CHAPTER

12

CHAPTER 12

SERVICING

TABLE OF CONTENTS

Subject	Subject No.
SERVICING - GENERAL	12-0
AIR SERVICING	12-1-1
COMBINED AIR AND FLUID SERVICING	12-1-11
FUELING	12-1-41
HYDRAULIC FLUID SERVICING	12-1-51
ENGINE OIL TANK SERVICING	12-1-61
ENGINE ACCESSORY OIL SERVICING	12-1-62
AIR CONDITIONING AIR CYCLE MACHINE OIL SERVICING	12-1-63

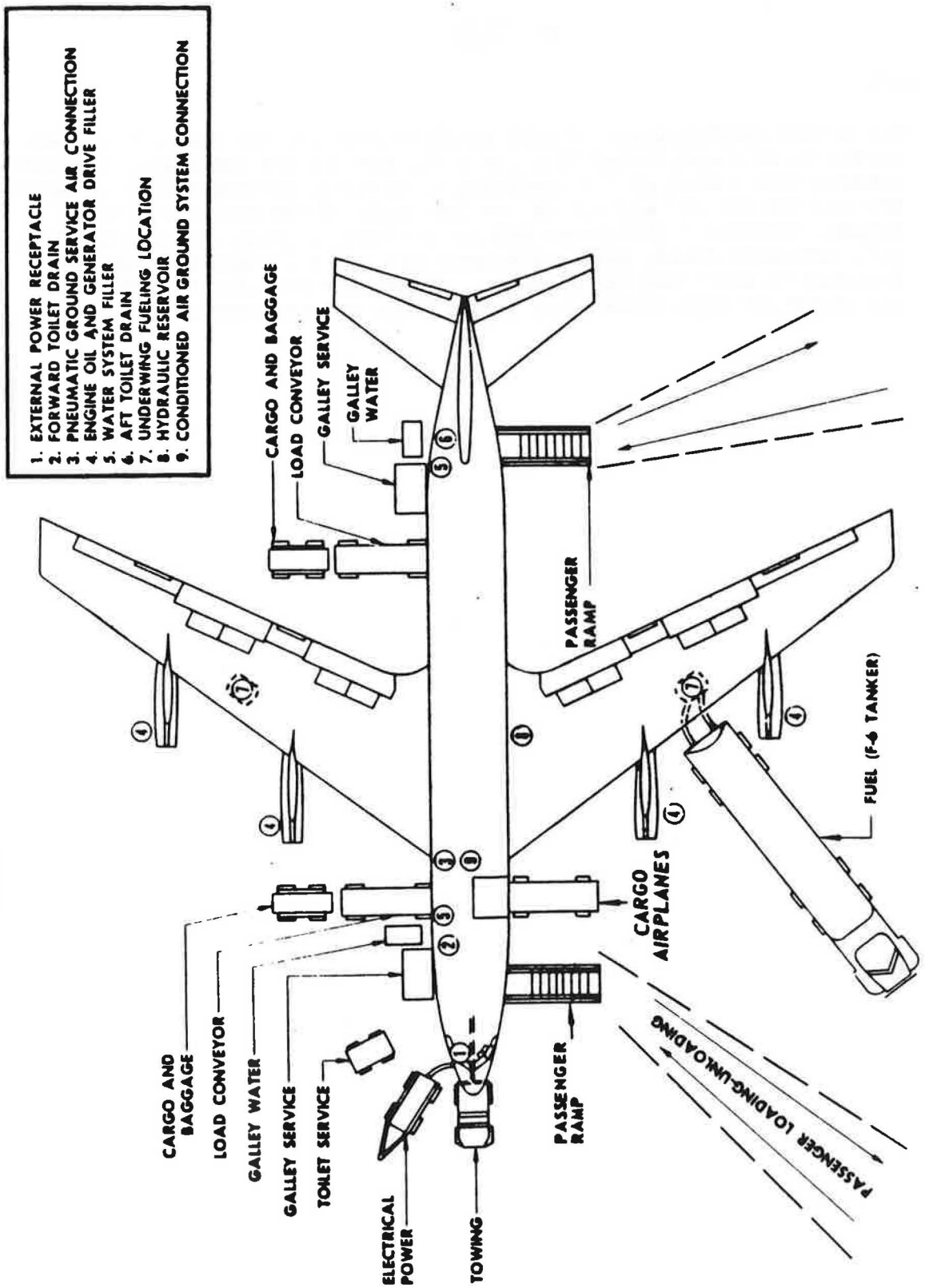
Subject	Subject No.
OXYGEN SERVICING.	12-1-71
TOILET SERVICING.	12-1-81
WATER SERVICING	12-1-91
LIQUID SOAP DISPENSER SERVICING	12-1-111
ACCESS DOORS AND PANELS	12-2-0
CLEANING AND WASHING.	12-3-1
COLD WEATHER OPERATION.	12-4-1

BATTERY SERVICING
(see BATTERY, Unit Servicing, Chapter 24)

ENGINE FIRE EXTINGUISHER SYSTEM SERVICING
(see FIRE EXTINGUISHER SYSTEMS, Chapter 26)

PORTABLE FIRE EXTINGUISHER SYSTEM SERVICING
(see EMERGENCY EQUIPMENT, Chapter 25)

FLAP DRIVE GEARBOXES SERVICING
(see WING FLAPS, Chapter 27)



Typical Terminal Service Arrangement
Figure 1

SERVICING

1. General

A. The design configuration of this airplane provides for most of the servicing to be accomplished from the right side of the fuselage. To avoid interference during ground servicing activities, passenger loading doors are located forward and aft on the left side of the fuselage. This chapter contains instructions and precautions for replenishment of fuel, oil, hydraulic fluid, water, tire pressure and all other such items involved in servicing the airplane. Charts are provided to show tank and reservoir capacities. See figure 1 for general service layout.

AIR AND NITROGEN SERVICING

1. Landing Gear Tires

A. GENERAL

(1) All tires must initially be inflated with nitrogen to the specified pressure. At line stations where nitrogen is not available, topping off with air is acceptable provided that :

(a) An entry is made in the logbook, identifying the tire position and stating : " TIRE REINFLATED WITH AIR " RESERVICE WITH NITROGEN AT FIRST STATION WHERE NITROGEN IS AVAILABLE ".

(b) Reservicing is done at first station where nitrogen is available, by fully deflating the tire and reinflating with nitrogen.

Tires of which the oxygen ratio is unknown (e.g. tires on loan, etc.) must be reserviced per step (b) above.

(2) Specified pressures are for airplane on the ground. Reduce 4 % for no load.

(3) Pressure should be checked after the tire has cooled down to ambient temperature i.e. approx. 1H.30' after stopping.

(4) Pressure should be checked at interval specified in the Maintenance Schedule. It is recommended that pressure checks should be made as close as possible to the first flight of the day.

(5) Pressure should be corrected if the ambient temperature reduces more than 15° C after filling or if such condition is expected (i.e. tire inflated in hangar in winter).

B. EQUIPMENT AND MATERIAL

(1) Source of clean dry nitrogen - commercial grade (99.9 % pure nitrogen).

(2) Source of clean dry air with a maximum moisture content corresponding to an atmospheric dew point of - 20°F (- 29° C).

(3) Tire inflation tool - F70199-1, or equivalent.

(4) Pressure gage. If a separate pressure gage is utilized, use a gage having an accuracy of ± 2 psi or 0,1 Kg/cm^2 and graduated in 2 psi or 0,100 Kg/cm^2 increments.

Note : The inflation tool and pressure gage will be checked regularly every 6 months.

C. SERVICING

(1) Initial inflation.

(a) Inflate tire to pressure shown in fig.201 for normal flight operation.

(2) Replenish inflation, pressure check.

(a) If pressure checked is different from specified pressure in fig. 201 see criteria in figure 202 for reinflation or removal.

Note : pressures are specified in psi. See unit conversion table in figure 203

Notes : Drop in tire pressure may be due to one or more of the following reasons :

1 Decrease in ambient temperature after filling tire (1 % pressure drop for 3° C temperature change).

2 Leak at "O" ring between wheel halves.

3 Leak at thermal fuse (defective or melted).

4 Leak at tire bead seat.

5 Leak at inflation valve.

6 Tire leakage (punctured, vent holes ....)

7 Wheel crack.

Maximum Taxi gross weight	Gear	Tire Size	PSI	Kg/cm^2	Bars
	NLG	39x13/16PR	115 +5/-0	8.08 +0.35/-0	7.92 +0.34/-0
	MLG	46x16/28PR	180 +5/-0	12.65 +0.35/-0	12.40 +0.34/-0

Fig 201 Normal tire pressure (aircraft on ground).

Condition	Pressure checked PSI		Actions required
	NLG	MLG	
1.Overinflated	> 120	> 185	If tire is at ambient temperature and first reading is confirmed by another gauge, deflate to upper limit of operating range. 1 Never reduce pressure on a hot tire.
	120	185	
2.Normal oper. range			No action required. See paragraph 1A.(5)
	115	180	
3.Underinflated			Reinflate to upper limit of operating range
	110	170	
4.Underinflated			-Reinflate to upper limit of operating range 2 -Initiate a second check within 24 hrs. -If 2nd check confirms 1rst one replace wheel/tire assy. 3
	105	160	
5.Underinflated			Replace wheel/tire assy. 3
	95	145	
6.Underinflated			Replace wheel/tire assy and adjacent one on same dual axle (overload condition) 3 4
	0	0	

Fig. 202 Criteria for tire reinflation or removal.

1 Enter the discrepancy into appropriate document to enable tracing back the cause of inflation error.

2 Enter the discrepancy into appropriate document or place indicator on inflation valve for follow-up.

3 Enter aircraft, position, pressure checked, mention " inspection required due to pressure drop " into the removal tag. Mark letter "F" on tire (adjacent to inflation valve).

4 Enter aircraft, position, mention " overloaded " into the removal tag. Mark letter "D" on tire. (adjacent to inflation valve). If it can be shown that the pressure loss took place after the airplane was parked and that no rolling took place, tire needs not be changed.

CAUTION: SEE PARAGRAPH A.(1)(a) - page 201

PSI	Kg/cm^2	Bars
110	7,73	7,58
115	8,08	7,92
120	8,43	8,26
125	8,78	8,62
130	9,14	8,96
135	9,49	9,31
140	9,84	9,65
145	10,19	10,00
150	10,54	10,34
155	10,89	10,68
160	11,24	11,03
165	11,60	11,31
170	11,95	11,72
175	12,30	12,06
180	12,65	12,40

Fig. 203 Pressure Unit Conversion Table.

2. Air Bottles

A. Starter (charging valves located approximately midway in each main landing gear wheel well on inboard side on 707-329C)

WARNING: DO NOT LOOSEN VALVE BODY. INSIDE PRESSURES CAN BLOW VALVE OUT, CAUSING INJURY TO PERSONNEL. REMOVE VALVE CAP. ATTACH PRESSURE SOURCE, LOOSEN VALVE OUTER HEX-SWIVEL NUT ONE TURN, SERVICE TO SPECIFIED PRESSURE, TIGHTEN VALVE OUTER HEX-SWIVEL NUT, DISCONNECT SERVICE PRESSURE AND REPLACE VALVE CAP.

(1) Clean dry air - charge to 3100 (± 100) psi.

B. Emergency Brake (charging valve is located on the nose wheel well front bulkhead)

(1) Charge with dry nitrogen to 1200 (± 50) psi. See WARNING above.

3. Hydraulic Accumulators

A. Utility System Accumulator (The utility system accumulator is located just outboard of the right wheel well forward end).

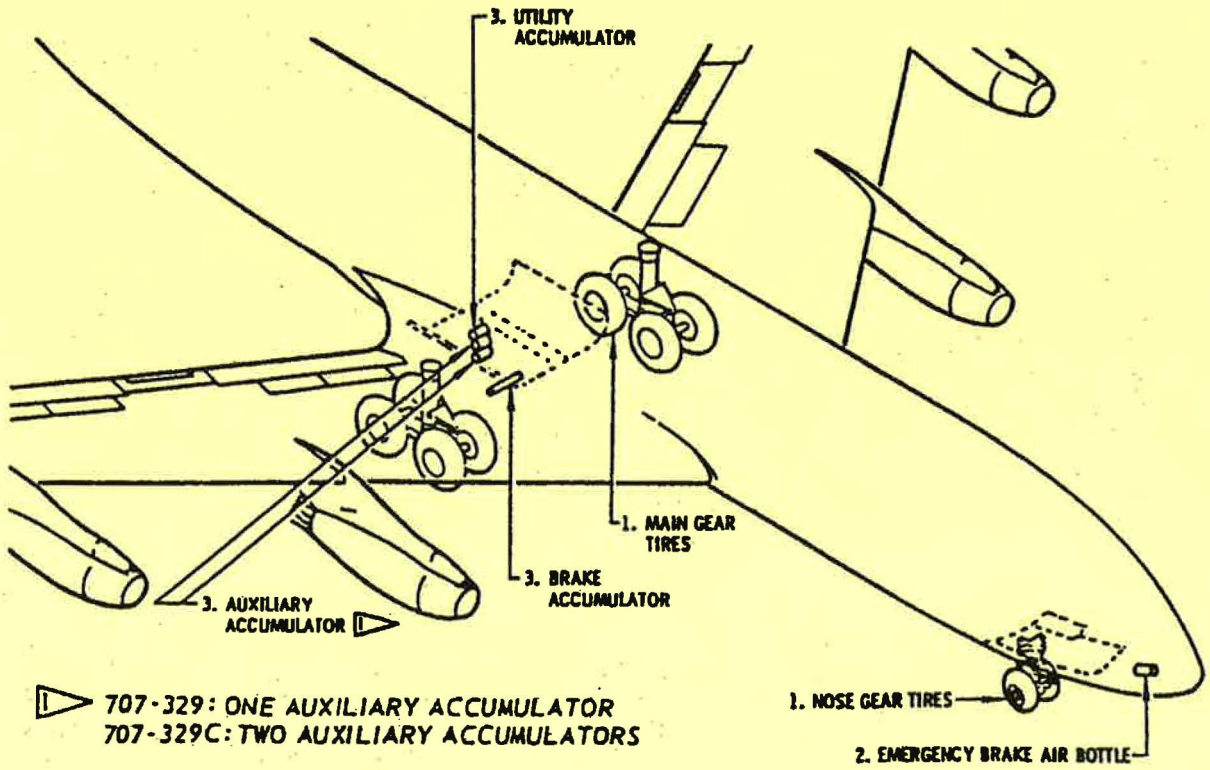
WARNING: DO NOT LOOSEN VALVE BODY. INSIDE PRESSURES CAN BLOW VALVE OUT, CAUSING INJURY TO PERSONNEL. REMOVE VALVE CAP. ATTACH PRESSURE SOURCE, LOOSEN VALVE OUTER HEX-SWIVEL NUT ONE TURN, SERVICE TO SPECIFIED PRESSURE, TIGHTEN VALVE OUTER HEX-SWIVEL NUT DISCONNECT SERVICE PRESSURE AND REPLACE VALVE CAP.

(1) Depressurize utility hydraulic system by opening manual bypass valve located in right wheel well.

(2) Close manual bypass valve.

(3) Charge accumulator with dry nitrogen, using instruction chart just inboard of the accumulator.

IICN: 1P-AMMX-12-0001-01



Air and Nitrogen Servicing Location Diagramm
Fig. 201

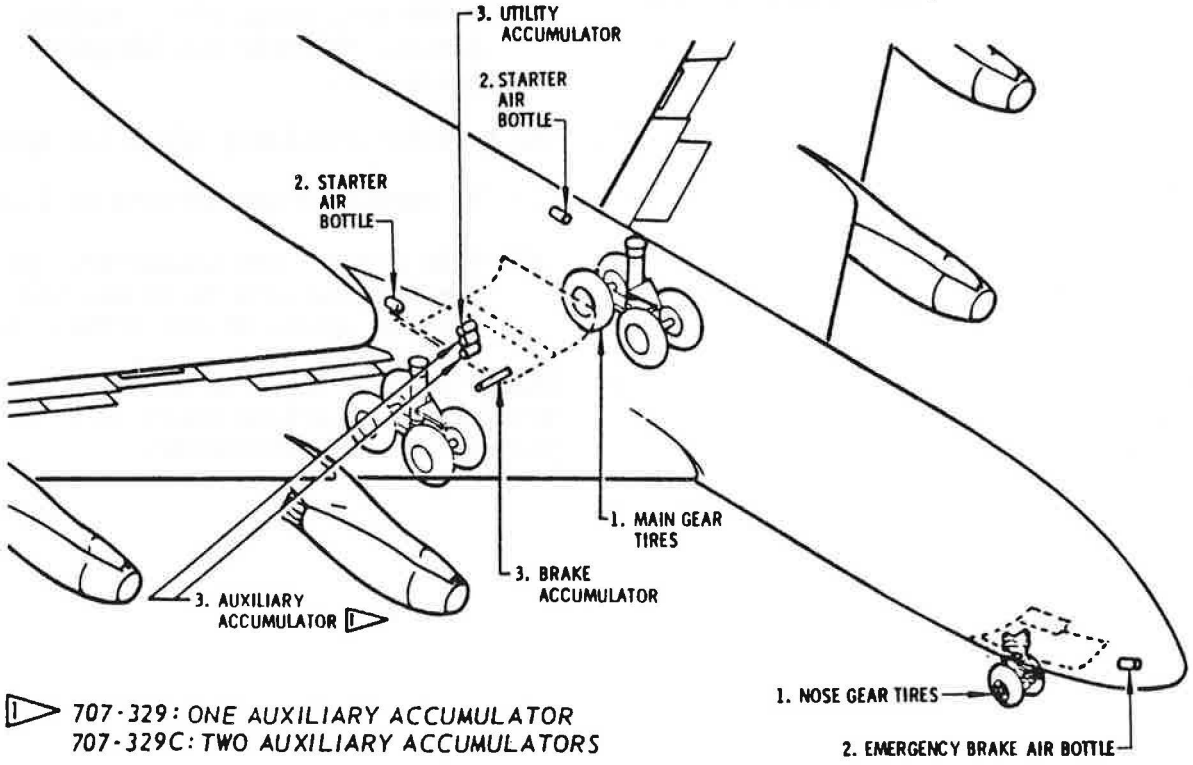
Item to be Serviced (See figure 201.)	Service Information
3. Hydraulic Accumulators	A. Utility System Accumulator (The utility system accumulator is located just outboard of the right wheel well forward end.)

WARNING: DO NOT LOOSEN VALVE BODY. INSIDE PRESSURES CAN BLOW VALVE OUT, CAUSING INJURY TO PERSONNEL. REMOVE VALVE CAP. ATTACH PRESSURE SOURCE, LOOSEN VALVE OUTER HEX-SWIVEL NUT ONE TURN, SERVICE TO SPECIFIED PRESSURE, TIGHTEN VALVE OUTER HEX-SWIVEL NUT, DISCONNECT SERVICE PRESSURE AND REPLACE VALVE CAP.

(1) Depressurize utility hydraulic system by opening manual bypass valve located in right wheel well.

(2) Close manual bypass valve.

(3) Charge accumulator with dry nitrogen, using instruction chart just inboard of the accumulator.



[1] 707-329: ONE AUXILIARY ACCUMULATOR
707-329C: TWO AUXILIARY ACCUMULATORS

Air and Nitrogen Servicing Location Diagram
Figure 201

Item to be Serviced. (See figure 201.)	Service Information

B. Auxiliary System Accumulator

NOTE: On 707-329 airplanes the auxiliary system accumulator is installed just outboard of the right wheel well. On 707-329C airplanes two auxiliary system accumulators are installed just outboard of the right wheel well. On two accumulator installations both accumulators are charged through the charging valve installed in the upper accumulator.

WARNING: DO NOT LOOSEN VALVE BODY. INSIDE PRESSURES CAN BLOW VALVE OUT, CAUSING INJURY TO PERSONNEL. REMOVE VALVE CAP. ATTACH PRESSURE SOURCE, LOOSEN VALVE OUTER HEX-SWIVEL NUT ONE TURN, SERVICE TO SPECIFIED PRESSURE, TIGHTEN VALVE OUTER HEX-SWIVEL NUT, DISCONNECT SERVICE PRESSURE AND REPLACE VALVE CAP.

(1) Depressurize auxiliary hydraulic system.

(a) By operating the inboard spoilers.

(b) With ground cart connected, open the interconnect valve and the utility system manual bypass valve.

(2) Charge accumulator with dry nitrogen using the instruction chart just inboard of the accumulator.

