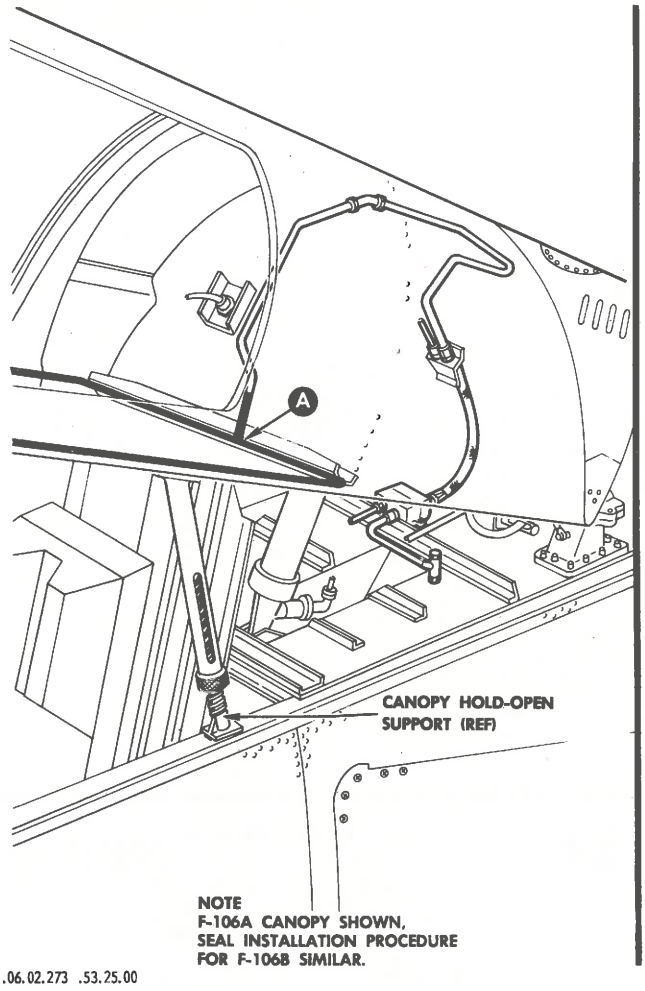
8-64. REPLACEMENT, CANOPY SEAL RELIEF AND SAFETY VALVES.

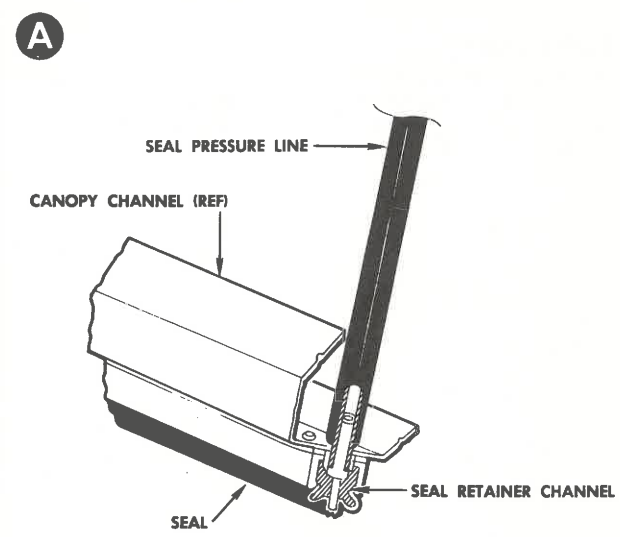
Procedures for replacing the canopy seal relief and safety valve are obvious and routine. Be careful to install valve with "OUT" ports connected to downstream tubing. Be sure to install valves having proper pressure settings; that is, 16 and 30 psi.

ADJUSTMENT

8-65. ADJUSTMENT, CANOPY SEAL SELECTOR VALVE.

Adjust the selector valve mechanical connections as described on figure 8-30 or 8-31.





INSTALLATION

a. Remove canopy and place on suitable padded work bench.
b. Remove seal from seal retainer channel.
c. Inspect retainer for dirt, burrs, or other damage.
d. Insert air pressure line of new seal into hole in seal retainer; then continue pressing remainder of seal into retainer.
e. Reinstall canopy and connect pressure line. Pressure test canopy seal.

Figure 8-29. Canopy Seal Installation

PILOT'S SEAT (UPWARD EJECTION)

Applicable to F-106A airplanes 56-453 thru 59-059, and F-106B airplanes 57-2507 thru 58-904 prior to incorporation of TCTO 1F-106-569.

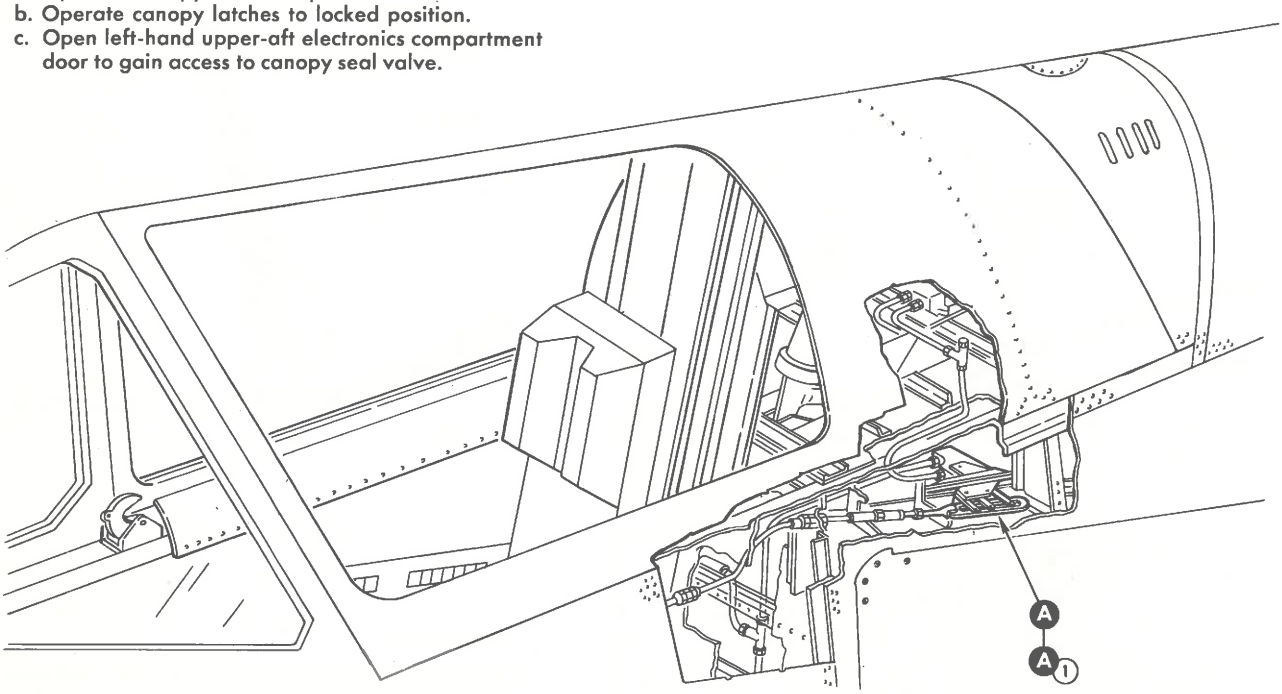
DESCRIPTION

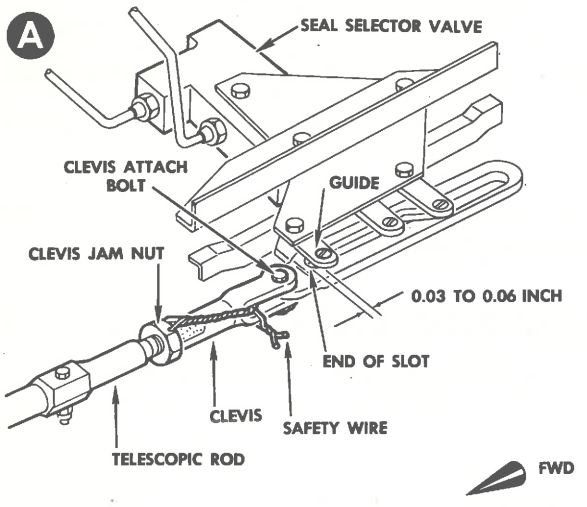
8-66. GENERAL.

The pilot's seat assembly is of the ballistic ejection type and is equipped with canopy jettison and seat ejection controls, a height adjustment mechanism, a seat belt, shoulder straps, an inertia reel, a survival kit, and pilot's personal leads disconnect assemblies. The ballistic ejection system is discussed in paragraphs 8-80 through 8-85. The survival kit is not included in all seat assemblies; refer to paragraph 8-67 for survival kit effectivity. The belt and shoulder straps are fastened by a single clasp in the pilot's lap. The clasp is normally released by hand, and is automatically released during emergency seat ejection. The shoulder straps are attached to the spring-loaded inertia reel that allows the pilot limited shoulder movement, but prevents his being thrown forward in case of an accident. The inertia reel is attached to the back of the seat, and is locked automatically when a rapid pull (equivalent to 2 or 3 G deceleration) force is

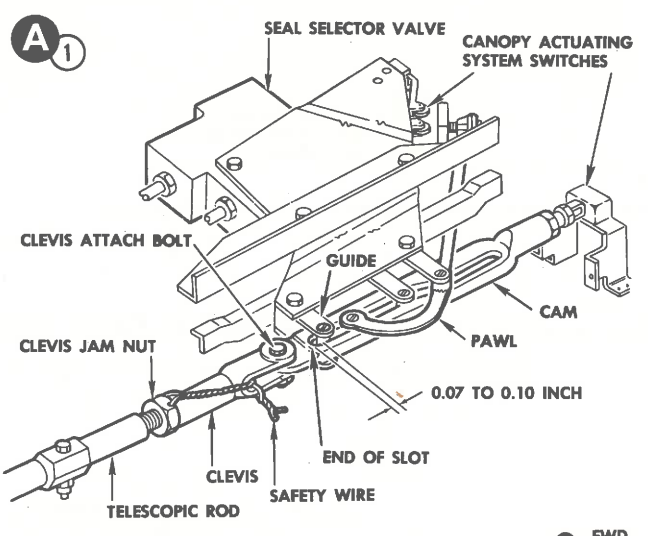
PREPARATION

a. Operate canopy to closed position.
b. Operate canopy latches to locked position.
c. Open left-hand upper-aft electronics compartment door to gain access to canopy seal valve.





APPLICABLE TO AIRPLANES EQUIPPED WITH PNEUMATIC CANOPY ACTUATORS.



APPLICABLE TO AIRPLANES EQUIPPED WITH ELECTRIC CANOPY ACTUATORS.

ADJUSTMENT

a. After latch mechanism has been properly adjusted and with latches in the locked position, adjust telescopic rod clevis to provide clearance between end of slot and guide as shown in applicable detail.
b. Tighten and safety-wire clevis jam nut. Complete installation of clevis attach bolt.
c. *Applicable to airplanes equipped with electric canopy actuators,* adjust canopy actuating system switches.
d. Check canopy actuator and latch switches for proper operation.

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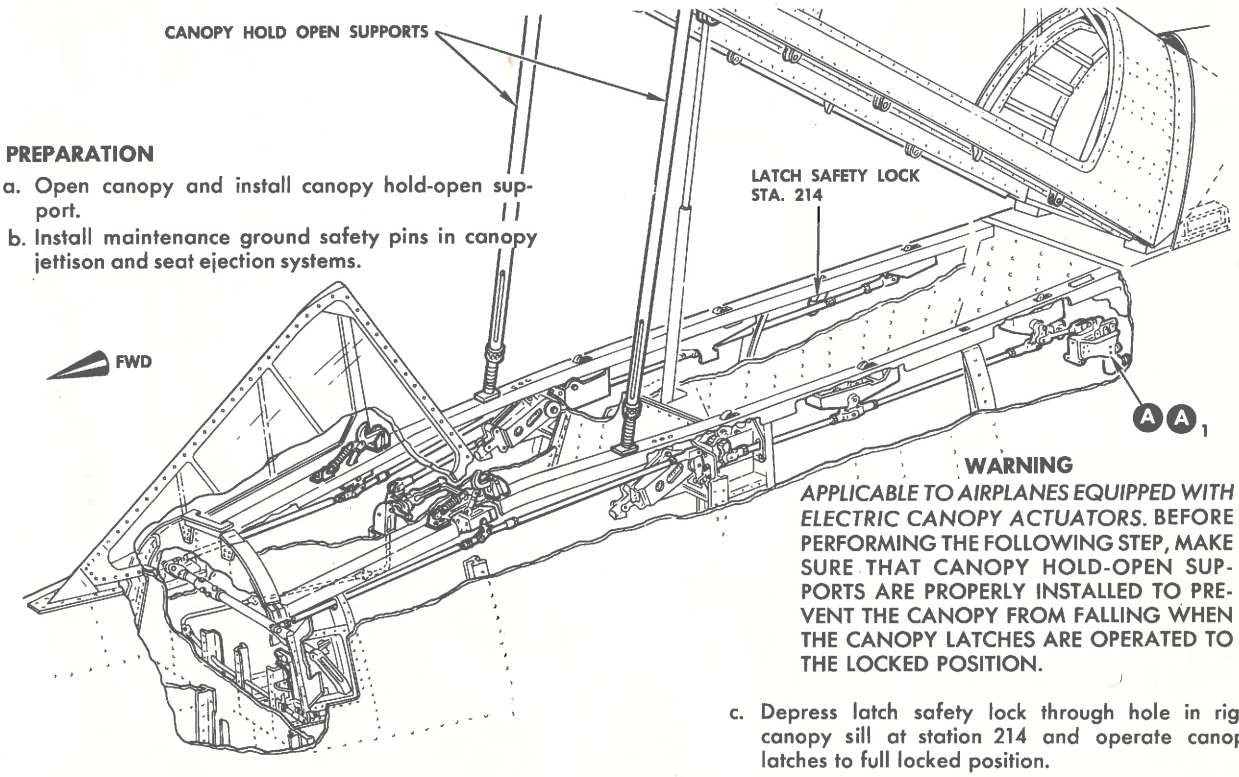
Figure 8-30. Canopy Seal Selector Valve Adjustment, F-106A



PREPARATION

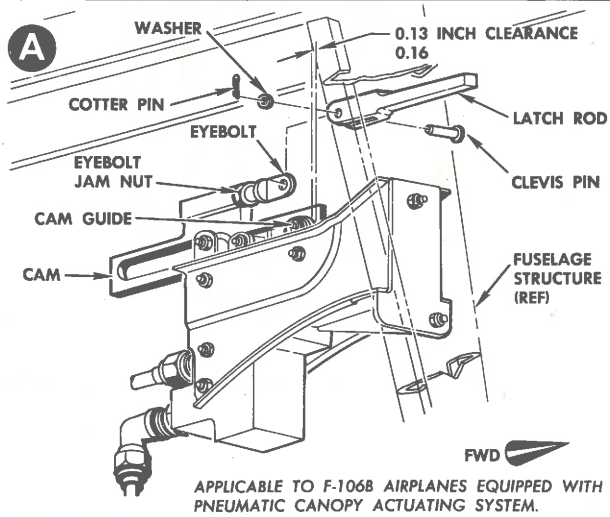
a. Open canopy and install canopy hold-open support.

b. Install maintenance ground safety pins in canopy jettison and seat ejection systems.

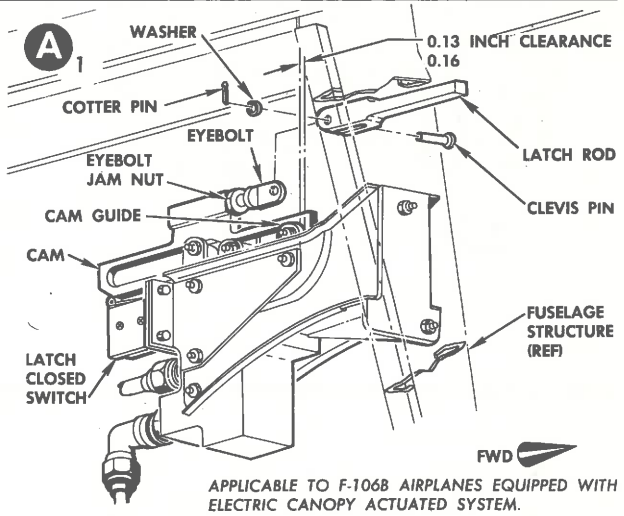
WARNING

APPLICABLE TO AIRPLANES EQUIPPED WITH ELECTRIC CANOPY ACTUATORS. BEFORE PERFORMING THE FOLLOWING STEP, MAKE SURE THAT CANOPY HOLD-OPEN SUPPORTS ARE PROPERLY INSTALLED TO PREVENT THE CANOPY FROM FALLING WHEN THE CANOPY LATCHES ARE OPERATED TO THE LOCKED POSITION.

c. Depress latch safety lock through hole in right canopy sill at station 214 and operate canopy latches to full locked position.



APPLICABLE TO F-106B AIRPLANES EQUIPPED WITH PNEUMATIC CANOPY ACTUATING SYSTEM.



APPLICABLE TO F-106B AIRPLANES EQUIPPED WITH ELECTRIC CANOPY ACTUATED SYSTEM.

ADJUSTMENT

NOTE

THE CANOPY LATCH SYSTEM MUST BE ADJUSTED BEFORE ANY ATTEMPT IS MADE TO ADJUST THE CANOPY SEAL SELECTOR VALVE.

Adjust eyebolt to obtain 0.13 to 0.16 inch clearance between the forward end of the cam slot and the cam guide. Tighten eyebolt jam nut.

b. Install clevis pin, washer, and cotter pin.

c. *Applicable to airplanes equipped with electrical canopy actuators.* Adjust latch closed switch so that cam actuates switch within the last 0.06 inch of travel. The switch shall not bottom out.

d. Operate canopy latches to unlocked position, remove canopy hold-open supports, close canopy and check latches for proper operation.

e. Remove maintenance ground safety pins from canopy jettison and seat ejection system.

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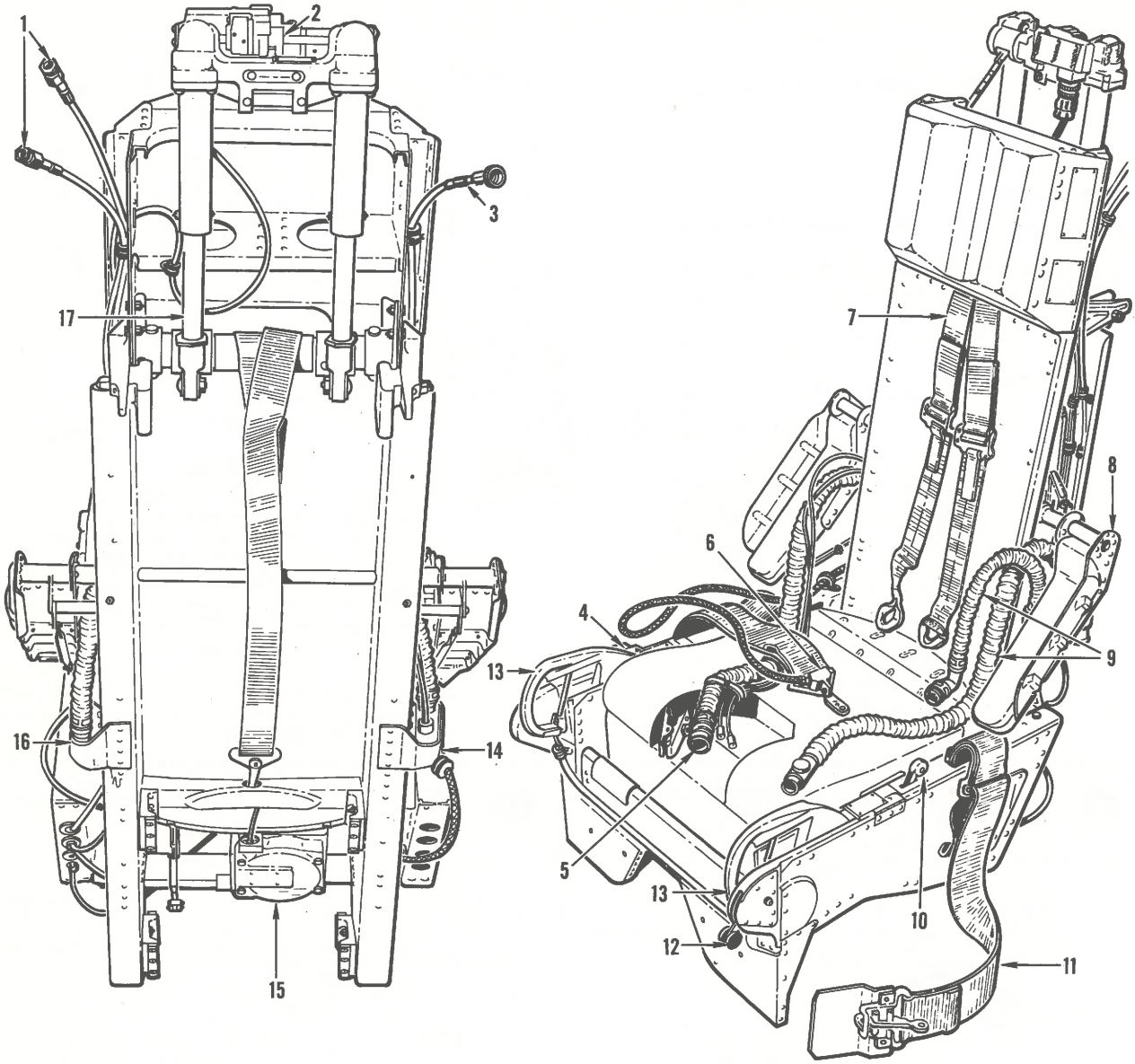
Figure 8-31. Canopy Seal Selector Valve Adjustment, F-106B



1. BALLISTIC HOSES.
2. SEAT ADJUSTING ACTUATOR.
3. BALLISTIC HOSE.
4. SEAT ADJUSTING SWITCH.
5. OXYGEN TUBE AND ELECTRICAL LEADS.
6. LAP BELT AUTOMATIC RELEASE MECHANISM.
7. SHOULDER HARNESS.
8. ARM GUARD (RAISED DURING EJECTION).
9. ANTI-G SUIT AND VENT SUIT TUBING.
10. INERTIA REEL LOCK.
11. LAP BELT.
12. CANOPY JETTISON CONTROL.
13. CANOPY JETTISON AND SEAT EJECTION CONTROL HANDLE.
14. QUICK-DISCONNECT ASSEMBLY (FOR PILOT'S OXYGEN AND ELECTRICAL LEADS).
15. INERTIA REEL.
16. LH QUICK-DISCONNECT ASSEMBLY (FOR PILOT'S ANTI-G AND VENT SUIT TUBING).
17. SEAT ADJUSTING SCREW JACK.

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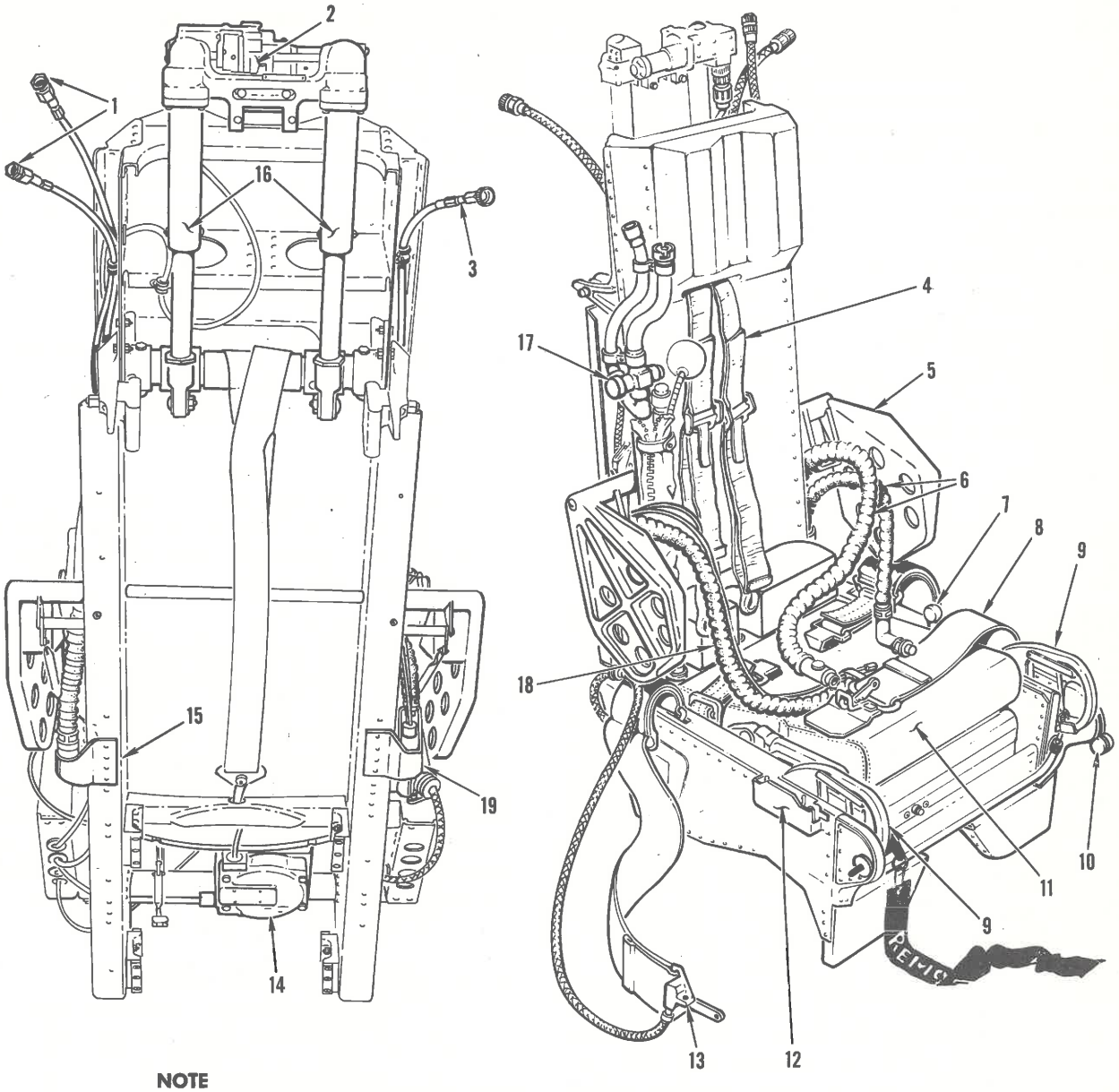
Figure 8-32. Upward Ejection Seat, F-106A
Applicable to 56-453 thru -462 and 56-467 prior to incorporation of TCTO 1F-106J-506 and TCTO 1F-106(J)-622



NOTE

APPLICABLE TO F-106A AIRPLANES 57-2478 AND SUBSEQUENT; AND F-106B AIRPLANES 57-2527 AND SUBSEQUENT.

1. BALLISTIC HOSES.
2. SEAT ADJUSTING ACTUATOR.
3. BALLISTIC HOSE.
4. SHOULDER HARNESS.
5. ARM GUARD (RAISED DURING EJECTION).
6. ANTI-G SUIT AND VENT SUIT TUBING.
7. INERTIAL REEL LOCK.
8. LAP BELT.
9. CANOPY JETTISON AND SEAT EJECTION CONTROL HANDLE.
10. CANOPY JETTISON CONTROL.
11. SURVIVAL KIT.
12. SEAT ADJUSTING SWITCH.
13. LAP BELT AUTOMATIC RELEASE MECHANISM.
14. INERTIA REEL.
15. LH QUICK-DISCONNECT ASSEMBLY (FOR PILOT'S ANTI-G AND VENT SUIT TUBING).
16. SEAT ADJUSTING SCREW JACK.
17. "KIT-TO-MAN" PERSONAL LEADS.
18. OXYGEN TUBE AND ELECTRICAL LEADS (SEE NOTE).
19. QUICK-DISCONNECT ASSEMBLY FOR PILOT'S OXYGEN AND ELECTRICAL LEADS (SEE NOTE).

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Figure 8-33. Upward Ejection Seat
Applicable to F-106A airplanes 56-463 thru 56-466, 57-299 thru 59-059; and 56-453, -454, -457 thru -462, and 56-467 after incorporation of TCTO 1F-106J-506 and TCTO 1F-106(J)-622.
Applicable to F-106B airplanes 57-2507 thru 58-904

exerted on the harness assembly. An electrical actuator and two screw jacks at the top of the seat provide the pilot with 4.25 (±0.03) inches of vertical seat adjustment. The actuator is controlled by a switch on the right-hand armrest. Forearm guards protect the pilot's arms during seat ejection. These guards are stowed in the down position by latches which are released when either of the two canopy jettison and seat ejection control handles is raised. This permits them to swing into an upright position, and lock in place for seat ejection. See figure 8-32 or 8-33 for an illustration of the pilot's seat.

8-67. SURVIVAL KIT.

Applicable to F-106A airplanes 56-463 thru 56-466, 57-229 thru 59-059, and F-106B airplanes. Applicable to F-106A airplanes 56-453, -454, -457 thru -462, and 56-467 after incorporation of TCTO 1F-106J-506. A survival kit is installed in place of the seat cushion. The kit consists of an interconnected, two-piece, reinforced fiberglass container and a cushion that provides a seat pack for the pilot. Mounted within the container are oxygen system components for both normal and emergency operations, a CO_2 bottle for life raft inflation, life raft, radio, radar and sun reflector, rifle, fishing gear, water purifier, sleeping bag, food, first-aid kit and other items required for survival that are peculiar to the area in which the airplane is based. The kit attaches, through a hole in the seat, to the airplane's oxygen system, the communications system, and the helmet face plate defog system, by a multipurpose quick-disconnect fitting on the bottom of the container. A flexible personal lead assembly is attached to the kit by a multipurpose quick-disconnect fitting on the aft right side of the container. When the personal leads are not connected, dust caps must be installed. A strap is attached to each side of the kit by a self locking wedge type fitting. The opposite end of the strap has a fitting for attachment to the pilot's parachute harness. During normal ground operations, the pilot attaches and/or detaches the straps to his parachute harness and connects and/or disconnects the kit's personal leads assembly to his equipment. During a ground emergency, such as a crash or fire, the pilot is separated from the kit by pulling up and aft on the flexible loop of yellow emergency release handle which is located on the forward right side of the kit. This action disconnects the parachute harness attachment straps from the kit and also disconnects the personal leads assembly from the kit. See figure 8-34 for an illustration of the survival kit.

8-68. Normal Operation of Survival Kit.

When the "on-off" valve of the oxygen control panel is positioned at "ON," gaseous oxygen from the airplane normal supply is routed to the automatic regulator contained within the kit. The regulator provides 100% oxygen at a positive pressure and with continuous flow through the personal leads to the pilot at all altitudes. The "on-off" valve must be positioned at "OFF" during ground operations except while performing an operational check of the oxygen system. Refer to T.O. 1F-106A-2-6 for detailed information on the oxygen system.

8-69. Emergency Operation of Survival Kit.

After canopy jettison and seat ejection, as described in paragraphs 8-83 have taken place, the survival kit functions as follows:

NOTE

The pilot's parachute opens automatically upon descent to 15,000 feet, or, if ejection is below 15,000 feet, parachute opens one to two seconds after pilot leaves seat.

a. Pilot descends with breathing oxygen and suit pressure (if necessary) being supplied from survival kit. Oxygen supply is adequate for 10 to 15 minutes.

b. When the pilot pulls the emergency release handle, the lower portion of the survival kit, attached to the parachute harness by a lanyard, drops and suspends 25 feet below the pilot. This action disconnects the personal leads, inflates the life raft, and allows the life raft to drop and suspend, by the lanyard, at the midpoint between the pilot and the lower portion of the survival kit.

8-70. SEAT ADJUSTMENT ACTUATOR.

The seat adjustment actuator is an electrically driven, double-screw jack unit, capable of adjusting the seat vertically through a range of 4.25 (±0.03) inches. The screw jacks attach to the seat, and the motor housing attaches to the top of the seat catapult. In an emergency seat ejection, the actuator jettisons with the seat. The actuator control switch is on the right-hand armrest. The seat adjustment system is connected to the 28-volt dc nonessential bus through the "SEAT ADJUST" fuse on the cockpit left-hand fuse panel.

OPERATIONAL CHECKOUT

8-71. OPERATIONAL CHECK, SEAT ADJUSTMENT SYSTEM.

The following operational check is designed to test the operation of the pilot's seat adjustment mechanism. If the requirements of the check cannot be met, refer to System Analysis, paragraph 8-75, for probable causes and corrective procedures.

8-72. Equipment Requirements.

FIGURE	NAME	TYPE	ALTERNATE	USE AND APPLICATION
1-25	Generator Set (Gas).	8-96026-801 AF/M32A-13 (6115-583-9365)	8-96026 AF/M32M-2 (6115-617-1417)	To energize electrical systems on aircraft equipped with special quick disconnect receptacle.
	Generator Set (Elec).	8-96025-803 AF/ECU-10/M (6125-583-3225)	8-96025-805 A/M24M-2	
			8-96025 AF/M24M-1 (6125-620-6468)	
1-24	Generator Set.		MC-1 (6125-500-1190)	To energize electrical systems (except AWCIS) on aircraft equipped with standard AN receptacle and on others by using adapter cable 8-96052-801.
			MD-3	
1-26	Adapter Cable.	8-96052-801 (6115-690-4050)		To connect MC-1 and MD-3 units to aircraft equipped with special quick-disconnect receptacle.
	Canopy Hold-Open Support Assembly.	8-96038-801 *(for F-106A airplanes).* 8-96137 *(for F-106B airplanes)*		To hold canopy open and prevent inadvertent operation.

8-73. Preparation.

a. Inspect to insure that a good "SEAT ADJUST" fuse is installed on the cockpit left-hand fuse panel.

b. Connect external source of 28-volt dc electrical power to airplane external power receptacle. Refer to Section I for procedure.

c. Open canopy and install canopy hold-open support assembly, 8-96038-801 or 8-96137, to prevent inadvertent operation.

8-74. Procedure.

a. Place seat adjustment switch at "LOWER" position. Seat shall move to lowest limit and stop. Check that lowest seat position is 4.25 (±0.03) inches from highest position.

WARNING

Seat ballistic hose connected to lap belt, M-12 initiator, may be crimped, kinked, or flattened if seat lowers more than 4.28 inches from highest position. If hose is damaged, replace hose.

b. Place seat adjustment switch at "RAISE" position. Seat shall move to highest position and stop. Time of travel shall not exceed 30 seconds. Check ballistic system hoses at each side of seat for proper installation.

WARNING

The seat ejection ballistic system is an emergency system. Make sure that ballistic system hoses have sufficient slack for normal seat operations; the hoses shall not be pulled taut and shall not be crimped, flattened or kinked. Refer to paragraph 8-98 for test procedure of ballistic system quick-disconnect couplings.

c. Place seat adjust switch at "LOWER" position for 10 to 15 seconds and then move switch to "OFF." Seat shall lower to intermedite position and stop. Check ballistic system hoses at each side of seat for proper installation; refer to WARNING.

d. Disconnect external electrical power from airplane.

SYSTEM ANALYSIS

8-75. SYSTEM ANALYSIS, PILOT'S SEAT.

PROBABLE CAUSE	ISOLATION PROCEDURE	REMEDY
SEAT WILL NOT RAISE OR LOWER WHEN SWITCH IS ACTUATED.		
"SEAT ADJUST" fuse blown or not installed.	Inspect fuse on cockpit left-hand fuse panel.	Install good fuse.
Defective actuator motor.	Disconnect electrical plug from actuator motor. Energize airplane dc electrical system. Place seat adjustment switch at "LOWER" or "RAISE" and check for power at electrical plug contacts. If no power is present, check wiring for break. If power is present, actuator is at fault.	Replace actuator per paragraphs 8-78 and 8-79.
SEAT BINDS WHEN RAISED OR LOWERED, OR WILL NOT TRAVEL THROUGH FULL RANGE OF ADJUSTMENT.		
Obstructions between rails and seat sliding blocks.	Check for obstruction.	Clear rails and blocks of obstructions if such are evident.

REPLACEMENT

8-76. REPLACEMENT, SURVIVAL KIT.

Remove and/or install survival kit as instructed in figure 8-34.

8-77. REPLACEMENT, PILOT'S SEAT.

Remove and install the pilot's seat as instructed on figure 8-35.

8-78. REMOVAL, SEAT ADJUSTMENT ACTUATOR.

a. Open canopy, install canopy hold-open support 8-96038-801 for F-106A airplanes, or 8-96137 for F-106B airplanes, and install canopy jettison and seat ejection safety pin assembly 8-96012 for F-106A airplanes, or 8-96147 for F-106B airplanes. See figures 8-42 or 8-43 for an illustration of the safety pin assembly installation.

b. Connect external source of 28-volt dc electrical power to airplane; refer to paragraph 1-42 for procedure.

c. Place seat adjustment switch at its "raise" position until seat raises to maximum height.

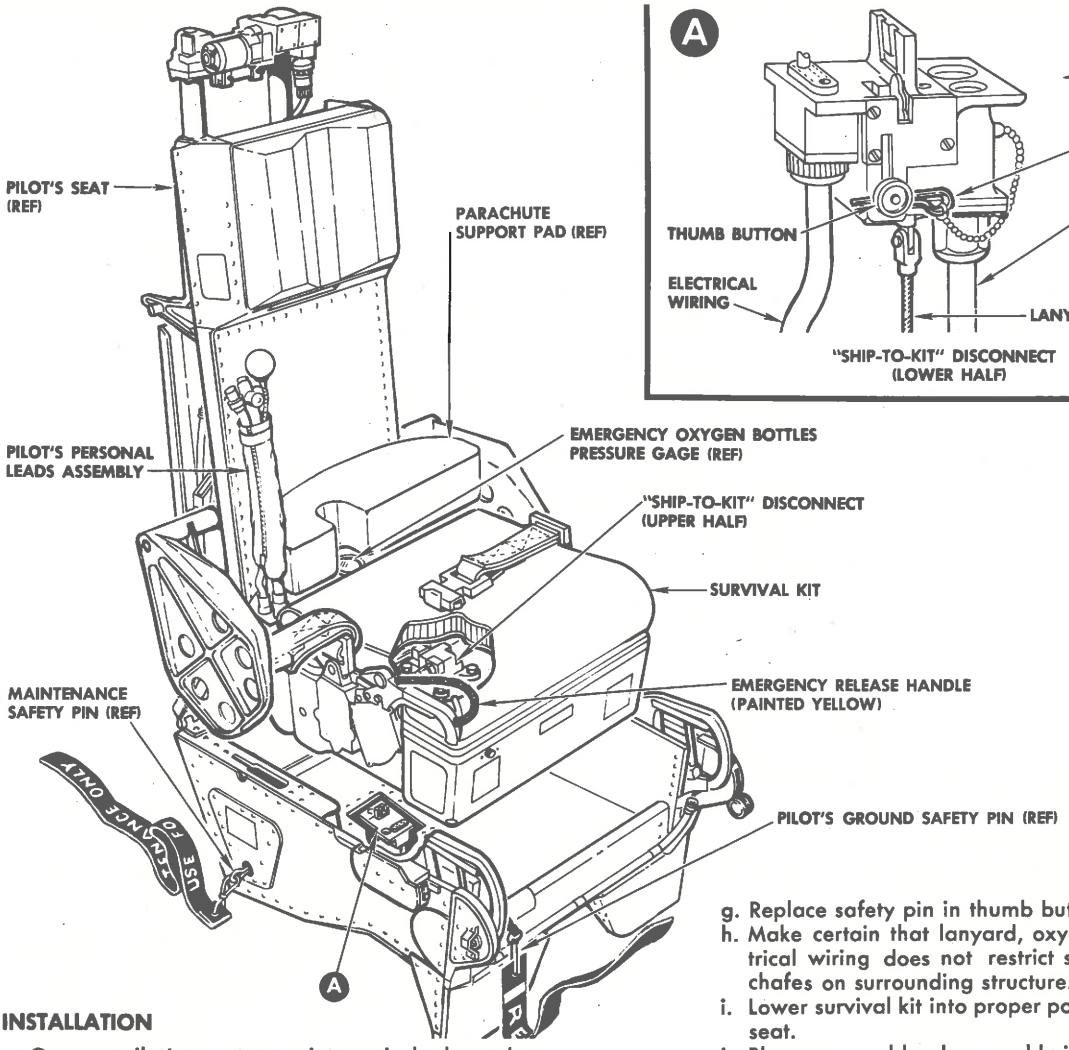
d. Turn off electrical power and disconnect electrical plug from actuator motor.

e. Remove bolts securing actuator jacks to seat. Lower seat to floor of cockpit.

f. Remove pin and two bolts securing actuator to top of seat catapult and remove actuator.

8-79. INSTALLATION, SEAT ADJUSTMENT ACTUATOR.

a. Open canopy, install canopy hold-open support 8-96038-801 for F-106A airplanes, or 8-96137 for F-106B airplanes, and install canopy jettison and seat ejection safety pin assembly 8-96012 for F-106A airplanes, or 8-86147 for F-106B airplanes. See figures 8-42 or 8-43 for an illustration of the safety pin assembly installation.



INSTALLATION

a. Operate pilot's seat to a point one inch above the lowest position.
b. Lift "Ship-to-Kit" disconnect fitting (lower half) through hole in pilot's seat and place on the pilot's seat pan.

WARNING

IT IS IMPERATIVE THAT THE LANYARD PORTION OF THE SHIP-TO-KIT DISCONNECT (DETAIL A) WILL RELEASE OR CAUSE THE DISCONNECT LOWER HALF TO SEPARATE PRIOR TO COMPLETE EXTENSION OF THE ELECTRICAL WIRING OR OXYGEN HOSE.

c. Remove safety pin from the thumb button on the "Ship-to-Kit" disconnect fitting (lower half).
d. Place survival kit in pilot's seat pan. Tilt back-side of the survival kit up and forward.
e. Depress thumb button and push "Ship-to-Kit" disconnect fitting (lower half) into "Ship-to-Kit" disconnect fitting (upper half) located underneath the survival kit.
f. When thumb button snaps out, "Ship-to-Kit" disconnect is engaged.
g. Replace safety pin in thumb button.
h. Make certain that lanyard, oxygen hose, or electrical wiring does not restrict seat operation or chafes on surrounding structure.
i. Lower survival kit into proper position in the pilot's seat.
j. Place personal leads assembly in upright position.
k. Perform an operational check of the oxygen system; Refer to T.O. 1F-106A-2-6 for procedure.
l. Perform an operational check of the communications system; refer to T.O. 1F-106A-2-14 for procedure.

REMOVAL

a. Operate pilot's seat to a point one inch above the lowest position.
b. Tilt back side of survival kit up and forward.
c. Remove safety pin, press thumb button, pull "Ship-to-Kit" disconnect fitting (lower half) from the survival kit.
d. Replace safety pin in thumb button. Install dust protector on "Ship-to-Kit" disconnect fittings.
e. Remove kit.

CAUTION

DO NOT LIFT OR CARRY KIT BY PERSONAL LEADS ASSEMBLY OR BY EMERGENCY RELEASE HANDLE.

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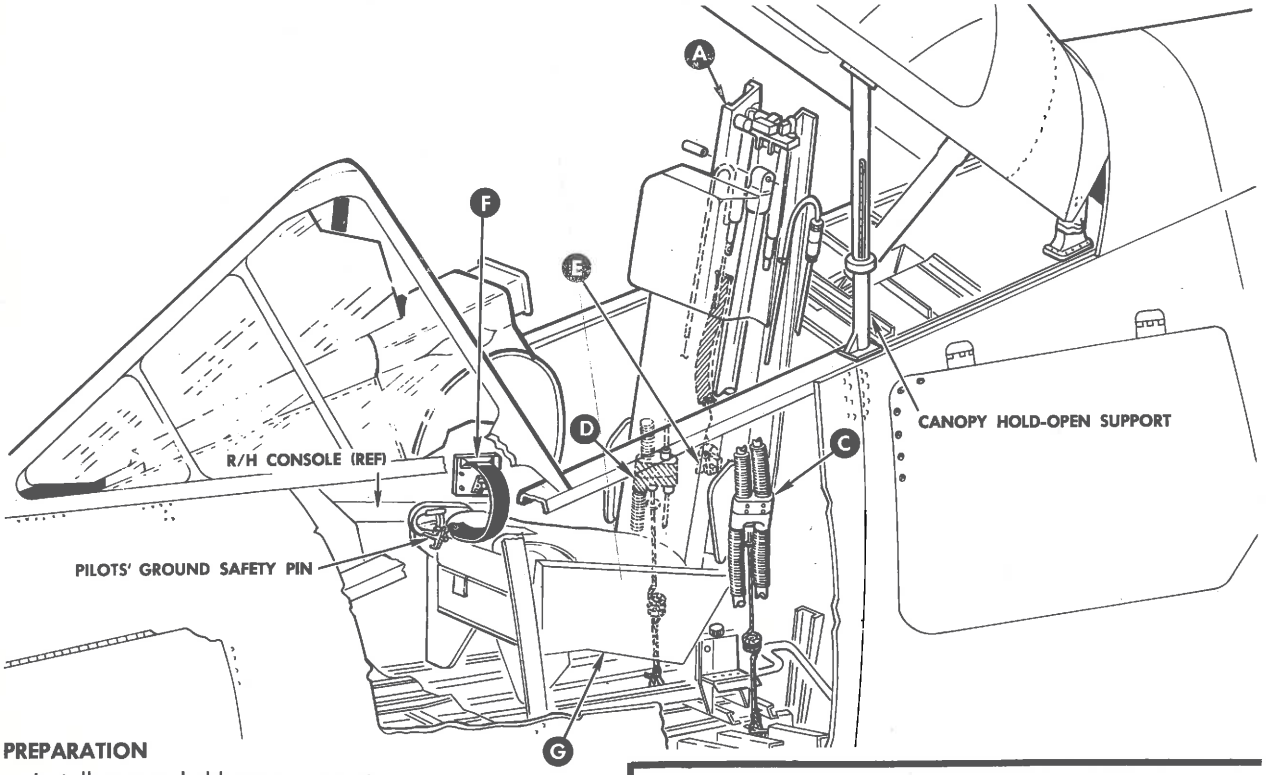
Figure 8-34. Upward Ejection Seat Survival Kit Replacement
Applicable to F-106A airplanes 56-463 thru 56-466, 57-229 thru 59-059; and 56-453, -454, -457 thru -462, and 56-467 after incorporation of TCTO 1F-106J-506 and TCTO 1F-106(J)-622.
Applicable to F-106B airplanes 57-2507 thru 58-904

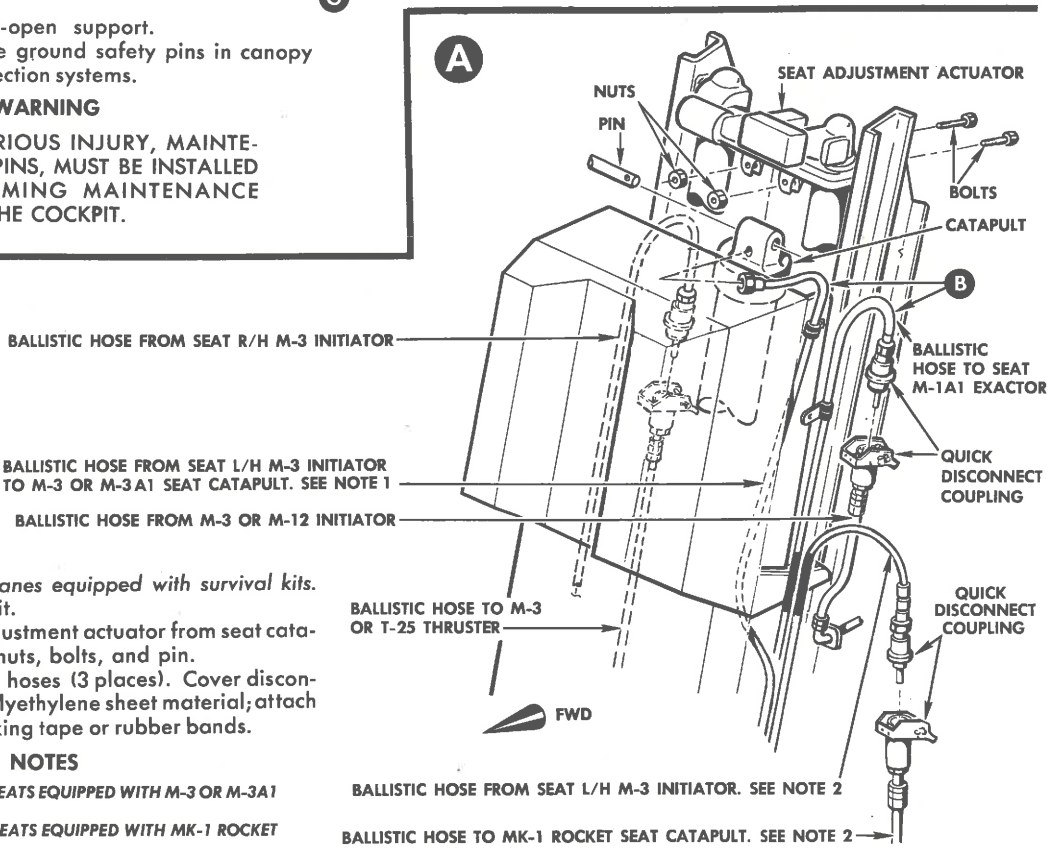


PREPARATION

a. Install canopy hold-open support.
b. Install maintenance ground safety pins in canopy jettison and seat ejection systems.

WARNING

TO PREVENT SERIOUS INJURY, MAINTENANCE SAFETY PINS, MUST BE INSTALLED WHEN PERFORMING MAINTENANCE WORK WITHIN THE COCKPIT.



REMOVAL

a. *Applicable to airplanes equipped with survival kits.* Remove survival kit.
b. Disconnect seat adjustment actuator from seat catapult by removing nuts, bolts, and pin.
c. Disconnect ballistic hoses (3 places). Cover disconnect points with polyethylene sheet material; attach material with masking tape or rubber bands.

NOTES

1. *APPLICABLE TO SEATS EQUIPPED WITH M-3 OR M-3A1 CATAPULTS.*
2. *APPLICABLE TO SEATS EQUIPPED WITH MK-1 ROCKET SEAT CATAPULT.*

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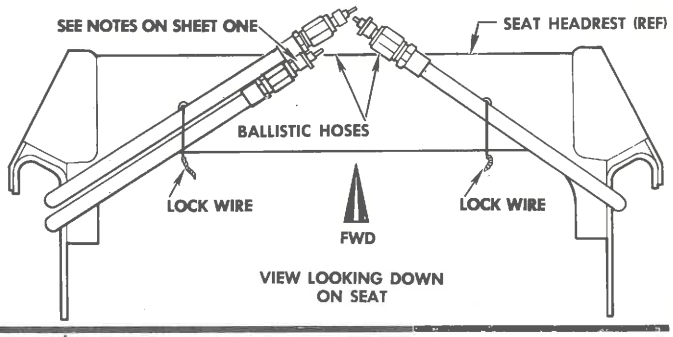
Figure 8-35. Upward Ejection Seat Replacement (Sheet 1 of 4)

B

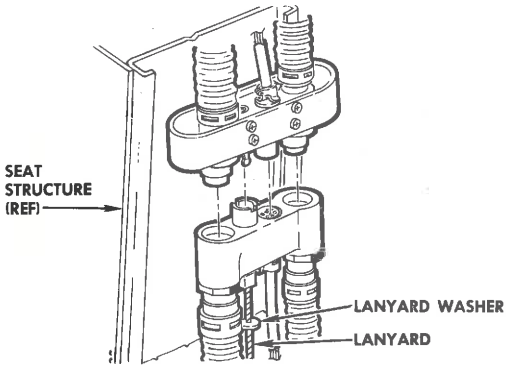
d. Lockwire ballistic hoses to seat structure, as shown, any time hoses are disconnected or seat is removed.

WARNING

USE CARE TO AVOID KINKING OR FLATTENING BALLISTIC HOSES. SEVERE DAMAGE OF THIS TYPE MAY PREVENT PILOT EJECTION.



C

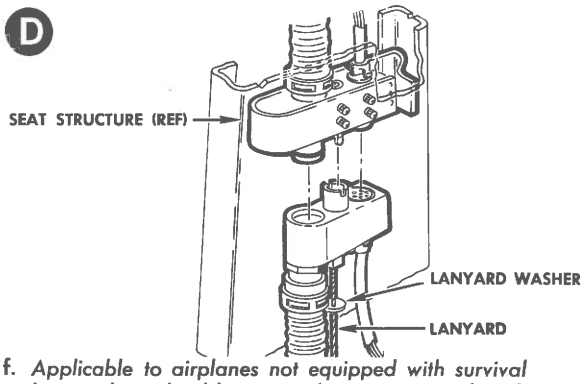


e. Disconnect the multi-purpose quick-disconnect on the left side of seat. Cover both portions of quick-disconnect fitting with polyethylene sheet material; attach material with masking tape or rubber bands.

NOTE

TO DISCONNECT FITTING, APPLY DOWNWARD PRESSURE ON LANYARD WASHER.

D



f. *Applicable to airplanes not equipped with survival kits and applicable to airplanes equipped with dual oxygen system.* Disconnect the multi-purpose quick-disconnect on the right side of seat; see note in detail C. Cover both portions of quick-disconnect fitting with polyethylene sheet material; attach material with masking tape or rubber bands.

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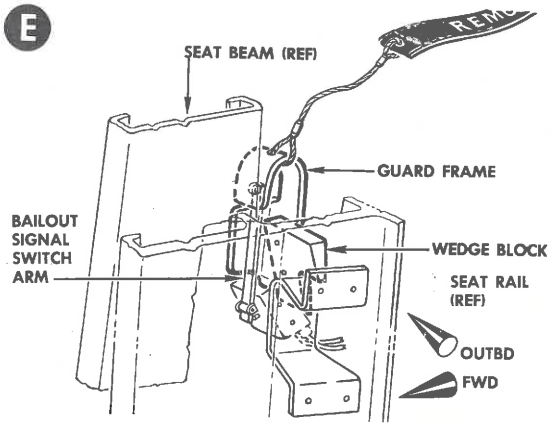
E

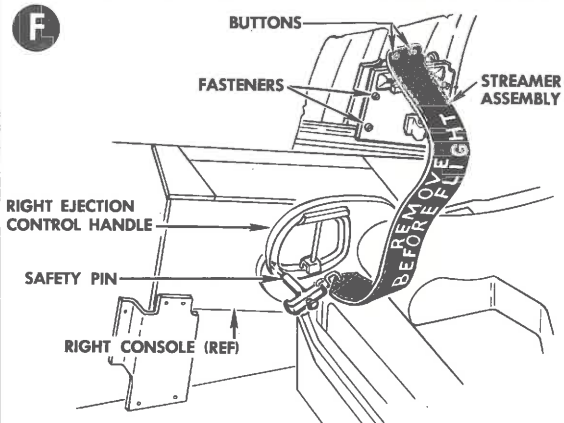


g. *Applicable to aft seats of F-106B airplanes.* Install 8-96196 bail-out switch guard.