Item to be Serviced. (See figure 201.)	Service Information
	C. Brake Accumulator (The brake accumulator is located just outboard of the right wheel well forward end.)
	WARNING: DO NOT LOOSEN VALVE BODY. INSIDE PRESSURES CAN BLOW VALVE OUT, CAUSING INJURY TO PERSONNEL. REMOVE VALVE CAP. ATTACH PRESSURE COURCE, LOOSEN VALVE OUTER HEX-SWIVEL NUT ONE TURN, SERVICE TO SPECIFIED PRESSURE, TIGHTEN VALVE OUTER HEX-SWIVEL NUT, DISCONNECT SERVICE PRESSURE AND REPLACE VALVE CAP.
	(1) Depressurize the brake system pressure by operating the brakes approximately eight times. This will also depressurize the utility hydraulic system.
	(2) Charge the accumulator using the instruction chart just inboard of the accumulator.

COMBINED AIR AND FLUID SERVICING

Item to be Serviced and Figure 201 Index No.	Service Information
1. Landing Gear Leveling Cylinder (Turbojet only)	A. Procedure

WARNING: DO NOT LOOSEN VALVE BODY. INSIDE PRESSURES CAN BLOW VALVE OUT, CAUSING INJURY TO PERSONNEL. REMOVE VALVE CAP. ATTACH PRESSURE SOURCE, LOOSEN VALVE OUTER HEX-SWIVEL NUT ONE TURN, SERVICE TO SPECIFIED PRESSURE, TIGHTEN VALVE OUTER HEX-SWIVEL NUT, DISCONNECT SERVICE PRESSURE AND REPLACE VALVE CAP.

(1) Depressurize at air valve before removing filler plug.

(2) Remove filler plug and fill lower piston cavity with MIL-H-5606 until fluid overflows.

(3) Replace filler plug and pressurize cylinder. On airplanes having a three inch long plug protruding from the aft end of the air chamber as shown on detail A, figure 201, pressurize to 1500 (± 25) psig using a gauge. On all other airplanes, those having the cylinder without the extension plug (see also detail A) pressurize to 925 (± 25) psig.

(4) Check for leaks.

(5) Safety wire plug.

2. Landing Gear Shock Strut — A. Nose Gear

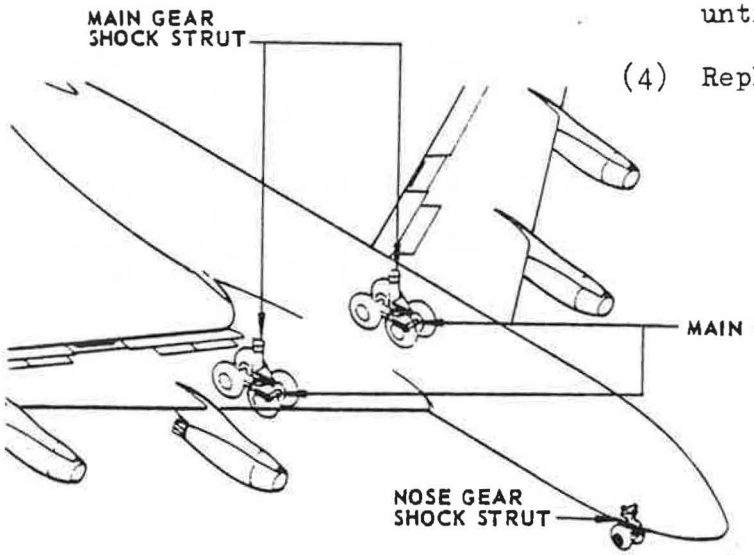
WARNING: DO NOT LOOSEN VALVE BODY. INSIDE PRESSURES CAN BLOW VALVE OUT, CAUSING INJURY TO PERSONNEL. REMOVE VALVE CAP. ATTACH PRESSURE SOURCE, LOOSEN VALVE OUTER HEX-SWIVEL NUT ONE TURN, SERVICE TO SPECIFIED PRESSURE, TIGHTEN VALVE OUTER HEX-SWIVEL NUT, DISCONNECT SERVICE PRESSURE AND REPLACE VALVE CAP.

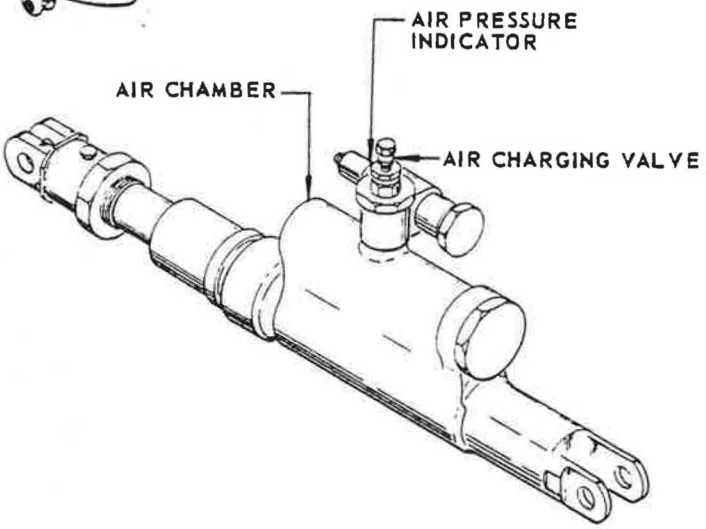
(1) Deflate shock strut through air valve.

(2) Remove air valve from shock strut.

(3) Fill shock strut with full formulated shock strut oil (Ref.: SL 707-12-2B) until fluid runs over.

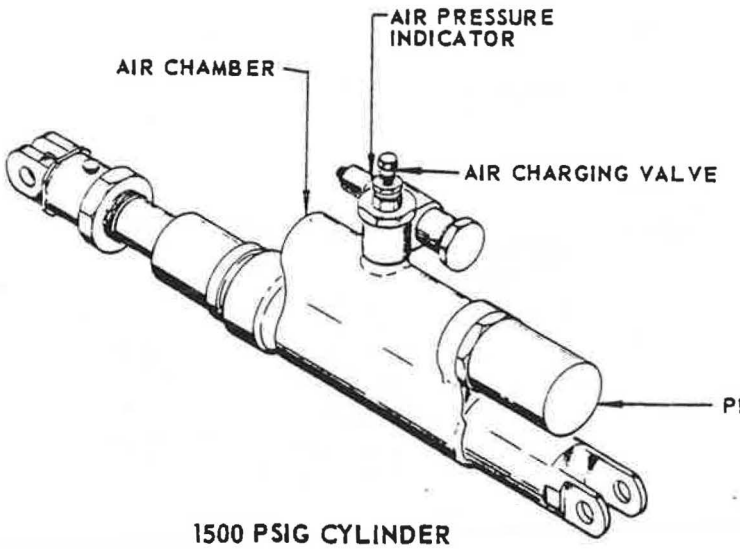
(4) Replace air valve.





925 PSIG CYLINDER

(TURBOJET ONLY)
DETAIL A



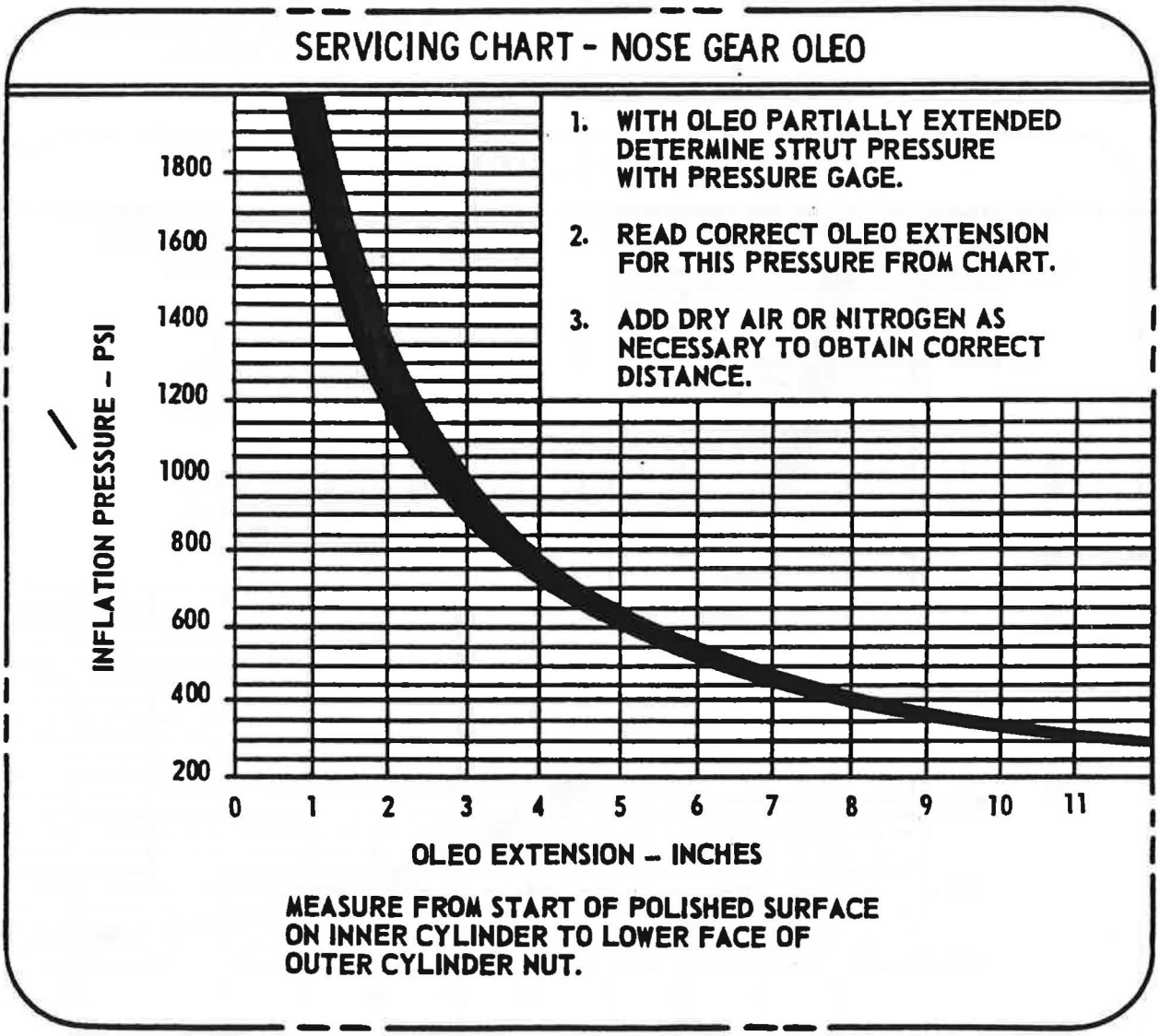
1500 PSIG CYLINDER

Combined Air and Fluid Servicing Points
Figure 201

(5) Inflate shock strut with clean dry air per placard in nose wheel well. (See figure 202.)

B. Main Gear

(1) Proceed as above, but inflate per placard in left main wheel well. (See figure 203.)



3. Control Surface Snubbers NOTE: To be bench serviced. Consult overhaul manual.

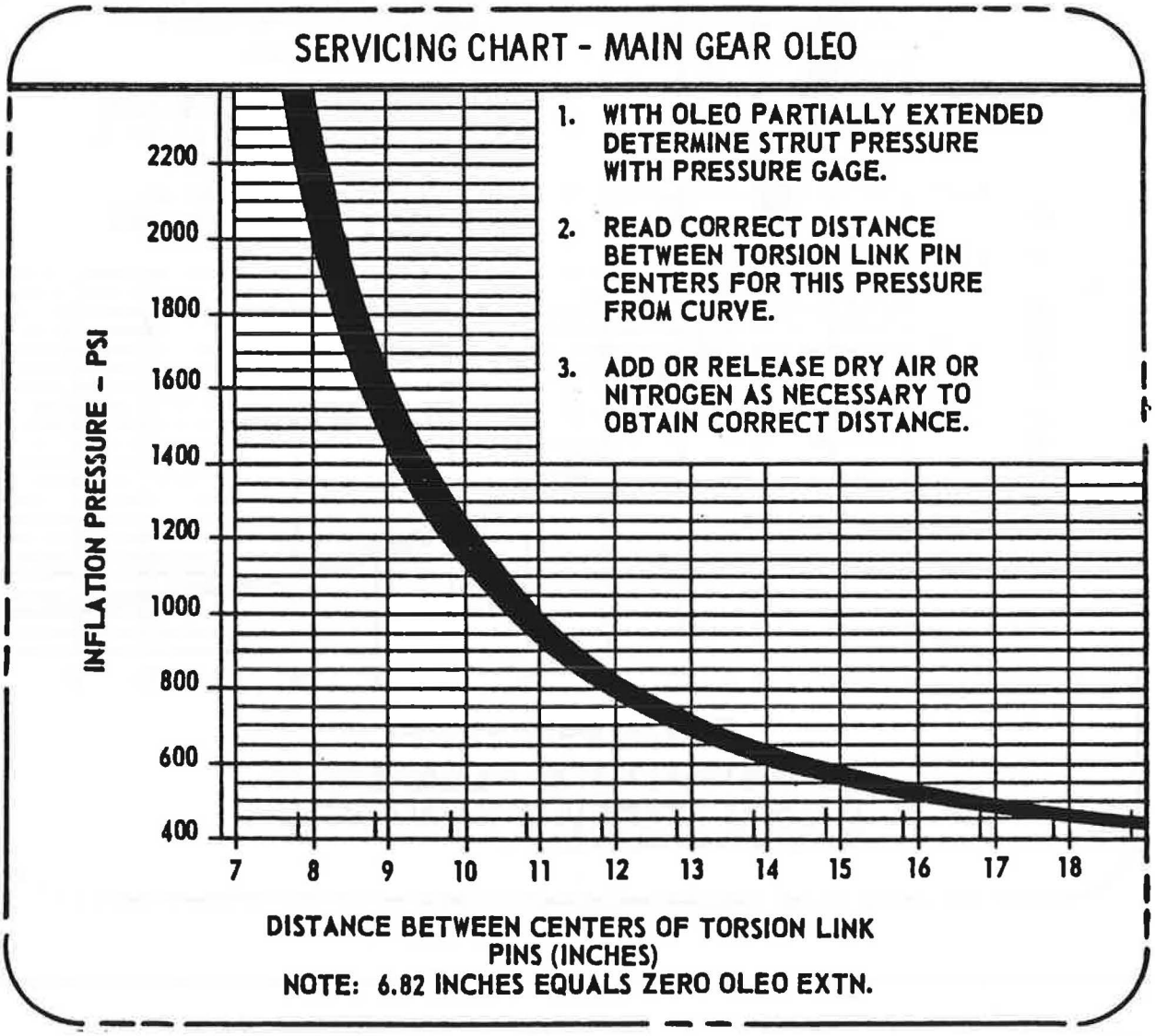
4. Main Gear Snubbers (Turbojet only)

NOTE: On turbofan airplanes the leveling cylinder and snubber unit is connected to the hydraulic system and does not require servicing.

A. Procedure

(1) Service with oil, MIL-H-5606, through charging valve in stem of a compensating piston, at 60 to 70 psi, until filler stem indicator is at or within 1/16 inch above surrounding air temperature.

(2) Tighten charging valve 45 to 65 pound-inches torque.



Main Gear Shock Strut Inflation
Figure 203

FUELING

1. General

A. The fuel for the P&WA engines shall conform to PWA-522 specifications.

B. The airplane may be fueled either by the overwing gravity feed method or by the pressure fueling method. Overwing fueling ports are located on the upper surfaces of the wings. (See figure 201.) Pressure fueling stations (one at each wing) are located under the wing between the nacelle struts. (See figure 201.) Pressure fueling receptacles, fueling shutoff valves and fueling preset indicator lights (when installed) are located in the fueling bay at each fueling station.

C. Desired fuel quantity can be preset (when preset system installed) in the control cabin at the flight engineer's auxiliary panel so that when desired quantity of fuel is reached, the preset indicator lights will illuminate. (See Chapter 28.)

D. On 707-300 and 707-300B airplanes, load main tanks 1, 2, 3, and 4 equally.

(1) If additional fuel is required after tanks 1 and 4 are full, continue to load main tanks 2 and 3.

(2) If additional fuel is required after main tanks 1, 2, 3, and 4 are full, load outboard reserve tanks.

(3) If all main and outboard reserve tanks are full and additional fuel is required, load center wing tank to required fuel quantity.

NOTE: Center wing tank fuel may be substituted for payload in any quantity up to the maximum allowable payload or to the center wing tank capacity, whichever is lower, provided the difference in effect on balance is also accounted for.

E. On 707-300C airplanes load main tanks 1, 2, 3, and 4 equally to a total of 6090 gallons.

(1) If additional fuel is required, fill outboard reserve tank and tanks 2 and 3 to a total of 7846 gallons.

(2) If additional fuel is required, complete filling of main tanks 1, 2, 3, and 4.

(3) If all main and outboard reserve tanks are full and additional fuel is required, load center wing tank to required fuel quantity.

NOTE: Center wing tank fuel may be substituted for payload in any quantity up to the maximum allowable payload or to the center wing tank capacity, whichever is lower, provided the difference in effect on balance is also accounted for.

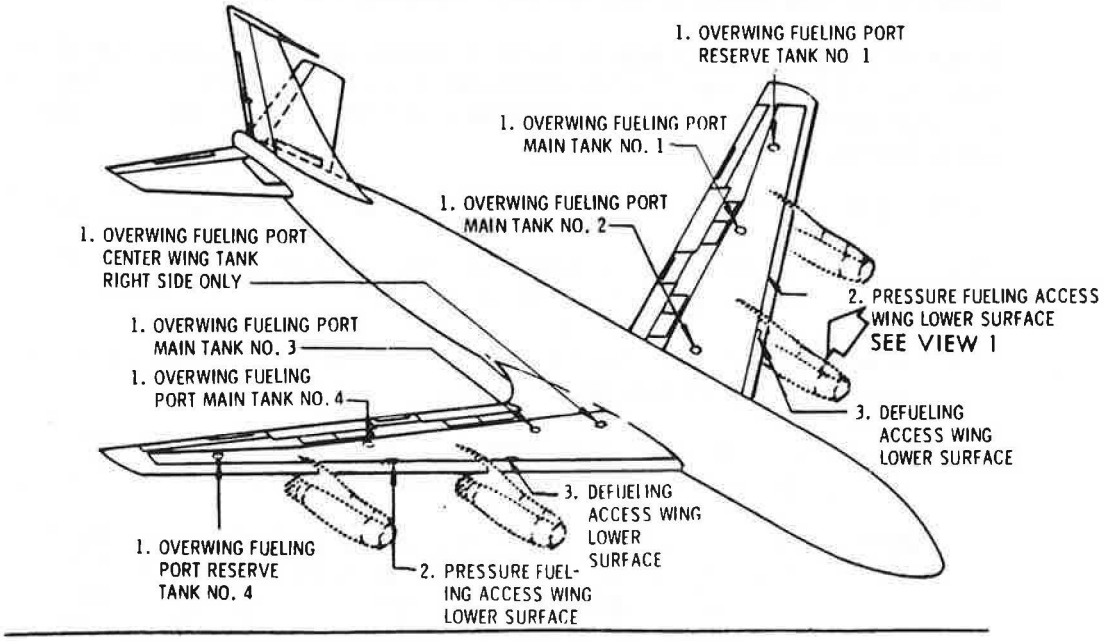
F. Tanks selected for flight may be loaded simultaneously.

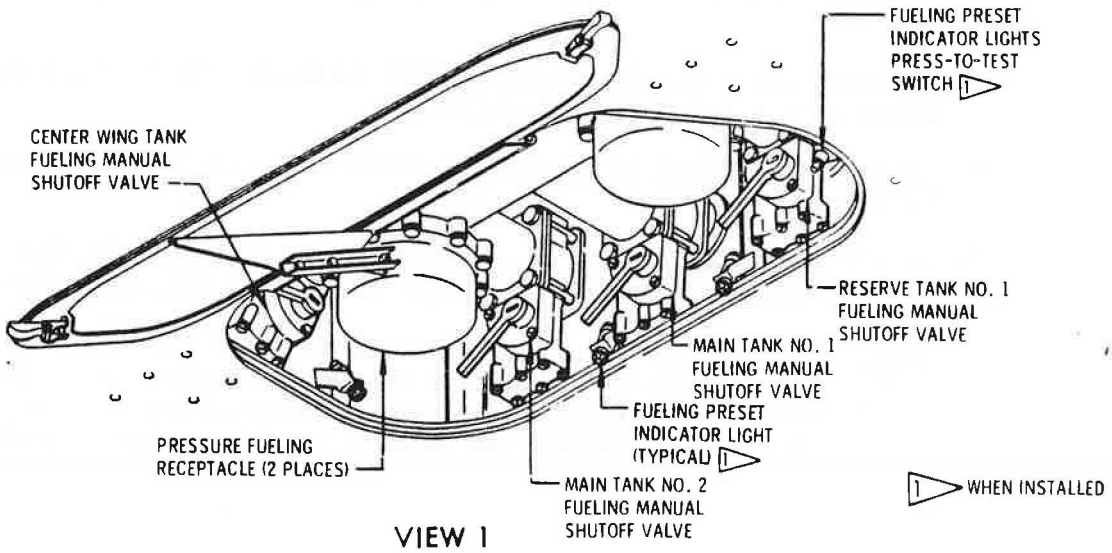
G. See Chapter 28 for defueling procedures.

2. Fueling Precautions

A. During any fueling operation, follow standard fueling precaution practices.

CAUTION: DO NOT PARK ANY GROUND EQUIPMENT NEAR THE WING TIP DURING FUELING BECAUSE THE FUEL TANKS VENT OUT THROUGH THE WING TIP. THE WING TIP ALSO SETTLES UNDER THE FUEL LOAD.





VIEW 1

Fueling Access and Walkway Location Diagram
Figure 201

1. Overwing Fueling (Fig. 201)

A. Ground airplane and Fueling truck (Ref Chapter 13, Static Grounding).

WARNING : AIRPLANE AND FUELING TRUCKS MUST BE PROPERLY GROUNDED BEFORE FUELING OPERATION TO PREVENT POSSIBILITY OF FIRE OR EXPLOSION DUE TO DISCHARGE OF STATIC ELECTRICITY.

B. Ground fueling nozzles to grounding jacks adjacent to fill ports with nozzle bonding cable.

WARNING : DO NOT REMOVE FILLER CAPS BEFORE GROUNDING FUEL NOZZLES. FIRE OR EXPLOSION COULD RESULT FROM STATIC DISCHARGE.

C. Remove cape from overwing filler ports.

CAUTION : DO NOT REMOVE FILLER CAP BEFORE MAKING CERTAIN FUEL LEVEL IS BELOW LEVEL OF CAP. IN SOME AIRPLANE ATTITUDES WITH FUEL IN TANKS, REMOVAL OF FILLER CAP WILL RESULT IN FUEL FLOWING OUT THROUGH FILLER PORT ON TO WING.

D. Insert fueling nozzles into filler ports.

E. Start fueling operation.

F. Upon completion of fueling, remove fuel nozzles and install filler caps.

G. Disconnect nozzle bonding cables.

H. Disconnect fueling truck grounding cables.

4. Pressure Fueling

A. Connect a bonding cable from the fueling vehicle to an approved electrical grounding or bonding connection on the airplane.

WARNING : DO NOT CONNECT A HEADSET AND DO NOT TOUCH CONNECTIONS TO THE AIRPLANE DURING ATMOSPHERIC ELECTRICAL ACTIVITY OR IN STRONG RADIATIVE FIELDS. LIGHTNING STRIKE AND HIGH DISCHARGE CURRENTS CAN CAUSE SEVERE INJURY.

DO NOT KEY HF SYSTEM WHILE AIRCRAFT IS BEING FUELED. AN EXPLOSION MAY RESULT.

CAUTION : ATTACH BONDING CABLES ONLY TO SPECIFIED POINTS ON THE AIRPLANE. INCORRECTLY ATTACHED BONDING CABLES CAN CAUSE SCRATCHES WHICH CAN CAUSE CORROSION AND CRACKS ON STRESSED PARTS. BOND WIRES ATTACHED TO COMPOSITE DOORS OR FAIRINGS DO NOT PROVIDE A BOND.

NOTE : If the fueling vehicle has a permanently attached grounding/bonding cable, it may be used.

B. Connect external power and position fueling switch at external power receptacle to ON.

C. Press fuel quantity indicators PRESS-TO-TEST switch on flight engineer's lover panel and verify that fuel quantity indicators are operating.

D. Position fueling preset switches (when installed) on flight engineer's panel to FUEL and adjust potentiometers until indicators read amount of fuel to be added.

NOTE : Use of fueling preset system is not necessary if tanks are to be completely filled

E. Open pressure fueling station access door, and remove fueling receptacle caps.

CAUTION : TO PREVENT THE POSSIBILITY OF THE PRESSURE FUELING STATION ACCESS DOORS INTERFERRING WITH THE WING LEADING EDGE FLAPS, THE DOORS MUST NOT BE OPENED BEYOND THEIR NORMAL DETENT POSITION.

F. Connect fueling nozzle bonding cable to grounding jack on wings.

NOTE : Bonding cable is not required it electrical continuity exists between nozzle and receptacle.

G. Connect fueling nozzles to fueling receptacles (Fig. 201).

H. Open fueling manual shutoff valves at fueling stations.

I. Check fueling present indicator lights (when installed) by pressing fueling preset indicator lights PRESS-*TO-TEST switch at each fueling station.

J. Proceed to fuel tanks. (See Fig. 202 for approximate capacities.)

CAUTION : DO NOT EXCEED 50 PSI FUELING PRESSURE.

TANK	U.S. GALLONS	IMPERIAL GALLONS	LITERS
NO. 1 AND 4 RESERVE TOTAL FUEL CAPACITY (EACH)	440	366	1666
NO. 1 AND 4 MAIN TOTAL FUEL CAPACITY (EACH)	2329	1940	8820
No. 2 AND 3 MAIN TOTAL FUEL CAPACITY (EACH)	4075	3395	15,430
TOTAL BOTH WINGS	13,688	11,402	51,832
CENTER WING TANK (4 CELLS) TOTAL FUEL CAPACITY	7664	6375	29,000
TOTAL NET FUEL	21,352	17,777	80,832
CENTER WING TANK (7 CELLS)	10,221	8511	38,690
TOTAL NET FUEL	23,909	19,913	90,522

T.R. 2-70
Fuel Tank Capacities
Figure 202

K. In order to verify correct operation of the fueling level control valves, place the fueling precheck switch to CLOSE or TEST position. After completing check, place switch to NORM position.

NOTE: The fueling precheck switch (when installed) is located on the fueling instrument panel (when installed) just forward of the fueling station.

L. Close applicable shutoff valves when respective fueling preset indicator light (when installed) illuminates. If preset system is not being used close shutoff valves when fueling of tank is completed.

M. Close all fueling shutoff valves after completing fueling operation.

N. After closing all fueling shutoff valves, reverse fueling pump to evacuate manifold and then stop fueling pump.

O. Disconnect fueling hose nozzles.

P. Disconnect nozzle bonding cable (if installed).

Q. Replace fueling receptacle caps, and wipe up at the fueling station.

R. Disconnect fueling track grounding cable.

S. Close pressure fueling access door.

T. Position fueling preset switches (when installed) to NORM.

U. Position fueling switch at external power receptacle to OFF, and disconnect external power.

5. Fuel Tank Sump Drainage

A. General

(1) Periodic draining of fuel tank sumps is essential for removal of free water from fuel tanks. Do not drain sumps while tanks are being fueled as the water will be suspended in the fuel. Allow maximum practical settling period prior to draining as the settling period for water in fuel is one hour per foot of fuel depth. If it is not possible to allow a settling period after fueling, the sumps should be drained before fueling to prevent excessive accumulation of water from repeated fueling.

(2) Fuel temperatures should be above 32°F before sump draining is attempted to assure removal of all accumulated water and ice from the sump. If it is not possible to allow the fuel temperature to rise above 32°F prior to draining the sumps, the use of an approved fuel anti-icing additive may facilitate drainage. Phillips PFA 55 MB additive, or equivalent, may be used in a concentration not to exceed 0.1 per cent by volume.

B. Equipment and Materials

(1) Clear plastic or glass container of one gallon capacity.

(2) Wrench Assembly - Fuel Drain Valve, F65834-500 or equivalent.

C. Drain Fuel Tank Sumps

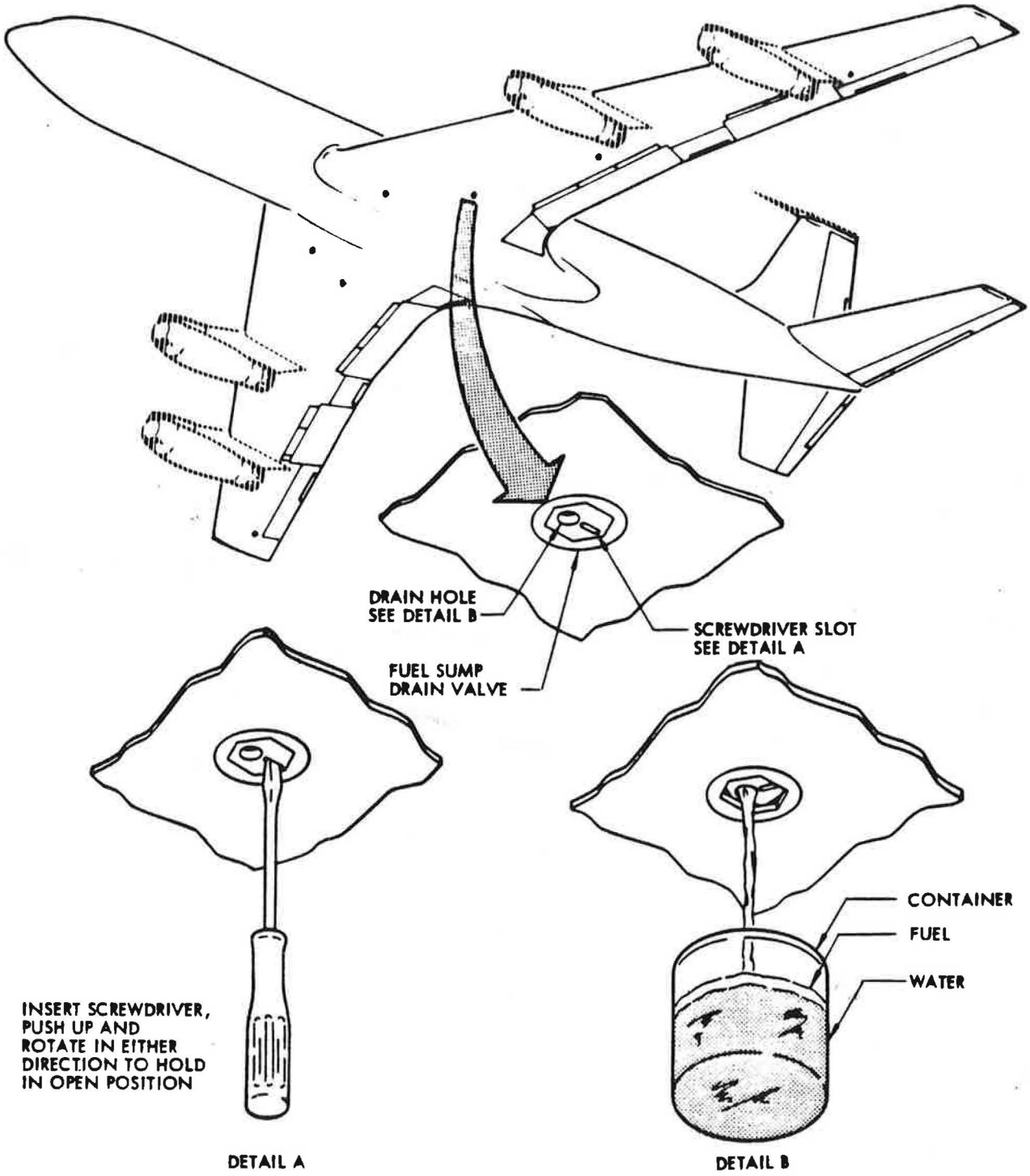
(1) Insert screwdriver or wrench assembly in slot in fuel sump drain valve. (See figure 203.)

(2) Push up and rotate drain valve in either direction to hold in open position.

(3) Use clear plastic or glass container to catch drainage so that line of separation between water and fuel can be noted.

(4) Drain each sump long enough to ensure that all free water is removed.

(5) Insert screwdriver or wrench assembly and close drain valve.


DRAIN HOLE
SEE DETAIL B
SCREWDRIVER SLOT
SEE DETAIL A
FUEL SUMP
DRAIN VALVE
INSERT SCREWDRIVER, PUSH UP AND ROTATE IN EITHER DIRECTION TO HOLD IN OPEN POSITION
DETAIL A
CONTAINER
FUEL
WATER
DETAIL B

HYDRAULIC FLUID SERVICING

Item to be Serviced (See figure 201.)	Service Information
1. Hydraulic Reservoir	A. Utility and Auxiliary System Reservoirs.

NOTE: Auxiliary reservoir is serviced automatically when the utility reservoir is serviced. Reservoir filling procedure is same with or without utility or auxiliary system pressure. Brake system should be pressurized.

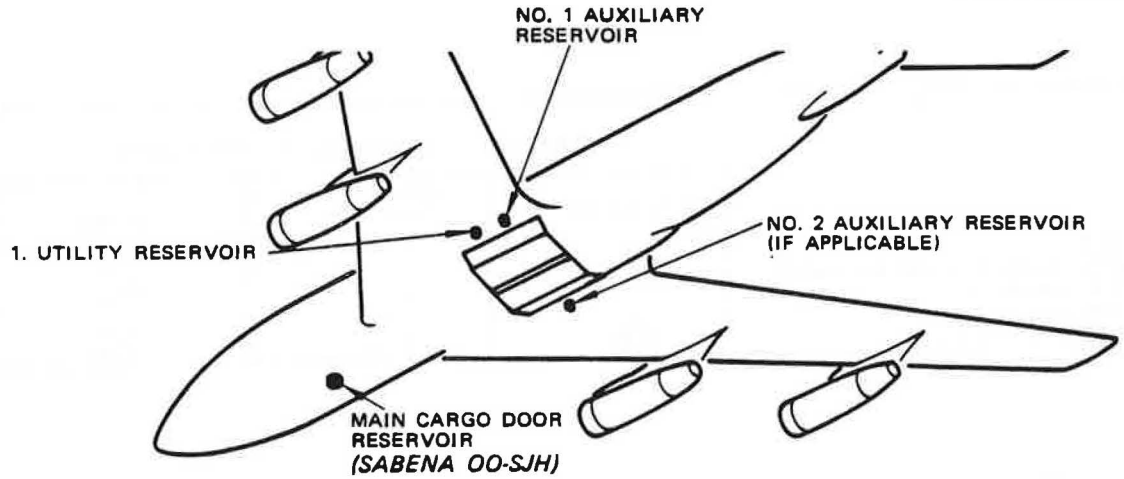
(1). Depressurize utility reservoir.

(a) On airplanes not equipped with a manual depressurization valve, slowly unscrew reservoir cap 3 full turns until compressed air has escaped.

CAUTION: DO NOT REMOVE FILLER CAP UNTIL RESERVOIR IS DEPRESSURIZED OR FLUID WILL ESCAPE.

(b) On airplanes equipped with a manual depressurization valve, remove screws and depress knurled button on depressurization valve.

NOTE: Depressurization valve is located above and just aft of utility reservoir.



Hydraulic Fluid Servicing Location Diagram
Figure 201

Item to be Serviced. (See figure 201.)	Service Information
	(2) On airplanes with two auxiliary reservoirs, unscrew bleed plug on No. 2 auxiliary reservoir 3 turns to allow air to escape.
	(3) Fill with hydraulic fluid, fire resistant-BMS 3-11 to top of filler neck. See figure 202 and refer to metal-cal installed above and inboard of the utility hydraulic reservoir.
	(4) Allow air to escape from filler neck during filling.
	NOTE: Overflow usually occurs during filling operation. Precautions should be taken to catch overflow.
	(5) Make sure peep sight window on utility reservoir is completely covered with fluid.
	(6) On airplanes with two auxiliary reservoirs, check that No. 2 auxiliary reservoir is filled to top of bleed plug.
	(7) Replace filler cap and safety pin.
	(8) On airplanes with two auxiliary reservoirs torque bleed plug on No. 2 auxiliary reservoir to 50 pound-inches and lockwire.

HYDRAULIC RESERVOIRS CAPACITY DATA

	U.S. GALLONS	IMPERIAL GALLONS	LITERS
UTILITY	5.4	4.5	20.4
UTILITY (WITH EXPANSION TANK)	6.9	5.7	26.1
NO. 1 AUXILIARY	1.4	1.1	5.3
NO. 2 AUXILIARY	1.4	1.1	5.3
MAIN CARGO DOOR	0.36	0.30	1.36

Hydraulic Reservoirs Capacity
Figure 202

Item to be Serviced. (See figure 201.)	Service Information
	B. Main Cargo Door Reservoir (707-321C only) (1) Deactivate main cargo door. See Chapter 52, Main Cargo Door. (2) Remove reservoir filler cap. (3) With main cargo door closed fill reservoir with hydraulic fluid, fire resistant-BMS 3-11 to top of filler neck. (See figure 202.) (4) Replace reservoir filler cap. (5) Drain fluid spillage from scupper under filler neck.
2. Flap Drive Gearboxes	A. Procedure See Chapter 27, Flight Controls.

ENGINE OIL TANK SERVICING

1. General

   A. Servicing of the engine oil system is accomplished by either replenishing or changing the oil supply. This procedure outlines the steps required to replenish the engine oil supply. Refer to Chapter 79, Engine Oil System, for engine oil change procedures.

   B. The engine oil supply tank is serviced through a filler port in the tank.

2. Equipment and Materials

   A. Engine oil conforming to PWA Specification 521B (See PWA Service Bulletin No. 238 or refer to Chapter 13.)

   CAUTION: SOME OILS ARE NOT COMPATIBLE WHEN MIXED. UNLESS COMPATIBILITY IS ASSURED, DO NOT MIX NAME BRAND OILS.

   ENSURE THAT SERVICING CONTAINERS AND OPENING ACCESSORIES ARE CLEAN. DISPOSE OF UNUSED OIL REMAINING IN CONTAINERS.

	ENGINE OIL TANK CAPACITY DATA					
	U.S. GALLONS		IMPERIAL GALLONS		LITERS	
	ENG 1, 2	ENG 3, 4	ENG 1, 2	ENG 3, 4	ENG 1, 2	ENG 3, 4
ENGINE NO. 1, 2, 3, 4 (Turbojet)						
CAPACITY (TOP OF FILLER) (EA)	7.9	7.9	6.6	6.6	30.0	30.0
EXPANSION (EA)	1.0	1.0	0.83	0.83	3.8	3.8
ENGINE NO. 1, 2, 3, 4 (Turbofan)						
CAPACITY (TOP OF FILLER) (EA)	6.0 ± 0.1	6.1 ± 0.1	4.99 ± 0.1	5.1 ± 0.1	22.7 ± 0.4	23.1 ± 0.4
EXPANSION (EA)	2.1 ± 0.1	2.0 ± 0.1	1.75 ± 0.1	1.66 ± 0.1	7.9 ± 0.4	7.5 ± 0.4

3. Service Engine Oil Tank - Gravity Method

CAUTION: THE ENGINE IS SUBJECT TO STATIC INTERNAL OIL LEAKAGE AND UP TO TWO GALLONS OF OIL MAY DRAIN BACK INTO THE ENGINE SUMPS. IN ORDER TO ELIMINATE OVERSERVICING, WHICH COULD RESULT IN A BUILD UP OF SUFFICIENT INTERNAL PRESSURE TO RUPTURE THE OIL TANK DURING ENGINE OPERATION, THE OIL TANK SHOULD BE SERVICED WITHIN 30 MINUTES AFTER ENGINE SHUTDOWN.

NOTE: If engine oil tank is not serviced within 30 minutes after engine shutdown, then prior to servicing, the engine shall be operated at idle rpm for at least 1 minute to return scavenge oil to the tank. Refer to figure 201 for engine oil tank capacities.

A. Open oil tank access door on forward left side of engine cowling.

B. Remove filler cap from port in sump cavity.

C. Fill oil tank to lip of filler neck with new oil. Replace oil tank filler cap and close oil tank access door.

NOTE: Any oil spilled in the sump cavity or overserviced will drain overboard through the scupper drain.

ENGINE ACCESSORY OIL SERVICING

1. General

A. Oils approved for use in accessory equipment conform to P&WA (Pratt & Whitney Aircraft) Specification No. 521B (P&WA Service Bulletin No. 238) and are in two categories, Type I and Type II. Figure 201 lists the oils by number and the units for which they are approved. Refer to following paragraphs for procedures applicable to each component.