CAUTION

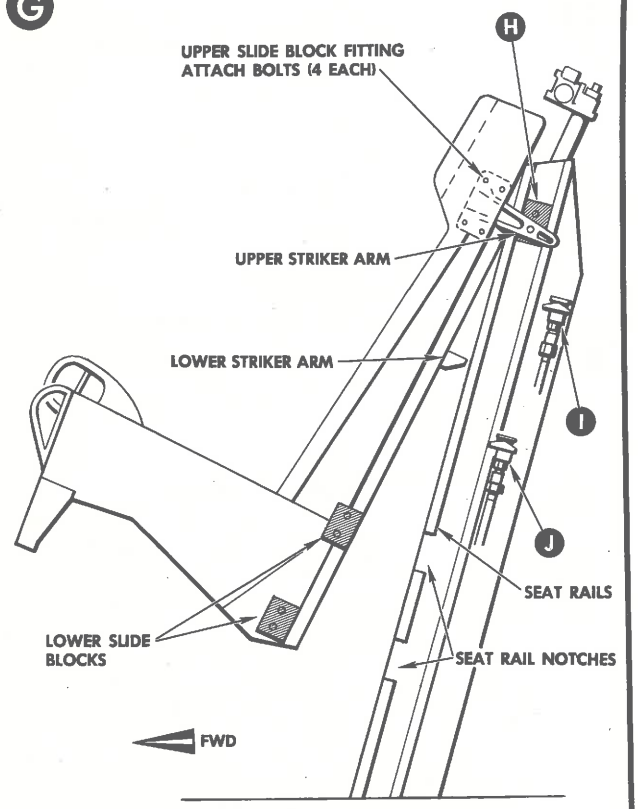
IF BAIL-OUT SWITCH GUARD IS NOT AVAILABLE, TIE-BACK BAIL-OUT SIGNAL SWITCH ARM. THIS PROTECTS THE SWITCH DURING SEAT INSTALLATION. REMOVE SWITCH GUARD OR THE TIEBACK AFTER SEAT IS INSTALLED.

F



h. Detach safety pin streamer assembly from airplane structure by unsnapping buttons (2) or by unloosening fasteners (4). Place assembly in seat; do not remove safety pin from seat ejection control handle.

Figure 8-35. Upward Ejection Seat Replacement (Sheet 2 of 4)

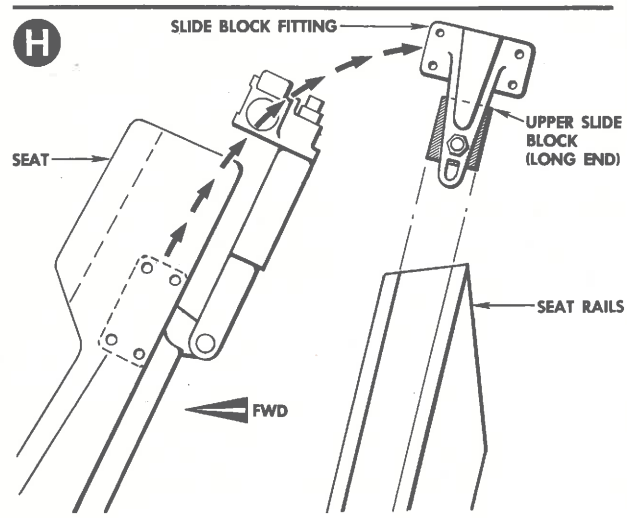


NOTE

THREE MEN ARE REQUIRED TO HANDLE THE SEAT; TWO MEN SHALL GRASP THE SEAT AT THE LOWER FRONT AND SIDES AND THE THIRD MAN SHALL GUIDE THE SEAT AT THE TOP.

WARNING

DO NOT USE EJECTION CONTROL HANDLE OR ARM GUARDS AS HANDHOLDS WHILE HANDLING SEAT.



i. *Applicable to aft seats of F-106B airplanes if canopy is installed.* Remove 4 bolts, attaching each upper slide block fitting to seat, rotate fittings up and aft to clear seat, and remove slide blocks from seat tracks by sliding assemblies upward. See details G and H.

j. Raise seat until lower slide blocks line up with notches in rails, then pull lower end of seat forward to disengage lower slide blocks from rails. See detail G.

k. Slide seat upward until upper slide blocks are disengaged from seat rails. *(Not applicable to aft seats of F-106B airplanes if canopy is installed.)*

l. Remove seat; see note. Place seat in upright position on a flat surface to prevent damage to mechanism on underside.

CAUTION

APPLICABLE TO AIRPLANES NOT EQUIPPED WITH CONTROL ROD GUARDS. WHEN SEAT IS REMOVED, THE AILERON CONTROL ROD IS EXPOSED. AVOID STEPPING ON, OR OTHERWISE DAMAGING, THIS CONTROL ROD. IF CONTROL ROD IS BENT OR DAMAGED, THE ROD MUST BE REPLACED AND THE SYSTEM RIGGED BY PROCEDURE GIVEN IN T.O. 1F-106A-2-7.

INSTALLATION

WARNING

TO PREVENT SERIOUS INJURY, SAFETY PINS MUST BE INSTALLED IN THE CANOPY JETTISON AND SEAT EJECTION SYSTEMS DURING THIS PROCEDURE.

a. See note in detail G. *On F-106A airplanes and on forward seats of F-106B airplanes,* position seat as shown in detail G, engage upper slide blocks in seat rails with long end of blocks up as shown in detail H, lower seat until lower slide block can pass through notches in seat rails. *Applicable to aft seats of F-106B airplanes,* position seat so that lower slide blocks can pass through notches in seat rails, lower seat, engage upper slide blocks in seat rails with long end of blocks up and connect upper slide blocks to seat by installing attach bolts. See details G, H, and I.

CAUTION

DO NOT ENGAGE LOWER SLIDE BLOCKS IN TOP OF SEAT RAILS AND SLIDE SEAT DOWN RAILS AS DAMAGE TO QUICK DISCONNECT COUPLINGS MAY RESULT.

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Figure 8-35. Upward Ejection Seat Replacement (Sheet 3 of 4)

b. Raise seat until seat striker arms are in line with ballistic hose quick-disconnect coupling levers attached to seat rails. Check striking overlap of lever to seat striker; overlap shall be from 0.25 inch minimum to 0.32 inch maximum. See details I and J.
c. Connect seat adjustment actuator to seat catapult by installing pin, bolts and nuts; see detail A.
d. Attach safety pin streamer to airplane structure by buttons (2) or by fasteners (4); see detail F. Do not remove safety pin from seat ejection control handle.
e. *Applicable to aft seats of F-106B airplanes,* remove or tieback bail-out switch guard; see detail E.
f. Connect multipurpose quick-disconnect fittings to each side of seat; see details C and D.

WARNING

IT IS IMPERATIVE THAT THE LANYARD PORTION OF THE DISCONNECT UNIT WILL RELEASE OR CAUSE SEPARATION OF THE FITTING PRIOR TO COMPLETE EXTENSION OF THE ELECTRICAL HARNESS OR FLEXIBLE HOSES.

g. Cut lockwire securing ballistic hoses to top of seat; see detail B. Connect ballistic hoses (3) as shown in detail A.
h. *Applicable to airplanes equipped with survival kits.* Install survival kit.
i. Perform an operational check of the seat adjustment system.

WARNING

REMOVE ALL SAFETY PINS EXCEPT SAFETY PIN IN RIGHT EJECTION CONTROL HANDLE; FAILURE TO REMOVE MAINTENANCE SAFETY PINS WILL PREVENT PILOT EJECTION.

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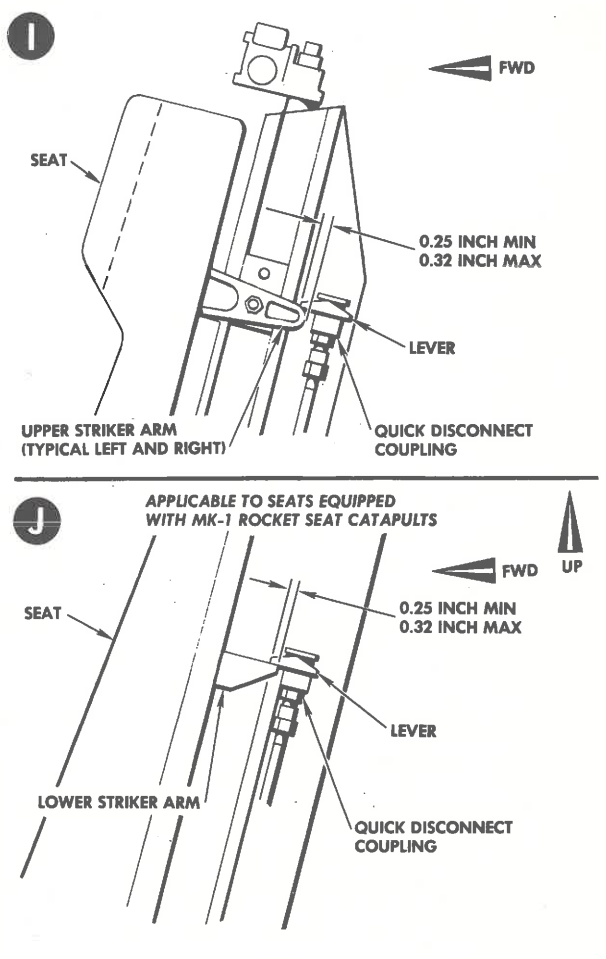


Figure 8-35. Upward Ejection Seat Replacement (Sheet 4 of 4)

b. Connect airplane electrical plug to actuator.

c. Connect external source of 28-volt dc electrical power to airplane; refer to paragraph 1-42 for procedure.

d. Place seat adjustment switch at its "RAISE" position until actuator screwjacks are fully retracted.

e. Turn off electrical power.

f. Secure actuator to top of seat catapult with pin and two bolts.

g. Raise seat about 4.25 inches from cockpit floor. Align mounting holes and secure actuator screwjacks to seat with mounting bolts.

h. Perform operational check per paragraphs 8-71 through 8-74.

PILOT ESCAPE SYSTEM (UPWARD EJECTION)

Applicable to F-106A airplanes 56-453 thru 59-059, and F-106B airplanes 57-2507 thru 58-904 prior to incorporation of TCTO 1F-106-569.

DESCRIPTION

8-80. GENERAL.

Under emergency conditions, the canopy can be jettisoned, and the seat and pilot ejected, by means of a pilot escape system operated by controls on the pilot's seat. The canopy can also be jettisoned by means of an external emergency handle. The pilot escape system is an integration of the canopy latching system and a canopy and seat ballistic (explosive) power system. Proper operation of the system will unlatch and jettison the canopy, eject the seat and pilot from the airplane, and separate the seat from the pilot after ejection. The system is completely independent of any airplane power source. The canopy latch mechanism is discussed in paragraph 8-4 and 8-5. See applicable figures 8-36 through 8-40 for perspective and schematic illustrations of the pilot escape system.

8-81. CANOPY AND SEAT BALLISTIC SYSTEM.

The canopy and seat ballistic system consists of a system of mechanical controls and linkage, ballistic (explosive) devices, and high-pressure tubing. The mechanical controls consist of a canopy jettison and seat arming handle on each side of the seat. A canopy jettison control on the left side of the seat allows the canopy to be jettisoned without ejecting the seat. An additional control handle, on the left side of the fuselage near the wing leading edge, allows the canopy to be jettisoned by ground personnel. The canopy is jettisoned by means of an explosive cartridge and the combination pneumatic-ballistic actuating cylinder. The explosive cartridge is fired by high-pressure gas released from ballistic units (M-3 and M-5 initiators) actuated by one of the canopy jettison controls. The seat is ejected by means of a catapult actuated by high-pressure gas released by a ballistic unit (M-3 initiator).

CAUTION

Gases formed by firing ballistic units have a corrosive effect on all components of the system. If any of the ballistic units have been fired for any reason, all affected ballistic units, hoses, fittings must be replaced.

WARNING

Ballistic units are dangerous and should be treated with the respect due an explosive device. Observe all safety precautions listed in paragraph 8-86.

8-82. CANOPY JETTISON (PILOT CONTROLLED).

At the pilot's option (either pilot on F-106B airplanes), the canopy can be jettisoned without ejecting the pilot's seat. This is accomplished by squeezing and raising the split knob handle at the forward left-hand side of the seat. This causes the canopy unlatch M-3 initiator to fire and send high-pressure gas to the canopy thruster. The explosive-charged thruster fires, unlatches the canopy and causes the canopy remover M-5 initiator to fire. The canopy remover M-5 initiator sends high-pressure gas to fire a second M-5 initiator and the cartridge in the

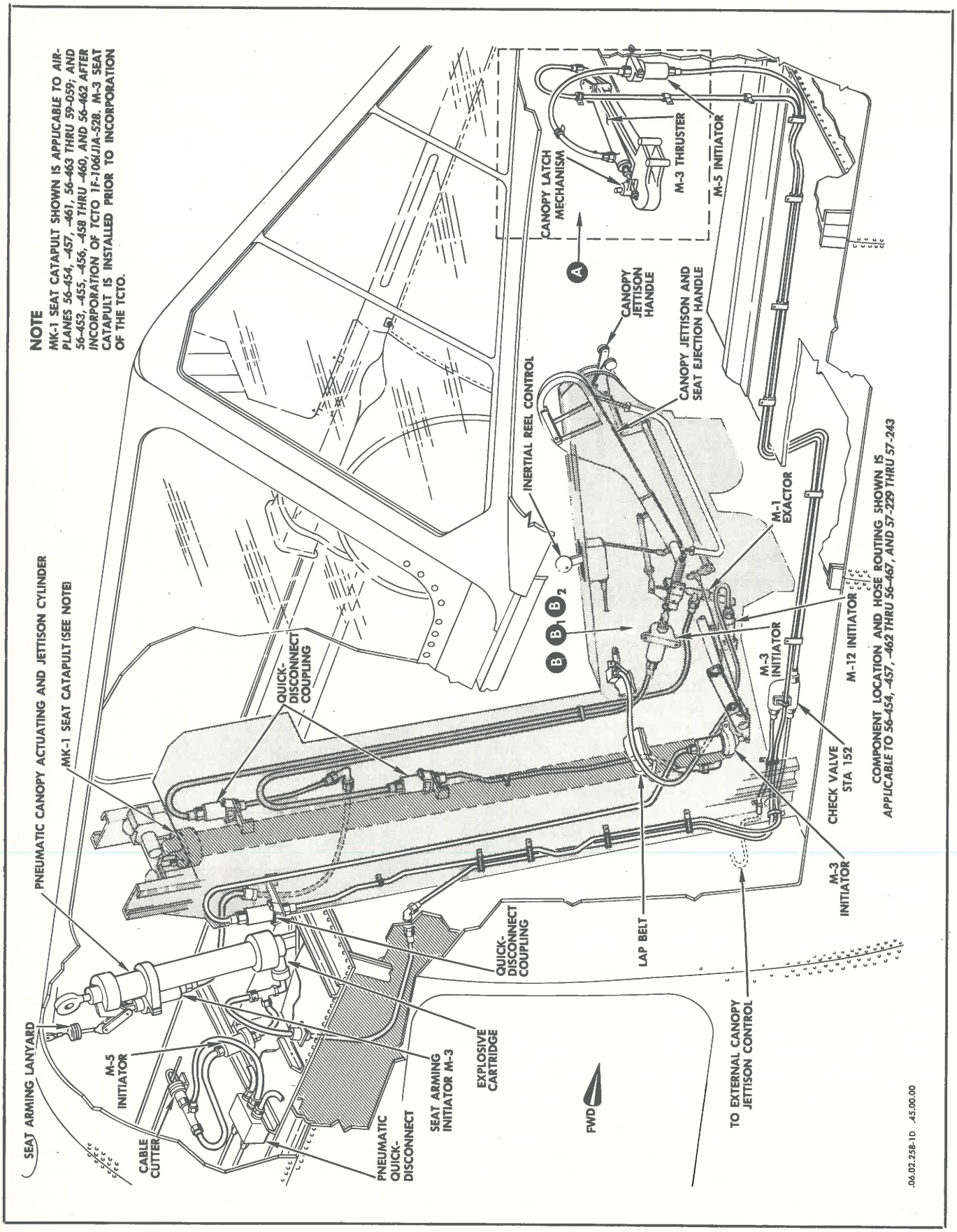


Figure 8-36. Pilot Escape System Perspective, Upward Ejection, F-106A (Sheet 1 of 4)

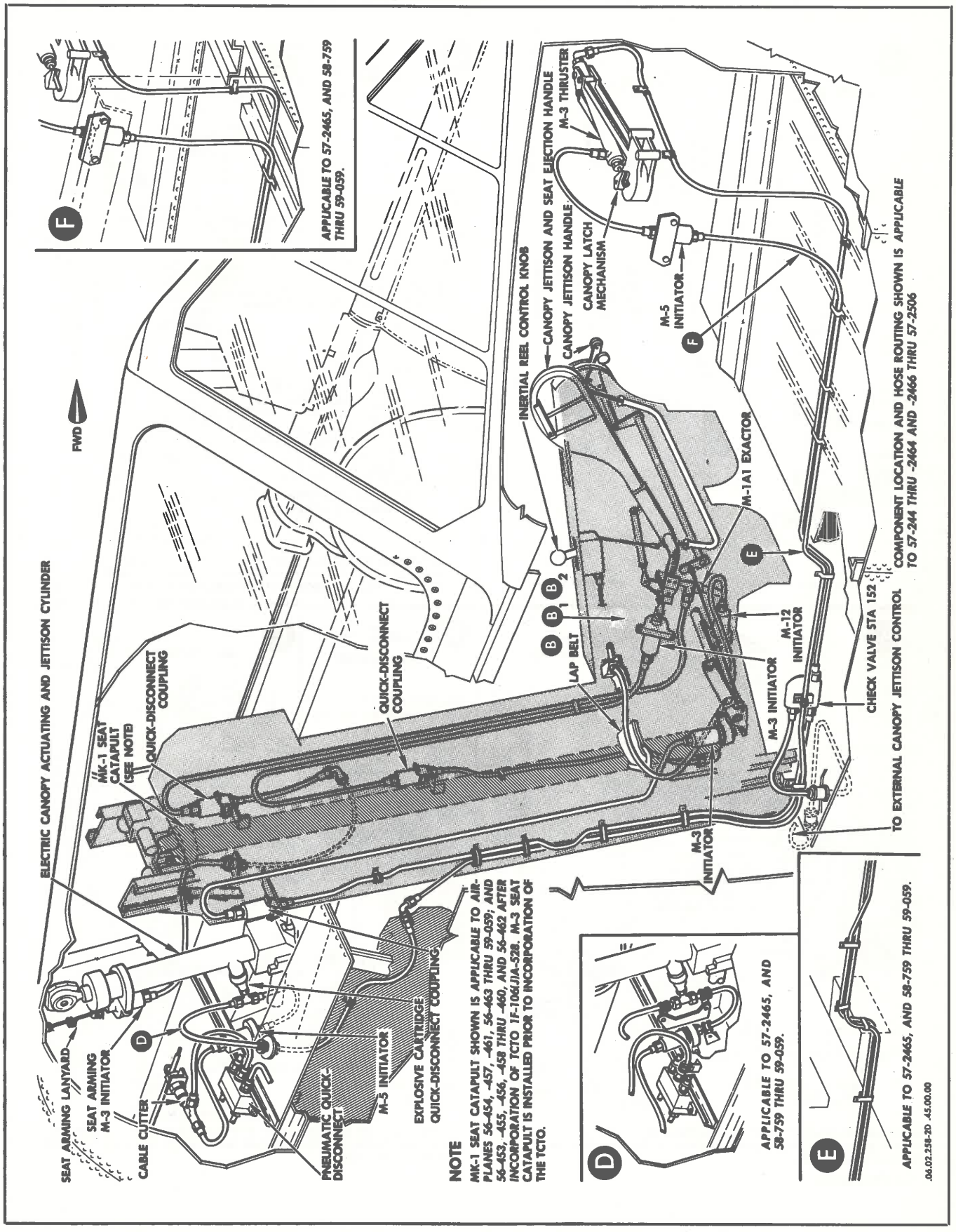


Figure 8-36. Pilot Escape System Perspective, Upward Ejection, F-106A (Sheet 2 of 4)

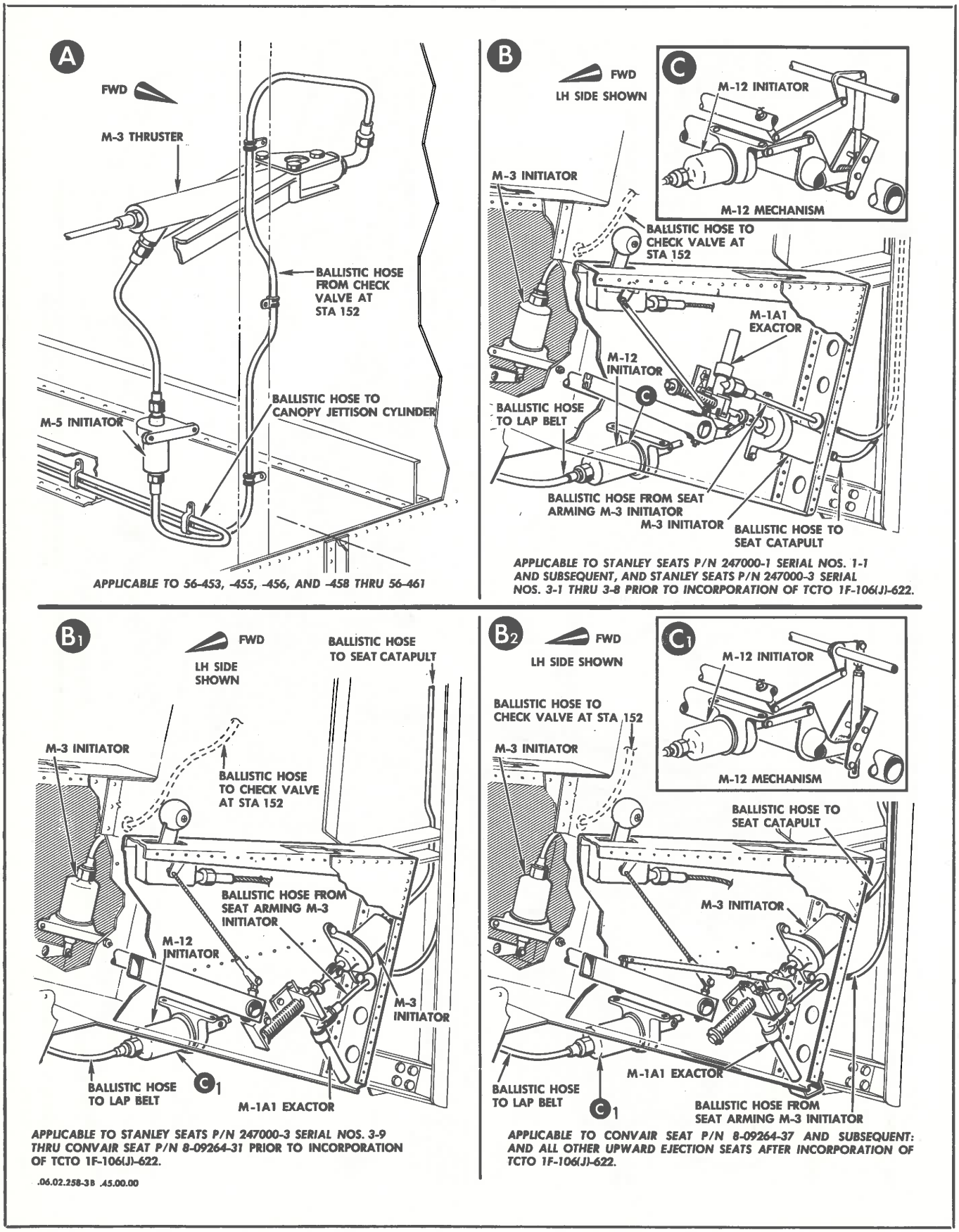


Figure 8-36. Pilot Escape System Perspective, Upward Ejection, F-106A (Sheet 3 of 4)

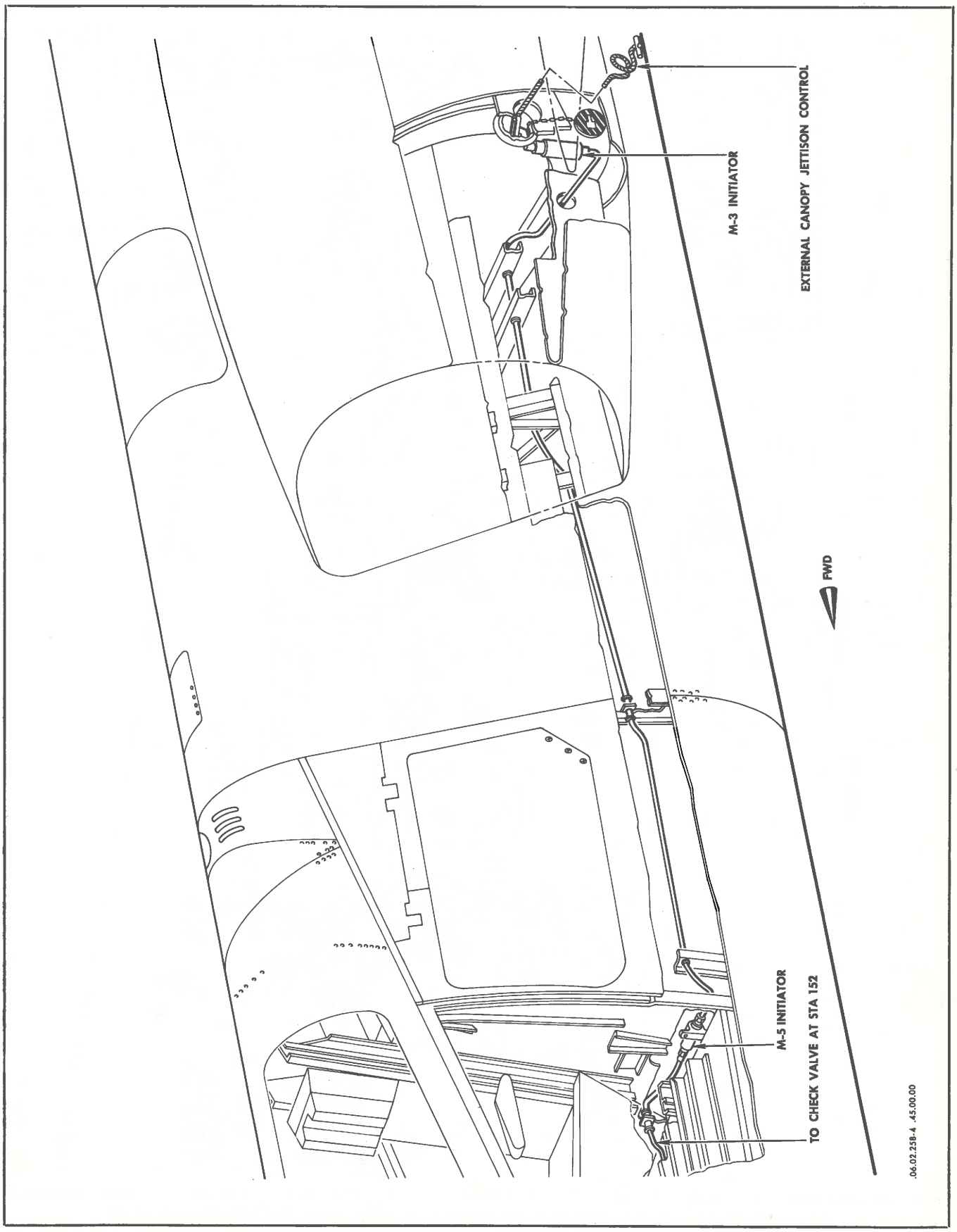


Figure 8-36. Pilot Escape System Perspective, Upward Ejection, F-106A (Sheet 4 of 4)

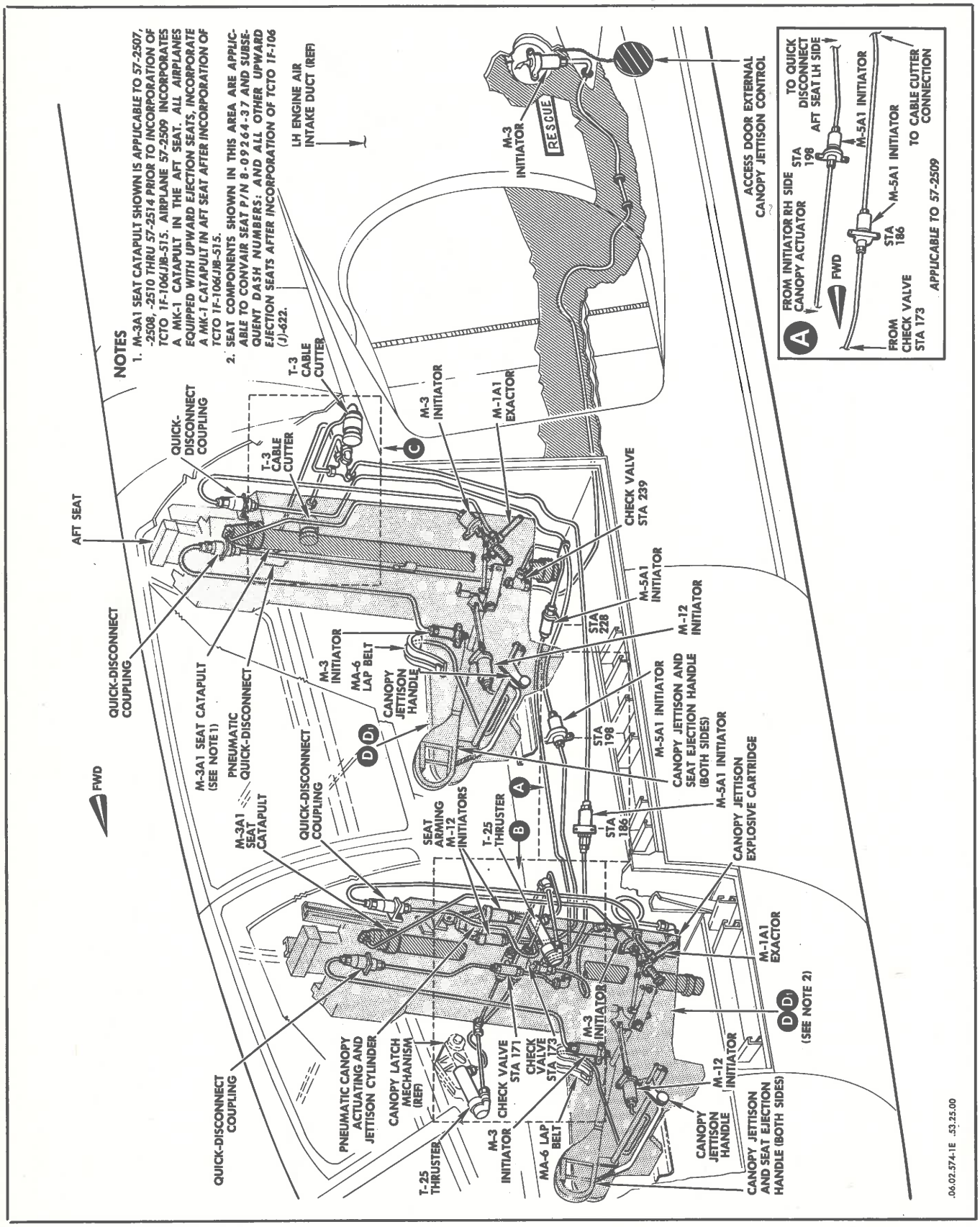


Figure 8-37. Pilot Escape System Perspective, Upward Ejection, F-106B (Sheet 1 of 2)
Applicable to 57-2507 thru 57-2514 prior to incorporation of TCTO 1F-106(J)B-519 and TCTO 1F-106(J)B-525

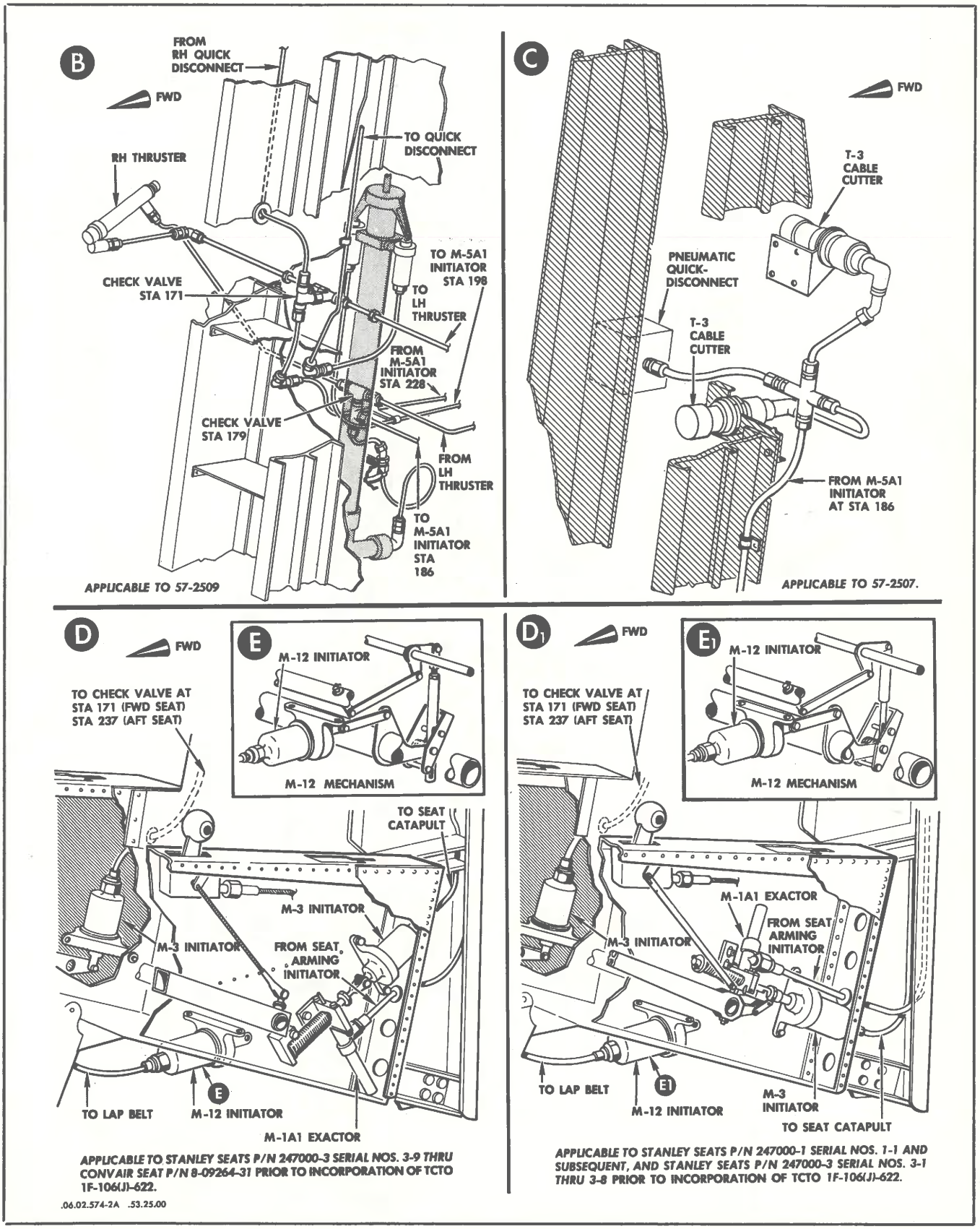


Figure 8-37. Pilot Escape System Perspective, Upward Ejection, F-106B (Sheet 2 of 2)
Applicable to 57-2507 thru 57-2514 prior to incorporation of TCTO 1F-106(J)B-519 and TCTO 1F-106(J)B-525

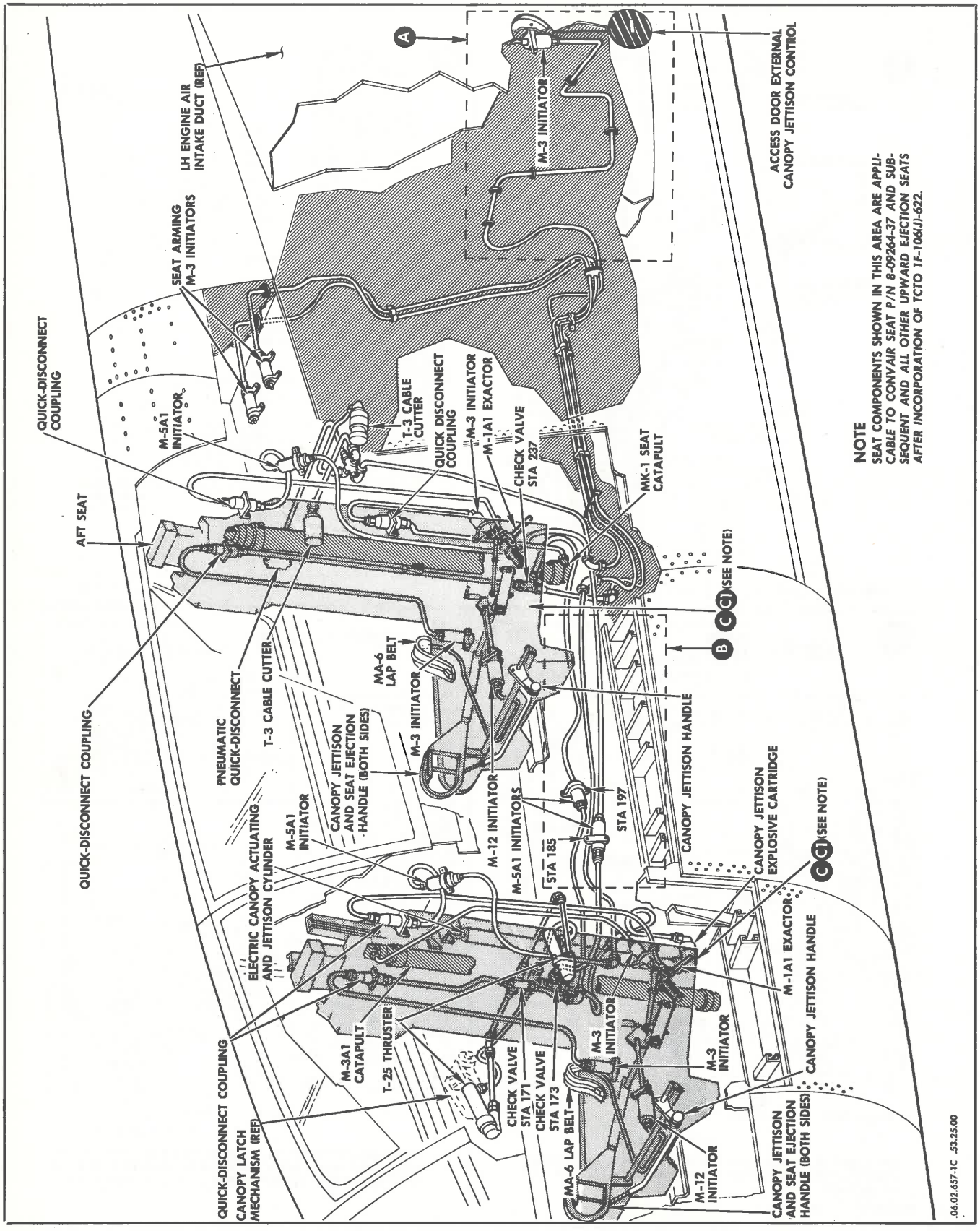


Figure 8-38. Pilot Escape System Perspective, Upward Ejection, F-106B (Sheet 1 of 2)
Applicable to 57-2515 thru 58-904; and 57-2507 thru 57-2514 after incorporation of TCTO 1F-106(J)B-519 and TCTO 1F-106(J)B-525

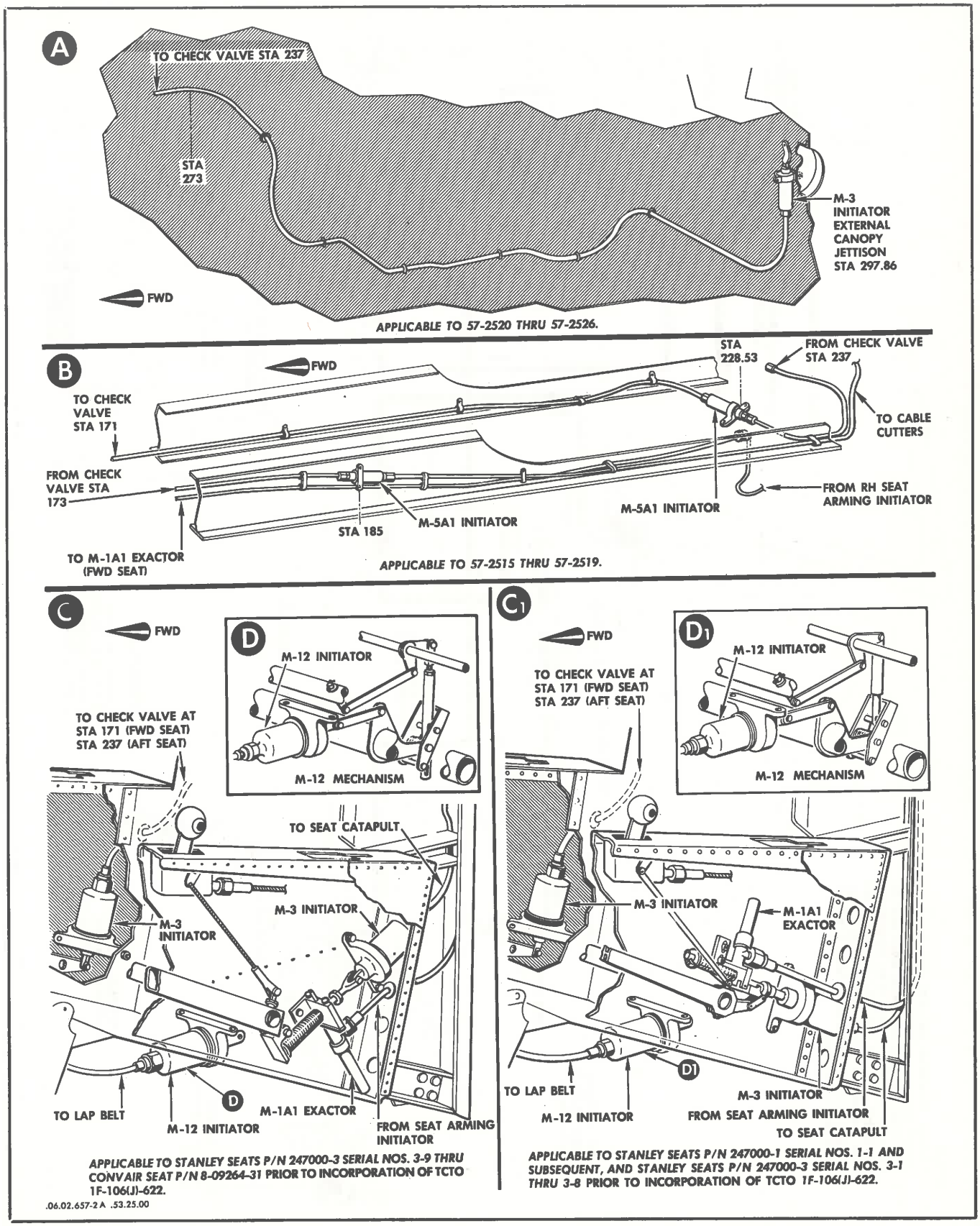
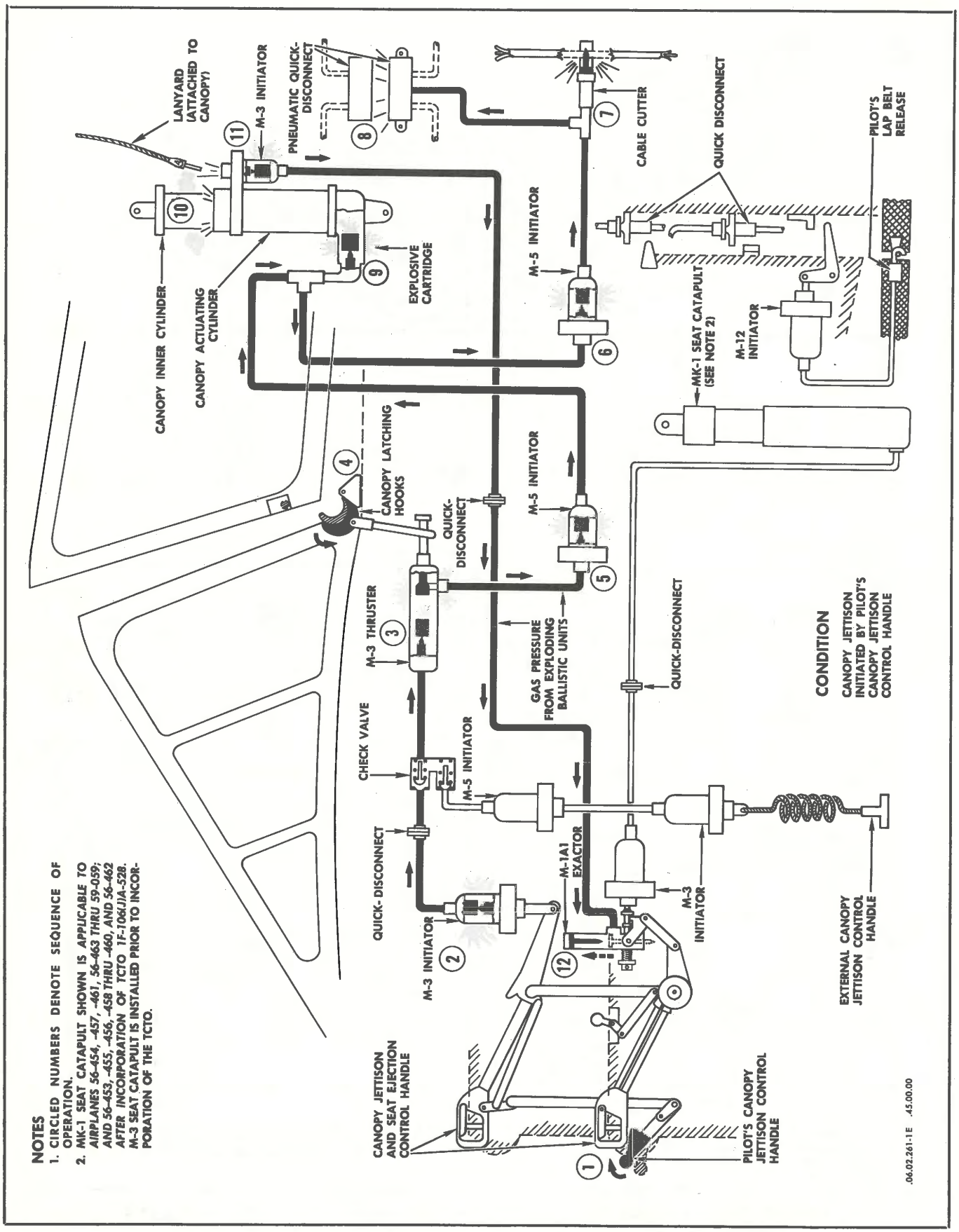


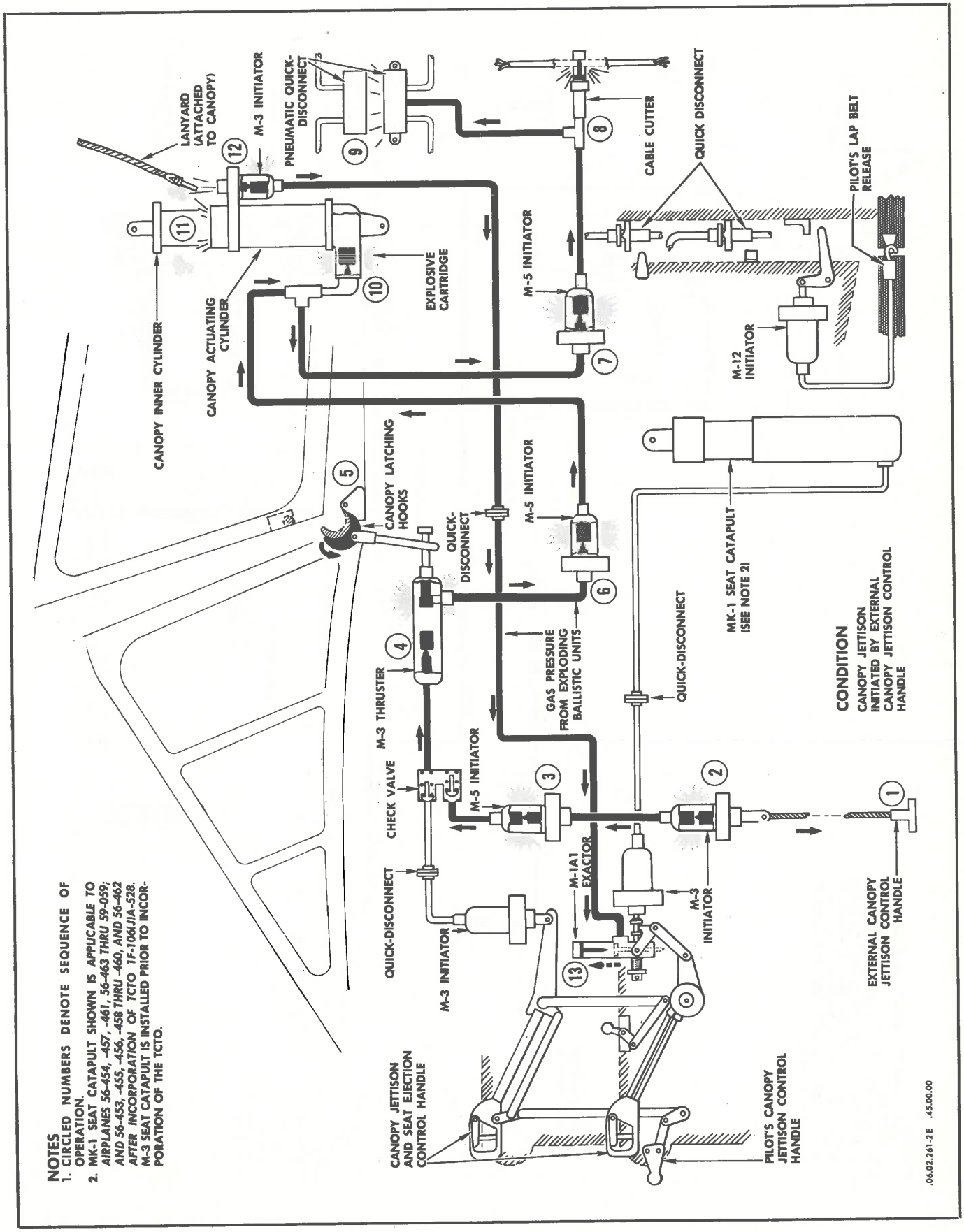
Figure 8-38. Pilot Escape System Perspective, Upward Ejection, F-106B (Sheet 2 of 2)
Applicable to 57-2515 thru 58-904; and 57-2507 thru 57-2514 after incorporation of TCTO 1F-106(J)B-519 and TCTO 1F-106(J)B-525



NOTES

1. CIRCLED NUMBERS DENOTE SEQUENCE OF OPERATION.
2. *MK-1 SEAT CATAPULT SHOWN IS APPLICABLE TO AIRPLANES 56-454, -457, -461, 56-463 THRU 59-059; AND 56-453, -455, -456, -458 THRU -460, AND 56-462 AFTER INCORPORATION OF TCTO 1F-106(J)A-528. M-3 SEAT CATAPULT IS INSTALLED PRIOR TO INCORPORATION OF THE TCTO.*

Figure 8-39. Pilot Escape System Schematic, Upward Ejection, F-106A (Sheet 1 of 3)



NOTES
1. CIRCLED NUMBERS DENOTE SEQUENCE OF OPERATION.
2. MK-1 SEAT CATAPULT SHOWN IS APPLICABLE TO AIRPLANES 56-454, -457, -461, 56-463 THRU 59-059; AND 56-453, -455, -456, -458 THRU -460, AND 56-462 AFTER INCORPORATION OF TCTO 1F-106UA-528. M-3 SEAT CATAPULT IS INSTALLED PRIOR TO INCORPORATION OF THE TCTO.