2. Equipment and Materials

A. Oil conforming to P&WA Specification No. 521B (See P&WA Service Bulletin No. 238 and lists in paragraphs 2.B. and 2.C. or refer to Chapter 13.)

B.

Approved Type I Oil		Manufacturer
(1)	ESSO/ENCO 15	Humble Oil and Refining Co.
(2)	ESSO/ENCO T.J. 15	Humble Oil and Refining Co.
(3)	TEXACO SATO 15	Texaco
	CALTEX SATO 15	California Texas Co.
(4)	SINCLAIR TURBO S OIL 15	Sinclair Refining Co.
(5)	BP AERO TURBINE OIL 15	Sinclair Refining Co.
(6)	AEROSHELL TURBINE OIL 300	Shell Oil Co.
(7)	CASTROL 3C - GAS TURBINE LUBRICANT	Castrol Limited

C. Approved Type II Oil

	Manufacturer
(1) TEXACO SATO 5180	Texaco
CALTEX SATO 5180	California Texas Co.
(2) ESSO/ENCO 5251	Humble Oil and Refining Co.
(3) MOBIL OIL JET II	Mobil Oil Co.
(4) SINCLAIR TURBO S OIL TYPE II	Sinclair Refining Co.
(5) ESSO/ENCO 2380	Humble Oil and Refining Co.

CAUTION: DO NOT MIX OILS WITH DIFFERENT TYPE AND LIST NUMBERS WHEN ADDING OR CHANGING OIL. DIFFERENCES IN CHEMICAL COMPOSITION OF OILS WITH DIFFERENT TYPE AND LIST NUMBERS MAY MAKE THEM INCOMPATIBLE IF MIXED.

Oil		Generator Drive (Pratt & Whitney Eng.) (CSD)	Turbo Compressor (T/C)
Type	List. No.		
I	(1)	CSD	T/C
I	(2)	CSD	T/C
I	(3)	CSD	T/C
I	(4)	CSD	
I	(5)	CSD	
I	(6)	CSD	T/C
I	(7)	CSD	T/C
II	(1)	CSD	T/C
II	(2)	CSD	T/C
II	(3)	CSD	T/C
II	(4)	CSD	
II	(5)	CSD	T/C

3. Generator Constant Speed Drive (Pratt and Whitney Engines)

A. Service with oil indicated on figure 201.

WARNING: USE EXTREME CARE WHEN DRAINING CSD OIL OR REMOVING CSD COMPONENTS. HOT OIL CAN CAUSE INJURY.

PROLONGED CONTACT WITH CSD OIL CAN CAUSE DERMATITIS. OIL WILL STAIN CLOTHING AND CAN SOFTEN PAINT.

B. Check oil level at sight gage on generator drive. If oil level is below operating range (green or white/black band on gage), service per steps C. and D.

C. Fill generator drive by pumping oil through tee-fitting in line to oil cooler. Use pressure of 5 to 30 psi.

D. Continue to pump until oil rises to within one eighth of an inch of the lower edge of the green (or white/black) band on gage. Allow the oil level to stabilize for at least 2 minutes. The oil level will rise when the drive is warm.

CAUTION: DO NOT OVERFILL. THE OIL LEVEL SHOULD NOT BE HIGHER THAN THE GREEN (OR WHITE/BLACK) BAND OR MORE THAN ONE FOURTH OF AN INCH BELOW. EXCESS OIL CAUSES OVERHEATING OF GENERATOR DRIVE. DO NOT ALLOW SIGHT GAGE TO OVERFILL BY MISTAKING SHADOWS AND REFLECTIONS FOR OIL COLUMN.

E. On generator drives with a wet spline cavity, inject oil through spline cavity fill check valve until oil reaches top of standpipe. Refer to Chapter 24, Generator Constant Speed Drive.

NOTE: If no standpipe installed, empty cavity through spline shaft drain plug on gear box. Replace drain plug and inject 1.5 pints of above recommended engine oil through spline cavity fill check valve. Approximately 35 psi is required to force oil thru the CSD fill check valve into the spline cavity.

Figure 202
Deleted

4. Turbocompressors

A. Service with oil per figure 201 to full mark on dipstick.

NOTE: Dipsticks are marked for use on either left or right engine.

AIR CONDITIONING AIR CYCLE MACHINE OIL SERVICING

1. Service Air Conditioning Air Cycle Machine

   A. Open air conditioning equipment bay door.

   B. Service air cycle machine with oil, MIL-L-6085, to FULL mark on dipstick.

OXYGEN - SERVICING

1. General

A. Passenger oxygen system servicing is accomplished by the cylinder replacement method in paragraph 2.

B. Crew and personnel accommodations oxygen system servicing is accomplished by the cylinder replacement method in paragraph 2 or if desired, on AF F-BHSD and on AA ALL EXCEPT N7559A thru N7569A, by the external fill method in paragraph 3.

C. Portable oxygen servicing is accomplished by replacing the cylinders with fully serviced cylinders.

D. Oxygen Requirements

(1) Gaseous oxygen for aviation purposes shall contain not less than 99.5% oxygen by volume and be free from all contaminants of known toxicity to the maximum practicable extent. Moisture content shall not exceed 0.005 milligram of water vapor per liter of gas at temperature of 70°F and pressure of 760 millimeters of Hg. Oxygen per Specification MIL-O-27210, Type I, meets these requirements.

E. Precautionary Measures

(1) Ensure that hands, clothing, tools, servicing area, and servicing equipment are clean and free of petroleum products, hydraulic fluid, or dirt before servicing the oxygen system.

(2) Keep oxygen away from all sources of ignition (hot exhausts, sparks, flame, smoking, etc.).

(3) Do not allow oxygen to mix with other gases, fumes, or flammable materials.

(4) Use only aviation grade breathing oxygen. Welding oxygen and hospital oxygen may be pure enough for breathing but could contain excess water which could freeze and plug the lines, regulators, and valves of the airplane oxygen system.

(5) Open all oxygen valves slowly to prevent sudden pressure rise. This will minimize the possibility of fire due to resultant temperature rise. Ensure that valves are also open fully.

WARNING: VALVES MUST BE OPENED SLOWLY OR EXCESSIVE TEMPERATURES MAY RESULT.

(a) Opening Oxygen Cylinder Valves

1) Slowly open oxygen cylinder shutoff valve to full open. Do not exceed 25 pound-inches (finger-tight). Then close valve one-fourth turn. Lockwire valve in this position when restoring the system to normal.

CAUTION: IF GIVEN TORQUE IS EXCEEDED, VALVE MAY BE DAMAGED.

2. Service Oxygen System (Cylinder Replacement Method)

A. Prior to performing maintenance, review oxygen system safety precautions and general maintenance instructions outlined in 35-0, Maintenance Practices.

B. Ensure that airplane is properly grounded.

C. Gain access to oxygen cylinder.

D. Close all cylinder shutoff valves finger-tight. This is equivalent to a maximum torque of 25 pound-inches.

CAUTION: IF GIVEN TORQUE IS EXCEEDED VALVE MAY BE DAMAGED.

E. Ensure that hands, clothing, tools, oxygen cylinders, and associated connections are clean and free of petroleum products, hydraulic fluid, or dirt.

F. Loosen fittings at cylinder carefully to bleed system pressure.

CAUTION: DISCONNECT HIGH PRESSURE OXYGEN LINE AT VALVE COUPLING, NOT AT FLARELESS TUBE CONNECTION. DO NOT DISASSEMBLE THERMAL COMPENSATOR.

NOTE: Residual pressure may exist in lines and escape with some force.

G. Release clamps and remove cylinder assembly. Cap connections on cylinder. If replacement cylinder is not immediately installed, cap airplane connections.

WARNING: CONNECTIONS MUST BE CAPPED TO AVOID CONTAMINATION. ENSURE THAT CLEAN CAPS ARE USED. METAL CAPS MUST BE USED WHERE CONNECTOR THREADS ENGAGE THE CAP. ONCE USED, CAPS MUST BE RECLEANED IN ACCORDANCE WITH OXYGEN COMPONENT CLEANING PROCEDURES IN OVERHAUL MANUAL OR DISCARDED.

H. Ensure that hydrostatic test date on replacement oxygen cylinder has not expired and that cylinder is in good condition.

OXYGEN - SERVICING

1. General

A. Passenger oxygen system servicing is accomplished by the cylinder replacement method in paragraph 2.

B. Crew and personnel accommodations oxygen system servicing is accomplished by the cylinder replacement method in paragraph 2.

C. Portable oxygen servicing is accomplished by replacing the cylinder with fully serviced cylinders.

D. Oxygen Requirements

(1) Gaseous oxygen for aviation purposes shall contain not less than 99.5% oxygen by volume and be free from all contaminants of known toxicity to the maximum practicable extent. Moisture content shall not exceed 0.005 milligram of water vapor per liter of gas at temperature of 70°F and pressure of 760 millimeters of Hg. Oxygen per Specification MIL-O-27210, Type I, meets these requirements.

E. Precautionary Measures

(1) Ensure that hands, clothing, tools, servicing area and servicing equipment are clean and free of petroleum products, hydraulic fluid, or dirt before servicing the oxygen system.

WARNING: USE ONLY "OXYGEN-CLEAN" COMPONENTS IN THE OXYGEN SYSTEM. IF YOU DO NOT USE "OXYGEN-CLEAN" COMPONENTS, THIS CAN CAUSE A FIRE OR AN EXPLOSION WHEN NEAR PRESSURIZED OXYGEN WHICH CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

NOTE: Supplemental information concerning this subject is contained in the following Boeing Process Specification: BAC5001 Fluid Lines, Fitting and Pressure Testing, BAC5402 Oxygen System.

(2) Keep oxygen away from all sources of ignition (hot exhausts, sparks, flame, smoking, etc.).

(3) Do not allow oxygen to mix with other gases, fumes, or flammable materials.

(4) Use only aviation grade breathing oxygen. Welding oxygen and hospital oxygen may be pure enough for breathing but could contain excess water with could freeze and plug the lines, regulators, and valves of the airplane oxygen system.

(5) Open all oxygen valves slowly to prevent sudden pressure rise. This will minimize the possibility of fire due to resultant temperature rise. Ensure that valves are also open fully.

WARNING: VALVES MUST BE OPENED SLOWLY OR EXCESSIVE TEMPERATURES MAY RESULT.

(a) Opening Oxygen Cylinder Valves

1) Slowly open oxygen cylinder shutoff valve to full open. Do not exceed 25 pound-inches (finger-tight). Then close valve one-fourth turn. Lockwire valve in the position when restoring the system to normal.

CAUTION : IF GIVEN TORQUE IS EXCEEDED VALVE MAY BE DAMAGED.

2. Service Oxygen System (Cylinder Replacement Method)

A. Prior to performing maintenance, review oxygen system safety precautions and general maintenance instructions outlined in 35-0, Maintenance Practices.

B. Ensure that airplane is properly grounded.

C. Gain access to oxygen cylinder.

D. Close all cylinder shutoff valves finger-tight. This is equivalent to a maximum torque of 25 pound-inches

CAUTION : IF GIVEN TORQUE IS EXCEEDED VALVE MAY BE DAMAGED.

E. Ensure that hands, clothing, tools, oxygen cylinders, and associated connections are clean and free of petroleum products, hydraulic fluid, or dirt.

F. Loosen fittings at cylinder carefully to bleed system pressure.

CAUTION : DISCONNECT HIGH PRESSURE OXYGEN LINE AT VALVE COUPLING, NOT AT FLARELESS TUBE CONNECTION. DO NOT DISASSEMBLE THERMAL COMPENSATOR.

NOTE : Residual pressure may exist in lines and escape with some force.

G. Release clamps and remove cylinder assembly. Cap connections on cylinder. If replacement cylinder is not immediately installed, cap airplane connections.

WARNING : CONNECTIONS MUST BE CAPPED TO AVOID CONTAMINATION. ENSURE THAT CLEAN CAPS ARE USED. METAL CAPS MUST BE USED WHERE CONNECTOR THREADS ENGAGE THE CAP. ONCE USED, CAPS MUST BE RECLEANED IN ACCORDANCE WITH OXYGEN COMPONENT CLEANING PROCEDURES IN OVERHAUL MANUAL OR DISCARDED.

H. Make sure it as not been more than three years since the oxygen cylinder had its last hydrostatic test.

NOTE: The last hydrostatic test date will be stamped on the neck of the oxygen cylinder

I. Remove cap, if installed, from airplane connection and examine to ensure fittings are clean and free of contaminants, thread chips, etc.

J. Remove any lockwire or cotterpin which may be used to secure cap on fully charged oxygen cylinder. Slowly unscrew cap from cylinder and allow any trapped gas to bleed off before final disengagement of threads.

WARNING: FULL CYLINDER PRESSURE MAY EXIST INSIDE PRESSURE-TYPE CAP. CAP MAY BE BLOWN OFF WITH SOME FORCE IF UNSCREWED TOO RAPIDLY TO ALLOW FOR VENTING OF TRAPPED GAS.

NOTE: Pressure-type caps are used on oxygen cylinders having metal seats in the shutoff valves and are usually retained to cylinder with a short length of chain. Do not cut or detach chain after removal of cap.

K. Place fully charged cylinder assembly in mounting position.

NOTE: Ensure that high pressure outlet aligns with high pressure line connection.

L. Connect high pressure oxygen line. Tighten nut to a torque of 650 to 700 pound-inches. Connect overboard discharge line.

WARNING: NO OIL, LUBRICANT OR GASKETS SHALL BE USED IN MAKING THESE CONNECTIONS.

M. Clamp cylinder assembly in position.

N. Slowly open oxygen cylinder shutoff valve to full open. This will minimize the possibility of fire due to resultant temperature rise. Do not exceed 25 pound-inches (finger-tight). Then close valve one-fourth turn.

WARNING: VALVES MUST BE OPENED SLOWLY OR EXCESSIVE TEMPERATURES MAY RESULT.

CAUTION: IF GIVEN TORQUE IS EXCEEDED VALVE MAY BE DAMAGED.

O. Check that no leakage exists at cylinder connections using leak test solution specified in Chapter 13 or Chapter 20, as applicable. Test solution shall be wiped off with a clean cloth immediately after testing.

P. Check that system pressure is within required range.

Q. If oxygen cylinders have pressure caps retained to cylinders by chains, restrict excess movement of caps by securing with lockwire.

R. Restore system to normal by closing access.

PARAGRAPH 3 COMPLETELY DELETED BY SAB 707/548.

Pages 203 thru 208 are deleted.

TOILET SERVICING

1. General

A. The servicing procedures for forward and aft toilet systems are similar. The drain fitting and drain valve handle are accessible by opening the servicing door. (See figure 201.) Each time the toilet tank is serviced, recharge the system with recommended amount of flushing mixture.

B. Addition of antifreeze to toilet tanks is needed only when airplane is allowed to cold soak during cold weather operation. Refer to 12-4-1, Cold Weather Operation - Maintenance Practices, for recommended antifreeze addition procedure.

C. In adding antifreeze, ensure the total charge of flushing fluid and antifreeze mixture does not exceed 7 gallons, to avoid overfilling of the toilet tank if toilet usage is considerable.

2. Equipment and Materials

A. Jet Degerm, Century Chemical Co., Detroit, Michigan

B. West Sanitor Fluid, West Chemical Co., 42-16 West Street, Long Island, New York

C. Turco Deodor, Turco Products Inc., Los Angeles, California

D. Dess-Air, Dessair Ltd., London Wall, London E.C. 2

E. Timsen-Air, American Sanitary Products Co., 2301 Blake St., Denver, Colorado

F. Allen Formula 680 Deodorant, Allen Chemical Company, 3235 N.W.37th St., Miami, Florida 33142 (dilution ratio: 1 to 200 to 1 to 320 deodorant/water)

3. Service Toilets (Forward and Aft)

A. Open service panel, and operate pet cock in center of waste drain cap, to check for possible leakage from waste drain valve.

B. Remove waste drain and flush line caps.

C. Connect toilet service cart, waste drain hose, and water line.

D. Pull waste drain valve handle and allow waste to drain into ground cart.

E. Close drain valve and pump a minimum of 6 gallons of water through SERVICE PANEL flush connection.

NOTE: This water should be pumped at a minimum pressure of 20 psi.

F. Pull drain valve handle to let system drain.

G. Close waste drain valve, disconnect waste drain hose and water line.

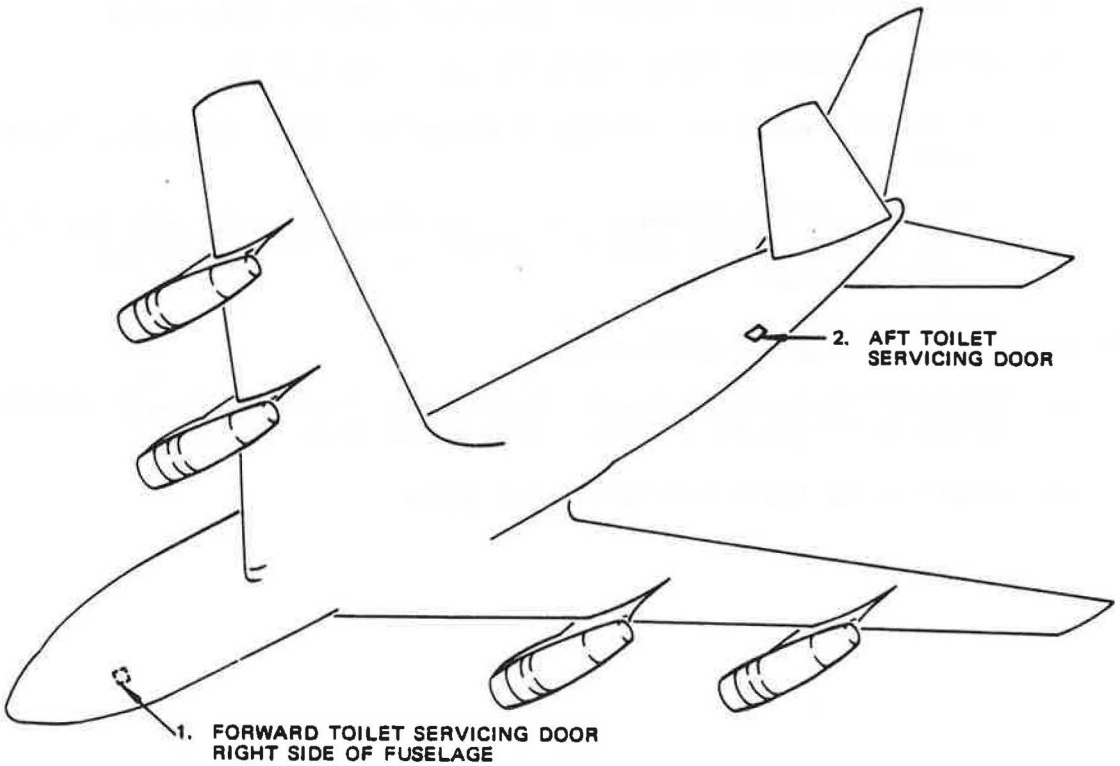
H. Connect chemical hose from ground cart to flushing connection and replenish the system with a minimum of 5 gallons of recharge mixture.

NOTE: A charge in excess of 7 gallons may result in overfilling if toilet usage is considerable.

I. Check waste outlet for leakage.

J. Repeat above procedure for all toilets.

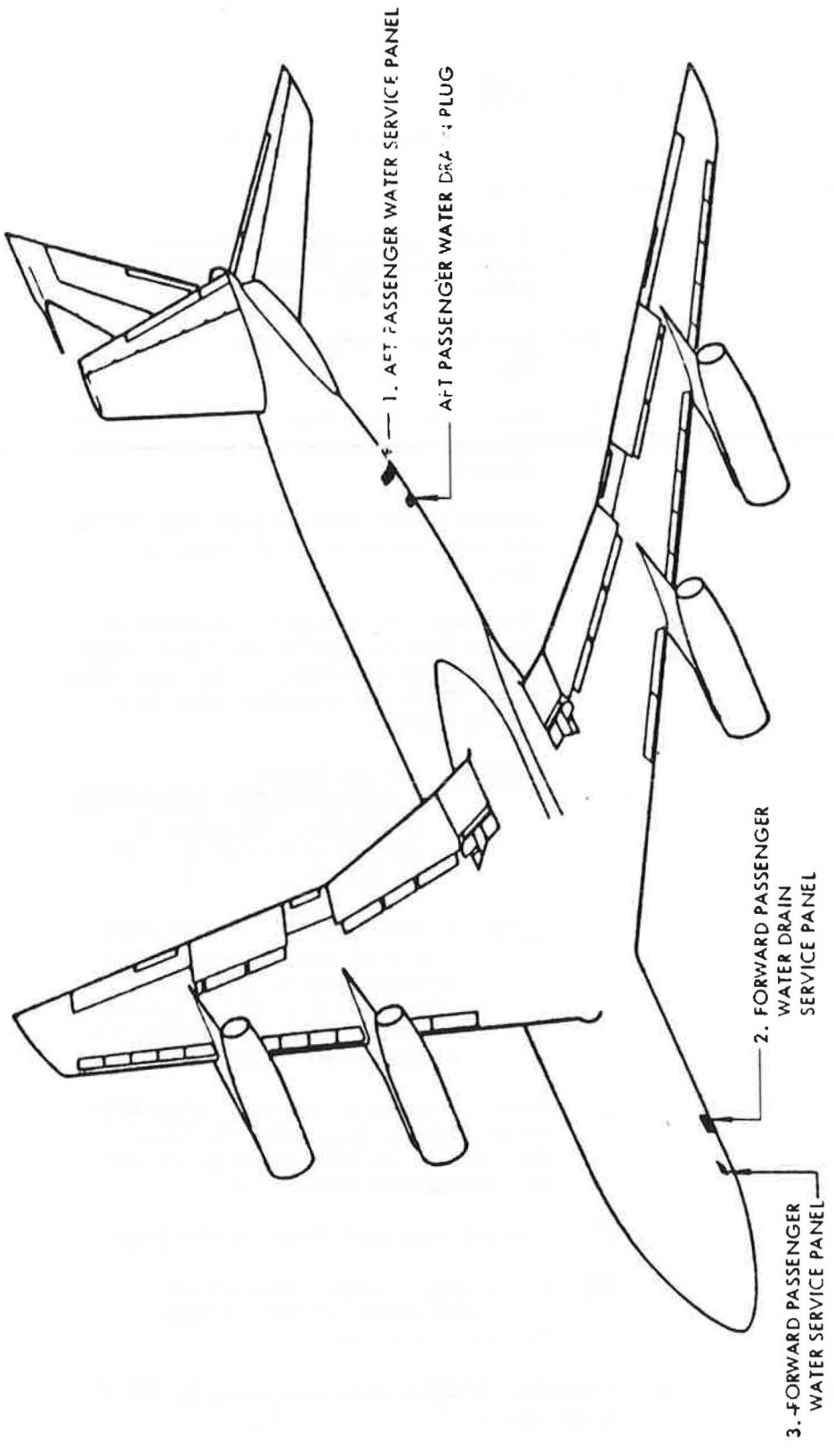
K. Replace all caps, close pet cock in waste drain cap, and close panel doors.



Toilet Servicing Access Location
Figure 201

WATER SERVICING

	Service Information
1. Aft Water System	A. Procedure
	(1) On Passenger/Cargo Convertible airplanes, open POTABLE WATER QTY IND COMPR AND VALVES CONTROL on P5.
	(2) Open water service panel door (Fig. 201).
	(3) Remove cap from fill line and overflow fitting. Check for ice and clear if blocked.
	(4) Connect water hose to fill connection and turn handle on fill drain to open.
	(5) Pump water at a maximum pressure of 40 psi (on ALL EXCEPT passenger/cargo convertible airplanes) into tank until water flows out overflow line in a steady stream.
	CAUTION: ON ALL EXCEPT PASSENGER/CARGO CONVERTIBLE AIRPLANES, PRESSURES IN EXCESS OF 40 PSI MAY CAUSE DAMAGE TO WATER TANK.
	NOTE: On ALL EXCEPT passenger/cargo convertible airplanes, inlet pressure may be source regulated or a 40 psi pressure restrictor may be installed in airplane fill inlet line.
	(6) Turn off water at source. When water stops flowing from overflow line, turn handle on fill drain to CLOSED and disconnect water hose.
	(7) Install caps and close access doors.
	(8) On Passenger/cargo convertible airplanes close circuit breaker opened in step (1) above.
2. Forward Water System	A. Procedure (Follow same procedure as for aft water system.)



Water Servicing Access Location Diagram
Figure 201

LIQUID SOAP DISPENSER - MAINTENANCE PRACTICES

1. Service Liquid Soap Dispenser

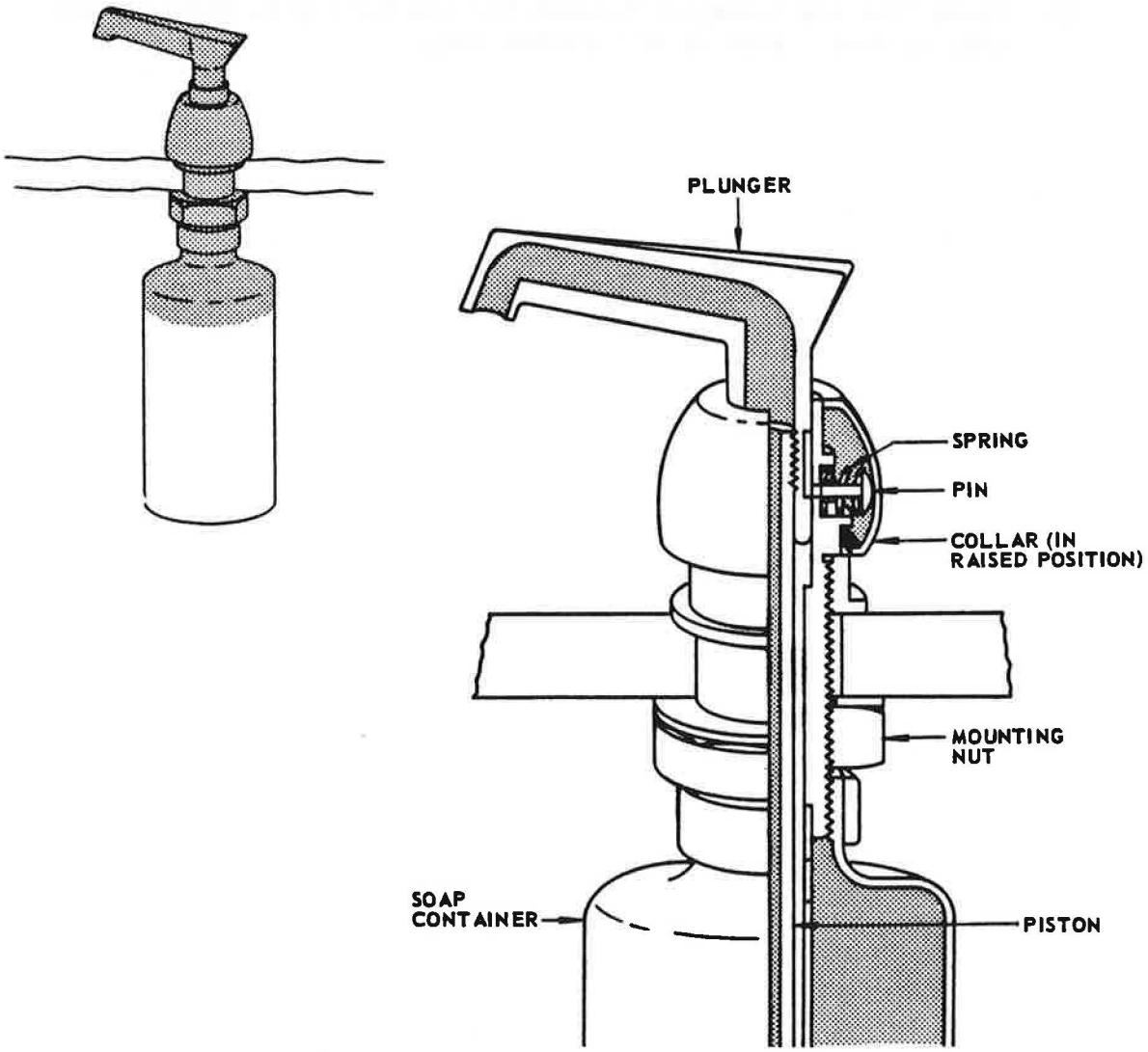
A. General

(1) The soap dispenser is filled by removing the plunger. Do not remove the container from beneath the counter.

B. Refill liquid soap dispenser.

(1) Raise collar to most upward position to release spring loaded pin. (See figure 201.)

(2) Remove plunger and piston assembly from container.



Liquid Soap Dispenser
Figure 201

(3) Pour liquid soap into hole vacated by the plunger.

NOTE: Capacity of the container is six ounces.

CAUTION: LIQUID SOAP WILL CAUSE DETERIORATION OF ELECTRICAL INSULATION. MAKE CERTAIN ANY OVERFLOW IS CLEANED UP.

C. Replace plunger assembly.

(1) Hold collar in the raised position.

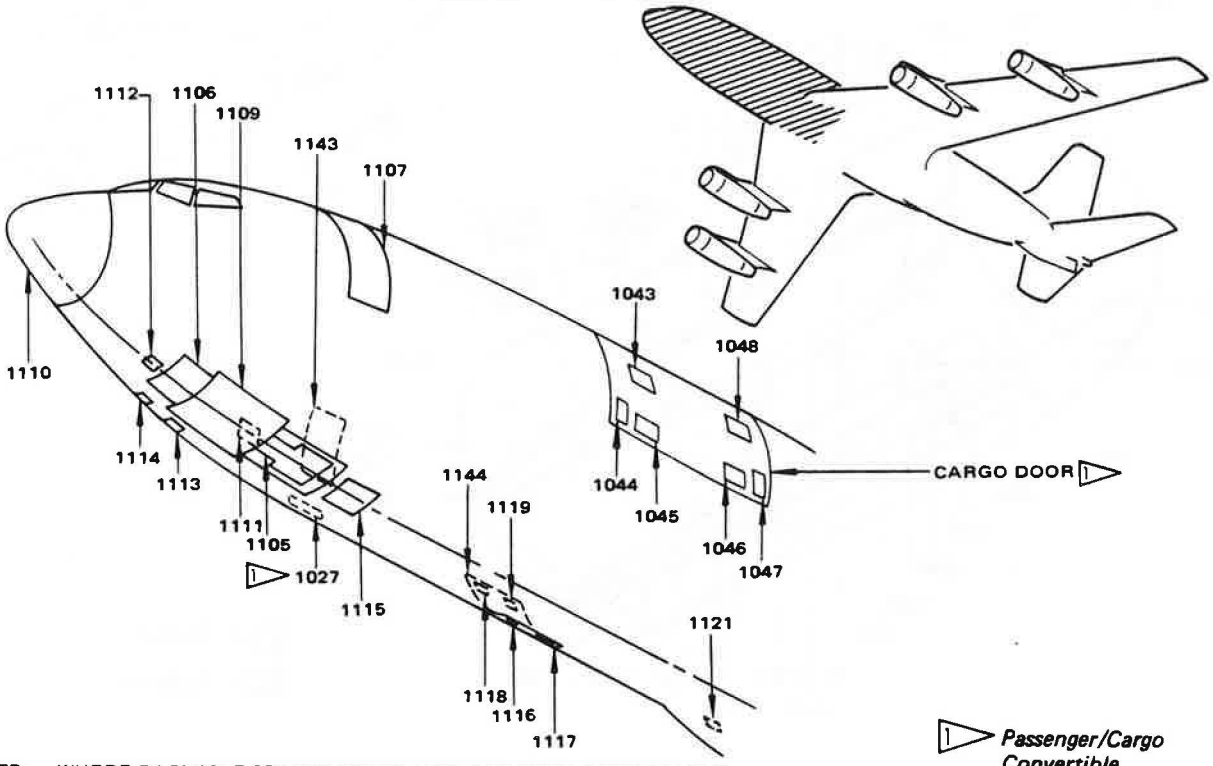
(2) Push down plunger assembly and hold down.

(3) Release collar.

(4) Rotate plunger assembly until spring loaded pin snaps into position.

(5) Check that the container beneath the counter top is tight and not leaking soap. Wipe up any spilled soap.

ACCESS DOORS AND PANELS

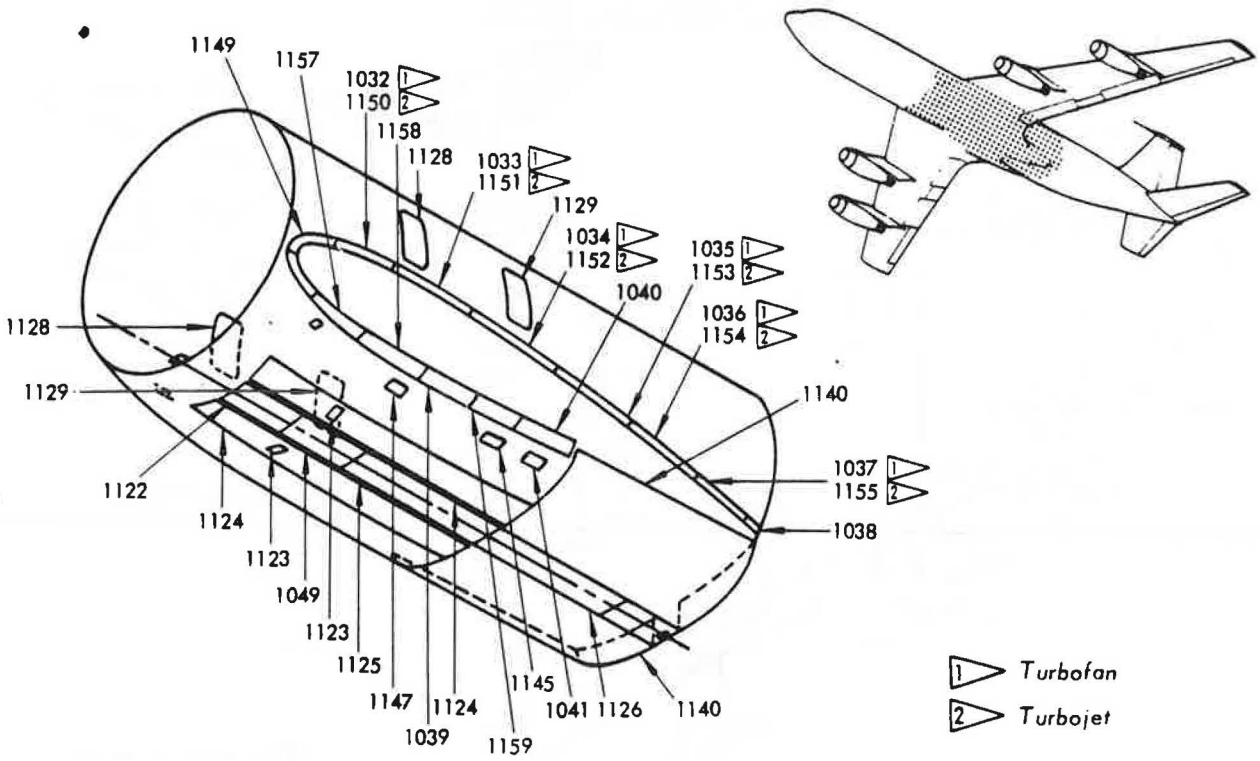


1 Passenger/Cargo Convertible Airplanes

NOTE: WHERE BACN10LE SPACER NUTPLATES ARE USED, TIGHTEN THE FASTENERS. THEN BACK OFF APPROX 1/4 TURN AND RETIGHTEN TO ENSURE PROPER SEATING OF THE FASTENER.

PANEL NO.	TITLE	FASTENERS	
		QTY.	TYPE
1027	WATER DRAIN DOOR	(*)	
1043	DRIFT PIN ACTUATOR ACCESS PANEL	24	DETAILED
1044	LATCH ACTUATOR ACCESS PANEL		DETAILED
1045	LATCH ACTUATOR ACCESS PANEL		DETAILED
1046	LATCH ACTUATOR ACCESS PANEL		DETAILED
1047	LATCH ACTUATOR ACCESS PANEL		DETAILED
1048	DRIFT PIN ACTUATOR ACCESS PANEL		DETAILED
1105	NOSE LANDING GEAR FAIRING		AN4-5A OR NAS333-5, *
1106	DOPPLER RADOME	(*)	
1107	FORWARD MAIN ENTRY DOOR		HANDLE LATCHED
1109	NOSE WHEEL WELL DOORS		MECHANICAL
1110	RADOME	16	NAS517-6-6
1111	FORWARD TOILET SERVICING DOOR	2	LATCHES
1112	ANTENNA COVER PANEL	12	NAS517-2-7
1113	FORWARD WATER SERVICING DOOR	3	LATCHES
1114	EXTERNAL POWER RECEPTACLE DOOR	2	LATCHES
1115	ELECTRONICS COMPARTMENT DOOR		HANDLE LATCHED
1116	FORWARD CARGO DOOR MECHANISM ACCESS	8	NAS517-3-4
1117	FORWARD CARGO DOOR MECHANISM ACCESS	8	NAS517-3-4
1118	FORWARD CARGO DOOR MECHANISM ACCESS	8	NAS517-3-4
1119	FORWARD CARGO DOOR MECHANISM ACCESS	8	NAS517-3-4
1121	PNEUMATIC GROUND SERVICE DOOR	1	LATCH
1143	FORWARD GALLEY DOOR		HANDLE LATCHED
1144	FORWARD CARGO DOOR		HANDLE LATCHED

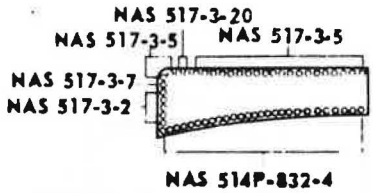
(*) QUICK-RELEASE FASTENERS



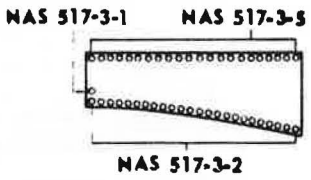
PANEL NO.	TITLE	FASTENERS
1032 1 2	WING TO FUSELAGE UPPER FAIRING ACCESS PANEL	(DETAILED)
1033 1 2	WING TO FUSELAGE UPPER FAIRING ACCESS PANEL	(DETAILED)
1034 1 2	WING TO FUSELAGE UPPER FAIRING ACCESS PANEL	(DETAILED)
1035 1 2	WING TO FUSELAGE UPPER FAIRING ACCESS PANEL	(DETAILED)
1036 1 2	WING TO FUSELAGE UPPER FAIRING ACCESS PANEL	(DETAILED)
1037 1 2	WING TO FUSELAGE UPPER FAIRING ACCESS PANEL	(DETAILED)
1038 1 2	WING TO FUSELAGE UPPER FAIRING ACCESS PANEL	(DETAILED)
1039	WING TO FUSELAGE UPPER FAIRING ACCESS PANEL	(DETAILED)
1040	WING TO FUSELAGE UPPER FAIRING ACCESS PANEL	(49 NAS517-3-2)
1041	TURBOFAN OUTLET ACCESS DOOR	(24 NAS517-3-2)
1049	ANTENNA ACCESS DOOR	(*)
1122	ANTENNA ACCESS DOOR	(*)
1123	AIR CYCLE UNIT ACCESS PANEL	(*)
1124	AIR CONDITIONING EQUIPMENT COMPARTMENT DOOR	LATCHES
1125	ANTENNA ACCESS DOOR	(*)
1126	ANTENNA ACCESS DOOR	(*)
1128	EMERGENCY ESCAPE HATCH	HANDLE LATCHED
1129	EMERGENCY ESCAPE HATCH	HANDLE LATCHED
1140	MAIN GEAR WHEEL WELL DOOR	MECHANICAL
1145	AUXILIARY COOLANT AIR INLET ACCESS PANEL	(10 AN509-C10-6)
1147	WING TO FUSELAGE LOWER FAIRING FORWARD ACCESS PANEL	(22 NAS517-3-2)
1149		(DETAILED)
1150 2		(DETAILED)
1151 2		(DETAILED)
1152 2		(DETAILED)
1153 2		(DETAILED)
1154 2		(DETAILED)
1155 2		(DETAILED)
1157		(DETAILED)
1158		(DETAILED)
1159		(DETAILED)

(*) QUICK RELEASE FASTENERS

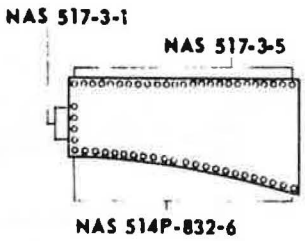
Fuselage Exterior Doors and Panels
Figure 1 (Sheet 2)