Figure 8-39. Pilot Escape System Schematic, Upward Ejection, F-106A (Sheet 2 of 3)

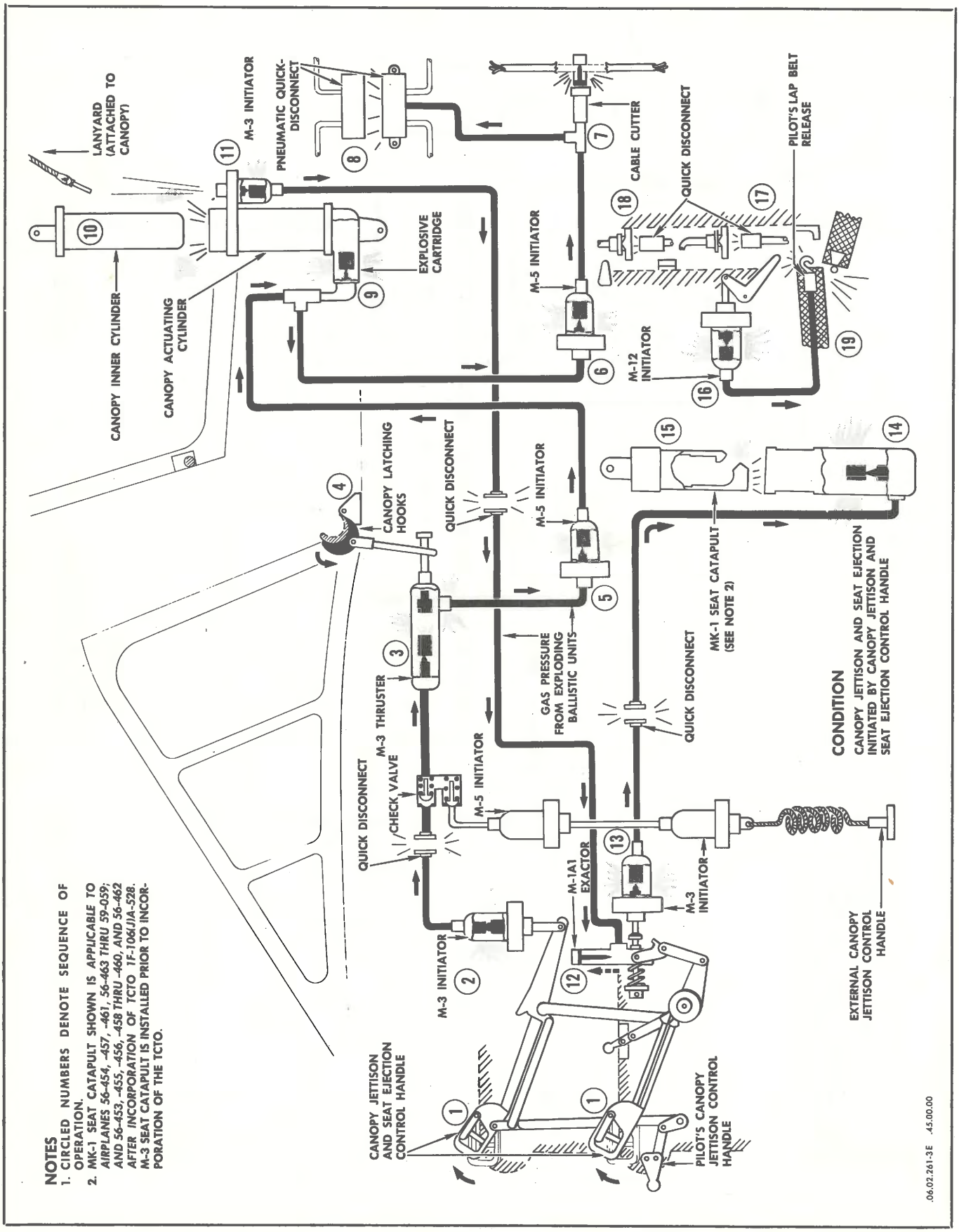


Figure 8-39. Pilot Escape System Schematic, Upward Ejection, F-106A (Sheet 3 of 3)

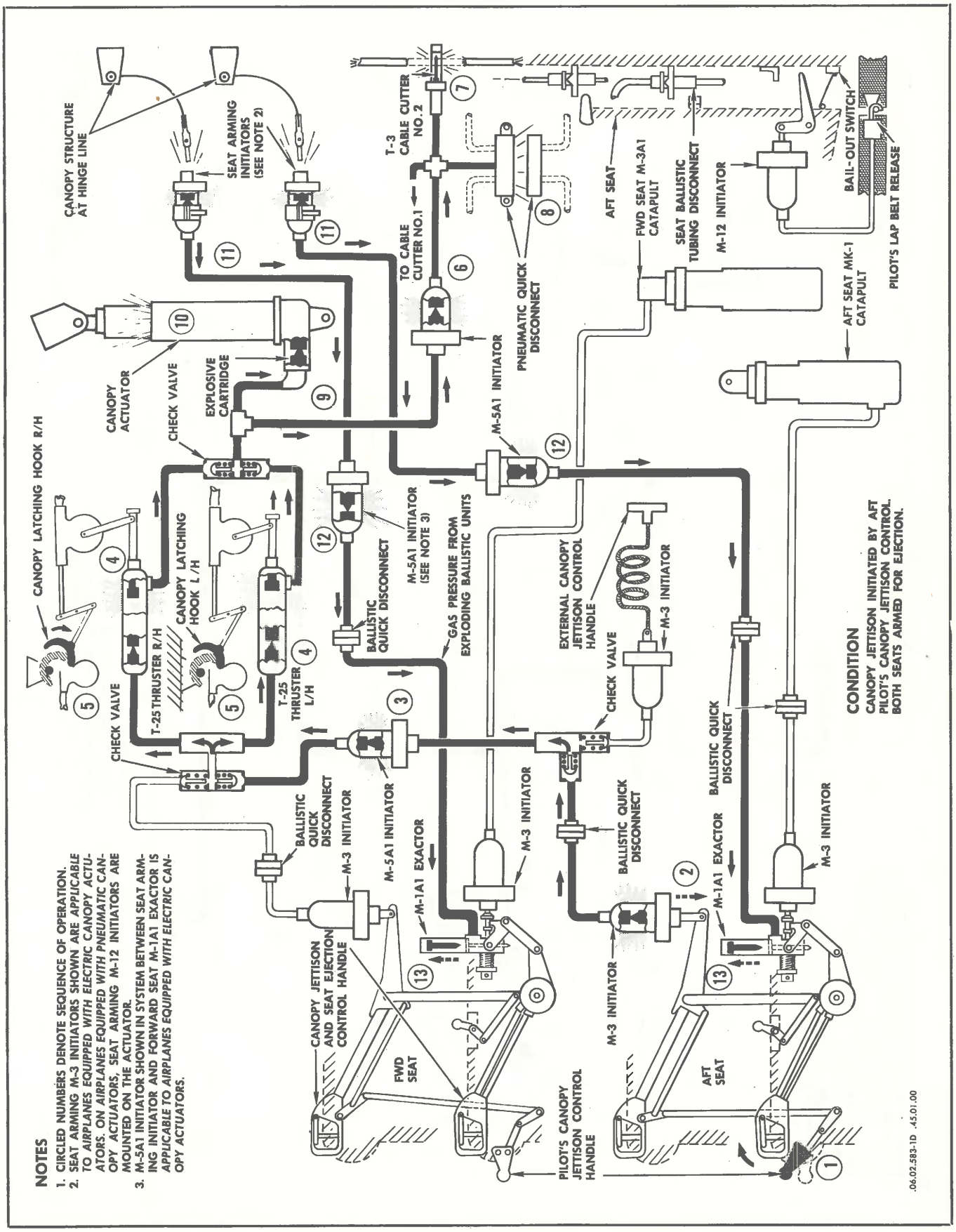


Figure 8-40. Pilot Escape System Schematic, Upward Ejection, F-106B (Sheet 1 of 3)

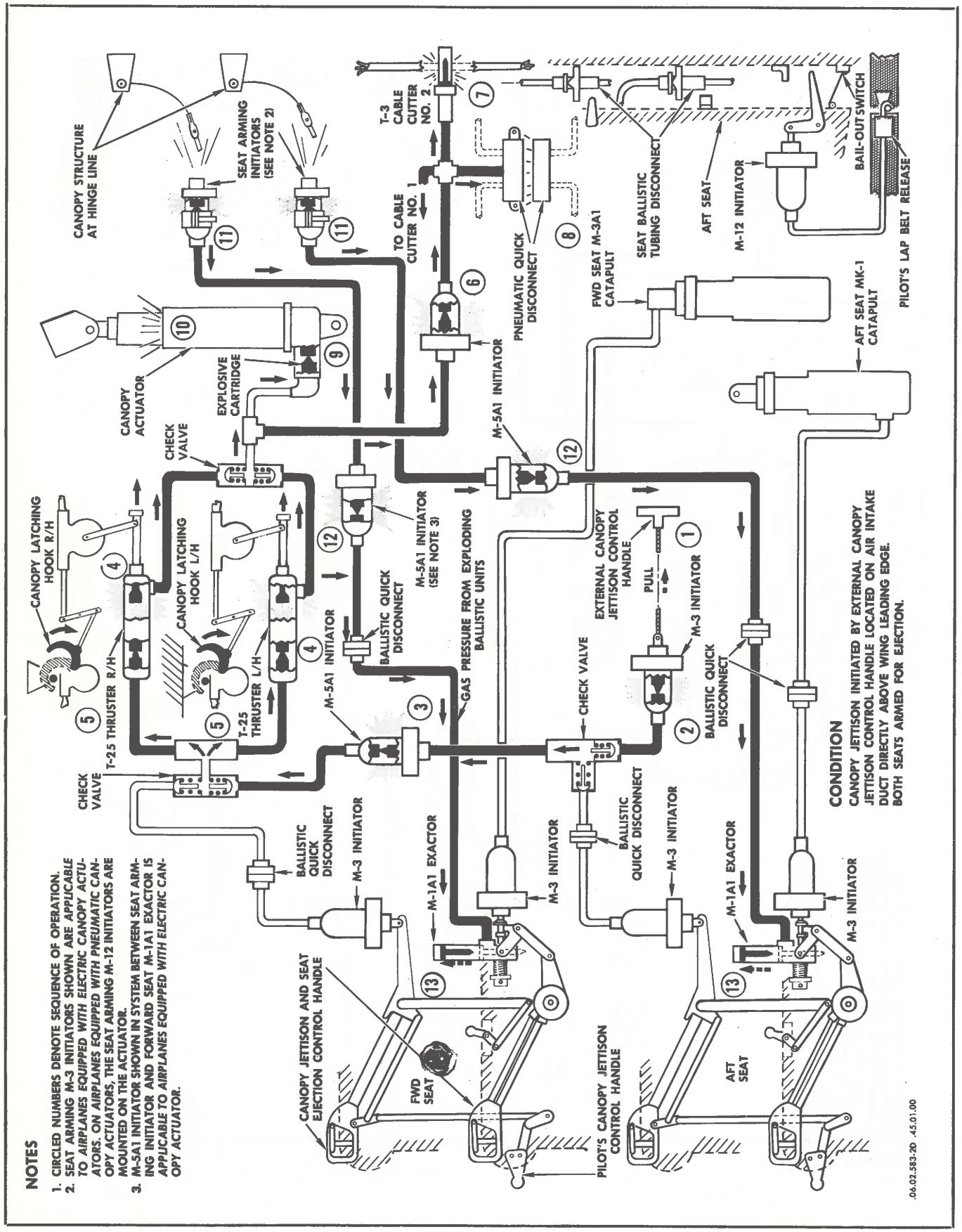


Figure 8-40. Pilot Escape System Schematic, Upward Ejection, F-106B (Sheet 2 of 3)

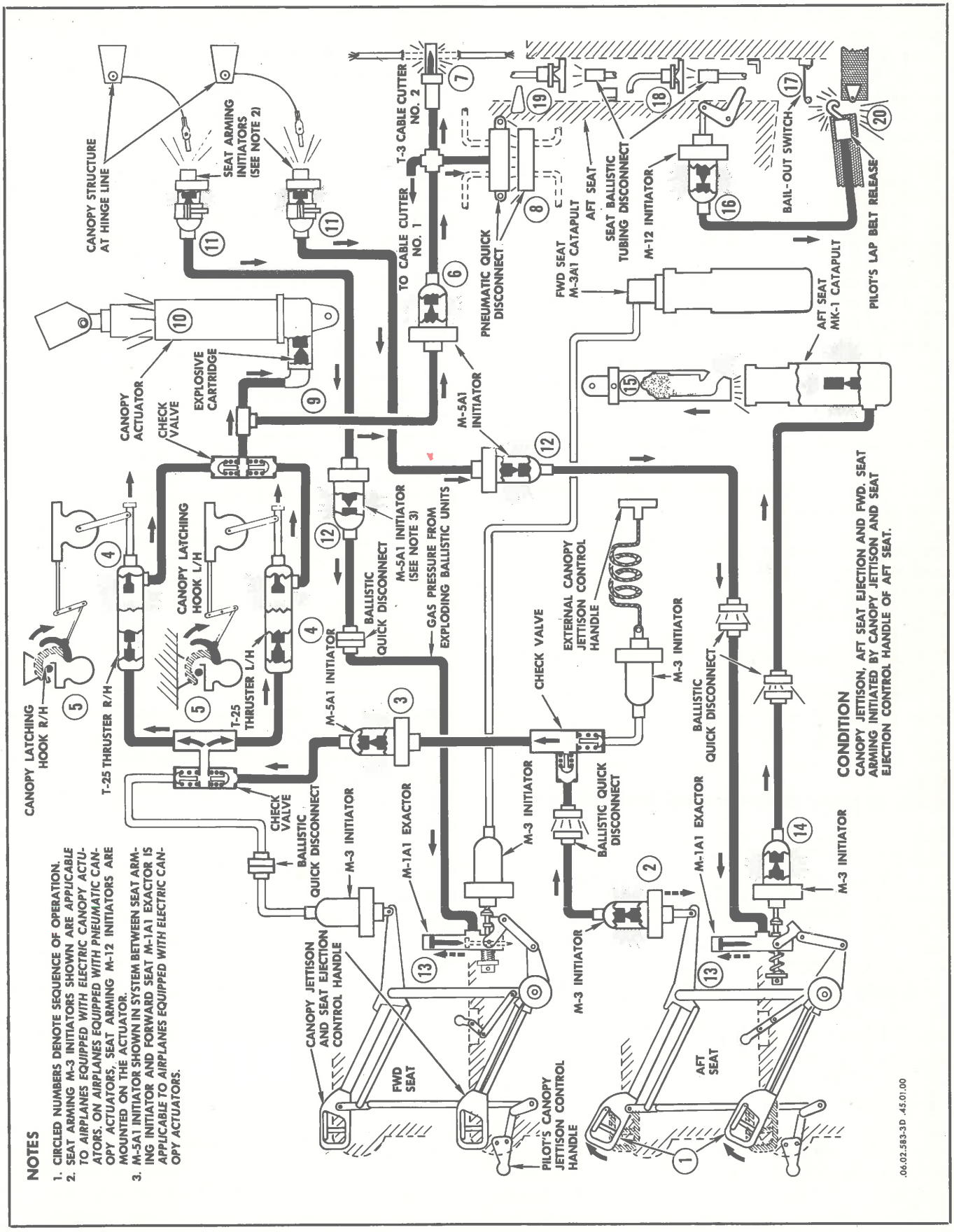


Figure 8-40. Pilot Escape System Schematic, Upward Ejection, F-106B (Sheet 3 of 3)

base of the canopy actuating cylinder. This second M-5 initiator produces high-pressure gas to actuate a cable cutter and a pneumatic disconnect. These components cut and disconnect electrical leads and pneumatic tubes leading to the canopy. When the explosive cartridge in the base of the actuating cylinder fires, high pressure gas forces the actuating cylinder piston and the canopy to jettison from the airplane. As the canopy separates from the airplane, it fires the seat arming initiator(s). *On F-106A airplanes,* high pressure gas from the seat arming M-3 initiator is routed to the M-1A1 exactor and removes a pin from the firing mechanism of the seat catapult M-3 initiator. *On F-106B airplanes equipped with pneumatic canopy actuating cylinders,* high pressure gas from the forward seat arming M-12 initiator is routed to the M-1A1 exactor and removes a pin from the firing mechanism of the seat catapult M-3 initiator. High pressure gas from the aft seat arming M-12 initiator fires an M-5A1 initiator which then routes high pressure gas to the M-1A1 exactor and removes a pin from the firing mechanism of the M-3 seat catapult initiator. *On F-106B airplanes equipped with electric canopy cylinders,* high pressure gas from the forward and aft seat arming M-3 initiators fire M-5A1 initiators. Gases from one of these initiators are routed to the forward seat M-1A1 exactor and gases from the other are routed to the aft seat M-1A1 exactor to remove a pin from the firing mechanisms of each seat catapult M-3 initiator. Although the seat ejection firing mechanism is now armed, a stop or safety lock prevents the firing mechanism from actuating the seat catapult M-3 initiator, until the pilot raises either of the two seat ejection control handles. The canopy may also be jettisoned in flight (forward pilot only on F-106B airplanes) by manually operating the canopy latch handle to the unlocked position. When the air loads jettison the canopy, the seat or seats are armed for ejection.

8-83. CANOPY JETTISON AND SEAT EJECTION.

The canopy can be jettisoned and the seat ejected by raising either of the two ejection control handles on the seat. Raising either handle locks the shoulder-harness inertia reel, raises the arm guards, and releases the initiator safety lock for seat ejection and fires the canopy unlatch M-3 initiator. This results in the jettisoning of the canopy as described in the preceding paragraph, and the firing of the seat catapult M-3 initiator. This initiator then sends high-pressure gases to the seat catapult and the seat is ejected. *Applicable to F-106A airplanes 56-453 thru -462 and 56-467 prior to incorporation of TCTO 1F-106J-506.* The upward movement of the seat disconnects the pilot's personal leads and ballistic hoses on each side of the seat at quick-disconnect fittings, and then fires the M-12 delay initiator to open the pilot's lap belt about one second after ejection. *Applicable to F-106A airplanes 56-463 thru 56-466, 57-229 thru 59-059, and F-106B airplanes 57-2507 thru 58-904. Applicable to F-106A airplanes 56-453, -454, -457 thru -462, and 56-467 after incorporation of TCTO 1F-106J-506.* The upward movement of the seat disconnects the pilot's personal leads on the left side of the seat, the ballistic hoses on each side of the seat, and the survival kit at the bottom of the kit. It then fires the M-12 delay initiator which opens the pilot's lap belt about one second after seat ejection. When the survival kit is disconnected, a cable system automatically pulls a pin which opens the shutoff valve of the kit emergency oxygen system. This action routes gaseous oxygen at 1800 psi from the two prefilled storage bottles, through a pressure reducer, shuttle valve, automatic regulator, and the personal leads, to the pilot.

8-84. BAILOUT SEQUENCE WARNING SYSTEM, F-106B.

Applicable to 57-2515 thru 58-904; and 57-2507 thru 57-2514 after incorporation of TCTO 1F-106(J)B-516. The bailout sequence warning system signals either pilot that bailout is imminent and then assures the forward pilot that the aft pilot has ejected. The system consists of two red bailout warning lights, one on each instrument panel, and two manually operated bailout signal switches, one on each left console. Also included in the system is a bailout flasher unit, a "seat gone" switch, and interconnecting electrical circuitry. Placing either bailout signal switch in the "ON" position will cause both bailout warning lights to flash on and off. In this condition, 28-volt dc electrical power from the essential bus energizes the bailout flasher unit and intermittent electrical power is then supplied to the warning lights. Ejection of the aft seat will actuate the "seat gone" switch on the aft seat ejection rail to a closed position. In this condition, continuous 28-volt dc electrical power from the essential bus is conducted to the warning lights causing steady illumination. The flasher unit is not a functional part of the circuit under these circumstances. A 5-ampere "BAIL OUT WARN" fuse on the left-hand forward fuse panel protects the circuit. See figure 8-41 for a schematic illustration of the system.

8-85. CANOPY JETTISON (EXTERNALLY CONTROLLED).

When the airplane is on the ground, the canopy will ordinarily be opened by means of the external latch control handle on the fuselage beneath the left windshield. In emergencies, however, the canopy can be jettisoned explosively by means of an emergency handle installed on the left side of the fuselage near the leading edge of the wing.

WARNING

To prevent ejection of pilot and seat, do not jettison canopy by external control unless seat ejection control handles are in down (normal) position.

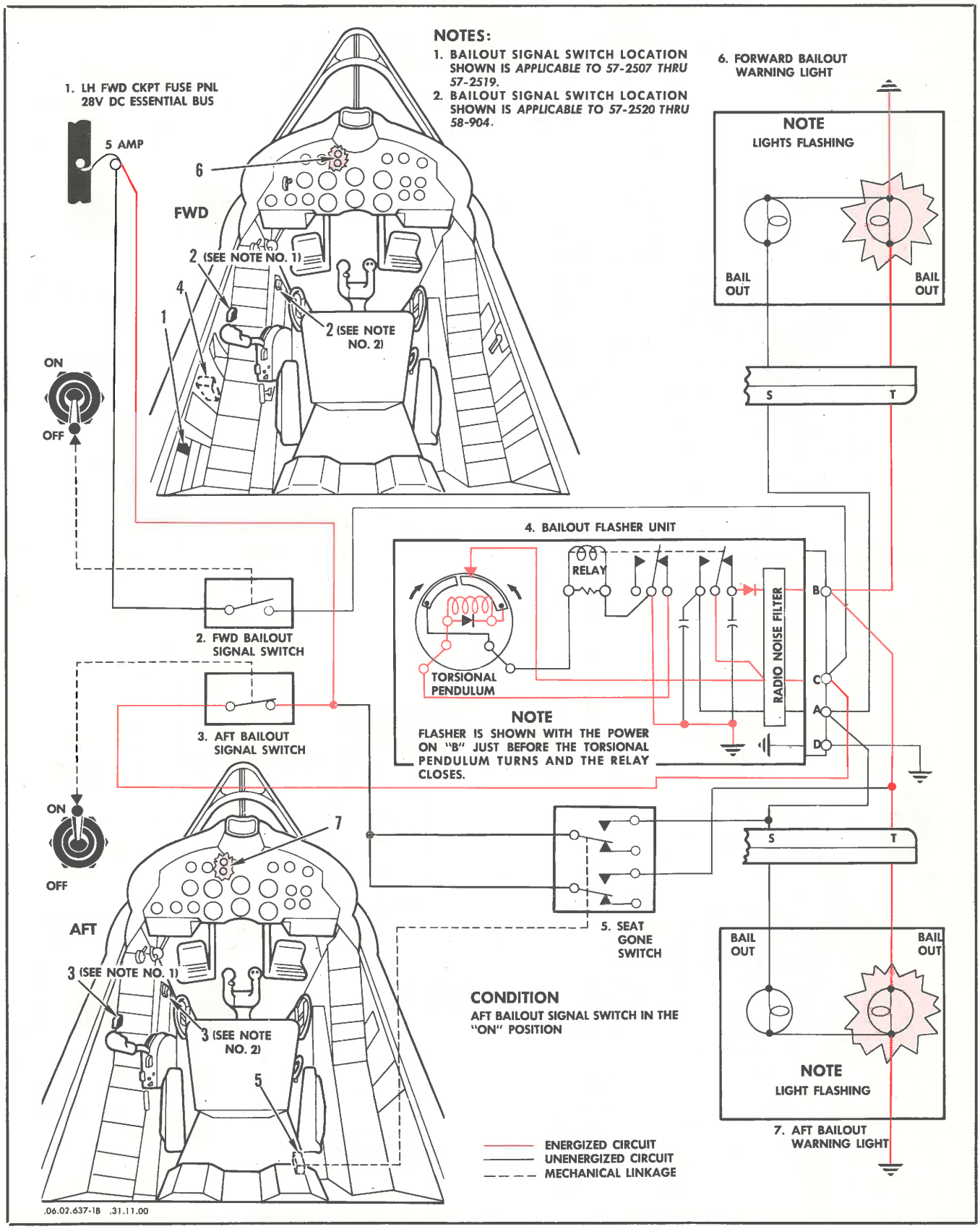


Figure 8-41. Bailout Sequence Warning System, F-106B (Sheet 1 of 2)
Applicable to 57-2515 thru 58-904; and 57-2507 thru 57-2514 after incorporation of TCTO 1F-106(J)B-516

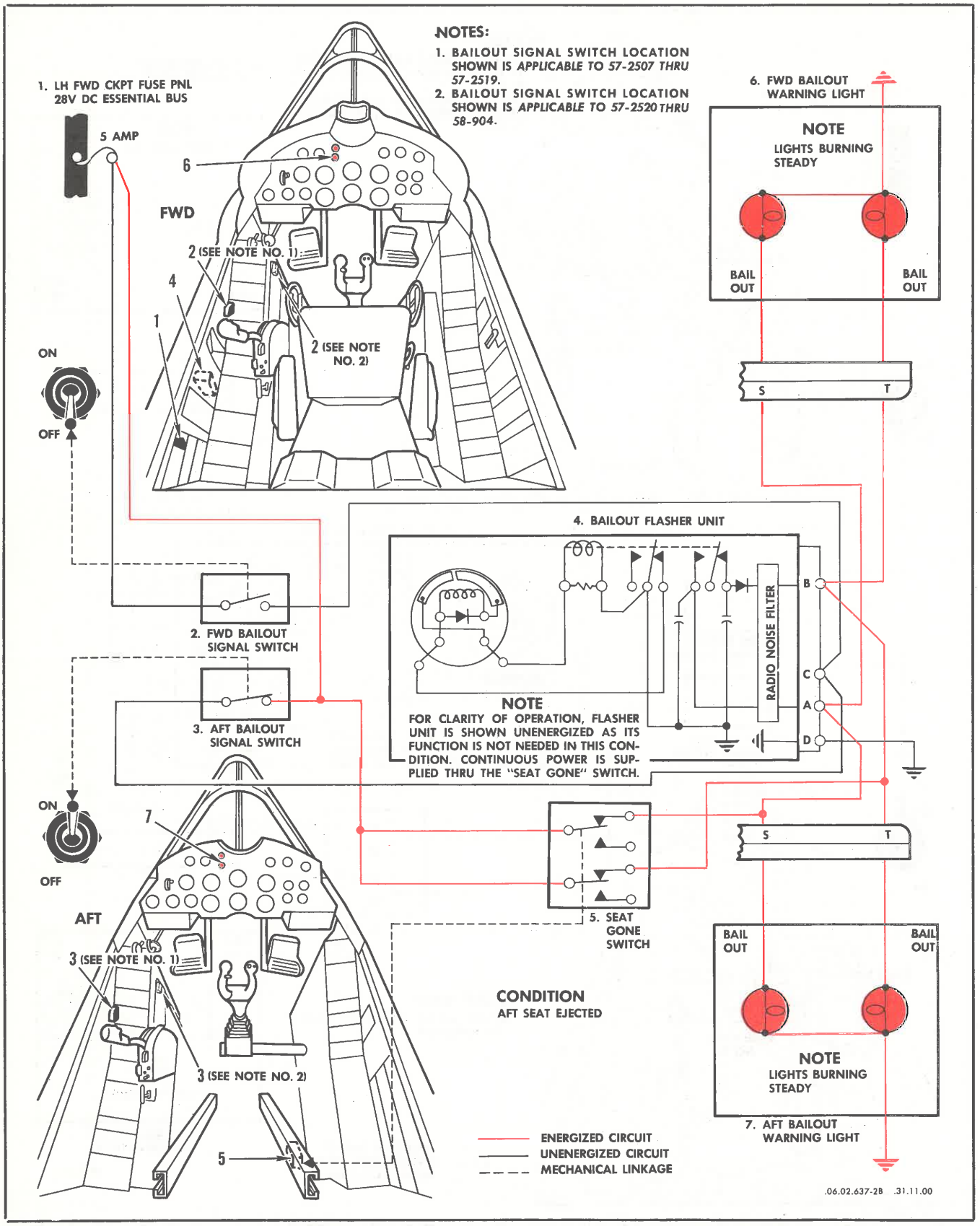


Figure 8-41. Bailout Sequence Warning System, F-106B (Sheet 2 of 2)
Applicable to 57-2515 thru 58-904; and 57-2507 thru 57-2514 after incorporation of TCTO 1F-106(J)B-516

Pulling this handle fires the alternate canopy unlatch M-3 initiator to send high-pressure gas to a booster M-5 initiator. The booster M-5 initiator then sends high-pressure gas to the canopy thruster. As a result the canopy will jettison in the manner described in paragraph 8-82. See figure 1-22 for an illustration of external canopy jettison procedure.

8-86. SAFETY PRECAUTIONS (BALLISTIC UNITS).

The ballistics units used in the canopy jettison and seat ejection system contain explosive charges which are hazardous if improperly handled. These units should be handled only by trained personnel. Observe the following precautions at all times:

a. Install canopy hold-open support 8-96038-801 for F-106A airplanes, or 8-96137 for F-106B airplanes, prior to performing any maintenance in the cockpit area.

b. Make sure that pilot's ground safety pin is installed in right hand ejection control handle of seat (both seats for F-106B airplanes). *Applicable to F-106A* airplanes, check initiator pins for full inward position and install 8-96012 maintenance ground safety pins as specified in figure 8-42. *Applicable to F-106B airplanes,* check initiator pins for full inward position and install 8-96147 maintenance ground safety pins as specified in figure 8-43.

WARNING

The ground safety pin will not effectively safety the initiators unless the initiator pin is in the full inward position before the pin is installed. Each mechanically actuated initiator should be individually safetied, while work is being performed on the system. See figure 8-45 for a detail view of an M-3 initiator.

c. Use the specific procedures outlined in this handbook when replacing any of the initiator units, seat catapult, canopy actuating cylinder, or ballistic units.

WARNING

Do not attempt disassembly of any of the ballistic units; an explosion may result. Units which are defective for any reason must be replaced. Defective units, or units that have been fired, must be sent to shops equipped to handle them.

d. Avoid denting the side walls of any of the units. Damage of this nature could cause malfunction of the system. Dented units should be rejected and not re-used in the system.

e. Observe the following precautions when replacing components of the canopy jettison and seat ejection systems.

1. Replace only one component at a time and reconnect hoses properly before disconnecting hoses to other components.
2. Loosen hose clamps only when necessary; do not disconnect hose clamps unless hose is to be replaced. Use care to preserve original hose routing.
3. Replace ballistic hoses when they are crimped, kinked, or flattened.
4. *Applicable to F-106A airplanes,* connect system components only as shown on figure 8-39. *Applicable to F-106B airplanes,* connect system components only as shown on figure 8-40.

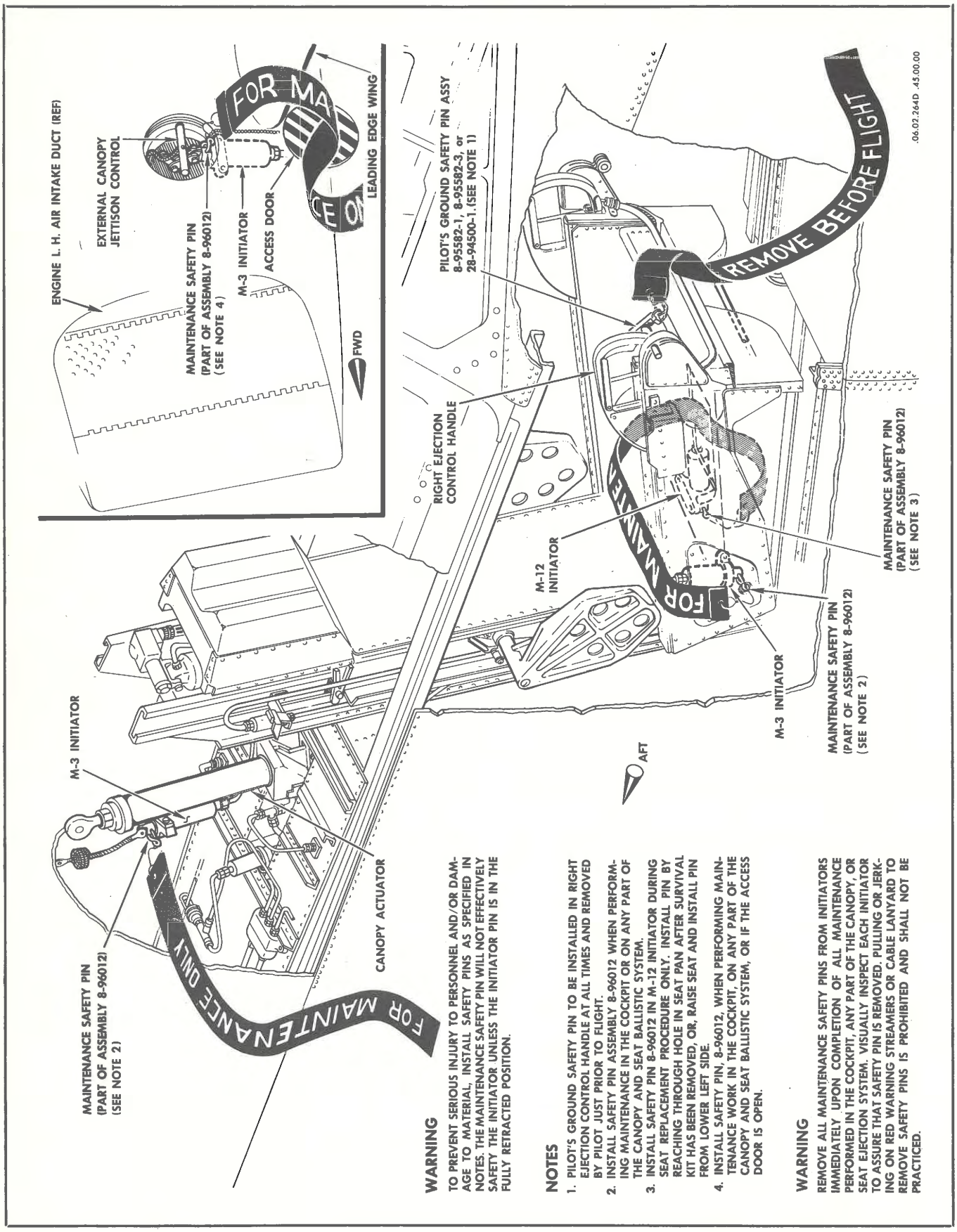
WARNING

Components of the canopy jettison and seat ejection systems must be connected as shown in applicable schematic illustrations to insure proper operation during bailout.

f. The canopy actuating cylinder contains a ballistic cartridge and firing mechanism. Whenever the actuating cylinder is removed from the airplane, and while the cartridge and firing mechanism is in the cylinder, treat the entire assembly with the same caution accorded any ballistic (explosive) unit. Do not leave the assembly lying where it can be knocked or dropped. If the actuating cylinder is not to be reinstalled within two days, store the unit according to standard ballistic equipment storage procedures.

8-87. M-3 OR M-3A1 SEAT CATAPULT.

Applicable to F-106A airplanes 56-453, -455, -456, -458 thru -460, and 56-462 prior to incorporation of TCTO 1F-106(J)A-528. Applicable to both seats of F-106B airplanes 57-2507, -2508, -2510 thru 57-2514 prior to incorporation of TCTO 1F-106(J)B-515. The M-3 (for F-106A airplanes) or M-3A1 (for F-106B airplanes) seat catapult is a three-tube telescoping cylinder with a firing mechanism in the top, or ram, end. The upper end of the inner tube is attached to the seat adjustment actuator and contains the explosive cartridge, firing mechanism, and pressure inlet. The upper end of the outer tube incorporates a trunnion by which the catapult is attached to the airplane structure. Raising of either seat ejection control handles fires an M-3 initiator. When the initiator is fired, the gas developed by the burning of the explosive contained in the initiator flows through the tube. The force thus exerted on the catapult firing pin propels it against the catapult cartridge. The catapult is unlocked by cam action as the firing pin moves. The



WARNING

TO PREVENT SERIOUS INJURY TO PERSONNEL AND/OR DAMAGE TO MATERIAL, INSTALL SAFETY PINS AS SPECIFIED IN NOTES. THE MAINTENANCE SAFETY PIN WILL NOT EFFECTIVELY SAFETY THE INITIATOR UNLESS THE INITIATOR PIN IS IN THE FULLY RETRACTED POSITION.

NOTES

1. PILOT'S GROUND SAFETY PIN TO BE INSTALLED IN RIGHT EJECTION CONTROL HANDLE AT ALL TIMES AND REMOVED BY PILOT JUST PRIOR TO FLIGHT.
2. INSTALL SAFETY PIN ASSEMBLY 8-96012 WHEN PERFORMING MAINTENANCE IN THE COCKPIT OR ON ANY PART OF THE CANOPY AND SEAT BALLISTIC SYSTEM.
3. INSTALL SAFETY PIN 8-96012 IN M-12 INITIATOR DURING SEAT REPLACEMENT PROCEDURE ONLY. INSTALL PIN BY REACHING THROUGH HOLE IN SEAT PAN AFTER SURVIVAL KIT HAS BEEN REMOVED, OR, RAISE SEAT AND INSTALL PIN FROM LOWER LEFT SIDE.
4. INSTALL SAFETY PIN, 8-96012, WHEN PERFORMING MAINTENANCE WORK IN THE COCKPIT, ON ANY PART OF THE CANOPY AND SEAT BALLISTIC SYSTEM, OR IF THE ACCESS DOOR IS OPEN.

WARNING

REMOVE ALL MAINTENANCE SAFETY PINS FROM INITIATORS IMMEDIATELY UPON COMPLETION OF ALL MAINTENANCE PERFORMED IN THE COCKPIT, ANY PART OF THE CANOPY, OR SEAT EJECTION SYSTEM. VISUALLY INSPECT EACH INITIATOR TO ASSURE THAT SAFETY PIN IS REMOVED. PULLING OR JERKING ON RED WARNING STREAMERS OR CABLE LANYARD TO REMOVE SAFETY PINS IS PROHIBITED AND SHALL NOT BE PRACTICED.

Figure 8-42. Upward Ejection Seat Jettison and Ejection System Safetying, F-106A

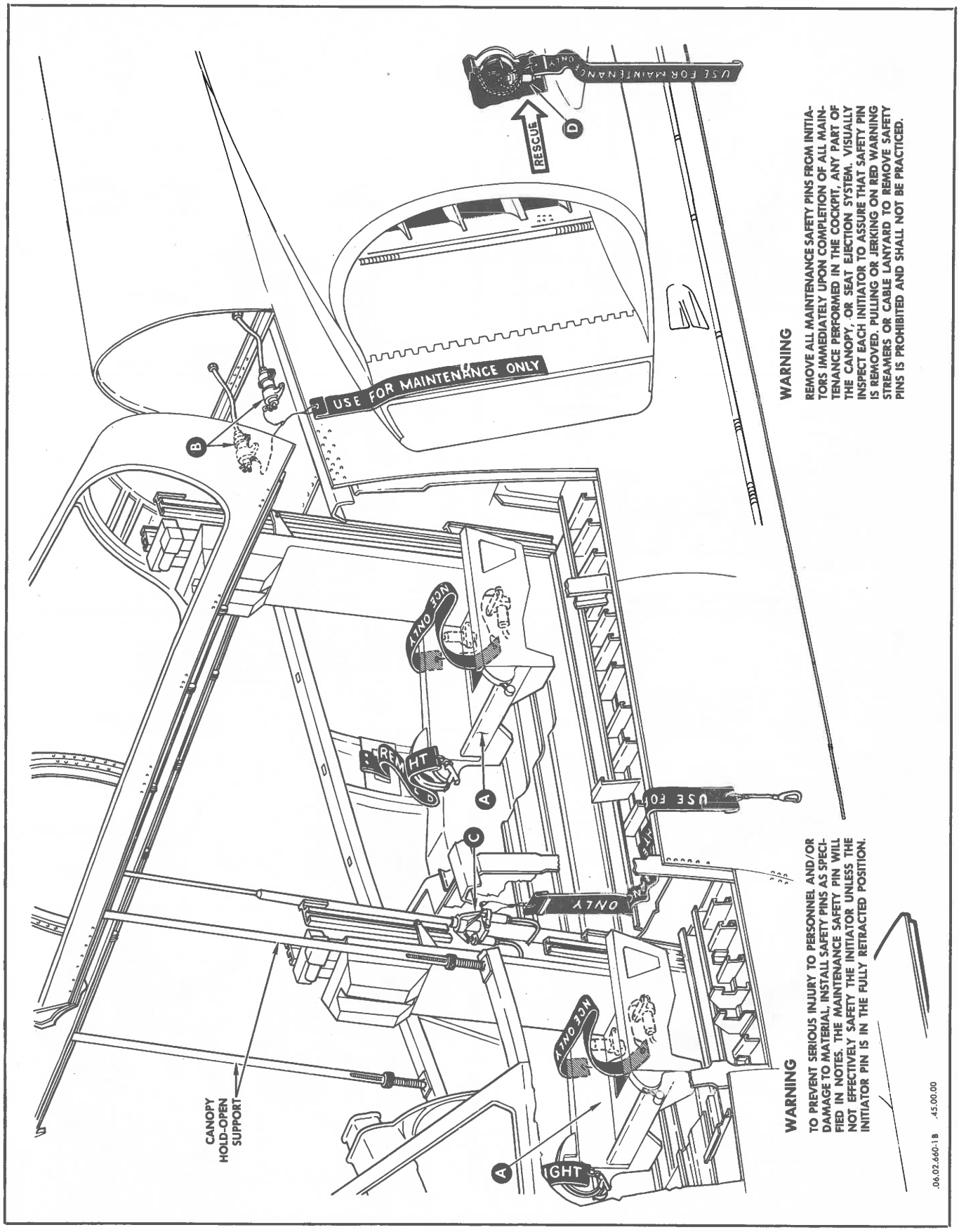
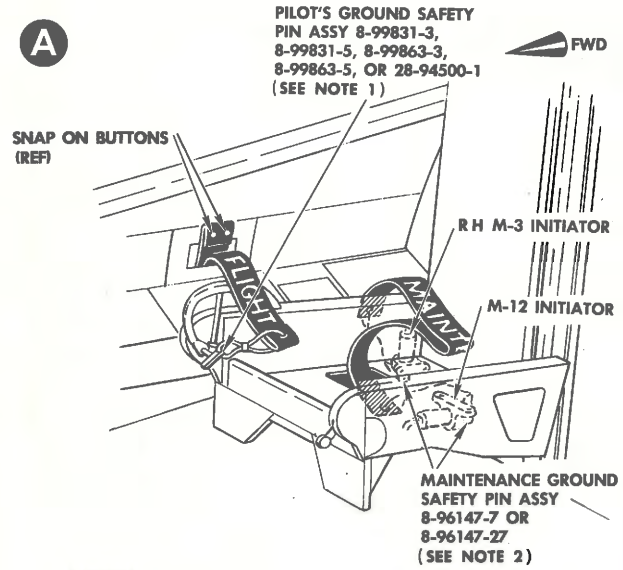


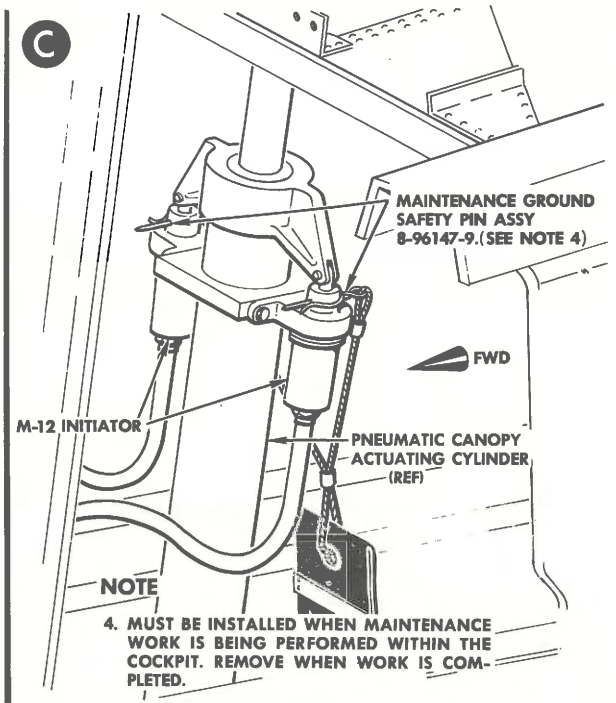
Figure 8-43. Upward Ejection Seat Jettison and Ejection System Safetying, F-106B (Sheet 1 of 2)



NOTES

1. MUST BE INSTALLED PRIOR TO ENTERING COCKPIT. TO BE REMOVED BY PILOT ONLY.
2. SAFETY PIN IN RIGHT-HAND M-3 INITIATOR SHALL BE INSTALLED WHEN MAINTENANCE WORK IS BEING PERFORMED WITHIN COCKPIT. SAFETY PIN IN M-12 INITIATOR SHALL BE INSTALLED DURING REMOVAL AND/OR INSTALLATION OF SEAT.

SEAT INSTALLATION (TYPICAL)

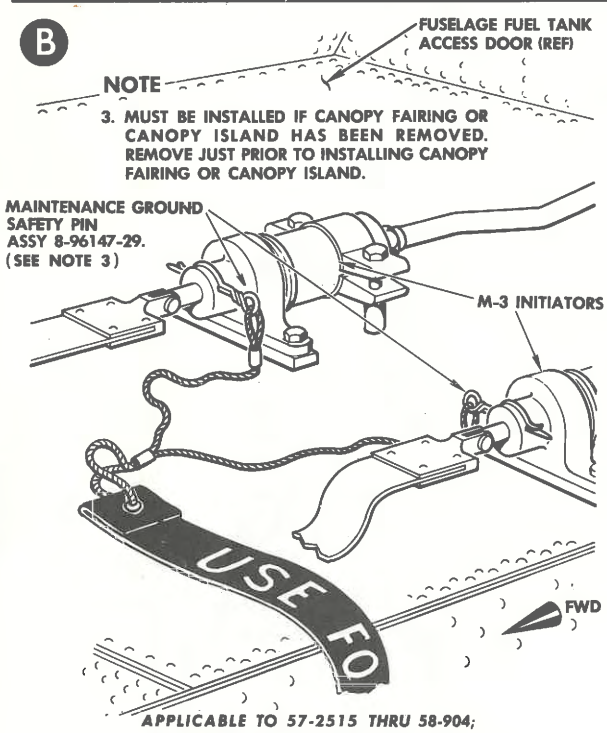


NOTE

4. MUST BE INSTALLED WHEN MAINTENANCE WORK IS BEING PERFORMED WITHIN THE COCKPIT. REMOVE WHEN WORK IS COMPLETED.

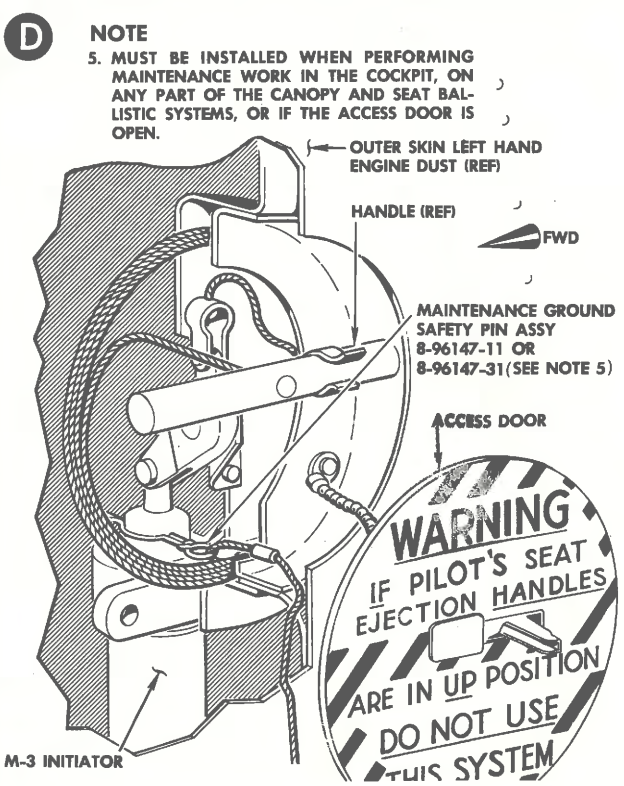
APPLICABLE TO 57-2507 THRU 57-2514 PRIOR TO INCORPORATION OF TCTO 1F-106(J)B-519 AND TCTO 1F-106(J)B-525.

SEAT ARMING INITIATORS



APPLICABLE TO 57-2515 THRU 58-904; AND 57-2507 THRU 57-2514 AFTER INCORPORATION OF TCTO IF-106(J)B-519 AND TCTO IF-106(J)B-525.

SEAT ARMING INITIATORS



EXTERNAL CANOPY JETTISON

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Figure 8-43. Upward Ejection Seat Jettison and Ejection System Safetying, F-106B (Sheet 2 of 2)

catapult thrust is developed by the burning of the smokeless propellant and black powder igniter contained in the cartridge. The catapult cartridge thus fired ejects the seat.

8-88. MK-1 SEAT CATAPULT.

Applicable to F-106A airplanes 56-454, -457, -461, 56-463 thru 59-059; and 56-453, -455, -456, -458 thru -460, and 56-462 after incorporation of TCTO 1F-106(J)A-528. Applicable to aft seat of F-106B airplanes 57-2509, 57-2515 thru 58-904; and 57-2507, -2508, -2510 thru 57-2514 after incorporation of TCTO 1F-106(J)B-515. The MK-1 seat catapult assembly is a combination catapult and rocket device used to eject the pilot and seat from the airplane. Major components of the assembly are the outer housing, the firing pin, the cartridge, the motor housing lock, and the rocket motor. An illustration of the assembly is shown in figure 8-44. The upper end of the outer housing is attached to the airplane structure and the lower end is connected, by tubing, to an M-3 initiator. The cartridge, the motor housing lock, and the rocket motor are assembled within the outer housing. The upper end of the rocket motor is attached to the seat assembly. When the pilot raises either of the two ejection control handles an M-3 initiator is fired and the seat catapult functions as follows: The catapult portion of the seat ejection sequence is actuated when the hot gases from the M-3 initiator drive a firing pin upward to fire the cartridge. Hot gases, resulting from initiation of the cartridge propellant, unlock and drive the motor housing lock, the rocket motor, and the pilot-seat mass upward for a distance of 30 inches. At this point the motor housing lock strikes a stop, two plugs shear, and the rocket motor continues its upward motion due to inertia. When the plugs shear, holes are uncovered in the motor housing lock permitting hot gases from the cartridge propellant to enter the rocket motor nozzle and rocket motor ignition occurs. During the remaining 11.13 inches of guided travel, before separating from the outer housing, maximum thrust is attained. After separation, the rocket motor delivers a continuous upward and forward thrust through the center of gravity of the pilot-seat mass until rocket burnout.

WARNING

The seat catapult contains an explosive cartridge which is dangerous to personnel. It shall be handled only by certified personnel who understand thoroughly the hazards and risks involved. Personnel handling the catapult and associated devices shall not tamper with or disassemble any of the components. A serious accident may result.

8-89. M-3 AND M-12 INITIATORS.

The M-3 and M-12 initiators are mechanically actuated ballistic units used in the canopy jettison and seat ejection systems. Figures 8-36 and 8-39 illustrate the location and function of these units for F-106A airplanes, figures 8-37, 8-38, and 8-40 illustrate the location and function of these units for F-106B airplanes. Externally, the M-3 and M-12 initiators are identical, however, the M-3 cartridge fires immediately when the initiator pin is actuated; whereas, the M-12 cartridge has a one-second delay before firing. See figure 8-45 for a detailed view of an M-3 initiator. These mechanically actuated initiators are employed to arm or to fire other components of the ballistic system. The initiator pin, which is the firing trigger of the initiator, is connected to a mechanical linkage of the system. When the initiator pin is pulled outward by the mechanical linkage, a spring is first compressed and then released. When the spring is released, it drives inward with the firing pin, the cartridge is ignited and burning gases, at greater than 5,000 psi, are routed through hoses to other system components. Before being installed, an initiator should be checked to ensure that the ordnance decal is properly affixed and that the safety pin is inserted through the cap neck and initiator pin. The initiator must be handled as an explosive item.

WARNING

Do not handle initiator unless a safety pin is installed.

8-90. M-5 INITIATOR.

The canopy jettison and seat ejection system uses three M-5 initiators. The M-5 initiator is similar to the M-3 initiator except that it accommodates an AN pressure fitting at each end. The M-5 initiator does not have an external pin; the firing mechanism is internal and is actuated by gas pressure generated by other ballistic units.

8-91. M-1A1 EXACTOR.

The M-1A1 exactor is a small tubular unit with a standard AN pressure fitting and two attachment lugs. This closed-end tube contains a piston attached to a long pin extending through its attachment lug end. The piston is gas-operated by pressure from an initiator. In use, the exactor pin is installed through the hole in the firing mechanism bolt of the M-3 initiator that fires the seat catapult. The exactor, when actuated by high-pressure gas, withdraws a pin to fire or to allow firing of the catapult M-3 initiator.

8-92. M-3 THRUSTER.