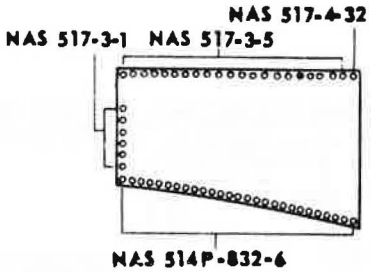
DETAIL A PANEL NO. 1032



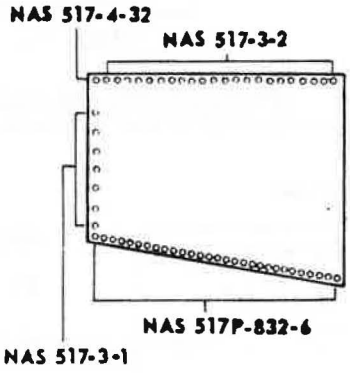
DETAIL B PANEL NO. 1033



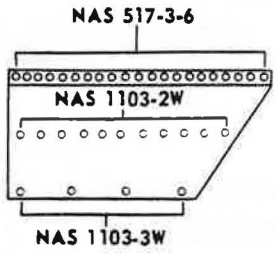
DETAIL C PANEL NO. 1034



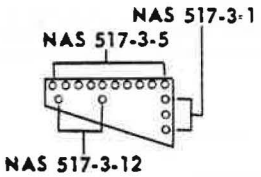
DETAIL D PANEL NO. 1035



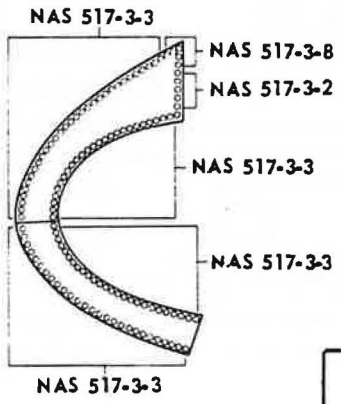
DETAIL E PANEL NO. 1036



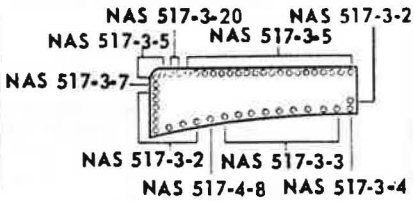
DETAIL F PANEL NO. 1037



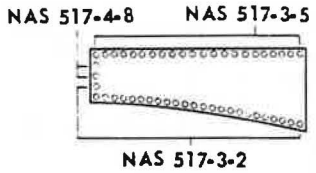
DETAIL G PANEL NO. 1038



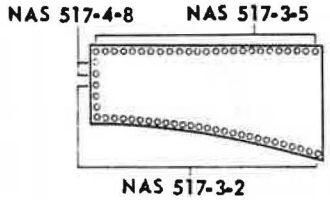
DETAIL H PANEL NO. 1149



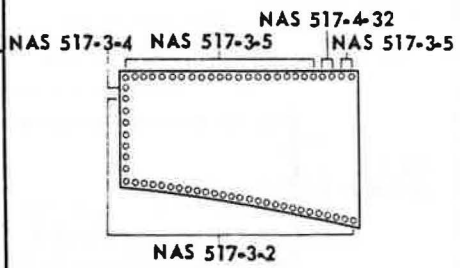
DETAIL J PANEL NO. 1150



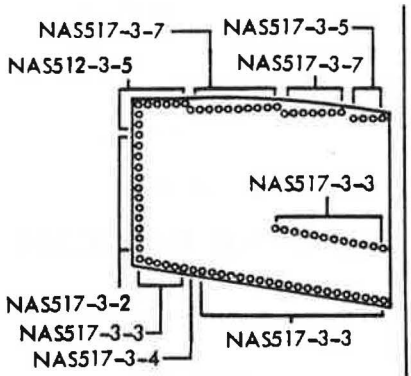
DETAIL K PANEL NO. 1151



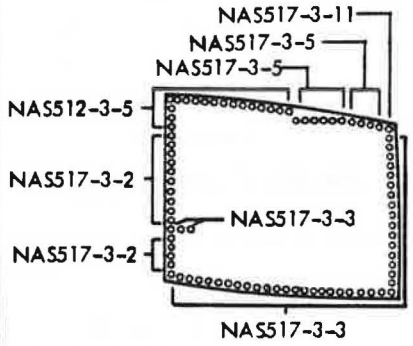
DETAIL L PANEL NO. 1152



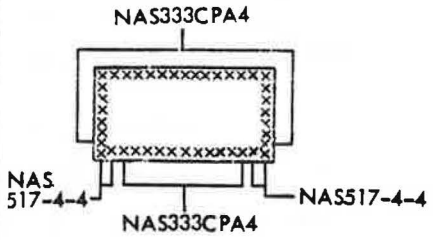
DETAIL M PANEL NO. 1153



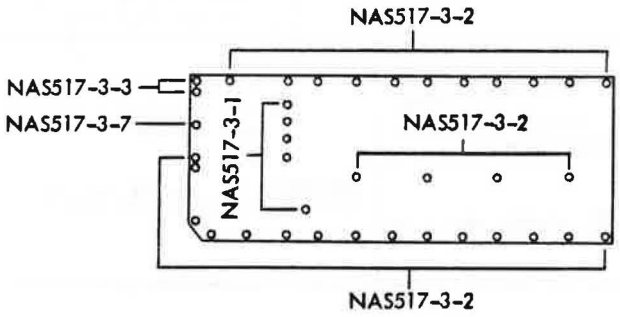
DETAIL N PANEL NO. 1154



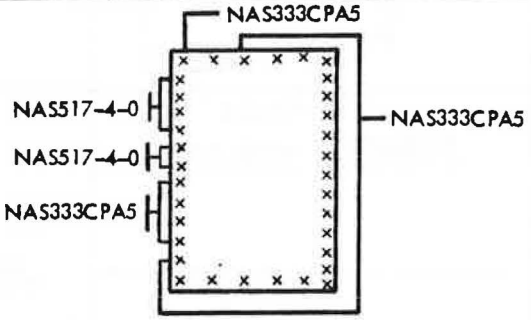
DETAIL O PANEL NO. 1155



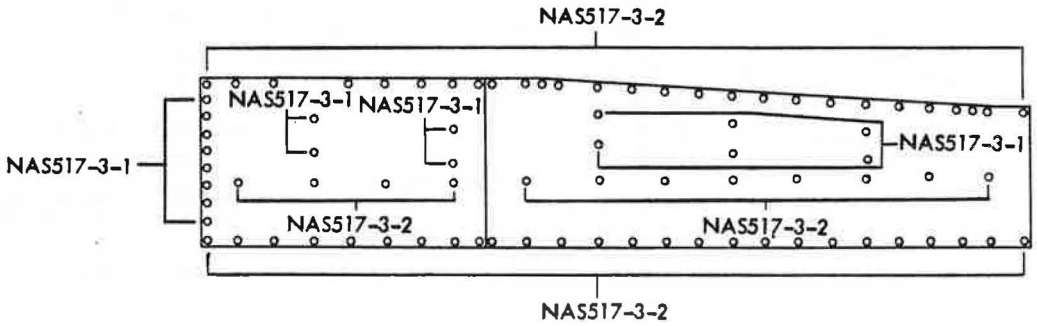
DETAIL S PANELS NO. 1043 AND 1048



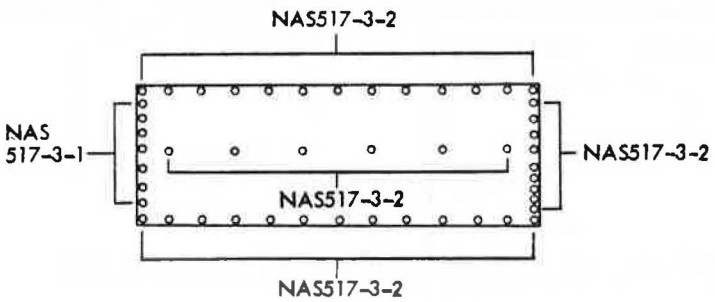
DETAIL P PANEL NO. 1157



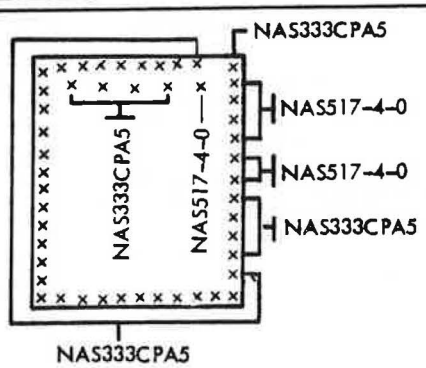
DETAIL T PANELS NO. 1044 AND 1047



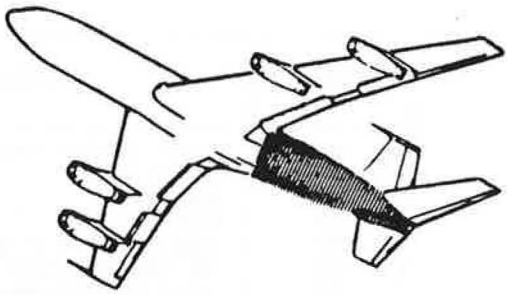
DETAIL Q PANELS NO. 1158 AND 1039

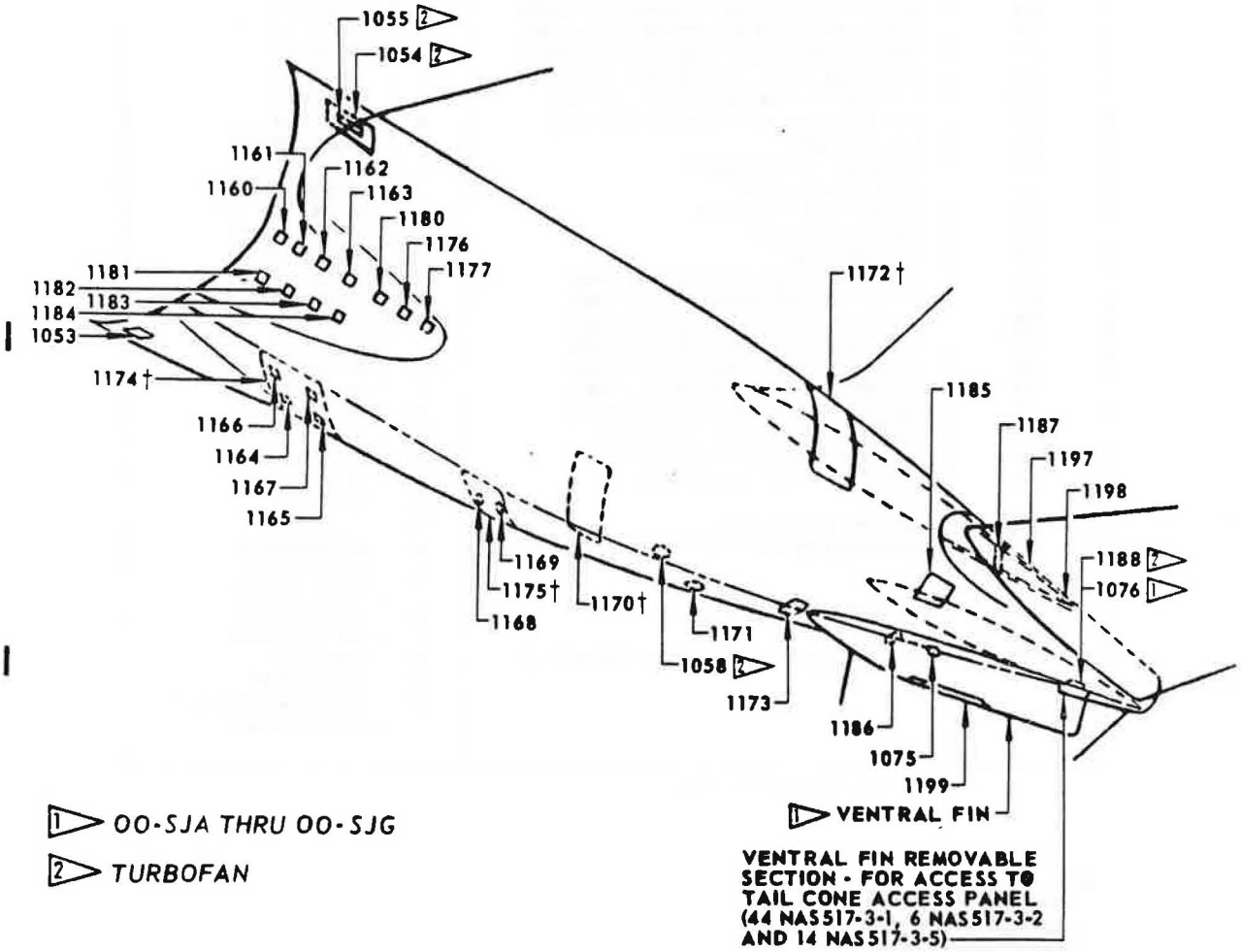


DETAIL R PANEL NO. 1159



DETAIL U PANELS NO. 1045 AND 1046





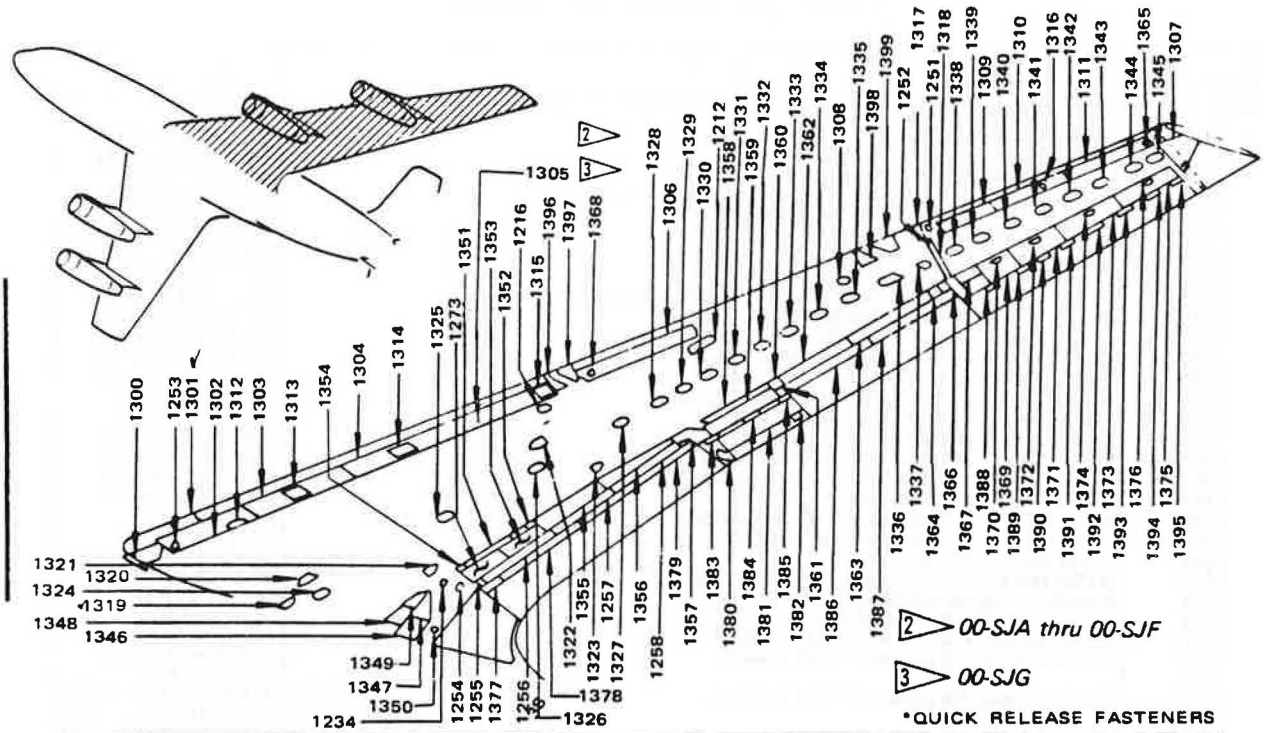
† THIS NUMBER IS NOT MARKED ON AIRPLANE AND IS GIVEN FOR SERVICE INFORMATION ONLY.

PANEL NO.	TITLE	FASTENERS	
		QTY.	TYPE
1053	GROUND CHARGE FITTING ACCESS DOOR	(*)	
2 1054	ACCESS FAIRING		
2 1055	ACCESS DOOR	8	NAS517-3-0
2 1058	ACCESS DOOR	(*)	
1075	STABILIZER SAFETY ROD ACCESS PANEL	16	NAS517-3-1
1 1076	TAIL CONE ACCESS PANEL	(*)	
1160	FUSELAGE TO FILLET FAIRING ACCESS PANEL	8	NAS517-3-0
1161	FUSELAGE TO FILLET FAIRING ACCESS PANEL	8	NAS517-3-0
1162	FUSELAGE TO FILLET FAIRING ACCESS PANEL	8	NAS517-3-0
1163	FUSELAGE TO FILLET FAIRING ACCESS PANEL	8	NAS517-3-0
1164	CENTER CARGO DOOR MECHANISM ACCESS PANEL	8	NAS517-3-4
1165	CENTER CARGO DOOR MECHANISM ACCESS PANEL	8	NAS517-3-4
1166	CENTER CARGO DOOR MECHANISM ACCESS PANEL	8	NAS517-3-4
1167	CENTER CARGO DOOR MECHANISM ACCESS PANEL	8	NAS517-3-4
1168	AFT CARGO DOOR MECHANISM ACCESS PANEL	4	NAS517-3-4
1169	AFT CARGO DOOR MECHANISM ACCESS PANEL	4	NAS517-3-4
1170	AFT GALLEY DOOR		HANDLE LATCHED
1171	AFT WATER SERVICING DOOR	1	LATCH
1172	AFT MAIN ENTRY DOOR		HANDLE LATCHED
1173	AFT TOILET SERVICING DOOR	2	LATCHES
1174	CENTER CARGO DOOR		HANDLE LATCHED
1175	AFT CARGO DOOR		HANDLE LATCHED
1176	FUSELAGE TO FILLET FAIRING ACCESS PANEL	8	NAS517-3-0
1177	FUSELAGE TO FILLET FAIRING ACCESS PANEL	8	NAS517-3-0
1180	FUSELAGE TO FILLET FAIRING ACCESS PANEL	8	NAS517-3-0
1181	FUSELAGE TO FILLET FAIRING ACCESS PANEL	8	NAS517-3-0
1182	FUSELAGE TO FILLET FAIRING ACCESS PANEL	8	NAS517-3-0
1183	FUSELAGE TO FILLET FAIRING ACCESS PANEL	8	NAS517-3-0
1184	FUSELAGE TO FILLET FAIRING ACCESS PANEL	8	NAS517-3-0
1185	STABILIZER JACK SCREW ACCESS PANEL	(*)	
1186	STABILIZER SAFETY ROD ACCESS PANEL	8	NAS517-3-5
1187	STABILIZER FITTING ACCESS PANEL	14	NAS517-3-2
		2	NAS517-3-3
2 1188	TAIL CONE ACCESS PANEL	(*)	
1197	FORWARD RUDDER TO BODY FAIRING	34	NAS514P1032-8
		1	NAS33CPA-12
		1	NAS514P1032-14
1198	AFT RUDDER TO BODY FAIRING	35	NAS514P1032-8
		1	NAS514P1032-14
1199	STABILIZER SAFETY ROD REMOVAL ACCESS PANEL	20	NAS517-3-1
		2	NAS1104-4-17
		2	NAS1104-4-18 THROUGH SKID SEGMENTS

(*) QUICK RELEASE FASTENERS

NOTE:
PANELS WHICH ARE LEFT HAND AND RIGHT HAND OPPOSITES ARE MARKED WITH THE SAME NUMBER AND WITH AN "L" OR "R" PRECEDING THE NUMBER.

† THIS NUMBER IS NOT MARKED ON AIRPLANE AND IS GIVEN FOR SERVICE INFORMATION ONLY.



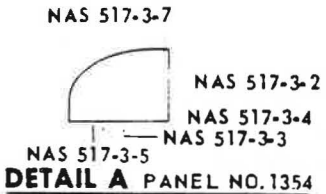
*QUICK RELEASE FASTENERS

PANEL NO.	TITLE	FASTENERS QTY.	FASTENERS TYPE
1212	PRESSURE FUELING DRY BAY ACCESS DOOR		LATCHES
1216	INBOARD DRY BAY ACCESS PANEL	(*)	
1234	LANDING GEAR TORQUE BOX ACCESS DOOR	4	NAS514P1032-14
1251	OUTBOARD WING ACCESS PANEL	8	NAS517-3-4
1252	JACKING POINT ACCESS PANEL	3	NAS512-3-2
1253	LEADING EDGE ANTI-ICE EXHAUST FAIRING	(*)	
1254	LANDING GEAR TRUNNION ACCESS PANEL	8	AN507C1032R14
1255	INBOARD COVE LIP DOOR		LATCHES
1256	INBOARD COVE LIP DOOR		LATCHES
1257	INBOARD COVE LIP DOOR		LATCHES
1258	INBOARD COVE LIP DOOR		LATCHES
1273	LOWER WING TRAILING EDGE PANEL	52	NAS517-3-4
1300	WING TO FUSELAGE FAIRING ACCESS PANEL	(*)	
1301	LANDING LIGHT ACCESS WINDOW	22	NAS517-3-3
1302	WING LEADING EDGE ACCESS PANEL	116	NAS517-4-5
		1	NAS517-4-13
1303	WING LEADING EDGE ACCESS PANEL	84	NAS517-4-5
1304	WING LEADING EDGE ACCESS PANEL	85	NAS517-4-5
1305	WING LEADING EDGE ACCESS PANEL	91	NAS517-4-5 2
		5	NAS517-5-13 2
		96	NAS517-4-5 3
		5	NAS517-5-13 3
1306	WING LEADING EDGE ACCESS PANEL	136	NAS517-4-5
1307	FUEL TANK VENT SCOOP ACCESS PANEL	67	BACB30BF3K4
		14	NAS517-4-3
1308	DRY BAY ACCESS PANEL	6	NAS517-3-8
1309	WING LEADING EDGE ACCESS PANEL	75	NAS517-4-5
1310	WING LEADING EDGE ACCESS PANEL	68	NAS517-4-5
1311	WING LEADING EDGE ACCESS PANEL	58	NAS517-4-5
		1	NAS517-3-7
1312	ENGINE CARRY ACCESS PANEL	11	NAS517-3-5
		7	NAS517-4-5
1313	WING LEADING EDGE PANEL ACCESS PANEL	(*)	
1314	WING LEADING EDGE PANEL ACCESS PANEL	(*)	
1315	WING LEADING EDGE PANEL ACCESS PANEL	(*)	
1316	WING LEADING EDGE PANEL ACCESS PANEL	(*)	
1317	WING LEADING EDGE GAP COVER	21	NAS517-3-3
		4	NAS517-4-5
		3	NAS517-4-8
1318	PRODUCTION BREAK GAP COVER	24	NAS517-3-17
1319	BOOST PUMP ACCESS PANEL	(*)	
1320	BOOST PUMP ACCESS PANEL	(*)	
1321	BOOST PUMP ACCESS PANEL	(*)	
1322	BOOST PUMP ACCESS PANEL	(*)	
1323	BOOST PUMP ACCESS PANEL	(*)	
1324	FUEL TANK ACCESS PANEL NO. 1	23	NAS517-4-11
1325	FUEL TANK ACCESS PANEL NO. 2 (DRIPSTICK)	23	NAS517-4-11
1326	FUEL TANK ACCESS PANEL NO. 3	23	NAS517-4-11

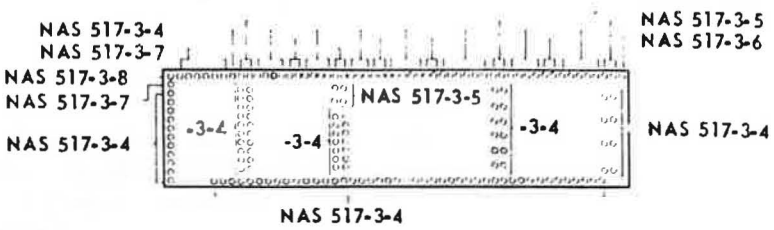
PANEL NO.	TITLE	FASTENERS
1327	FUEL TANK ACCESS PANEL NO. 4	(23 NAS 517-4-11)
1328	FUEL TANK ACCESS PANEL NO. 5	(23 NAS 517-4-11)
1329	FUEL TANK ACCESS PANEL NO. 6	(23 NAS 517-4-11)
1330	FUEL TANK ACCESS PANEL NO. 7 (DRIP STICK)	(23 NAS 517-4-11)
1331	FUEL TANK ACCESS PANEL NO. 8	(23 NAS 517-4-11)
1332	FUEL TANK ACCESS PANEL NO. 9	(23 NAS 517-4-11)
1333	FUEL TANK ACCESS PANEL NO. 10	(23 NAS 517-4-11)
1334	FUEL TANK ACCESS PANEL NO. 11	(23 NAS 517-4-11)
1335	FUEL TANK ACCESS PANEL NO. 12 (DRIP STICK)	(23 NAS 517-4-11)
1336	FUEL TANK ACCESS PANEL NO. 13	(23 NAS 517-4-11)
1337	FUEL TANK ACCESS PANEL NO. 14	(23 NAS 517-4-11)
1338	FUEL TANK ACCESS PANEL NO. 15	(23 NAS 517-4-11)
1339	FUEL TANK ACCESS PANEL NO. 16	(23 NAS 517-4-11)
1340	FUEL TANK ACCESS PANEL NO. 17	(23 NAS 517-4-11)
1341	FUEL TANK ACCESS PANEL NO. 18	(23 NAS 517-4-11)
1342	FUEL TANK ACCESS PANEL NO. 19	(23 NAS 517-4-11)
1343	FUEL TANK ACCESS PANEL NO. 20 (DRIP STICK)	(23 NAS 517-4-11)
1344	FUEL TANK ACCESS PANEL NO. 21	(23 NAS 517-4-11)
1345	FUEL TANK ACCESS PANEL NO. 22	(23 NAS 517-4-11)
1346	MAIN GEAR ACTUATOR ACCESS PANEL	(*)
1347	MAIN GEAR WALKING BEAM ACCESS PANEL	(*)
1348	HYDRAULIC ACCESS DOOR	(23 NAS 517-3-2, 5 NAS 517-3-2)
1349	HYDRAULIC SUPPLY SHUTOFF VALVE ACCESS PANEL	(15 NAS 517-3-6, 15 NAS 517-3-2)
1350	LANDING GEAR DOOR ACCESS DOOR	(6 NAS 221-8)
1351	FUEL JETTISON CHUTE DOOR	(LATCHED)
1352	FUEL DUMP VALVE ACCESS PANEL	(39 NAS 517-3-4)
1353	LOWER WING TRAILING EDGE PANEL	(192 NAS 517-3-4) (DETAILED)
1354		
1355	LOWER WING TRAILING EDGE PANEL	(154 NAS 517-3-4, 2 NAS 517-3-8) (DETAILED)
1356		
1357	LOWER WING TRAILING EDGE PANEL	(70 NAS 517-3-6, 3 NAS 517-3-9)
1358	TRAILING EDGE PANEL	(35 NAS 517-3-7, 2 NAS 517-4-8)
1359	INBOARD AILERON BALANCE COVER ACCESS PANEL	(51 NAS 517-3-5, 6 NAS 517-4-9, 3 NAS 517-5-20)
1360	INBOARD AILERON CONTROL ACCESS DOOR	(14 NAS 517-3-6, 2 NAS 517-4-8)
1361	AILERON SNUBBER ACCESS PANEL	(7 NAS 517-3-6)
1362	OUTBOARD COVE LIP DOOR	(LATCHES)
1363	OUTBOARD COVE LIP DOOR	(LATCHES)
1364	OUTBOARD COVE LIP DOOR	(LATCHES)
1365	LEADING EDGE ANTI-ICE EXHAUST FAIRING	(*)
1366	OUTBOARD AILERON CONTROL ACCESS PANEL	(23 NAS 517-4-4, 3 NAS 517-4-6, 1 NAS 517-4-8)
1367	OUTBOARD AILERON CONTROL ACCESS PANEL	(25 NAS 517-4-4, 1 NAS 517-4-7)
1368	LEADING EDGE ANTI-ICE EXHAUST FAIRING	(*)
1369	OUTBOARD AILERON BALANCE PANEL COVER	(37 NAS 517-4-6, 1 NAS 517-4-8)
1370	OUTBOARD AILERON BALANCE PANEL ACCESS PANEL	(*)
1371	OUTBOARD AILERON BALANCE PANEL COVER	(52 NAS 517-4-6)
1372	OUTBOARD AILERON BALANCE PANEL ACCESS PANEL	(*)
1373	OUTBOARD AILERON BALANCE PANEL COVER	(47 NAS 517-4-6)
1374	OUTBOARD AILERON BALANCE PANEL ACCESS PANEL	(*)
1375	OUTBOARD AILERON BALANCE PANEL COVER	(44 NAS 517-4-6)
1376	OUTBOARD AILERON BALANCE PANEL ACCESS PANEL	(*)
1377	INBOARD FLAP ACCESS PANEL	(DETAILED)
1378	INBOARD FLAP ACCESS PANEL	(DETAILED)
1379	INBOARD FLAP ACCESS PANEL	(DETAILED)
1380	INBOARD AILERON FAIRING ACCESS PANEL	(7 NAS 517-3-3, 1 NAS 517-3-6)
1381	LOWER INBOARD AILERON ACCESS PANEL	(DETAILED)
1382	LOWER INBOARD AILERON ACCESS PANEL	(7 NAS 517-3-3, 1 NAS 517-3-6)
1383	INBOARD AILERON HINGE ACCESS PANEL	(44 NAS 517-3-3, 1 NAS 1103-4W)
1384	INBOARD AILERON HINGE ACCESS PANEL	(24 NAS 517-3-3, 2 NAS 1103-4W)
1385	INBOARD AILERON HINGE ACCESS PANEL	(21 NAS 517-3-3, 1 NAS 1103-4W)
1386	OUTBOARD FLAP ACCESS PANEL	(DETAILED)
1387	OUTBOARD FLAP ACCESS PANEL	(DETAILED)
1388	OUTBOARD AILERON HINGE ACCESS PANEL	(16 NAS 517-3-2)
1389	OUTBOARD AILERON HINGE ACCESS PANEL	(16 NAS 517-3-2)
1390	OUTBOARD AILERON HINGE ACCESS PANEL	(16 NAS 517-3-2)
1391	OUTBOARD AILERON HINGE ACCESS PANEL	(16 NAS 517-3-2)
1392	OUTBOARD AILERON HINGE ACCESS PANEL	(16 NAS 517-3-2)
1393	OUTBOARD AILERON HINGE ACCESS PANEL	(16 NAS 517-3-2)
1394	OUTBOARD AILERON HINGE ACCESS PANEL	(16 NAS 517-3-2)
1395	OUTBOARD AILERON HINGE ACCESS PANEL	(10 NAS 517-3-2)
1396	INBOARD STRUT LEADING EDGE GAP COVER	(*)
1397	INBOARD STRUT LEADING EDGE GAP COVER	(*)
1398	OUTBOARD STRUT LEADING EDGE GAP COVER	(*)
1399	OUTBOARD STRUT LEADING EDGE GAP COVER	(*)

* QUICK RELEASE FASTENERS

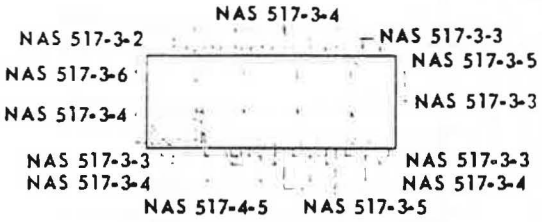
Wing Lower Surface Access Panels
Figure 2 (Sheet 2 of 10)



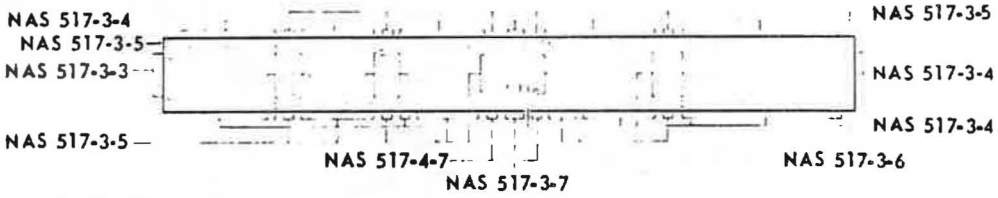
DETAIL A PANEL NO. 1354



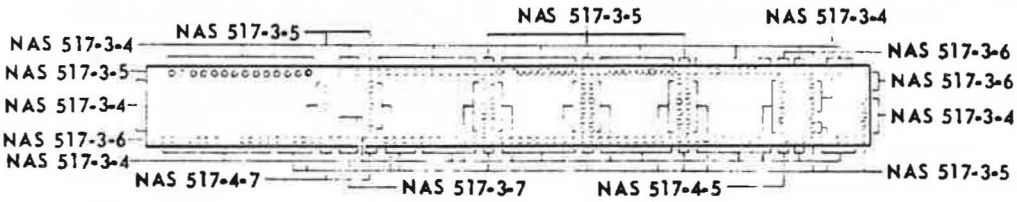
DETAIL B PANEL NO. 1356



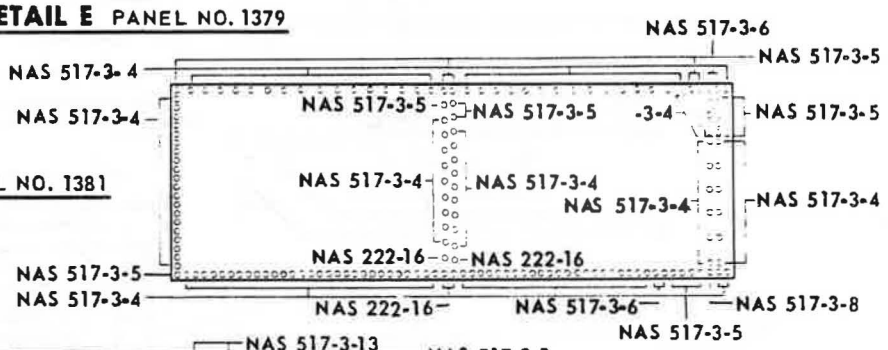
DETAIL C PANEL NO. 1377



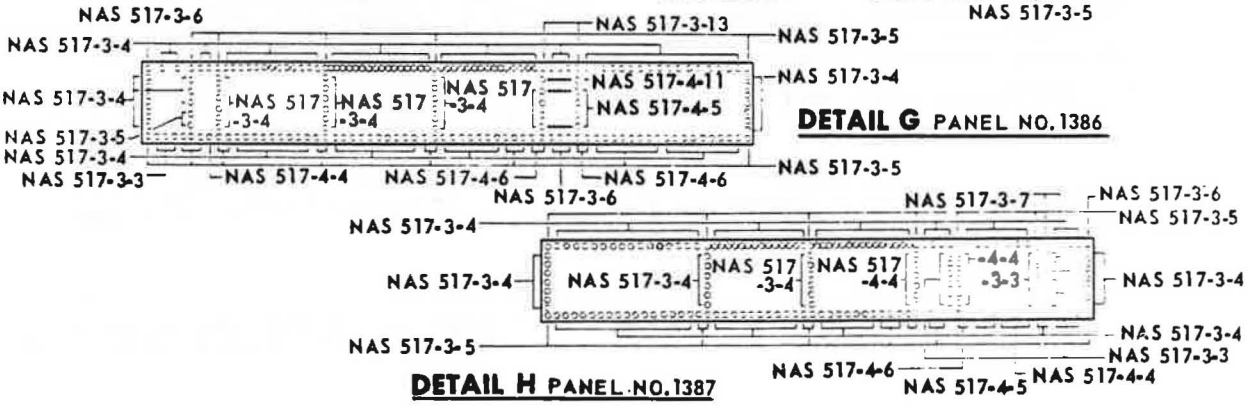
DETAIL D PANEL NO. 1378



DETAIL E PANEL NO. 1379

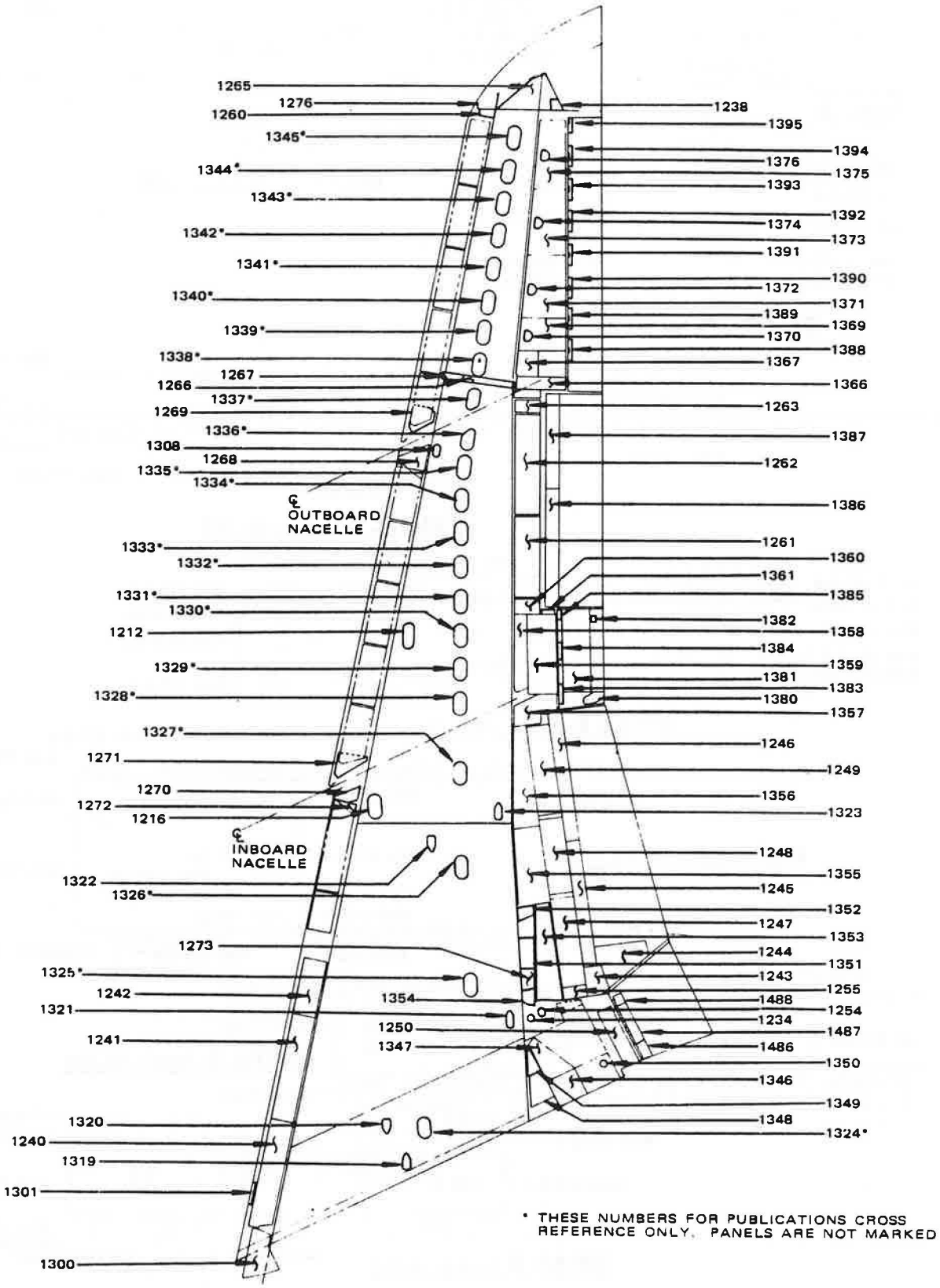


DETAIL F PANEL NO. 1381



DETAIL G PANEL NO. 1386

DETAIL H PANEL NO. 1387



Wing Lower Surface Access Panels
Figure 2 (Sheet 4)