Applicable to F-106A airplanes. The M-3 thruster is a cylinder approximately 1 inch in diameter and 8 inches long and accommodates an AN pressure fitting at each end. This cylinder contains a cartridge, a gas-operated firing mechanism, and a piston assembly. The piston shaft of the unit is connected to the canopy latch linkage. In

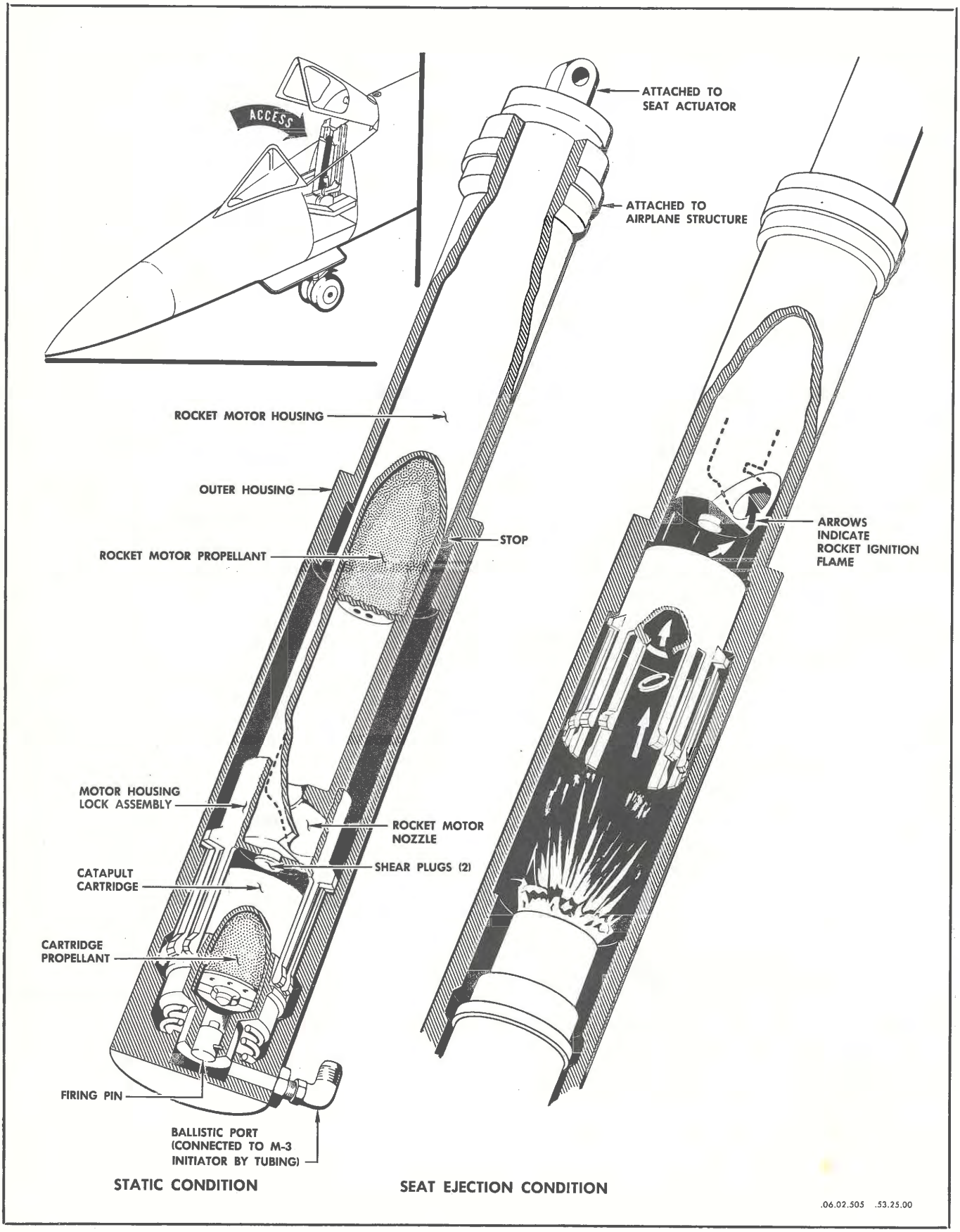


Figure 8-44. MK-1 Seat Catapult

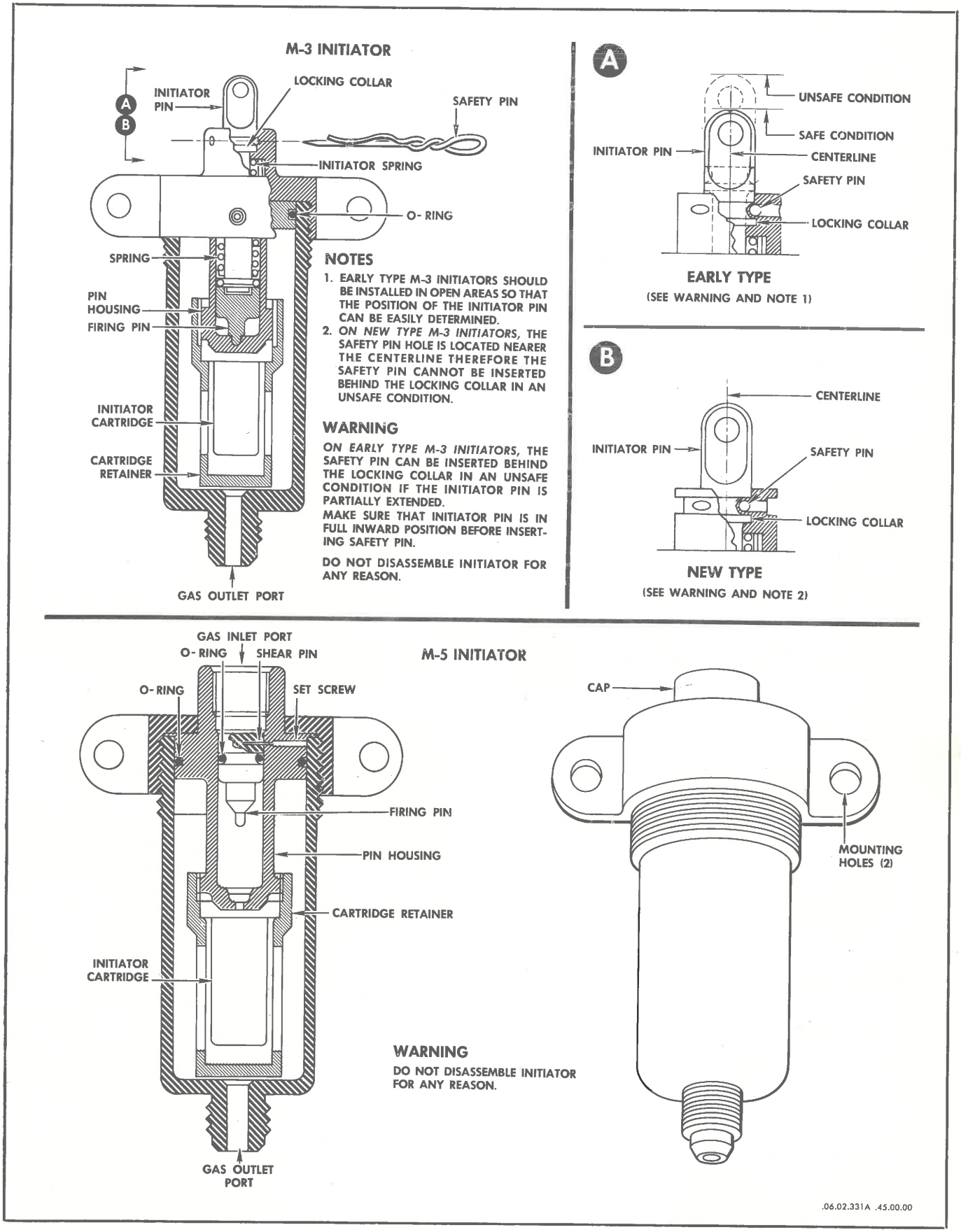


Figure 8-45. Ballistic Units

operation, the unit is fired by gas from an M-3 or an M-5 initiator and the piston extends approximately one and one-half inches to unlatch the canopy. A port is uncovered when the piston reaches the extremity of travel, and pressurized gas is routed through a hose to an M-5 initiator which fires to continue the jettisoning sequence. Since the unit is gas-fired, no safety pins are provided however, all safety pins must be installed in the other units of the system while any work is being accomplished on the unit.

8-93. T-25 THRUSTER.

Applicable to F-106B airplanes. Two cylindrically shaped T-25 thrusters are employed in the canopy jettison system to ballistically unlock the canopy latches. The cylinder is approximately 1 inch in diameter and 7 inches long. The cylinder has a pressure port at each end and is provided with mounting lugs. Each cylinder contains a gas operated firing mechanism, a cartridge, and a piston and shaft. The piston shaft of one thruster is connected to the left-hand canopy latch mechanism and the piston shaft of the other thruster is connected to the right-hand canopy latch mechanism. In operation, the firing mechanism is actuated by gases from either an M-3 or M-5A1 initiator, the cartridge is fired, and gases from the cartridge force the piston shaft to extend and unlock the canopy latches. When the piston reaches the end of the cylinder, an exhaust port is uncovered and gases from the cartridge are routed through hoses to other system components as shown in figure 8-40. Safety precautions outlined in paragraph 8-86 must be observed when performing maintenance on these units.

8-94. 8-06437-3 CABLE CUTTER.

Applicable to F-106A airplanes. The canopy jettison system employs the 8-06437-3 cable cutter, located just aft of the canopy actuating and jettison cylinder, to cut the canopy electrical harness when the canopy is jettisoned. The cylindrical shaped cable cutter is approximately 1.25 inches in diameter and 4 inches long. The unit contains a piston and shaft but does not contain a ballistic cartridge. In operation, gases from an M-5 initiator cause the piston shaft to extend and cut the electrical harness.

8-95. T-3 CABLE CUTTER.

Applicable to F-106B airplanes. The canopy jettison system employs two T-3 cable cutters, located immediately aft of the aft seat on the canopy shelf, to cut the canopy electrical harness when the canopy is jettisoned. The cylindrical shaped T-3 cable cutters are approximately 2½ inches in diameter and 4 inches long. Each unit contains a gas operated firing mechanism and a piston and shaft. In operation, the firing mechanism is actuated by gases from an M-5A1 initiator, the cartridge is fired, and gases from the cartridge force the piston shaft to extend and cut the electrical harness. When maintenance work is being perfromed on these units, safety precautions outlined in paragraph 8-86 must be observed.

8-96. PILOT'S PERSONAL LEADS DISCONNECTS.

Applicable to F-106A airplanes 56-453 thru -462 and 56-467 prior to incorporation of TCTO 1F-106J-506. The pilot's personal leads disconnect are attached to left and right-hand sides of the pilot's seat. The pilot's helmet face plate defog, headset and microphone leads and oxygen hose are attached to a disconnect unit on the aft right side of the seat. The anti-G suit and ventilation suit hoses are attached to a disconnect unit on the left side containing electrical leads for vertical seat adjustment and fore-and-aft rudder pedal adjustment switches. All connections disconnect from the airplane automatically when the seat is ejected. *Applicable to F-106A airplanes 56-463 thru 56-466, 57-229 thru 59-059; and F-106B airplanes 57-2507 thru 58-904. Applicable to F-106A airplanes 56-453, -454, -457 thru -462, and 56-467 after incorporation of TCTO 1F-106J-506.* The pilot's personal leads connect to the left side of the seat and to the right side of the survival kit. The anti-G suit and ventilation suit hoses are attached to a disconnect unit on the left side containing electrical leads for vertical seat adjustment and fore-and-aft rudder pedal adjustments. The pilot's helmet face plate defog, headset and microphone leads, and oxygen hose are connected to the aft right side of the survival kit.

8-97. AUTOMATIC-OPENING SAFETY BELT.

The MA-6 pilot's seat belt incorporates an automatic gas-operated release to disengage the seat belt, as well as a standard manually-operated release. The purpose of the automatic-opening safety belt is to extend the minimum and maximum safe altitudes for seat ejection. When the M-12 delay initiator is fired, it sends high-pressure gas to open the lap belt one second after ejection. When lap belt opens, the shoulder harness loops are freed to allow separation from the seat and actuation of the parachute release. The automatic feature of the safety belt system can be overriden at any time by manual operation.

NOTE

The MA-6 Automatic-Opening Lap Belt is equipped with an AN-823-3 elbow fitting located between the lap belt release mechanism and the ballistic hose from the M-12 initiator. The AN-823-3, 45°, elbow fitting may be replaced with a 90° elbow fitting if desired. Parker Part Number 3CCBTX-S, is the only 90° steel elbow approved for use in the ballistic system.

OPERATIONAL CHECKOUT

8-98. PREFLIGHT TEST, BALLISTIC SYSTEM QUICK-DISCONNECT COUPLINGS.

This procedure is designed to test the proper engagement of the ballistic system quick-disconnect couplings that connect the seat's ballistic hoses to the airplane's ballistic system hoses. On airplanes equipped with an M-3 seat catapult, there are two such quick-disconnect couplings. One is located on the outboard side of the left seat rail approximately 12 inches from the top of the seat rail. The other is located in an identical position on the right seat rail. On airplanes equipped with an MK-1 rocket seat catapult, an additional quick-disconnect coupling is located on the outboard side of the left seat rail approximately 24 inches from the top of the seat rail. The upper (male) portion of the coupling is connected to the seat hoses. The lower (female) portion of the coupling is connected to the airplane's ballistic system hoses. This portion of the coupling incorporates an external lever that operates the internal locking mechanism and an external leaf type spring which aids in retaining the lever in the locked position. Figure 8-35 illustrates the location of the quick-disconnect couplings.

a. Depress lever on lower portion of disconnect and inspect to see that red band is not showing.

NOTE

Red band is around the sleeve on the upper portion of disconnect and will not be visible if disconnect is fully engaged.

b. Release lever to normal position.

c. Apply approximately ten (10) pounds pull test in the upward direction to the ballistic hose attached to the upper portion of disconnect. The quick-disconnect coupling shall remain engaged.

CAUTION

When applying pull test, do not pull up on retractable sleeve. After pull test, visually check ballistic hose. The hose shall not be flattened, kinked, or twisted. To remove twist in hose, rotate upper portion of disconnect coupling.

If the requirements of the above test are not met, proceed as follows:

d. Depress lever on lower (female) portion of disconnect to a horizontal position.

e. Insert upper (male) portion into lower portion, by pushing downward on the ballistic hose fitting, until the red band around the retractable sleeve is no longer visible.

NOTE

Do not push on the retractable sleeve when making insertion.

f. Release lever to normal position.

g. Repeat step "c."

8-99. OPERATIONAL CHECK, CANOPY JETTISON AND SEAT EJECTION MECHANISM.

The following operational check is designed to test the canopy jettison and seat ejection mechanism of the seat assembly. For additional information, if required, refer to T.O. 13A5-18-83, T.O. 13A5-22-3, or T.O. 13A5-22-13.

8-100. Equipment Requirements.

FIGURE	NAME	TYPE	ALTERNATE	USE AND APPLICATION
	Spring type scale, 0 to 80 pounds, calibrated in 1 pound increments, and with limit indicator.	Local procurement		To measure force required to operate seat mechanisms.
	Test initiators (3). Initiators to be constructed to apply force of 40 pounds to actuating mechanism when initiator pin is extended 0.75 inch from retracted position. Initiators shall incorporate an indicator to determine when initiator pin is extended a minimum of 0.75 inch. Paint initiators red and label TEST INITIATOR.	Local fabrication		To simulate mechanical action of two M-3 and one M-12 initiators.

8-100. Equipment Requirements (Cont).

FIGURE	NAME	TYPE	ALTERNATE	USE AND APPLICATION
	Approved container for ballistic units.	Local procurement		Provides place to safely store ballistic initiators that are removed during procedure.
	Twenty inch section of seat rail with tripping lug installed identical to that used in F-106A/B airplanes.	Local fabrication		To provide means of testing the M-12 initiator actuating mechanism.

8-101. Preparation.

Remove seat from airplane; see figure 8-35 for procedure.

8-102. Procedure.

a. Remove two M-3 and one M-12 ballistic initiators from seat assembly; refer to paragraph 8-112 for procedure. Place initiators in approved storage container.

WARNING

To prevent serious injury, make sure that safety pin is installed in right ejection control handle of seat and that each initiator has an individual safety pin installed as shown in figure 8-45.

b. Install and connect 3 test initiators in seat assembly. Maximum misalignment of initiator pin hole to hole in connecting actuating mechanism is 0.03 inch.

c. *Applicable to Stanley seats P/N 247000-1 serial Nos. 1-1 and subsequent, and Stanley seats P/N 247000-3 serial Nos. 3-1 thru 3-8.* Check for 0.06 (+0.09, −0.04) inch maximum gap between seat ejection safety lock and M-1A1 exactor assembly.

d. *Applicable to Stanley seats P/N 247000-3 serial Nos. 3-9 thru Convair seat P/N 8-09264-31 prior to incorporation of TCTO 1F-106(J)-622.* Check seat ejection stop installation for proper installation. The maximum gap between the top surface of the stop and the leg guard shall be 0.06 inch maximum, the minimum gap between the inner surface of the stop and the spring of the M-1A1 exactor assembly shall be 0.06 inch, and the distance from the end of stop leg to the centerline of M-1A1 exactor assembly shall be a minimum of 0.25 inch. Check that electrical harness is positioned so that it does not interfere with stop action.

e. *Applicable to Convair seats P/N 8-09264-37 and subsequent; and to Stanley seats P/N 247000-3 serial Nos. 3-9 thru Convair seat P/N 8-09264-31 after incorporation of TCTO 1F-106(J)-622.* Check for 0.06 (+0.04, −0.04) inch gap between seat ejection safety lock and M-1A1 exactor assembly.

f. Remove M-1A1 exactor assembly; refer to paragraph 8-114 for procedure. Hold spring in compressed position, remove ballistic operated exactor pin, and install short length of 0.085 inch piano wire (safety pin) in assembly. Install assembly in seat. Remove piano wire pin from exactor assembly.

g. Check that the M-12 actuating mechanism is engaged and holding the M-12 initiator tripping arm in stowed (near vertical) position. Install seat rail section, clearance (between tripping arm and seat rail tripping lug shall be a minimum of 0.125 inch. Remove seat rail section.

h. Remove safety pin from right ejection control handle.

i. Attach spring scale to canopy jettison handle, release canopy jettison stowage lock, and pull up on spring scale. Force required to lift handle to full up position shall not exceed 25 pounds and the pin of the right-hand M-3 test initiator must extend a minimum of 0.75 inch from the retracted position. The safety lock of the left-hand M-3 test initiator shall not actuate. The tripping arm of the M-12 test initiator shall remain in the stowed position.

j. Place canopy jettison handle in stowed position. *Applicable to F-106A airplanes 57-244 thru 59-059; and 56-453 thru 57-243 after incorporation of TCTO 1F-106(J)-624. Applicable to F-106B airplanes 57-2520 thru 58-904 and 57-2507 thru 57-2519 after incorporation of TCTO 1F-106(J)-624.* Check AFCS disengage switch closed position by checking for continuity across pin Nos. 6 and 7 at seat left hand quick-disconnect. Raise and hold seat ejection control handle several inches from down position. Check AFCS disengage switch for open position; there shall be no continuity across pins 6 and 7 of seat left hand quick-disconnect. Place seat ejection control handle in down position.

k. Attach spring scale to center of gripping surface of left ejection control handle and pull up on spring scale. The following requirements must be met:

1. *Applicable to Convair seats P/N 8-09264-1 thru P/N 8-09264-19 prior to incorporation of TCTO 1F-106(J)-622.* The force required to actuate squeeze grip and release handle from down stowage lock shall be 20 (±10) pounds. After handle is released from down stowage lock, the force

required to lift handle to full up and locked position shall not exceed 30 pounds.

2. *Applicable to Convair seats P/N 8-09264-21 thru P/N 8-09264-31 prior to incorporation of TCTO 1F-106(J)-622.* The force required to unlock and lift handle to full up and locked position shall not exceed 60 pounds.

3. *Applicable to Convair seats P/N 8-09264-37 and subsequent; and Convair seats 8-09264-1 thru 8-09264-31 after incorporation of TCTO 1F-106(J)-622.* The force required to actuate squeeze grip shall be 20 (±10) pounds. After squeeze grip is actuated, the force required to lift handle to full up and locked position shall not exceed 60 pounds.

4. Both arm guards shall rise and lock in place.

5. The inertia reel control knob shall move forward to the locked position.

6. The pins of both M-3 test initiators must extend a minimum distance of 0.75 inch from retracted position when handles are full up and locked.

7. The tripping arm of the M-12 test initiator shall be in a near horizontal position; the initiator pin shall remain in the fully retracted position.

l. Remove exactor assembly, compress spring, and install short length of 0.085 piano wire (safety pin) in assembly. Release uplocks and place ejection control handle and arm guards in down position. Actuate left and right handle squeeze grips and engage ball ends of handle down lock cables. Install exactor assembly in seat. Remove piano wire safety pin from exactor assembly.

m. Place inertia reel knob in aft position.

CAUTION

To prevent internal damage to inertia reel, do not attempt to place inertia reel knob in aft position unless the ejection control handles and arm guards are in down position.

n. Repeat step "g."

o. Repeat step "k" except that the spring scale is to be attached to the right ejection control handle.

p. Position seat rail section so that M-12 tripping arm is contacting seat rail tripping lug; tripping arm shall have a 0.188 inch minimum overlap.

NOTE

When checking tripping arm overlap, hold seat rail section as far forward as possible.

q. Slide seat rail section until lug on seat rail trips the M-12 test initiator. The pin of the test initiator shall extend a minimum distance of 0.75 inch from retracted position. Remove seat rail section.

NOTE

If seat rail section is not available, insure minimum 0.188 inch overlap by checking dimension from plane of forward face of slide blocks to upper aft edge of tripping arm. This dimension shall be a minimum of 0.625 inch.

r. Remove exactor assembly, compress spring, and install ballistic operated pin. Release uplocks and place ejection control handle and arm guards in down position. Actuate left and right handle squeeze grips and engage ball ends of handle down lock cables. Install M-1A1 exactor assembly in seat; refer to paragraph 8-117 for procedure.

s. Repeat steps "g" and "m."

t. Install safety pin in right ejection control handle.

u. Remove 3 test initiators.

v. Perform steps "c," "d," or "e" as applicable.

w. Install right-hand M-3 initiator. Install left-hand M-3 initiator. Install M-12 initiator. Refer to paragraph 8-113 for procedure.

WARNING

To prevent serious injury, make sure that each initiator has an individual safety pin installed as shown in figure 8-42 or 8-43.

x. Check that screws for attaching seat inspection doors are of proper length; install inspection doors.

WARNING

If screws are too long, they will interfere with the mechanical action of canopy jettison and/or seat ejection control handles and the ballistic system will not function.

y. Install seat in airplane; see figure 8-35 for procedure.

WARNING

If seat is not immediately installed, just prior to installation conduct the following procedure: Install safety pin in seat right hand M-3 initiator, disconnect mechanical linkage from initiator, raise ejection control handles and check lap belt trip lever overlap per note following step "q." Place ejection control handles in stowed position and connect mechanical linkage to seat right hand M-3 initiator. Install seat in airplane.

z. Remove all maintenance safety pins from seat except pin in right ejection control handle.

REPLACEMENT

8-103. REMOVAL, SEAT CATAPULT.

All safety precautions in paragraph 8-86 must be observed when work is performed on or in vicinity of seat catapult.

a. Remove pilot's seat; see figure 8-35 for procedure.

b. Disconnect ballistic hose from seat catapult; cap hose opening and catapult port.

c. Remove strap that secures lower end of catapult.

d. Remove two bolts from trunnion at upper end and remove catapult.

8-104. INSTALLATION, SEAT CATAPULT.

All safety precautions in paragraph 8-86 must be observed when work is performed on or in the vicinity of seat catapult.

a. Position catapult with trunnion in U-shaped fittings at upper end of seat rail assembly. Make sure that the pressure hose adapter fitting is facing in the proper direction.

NOTE

If an M-3 catapult is to be installed, make sure that the catapult pressure hose adapter fitting is an AN816-4C and is facing forward. If an MK-1 rocket catapult is to be installed, make sure that the catapult pressure hose adapter elbow is an AN833-4 and is facing aft.

b. Install bolts in U-shaped fittings.

c. Connect ballistic hose to catapult.

d. Install strap that secures lower end of catapult; do not exceed 5 inch-pounds torque on attachment bolts at each side.

e. Install pilot's seat; see figure 8-35 for procedure.

8-105. REMOVAL, M-3 THRUSTER.

Applicable to F-106A airplanes. All safety precautions in paragraph 8-86 must be observed when work is performed on or in the vicinity of the M-3 thruster.

a. Disconnect ballistic hose from each end of thruster. Cap hoses and thruster fittings.

b. Remove nut and spacer from end of thruster extension.

c. Remove two bolts from thruster trunnion mounting plates and remove plates.

d. Remove thruster and extension as unit.

e. If thruster is to be replaced, remove thruster extension from thruster.

8-106. INSTALLATION, M-3 THRUSTER.

Applicable to F-106A airplanes. All safety precautions in paragraph 8-86 must be observed when work is being performed on or in the vicinity of the M-3 thruster.

a. Install thruster extension on thruster; use a new lock washer.

b. Insert the thruster extension through crank pin of canopy latch mechanism.

c. Install trunnion mounting plates with bolts.

d. Connect ballistic hoses to thruster. Make sure that the elbow fitting is made of steel.

e. Install spacer, nut, and cotter pin on thruster shaft. See figure 8-20 for adjustment procedure.

8-107. REMOVAL, T-25 THRUSTER.

Applicable to F-106B airplanes. All safety precautions in paragraph 8-86 must be observed when work is performed on or in the vicinity of a T-25 thruster.

a. Disconnect ballistic hoses from thruster. Cap hoses and thruster fittings.

b. Disconnect thruster adapter assembly from canopy latch hammer by removing cotter pin washer, and clevis pin.

c. Remove two bolts from thruster trunnion mounting plates. Remove thruster.

d. If a replacement thruster is to be installed, remove adapter assembly from thruster shaft.

8-108. INSTALLATION, T-25 THRUSTER.

Applicable to F-106B airplanes. All safety precautions in paragraph 8-86 must be observed when work is performed on or in the vicinity of a T-25 thruster.

a. Install adapter assembly on thruster shaft; do not tighten jam nut or lockwire assembly.

b. Install thruster and thruster trunnion mounting plates with two bolts.

c. Make sure that canopy hold-open supports are installed. Depress canopy latch interlock located under right cockpit sill and operate latches to full locked position.

WARNING

Applicable to airplanes equipped with electric canopy actuators. Operating canopy latches to unlocked position disengages the electric can-

opy actuator clutch and the canopy will fall unless canopy hold-open supports are installed.

d. Connect thruster shaft adapter assembly to canopy latch hammer by inserting clevis pin.

e. Adjust forked fitting of adapter to provide from 0.03 to 0.09 inch clearance between the striking face of the hammer and the latch mechanism lever. Tighten jam nut.

f. Lock wire the forked fitting, the jam nut and the adapter.

g. Connect thruster shaft adapter to canopy latch hammer with clevis pin, washer, and cotter pin.

h. Connect ballistic hoses to thruster.

i. Operate canopy latches to unlocked position.

8-109. REPLACEMENT, 8-06437-3 CABLE CUTTER.

Applicable to F-106A airplanes. The cable cutter must be replaced whenever the canopy jettison system has been fired.

a. Remove old cable cutter by standard shop procedures.

b. Mount new cable cutter assembly to airplane structure with bulkhead type mounting nuts. Tighten nuts and install lockwire.

c. Install permanent splice to one side of severed electrical harness; refer to T.O. 1F-106A-2-10 for procedure. Install vinyl sleeve approximately 5 inches long on splice wires. Thread splice wires through hole in cable cutter until center (lengthwise) of vinyl sleeve is at hole in cable cutter. Complete the permanent splice; refer to T.O. 1F-106A-2-10 for wiring diagrams.

d. Connect new ballistic hoses to cable cutter as shown on figure 8-39.

8-110. REMOVAL, T-3 CABLE CUTTER.

Applicable to F-106B airplanes. All safety precautions in paragraph 8-86 must be observed when work is performed on or in the vicinity of a T-3 cable cutter.

a. Disconnect ballistic hose from cable cutter. Cap hose and fitting of cutter.

b. Cut lockwire and remove safety clip from striker block retaining nut.

c. Remove retaining nut and striker block. Pull electrical harness clear of assembly.

d. Cut lockwire and remove bulkhead type mounting nut. Remove remainder of cable cutter assembly.

8-111. INSTALLATION, T-3 CABLE CUTTER.

Applicable to F-106B airplanes. All safety precautions in paragraph 8-86 must be observed when work is performed on or in the vicinity of a T-3 cable cutter.

a. Mount cable cutter assembly to airplane structure with bulkhead type mounting nuts. Tighten nuts and install lockwire.

b. Remove safety clip, striker block retaining nut, and striker block.

c. *Applicable if canopy has been jettisoned,* install permanent splice to one side of severed electrical harness. Refer to T.O. 1F-106A-2-10 for splicing procedure. Install vinyl sleeve approximately 5 inches long on splice wires. Complete the permanent splice; refer to T.O. 1F-106A-2-10 for wiring diagrams.

d. Insert electrical harness. Install striker block and striker block retaining nut. Install safety clip and lockwire.

e. Connect ballistic hose to cable cutter.

8-112. REMOVAL, M-3 OR M-12 INITIATORS.

All safety precautions in paragraph 8-86 must be observed when work is performed on or in the vicinity of M-3 or M-12 initiators.

a. Install a safety pin in initiator being removed.

b. Disconnect the system linkage from the initiator.

c. Disconnect ballistic hose from initiator; cap hose and initiator fitting.

d. Remove two initiator mounting bolts and remove initiator.

WARNING

Do not handle initiators unless a safety pin is installed.

8-113. INSTALLATION, M-3 OR M-12 INITIATOR.

All safety precautions in paragraph 8-86 must be observed when work is performed on or in the vicinity of M-3 or M-12 initiators.

a. Make certain that a safety pin is installed in the replacement unit. Visually inspect initiator to assure that less than four threads are showing between the initiator chamber and the initiator mounting cap. If four threads or more are showing, replace initiator with a like serviceable unit.

WARNING

Do not attempt to alter initiator to meet requirements or serious injury to personnel and/or damage to airplane may result.

b. Determine that initiator mechanism is properly assembled by removing safety pin and positioning the initiator so the initiator pin points down. If initiator pin

falls out, replace initiator. If initiator pin remains engaged, install safety pin and proceed with installation.

c. Attach unit to the airplane structure by means of the mounting lugs.

d. Connect initiator pin to mechanical linkage.

WARNING

Maximum misalignment of hole in initiator pin to attachment hole in mechanical linkage is 0.03 inch. When connecting M-1A1 exactor assembly to left-hand M-3 initiator of seat, the exactor pin first must be installed.

e. Remove shipping safety pin from initiator.

f. *Applicable to all initiators except left-hand M-3 initiator of seat that is connected to M-1A1 exactor.* Install ground maintenance safety pin (with red streamer attached) in initiator.

g. Connect ballistic hose to initiator.

h. Record in AF Form 781, initiator serial number and location of initiator in system.

8-114. REMOVAL, M-5 OR M-5A1 INITIATOR.

All safety precautions in paragraph 8-86 must be observed when work is performed on or in the vicinity of an M-5 or M-5A1 initiator.

a. Disconnect ballistic hoses from initiator. Cap hoses and initiator fittings.

b. Remove mounting bolts, initiator, and mounting adapter.

8-115. INSTALLATION, M-5 OR M-5A1 INITIATOR.

All safety precautions in paragraph 8-86 must be observed when work is performed on or in the vicinity of an M-5 or M-5A1 initiator.

a. Install mounting adapter and initiator with mounting bolts.

b. Connect ballistic hoses to initiator.

c. Record in AF Form 781, initiator serial number and location of initiator in system.

8-116. REMOVAL, M-1A1 EXACTOR.

All safety precautions in paragraph 8-86 must be observed when work is performed on or in the vicinity of the M-1A1 exactor.

a. Remove seat; see figure 8-35 for procedure.

b. Install safety pin in M-3 initiator connected to M-1A1 exactor.

c. Disconnect exactor linkage from M-3 initiator.

d. Disconnect ballistic hose from M-1A1 exactor. Cap hose and exactor fitting.

e. Remove mounting screws. Remove exactor.

8-117. INSTALLATION, M-1A1 EXACTOR.

All safety precautions in paragraph 8-86 must be observed when work is performed on or in the vicinity of the M-1A1 exactor.

a. Make sure that exactor pin is installed in exactor assembly.

b. Position exactor assembly, insert mounting screws and check alignment of hole in exactor forked fitting to hole in initiator pin.

c. Remove exactor assembly, adjust forked fitting as necessary to obtain proper alignment, and tighten jam nut.

WARNING

Maximum misalignment of hole in initiator pin to hole in exactor forked fitting is 0.03 inch.

d. Install exactor assembly with mounting screws.

e. Connect exactor assembly to M-3 initiator.

f. Connect ballistic hose to exactor assembly.

g. Remove safety pin from M-3 initiator connected to M-1A1 exactor assembly.

h. Install seat by procedure given in figure 8-35.

PILOT'S SEAT (ROTATIONAL UPWARD EJECTION)

Applicable to F-106A airplanes 59-060 and subsequent; and 56-453 thru 59-059 after incorporation of TCTO 1F-106-569. Applicable to F-106B airplanes 59-149 and subsequent; and 57-2507 thru 58-904 after incorporation of TCTO 1F-106-569.

DESCRIPTION

8-118. GENERAL.

The rotational upward ejection seat assembly is equipped with a canopy jettison (only) control handle located on the forward left side, a canopy jettison and seat ejection (both) control ring located at the forward edge of the seat, and an emergency harness release handle located on the right side of the seat. Other controls on the seat assembly are the seat adjustment (vertical) control switch and the rudder pedal adjustment switch, both of which are located on the right side, and the shoulder harness inertia reel control handle located on the left side. The shoulder harness straps connect to the back type parachute and the inertia reel which is mounted below the seat head rest on the back of the seat. The spring loaded inertia reel allows the pilot limited shoulder movement, but prevents his being thrown forward in case of an accident. The inertia reel locks automatically, when a rapid pull (equivalent to 2 or 3 G deceleration) force is exerted on the shoulder harness, or during seat ejection. The main risers of the seat's back type parachute are attached to the pilot's integrated harness. A survival pack located at each side of the parachute, the lap safety belt, and the shoulder harness straps are connected to the pilot's parachute container. Vertical adjustment of the seat is provided by an electric driven actuator connected to the bottom of the seat. Two quick-disconnect couplings also located on the bottom of seat provide the means for connecting the airplane's "G" and vent suit system, electrical systems, and the oxygen system to the seat. The "G" and vent suit connections to the pilot are located at the aft left side of the seat cushion and the mask defog, headset and microphone leads, and the oxygen system connections (personal leads) to the pilot are located at the aft right side of the seat cushion. The seat contains an oxygen regulator and two emergency oxygen bottles. During normal flight, gaseous oxygen from the airplane's oxygen supply is routed to the regulator within the seat. The regulator provides 100% oxygen at a positive pressure and with continuous flow to the pilot at all altitudes. The emergency oxygen bottles are used, if the airplane's system is exhausted, or, after seat ejection. The oxygen emergency system shutoff valve is actuated manually by the pilot or is automatically actuated during seat ejection. The seat contains numerous ballistic devices which are described in paragraphs 8-155 through 8-172. See figure 8-46 for an illustration of the seat assembly. See figure 8-47 for a schematic illustration of the seat's electrical systems.

8-119. SURVIVAL PACKS.

The two triangular shaped survival packs are approximately 33 inches long and are of fiberglass construction. One pack is installed in the seat on each side of the back type parachute. The packs are connected to each other and to the pilot's parachute container. The right pack is designed to contain a life raft, a CO_2 bottle for life raft inflation, and space for miscellaneous items. Other items required for survival, such as a radio, radar and sun reflector, sleeping bag, rifle, fishing gear, water purifier, and first aid kit may be contained within the left survival pack.

NOTE

Survival items contained within the survival pack may vary; the area in which the airplane is based dictates the specific items required for survival.

The survival packs are normally connected to and/or disconnected from the pilot's parachute container manually. During an emergency, such as a crash, over the side bail-out, or after ejection, both packs may be released mechanically and simultaneously by operating the emergency harness release handle on the right side of the seat.

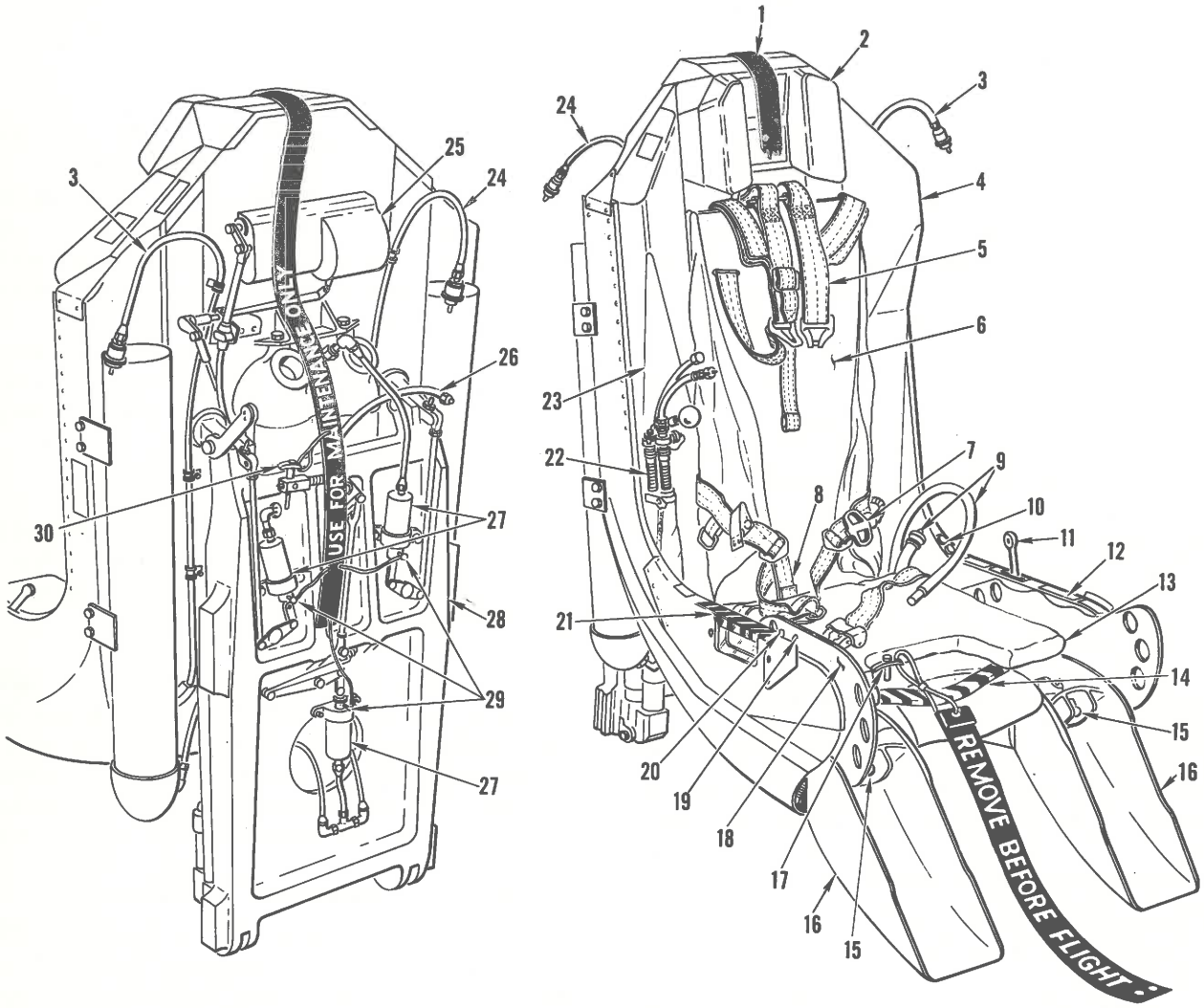
8-120. SEAT ADJUSTMENT ACTUATOR.

The seat adjustment actuator is an electrically driven screw jack unit capable of adjusting the seat vertically through a five inch total range. The actuator's reversible electric motor receives power from the airplane's 28-volt dc nonessential bus through the "SEAT ADJUST" fuse of the cockpit fuse panel when the seat adjust control switch on the right side of seat is actuated. See figure 8-47 for a schematic illustration of this system.

NOTE

On F-106A airplanes and in the forward cockpit of F-106B airplanes, the "SEAT ADJUST" fuse is installed in the cockpit left fuse panel. *In the aft cockpit of F-106B airplanes,* the "SEAT ADJUST" fuse is installed in the right fuse panel.

The lower end of the actuator is connected to the airplane structure and the upper end (screw jack) is connected to the bottom of the seat. When the seat is ejected, the connection to the seat is ballistically separated and the actuator remains in the airplane.



CONDITION

SEAT REMOVED FROM AIRPLANE

1. WARNING STREAMER OF 8-96012-29 MAINTENANCE SAFETY PIN ASSEMBLY.
2. HEADREST.
3. BALLISTIC HOSE QUICK-DISCONNECT COUPLING (AFT SEAT OF F-106B AIRPLANES ONLY).
4. LEFT SURVIVAL PACK.
5. SHOULDER HARNESS AND PARACHUTE ATTACHMENT STRAPS.
6. PARACHUTE.
7. PARACHUTE D-RING.
8. LAP BELT.
9. ANTI-G AND VENT SUIT LEADS.
10. THRUSTER OIL TEST LIGHT AND TEST SWITCH.
11. INERTIA REEL CONTROL HANDLE.
12. CANOPY JETTISON ALTERNATE CONTROL HANDLE.
13. SEAT PAD.
14. CANOPY JETTISON AND SEAT EJECTION CONTROL RING.
15. FOOT RETRACTING CABLES.
16. FOOT PANS.
17. PILOT'S GROUND SAFETY PIN.
18. LEG GUARD.
19. RUDDER PEDAL ADJUSTMENT SWITCH.
20. SEAT ADJUSTMENT (VERTICAL) SWITCH.
21. EMERGENCY HARNESS RELEASE HANDLE.
22. PERSONAL LEADS.
23. RIGHT SURVIVAL PACK.
24. BALLISTIC HOSE QUICK-DISCONNECT COUPLING (ALL SEATS).
25. INERTIA REEL.
26. BALLISTIC HOSE (AFT SEAT OF F-106B AIRPLANES ONLY).
27. M-27 INITIATORS.
28. SEAT CARRIAGE.
29. MAINTENANCE SAFETY PINS.
30. PIP TYPE MAINTENANCE SAFETY PIN.

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Figure 8-46. Rotational Upward Ejection Seat

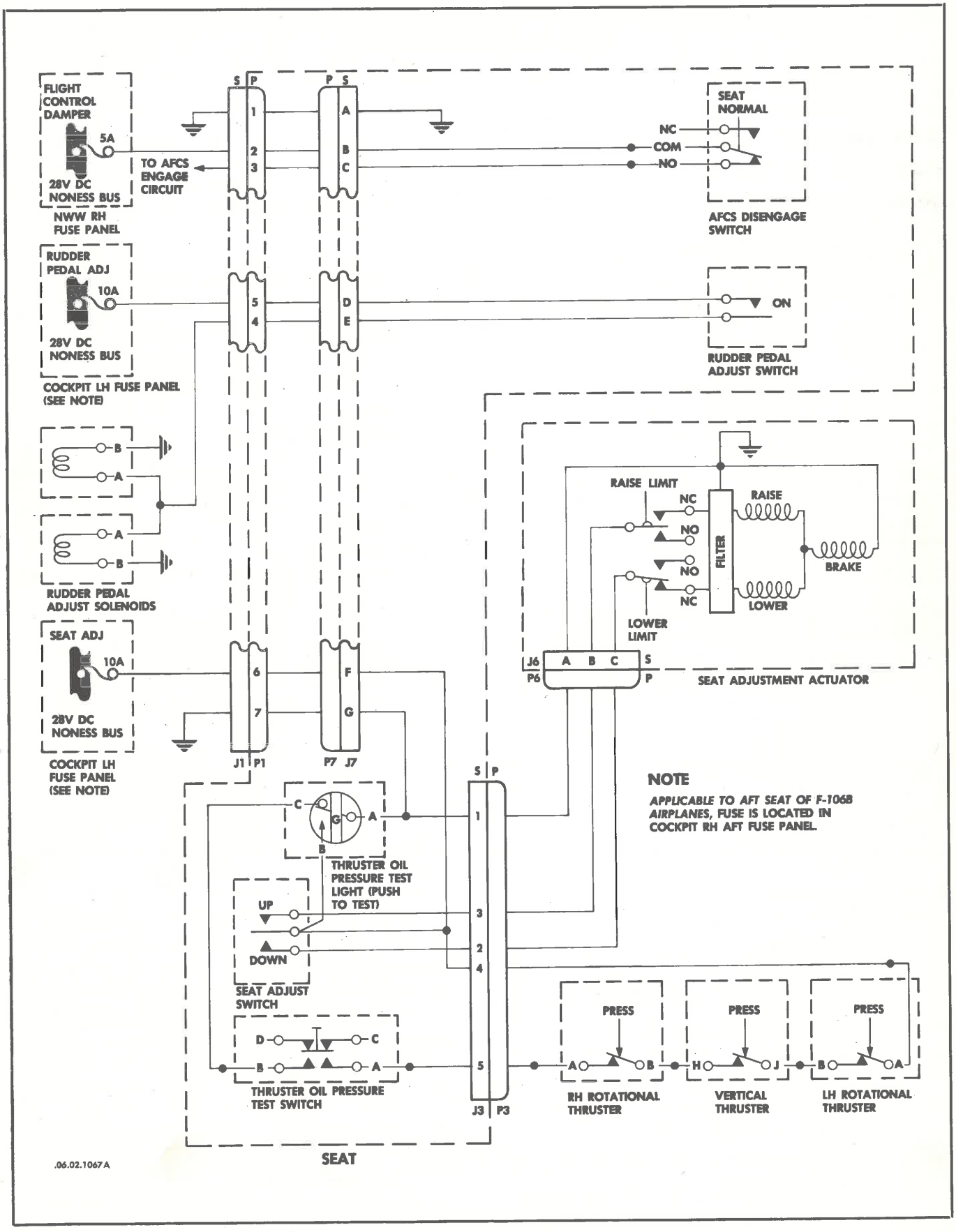


Figure 8-47. Rotational Upward Ejection Seat Electrical Schematic

OPERATIONAL CHECKOUT

8-121. OPERATIONAL CHECK, PILOT'S SEAT.

The following operational check provides a test of all systems connected to or contained within the pilot's seat except the canopy jettison and seat ejection (ballistic) systems. If the requirements of this check cannot be met, refer to system analysis, paragraph 8-125 for probable causes and corrective procedures.

8-122. Equipment Requirements.

FIGURE	NAME	TYPE	ALTERNATE	USE AND APPLICATION
1-25	Generator Set (Gas).	8-96026-801 AF/M32A-13 (6115-583-9365)	8-96026 AF/M32M-2 (6115-617-1417)	To energize electrical systems on aircraft equipped with special quick disconnect receptacle.
	Generator Set (Elec).	8-96025-803 AF/ECU-10/M (6125-583-3225)	8-96025-805 A/M24M-2	
			8-96025 AF/M24M-1 (6125-620-6468)	
1-24	Generator Set.		MC-1 (6125-500-1190)	To energize electrical systems (except AWCIS) on aircraft equipped with standard AN receptacle and on others by using adapter cable 8-96052-801.
			MD-3	
1-26	Adapter Cable.	8-96052-801 (6115-690-4050)		To connect MC-1 and MD-3 units to aircraft equipped with special quick-disconnect receptacle.

8-123. Preparation.

a. Check that the following fuses are installed.

1. "SEAT ADJUST" in cockpit left fuse panel for F-106A airplanes and forward seat of F-106B airplanes. In right aft cockpit fuse panel for aft seats of F-106B airplanes.
2. "RUDDER PEDAL ADJ" in cockpit left fuse panel for F-106A airplanes and forward seat of F-106B airplanes. In right aft cockpit fuse panel for aft seats of F-106B airplanes.
3. "FLIGHT CONTROL DAMPER" in right nose wheel well fuse panel.

b. Connect external source of 28-volt dc power to the airplane; refer to Section I of this manual for procedure.

8-124. Procedure.

a. Actuate the "SEAT ADJ" control switch to "DOWN" position. Release switch. Measure distance between seat and cockpit floor.

b. Hold "SEAT ADJ" control switch at "UP" position until the up limit switch actuates. Release switch. Measure distance between seat and cockpit floor; this distance shall be a minimum of 5 inches greater than the initial measurement taken in step "a." The time required for the seat to travel 5 inches shall not exceed 30 seconds.

c. Hold "SEAT ADJ" control switch at "DOWN" position until the down limit switch actuates. Release switch.

d. Press the push-to-test "THRUSTER OIL PRESSURE TEST LIGHT" just aft of inertia reel lock control; the light shall illuminate.

e. Press the "THRUSTER OIL PRESSURE TEST SWITCH"; the "THRUSTER OIL PRESSURE TEST LIGHT" shall illuminate.

WARNING

Failure of "THRUSTER OIL PRESSURE TEST LIGHT" to illuminate indicates low oil pressure in vertical and/or rotational thrusters. The thrusters shall be replaced because low oil pressure will cause malfunction during seat ejection.

f. Operate inertia reel control handle on left side of seat to "AUTOMATIC" position. Slowly pull forward on the shoulder harness straps. The shoulder harness straps shall reel out freely.

g. Slowly release pull on shoulder harness straps. The inertia reel shall wind in the slack as pull on straps is released.

h. Pull forward on shoulder harness straps with a rapid positive motion. The inertia reel shall lock and prevent the shoulder harness straps from reeling out.

i. Operate inertia reel control handle to "MANUAL" position then to "AUTOMATIC" position. Inertia reel shall unlock. If reel does not unlock, repeat operation.

j. Operate inertia reel control handle to "MANUAL" position. Inertia reel shall lock to prevent further extension, but shall retract with ratchet action if pull force is relieved.

k. Repeat step "i."

l. Engage the flight mode selector switch on the pilot's left console as follows: place flight mode switch in pitch position, depress and hold manual mode switch trigger, move flight mode switch to assist position, then release manual mode switch trigger. The flight mode switch shall remain in the assist position.

NOTE

If the requirements of steps "l" through "p" are not met, refer to T.O. 1F-106A-2-7 for corrective procedures.

m. Disengage the flight mode selector switch by depressing the "EMER DIR MAN" switch on the control stick base. The flight mode selector switch shall move to the "DIR MAN" position.

n. Actuate the "RUD PED ADJ" switch on the right side of the seat. The rudder pedals shall move to the full aft position. Release switch. Measure distance between seat and rudder pedals.

o. Actuate "RUD PED ADJ" switch and push pedals approximately 2 inches forward with feet. Release switch and then remove feet from rudder pedals. The rudder pedals shall lock at the position where they were placed. Repeat this operation at several different positions until the full forward position is released.

p. Measure distance from seat to full forward position of rudder pedals; the difference between this measurement and the measurement taken in step "n" shall be approximately 7 inches.

q. Check oxygen system for proper operation; refer to T.O. 1F-106A-2-6 for procedure.

r. Disconnect external electrical power from the airplane.

SYSTEM ANALYSIS

8-125. SYSTEM ANALYSIS, PILOT'S SEAT.

PROBABLE CAUSE	ISOLATION PROCEDURE	REMEDY
SEAT WILL NOT RAISE OR LOWER WHEN CONTROL SWITCH IS ACTUATED.		
Defective "SEAT ADJUST" fuse, or, fuse not installed.	Check fuse in forward cockpit left fuse panel for F-106A airplanes and for forward seats of F-106B airplanes. Check fuse in aft cockpit right fuse panel for aft seats of F-106B airplanes.	Remove defective fuse; install new fuse.
Defective seat adjustment control switch.	Check that power is available at switch by pressing push-to-test thruster oil pressure test light. If light illuminates power is available. Remove power from the airplane, remove switch mounting screw and check switch for continuity. If continuity reading is not obtained switch is defective.	Replace defective switch.

8-125. SYSTEM ANALYSIS, PILOT'S SEAT (CONT).

PROBABLE CAUSE	ISOLATION PROCEDURE	REMEDY
SEAT WILL NOT RAISE OR LOWER WHEN CONTROL SWITCH IS ACTUATED (CONT).		
Defective seat actuator.	If switch continuity reading is obtained, seat actuator may be defective. Remove seat and isolate trouble; see figure 8-47 for a schematic illustration of this system.	Replace actuator if defective.
Defective circuit to seat adjustment control switch.	Remove seat cushion. Remove access door to gain access to rear of seat interior; heed WARNING placard on access door. Check for power to switch. If power reading is not obtained, circuit from fuse to switch is defective. Isolate trouble; see figure 8-47.	Repair defective circuit.
THRUSTER OIL PRESSURE LIGHT DOES NOT ILLUMINATE WHEN TEST SWITCH IS ACTUATED.		
Defective "SEAT ADJUST" fuse, or, fuse not installed.	Check fuse in forward cockpit left fuse panel for F-106A airplanes and for forward seats of F-106B airplanes. Check fuse in aft right fuse panels for aft seats of F-106B airplanes.	Remove defective fuse; install new fuse.
Test light bulb burned out.	Press the push-to-test thruster oil pressure test light. If light does not illuminate, bulb is burned out, or circuit between fuse and bulb is defective.	Replace test light bulb.
Defective thruster oil pressure test switch.	Remove seat cushion. Remove access door to gain access to rear of seat interior; heed WARNING placard on access door. Check for power to switch. If power reading is obtained, depress switch and check for power from switch. If power reading from switch is not obtained, switch is defective.	Replace defective switch.
One or more defective thrusters.	If power reading to test switch is not obtained, one or more of the thrusters may have low oil pressure. Remove seat and isolate trouble; see figure 8-47 for a schematic illustration of this system.	Replace thruster(s) if defective.

REPLACEMENT

8-126. REPLACEMENT, PILOT'S SEAT.

Remove and/or install the pilot's seat by procedures given in figure 8-48.

PILOT'S ESCAPE SYSTEM (ROTATIONAL UPWARD EJECTION)

Applicable to F-106A airplanes 59-060 and subsequent; and 56-453 thru 59-059 after incorporation of TCTO 1F-106-569. Applicable to F-106B airplanes 59-149 and subsequent; and 57-2507 thru 58-904 after incorporation of TCTO 1F-106-569.

DESCRIPTION

8-127. GENERAL.

The pilot escape system provides a means for jettisoning the canopy, ejecting the flight stable seat and pilot, furnishing the pilot with oxygen when he is above 15,000 feet altitude, separating the pilot with his survival gear from the seat at or below 15,000 feet, and deploying his parachute after separation from the seat. This ballistic (explosive) powered system is completely independent of any airplane power source and is operated by mechanical controls on the pilot's seat. The canopy jettison and seat ejection control ring is located at the forward edge of the seat. When this control is operated, the canopy is jettisoned, the seat is ejected, and a complete sequence of events takes place. A canopy jettison (only) control handle is located on the left arm rest of the seat. When this control is operated, the canopy is jettisoned and the seat is armed, however, seat ejection and subsequent events will not occur until the seat ejection control ring is pulled. The canopy (only) can also be jettisoned when the airplane is groundborne by the external canopy jettison control handle. This handle is located at the left side of the fuselage near the leading edge of the wing and may be used during an emergency by ground personnel. Refer to paragraphs 8-129 through 8-153 and see figures 8-49 and 8-51 for complete operational sequence of the pilot escape system.

8-128. BALLISTIC SYSTEM.

The ballistic system consists of mechanical controls, mechanical linkages, ballistic (explosive) devices, and high pressure flexible hoses. The hoses incorporated in the seat assembly are furnished with tape at each end; the tape gives definite instructions as to which component(s) of the system the hose shall be connected.

CAUTION

Gases formed by firing ballistic units have a corrosive effect on all affected components of the system. If any of the ballistic units have been fired for any reason, all affected units, hoses, and fittings must be replaced.

WARNING

Ballistic units are dangerous and should be treated with the respect due an explosive device. Observe all safety precautions listed in paragraph 8-154.

See figures 8-49 and 8-51 for schematic illustrations showing ballistic system flow.

8-129. CANOPY JETTISON AND SEAT EJECTION, F-106A.

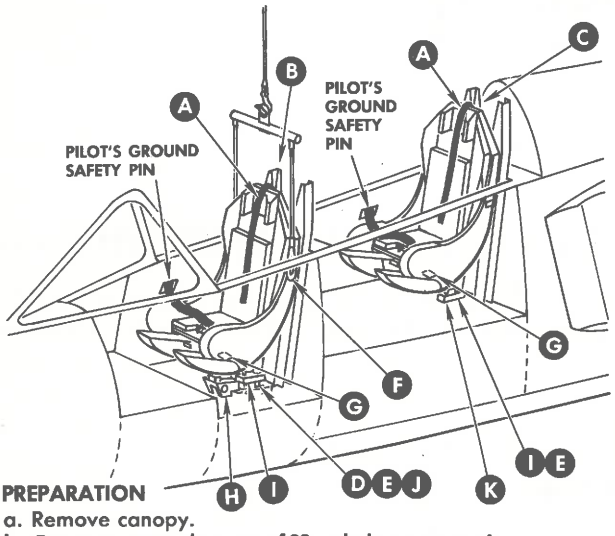
8-130. Pre-launch Sequence.

The canopy jettison and seat ejection pre-launch sequence begins when the pilot performs the initial pull on the canopy jettison and seat ejection control ring (1) located at the forward edge of the seat.

NOTE

Numbers within parenthesis (2), (3), etc, denote items shown on figure 8-49.

This pull on the canopy jettison and seat ejection control ring (1) mechanically actuates the seat AFCS switch (2) to electrically disengage the AFCS system and mechanically fires the gas generator (3) of the foot and seat pan rotary actuator (4) and fires the canopy unlatch M-3A1 initiator (10) which initiates the canopy jettison sequence.

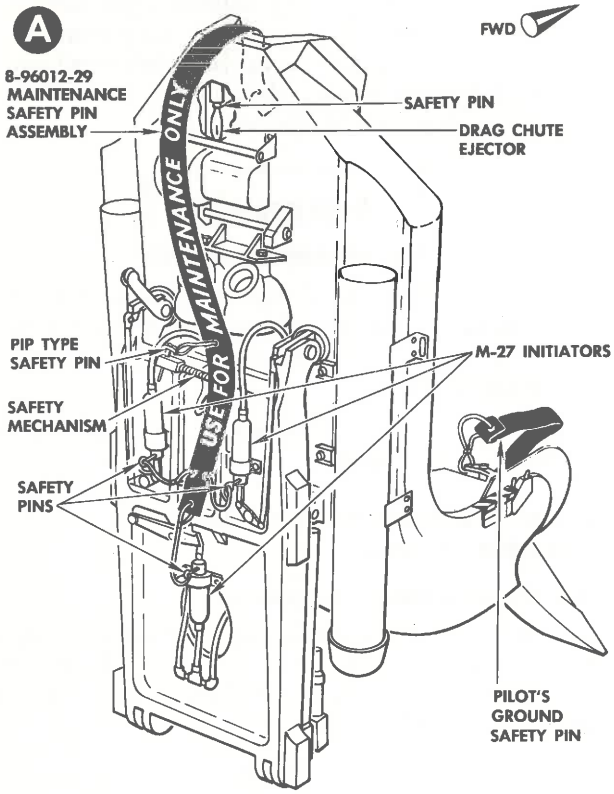


PREPARATION

a. Remove canopy.

b. Connect external source of 28-volt dc power to airplane. Check that "SEAT ADJ" fuse is installed.

c. Detach pilot's ground safety pin warning streamer assembly from airplane structure by unsnapping buttons. Do not remove pilot's ground safety pin from forward edge of seat.



d. Install safety pin of 8-96012-29 assembly in drag chute ejector; actuate safety mechanism on back of seat carriage and install pip type safety pin.

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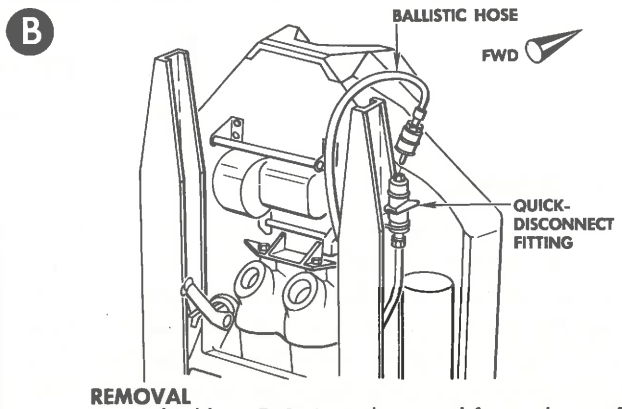
WARNING

DO NOT REMOVE AND/OR INSTALL SEAT UNLESS THE PILOT'S GROUND SAFETY PIN, THE DRAG CHUTE EJECTOR SAFETY PIN, AND THE PIP TYPE SAFETY PIN OF THE 8-96012-29 ASSEMBLY ARE PROPERLY INSTALLED IN SEAT.

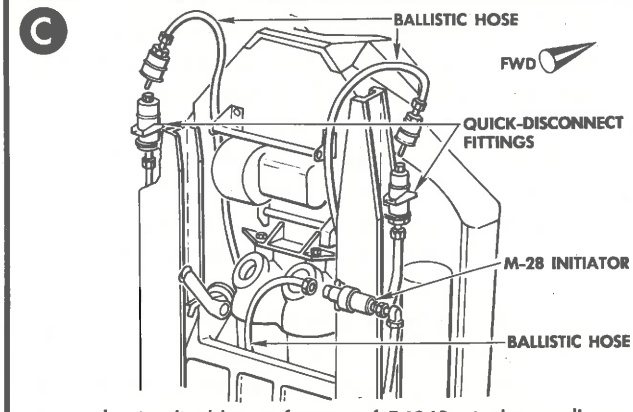
DO NOT OPERATE SEAT CONTROLS MARKED WITH YELLOW AND BLACK DIAGONAL STRIPES. SEAT ASSEMBLY INCORPORATES NUMEROUS BALLISTIC UNITS WHICH CONTAIN EXPLOSIVE CHARGES: THESE ARE TO BE HANDLED WITH CARE ONLY BY TRAINED PERSONNEL.

e. Retract foot pans manually.



REMOVAL

a. *Applicable to F-106A airplanes and forward seat of F-106B airplanes,* disconnect ballistic hose at quick-disconnect fitting on right seat rail.

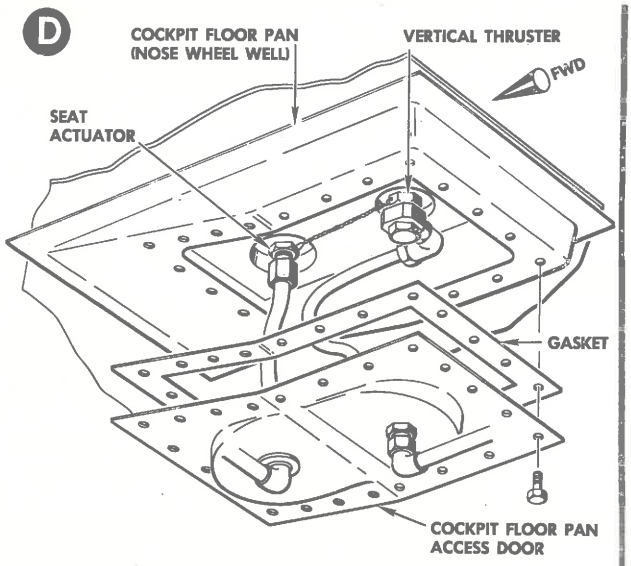


b. *Applicable to aft seats of F-106B airplanes,* disconnect ballistic hose from M-28 initiator mounted on upper right seat rail; cap the hose and the initiator. Disconnect ballistic hoses at quick-disconnect fittings on each seat rail.

c. Cover both portions of quick-disconnect fittings with polyethylene sheet material; attach material with masking tape or rubber bands.

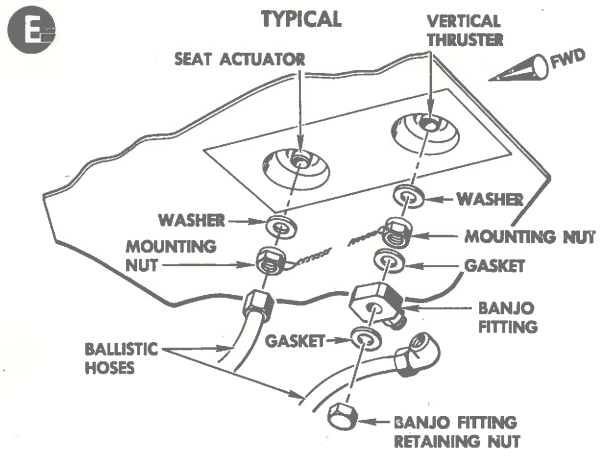
d. Operate seat to full down position by actuating seat adjustment control switch located on right arm rest.

Figure 8-48. Rotational Upward Ejection Seat, Replacement (Sheet 1 of 4)



e. *Applicable to forward seats of F-106B airplanes,* remove cockpit floor pan access door attach bolts located in nose wheel well. Pull door clear to gain access to bottom of seat actuator and vertical thruster.

f. *Applicable to aft seats of F-106B airplanes,* open lower aft electronics compartment door. Refer to T.O. 1F-106A-2-14 and remove electronic equipment, as required, in order to remove left and right access doors at forward top of compartment. Remove access doors (2) to gain access to bottom of seat actuator and vertical thruster.



g. Disconnect ballistic hoses from seat actuator and vertical thruster; cap hoses.
h. Remove banjo fitting retainer nut, banjo fitting, and 2 gaskets from vertical thruster.
i. Remove safety wire; remove mounting nuts and washers from seat actuator and vertical thruster.

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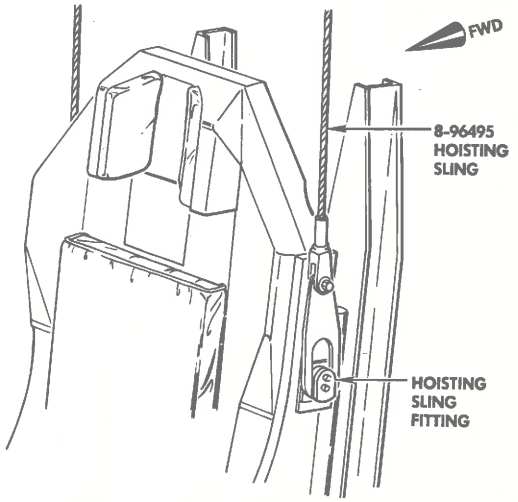
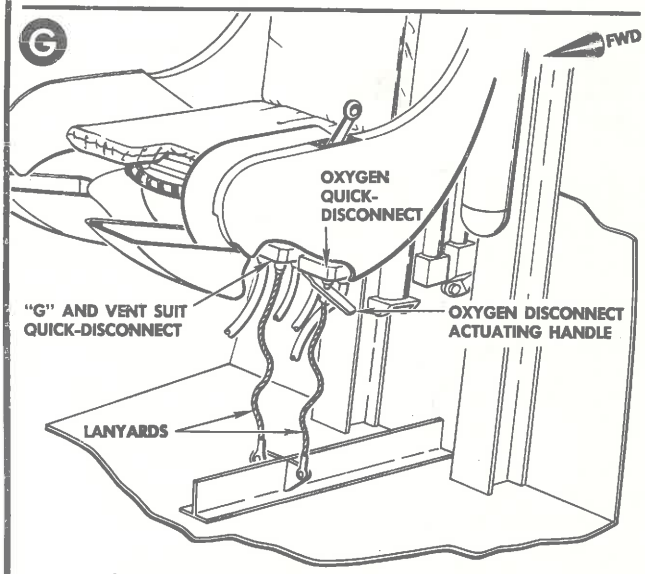


j. Attach hoisting sling 8-96495, to overhead lift (minimum capacity 1/2 ton) and attach sling to hoisting fittings at each side of seat.
k. Operate overhead lift until slack is removed from hoisting sling cables; check that hoist sling fittings are properly engaged at each side.



l. Hoist seat to position where "ship to seat" personal leads quick-disconnects (2) are accessible. Disengage "G" and vent suit quick-disconnect by applying downward pressure on lanyard. Disengage oxygen quick-disconnect by actuating handle. Cover both disconnects in accordance with step "c."

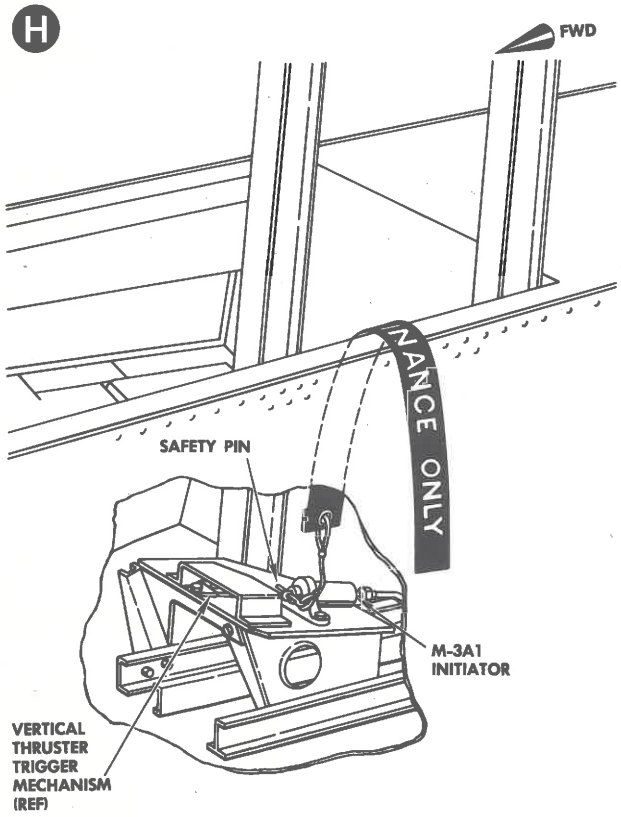
CAUTION

DO NOT DISENGAGE OXYGEN QUICK-DISCONNECT BY LANYARD AS EMERGENCY OXYGEN VALVE WILL ACTUATE.

m. Slowly hoist the seat clear of airplane, use a man at each side to guide seat. Install maintenance safety pins in seat carriage M-27 initiators (3); see Detail A. Lower the seat into storage dolly. Remove hoisting sling.

Figure 8-48. Rotational Upward Ejection Seat, Replacement (Sheet 2 of 4)

H



n. *Applicable to forward seat of F-106B airplanes,* install maintenance safety pin in M-3A1 initiator mounted on seat ejection trigger mechanism.

INSTALLATION

a. Refer to PREPARATION procedure on sheet 1 of this illustration. Perform steps "b," "d," and "e," and heed warning.
b. Attach hoisting sling, 8-96495, to overhead lift (minimum capacity 1/2 ton) and attach sling to hoisting fittings at each side of seat.
c. Operate overhead lift until slack is removed from hoisting cables; check that hoist sling fittings are properly engaged at each side. See Detail F.
d. Check that seat actuator and vertical thruster are fully retracted.
e. Hoist seat clear of storage dolly. Check that individual safety pins have been removed from seat initiators; do not remove pip type safety pins (2) referenced in step "d" of PREPARATION procedure.

WARNING

IF INDIVIDUAL SAFETY PINS ARE NOT REMOVED FROM SEAT INITIATORS, SEAT WILL NOT EJECT DURING EMERGENCY ESCAPE.

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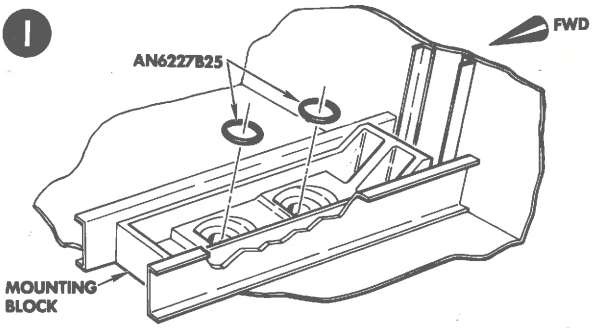


f. Enter cockpit, remove dirt or foreign matter from bottom of seat rails, cockpit floor, triggering mechanism, and recesses of actuator-vertical thruster mounting block. Install AN6227B25 o-ring in each recess of mounting block. *Applicable to forward seat of F-106B airplanes,* remove safety pin installed in M-3A1 initiator mounted on triggering mechanism. See Detail H.

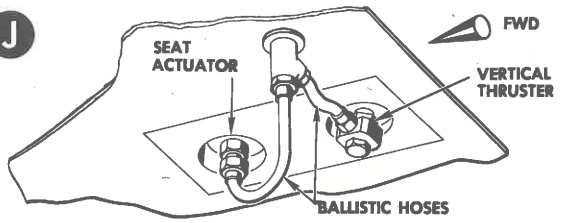
g. Hoist seat to position above cockpit. Slowly lower seat until slide blocks of seat carriage are engaged in seat rails; use a man at each side to guide seat and check for clearance of protruding parts.
h. Continue to slowly lower seat; check alignment of seat trigger mechanism probe with receptacle of cockpit trigger mechanism. After probe is engaged approximately 1 inch in receptacle, stop lowering seat.

CAUTION

TO PREVENT STRUCTURAL DAMAGE, THE OPERATOR OF OVERHEAD LIFT SHALL INSTANTLY OBEY SIGNALS OF PERSON DIRECTING SEAT INSTALLATION.

i. Engage both personal leads assemblies to seat. See Detail G.
j. Continue to slowly lower the seat until seat actuator and vertical thruster are correctly aligned and seated. Manually unlock and lower foot pans to cockpit floor.
k. Disengage and remove the hoisting sling.
l. Install 8-95861 washer and 8-95860 mounting nuts on seat actuator and vertical thruster. See Detail E. Torque the mounting nuts to 100 to 150 inch-pounds, loosen nuts to zero torque, and then tighten nuts to 30 inch-pounds torque. Safety-wire nuts to each other.
m. Install 8-95842 banjo fitting with AN6290-3 gasket on each side and install the banjo fitting retainer nut. Torque nut to 65 to 100 inch-pounds. See Detail E.

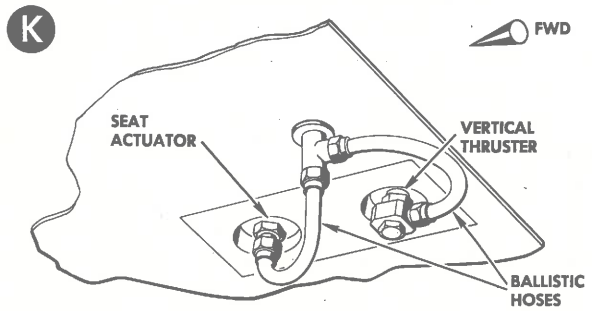
J



n. *Applicable to F-106A airplanes,* connect ballistic hoses to seat actuator and vertical thruster.

Figure 8-48. Rotational Upward Ejection Seat, Replacement (Sheet 3 of 4)

o. *Applicable to forward seat of F-106B airplanes,* connect ballistic hoses to seat actuator and vertical thruster. Check access door gasket serviceability. Install access door. See Detail D.



p. *Applicable to aft seats of F-106B airplanes,* connect ballistic hoses to seat actuator and vertical thruster. Check access doors sealant; if sealant is damaged, refer to Section VI for replacement procedure. Install access doors. Install electronic equipment, as required, refer to T.O. 1F-106A-2-14 for procedure.

q. *Applicable to F-106A airplanes and forward seat of F-106B airplanes,* connect ballistic hose at quick-disconnect fitting on right side of seat. See Detail B.

r. *Applicable to aft seats of F-106B airplanes,* connect ballistic hoses (3) as shown in Detail C.

s. Check operation of seat adjustment actuator, rudder pedals actuator, thruster oil pressure indicating system, AFCS system, and oxygen system.

t. Install canopy. Check operation of canopy and latches.

u. Remove all maintenance safety pins. Install pilot's ground safety pin at forward edge of seat.

WARNING

FAILURE TO REMOVE MAINTENANCE SAFETY PINS WILL PREVENT PROPER OPERATION OF PILOT ESCAPE SYSTEM.

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Figure 8-48. Rotational Upward Ejection Seat, Replacement (Sheet 4 of 4)

NOTE

The canopy jettison sequence is described in paragraph 8-131.

Gases from the gas generator cause the actuator shaft and cable pulleys to rotate. This action, mechanically actuates and locks the shoulder harness inertia reel (5), retracts the cables connected to the pilot's feet (6) and raises the foot pans (7) and leg guards (8). When both feet of the pilot are fully retracted, the ejection control ring mechanism safety locks (9) are released.

8-131. Canopy Jettison Sequence.

The initial pull on the canopy jettison and seat ejection control ring (1) described in paragraph 8-130 begins the canopy jettison sequence.

NOTE

Numbers within parenthesis (10), (11), etc, denote items shown on figure 8-49.

This action causes the canopy unlatch M-3A1 initiator (10) to fire and send high-pressure gas through a check valve to fire a cartridge in the M-3A1 canopy unlock thruster (11). High-pressure gas from the thruster cartridge drives the thruster piston to mechanically unlock the canopy latches (12). When this piston reaches the end of its stroke, a port is uncovered and the gases fire the canopy remover M-5A1 initiator (13). The high-pressure gas from this unit performs two tasks. It fires a second M-5A1 initiator (14); gases from this unit are directed to the wire cutter (15) and the pneumatic (canopy seal system) disconnect fitting (16). These gases provide the force to cut the electrical wiring leading to the canopy and separate the pneumatic disconnect fitting. The canopy remover initiator (13) also fires an explosive cartridge (17) in the base of the canopy remover (actuator) (18). When this explosive cartridge fires, high-pressure gas in the canopy remover force the remover piston and the canopy to jettison from the airplane. The upward movement of the canopy mechanically fires an M-3A1 initiator (19). High-pressure gas from this unit withdraws an arming pin (20) from the vertical thruster M-29 initiator (23). Refer to paragraph 8-132 for subsequent sequence of events.

8-132. Seat Ejection Sequence.

Continued pull on the canopy jettison and seat ejection control ring (1), after the arming pin (20) of the vertical thruster M-29 initiator (23) is withdrawn and the ejection control mechanism safety locks (9) are released, begins the seat ejection sequence.

NOTE

Numbers within parenthesis (20), (23), etc, denote items shown on figure 8-49.

This action mechanically rotates the vertical thruster trigger torque tube (21) which mechanically fires the vertical thruster M-29 initiator (23). High-pressure gas from this initiator withdraws an exactor pin (24) to disconnect the seat adjustment actuator (25) from the seat. These gases also fire an explosive cartridge (26) in the base of the vertical thruster. High-pressure gas from this cartridge forces the vertical thruster piston (27) to extend and move the seat and carriage upward on the seat rails. During the initial portion of this upward movement, the ballistic hose quick-disconnect coupling (28) and the ship-to-seat personal leads quick-disconnect fittings (29)

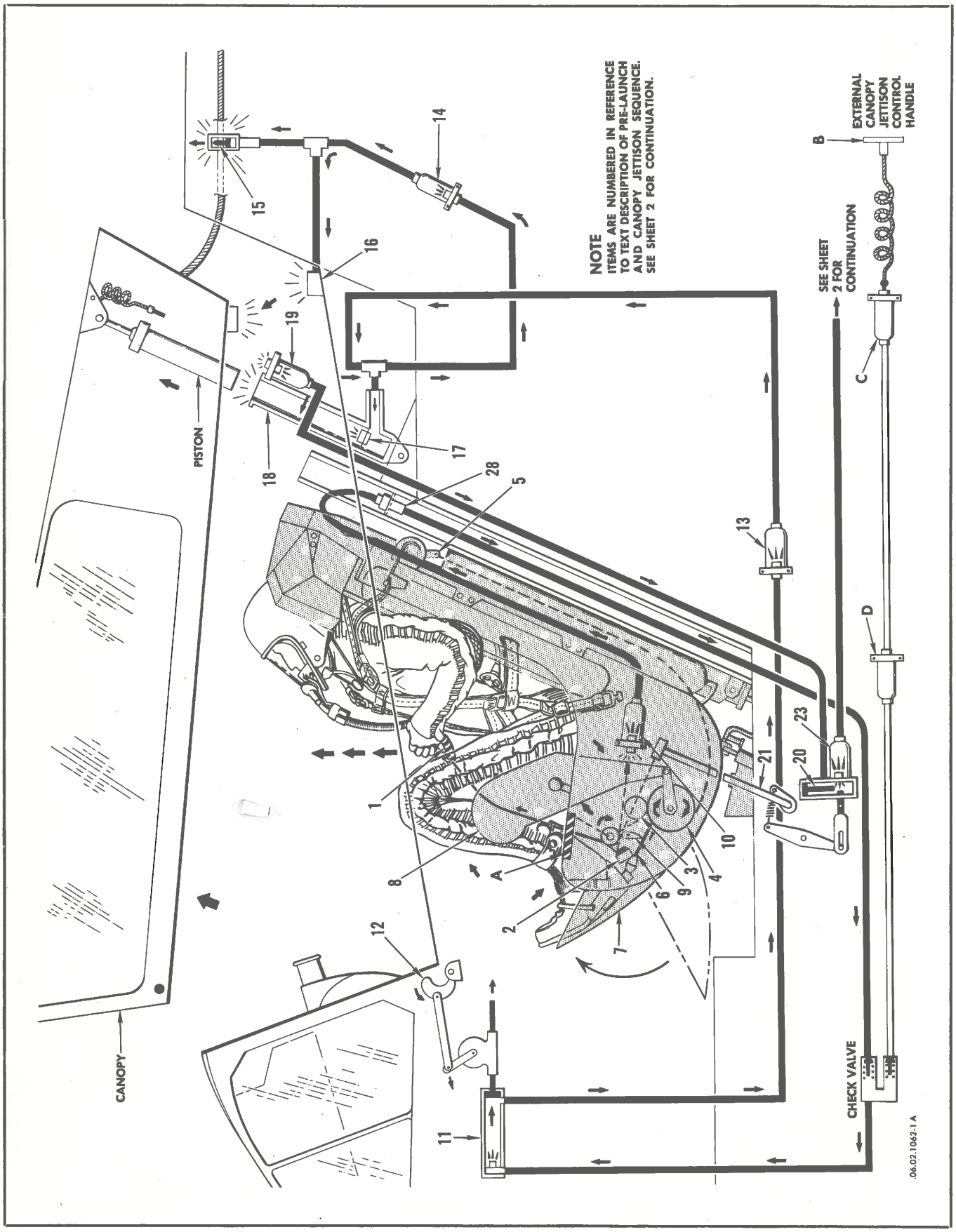


Figure 8-49. Pilot Escape System Schematic, Rotational Upward Ejection, F-106A (Sheet 1 of 4)

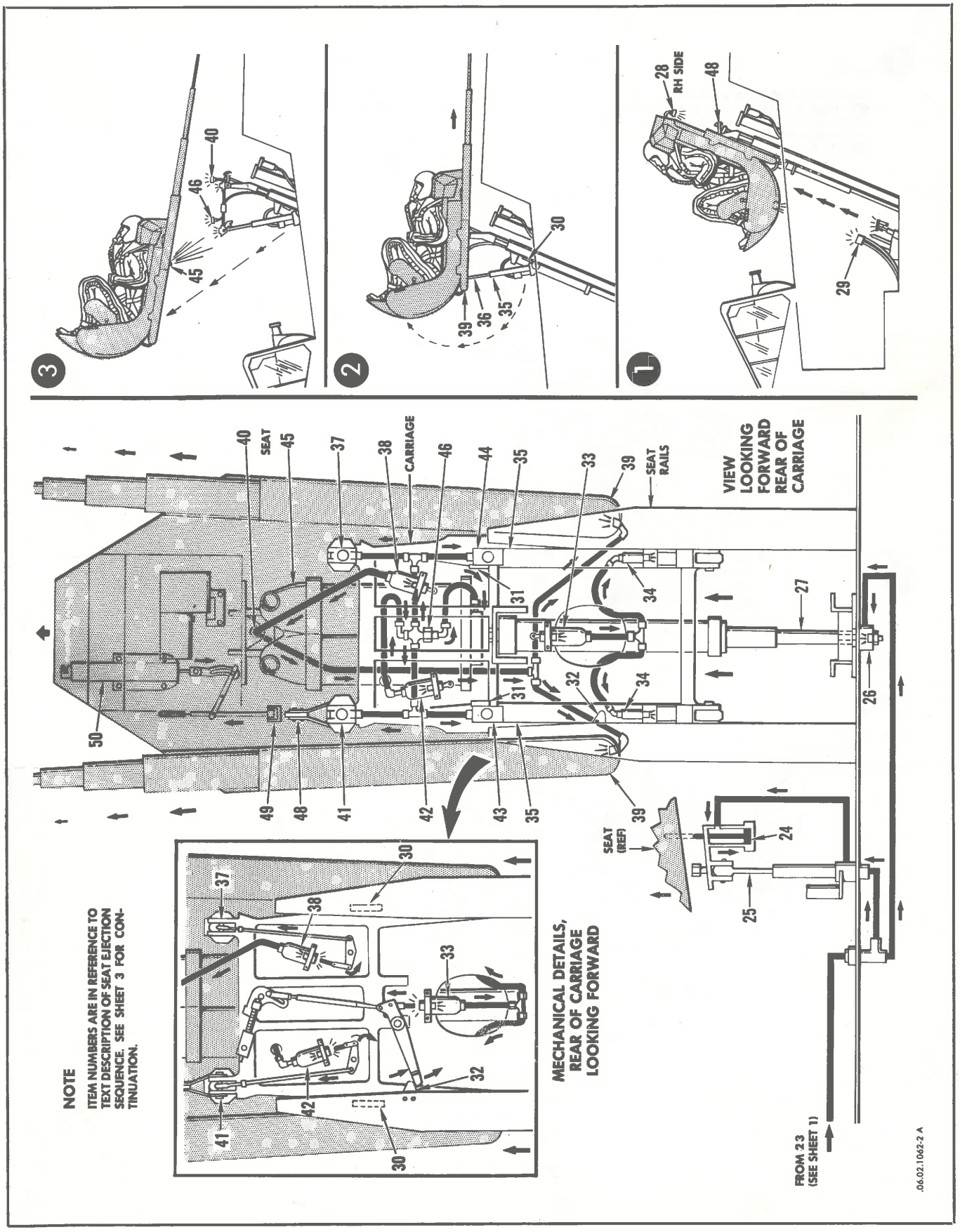


Figure 8-49. Pilot Escape System Schematic, Rotational Upward Ejection, F-106A (Sheet 2 of 4)

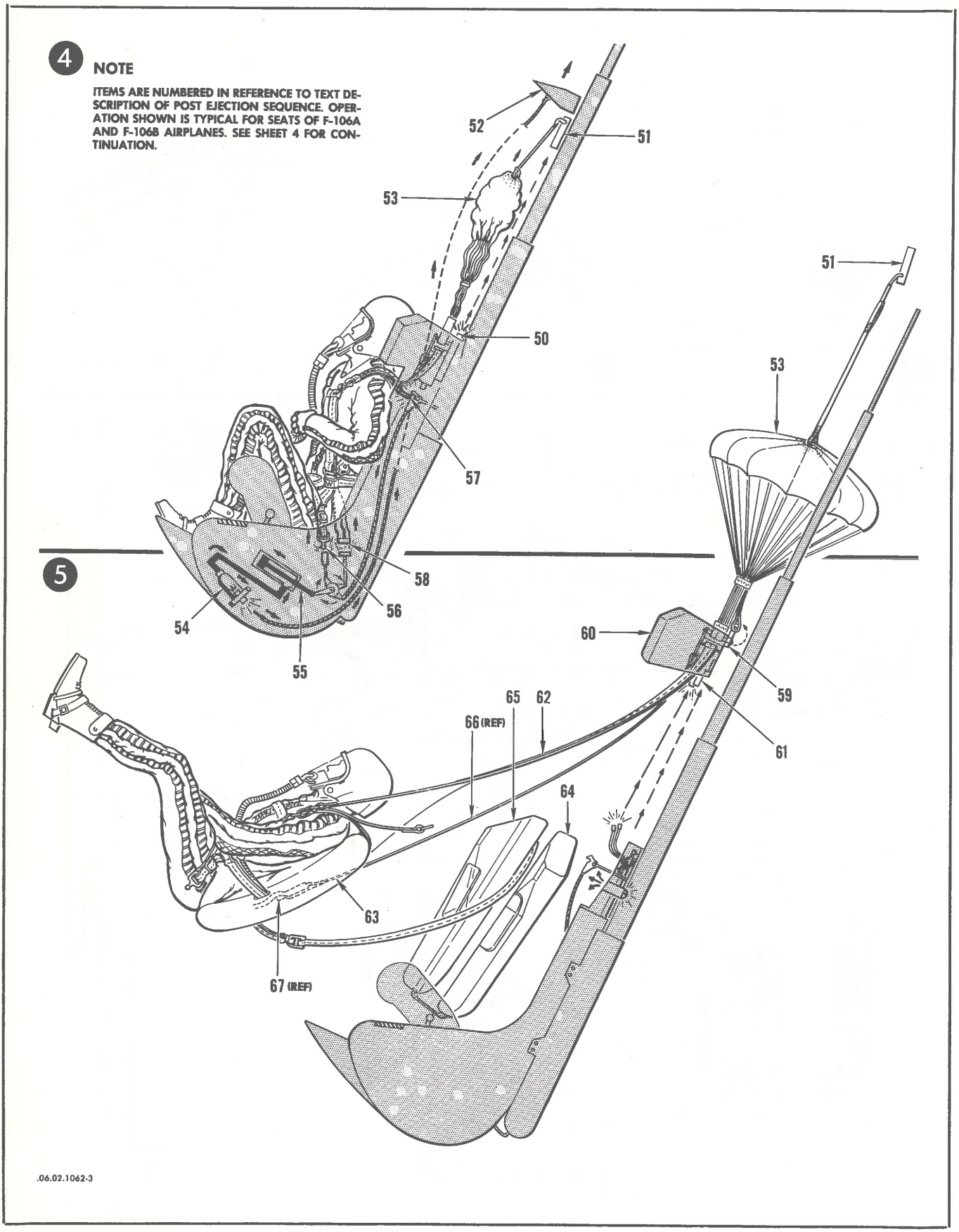
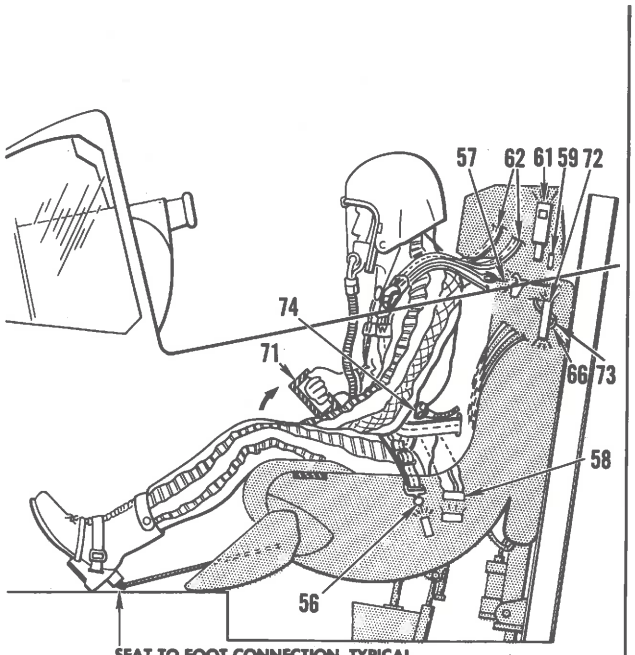


Figure 8-49. Pilot Escape System Schematic, Rotational Upward Ejection, F-106A (Sheet 3 of 4)



NOTE

ITEMS ARE NUMBERED IN REFERENCE TO TEXT DESCRIPTION OF OVER THE SIDE BAILOUT OR RAPID EGRESS FROM COCKPIT. OPERATION SHOWN IS TYPICAL FOR SEATS OF F-106A AND F-106B AIRPLANES.

6

NOTE

ITEMS ARE NUMBERED IN REFERENCE TO TEXT DESCRIPTION OF POST EJECTION SEQUENCE. OPERATION SHOWN IS TYPICAL FOR SEATS OF F-106A AND F-106B AIRPLANES.

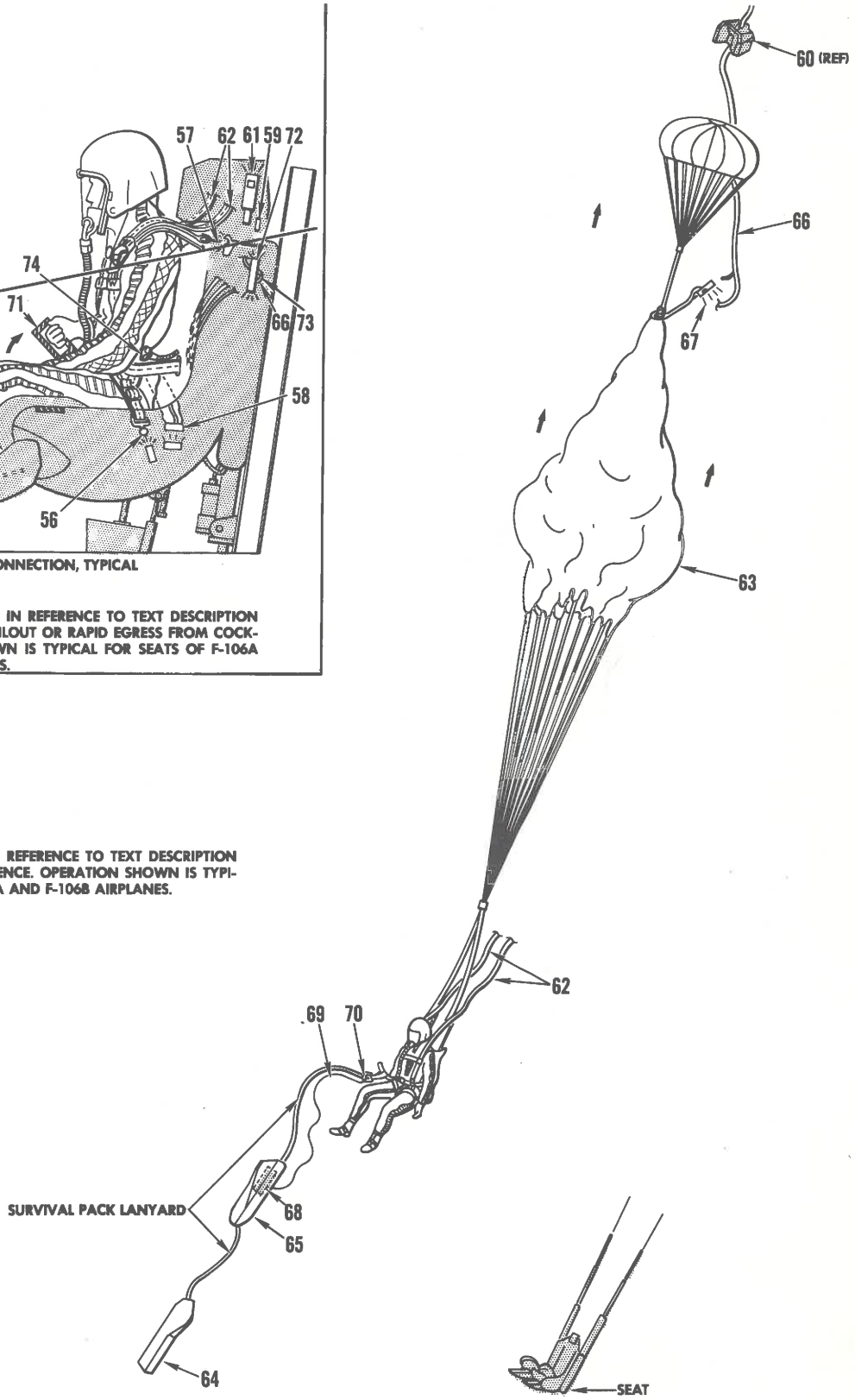


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Figure 8-49. Pilot Escape System Schematic, Rotational Upward Ejection, F-106A (Sheet 4 of 4)

are mechanically separated. The separation of the personal leads to the seat automatically actuates the seat emergency oxygen system shutoff valve and this system furnishes the pilot and his partial pressure suit with oxygen until the pilot is separated from the seat. During the latter portion of seat and carriage upward movement, tripping lugs (30) mechanically release the anti-rotation locks (31) and another tripping lug (32) mechanically fires the rotational thruster M-27 initiator (33). High-pressure gas from this initiator fires an explosive cartridge (34) in the base of each rotational thruster (35). High-pressure gas from each cartridge force each rotational thruster piston (36) to extend and rotate the seat to the launch position. This rotational action causes a lug (48) to cock the drag chute ejector arming mechanism (49) and the cam on breakaway bolt (37) to fire the flight stabilizer boom M-27 initiator (38). High-pressure gas from this initiator fires an explosive cartridge in each flight stabilizer boom (39). High-pressure gas from each cartridge force the telescopic flight stabilizer boom to extend. After the booms are actuated, the pressure build-up within the hose from initiator (38) causes the pressure disconnect (40) to separate. Further rotational action causes the cam on breakaway bolt (41) to fire an M-27 initiator (42). High-pressure gas from this initiator fires an explosive charge in breakaway bolts (37), (41), (43), (44) to separate the seat from the seat carriage, ignites the MK-2 rocket motors (45), and separates the pressure disconnect (46). After separation, the rocket motors deliver a continuous upward and forward thrust until rocket burnout. As the seat leaves the airplane, lug (48) releases the drag chute ejector arming mechanism (49) thereby arming the drag chute ejector (50). Refer to paragraph 8-133 for subsequent sequence of events.

8-133. Post Ejection Sequence.

The post ejection sequence is automatically initiated by the actuation of an aneroid control contained in the drag chute ejector (50).

NOTE

Numbers within parenthesis (50), (51), etc., denote items shown on figure 8-49.

If ejection takes place above 15,000 feet altitude, the aneroid control of the drag chute ejector will not actuate until the pilot in the flight stable seat has descended to 15,000 feet altitude. If ejection takes place at or below 15,000 feet altitude, the aneroid control will actuate immediately. When the aneroid control actuates, it fires a 2 second delay cartridge contained in the drag chute ejector (50). High-pressure gas from this cartridge expels a projectile (51). The projectile removes the headrest lid (52), deploys the drag chute (53), and mechanically fires an M-3A1 initiator (54). High-pressure gas from this initiator actuates a piston (55). When this piston actuates, it mechanically disengages the lap belt disconnects (56), the shoulder strap disconnects (57), and the personal leads disconnect (58). These actions free the pilot from all attachments to the seat except those at his feet. Meanwhile, pull from the deployed drag chute (53) releases the headrest container latch (59) and the headrest container (60) is separated from the seat. When the headrest container separates from the seat, it mechanically fires a 1.5 second delay cartridge in each of the hesitation riser cutters (61). During this time delay period, the force exerted by the drag chute (53) on the hesitation risers (62) pulls the pilot, his parachute (63), and his lanyard connected survival packs (64) and (65) clear of the seat. At the end of the 1.5 second time delay, the hesitation riser cutters (61) cut the hesitation risers (62). This action, transfers the force exerted by the drag chute (53) to a line (66) which deploys the pilot's parachute (63) and fires a 1.5 second delay cartridge in the first stage line cutter (67). Parachute deployment line (66) is cut after the 1.5 second time delay, thus separating the drag chute and headrest from the pilot's parachute. The pilot descends with the lanyard connected survival packs (64) and (65) suspended below him. At his option, the pilot may deploy and inflate a life raft (68) contained in survival pack (65) by pulling on the small line (69) attached to survival pack disconnect (70) or he may free himself of the survival packs by disengaging the survival pack disconnect (70).

8-134. CANOPY JETTISON (PILOT CONTROLLED), F-106A.

The canopy can be jettisoned by the pilot without ejecting the seat while the airplane is either airborne or groundborne. This operation is accomplished by depressing the stowage lock and then pulling aft on the canopy jettison control handle (A) located on the left arm rest of the seat.

NOTE

Letters or numbers within parenthesis (A), (10), etc., denote items shown on figure 8-49.

This mechanical action causes the canopy unlatch M-3A1 initiator (10) to fire and send high-pressure gas through a check valve to fire a cartridge in the M-3A1 canopy unlock thruster (11). High-pressure gas from the thruster cartridge drives the thruster piston to mechanically unlock the canopy latches (12). When this piston reaches the end of its stroke, a port is uncovered and the gases fire the canopy remover M-5A1 initiator (13). The high-pressure gas from this unit performs two tasks. It fires a second M-5A1 initiator (14); gases from this unit are directed to the wire cutter (15) and the pneumatic (canopy seal system) disconnect fitting (16). These gases provide the force to cut the electrical wiring leading to the canopy and separate the pneumatic disconnect fitting. The canopy remover initiator (13) also fires an explosive cartridge (17) in the base of the canopy remover (actuator) (18). When this explosive cartridge fires, high-pressure gas in the canopy remover force the remover piston and the canopy to jettison from the airplane. The upward movement of the canopy mechanically fires an M-3A1 initiator (19). High-pressure gas from this unit withdraws an arming pin (20) from the vertical thruster M-29 initiator (23). This initiator is now armed for seat ejection.

WARNING

Insert pilot's ground safety pin at forward edge of seat to prevent inadvertent seat ejection.

8-135. CANOPY JETTISON (EXTERNALLY CONTROLLED), F-106A.

The canopy can be jettisoned externally by a ground crew member while the airplane is on the ground. This operation is accomplished by removing a door installed on the left side of the fuselage near the leading edge of the wing and pulling outboard on the external canopy jettison control handle (B).

NOTE

Letters or numbers within parentheses (B), (C), (11), etc., denote items shown on figure 8-49.

WARNING

To prevent ejection of pilot and seat, do not jettison canopy by external control handle if the canopy and seat ejection control ring (1) has been pulled from the normal (stowed) position.

Pulling this handle (B) mechanically fires the alternate canopy unlatch M-3A1 initiator (C). High-pressure gas from this unit fires a booster M-5A1 initiator (D); gases from this booster initiator are routed through a check valve to fire a cartridge in the M-3A1 canopy unlock thruster (11). High-pressure gas from the thruster cartridge drives the thruster piston to mechanically unlock the canopy latches (12). When this piston reaches the end of its stroke, a port is uncovered and the gases fire the canopy remover M-5A1 initiator (13). The high-pressure gas from this unit performs two tasks. It fires a second M-5A1 initiator (14); gases from this unit are directed to the wire cutter (15) and the pneumatic (canopy seal system) disconnect fitting (16). These gases provide the force to cut the electrical wiring leading to the canopy and separate the pneumatic disconnect fitting. The canopy remover intiator (13) also fires an explosive cartridge (17) in the base of the canopy remover (actuator) (18). When this explosive cartridge fires, high-pressure gas in the canopy remover force the remover piston and the canopy to jettison from the airplane. The upward movement of the canopy mechanically fires an M-3A1 initiator (19). High-pressure gas from this unit withdraws an arming pin (20) from the vertical thruster M-29 initiator (23). This initiator is now armed for seat ejection; the seat shall be removed and all affected ballistic system components including the M-29 initiator shall be replaced.

WARNING

Insert pilot's ground safety pin at forward edge of seat to prevent inadvertent seat ejection.

See figure 1-23 for an illustration of the external canopy jettison procedure.

8-136. OVER THE SIDE BAILOUT, F-106A.

If it becomes necessary to bail out over the side, the pilot jettisons the canopy as described in paragraph 8-134 or by manually operating the canopy latch handle to the unlocked position thereby enabling the air loads to jettison the canopy. The pilot then pulls the emergency harness release handle (71) located on the right side of the seat.

NOTE

Numbers within parentheses (71), (59), etc., denote items shown on figure 8-49.

This action mechanically disengages the headrest container latch mechanism (59), fires a 1.5 second delay cartridge in the outboard hesitation riser cutter (61) to cut the parachute hesitation risers (62), disengages the lap belt disconnects (56), disengages the personal leads disconnect (58), releases the shoulder strap disconnect (57), and fires alternate cutter (72) to cut the parachute deployment line (66), and the survival packs lanyard (73). The foregoing operation will free the pilot of all attachments to the seat except those at his feet. The seat to feet attachments will disengage as the pilot climbs out of the cockpit. After bailout, the pilot deploys his parachute by pulling on the parachute's manual ripcord grip (74).

8-137. RAPID EGRESS FROM COCKPIT (ON GROUND), F-106A.

Rapid egress from the cockpit may be used during an emergency such as a crash, fire, or impending fire. The canopy is opened normally or is jettisoned either by the pilot as described in paragraph 8-134 or externally by a ground crew member as described in paragraph 8-135. After the canopy is opened or jettisoned, the emergency harness release handle (71) located on the right side of the seat is pulled upward.

NOTE

Numbers within parentheses (71), (59), etc., denote items shown on figure 8-49.

The action mechanically disengages the headrest container latch mechanism (59), fires a 1.5 second delay cartridge in the outboard hesitation riser cutter (61) to cut the parachute hesitation risers (62), disengages the lap belt disconnects (56), disengages the personal leads disconnect (58), releases the shoulder strap disconnect (57), and fires alternate cutter (72) to cut the parachute

deployment line (66) and the survival packs lanyard (73). The foregoing operation will free the pilot from all equipment except his parachute and the seat to feet connection. The seat to feet connection will disengage as the pilot climbs out of the cockpit with his parachute attached to him.

8-138. BAILOUT WARNING SYSTEM, F-106B.

The bailout (canopy jettison and seat ejection) warning system, illustrated in figure 8-50, signals both pilots that bailout is imminent. The system consists of two red bail-out warning lights, one on each instrument panel, and two manually operated signal switches, one on each left console. Also included in the system, is a bailout flasher unit and interconnecting electrical circuitry. Placing either bailout signal switch in the on position will cause both bailout warning lights to flash on and off. In this condition, as shown in figure 8-50, dc power from the 28-volt essential bus energizes the bailout flasher unit. Intermittent electrical power is then supplied to the warning lights. A 5-ampere "BAIL OUT WARN" fuse in the left-hand forward cockpit fuse panel protects the circuit.

8-139. CANOPY JETTISON AND SEAT EJECTION, F-106B.

Canopy jettison and seat ejection is normally initiated by the pilot in the aft seat. After the pilot in the aft seat has ejected, the pilot in the forward seat initiates his own ejecion. The pilot in the forward seat, however, can initiate canopy jettison and rear seat ejection and then initiate his own ejection.

8-140. Forward Seat Pre-launch Sequence (Initiated By Pilot In Forward Seat).

The forward seat pre-launch sequence begins when the forward pilot performs the initial pull on the canopy jettison and seat ejection control ring (1) located at the forward edge of the seat.

NOTE

Numbers within parentheses (1), (2), etc., denote items shown on figure 8-51.

This pull on the canopy jettison and seat ejection control ring (1) mechanically actuates the seat AFCS switch (2) to electrically disengage the AFCS system and mechanically fires the gas generator (3) of the foot and seat pan rotary actuator (4) and fires the canopy unlatch M-3A1 initiator (10) which initiates the canopy jettison sequence.

NOTE

The canopy jettison sequence is described in paragraph 8-141.

Gases from the gas generator cause the actuator shaft and cable pulleys to rotate. This action, mechanically actuates and locks the shoulder harness inertia reel (5), retracts the cables connected to the pilot's feet (6), and raises the foot pans (7) and leg guards (8). When both feet of the pilot are fully retracted, the ejection control ring mechanism safety locks (9) are released.

8-141. Canopy Jettison Sequence (Initiated By Pilot in Forward Seat).

The initial pull on the canopy jettison and seat ejection control ring (1) described in paragraph 8-140 begins the canopy jettison sequence.

NOTE

Numbers within parentheses (10), (11), etc., denote items shown on figure 8-51.

This action causes the canopy unlatch M-3A1 initiator (10) to fire and send high-pressure gas through a check valve to fire a cartridge in the T-25 canopy unlock thrusters (12).

High-pressure gas from the thruster cartridges drive the thruster pistons to mechanically unlock the canopy latches (13). When these pistons reach the end of their stroke, ports are uncovered and the gases fire an M-5A1 initiator (14). The high-pressure gases from this unit fire an explosive cartridge in each wire cutter (15) and separate the pneumatic (canopy seal system) disconnect fitting (16). Gases from the wire cutter cartridges provide the force to cut the electrical wiring leading to the canopy. Gases from the thruster cartridges (12) also fire an explosive cartridge (17) in the base of the canopy remover (actuator) (18). When this explosive cartridge fires, high-pressure gas in the canopy remover force the remover piston and the canopy to jettison from the airplane. As the canopy separates from the airplane it mechanically fires an M-3A1 initiator (19). High-pressure gas from this unit withdraws an arming pin (20 AFT) from the aft seat vertical thruster M-29 initiator (23 AFT). Refer to paragraph 8-142 for subsequent sequence of events which are limited to the aft seat because the arming pin (20) of the forward seat vertical thruster M-29 initiator (23) will not be withdrawn until after the aft seat is ejected.

8-142. Aft Seat Pre-launch Sequence (Initiated By Pilot In Forward Seat).

Continued pull on the forward seat canopy jettison and seat ejection control ring (1), after the arming pin (20 AFT) of the aft seat vertical thruster M-29 initiator (23 AFT) has been withdrawn and the forward seat's ejection control mechanism safety locks (9) are released, starts the aft seat prelaunch sequence.

NOTE

Numbers within parentheses (21), (22), (3 AFT), etc., denote items shown on figure 8-51.

This action mechanically rotates the forward seat vertical thruster trigger torque tube (21) to mechanically fire

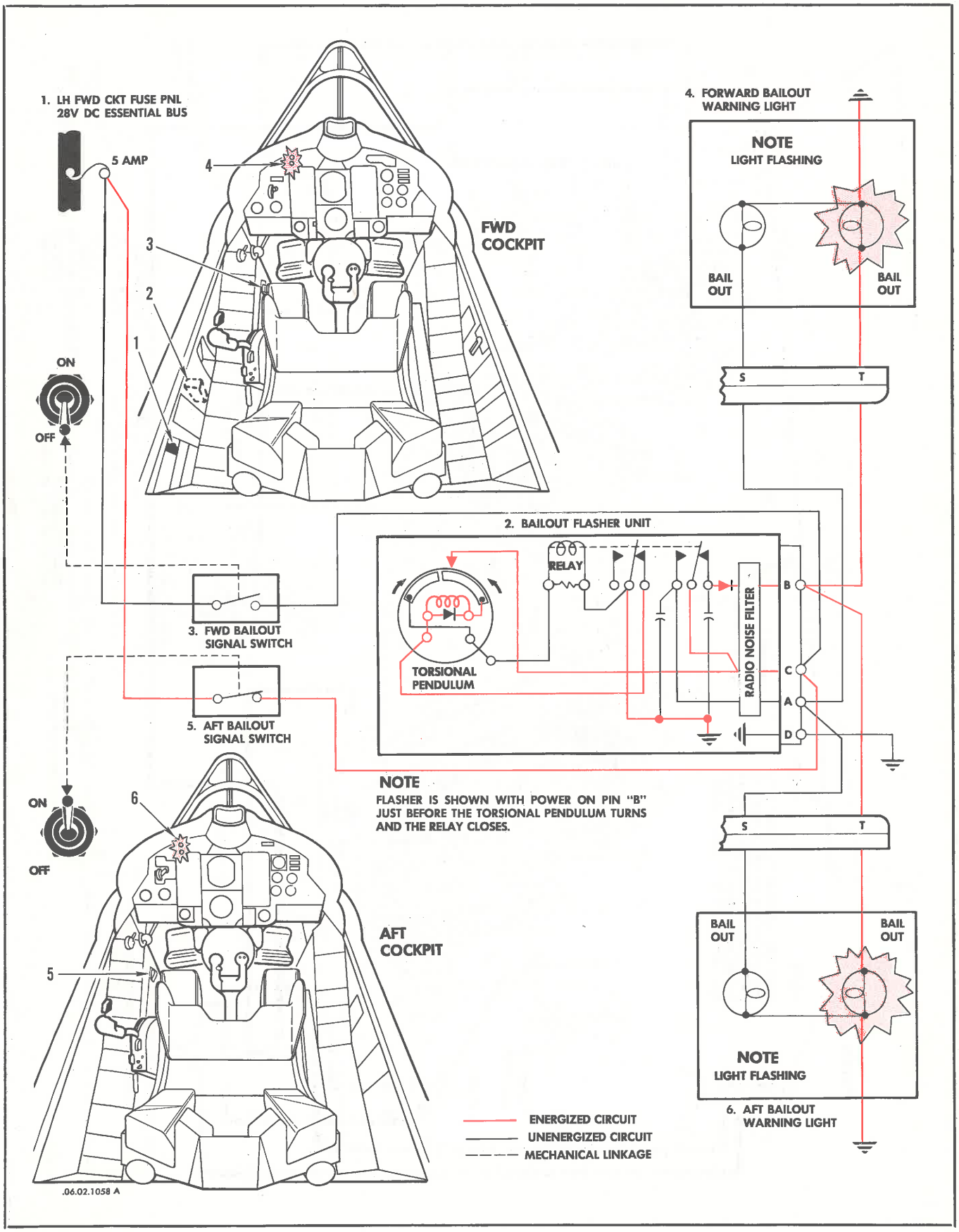


Figure 8-50. Bailout Warning System, F-106B

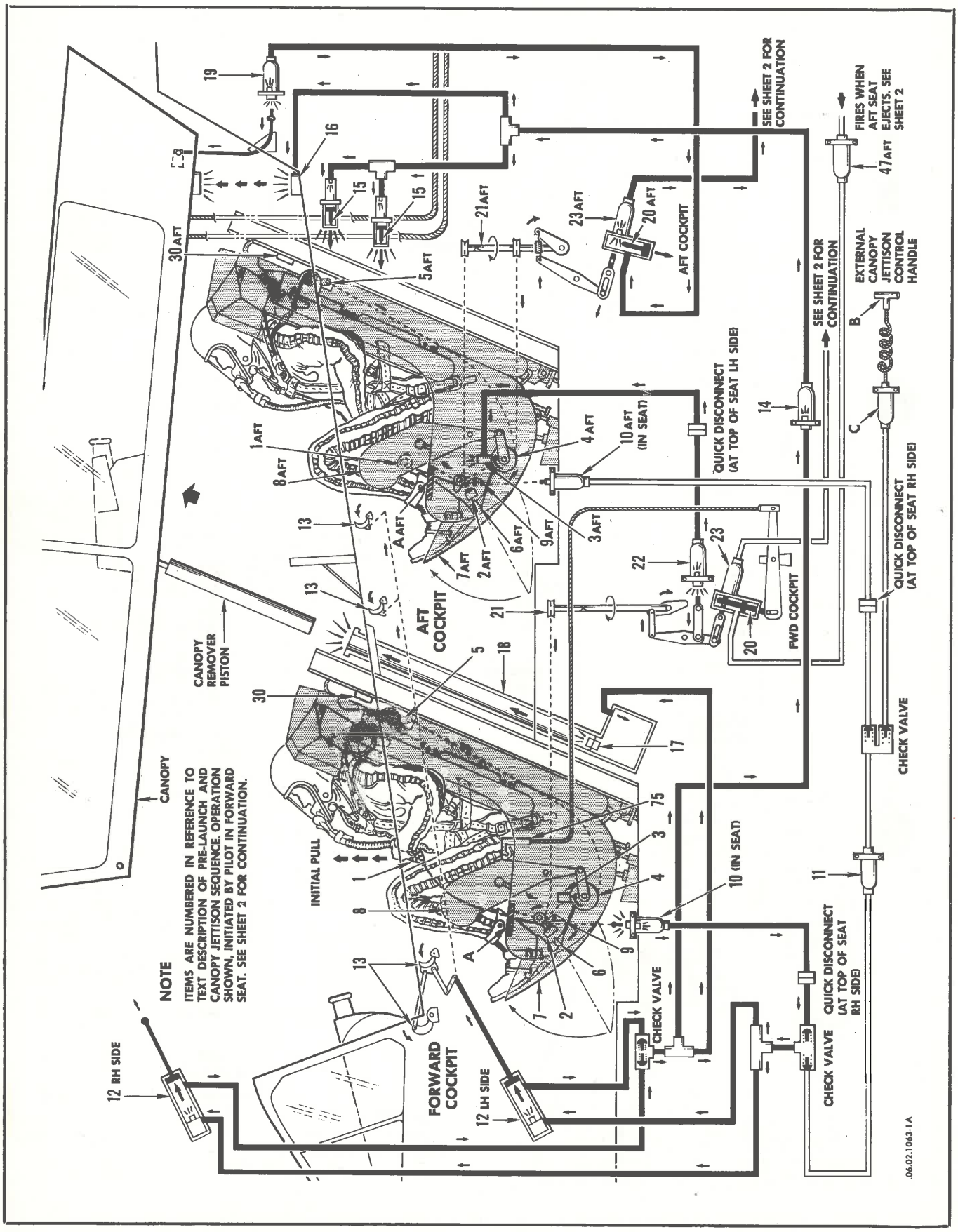


Figure 8-51. Pilot Escape System Schematic, Rotational Upward Ejection, F-106B (Sheet 1 of 2)

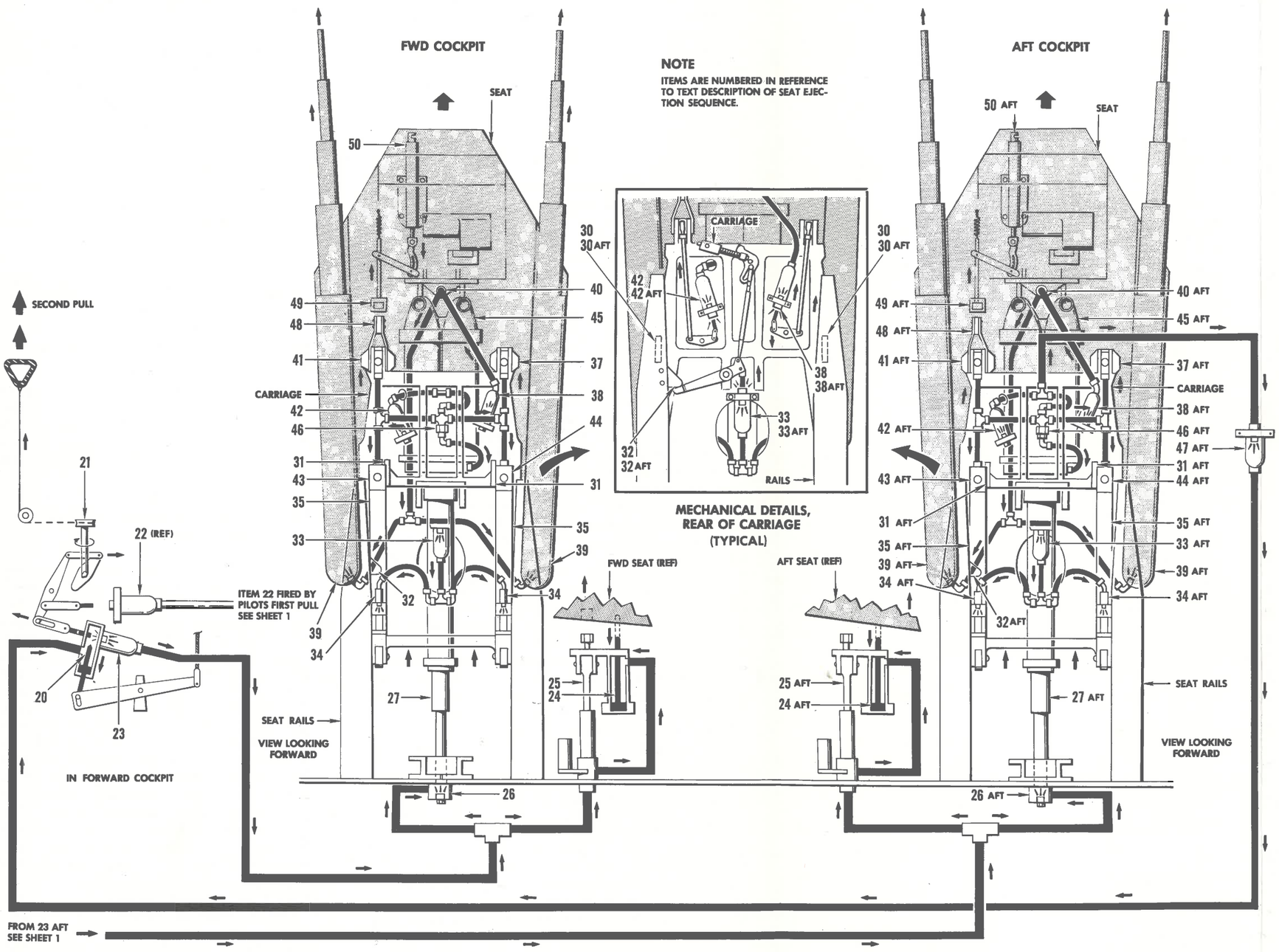


Figure 8-51. Pilot Escape System Schematic, Rotational Upward Ejection, F-106B (Sheet 2 of 2)

an M-3A1 initiator (22). High-pressure gas from this initiator fires the gas generator (3 AFT) of the foot and seat pan rotary actuator (4 AFT). Pressure from the gas generator causes the actuator shaft and cable pulleys to rotate. This action mechanically actuates and locks the shoulder harness inertia reel (5 AFT), retracts the cables connected to the pilot's feet (6 AFT), raises the foot pans (7 AFT) and leg guards (8 AFT), unlocks the seat ejection safety locks (9 AFT), and rotates the aft seat vertical thruster trigger torque tube (21 AFT). Refer to paragraph 8-143 for subsequent sequence of events.

8-143. Aft Seat Ejection Sequence (Initiated By Pilot In Forward Seat).

Rotation of the aft seat vertical thruster trigger torque tube (21 AFT) transmits force through a coiled spring link and mechanically fires the vertical thruster M-29 initiator (23 AFT) to begin the aft seat ejection sequence.

NOTE

Numbers within parentheses (21 AFT), (23 AFT), etc., denote items shown on figure 8-51.

High-pressure gas from this initiator withdraws an exactor pin (24 AFT) to disconnect the seat adjustment actuator (25 AFT) from the seat. These gases also fire an explosive cartridge (26 AFT) in the base of the vertical thruster. High-pressure gas from this cartridge forces the vertical thruster piston (27 AFT) to extend and move the seat and carriage upward on the seat rails. During the initial portion of this upward movement, the ballistic hose quick-disconnect couplings (28 AFT) and the ship-to-seat personal leads quick-diconnect fittings (29 AFT) are mechanically separated. The separation of the personal leads to the seat automatically actuates the seat emergency oxygen system shutoff valve and this system furnishes the pilot and his partial pressure suit with oxygen until the pilot is separated from the seat. During the latter portion of seat and carriage upward movement, tripping lugs (30 AFT) mechanically release the anti-rotation locks (31 AFT) and another tripping lug (32 AFT) mechanically fires the rotational thruster M-27 initiator (33 AFT). High-pressure gas from this initiator fires an explosive cartridge (34 AFT) in the base of each rotational thruster (35 AFT). High-pressure gas from each cartridge forces each rotational thruster piston (36 AFT) to extend and rotate the seat to the launch position. This rotational action causes a lug (48 AFT) to cock the drag chute ejector arming mechanism (49 AFT) and the cam on break-away bolt (37 AFT) to fire the flight stabilizer boom M-27 initiator (38 AFT). High-pressure gas from this initiator fires an explosive cartridge in each flight stabilizer boom (39 AFT). High-pressure gas from each cartridge force the telescopic flight stabilizer booms to extend. After the booms are actuated, the pressure build-up within the hose from initiator (38) causes the pressure disconnect (40) to separate. Further rotational action causes the cam on breakaway bolt (41 AFT) to fire an M-27 initiator (42 AFT). High-pressure gas from this initiator fires an explosive charge in breakaway bolts (37 AFT), (41 AFT), (43 AFT), (44 AFT) to separate the seat from the seat carriage, ignites the MK-2 rocket motor (45 AFT), separates the pressure disconnect (46 AFT), and fires the M-28 initiator (47 AFT). High-pressure gas from this unit withdraws the arming pin (20) from the forward seat vertical thruster M-29 initiator (23). After separation, the rocket motors deliver a continuous upward and forward thrust through the center of gravity of the pilot-seat mass until rocket burnout. As the seat leaves the airplane, lug (48 AFT) releases the drag chute ejector arming mechanism (49 AFT) thereby arming the drag chute ejector (50 AFT). Refer to paragraph 8-144 for post ejection sequence of events. Refer to paragraph 8-145 for forward seat ejection sequence of events.

8-144. Post Ejection Sequence.

The post ejection sequence for the aft and forward seats of F-106B airplanes is identical to that described in paragraph 8-133 and shown in figure 8-49.

8-145. Forward Seat Ejection Sequence (Initiated By Pilot In Forward Seat).

Continued pull on the canopy jettison and seat ejection control ring (1), after the arming pin (20) of the vertical thruster M-29 initiator (23) is withdrawn and the forward seat's ejection control mechanism safety locks (9) are released, begins the forward seat ejection sequence.

NOTE

Numbers within parenthesis (20), (23), etc., denote items shown on figure 8-51.

This action mechanically rotates the vertical thruster trigger torque tube (21) which mechanically fires the vertical thruster M-29 initiator (23). High-pressure gas from this initiator withdraws an exactor pin (24) to disconnect the seat adjustment actuator (25) from the seat. These gases also fire an explosive cartridge (26) in the base of the vertical thruster. High-pressure gas from this cartridge forces the vertical thruster piston (27) to extend and move the seat and carriage upward on the seat rails. During the initial portion of this upward movement, the ballistic hose quick-disconnect coupling (28) and the ship-to-seat personal leads quick-disconnect fittings (29) are mechanically separated. The separation of the personal leads to the seat automatically actuates the seat emergency oxygen system shutoff valve and this system furnishes the pilot and his partial pressure suit with oxygen until the pilot is separated from the seat. During the latter portion of seat and carriage upward movement, tripping lugs (30) mechanically release the anti-rotation locks (31) and another tripping lug (32) mechanically fires the rotational thruster M-27 initiator (33). High-pressure gas from this initiator fires an explosive cartridge (34) in the base of each rotational thruster (35). High-pressure gas from each cartridge forces each rotational thruster piston (36) to extend and rotate the seat to the launch position. This rotational action causes

a lug (48) to cock the drag chute ejector arming mechanism (49) and the cam on breakaway bolt (37) to fire the flight stabilizer boom M-27 initiator (38). This initiator fires an explosive cartridge in each flight stabilizer boom (39). High-pressure gas from each cartridge force the telescopic flight stabilizer booms to extend. After the booms are actuated, the pressure build-up within the hose from initiator (38) causes the pressure disconnect (40) to separate. Further rotational action causes the cam on breakaway bolt (41) to fire an M-27 initiator (42). High-pressure gas from this initiator fires an explosive charge in breakaway bolts (37), (41), (43), (44) to separate the seat from the seat carriage, ignites the MK-2 rocket motors (45), and separates the pressure disconnect (46). After separation, the rocket motors deliver a continuous upward and forward thrust through the center of gravity of the pilot-seat mass until rocket burnout. As the seat leaves the airplane, lug (48) releases the drag chute ejector arming mechanism (49) thereby arming the drag chute ejector (50). Refer to paragraph 8-133 for subsequent sequence of events.

8-146. Aft Seat Pre-launch Sequence (Initiated By Pilot In Aft Seat).

Canopy jettison and seat ejection is normally initiated by the pilot in the aft seat. The aft seat pre-launch sequence begins when the pilot performs the initial pull on the aft seat canopy jettison and ejection control ring (1 AFT).

NOTE

Numbers within parenthesis (1 AFT), (2 AFT), etc., denote items shown on figure 8-51.

This pull on the canopy jettison and seat ejection control ring (1 AFT) mechanically actuates the seat AFCS switch (2 AFT) to electrically disengage the AFCS system and mechanically fires the gas generator (3 AFT) of the foot and seat pan rotary actuator (4 AFT) and fires the canopy unlatch M-3A1 initiator (10 AFT) which initiates the canopy jettison sequence.

NOTE

The canopy jettison sequence is described in paragraph 8-147.

Gases from the gas generator cause the actuator shaft and cable pulleys to rotate. This action mechanically actuates and locks the shoulder harness inertia reel (5 AFT), retracts the cables connected to the pilot's feet (6 AFT), raises the foot pans (7 AFT) and leg guards (8 AFT), and mechanically rotates the vertical thruster torque tube (21 AFT) which cocks the vertical thruster triggering mechanism. When both feet of the pilot are fully retracted, the ejection control ring mechanism safety locks (9 AFT) are released.

8-147. Canopy Jettison Sequence (Initiated By Pilot In Aft Seat).

The initial pull on the canopy jettison and seat ejection control ring (1 AFT) described in paragraph 8-146 begins the canopy jettison sequence.

NOTE

Numbers within parentheses (10 AFT), (11 AFT) etc., denote items shown on figure 8-51.

This action causes the canopy unlatch M-3A1 initiator (10 AFT) to fire and send high-pressure gas through a check valve to fire an M-5A1 booster initiator (11). Gases from this booster initiator are routed through a second check valve to fire a cartridge in each T-25 canopy unlock thruster (12). High-pressure gas from the thruster cartridges drive the thruster pistons to mechanically unlock the canopy latches (13). When these pistons reach the end of their stroke, ports are uncovered and the gases fire an M-5A1 initiator (14). High-pressure gases from this unit fire an explosive cartridge in each wire cutter (15) and separate the pneumatic (canopy seal system) disconnect fitting (16). Gases from the wire cutter cartridges provide the force to cut the electrical wiring leading to the canopy. Gases from the thruster cartridges (12) also fire an explosive cartridge (17) in the base of the canopy remover (actuator) (18). When this explosive cartridge fires, high-pressure gas in the canopy remover force the remover piston and the canopy to jettison from the airplane. As the canopy separates from the airplane it mechanically fires an M-3A1 initiator (19). High-pressure gas from this unit withdraws an arming pin (20 AFT) from the aft seat vertical thruster M-29 initiator (23 AFT). Refer to paragraph 8-148 for subsequent sequence of events.

8-148. Aft Seat Ejection Sequence (Initiated By Pilot In Aft Seat).

After the arming pin (20 AFT) of the aft seat vertical thruster M-29 initiator (23 AFT) has been withdrawn, the cocked spring link of the vertical thruster triggering mechanism exerts force to fire the vertical thruster M-29 initiator (23 AFT) and begins the aft seat ejection sequence. The subsequent sequence of events for the aft seat is similar to those described in paragraphs 8-143 and 8-144. After the aft seat is ejected, the forward pilot initiates his pre-launch sequence as described in paragraph 8-140 except that the canopy has already been jettisoned. After the pre-launch sequence, refer to paragraph 8-145 for forward seat ejection sequence.

8-149. CANOPY JETTISON (PILOT CONTROLLED), F-106B.

The canopy can be jettisoned by either pilot without ejecting the seat while the airplane is either airborne or groundborne. In an airborne condition, the pilot in the forward seat can jettison the canopy by manually operating the canopy latches to the unlocked position; the airloads complete the operation. Either pilot can jettison the canopy (only) by depressing the stowage lock and then pulling aft on his canopy jettison control handle (A) or (A, AFT) located on the left arm rest of the seat.

NOTE

Letters or numbers within parentheses (A), (10), etc., denote items shown on figure 8-51.

This mechanical action by the pilot in the forward seat causes the M-3A1 canopy unlatch initiator (10) to fire and send high-pressure gas through a check valve to fire a cartridge in each T-25 canopy unlock thruster (12).

NOTE

If canopy jettison is initiated by the pilot in the aft seat, the M-3A1 canopy unlatch initiator (10 AFT) fires and sends high-pressure gas through a check valve to fire an M-5A1 booster initiator (11). Gases from the booster initiator are routed through a second check valve to fire a cartridge in each T-25 canopy unlatch thruster (12).

High-pressure gas from the thruster cartridges drive the thruster pistons to mechanically unlock the canopy latches (13). When these pistons reach the end of their stroke, ports are uncovered and the gases fire an M-5A1 initiator (14). High-pressure gases from this unit fire an explosive cartridge in each wire cutter (15) and separate the pneumatic (canopy seal system) disconnect fitting (16). Gases from the wire cutter cartridges provide the force to cut the electrical wiring leading to the canopy. Gases from the thruster cartridges (12) also fire an explosive cartridge (17) in the base of the canopy remover (actuator) (18). When this explosive cartridge fires, high-pressure gas in the canopy remover forces the remover piston and the canopy to jettison from the airplane. As the canopy separates from the airplane it mechanically fires an M-3A1 initiator (19). High-pressure gas from this unit withdraws an arming pin (20 AFT) from the aft seat vertical thruster M-29 initiator (23 AFT). This initiator is now armed for seat ejection.

WARNING

Insert pilot's ground safety pin at forward edge of each seat to prevent inadvertent seat ejection.

8-150. CANOPY JETTISON (EXTERNALLY CONTROLLED), F-106B.

The canopy can be jettisoned externally by a ground crew member while the airplane is on the ground. This operation is accomplished by removing a door installed on the left side of the fuselage near the leading edge of the wing and pulling outboard on the external canopy jettison control handle (B).

NOTE

Letters or numbers within parentheses (B), (C), (11), etc., denote items shown on figure 8-51.

WARNING

To prevent ejection of pilot and seat, do not jettison canopy by external control handle if

the canopy jettison and seat ejection control ring (1) or (1 AFT) has been pulled from the normal (stowed) position or if the pilot's feet in the aft seat have been retracted.

Pulling this handle (B) mechanically fires the alternate canopy unlatch M-3A1 initiator (C). High-pressure gas from this unit is routed through a check valve and fires a booster M-5A1 initiator (11). Gases from this booster initiator are routed through a second check valve to fire a cartridge in each T-25 canopy unlock thruster (12). High-pressure gas from the thruster cartridges drive the thruster pistons to mechanically unlock the canopy latches (13). When these pistons reach the end of their stroke, ports are uncovered and the gases fire an M-5A1 initiator (14). High-pressure gases from this unit fire an explosive cartridge in each wire cutter (15) and separate the pneumatic (canopy seal system) disconnect fiitting (16). Gases from the wire cutter cartridges provide the force to cut the electrical wiring leading to the canopy. Gases from the thruster cartridges (12) also fire an explosive cartridge (17) in the base of the canopy remover (actuator) (18). When this explosive cartridge fires, high-pressure gas in the canopy remover force the remover piston and the canopy to jettison from the airplane. As the canopy separates from the airplane it mechanically fires an M-3A1 initiator (19). High-pressure gas from this unit withdraws an arming pin (20 AFT) from the aft seat vertical thruster M-29 initiator (23 AFT). This initiator is now armed for seat ejection.

WARNING

Insert pilot's ground safety pin at forward edge of each seat to prevent inadvertent seat ejection. It will be necessary to remove the seat and replace all affected ballistic devices, hoses, fittings, etc.

See figure 1-23 for an illustration of the external canopy jettison procedure.

8-151. OVER THE SIDE BAILOUT, F-106B.

If it becomes necessary to bail out over the side, either pilot jettisons the canopy as described in paragraph 8-149 or the forward pilot (only) jettisons the canopy by manually operating the canopy latch handle to the unlocked position thereby enabling the air loads to jettison the canopy. The pilot then pulls the emergency harness release handle (71) located on the right side of the seat.

NOTE

Numbers within parentheses (71), (59), etc., denote items shown on figure 8-49.

This action mechanically disengages the headrest container latch mechanism (59), fires a 1.5 second delay cartridge in the outboard hesitation riser cutter (61) to cut the parachute hesitation risers (62), disengages the lap belt disconnect (56), disengages the personal leads disconnect (58), releases the shoulder strap disconnect (57), and fires alternate cutter (72) to cut the parachute deployment line (66) and the survival packs lanyard (73). The foregoing operation will free the pilot of all attachments to the seat except those at his feet. The seat to feet attachments disengage as the pilot climbs out of the cockpit. After bailout, the pilot deploys his parachute by pulling on the parachute's manual ripcord grip (74).

8-152. RAPID EGRESS FROM COCKPIT (ON GROUND), F-106B.

Rapid egress from the cockpit may be used during an emergency such as a crash, fire, or impending fire. The canopy is opened normally or is jettisoned either by the pilot as described in paragraph 8-149 or externally by a ground crew member as described in paragraph 8-150. After the canopy is opened or jettisoned, the emergency harness release handle (71) located on the right side of the seat is pulled upward.

NOTE

Numbers within parentheses (71), (59), etc., denote items shown on figure 8-49.

The action mechanically disengeges the headrest container latch mechanism (59), fires a 1.5 second delay cartridge in the outboard hesitation riser cutter (61) to cut the parachute hesitation risers (62), disengages the lap belt disconnects (56), disengages the personal leads disconnect (58), releases the shoulder strap disconnect (57), and fires alternate cutter (72) to cut the parachute deployment line (66) and the survival packs lanyard (73). The foregoing operation will free the pilot from all equipment except his parachute and the seat to feet connection. The seat to feet connection will be disengaged as the pilot climbs out of the cockpit with his parachute attached to him.

8-153. MANUAL ARMING OF FORWARD SEAT, F-106B.

The forward seat vertical thruster M-29 initiator (23) is normally armed for seat ejection when gases from the M-28 initiator (47 AFT) withdraws arming pin (20) after aft seat ejection.

NOTE

Numbers within parentheses (20), (23), etc., correspond to those shown in figure 8-51.

If the forward seat cannot be armed for ejection in the normal manner, the pilot in the forward seat can arm his seat for ejection by pulling the vertical thruster manual arming handle (75) located on the left console. This action mechanically withdraws the arming pin (20) from the vertical thruster M-29 initiator (23). Forward seat ejection is then accomplished when the pilot pulls the canopy jettison and seat ejection control ring (1).

NOTE

The vertical thruster manual arming handle (75) is not used unless the aft seat will not operate and the aft seat occupant cannot bail out over the side or save himself in any manner. When the forward seat ejects before the aft seat, the rocket blast of the forward seat will be directed on the aft seat occupant.

8-154. SAFETY PRECAUTIONS (BALLISTIC UNITS).

The ballistics units used in the canopy jettison and seat ejection system contain explosive charges which are hazardous if improperly handled. These units should be handled only by trained personnel. Observe the following precautions at all times:

a. Check that pilot's ground safety pin is installed at forward edge of seat(s) before entering the cockpit.

b. Install maintenance safety pins when performing maintenance work within the cockpit or on any part of the canopy jettison and seat ejection system. See figure 8-52 for F-106A safetying requirements. See figure 8-53 for F-106B safetying requirements. Before installing maintenance safety pins in individual initiators, make sure that the initiator pin is in the full inward position.

WARNING

The maintenance safety pin will not effectively safety the initiators unless the initiator pin is in the full inward position before the safety pin is installed. See figure 8-45 for a detail view of an M-3 initiator which is typical for mechanically actuated initiators.

c. Use the specific procedures outlined in this manual when replacing any of the initiator units, canopy actuating cylinder, or ballistic units.

WARNING

Do not attempt disassembly of any of the ballistic units; an explosion may result. Units which are defective for any reason must be replaced. Defective units, or units that have been fired, must be sent to shops properly equipped to handle them.

d. Avoid denting the side walls of any of the units.

Damage of this nature could cause malfunction of the system. Dented units should be rejected and not re-used.

e. Observe the following precautions when replacing components of the canopy jettison and seat ejection systems.

1. Replace only one component at a time and reconnect hoses properly before disconnecting hoses to other components.
2. Loosen hose clamps only when necessary; do not disconnect hose clamps unless hose is to be replaced. Use care to preserve original hose routing.
3. Replace ballistic hoses when they are crimped, kinked, or flattened.
4. *Applicable to F-106A airplanes,* connect system components only as shown on figure 8-49. *Applicable to F-106B airplanes,* connect system components only as shown on figure 8-51.

WARNING

Components of the canopy jettison and seat ejection systems must be connected as shown in applicable schematic illustrations to insure proper operation during bailout.

f. The canopy actuating cylinder contains a ballistic cartridge and firing mechanism. Whenever the actuating cylinder is removed from the airplane, and while the cartridge and firing mechanism is in the cylinder, treat the entire assembly with the same caution accorded any ballistic (explosive) unit. Do not leave the assembly lying where it can be knocked or dropped. If the actuating cylinder is not to be reinstalled within two days, the unit shall be stored according to standard ballistic equipment storage procedures.

8-155. M-3A1 AND M-27 INITIATORS.

The M-3A1 and M-27 initiators are mechanically actuated ballistic units used in the canopy jettison and seat ejection systems. Figure 8-49 illustrates the function of these units for F-106A airplanes. Figure 8-51 illustrates the function of these units for F-106B airplanes. These initiators are similar in shape although the M-27 initiator is smaller than the M-3A1 initiator. These mechanically actuated initiators are employed to arm or to fire other components of the ballistic system. The initiator pin, which is the firing trigger of the initiator, is connected to a mechanical linkage of the system. When the initiator pin is pulled outward by the mechanical linkage, a spring is first compressed and then released. When the spring is released, it drives inward with the firing pin, the cartridge is ignited and burning gases are routed through hoses to other system components. Before being installed, an initiator should be checked to ensure that the ordnance decal is properly affixed, and that the safety pin is inserted through the cap neck and the initiator pin. The initiator must be handled as an explosive item.

WARNING

Do not handle initiator unless a safety pin is installed.

8-156. M-5A1 INITIATOR.

The M-5A1 initiator is a gas actuated ballistic unit used in the canopy jettison and seat ejection system. It is similar to the M-3A1 initiator except that it accommodates standard AN pressure fitting at each end. The M-5A1 initiators firing mechanism is internal and is actuated by gas pressure generated from other ballistic units. High-pressure gases from the M-5A1 initiators are routed through hoses to other system components as shown in figures 8-49 and 8-51.

8-157. M-28 INITIATOR.

Applicable to F-106B airplanes, the M-28 initiator is a gas actuated ballistic unit similar to an M-5A1 initiator. The firing mechanism is internal and is actuated by gas pressure from an M-27 initiator just before the aft seat is ejected. High-pressure gas from the M-28 initiator is routed through a hose to withdraw the arming (exactor) pin of the forward seat M-29 initiator.

8-158. M-29 INITIATOR.

The M-29 initiator is essentially an M-3A1 initiator with an integral arming (exactor) pin contained within a common housing. The arming pin which locks the initiator pin is normally withdrawn by high-pressure gas from another initiator as shown in figures 8-49 and 8-51. Manual arming of the M-29 initiator of the forward seat of F-106B airplanes is also possible but this method should be used as a last resort measure. Refer to paragraph 8-153 for manual arming procedure. After the arming pin is withdrawn, the initiator pin, which is the firing trigger of the initiator, is pulled outward by mechanical action. When the initiator pin is pulled outward, a spring is first compressed and then released. The released spring drives inward with the firing pin, the initiator cartridge is ignited, and burning gases are routed through hoses to other system components.

8-159. M-3A1 CANOPY UNLATCH THRUSTER.

Applicable to F-106A airplanes. The M-3A1 thruster is a cylinder approximately 1 inch in diameter and 8 inches long, and accommodates an AN pressure fitting at each end. This cylinder contains a cartridge, a gas-operated firing mechanism, and a piston assembly. The piston shaft of the unit is connected to the canopy latch linkage. In operation, the unit is fired by gas from an M-3A1 or an M-5A1 initiator and the piston extends approximately one and one-half inches to unlatch the canopy. A port is uncovered when the piston reaches the extremity of travel, and pressurized gas is routed through a hose to an M-5A1 initiator which fires to continue the jettison sequence.

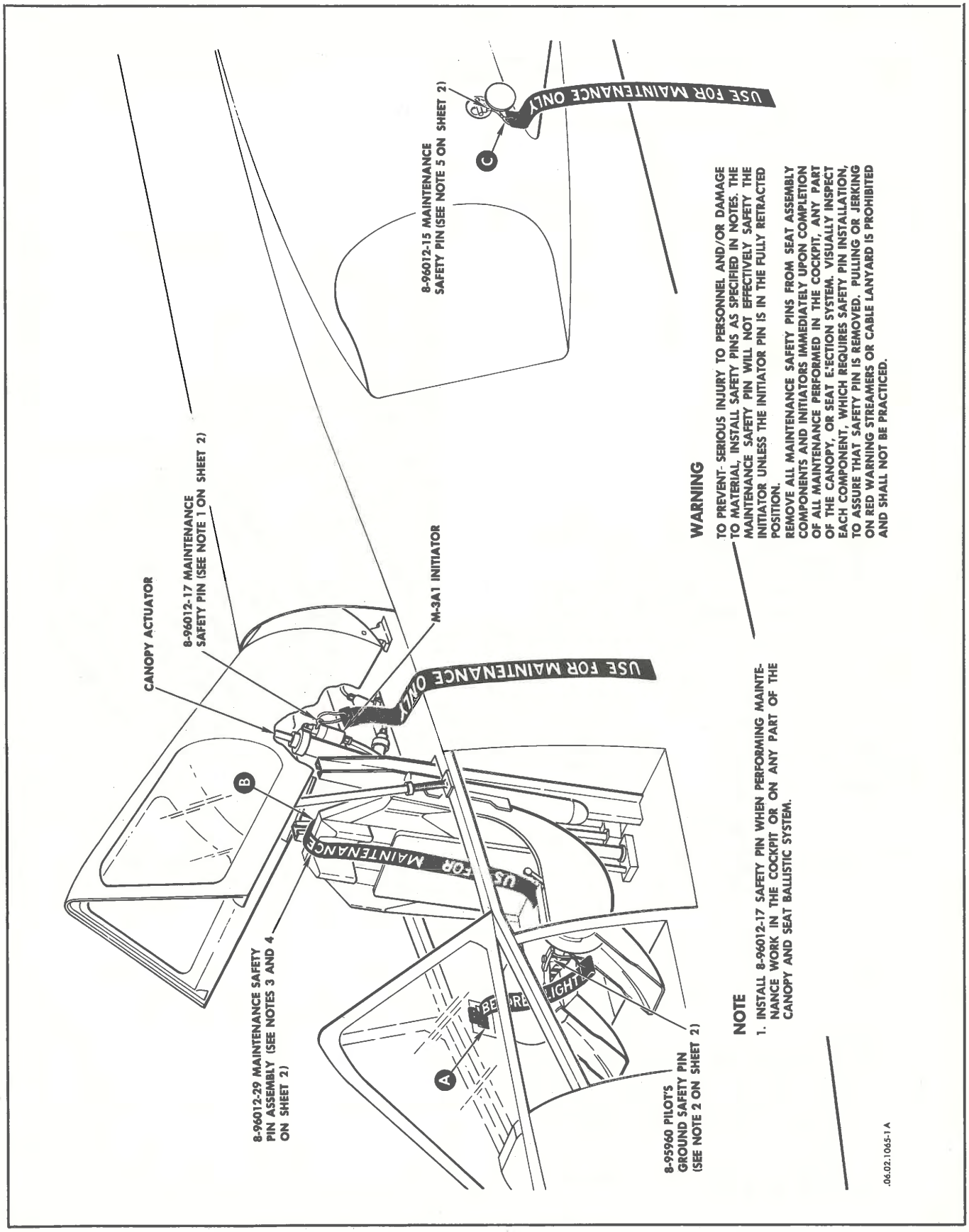
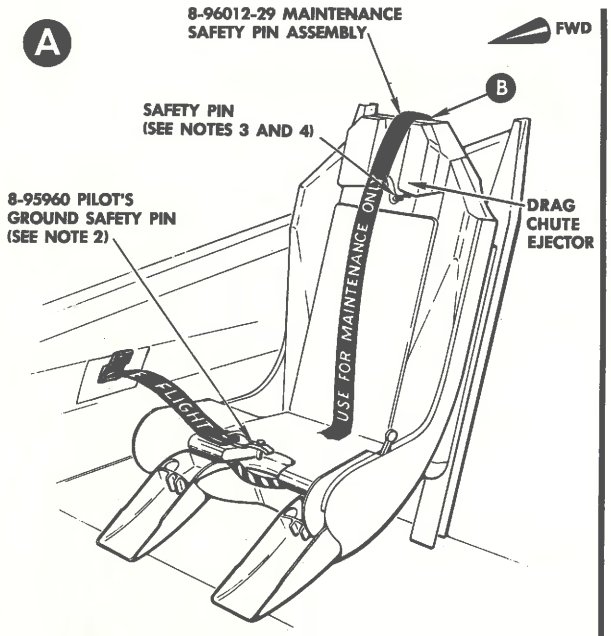
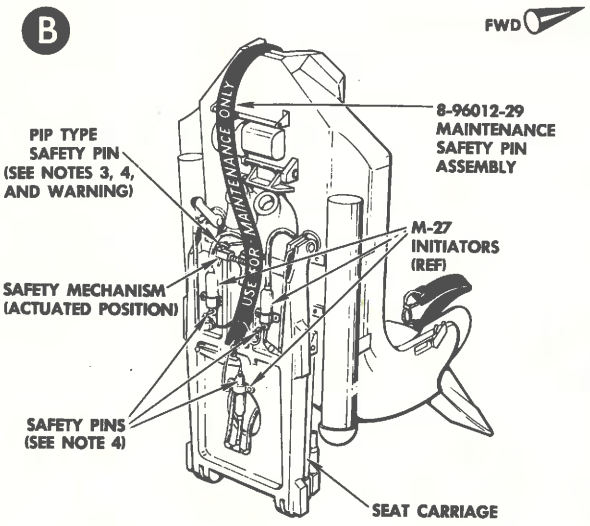


Figure 8-52. Rotational Upward Ejection Seat Jettison and Ejection System Safetying, F-106A (Sheet 1 of 2)



NOTES

2. PILOT'S GROUND SAFETY PIN, 8-95960, TO BE INSTALLED IN EJECTION CONTROL SPOOL (LOWER FORWARD EDGE OF SEAT) AT ALL TIMES EXCEPT WHEN REMOVED BY PILOT JUST PRIOR TO FLIGHT.
3. INSTALL DRAG CHUTE EJECTOR SAFETY PIN AND PIP TYPE SAFETY PIN (SHOWN IN DETAIL B) OF 8-96012-29 ASSEMBLY WHEN PERFORMING MAINTENANCE WORK IN THE COCKPIT OR ON ANY PART OF THE CANOPY AND SEAT BALLISTIC SYSTEM.

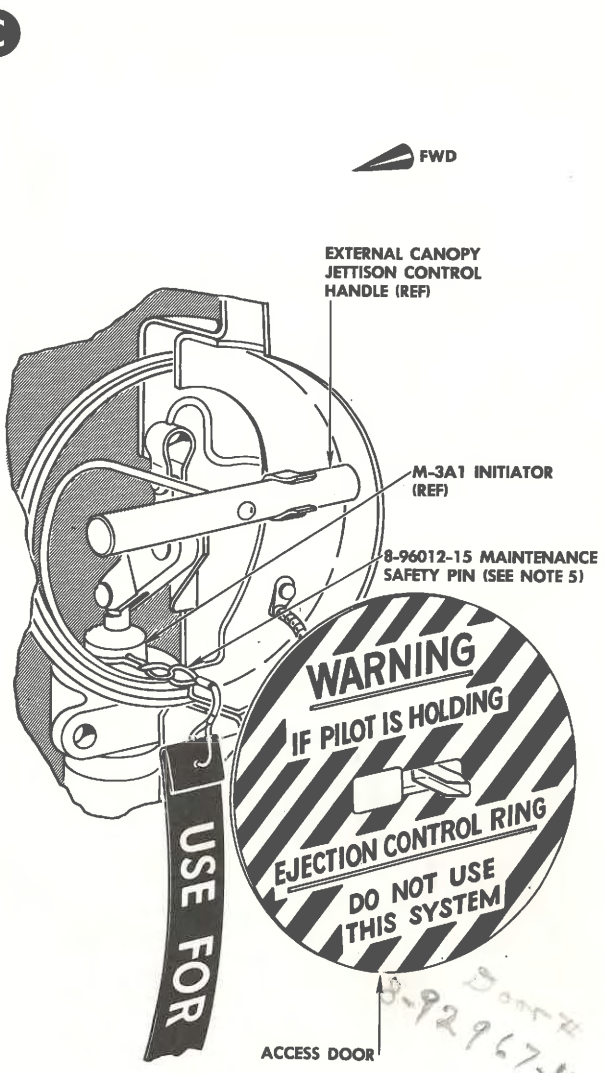


NOTE

4. INSTALL ALL PINS OF 8-96012-29 SAFETY PIN ASSEMBLY DURING REMOVAL AND/OR INSTALLATION OF SEAT. INSTALL SAFETY PINS IN THE M-27 INITIATORS (3) MOUNTED ON THE SEAT CARRIAGE WHEN THE SEAT IS HOISTED TO A POINT WHERE INITIATORS ARE ACCESSIBLE. REMOVE SAFETY PINS FROM THESE M-27 INITIATORS (3) AS THE SEAT IS LOWERED INTO THE COCKPIT.

WARNING

SAFETY MECHANISM MUST REMAIN IN ACTUATED POSITION AFTER PIP PIN IS INSTALLED.



NOTE

5. INSTALL 8-96012-15 SAFETY PIN WHEN PERFORMING MAINTENANCE WORK IN THE COCKPIT, ON ANY PART OF THE CANOPY AND SEAT BALLISTIC SYSTEM, OR IF THE ACCESS DOOR IS OPEN.

.06.02.1065-2 A

Figure 8-52. Rotational Upward Ejection Seat Jettison and Ejection System Safetying, F-106A (Sheet 2 of 2)

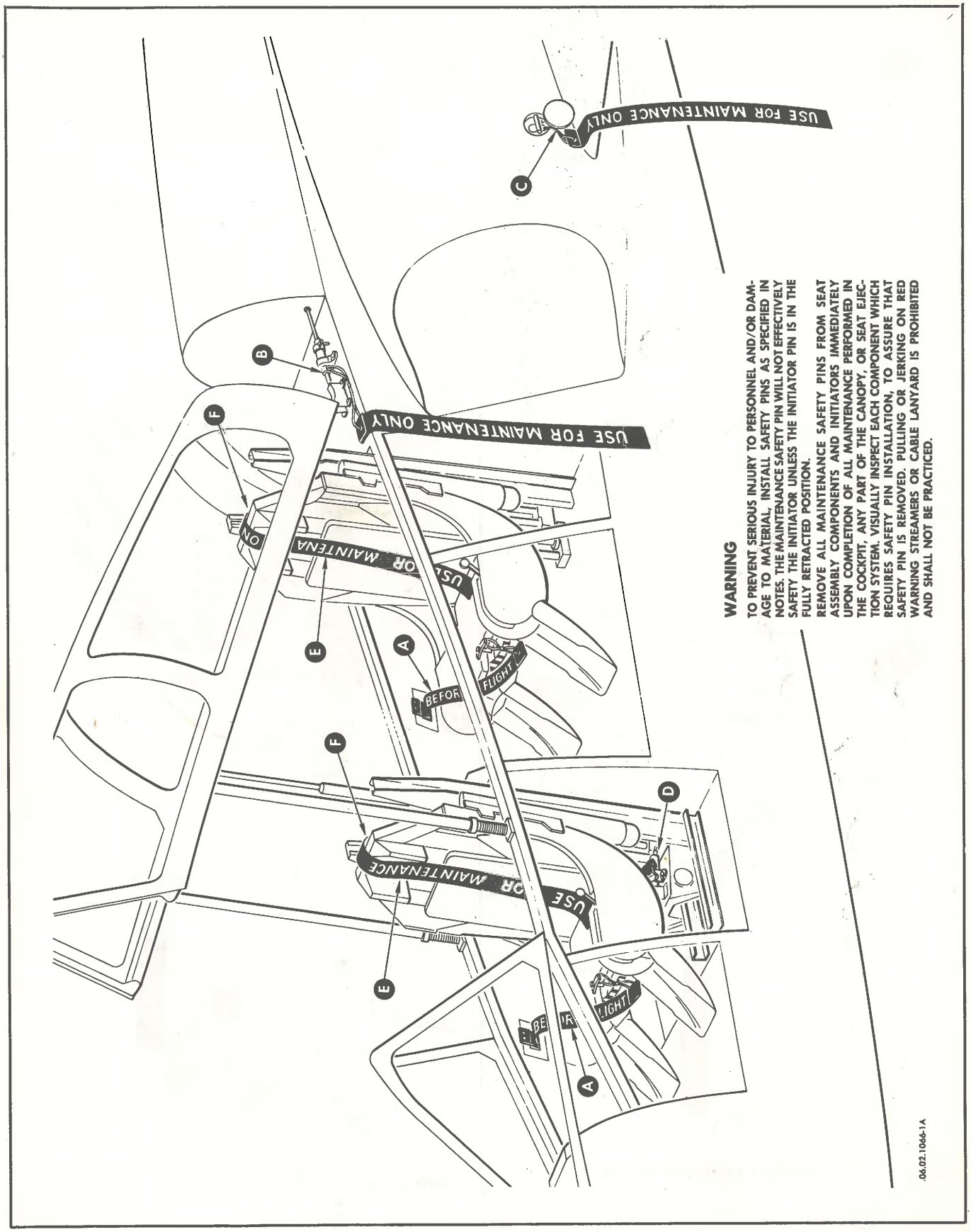


Figure 8-53. Rotational Upward Ejection Seat Jettison and Ejection System Safetying, F-106B (Sheet 1 of 3)

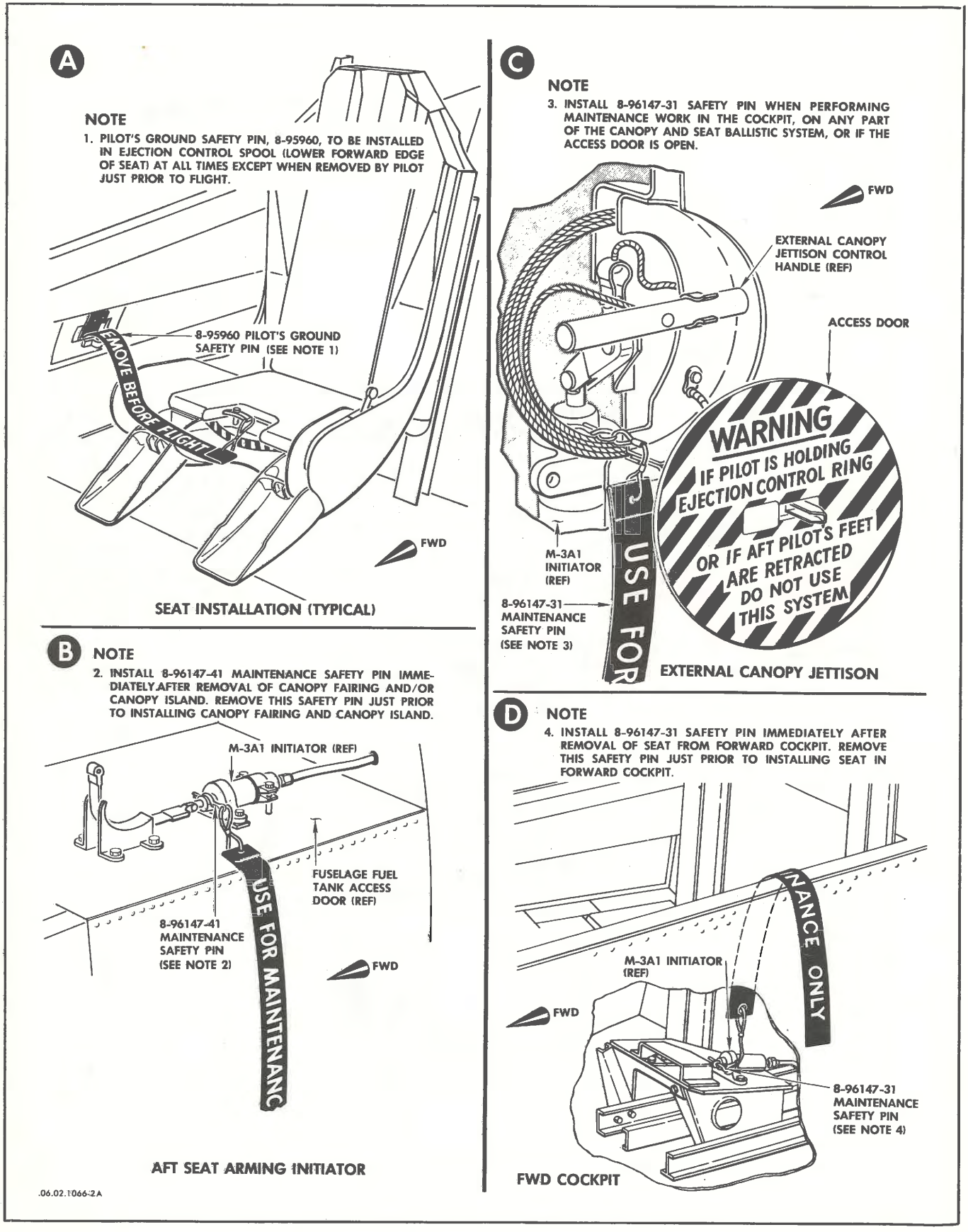
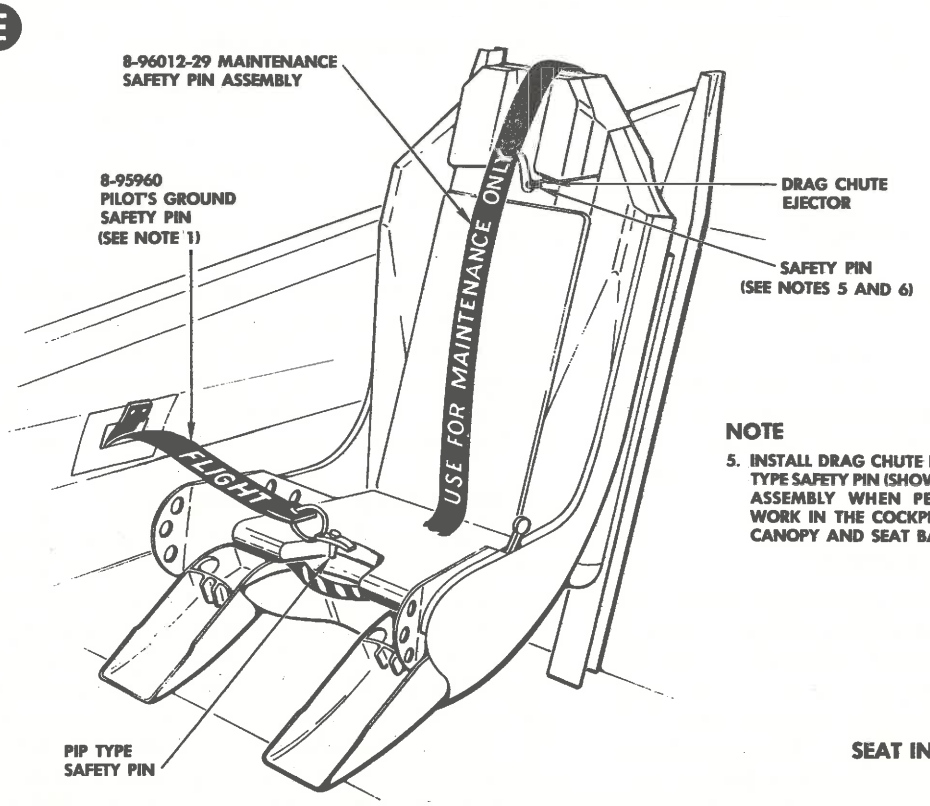


Figure 8-53. Rotational Upward Ejection Seat Jettison and Ejection System Safetying, F-106B (Sheet 2 of 3)

E

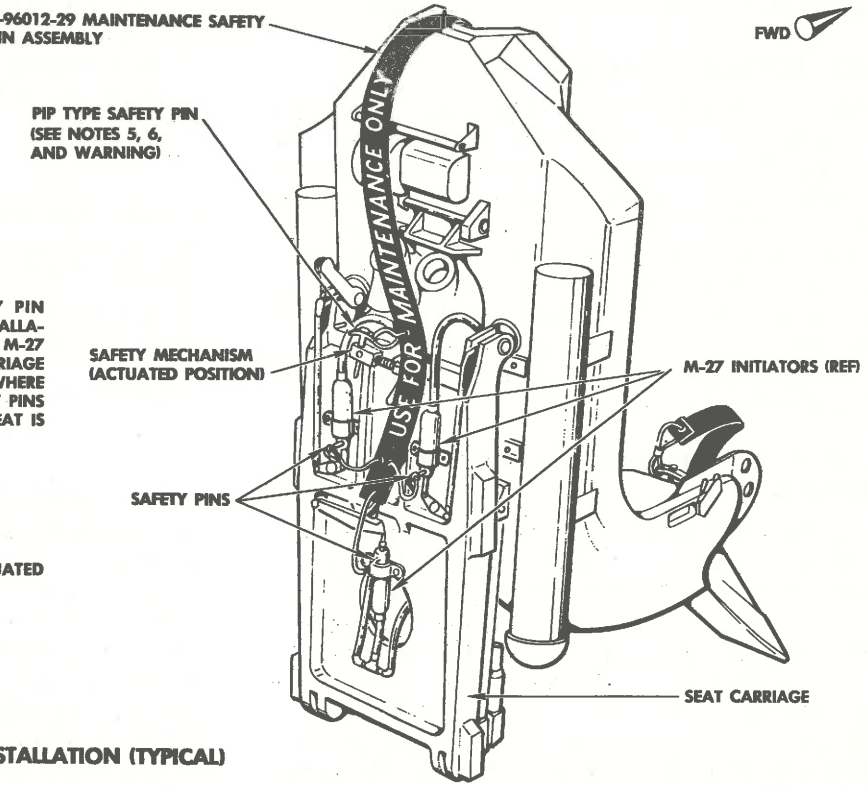


NOTE

5. INSTALL DRAG CHUTE EJECTOR SAFETY PIN AND PIP TYPE SAFETY PIN (SHOWN IN DETAIL F) OF 8-96012-29 ASSEMBLY WHEN PERFORMING MAINTENANCE WORK IN THE COCKPIT OR ON ANY PART OF THE CANOPY AND SEAT BALLISTIC SYSTEM.

SEAT INSTALLATION (TYPICAL)

F



NOTE

6. INSTALL ALL PINS OF 8-96012-29 SAFETY PIN ASSEMBLY DURING REMOVAL AND/OR INSTALLATION OF SEAT. INSTALL SAFETY PINS IN THE M-27 INITIATORS (3) MOUNTED ON THE SEAT CARRIAGE WHEN THE SEAT IS HOISTED TO A POINT WHERE INITIATORS ARE ACCESSIBLE. REMOVE SAFETY PINS FROM THESE M-27 INITIATORS (3) AS THE SEAT IS LOWERED INTO THE COCKPIT.

WARNING

SAFETY MECHANISM MUST REMAIN IN ACTUATED POSITION AFTER PIP PIN IS INSTALLED.

SEAT INSTALLATION (TYPICAL)

.06.02.1066-3 A

Figure 8-53. Rotational Upward Ejection Seat Jettison and Ejection System Safetying, F-106B (Sheet 3 of 3)

8-160. T-25 CANOPY UNLATCH THRUSTERS.

Applicable to F-106B airplanes. Two cylindrically shaped T-25 thrusters are employed in the canopy jettison system to ballistically unlock the canopy latches. The cylinder is approximately 1 inch in diameter and 7 inches long. The cylinder has a pressure port at each end and is provided with mounting lugs. Each cylinder contains a gas-operated firing mechanism, a cartridge, and a piston and shaft. The piston shaft of one thruster is connected to the left-hand canopy latch mechanism and the piston shaft of the other thruster is connected to the right-hand canopy latch mechanism. In operation, the firing mechanism is actuated by gases from either an M-3A1 or an M-5A1 initiator, the cartridge is fired, and gases from the cartridge force the piston shaft to extend and unlock the canopy latches. When the piston reaches the end of the cylinder, an exhaust port is uncovered and gases from the cartridge are routed through hoses to continue the canopy jettison sequence.

8-161. 8-06437-3 WIRE CUTTER.

Applicable to F-106A airplanes. The canopy jettison system employs an 8-06437-3 wire cutter, located just aft of the canopy actuating and jettison cylinder, to cut the canopy electrical harness when the canopy is jettisoned. The cylindrical shaped wire cutter is approximately 1.25 inches in diameter and 4 inches long. The unit contains a piston and shaft but does not contain a ballistic cartridge. In operation, gases from an M-5A1 initiator cause the piston shaft to extend and cut the electrical harness.

8-162. T-3 WIRE CUTTER.

Applicable to F-106B airplanes. The canopy jettison system employs two T-3 wire cutters, located immediately aft of the aft seat on the canopy shelf, to cut the canopy electrical harness when the canopy is jettisoned. The cylindrical shaped T-3 wire cutters are approximately 2½ inches in diameter and 4 inches long. Each unit contains a gas-operated firing mechanism and a piston and shaft. In operation, the firing mechanism is actuated by gases from an M-5A1 initiator, the cartridge is fired, and gases from the cartridge force the piston shaft to extend and cut the electrical harness.

8-163. FOOT AND SEAT PAN ROTARY ACTUATOR.

The cylindrically shaped foot and seat pan rotary actuator is approximately 17.5 inches long and 3.5 inches in diameter. It is located under the seat pan in the forward portion of the seat. A gas generator is externally mounted on the top of the actuator. This gas generator is normally fired by mechanical action, however, the firing mechanism may be gas actuated as described in paragraph 8-142. Gases from the fired gas generator cause the actuator shaft and feet retraction cable pulleys to rotate. This action, mechanically actuates and locks the shoulder harness inertia reel, retracts the pilot's feet, raises the foot pans and leg guards, which release the ejection control ring safety locks, and on the aft seats of F-106B airplanes cocks the mechanism of the vertical thruster trigger torque tube.

8-164. VERTICAL THRUSTER.

The vertical thruster is a three tube telescoping cylinder of approximately 2.25 inches diameter. Its retracted length is approximately 20.5 inches and its extended length is approximately 48.6 inches. The thruster incorporates a gas actuated explosive cartridge in its base and a hydraulic reservoir with a pressure switch mounted on its side. The pressure switch indicates low oil pressure when the switch opens at 8 to 13 psi. When the gas actuated cartridge is fired, the telescoping pistons extend fully and lock in place. Near the end of the piston stroke the hydraulic oil acts as a snubber to reduce piston extension speed. Refer to paragraph 8-132 for a description of the functions performed by the vertical thruster.

8-165. ROTATIONAL THRUSTERS.

Two rotational thrusters (left and right) are used in the seat ejection system. The thrusters are cylindrically shaped with an approximate diameter of 1.6 inches. The retracted length (piston retracted) is approximately 18 inches and the extended length (piston extended) is approximately 30.2 inches. Each thruster incorporates a gas actuated explosive cartridge in its base and the cylinder contains hydraulic oil and a pressure switch which indicates oil pressure. Low oil pressure is indicated when the pressure switch opens at 8 to 13 psi. When the gas actuated cartridges are fired, the thruster pistons extend fully and lock in place. Near the end of the piston's stroke, the hydraulic oil acts as a snubber to reduce piston extension speed. Refer to paragraph 8-132 for a description of the functions performed by the rotational thrusters.

8-166. BREAKAWAY BOLTS.

Four breakaway bolts and self locking shear nuts connect the seat to the seat carriage. The upper two bolts are of the eye type and are equipped with integral cams. The lower two bolts are of the fork type. Each bolt contains a gas actuated explosive cartridge and incorporates an AN815-4C fitting. Refer to paragraph 8-132 for a description of the functions of these breakaway bolts.

8-167. SEAT STABILIZING BOOMS.

A seat stabilizing boom is mounted on the left and right sides of the seat back. The base of each cylindrically shaped 5 tube telescopic boom is approximately 3.7 inches in diameter. When the booms are retracted, their length is approximately 28 inches. When the booms are extended, their length is approximately 124 inches. The base of each boom contains a gas actuated cartridge. These cartridges are fired by gases from an M-27 initiator when the seat reaches the correct position (just prior to rocket motor ignition). Gases from the boom cartridges force the booms to fully extend and lock in place. The booms serve to stabilize the seat in free flight after seat ejection.

8-168. MK-2 ROCKET.

The MK-2 rocket consists of twin rocket motors with separate tubes and common end castings. The rocket is approximately 16 inches long, 8.7 inches wide, and 4.4 inches thick. Each rocket tube contains a gas actuated cartridge which is fired by gases from an M-27 initiator. The rocket tube cartridges then simultaneously ignite the main propellant of each rocket motor. The rocket motors deliver a continuous forward and upward thrust through the center of gravity of the pilot-seat mass until rocket burnout.

8-169. DRAG CHUTE EJECTOR.

The drag chute ejector is mounted on the seat structure adjacent to the seat headrest. This unit incorporates an aneroid device which actuates at or below 15,000 feet altitude. When the aneroid device actuates, it fires a 2 second delay cartridge. Gases from the cartridge expel a projectile. Refer to paragraph 8-133 for a description of the subsequent sequence of events.

8-170. HESITATION RISER CUTTERS.

Two hesitation riser cutters are mounted within the seat headrest container. Each of these units contain a mechanically actuated 1.5 second delay cartridge. When the headrest container is separated from the seat, it mechanically fires the delay cartridges. Gases from the cartridges provide the force to cut the hesitation risers. Refer to paragraph 8-133 for a description of subsequent sequence of events.

8-171. FIRST STAGE CUTTER.

The first stage cutter is contained in the pilot's parachute pack. The cutter contains a 1.5 second delay cartridge. After the drag chute deploys the pilot's parachute, it mechanically actuates the cutter cartridge. Gases from this cartridge provide the force to cut the line connecting the drag chute to the pilot's parachute. Refer to paragraph 8-133 for a description of subsequent events.

8-172. ALTERNATE CUTTER.

The alternate cutter is mounted on the seat structure adjacent to the seat headrest. This cutter contains a mechanically actuated cartridge. The cartridge is fired when the emergency harness release handle on the right side of the seat is actuated. Gases from the cartridge provide the force to cut the parachute deployment line and the survival pack lanyards. Refer to paragraphs 8-136 and 8-137 for complete information as to when the alternate cutter is used.

OPERATIONAL CHECKOUT

8-173. PREFLIGHT TEST, BALLISTIC SYSTEM QUICK-DISCONNECT COUPLINGS.

This procedure is necessary to test the proper engagement of the ballistic system's quick-disconnect couplings that connect the seat hose to the airplane ballistic system hose. On F-106A airplanes and on the forward seat of F-106B airplanes, there is one quick-disconnect coupling at the upper right side of the seat. On the aft seats of F-106B airplanes, there are two quick-disconnect couplings. One is located at the upper left side and the other at the upper right side of the seat. The upper (male) portion of the coupling is connected to the seat hose. The lower (female) portion of the coupling is connected to the airplane ballistic system hose. This portion of the coupling incorporates an external lever that operates the internal locking mechanism and an external leaf type spring which aids in retaining the lever in the locked position. To test for proper coupling engagement, proceed as follows:

a. Depress lever on lower portion of disconnect and inspect to see that red band is not showing.

NOTE

A red band around the sleeve on the upper portion of the disconnect will not be visible if disconnect is fully engaged.

b. Release lever to normal position.

c. Apply approximately ten (10) pounds pull test in the upward direction to the ballistic hose attached to the upper portion of disconnect. The quick-disconnect coupling shall remain engaged.

CAUTION

When applying pull test, do not pull up on retractable sleeve. After pull test, visually check ballistic hose. The hose shall not be flattened, kinked, or twisted. To remove twist in hose, rotate upper portion of disconnect coupling.

If the requirements of the preceding test are not met, proceed as follows:

d. Depress lever on lower (female) portion of disconnect to a horizontal position.

e. Insert upper (male) portion into lower portion, by pushing downward on the ballistic hose fitting, until the red band around the retractable sleeve is no longer visible.

NOTE

Do not push on the retractable sleeve when making insertion.

f. Release lever to normal position.

g. Repeat step "c."

8-174. PREFLIGHT TEST, DRAG CHUTE EJECTOR ANEROID.

This test is necessary to check the drag chute ejector aneroid for leakage. Proceed as follows:

a. Set airplane altimeter at 29.92.

b. Compare the altitude reading of the airplane's altimeter and the drag chute ejector's aneroid. The aneroid reading shall be within 1,000 feet of the airplane's altimeter reading.

If the requirement of the preceding test is not met, the drag chute ejector shall be replaced.

8-175. PREFLIGHT TEST, THRUSTER OIL PRESSURE.

This test is necessary to check the oil pressure of the seat's vertical and rotational thrusters. Proceed as follows:

a. Press the "THRUSTER OIL PRESSURE TEST SWITCH"; the "THRUSTER OIL PRESSURE TEST LIGHT" shall illuminate.

WARNING

Failure of "THRUSTER OIL PRESSURE TEST LIGHT" to illuminate indicates low oil pressure in vertical and/or rotational thrusters. If oil pressure is low, seat ejection will malfunction.

b. Refer to paragraph 8-125 for system analysis if test light fails to illuminate.

8-176. OPERATIONAL CHECK, SEAT ASSEMBLY.

The following operational check is designed to test the seat assembly. For additional information, if required, refer to T.O. 13A5-26-3.

8-177. Equipment Requirements.

FIGURE	NAME	TYPE	ALTERNATE	USE AND APPLICATION
	Overhead lift (½ ton minimum capacity).	Local procurement		Provides means for hoisting seat.
8-48	Seat hoisting sling.	8-96495 (1730-726-6085)		Provides means for hoisting seat.
	Seat handling dolly.	8-96497 (1730-711-2837)		Provides means for handling seat.
	Seat test kit.	8-96496 (4920-710-7363)		Provides means for operational checkout of seat.
8-54	Hesitation riser cutter simulator.	8-96627 (Part of 8-96496)		Simulates action of ballistic system unit which it replaces.
8-54	Alternate cutter simulator.	8-96626 (Part of 8-96496)		Simulates action of ballistic system unit which it replaces.
8-54	Drag chute ejector simulator.	8-09682-807 (Part of 8-96496)		Simulates action of ballistic system unit which it replaces.
8-54	Initiator simulators (5).	8-09672-1 (Part of 8-96496)		Simulates action of ballistic system unit which it replaces.
8-54	Gas generator simulator.	8-09682-805 (Part of 8-96496)		Simulates action of ballistic system unit which it replaces.

8-177. Equipment Requirements (Cont).

FIGURE	NAME	TYPE	ALTERNATE	USE AND APPLICATION
8-54	Spring scale.	97-87200-001 (Part of 8-96496)		Measures control forces.
8-54	Hook assembly.	8-96591 (Part of 8-96496)		To attach spring scale to emergency harness release handle.
8-54	Loop assembly.	8-96607 (Part of 8-96496)		To attach spring scale to alternate canopy jettison control handle.
8-54	Adapter assembly.	8-96608 (Part of 8-96496)		To attach spring scale to ejection control ring.
	Battery powered test light.	Local manufacture		To check AFCS switch operation.
	0 to 500 psi source of dry filtered air or nitrogen.	Local procurement		To check seat disconnects.
	Maintenance safety pins.	8-96012 or 8-96147		To safety ballistic units.
	Cockpit check gage.	8-99904-905		Provides means for operational check of seat ejection components in cockpit (seat removed).
	Approved container(s) for ballistic units.	Local procurement		Provides place to safely store ballistic units removed during procedure.

8-178. Preparation.

a. Remove the seat from the airplane, see figure 8-48 for procedure.

NOTE

Applicable to forward seats of F-106B airplanes. Check that the air blast shield release mechanism operates to disengage the forward ends of blast shield retainer cables as the seat is removed from the airplane.

Support the seat by overhead lift and hoisting sling in the position best suited for the following operations.

NOTE

Numbers with parentheses (33), (38), etc., in this and in subsequent paragraphs correspond to those shown in figures 8-49 and 8-51.

b. Disconnect the ballistic hoses from the three M-27 initiators (33), (38), and (42) mounted on the back of the seat assembly and the ballistic hoses from each rotational thruster (34). Install dust caps in ballistic hoses and on fittings of initiators and thrusters.

WARNING

Do not install pressure type caps.

c. Remove the two rotational thrusters (34) by removing attach pins at breakaway bolts. Reinstall the left and right anti-rotation locks by installing attach pins at breakaway bolts.

WARNING

Place removed components containing ballistic devices in approved storage container(s) as procedure progresses.

d. Remove the seat actuator (25) and the vertical thruster (27) by removing attach pins and disconnecting electrical harness.

e. Install individual safety pins with warning streamers attached in each of the three M-27 initiators (33), (38), and (42) mounted on the back of the seat assembly. Disconnect the initiators from their mechanical linkages by removing attach pins. Remove the three initiators by removing mounting bolts. Install three 8-09672-1 simulators with mounting bolts. Connect simulators to mechanical linkages with attach pins. See figure 8-54 for an illustration showing the application of operational checkout equipment.

WARNING

Install individual safety pins, with warning streamers attached, in components containing ballistic devices as procedure progresses.

f. Remove the seat cushion. Remove the seat personal equipment; see figure 8-55 for procedure. Install and connect 8-96626 alternate cutter simulator; see figure 8-54. Install and connect 8-09682-801 drag chute ejector simulator; see figure 8-54. Install cover plate; see figure 8-55. Install and connect 8-96627 hesitation riser cutter simulators; see figure 8-54.

g. Remove the seat pan. Install safety pin in the gas generator (3) mounted on top of the foot and seat pan rotary actuator (4). Disconnect the gas generator from its mechanical linkage. Disconnect ballistic hose. Remove the gas generator; install 8-09682-805 simulator in its place. Connect simulator to mechanical linkages.

h. Remove the access plate at the rear of the seat pan. Remove emergency oxygen bottles; refer to T.O. 1F-106A-2-6 for procedure. Install safety pins (warning streamer attached) in seat occupant initiator (54) and canopy unlock initiator (10). Disconnect initiator (54) from its mechanical linkage by removing attach pin. Disconnect ballistic hose. Remove the initiator; install and connect simulator 8-09672-1 in its place.

i. Disconnect the initiator (10) from its mechanical linkage by removing attach pin. Disconnect ballistic hose. Remove the initiator mounting bracket attach bolts from the seat structure. Remove the initiator from its mounting bracket; install and connect simulator 8-09672-1 in its place.

j. Raise the seat rails of 8-96496 test stand to the upper position; install pip pins in test stand. Check that the triggering mechanism protractor is in 0° position.

8-179. Procedure.

a. Hoist the seat into position where seat slide blocks engage test stand seat rails. Lower the seat slowly. As the seat is lowered on the rails, check that the rotational thruster initiator triggering lever clears the tripping lug by a minimum of 0.07 inch.

b. Continue to lower seat. Check that seat's vertical thruster torque tube automatically indexes itself with the test stand's trigger mechanism.

c. Remove the bolts from the seat's flight stabilizer booms lower brackets; install test stand support brackets. Remove seat hoisting sling.

d. Install the locking device on the inertia reel power retraction actuating lever.

e. Check the canopy jettison (only) sequence as follows:

1. Depress the canopy jettison control handle (A) stowage lock on left side of seat; the control handle shall spring up to the operating position.
2. Check that safety pin (pip pin) is installed at forward edge of seat. Attempt to actuate the canopy jettison simulator by pulling aft on the canopy jettison control handle on the left side of the seat. The canopy jettison mechanical linkage shall not operate.
3. Attach loop assembly 8-96607 to canopy jettison control handle. Attach spring scale to loop assembly. Remove the safety pin from the forward edge of the seat. Pull aft on the spring scale until the handle has completed its full range of travel. The force required to operate the handle shall not exceed 25 pounds, the pin of the canopy jettison simulator shall extend a minimum of 0.75 inch, and the ejection control spool shall not rotate. Remove the spring scale. Remove loop assembly.
4. Place the canopy jettison control handle in the stowed position; check that canopy jettison simulator pin is in retracted position.

f. Check that seat adjustment actuator disconnects properly as follows:

1. Connect the seat adjustment actuator to the seat disconnect by installing attach pin.
2. Connect source of 0 to 500 psi dry filtered air or nitrogen to fitting at bottom of seat actuator.
3. Apply a downward pull of approximately 25 pounds to the seat adjustment actuator. Slowly turn on and increase pressure to 500 psi. The seat adjustment actuator shall disconnect at a maximum of 500 psi.
4. Reduce the pressure source of 0 psi. Disconnect pressure source from seat adjustment actuator; install dust cap on fitting at bottom of actuators.
5. Release the exactor pin lock on the seat actuator disconnect; reset exactor pin to fully extended position. Connect actuator to seat by actuator disconnect.
6. *(Deleted).*

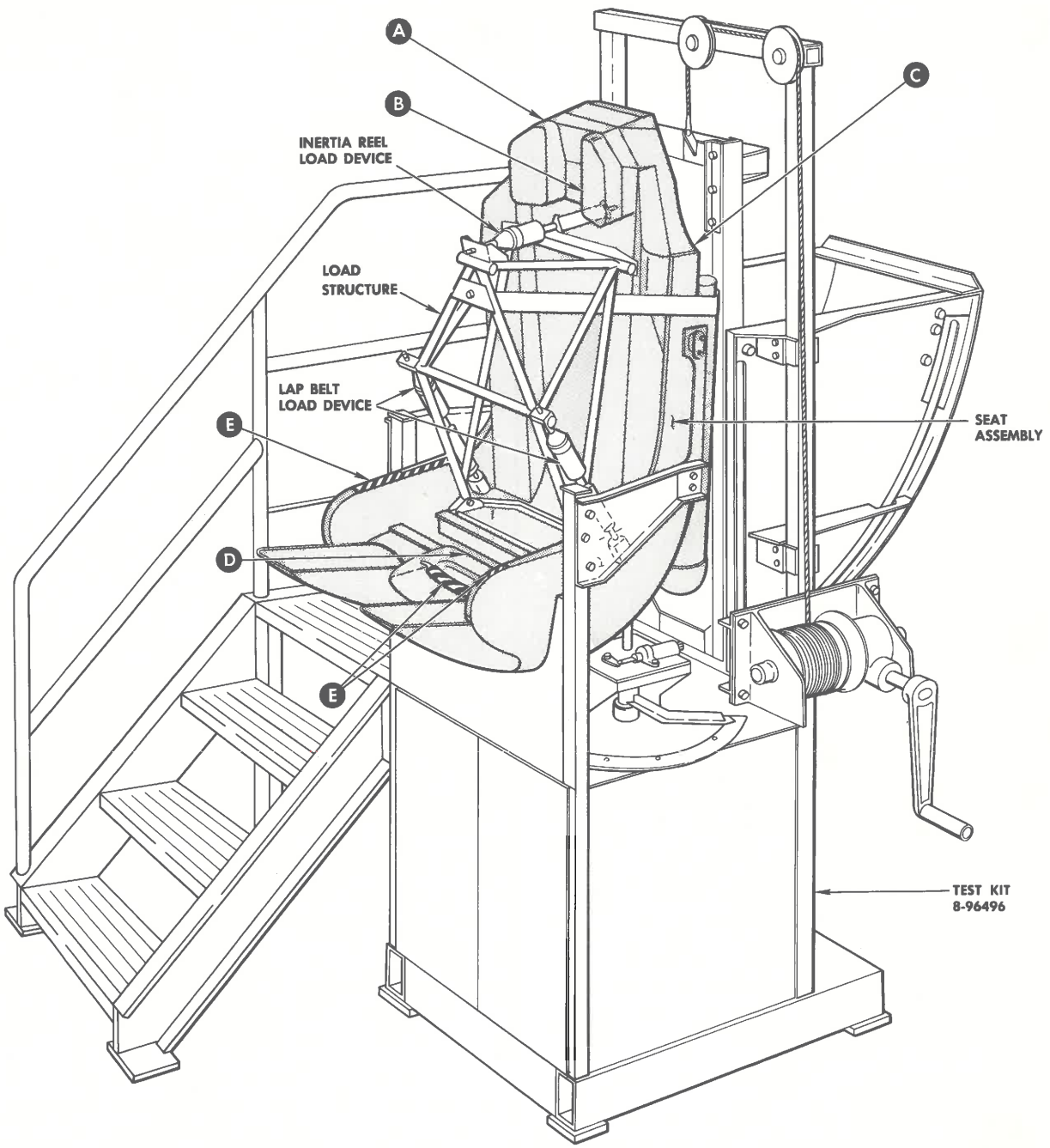


Figure 8-54. Rotational Upward Ejection Seat Operational Checkout Equipment (Sheet 1 of 3)

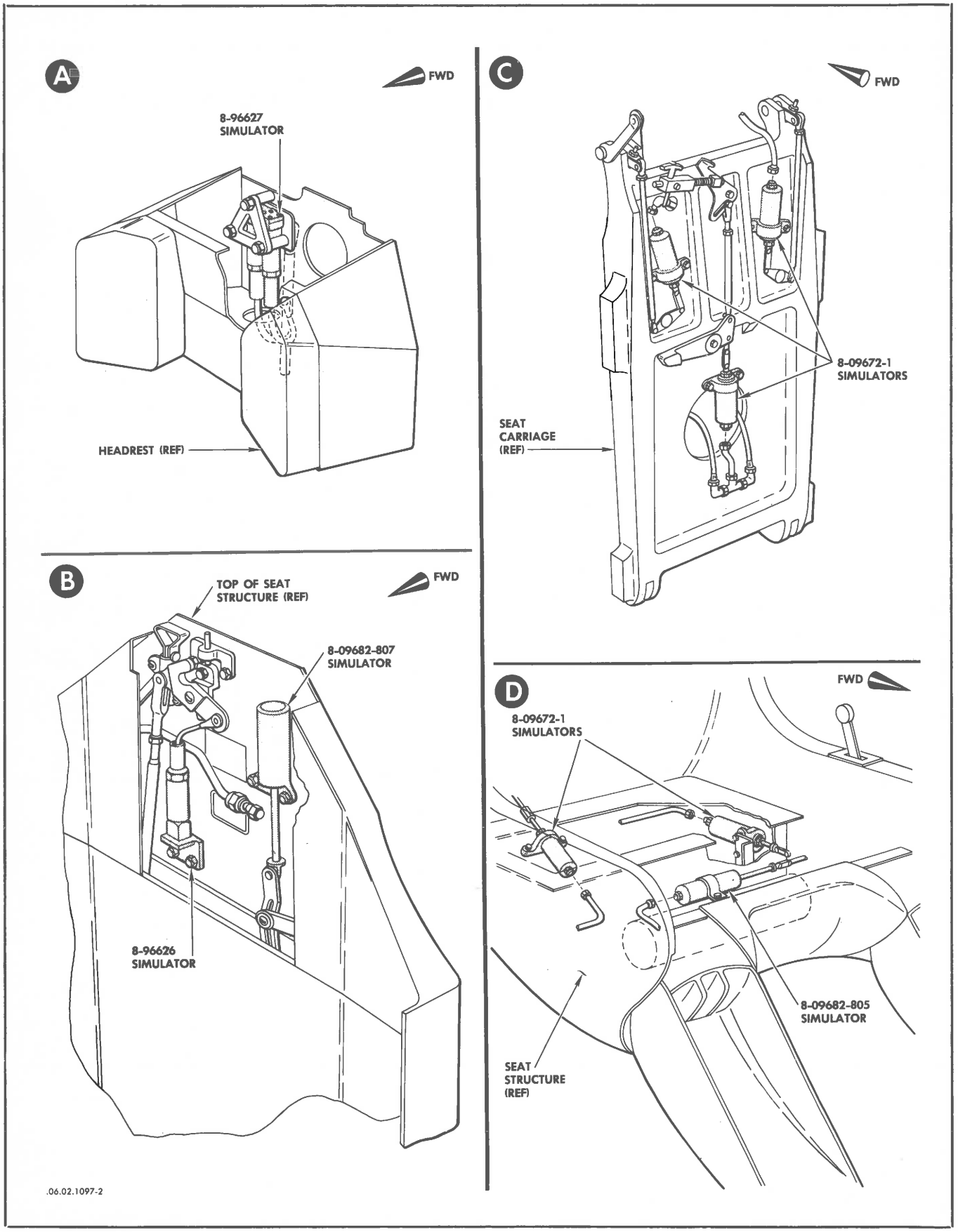


Figure 8-54. Rotational Upward Ejection Seat Operational Checkout Equipment (Sheet 2 of 3)

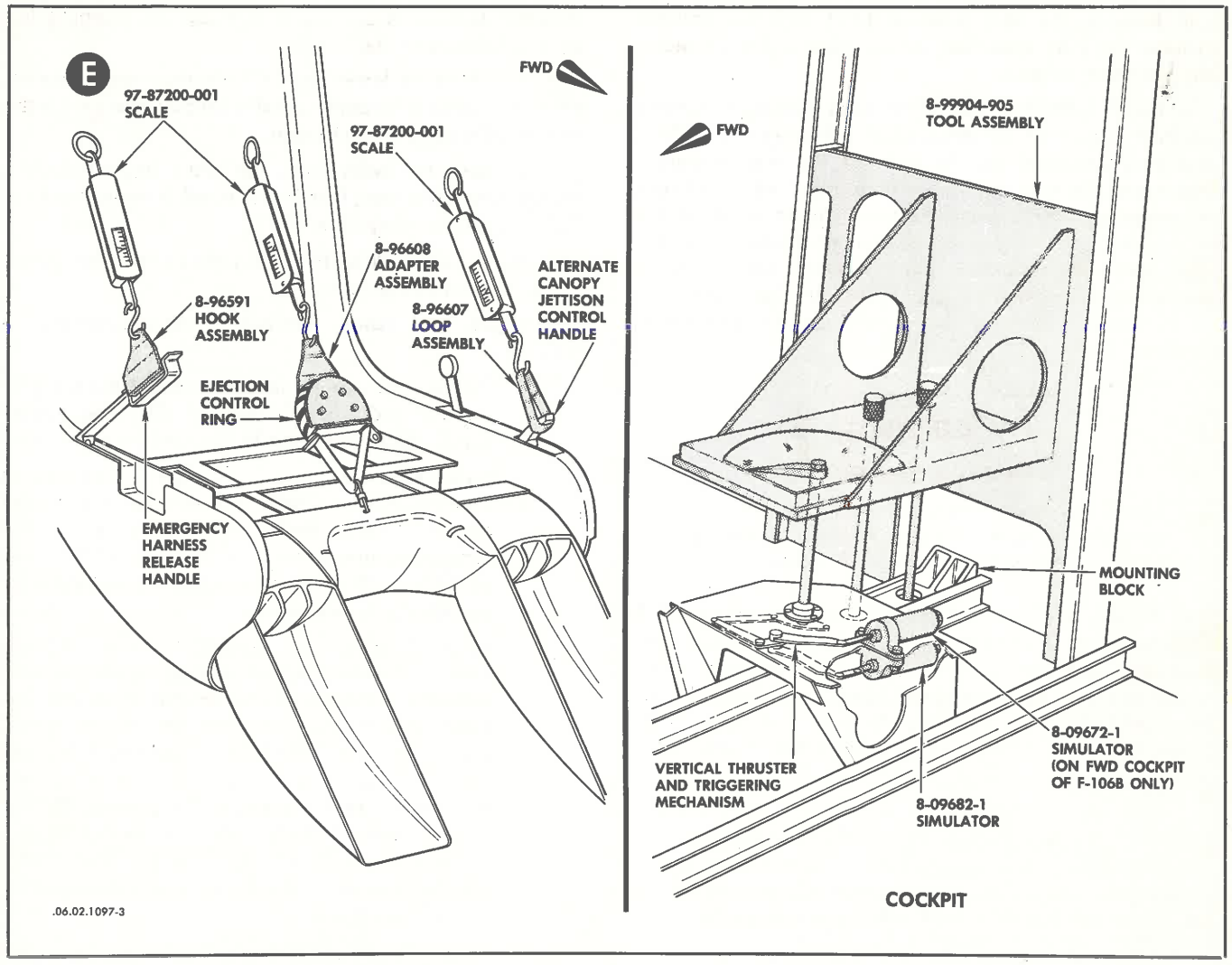


Figure 8-54. Rotational Upward Ejection Seat Operational Checkout Equipment (Sheet 3 of 3)

g. Install emergency oxygen bottles; refer to T.O. 1F-106A-2-6 for procedure. Check emergency oxygen system as follows:

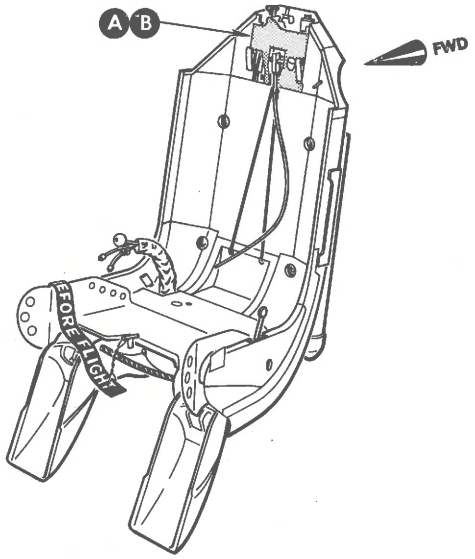
1. Check to insure that the pressure plugs are instaled on all outlets.
2. Attach the spring scale to the "Green Apple" portion of the personal leads extension (58).
3. Using the spring scale, pull straight up on the "Green Apple" to the end of the cable stroke.
4. The force required to pull up on the "Green Apple" shall be 20 (±5) pounds.
5. Remove the spring scale from the "Green Apple."

NOTE

Actuation of the "Green Apple" will actuate the oxygen toggle valve. This toggle valve must be reset immediately upon completion of this test. Charge emergency oxygen bottles to 1900 psi; refer to Section II of this manual for procedure.

h. Connect shoulder straps to disconnect fitting attached to inertia reel strap. Check the operation of the inertia reel as follows:

1. Actuate the inertia reel control handle to the "AUTOMATIC" position.
2. Slowly pull forward on the shoulder harness straps. The shoulder harness straps shall reel out freely. There shall be a retentive force on the shoulder harness of 3 pounds minimum.
3. Slowly release the tension on the shoulder harness. The inertia reel shall wind in the slack as the tension on the shoulder harness is eased off.
4. Suddenly pull forward on the shoulder harness. The inertia reel shall lock when the shoulder harness is pulled suddenly.



REMOVAL

a. Remove the pilot's parachute by reversing the procedures given in INSTALLATION steps "r" through "v" and "x" through "z" in reverse order.
b. Remove the survival packs by reversing the procedures given in INSTALLATION steps "l," "m," "o," and "p" in reverse order.
c. Remove the headrest by reversing the procedures given in INSTALLATION steps "e," "h," "i" through "k," and "n" in reverse order.
d. Remove cover plate attach screws. Pull shoulder strap disconnect attached to inertia reel strap and cover plate clear. See detail B.
e. Install maintenance safety pin (warning streamer attached) in drag chute ejector and alternate cutter.
f. Remove drag chute ejector and alternate cutter by reversing procedures given in steps "a" and "b" of INSTALLATION procedure.

PREPARATION (INSTALLATION)

Install maintenance safety pins (warning streamer attached) in alternate cutter, drag chute ejector, and in hesitation riser cutters (2).

WARNING

DO NOT HANDLE ALTERNATE CUTTER, DRAG CHUTE EJECTOR, OR HESITATION RISER CUTTERS UNLESS A SAFETY PIN IS INSTALLED IN EACH OF THESE BALLISTIC UNITS.

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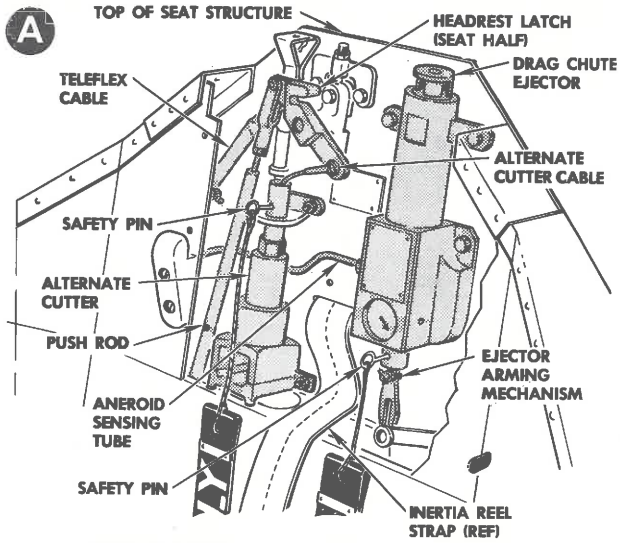
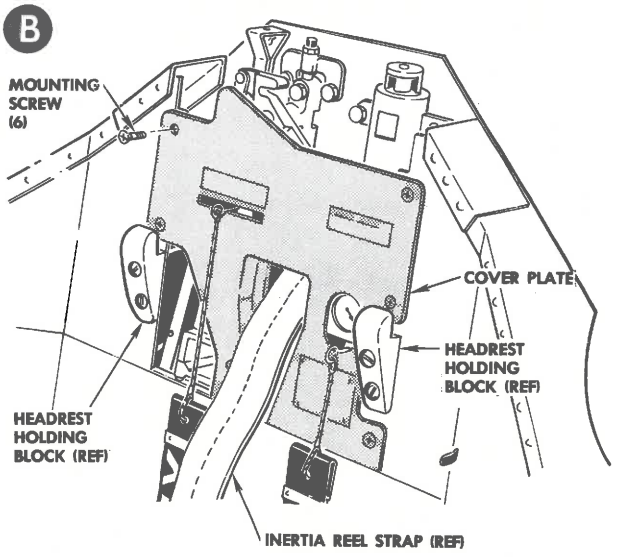


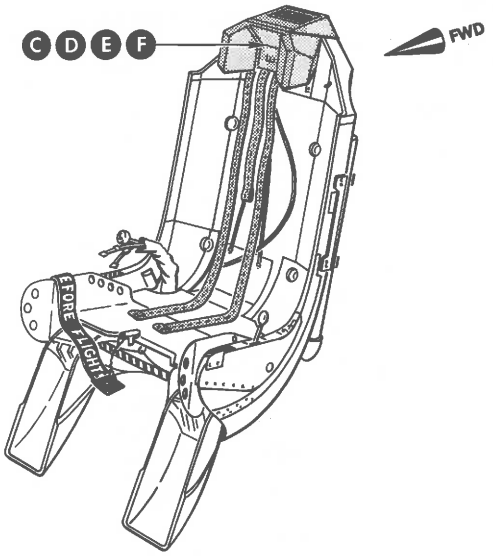
INSTALLATION

a. Install drag chute ejector on seat back structure with mounting bolts. Connect aneroid sensing tube to ejector. Connect ejector to arming mechanism with attach pin, washer, and cotter pin.
b. Position alternate cutter and install upper mounting bolts. Position bracket shown in detail K on rear face of seat structure and install lower mounting bolts. Connect alternate cutter cable to headrest latch (seat half) with attach pin, washer, and cotter pin.
c. Check that teleflex cable and push rod are properly connected to headrest latch (seat half). The top flat surface of the latch half shall be horizontal and parallel to the top of the seat structure.

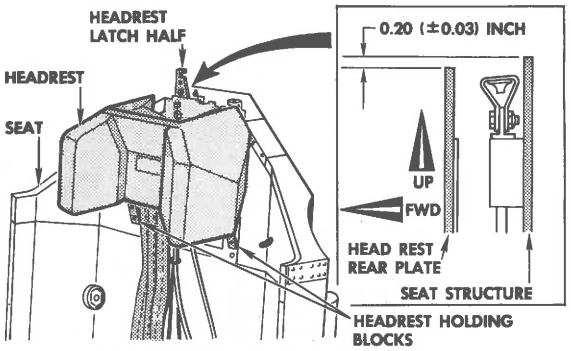


d. Install cover plate on seat structure with mounting screws.

Figure 8-55. Seat Personal Equipment, Replacement for Operational Check (Sheet 1 of 5)



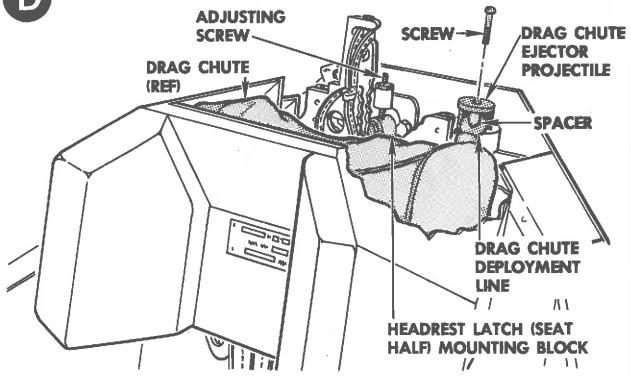
C



e. Check that headrest latch half is in open position; see detail E. Remove safety pin from alternate cutter. Place headrest (headrest lid removed) in position on seat structure.

f. Adjust headrest holding blocks so that top edge of headrest rear plate is 0.20 (±0.03) inch below and parallel to the top of seat structure.

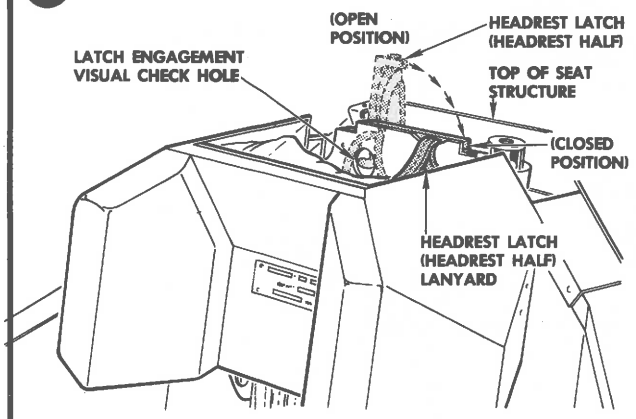
D



g. Check that adjusting screw is contacting headrest latch (seat half) mounting block.

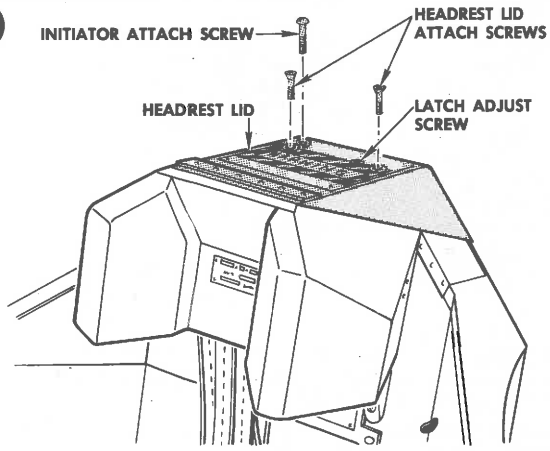
h. Connect drag chute deployment line to drag chute ejector projectile with screw and spacer.

E



i. Actuate headrest latch (headrest half) to closed position. Check that the latch halves are fully engaged, that the top flat surfaces of both latch halves are horizontal and parallel to the top of the seat structure, and that the lanyard attached to the upper latch half is not routed over the top surface of the upper latch half.

F



j. Position headrest lid on headrest and install lid attach screws. Remove latch adjust screw. Insert a probe through the screw hole until contact is made with headrest latch. Press firmly down on probe and mark insertion depth on probe. Remove probe. Make mark on latch adjust screw corresponding to mark on probe. Install latch adjust screw to marked depth.

k. Install initiator attach screw in corresponding receptacle; check that free play does not exist at this connection.

NOTE

IF FREE PLAY EXISTS AT CONNECTION, ADJUST THE FITTING CONTAINING THE RECEPTACLE TO ELIMINATE THIS CONDITION.

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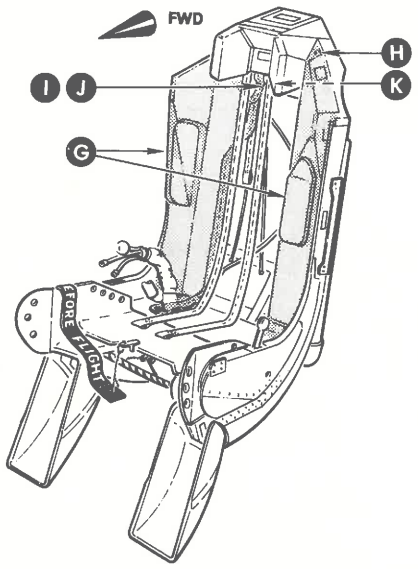
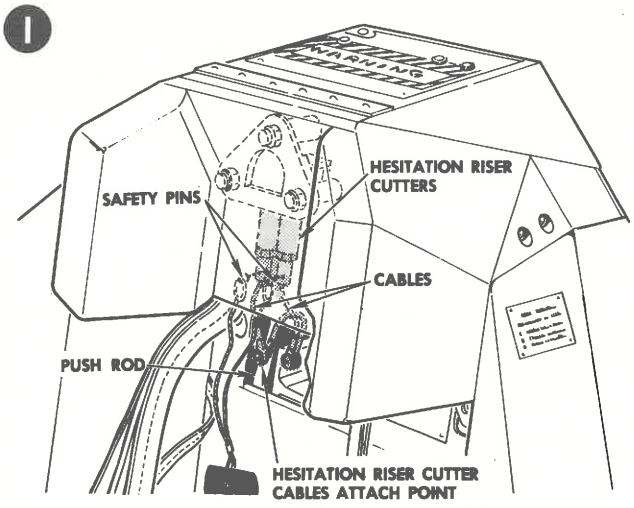
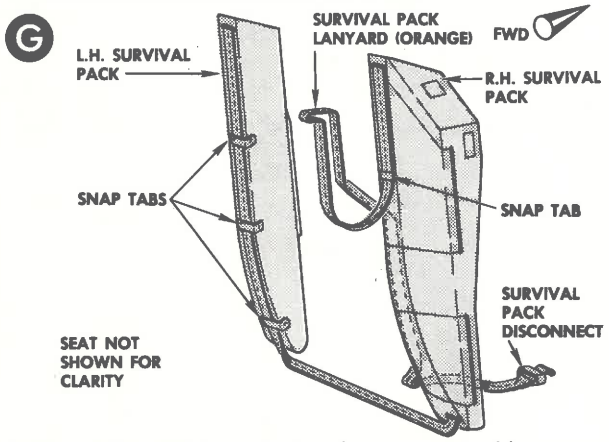
Figure 8-55. Seat Personal Equipment, Replacement for Operational Check (Sheet 2 of 5)

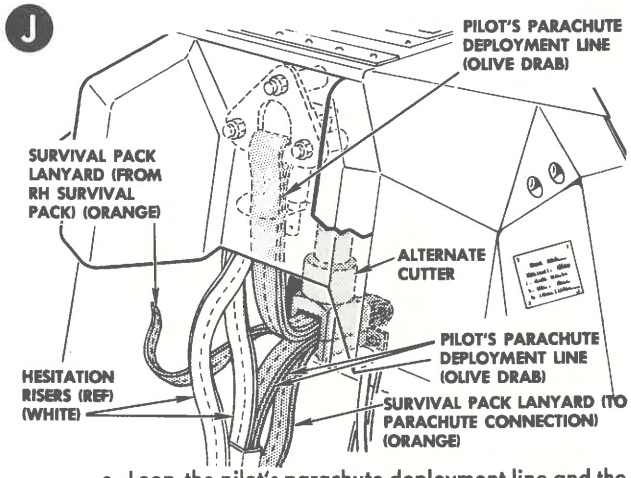




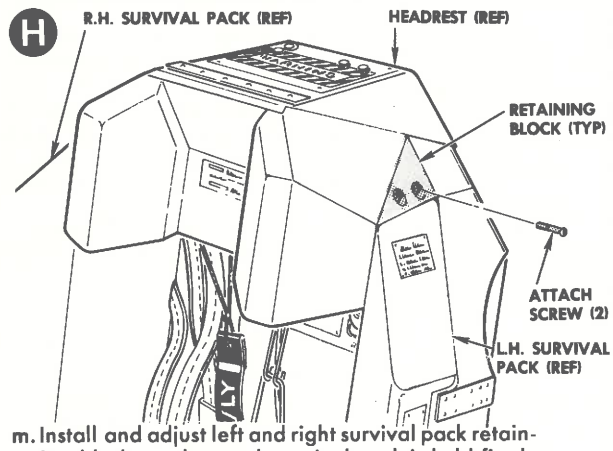
n. Connect hesitation riser cutter's cables (2) to push rod with attach screw and washer. Remove safety pins from hesitation riser cutters.



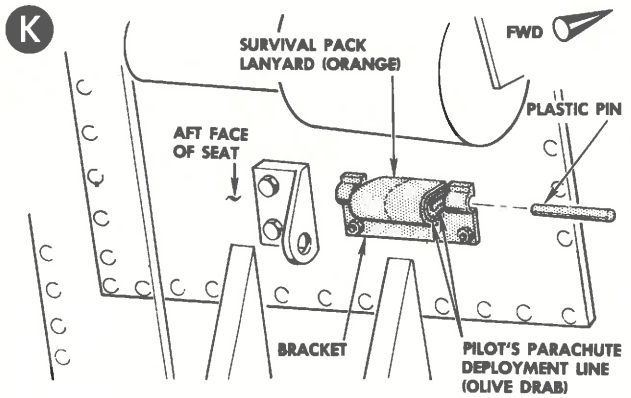
l. Place left and right survival packs in seat assembly. Route survival pack lanyards as shown and secure in place with snap tabs.



o. Loop the pilot's parachute deployment line and the survival pack lanyard together as shown and insert loop into alternate cutter.



m. Install and adjust left and right survival pack retaining blocks so that each survival pack is held firmly in the proper position.



p. Secure the loops of the parachute deployment line and the survival pack lanyard by inserting plastic pin in bracket mounted on aft face of seat.

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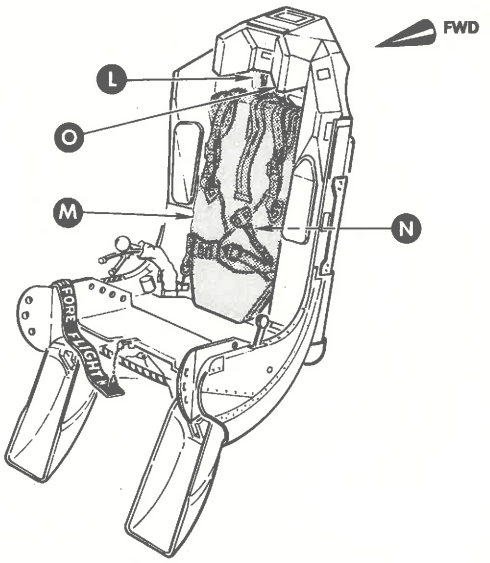
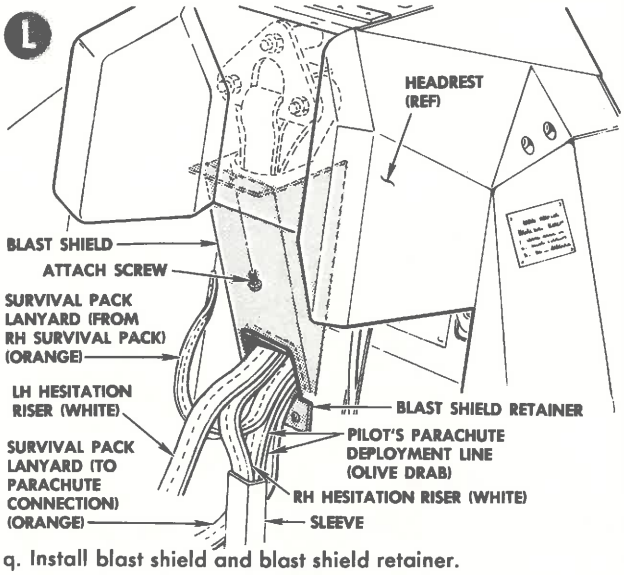
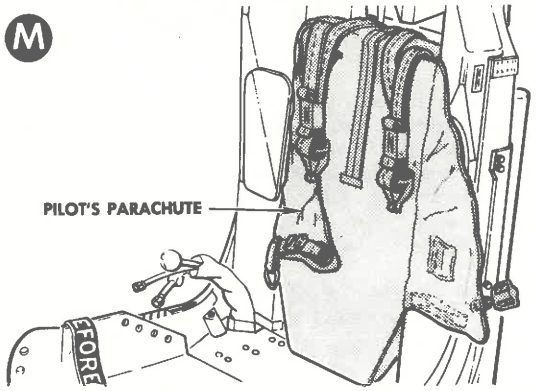
Figure 8-55. Seat Personal Equipment, Replacement for Operational Check (Sheet 3 of 5)

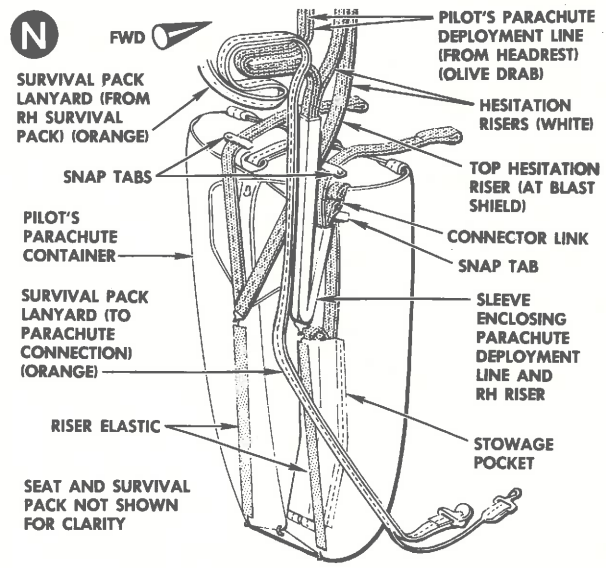




q. Install blast shield and blast shield retainer.

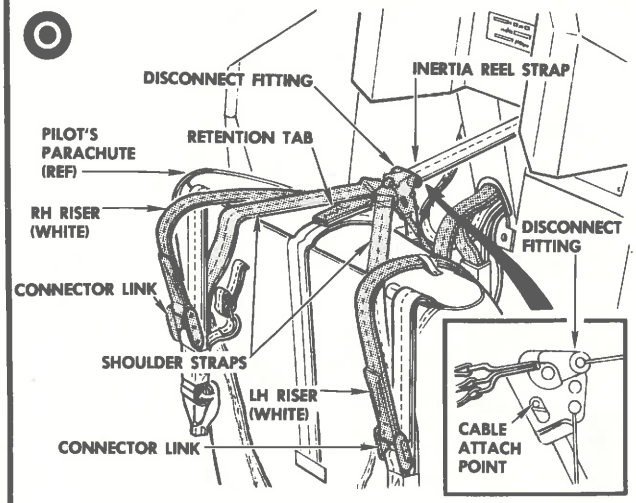


r. Place the pilot's parachute in the seat assembly; tilt the parachute forward.



s. Stow the pilot's parachute deployment line in stowage pocket; secure the top of this line to the parachute container with snap tab. Connect the pilot's parachute deployment line with connector link.

t. Connect top hesitation riser (at blast shield) to left riser elastic. Connect other hesitation riser to right riser elastic. Secure hesitation risers to parachute container with snap tabs.



u. Connect shoulder straps and parachute retention tab to disconnect fitting attached to inertia reel strap. Connect hesitation risers to the combination pilot's parachute and shoulder harness riser assembly with connector links.

NOTE

TO DISCONNECT SHOULDER STRAPS AND PARACHUTE RETENTION TAB, INSERT TOOL INTO SIDE OF DISCONNECT FITTING AND PRESS DOWN ON CABLE ATTACH POINT.

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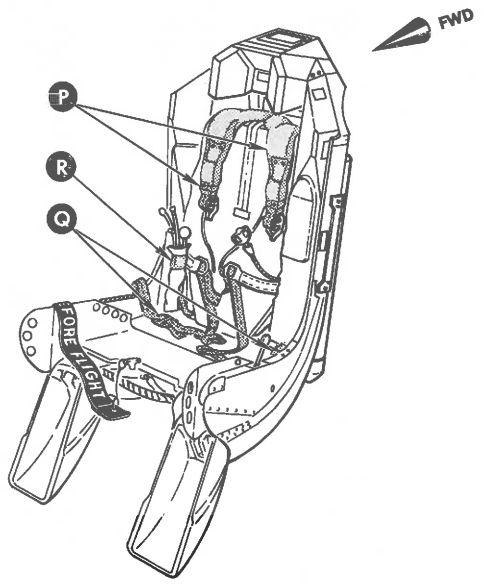
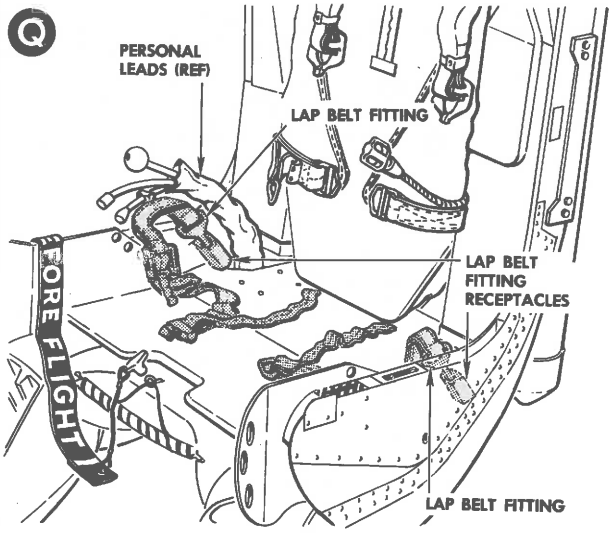
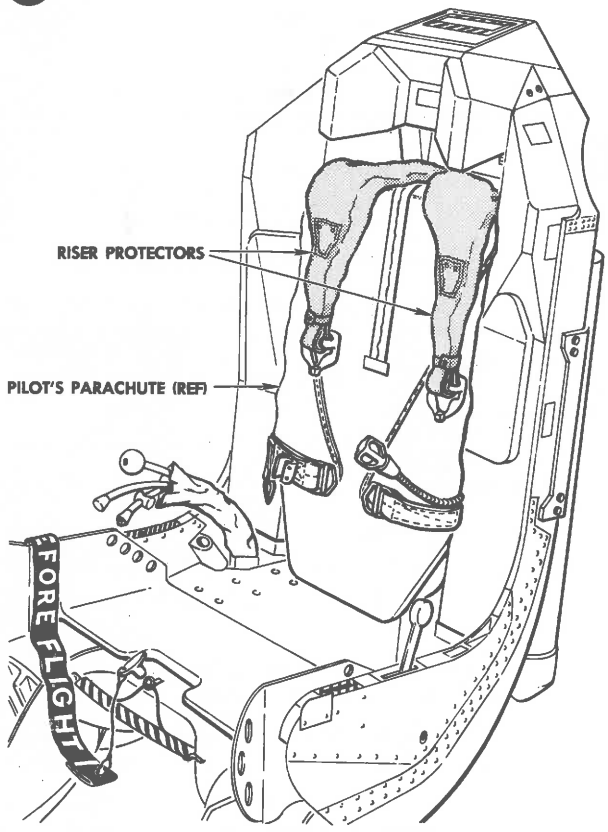
Figure 8-55. Seat Personal Equipment, Replacement for Operational Check (Sheet 4 of 5)

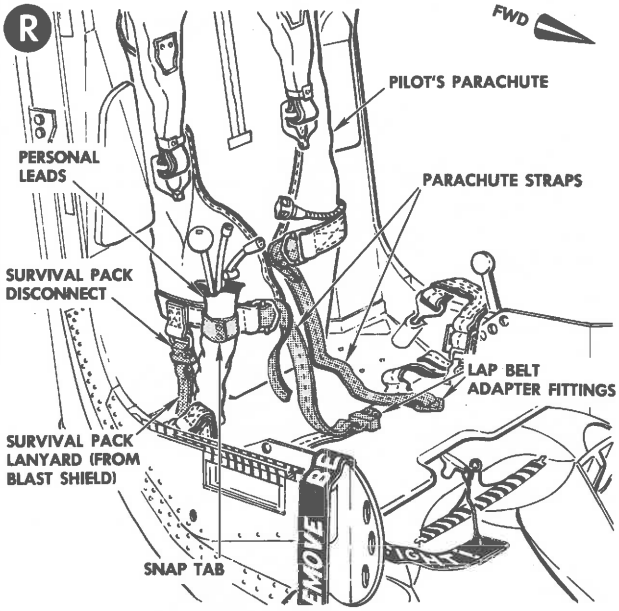




w. Insert left and right lap belt fittings into their respective receptacles.



v. Install riser protectors.



x. Place pilot's parachute in upright position. Connect left and right parachute straps to left and right lap belt adapter fittings.

y. Secure personal leads to right web of parachute container with snap tab.

z. Connect survival pack lanyard to pilot's parachute on right side by engaging the survival pack disconnect.

WARNING

MAKE SURE THAT ENTIRE LENGTH OF SURVIVAL PACK LANYARD FROM BLAST SHIELD IS ROUTED OUTBOARD OF PARACHUTE DEPLOYMENT LINE AND HESITATION RISERS AS SHOWN IN DETAIL N.

.06.02.1068-5

Figure 8-55. Seat Personal Equipment, Replacement for Operational Check (Sheet 5 of 5)

5. Cycle the inertia reel control handle to the "MANUAL" position and then back to the "AUTOMATIC" position. The inertia reel shall unlock.
6. Actuate the inertia reel control handle to the "MANUAL" position. The inertia reel shall lock.
7. Actuate the inertia reel control handle to the "AUTOMATIC" position. The inertia reel shall unlock (recycle the control handle if necessary).
8. Remove the locking device from the power retraction actuating lever on the inertia reel.
9. Pull the shoulder harness forward for the full range of travel.
10. While maintaining a pull on the shoulder harness of at least 150 pounds, trip the inertia reel power retraction cable.

WARNING

Do not trip the power retraction cable unless a 150 pounds minimum load is maintained on the shoulder harness.

The inertia reel shall apply a retracting load of 115 (±15) pounds to the shoulder harness.

11. Slowly release the tension on the shoulder harness and allow the shoulder harness to fully retract.
12. Reset the inertia reel power retraction spring.
13. *(Deleted).*

i. Check the operation of the seat-occupant disconnect mechanism, as follows:

1. Connect the seat-to-man personal leads (58) to the oxygen equipment assembly quick disconnect receptacle.
2. Connect the pressure source to the seat-occupant disconnect actuator (55). Remove the plug from the cap end of the actuator.
3. Apply a 300 (±10) pound load to the lap belt and a 240 (±10) pound load to the shoulder harness. The lap belt and the shoulder harness shall not disengage.
4. Turn on and increase the pressure to 500 psi maximum.

WARNING

Stand clear of the shoulder harness and the lap belt while applying pressure to the actuator.

The emergency harness release handle (71) shall remain in the stowed position. The right hand and the left hand lap belt disconnects (56) shall disengage. The shoulder strap disconnect (57) shall disengage. The personal leads disconnect (58) shall separate. The actuator pin shall lock in the engaged position.

5. Reduce the pressure on the seat-occupant disconnect actuator and then disconnect the pressure source from the actuator.
6. Release the piston rod lock on the seat occupant disconnect actuator. The spring loaded actuator piston rod shall fully extend. Install the plug in the cap end of the actuator.
7. Remove the "load" from the lap belt and from the shoulder harness.
8. Reconnect the lap belt and the shoulder harness fittings to their respective disconnect receptacles. Apply a 300 (±10) pound load to the lap belt and a 240 (±10) pound load to the shoulder harness.
9. Reconnect the personal leads to the oxygen equipment assembly.
10. Attach 8-96591 hook assembly to the emergency harness release handle (71). Attach spring scale to hook assembly.
11. Using the spring scale, pull up on the emergency harness release handle.

WARNING

Stand clear of shoulder harness and lap belt while applying pull on the emergency harness release handle.

NOTE

The pull on the handle shall be in the same arc as would normally be applied by the seat occupant.

The force required to pull the handle to the up and locked position shall not exceed 40 pounds. The headrest container mechanism latch (59) shall disengage. The outboard simulated hesitation riser cutter shall indicate 0.75 inch minimum travel. The simulated alternate cutter shall indicate 0.75 inch minimum travel. The right hand and the left hand lap belt disconnects (56) shall disengage. The shoulder strap disconnect (57) shall disengage. The personal leads disconnect (58) shall disengage.

12. Release the emergency harness release handle uplock and return the handle to the stowed position.
13. Remove the spring scale and the hook assembly from the handle.

j. Check the operation of the seat-occupant disconnect initiator, as follows:

1. Attach the spring scale to the seat-occupant disconnect lanyard initiator disconnect.
2. Using the spring scale, pull vertically on the disconnect until the disconnect separates. The simulated seat-occupant initiator shall indicate 0.75 inch minimum travel when the disconnect separates. The force required to pull the initiator pin 0.75 inch shall not exceed 60 pounds.
3. Remove the spring scale from the disconnect.

k. Check the heel fitting disconnect operation as follows:

1. Engage the ball coupling at the end of the left-hand foot retraction cable with the left heel fitting socket.
2. Attach the spring scale to the foot retraction cable.
3. Using the spring scale, pull straight down on the foot retraction cable until the cable separates from the heel fitting. The force required to separate the cable from the heel fitting shall be 20 (±5) pounds.
4. Repeat steps 1, 2, and 3 for right-hand cable and heel fitting.

l. Check seat ejection mechanism as follows:

1. Connect leads of AFCS test light to pins Nos. 2 and 3 of the ship-to-seat personal leads receptacle (29) at the bottom of the seat. The AFCS test light shall illuminate.
2. Release the ejection control ring (1) from the stowage clips and check to insure that pulling on the ejection control ring will not rotate the ejection control spool while the safety pin is installed.
3. Remove the safety pins from the ejection control spool and the rotational thruster initiator actuating mechanism. Attach 8-96608 adapter to ejection control ring.
4. Reattach the ejection control ring to the stowage clips.
5. Using the spring scale, slowly pull up on the ejection control ring until the ejection control ring mechanism safety locks (9) prevent further travel of the ejection control ring.

NOTE

Pull up on the ejection control ring in approximately the same arc as would normally be applied by the seat occupant.

The force required to release the ejection control ring from the stowage clips shall be 25 (±5) pounds. The maximum force required to actuate any linkage operated by the ejection control spool shall not exceed 60 pounds. The AFCS switch test light shall extinguish between 0.20 and 0.86 inch travel of the ejection control ring cable. The simulated gas generator initiator and the simulated canopy unlock initiator shall each indicate a minimum of 0.75 inch travel by the time the foot pan safety locks engage to prevent further cable travel. The vertical thruster triggering torque tube (21) shall not move.

6. Manually check for freedom of movement of leg guards (8). Manually raise foot pans (7) to the up and locked position. The ejection control ring mechanism safety locks (9) shall disengage.
7. Continue to pull on the ejection control ring (1) until the full travel of the ejection control ring cable has been reached. The force required to pull the ejection control ring through the full range of travel of the ejection control ring cable shall not exceed 60 pounds. *Applicable to F-106A airplanes and aft seat of F-106B airplanes,* the simulated vertical thruster initiator shall indicate 0.75 inch minimum travel at maximum travel of the ejection control ring cable. *Applicable to forward seat of F-106B airplanes,* the simulated gas generator initiator shall indicate 0.75 inch minimum travel prior to load being applied to the simulated vertical thruster initiator which shall indicate 0.75 inch minimum travel at maximum travel of the ejection control ring cable. *Applicable to all seats,* the total ejection control ring cable travel shall be 3.83 (+0.30 −0.00) inches.
8. Unlock the test stand seat rails and slowly move the rails downward until the anti-rotation locks (31) just strike the tripping lugs (30) on the test stand seat rails. The striking overlap of the left and right anti-rotational locks (31) shall be 0.18 inch minimum.

NOTE

Shift seat rails to left when checking righthand lock.
Shift seat rails to right when checking lefthand lock.

The striking faces of the anti-rotational locks shall align and make full contact with tripping lugs during this check.

9. Raise test stand seat rails approximately 2 inches then slowly lower rails until tripping lever for rotational thruster initiator is 0.06 inch from tripping lug (32) on seat rails. Both anti-rotational locks (31) shall be full disengaged with 0.06 inch minimum clearance between locks and tripping lugs (30). Continue to lower seat rails until the tripping lever contacts lug (32). The striking overlap of the tripping lever shall be a minimum of 0.18 inch.

NOTE

Shift seat rails to right when checking striking overlap of tripping lever.

10. Note vertical position of test stand seat rails relative to seat structure; lower rails 2.30 inches. The simulated rotational thruster initiator (33) shall indicate 0.75 inch minimum travel. Continue to lower seat rails to full down position.
11. Slowly rotate the test stand seat rails to 63° (±0.5°). The simulated stabilizer booms initiator (38) shall indicate 0.38 inch minimum travel.

CAUTION

While rotating test stand seat rails, make sure that lug (48) located at top left of seat carriage does not cause the drag chute arming mechanism (49) to bottom out before 80° maximum rotation of rails is reached.

12. Continue to rotate the test stand seat rails; at 71° maximum rotation of the rails, the simulated stabilizer booms initiator (38) shall indicate 0.75 inch minimum travel.
13. Disconnect the simulated stabilizer booms initiator (38) from attaching mechanical linkage by removing attach pin.
14. Continue to rotate the test stand seat rails; at 73° (±0.5°) rotation of the rails, the drag chute arming mechanism shall cock. The simulated rocket-breakaway bolts initiator (42) travel shall not exceed 0.05 inch at this time.
15. Continue to rotate test stand seat rails; at 77° (±0.5°) rotation of the rails, the simulated rocket-breakaway bolts initiator (42) shall indicate 0.38 inch travel.
16. Continue to rotate test stand seat rails; at 80° maximum rotation of the seat rails, the simulated rocket-breakaway bolts initiator (42) shall indicate 0.75 inch minimum travel.

17. Return the test stand seat rails to the full down position. The simulated drag chute ejector shall indicate 0.94 inch minimum travel when the test seat rails are returned to the full down position.

m. Disconnect the test stand support brackets from both flight stabilizer boom lower brackets. Reinstall bolts in flight stabilizer boom lower brackets. Disconnect AFCS test light from seat. Check to see that all connections between test stand and seat have been disconnected.

n. Attach hoisting sling to seat. Hoist seat clear of test stand.

NOTE

When the seat is removed from the test stand, the vertical thruster triggering torque tube at the bottom of the seat shall disengage from the seat.

o. Reinstall the vertical thruster triggering torque tube at the bottom of the seat and return the seat ejection control spool to the normal (unactuated) position. Install the pip pin of 8-96012-29 maintenance safety pin assembly and the pilot's ground safety pin 8-95960.

p. Remove all test equipment from the seat. Reinstall all the ballistic units and parts of the seat that have been removed, activated, or disengaged by reversing the procedure in paragraph 8-178.

WARNING

Mechanically actuated ballistic units shall have an individual safety pin (with warning streamer attached) installed before and during installation. Make sure that no preload exists when connecting these units to the seat mechanical linkages. Make sure that the correct hose is connected to the right unit. After installation of these units is complete, remove individual safety pins. Failure to remove these safety pins will prevent seat ejection.

q. After re-installing the headrest with lid removed, carefully check for the correct engagement of the headrest latch assembly as follows:

1. The top flat surface of the latch half which attaches to the seat shall be horizontal and parallel to the top edge of seat.
2. The top flat surface of the upper latch half which attaches to the headrest shall be horizontal and parallel to the top edge of the seat and the two latch halves shall be engaged correctly.
3. The lanyard from the upper latch half shall pass forward from the retaining pin at the end of the latch half without passing over the top of the arm.

r. Install the headrest lid with latch adjust screw removed as outlined in figure 8-55. Insert a suitable probe through the latch adjust screw hole until contact is made with the upper headrest latch half, then hold firmly downward while marking the depth of insertion of the tool. Remove the tool and install the latch adjust screw to the same depth to insure retaining correct engagement of the latch halves.

WARNING

Failure to install latch adjust screw to proper depth may result in malfunction of headrest assembly.

s. Install seat in 8-96497 seat handling dolly. Secure seat actuator and vertical thruster to dolly mounting block. Do not install the cover which encloses the seat.

t. Check the seat ejection components in the cockpit (with seat removed) as follows:

1. *Applicable to cockpit of F-106A airplanes and aft cockpit of F-106B airplanes.* Disconnect the ballistic hose from the M-29 initiator (23). Install a dust type cap in the ballistic hose and on the initiator fitting. Disconnect the initiator from the mechanical linkage by removing attach pin. Remove the initiator mounting bolts and remove the initiator. Install an 8-09682-1 simulator. Connect simulator to mechanical linkage with attach pin.
2. *Applicable to forward cockpit of F-106B airplanes,* install individual safety pin with warning streamer attached in the gas generator M-3A1 initiator (22) mounted over the M-29 initiator. Disconnect the ballistic hose from each initiator; install a dust type cap in each hose and on each initiator fitting. Disconnect each initiator from its mechanical linkage by removing attach pins. Remove the initiator mounting bolts and remove both initiators. Install an 8-09672-1 simulator and an 8-09682-1 simulator as shown in figure 8-54. Connect the simulators to the mechanical linkage with attach pins.
3. Engage the 8-99904-905 cockpit check gage in the airplane's seat rails and then slowly slide the

check gage down the rails. The go-no-go portion of the check gage shall indicate the correct location of the rotational thruster tripping lug (32), the anti-rotational lock tripping lugs (30), and the ballistic hose quick-disconnect coupling(s) (28). The check gage shall clear all cockpit equipment. The vertical thruster and seat adjustment actuator locating portion of the check gage shall indicate the correct location of the vertical thruster and seat actuator mounting sockets. The probe on the check gage shall smoothly enter the vertical thruster triggering mechanism and shall not pre-load the simulated initiator(s).

4. *Applicable to cockpit of F-106A airplanes and aft cockpit of F-106B airplanes,* slowly rotate the torque wrench, on the check gage, clockwise until the check gage probe has rotated 42 degrees. The force required to rotate the probe shall not exceed 45 inch-pounds at any point during probe rotation. The simulated vertical thruster initiator shall indicate 0.75 inch minimum travel at 42 degrees maximum rotation of the probe.
5. *Applicable to forward cockpit of F-106B airplanes,* slowly rotate the torque wrench, on the check gage, clockwise until the check gage probe has rotated 42 degrees. The force required to rotate the probe shall not exceed 45 inch-pounds at any point during probe rotation. The simulated gas generator initiator shall indicate 0.75 inch minimum travel at 42 degrees maximum rotation of the probe. Continue to slowly rotate the torque wrench until the check gage probe has rotated 85.5 degrees. The force required to rotate the probe shall not exceed 45 inch-pounds at any point during probe rotation. The simulated vertical thruster initiator shall indicate 0.75 inch minimum travel at 85.5 degrees maximum rotation of the probe.
6. Continue to slowly rotate the torque wrench, on the check gage, clockwise until the check gage probe has rotated 102 degrees minimum. The force required to rotate the probe shall not exceed 45 inch-pounds at any point during probe rotation.
7. Remove the check gage from the cockpit.
8. Remove the simulator(s) and install the initiator(s) by reversing the procedure given in applicable steps "1" or "2". Refer to WARNING at end of step "p".

u. Install seat in airplane; see figure 8-48 for procedure.

CAUTION

Applicable to forward seats of F-106B airplanes. Hold the lever of the air blast shield release mechanism in the up and aft position while the seat is being lowered into the installed position. Position and align the fittings of the blast shield retainer cables with the fittings attached to the aft face of the seat tracks; then operate the lever of the release mechanism forward and down to engage cable fittings.

v. Perform an operational check with the seat installed in the airplane; refer to paragraph 8-121 for procedure.

REPLACEMENT

8-180. REMOVAL, M-3A1 CANOPY UNLATCH THRUSTER.

Applicable to F-106A airplanes. All safety precautions in paragraph 8-154 must be observed when work is performed on or in the vicinty of the M-3A1 thruster.

a. Disconnect ballistic hose from each end of thruster. Cap hoses and thruster fittings.

b. Remove nut and spacer from end of thruster extension.

c. Remove two bolts from thruster trunnion mounting plates and remove plates.

d. Remove thruster and extension as unit.

e. If thruster is to be replaced, remove thruster extension from thruster.

8-181. INSTALLATION, M-3A1 CANOPY UNLATCH THRUSTER.

Applicable to F-106A airplanes. All safety precautions in paragraph 8-154 must be observed when work is being performed on or in the vicinity of the M-3A1 thruster.

a. Install thruster extension on thruster; use a new lock washer.

b. Insert the thruster extension through crank pin of canopy latch mechanism.

c. Install trunnion mounting plates with bolts.

d. Connect ballistic hoses to thruster. Make sure that the elbow fitting is made of steel.

e. Install spacer, nut, and cotter pin on thruster shaft. Check canopy latch hook-to-roller clearance with canopy unlatched; see figure 8-20 for procedure.

8-182. REMOVAL, T-25 CANOPY UNLATCH THRUSTER.

Applicable to F-106B airplanes. All safety precautions in paragraph 8-154 must be observed when work is performed on or in the vicinity of a T-25 thruster.

a. Disconnect ballistic hoses from thruster. Cap hoses and thruster fittings.

b. Disconnect thruster adapter assembly from canopy latch hammer by removing cotter pin, washer, and clevis pin.

c. Remove two bolts from thruster trunnion mounting plates. Remove thruster.

d. If a replacement thruster is to be installed, remove adapter assembly from thruster shaft.

8-183. INSTALLATION, T-25 CANOPY UNLATCH THRUSTER.

Applicable to F-106B airplanes. All safety precautions in paragraph 8-154 must be observed when work is performed on or in the vicinity of a T-25 thruster.

a. Install adapter assembly on thruster shaft; do not tighten jam nut or lockwire assembly.

b. Install thruster and thruster trunnion mounting plates with two bolts.

c. Make sure that canopy hold-open supports are installed. Depress canopy latch interlock, located under right cockpit sill, and operate latches to full locked position.

WARNING

Applicable to airplanes equipped with electric canopy actuators. Operating canopy latches to unlocked position disengages the electric canopy actuator clutch and the canopy will fall unless canopy hold-open supports are installed.

d. Connect thruster shaft adapter assembly to canopy latch hammer by inserting clevis pin.

e. Adjust forked fitting of adapter to provide from 0.03 to 0.09 inch clearance between the striking face of the hammer and the latch mechanism lever. Tighten jam nut.

f. Lock wire the forked fitting, the jam nut, and the adapter.

g. Connect thruster shaft adapter to canopy latch hammer with clevis pin, washer, and cotter pin.

h. Connect ballistic hoses to thruster.

i. Operate canopy latches to unlocked position.

8-184. REPLACEMENT, 8-06437-3 WIRE CUTTER.

Applicable to F-106A airplanes. The wire cutter must be replaced whenever the canopy jettison system has been fired.

a. Remove old wire cutter by standard shop procedures.

b. Mount new wire cutter assembly to airplane structure with bulkhead type mounting nuts. Tighten nuts and install lockwire.

c. Install permanent splice to one side of severed electrical harness; refer to T.O. 1F-106A-2-10 for procedure. Install vinyl sleeve approximately 5 inches long on splice wires. Thread splice wires through hole in wire cutter until center (lengthwise) of vinyl sleeve is at hole in cable cutter. Complete the permanent splice; refer to T.O. 1F-106A-2-10 for wiring schematics.

d. Connect new ballistic hose to wire cutter.

8-185. REMOVAL, T-3 WIRE CUTTER.

Applicable to F-106B airplanes. All safety precautions in paragraph 8-154 must be observed when work is performed on or in the vicinity of a T-3 wire cutter.

a. Disconnect ballistic hose from wire cutter. Cap hose and fitting of cutter.

b. Cut lockwire and remove safety clip from striker block retaining nut.

c. Remove retaining nut and striker block. Pull electrical harness clear of assembly.

d. Cut lockwire and remove bulkhead type mounting nut. Remove remainder of wire cutter assembly.

8-186. INSTALLATION, T-3 WIRE CUTTER.

Applicable to F-106B airplanes. All safety precautions in paragraph 8-154 must be observed when work is performed on or in the vicinity of a T-3 wire cutter.

a. Mount wire cutter assembly to airplane structure with bulkhead type mounting nuts. Tighten nuts and install lockwire.

b. Remove safety clip, striker block retaining nut, and striker block.

c. *Applicable if canopy has been jettisoned,* install permanent splice to one side of severed electrical harness. Refer to T.O. 1F-106A-2-10 for splicing procedure. Install vinyl sleeve approximately 5 inches long on splice wires. Complete the permanent splice; refer to T.O. 1F-106A-2-10 for wiring schematics.

d. Insert electrical harness. Install striker block and striker block retaining nut. Install safety clip and lockwire.

e. Connect ballistic hose to wire cutter.

8-187. REMOVAL, M-3A1, M-27, OR M-29 INITIATOR.

All safety precautions in paragraph 8-154 must be observed when work is performed on or in the vicinity of initiators.

a. Install a safety pin in initiator being removed.

b. Disconnect the system linkage from the initiator.

c. Disconnect ballistic hose(s) from initiator; cap hose and initiator fitting(s).

d. Remove two initiator mounting bolts and remove initiator.

WARNING

Do not handle initiators unless a safety pin is installed.

8-188. INSTALLATION, M-3A1, M-27, OR M-29 INITIATOR.

All safety precautions in paragraph 8-154 must be observed when work is performed on or in the vicinity of initiators.

NOTE

An M-27 initiator may be substituted for any M-3A1 initiator. An M-3A1 initiator may be substituted for any M-27 initiator except for initiators (33), (38), and (42) which are mounted on the seat carriage. Numbers within parenthesis denote items shown on figures 8-49 and 8-51.

a. Make certain that a safety pin is installed in the replacement unit. Visually inspect initiator to assure that less than four threads are showing between the initiator chamber and the initiator mounting cap. If four threads or more are showing, replace initiator with a like serviceable unit.

WARNING

Do not attempt to alter initiator to meet requirements or serious injury to personnel and/or damage to airplane may result.

b. Determine that initiator mechanism is properly assembled by removing safety pin and positioning the initiator so the initiator pin points down. If initiator pin falls out, replace initiator. If initiator pin remains engaged, install safety pin and proceed with installation.

c. Attach unit to the structure by means of the mounting lugs and mounting bolts.

d. Connect initiator pin to mechanical linkage.

WARNING

Maximum misalignment of hole in initiator pin to attachment hole in mechanical linkage is 0.03 inch.

e. Connect ballistic hose(s) to initiator.

f. Remove safety pin from initiator.

g. Record in AF Form 781, initiator serial number and location of initiator in system.

8-189. REMOVAL, M-5A1 OR M-28 INITIATOR.

All safety precautions in paragraph 8-154 must be observed when work is performed on or in the vicinity of an initiator.

a. Disconnect ballistic hoses from initiator. Cap hoses and initiator fittings.

b. Remove mounting bolts, initiator, and mounting adapter.

8-190. INSTALLATION, M-5A1 OR M-28 INITIATOR.

All safety precautions in paragraph 8-154 must be observed when work is performed on or in the vicinity of an initiator.

NOTE

An M-28 initiator may be substituted for any M-5A1 initiator. An M-5A1 initiator shall not be substituted for the M-28 initiator mounted on the aft right hand seat rail of F-106B airplanes.

a. Install mounting adapter and initiator with mounting bolts.

b. Connect ballistic hoses to initiator.

c. Record in AF Form 781, initiator serial number and location of initiator in system.

8-191. REMOVAL, SEAT ADJUSTMENT ACTUATOR.

a. Remove the seat from airplane; see figure 8-48 for procedure.

b. Disconnect electrical harness from seat.

c. Remove attach pin and remove actuator.

8-192. INSTALLATION, SEAT ADJUSTMENT ACTUATOR.

a. Position actuator and install attach pin.

b. Connect electrical harness to seat.

c. Install seat in airplane; see figure 8-48 for procedure.

8-193. REMOVAL, VERTICAL THRUSTER.

All safety precautions in paragraph 8-154 must be observed when performing work on or in the vicinity of this thruster.

a. Remove the seat from the airplane; see figure 8-48 for procedure.

b. Disconnect the electrical harness from the seat.

c. Remove the atttach pin and remove thruster.

8-194. INSTALLATION, VERTICAL THRUSTER.

All safety precautions in paragraph 8-154 must be observed when performing work on or in the vicinity of this thruster.

a. Position the thruster and install attach pin.

b. Connect electrical harness to seat.

c. Install seat in airplane; see figure 8-48 for procedure.

8-195. REMOVAL, ROTATIONAL THRUSTER.

All safety precautions in paragraph 8-154 must be observed when performing work on or in the vicinity of either rotational thruster.

a. Remove the seat from the airplane; see figure 8-48 for procedure.

b. Disconnect the electrical harness from the seat.

c. Disconnect the ballistic hose from the thruster. Install dust caps in hose and on thruster fitting.

d. Remove upper and lower attach pins and remove thruster.

8-196. INSTALLATION, ROTATIONAL THRUSTER.

All safety precautions in paragraph 8-154 must be observed when performing work on or in the vicinity of either rotational thruster.

a. Position the thruster and install upper and lower attach pins; make sure the anti-rotational lock is engaged when installing upper attach pin.

b. Connect the electrical harness to the seat.

c. Connect the ballistic hose to the thruster.

d. Install seat in airplane; see figure 8-48 for procedure.

8-197. REPLACEMENT, PERSONAL EQUIPMENT.

All safety precautions in paragraph 8-154 must be observed when replacing personal equipment items. These items are the headrest, the drag chute, the pilot's parachute and the survival packs. See figure 8-55 for replacement procedure.

8-198. REPLACEMENT, DRAG CHUTE EJECTOR.

All safety precautions in paragraph 8-154 must be observed when replacing the drag chute ejector.

a. Remove the blast shield, the headrest, and access plate to gain access to the drag chute ejector. See figure 8-55 for procedure.

b. Disconnect mechanical linkages from the ejector.

c. Remove mounting bolts and remove ejector.

d. Installation is essentially the reverse of removal.

8-199. REMOVAL, SEAT LAP BELT.

a. Disconnect each half of the lap belt from the parachute.

b. Insert screwdriver at forward edge of lap belt receptacle, press down on movable portion of receptacle, pull ball end of lap belt inboard and up to remove lap belt half. Repeat procedure to remove other half of lap belt.

8-200. INSTALLATION, SEAT LAP BELT.

a. Install each half of the lap belt by inserting lap belt ball end into the seat lap belt receptacle; press ball end down and outboard. Pull up and inboard on lap belt; the lap belt shall remain engaged.

NOTE

That half of the lap belt which includes the belt latching mechanism shall be installed on the right side.

b. Connect each half of the lap belt to the parachute.

c. Press down firmly on the quick-disconnect fitting of the personal leads bundle to re-engage locking mechanism.

CAUTION

The locking mechanism of the personal leads bundle is released when the lap belt is removed and/or installed.

d. Check that personal leads bundle is properly engaged and locked in place by applying a 10 pound (approximate) upward pull to the bundle.

Section IX

EMERGENCY ARRESTING SYSTEM

Contents *Page*

DESCRIPTION

9-1. GENERAL.

Applicable to F-106A airplanes 59-001 and subsequent; and 56-453 thru 58-798 after incorporation of TCTO 1F-106(J)-627 or TCTO 1F-106-579A. Applicable to F-106B airplanes 57-2542 and subsequent; and 57-2507 thru 57-2541 after incorporation of TCTO 1F-106(J)-627 or TCTO 1F-106-579A. The emergency arresting system is used after the normal arresting devices such as speed brakes, drag chute, and wheel brakes have failed to stop the airplane. As the airplane approaches the end of the runway, the system's spring steel tail hook is extended by the pilot, the tail hook wear plate is held against the surface of the runway by spring action, and the hook cable shoe engages a cable stretched across the runway. An energy absorbing device attached to each end of the cable provides the cushioned force required to stop the airplane.

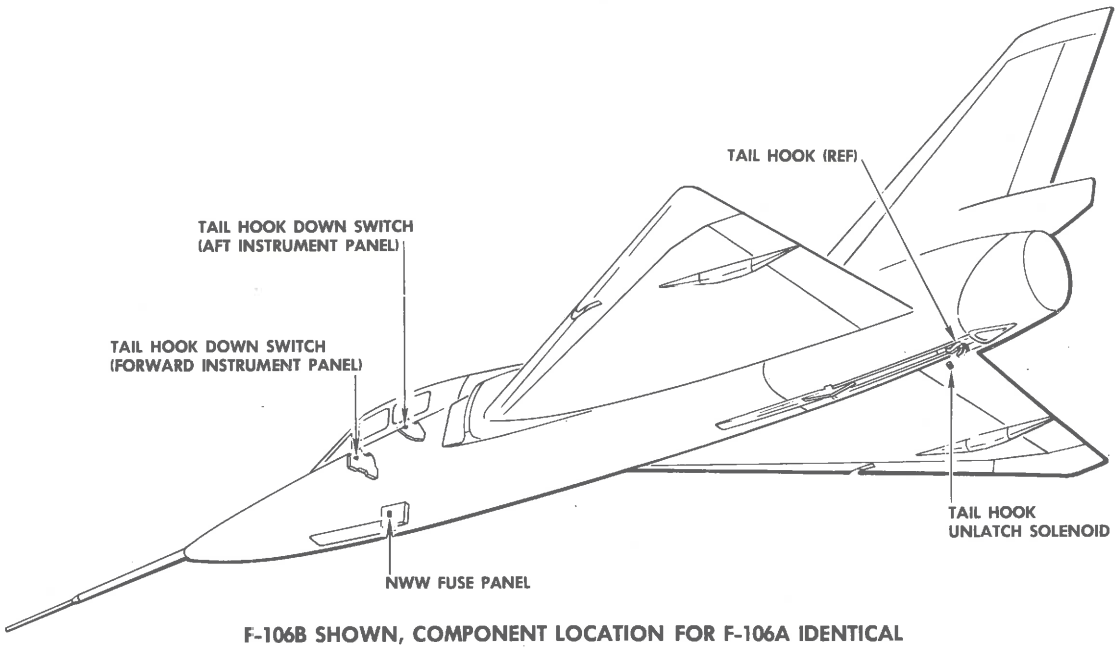
9-2. Components of the airplanes emergency arresting system are the spring steel tail hook assembly, the tail hook latch assembly, an electrically operated solenoid, and an electrical push button type switch. The forward end of the tail hook assembly is connected to the bottom of the fuselage at station 520. A solenoid assembly, installed in the engine compartment at station 640.72, is mechanically linked to the tail hook latch assembly to hold the tail hook in the retracted position. A push button switch, located on the left side of the pilot's instrument panel(s), is provided for tail hook system actuation and is equipped with a guard to prevent inadvertent tail hook deployment.

9-3. Operation.

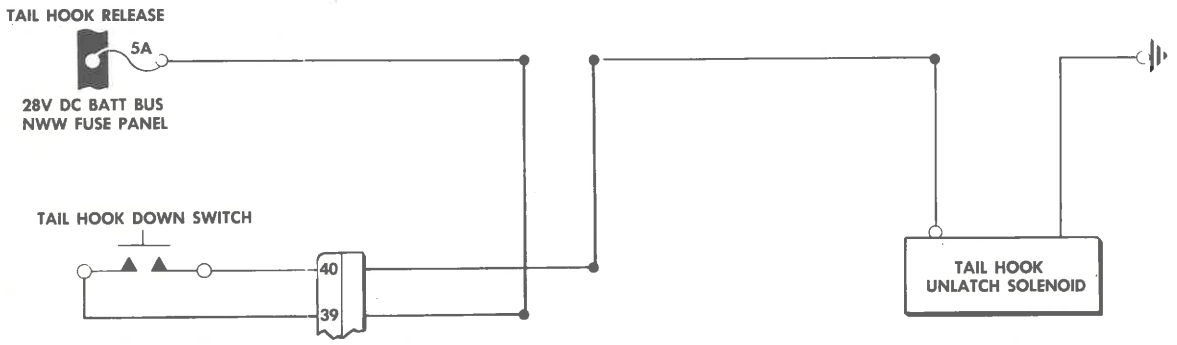
The tail hook is deployed by depressing the "TAIL HOOK DOWN" switch on the left side of the pilot's instrument panel(s). When this switch is depressed, 28-volt dc power from the airplane's battery bus flows through the "TAIL HOOK RELEASE" fuse of the nose wheel well right-hand fuse panel to the solenoid in the engine compartment. The solenoid is energized, the tail hook latching mechanism is unlatched, and the tail hook extends due to spring action. See figure 9-1 for a schematic illustration of this system. After extension, the tail hook must be manually raised and held at the retracted position while the latch mechanism is manually reset with a wrench to the latch position.

WARNING

Safety pin, 8-96514, must be installed at all times when the airplane is parked and the tail hook is retracted, to prevent serious injury to personnel. Remove safety pin just prior to flight.

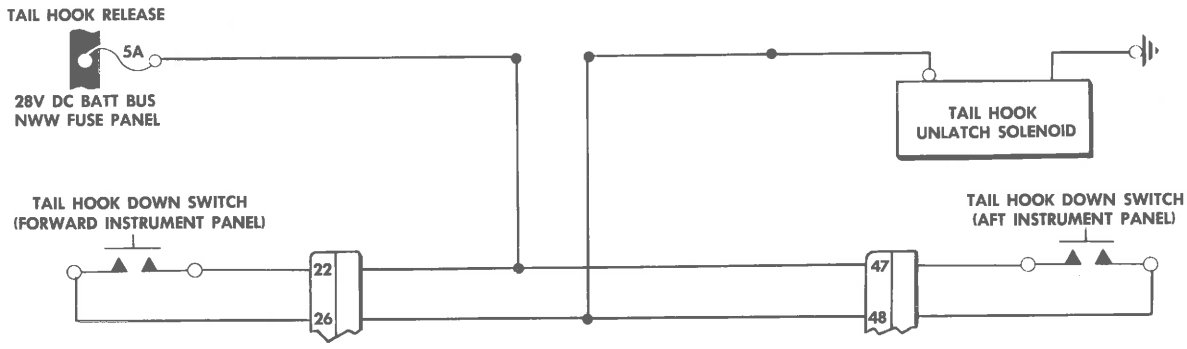


F-106B SHOWN, COMPONENT LOCATION FOR F-106A IDENTICAL



APPLICABLE TO 59-001 AND SUBSEQUENT; AND 56-453 THRU 58-798 AFTER INCORPORATION OF TCTO 1F-106(J)-627.

F-106A



APPLICABLE TO 57-2542 AND SUBSEQUENT; AND 57-2507 THRU 57-2541 AFTER INCORPORATION OF TCTO 1F-106(J)-627.

F-106B

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Figure 9-1. Emergency Arresting System, Schematic

OPERATIONAL CHECKOUT

9-4. OPERATIONAL CHECK, EMERGENCY ARRESTING SYSTEM.

The following operational check is designed to test the emergency arresting system. Refer to System Analysis subsection if the requirements of this test are not met.

9-5. Equipment Requirements.

FIGURE NO.	NAME	TYPE	ALTERNATE	USE AND APPLICATION
	Spring type scale, 0 to 10 pounds.	Local procurement.		Used to measure initial force required to rotate tail hook latch shaft.
	Tail hook safety pin assembly.	8-96514		Prevents inadvertent extension of tail hook.
	Tail hook retraction tool assembly.	8-96515 (1730-710-6172)		Provides means of raising and holding tail hook in retracted position and also includes a wrench for rotating latch shaft to latched position.
	Safety guard rails.	Local procurement.		Prevents unauthorized personnel from entering tail hook deployment area.
	Section of plywood or hard rubber 12 inches wide, 36 inches long, and 0.75 inches thick.	Local procurement.		Serves as an impact surface to protect parking area and tail hook from shock of tail hook extension.

9-6. Procedure.

a. Check that tail hook safety pin assembly, 8-96514, is installed.

b. Clear the area underneath the fuselage from station 510 to station 650. Set guard rails in place.

c. Place plywood or hard rubber section in position on parking surface so that center of section is directly below the tail hook assembly at approximately station 637.

d. Remove tail hook safety pin. Clear the area. Depress the "TAIL HOOK DOWN" switch, located on left side of pilot's instrument panel(s), momentarily. The tail hook shall extend.

e. Engage lower end of latch shaft with the 5/8-inch open end wrench portion of tool assembly 8-96515. Attach spring scale to hole of this wrench and measure force required to start rotation of shaft towards latched position (clockwise looking forward and up). The force required to rotate the shaft shall be from 1.9 pounds minimum to 3 pounds maximum. Remove spring scale and wrench.

f. Raise and hold tail hook in retracted position using tail hook retraction tool.

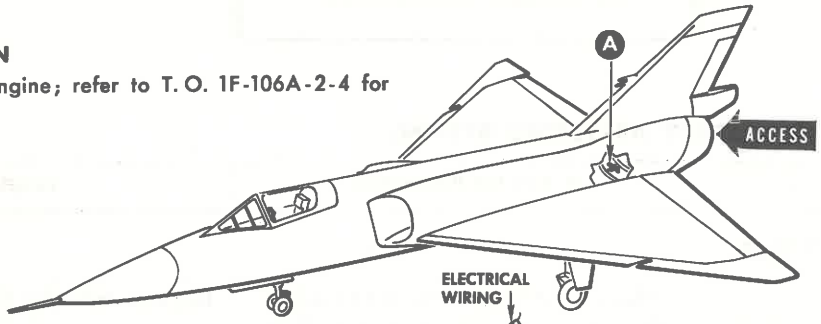
g. Engage lower end of latch shaft with the 5/8-inch open end wrench portion of 8-96515 tool assembly. Rotate latch shaft approximately 60 degrees clockwise (looking forward and up) until the lever attached to the latch shaft is held in the latched position by the trigger connected to the solenoid, remove open end wrench. The lower end of the latch shaft shall engage the tail hook latch plate and hold the tail hook in the retracted position. The trigger shall engage the latch lever a minimum of 0.15 inch.

h. *Applicable to F-106B airplanes,* clear the area and then momentarily depress the "TAIL HOOK DOWN" switch that was not operated in step "d." The tail hook shall extend. Repeat steps "f" and "g."

i. Install tail hook safety pin. Remove tail hook retraction tool, plywood or hard rubber section, and guard rails.

PREPARATION

a. Remove engine; refer to T. O. 1F-106A-2-4 for procedure.

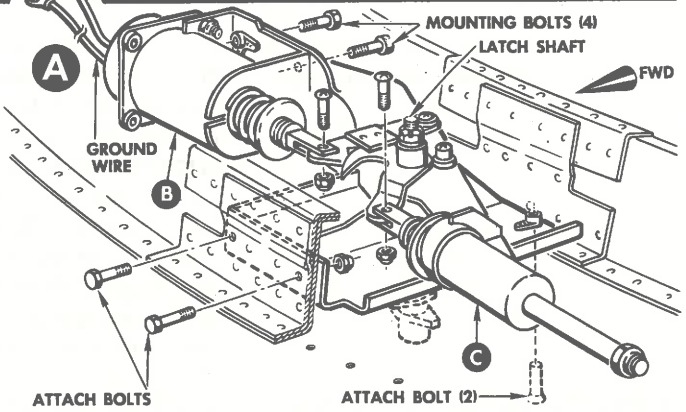


LATCH ASSEMBLY INSTALLATION

a. Remove latch shaft from assembly.
b. Position remainder of assembly to align with mounting holes in fuselage structure; install attach bolts.
c. Install latch shaft.
d. Connect electrical wiring to solenoid. Connect solenoid ground wire to structure.
e. Perform an operational check.

LATCH ASSEMBLY REMOVAL

Removal is essentially the reverse of installation.

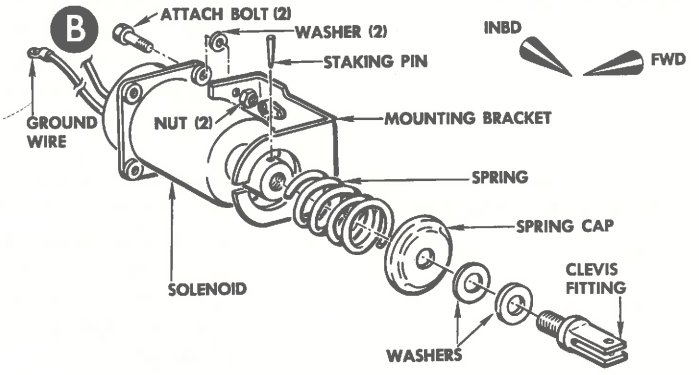


SOLENOID INSTALLATION

a. Assemble mounting bracket to solenoid with attach bolts.
b. Place 2 washers (1 thick and 1 thin) on clevis fitting shaft, position solenoid spring and spring cap, screw clevis fitting in until washers bottom on spring cap.
c. Drill 0.067 $\left(\begin{smallmatrix}+0.002\\-0.000\end{smallmatrix}\right)$ inch hole through solenoid shaft and clevis fitting shaft; install staking pin.
d. Connect solenoid assembly to latch assembly by installing mounting bolts and connecting clevis fitting to trigger. See detail A.
e. Connect electrical wiring to solenoid. Connect solenoid ground wire to structure.
f. Perform an operational check.

SOLENOID REMOVAL

Removal is essentially the reverse of installation.



LATCH SHAFT COMPRESSION SPRING ADJUSTMENT

a. Disconnect and remove spring plunger and attaching parts from latch assembly. Add washers between shoulder of spring plunger and spring to increase spring tension. Assemble and connect spring plunger and attaching parts to latch assembly. See detail A.
b. Check initial force required to compress spring; refer to operational check.

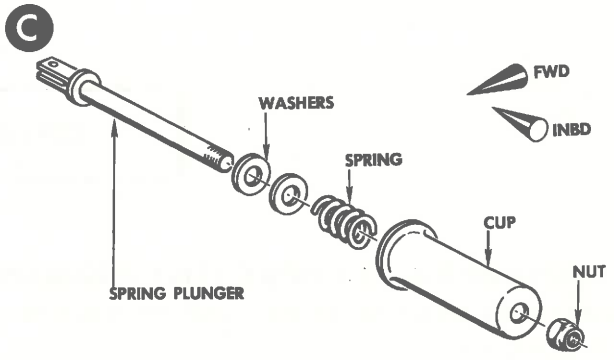


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Figure 9-2. Tail Hook Latch Mechanism, Installation & Adjustment

SYSTEM ANALYSIS

9-7. SYSTEM ANALYSIS, EMERGENCY ARRESTING SYSTEM.

PROBABLE CAUSE	ISOLATION PROCEDURE	REMEDY
TAIL HOOK WILL NOT EXTEND.		
Defective fuse.	Check "TAIL HOOK RELEASE" fuse at right nose wheel well fuse panel.	Replace defective fuse.
Defective tail hook unlatch solenoid.	*On F-106A airplanes,* disconnect wire G121C20 from solenoid. *On F-106B airplanes,* disconnect wire G121F20 from solenoid. Depress "TAIL HOOK DOWN" switch and check for battery voltage at solenoid end of disconnected wire. If voltage reading is obtained, solenoid is defective; if no voltage, circuit is defective. Release switch.	Replace solenoid.
Defective circuit to tail hook unlatch solenoid.	Check for continuity across "TAIL HOOK DOWN" switch; if no continuity, switch is defective. If continuity is obtained across switch, isolate wiring defect by continuity check of wires.	Replace switch or repair defective wiring.
Weak latch shaft compression spring or defective shaft bushing.	Check that latch trigger clears latch shaft lever when solenoid is energized. Manually operate shaft to unlatched position. If shaft rotates easily, compression spring is weak. If shaft is difficult to rotate, bushing is defective.	Adjust spring tension by adding washers or replace spring. Replace defective bushing.

REPLACEMENT

9-8. REPLACEMENT, TAIL HOOK LATCH MECHANISM.

Remove and/or install the tail hook latch mechanism by procedure given in figure 9-2.

9-9. REPLACEMENT, TAIL HOOK LATCH SOLENOID.

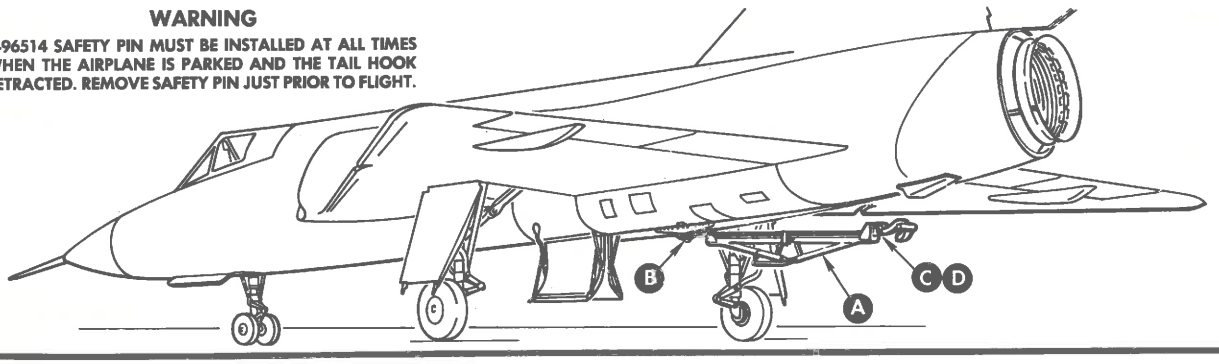
Remove and/or install the tail hook latch solenoid by procedure given in figure 9-2.

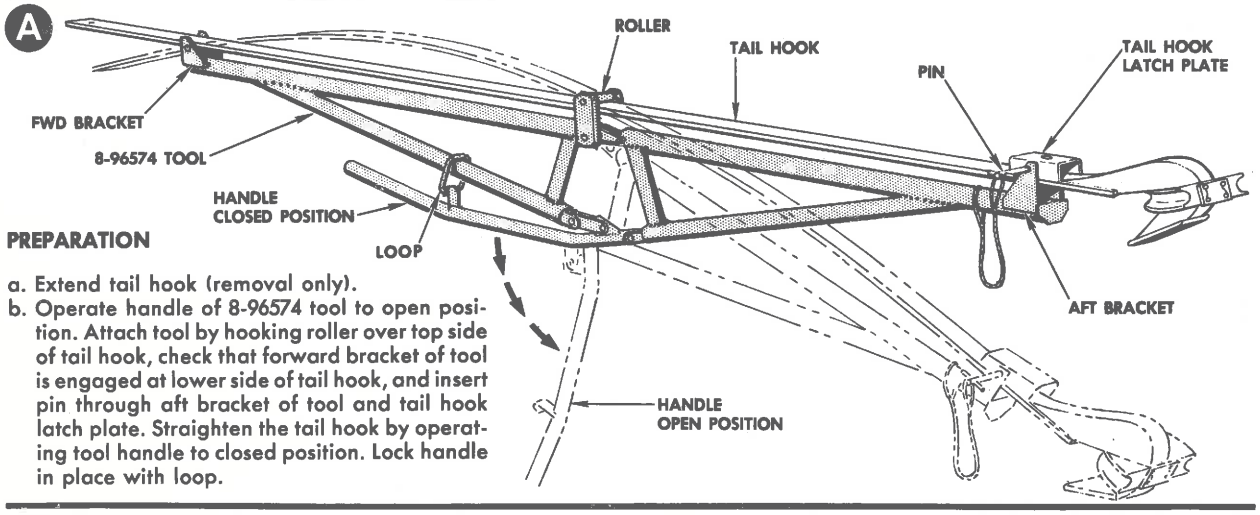
9-10. REPLACEMENT, TAIL HOOK.

Remove and/or install the tail hook by procedure given in figure 9-3.

WARNING

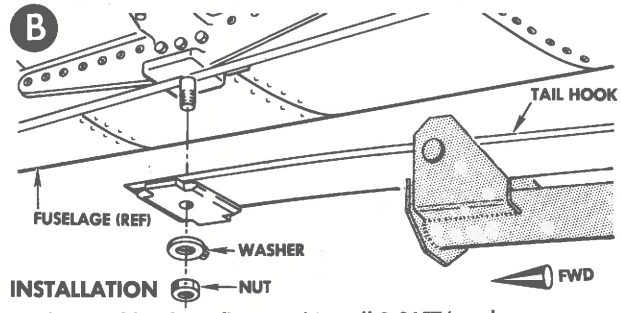
8-96514 SAFETY PIN MUST BE INSTALLED AT ALL TIMES WHEN THE AIRPLANE IS PARKED AND THE TAIL HOOK RETRACTED. REMOVE SAFETY PIN JUST PRIOR TO FLIGHT.





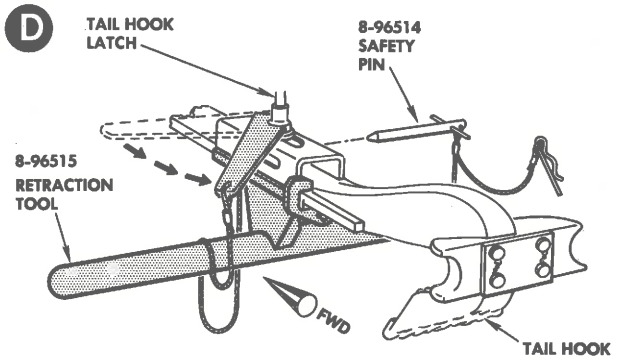
PREPARATION

a. Extend tail hook (removal only).
b. Operate handle of 8-96574 tool to open position. Attach tool by hooking roller over top side of tail hook, check that forward bracket of tool is engaged at lower side of tail hook, and insert pin through aft bracket of tool and tail hook latch plate. Straighten the tail hook by operating tool handle to closed position. Lock handle in place with loop.

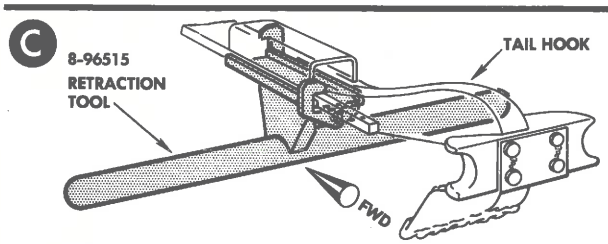


INSTALLATION

a. Place tail hook on floor and install 8-96574 tool per step "b" of PREPARATION procedure.
b. Position tail hook; install washer and nut. Torque nut to a value of 40 to 60 foot pounds with dry threads. Safety-wire nut to washer.
c. Remove 8-96574 tool by reversing procedure given in step "b" of PREPARATION procedure.



e. Raise tail hook to retracted position and engage tail hook latch. Install tail hook safety pin 8-96514 and remove 8-96515 tail hook retraction tool.



d. Install 8-96515 tail hook retraction tool on tail hook.

f. Perform an operational check.

REMOVAL

a. Perform steps "a" and "b" of PREPARATION procedure.
b. Support tail hook assembly. Remove safety wire, nut, and washer; see detail B. Remove tail hook.
c. Remove tool 8-96574 if tail hook is not to be reinstalled.

.06.02.1047 A

Figure 9-3. Tail Hook Replacement

9-11. REPLACEMENT, TAIL HOOK FAIRING.

Remove and/or install the tail hook fairing by standard shop procedure.

ADJUSTMENT

9-12. ADJUSTMENT, LATCH SHAFT COMPRESSION SPRING.

Adjust the tension of the latch shaft compression spring, if required, by the procedure given in figure 9-2.

SERVICING

9-13. SERVICING, EMERGENCY ARRESTING SYSTEM.

Servicing of the emergency arresting system consists of retracting and latching the tail hook. Refer to Section II, of this manual, for this procedure.

ALPHABETICAL INDEX

ALPHABETICAL INDEX (CONT)

ALPHABETICAL INDEX (CONT)

ALPHABETICAL INDEX (CONT)

T.O. 1F-106A-2-2C

SUPPLEMENT
TECHNICAL MANUAL

MAINTENANCE

GROUND HANDLING, SERVICING, AND AIRFRAME GROUP MAINTENANCE

USAF SERIES

F-106A AND B AIRCRAFT

THIS PUBLICATION SUPPLEMENTS T.O. 1F-106A-2-2, DATED 10 MAY 1960. A SUITABLE REFERENCE TO THIS SUPPLEMENT WILL BE MADE ON THE TITLE PAGE OF THE BASIC PUBLICATION.

PUBLISHED UNDER AUTHORITY OF THE SECRETARY OF THE AIR FORCE

25 NOVEMBER 1960

1. Section I, paragraph 1-57 (page 1-56) of basic technical manual is hereby amended to add a CAUTION immediately after paragraph 1.2 to read as follows:

CAUTION

An adjusted fuel flow of as much as 800 PPH less than the above established minimums is acceptable; however, when this condition exists, the afterburner must be checked for proper operation prior to releasing the aircraft for flight.

END