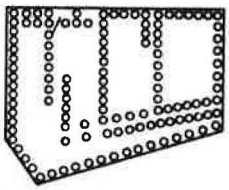
PANEL NO.	TITLE	FASTENERS	
		QTY.	TYPE
1212	PRESSURE FUELING DRY BAY ACCESS DOOR		(LATCHES)
1216	INBOARD DRY BAY ACCESS PANEL	(*)	
1234	LANDING GEAR TORQUE BOX ACCESS DOOR	4	NAS514P1032-14
1238	WING TIP ACCESS PANEL	11	BACB30BF3K5
1240	WING LEADING EDGE ACCESS PANEL	93	NAS517-4-5
1241	WING LEADING EDGE ACCESS PANEL	94	NAS517-4-5
1242	WING LEADING EDGE ACCESS PANEL	57	NAS517-4-5
1243	ACCESS PANEL		(DETAILED)
1244	ACCESS PANEL		(DETAILED)
1245	ACCESS PANEL		(DETAILED)
1246	ACCESS PANEL		(DETAILED)
1247	COVE LIP DOOR		(DETAILED)
1248	COVE LIP DOOR		(DETAILED)
1249	COVE LIP DOOR		(DETAILED)
1250	COVE LIP DOOR		(DETAILED)
1254	LANDING GEAR TRUNNION ACCESS PANEL	8	AN507C1032R14
1255	INBOARD COVE LIP DOOR		(LATCHES)
1260	WING LEADING EDGE ACCESS DOOR	11	NAS1503-2 OR NAS333CPA4
		4	NAS1504-7 OR NAS334CPA7
1261	COVE LIP DOOR		(DETAILED)
1262	COVE LIP DOOR		(DETAILED)
1263	COVE LIP DOOR		(DETAILED)
1265	FUEL VENT SCOOP PANEL		(DETAILED)
1266	GAP COVER		(DETAILED)
1267	JACKPOINT COVER		(DETAILED)
1268	OUTBOARD STRUT LEADING EDGE GAP COVER	(*)	
1269	OUTBOARD STRUT LEADING EDGE GAP COVER	(*)	
1270	INBOARD STRUT LEADING EDGE GAP COVER	(*)	
1271	INBOARD STRUT LEADING EDGE GAP COVER	(*)	
1272	ACCESS PANEL	(*)	
1273	LOWER WING TRAILING EDGE PANEL	52	NAS517-3-4
1276	ACCESS DOOR		
1300	WING TO FUSELAGE FAIRING ACCESS PANEL	(*)	
1301	LANDING LIGHT ACCESS WINDOW	22	NAS517-3-3
1308	DRY BAY ACCESS PANEL	6	NAS517-3-8
1319	BOOST PUMP ACCESS PANEL	(*)	
1320	BOOST PUMP ACCESS PANEL	(*)	
1321	BOOST PUMP ACCESS PANEL	(*)	
1322	BOOST PUMP ACCESS PANEL	(*)	
1323	BOOST PUMP ACCESS PANEL	(*)	
1324	FUEL TANK ACCESS PANEL NO. 1	23	NAS517-4-11
1325	FUEL TANK ACCESS PANEL NO. 2 (DRIP STICK)	23	NAS517-4-11
1326	FUEL TANK ACCESS PANEL NO. 3	23	NAS517-4-11

(*) QUICK-RELEASE FASTENERS

PANEL NO.	TITLE	FASTENERS
1327	FUEL TANK ACCESS PANEL NO. 4	(23 NAS 517-4-11)
1328	FUEL TANK ACCESS PANEL NO. 5	(23 NAS 517-4-11)
1329	FUEL TANK ACCESS PANEL NO. 6	(23 NAS 517-4-11)
1330	FUEL TANK ACCESS PANEL NO. 7 (DRIP STICK)	(23 NAS 517-4-11)
1331	FUEL TANK ACCESS PANEL NO. 8	(23 NAS 517-4-11)
1332	FUEL TANK ACCESS PANEL NO. 9	(23 NAS 517-4-11)
1333	FUEL TANK ACCESS PANEL NO. 10	(23 NAS 517-4-11)
1334	FUEL TANK ACCESS PANEL NO. 11	(23 NAS 517-4-11)
1335	FUEL TANK ACCESS PANEL NO. 12 (DRIP STICK)	(23 NAS 517-4-11)
1336	FUEL TANK ACCESS PANEL NO. 13	(23 NAS 517-4-11)
1337	FUEL TANK ACCESS PANEL NO. 14	(23 NAS 517-4-11)
1338	FUEL TANK ACCESS PANEL NO. 15	(23 NAS 517-4-11)
1339	FUEL TANK ACCESS PANEL NO. 16	(23 NAS 517-4-11)
1340	FUEL TANK ACCESS PANEL NO. 17	(23 NAS 517-4-11)
1341	FUEL TANK ACCESS PANEL NO. 18	(23 NAS 517-4-11)
1342	FUEL TANK ACCESS PANEL NO. 19	(23 NAS 517-4-11)
1343	FUEL TANK ACCESS PANEL NO. 20 (DRIP STICK)	(23 NAS 517-4-11)
1344	FUEL TANK ACCESS PANEL NO. 21	(23 NAS 517-4-11)
1345	FUEL TANK ACCESS PANEL NO. 22	(23 NAS 517-4-11)
1346	MAIN GEAR ACTUATOR ACCESS PANEL	(*)
1347	MAIN GEAR WALKING BEAM ACCESS PANEL	(*)
1348	HYDRAULIC ACCESS DOOR	(23 NAS 517-3-2, 5 NAS 517-3-2)
1349	HYDRAULIC SUPPLY SHUTOFF VALVE ACCESS PANEL	(15 NAS 517-3-6, 15 NAS 517-3-2)
1350	LANDING GEAR DOOR ACCESS DOOR	(6 NAS 221-8)
1351	FUEL JETTISON CHUTE DOOR	(LATCHED)
1352	FUEL DUMP VALVE ACCESS PANEL	(39 NAS 517-3-4)
1353	LOWER WING TRAILING EDGE PANEL	(192 NAS 517-3-4)
1354		(DETAILED)
1355	LOWER WING TRAILING EDGE PANEL	(154 NAS 517-4-3, 2 NAS 517-3-8)
1356		(DETAILED)
1357	LOWER WING TRAILING EDGE PANEL	(70 NAS 517-3-6, 3 NAS 517-3-9)
1358	TRAILING EDGE PANEL	(35 NAS 517-3-7, 3 NAS 517-4-8)
1359	INBOARD AILERON BALANCE COVER ACCESS PANEL	(51 NAS 517-3-5, 6 NAS 517-4-9, 3 NAS 517-5-20)
1360	INBOARD AILERON CONTROL ACCESS DOOR	(14 NAS 517-3-6, 2 NAS 517-4-8)
1361	AILERON SNUBBER ACCESS PANEL	(7 NAS 517-3-6)
1366	OUTBOARD AILERON CONTROL ACCESS PANEL	(23 NAS 517-4-4, 3 NAS 517-4-6, 1 NAS 517-4-8)
1367	OUTBOARD AILERON CONTROL ACCESS PANEL	(25 NAS 517-4-4, 1 NAS 517-4-7)
1369	OUTBOARD AILERON BALANCE PANEL COVER	(37 NAS 517-4-6, 1 NAS 517-4-8)
1370	OUTBOARD AILERON BALANCE PANEL ACCESS PANEL	(*)
1371	OUTBOARD AILERON BALANCE PANEL COVER	(52 NAS 517-4-6)
1372	OUTBOARD AILERON BALANCE PANEL ACCESS PANEL	(*)
1373	OUTBOARD AILERON BALANCE PANEL COVER	(47 NAS 517-4-6)
1374	OUTBOARD AILERON BALANCE PANEL ACCESS PANEL	(*)
1375	OUTBOARD AILERON BALANCE PANEL COVER	(44 NAS 517-4-6)
1376	OUTBOARD AILERON BALANCE PANEL ACCESS PANEL	(*)
1380	INBOARD AILERON FAIRING ACCESS PANEL	(7 NAS 517-3-3, 1 NAS 517-3-6)
1381	LOWER INBOARD AILERON ACCESS PANEL	(DETAILED)
1382	LOWER INBOARD AILERON ACCESS PANEL	(7 NAS 517-3-3, 1 NAS 517-3-6)
1383	INBOARD AILERON HINGE ACCESS PANEL	(44 NAS 517-3-3, 1 NAS 1103-4W)
1384	INBOARD AILERON HINGE ACCESS PANEL	(24 NAS 517-3-3, 2 NAS 1103-4W)
1385	INBOARD AILERON HINGE ACCESS PANEL	(21 NAS 517-3-3, 1 NAS 1103-4W)
1386	OUTBOARD FLAP ACCESS PANEL	(DETAILED)
1387	OUTBOARD FLAP ACCESS PANEL	(DETAILED)
1388	OUTBOARD AILERON HINGE ACCESS PANEL	(16 NAS 517-3-2)
1389	OUTBOARD AILERON HINGE ACCESS PANEL	(16 NAS 517-3-2)
1390	OUTBOARD AILERON HINGE ACCESS PANEL	(16 NAS 517-3-2)
1391	OUTBOARD AILERON HINGE ACCESS PANEL	(16 NAS 517-3-2)
1392	OUTBOARD AILERON HINGE ACCESS PANEL	(16 NAS 517-3-2)
1393	OUTBOARD AILERON HINGE ACCESS PANEL	(16 NAS 517-3-2)
1394	OUTBOARD AILERON HINGE ACCESS PANEL	(16 NAS 517-3-2)
1395	OUTBOARD AILERON HINGE ACCESS PANEL	(10 NAS 517-3-2)
1396	INBOARD STRUT LEADING EDGE GAP COVER	(*)
1397	INBOARD STRUT LEADING EDGE GAP COVER	(*)
1398	OUTBOARD STRUT LEADING EDGE GAP COVER	(*)
1399	OUTBOARD STRUT LEADING EDGE GAP COVER	(*)
1486	FILLET FLAP ACCESS PANEL	(48 NAS 333CPA7-5)
1487	FILLET FLAP ACCESS PANEL	(90 NAS 517-3-5)
1488	FILLET FLAP ACCESS PANEL	(27 NAS 333CPA6-5)

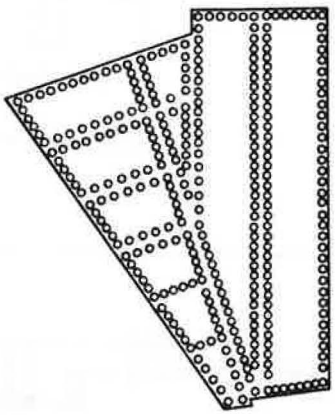
* QUICK RELEASE FASTENERS

Wing Lower Surface Access Panels
Figure 2 (Sheet 6)



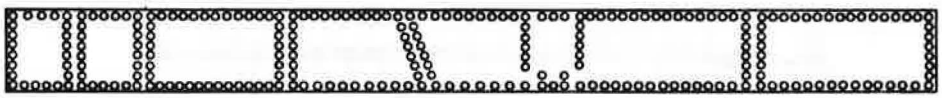
DETAIL A PANEL NO. 1243

(ALL FASTENERS ARE NAS 517-3-5)



DETAIL B PANEL NO. 1244

(ALL FASTENERS ARE NAS 517-3-7)



DETAIL C PANEL NO. 1245

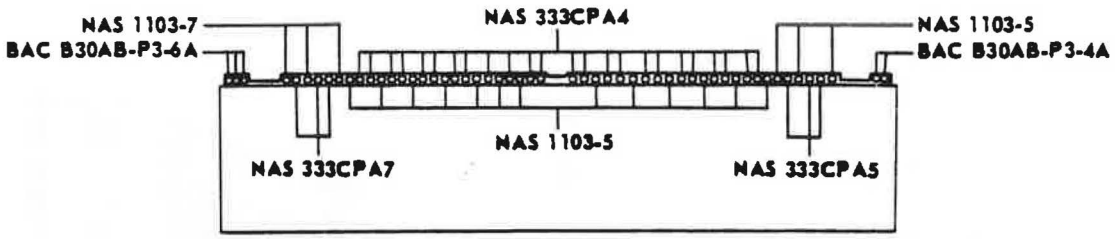
(ALL FASTENERS ARE NAS517-3-7)



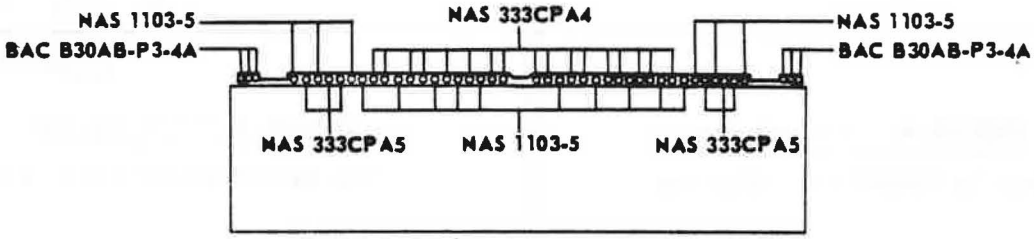
● NAS 517-4-10

DETAIL D PANEL NO. 1246

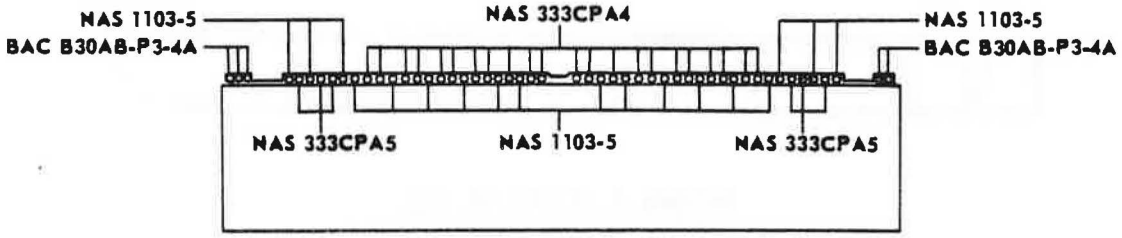
(ALL FASTENERS ARE NAS 517-3-5 EXCEPT AS NOTED



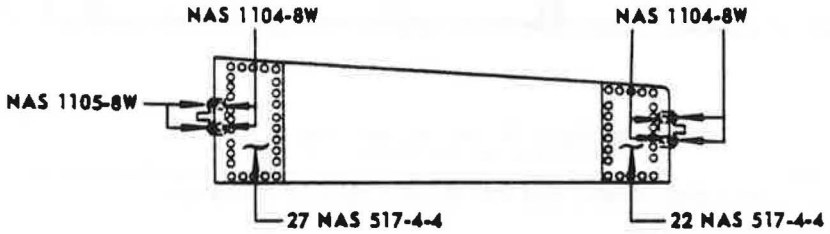
DETAIL N PANEL NO. 1247



DETAIL O PANEL NO. 1248

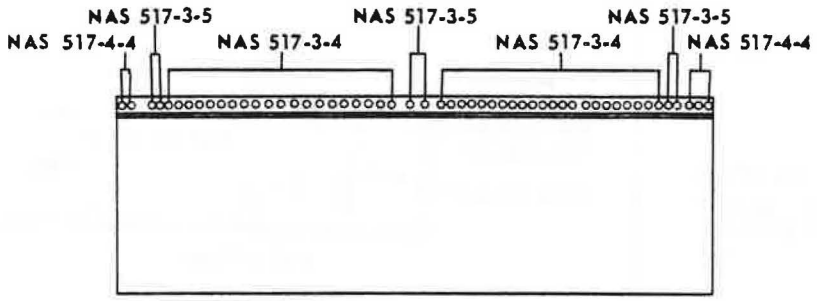


DETAIL P PANEL NO. 1249

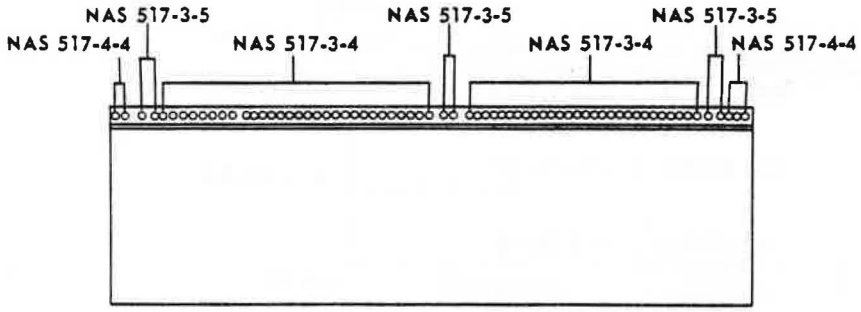


DETAIL Q PANEL 1250

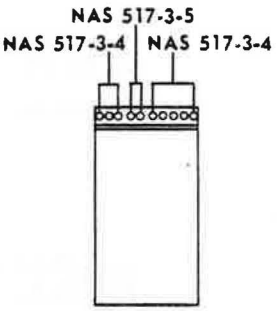
Wing Lower Surface Access Panels
Figure 2 (Sheet 8 of 10)



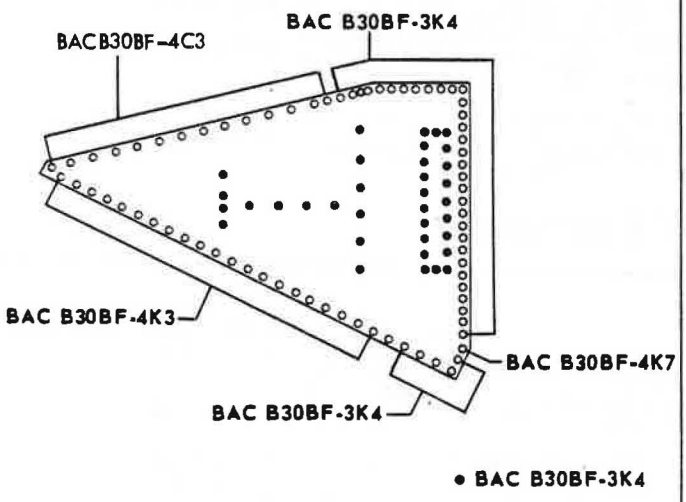
DETAIL R PANEL NO. 1261



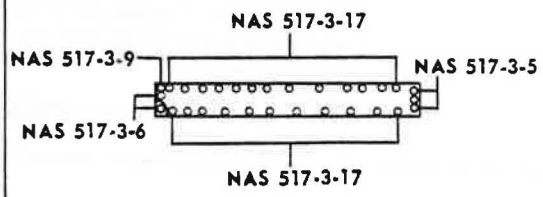
DETAIL S PANEL NO. 1262



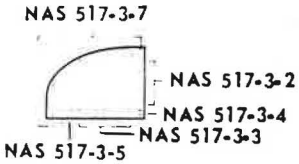
DETAIL T PANEL NO. 1263



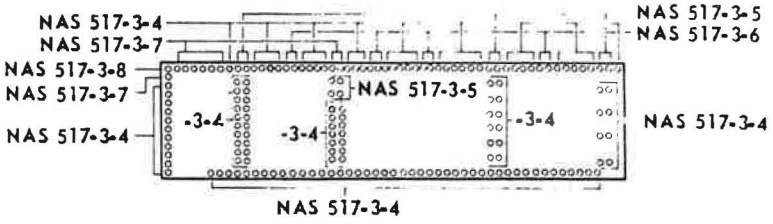
DETAIL U PANEL NO. 1265



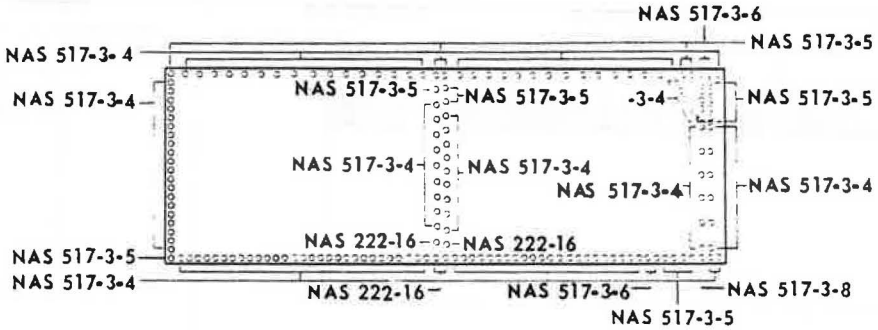
DETAIL V PANELS NO. 1266 AND 1267



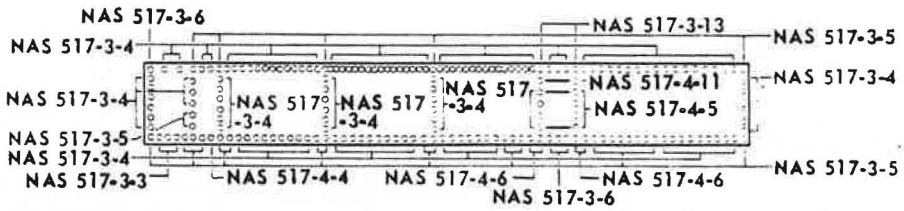
DETAIL W PANEL NO. 1354



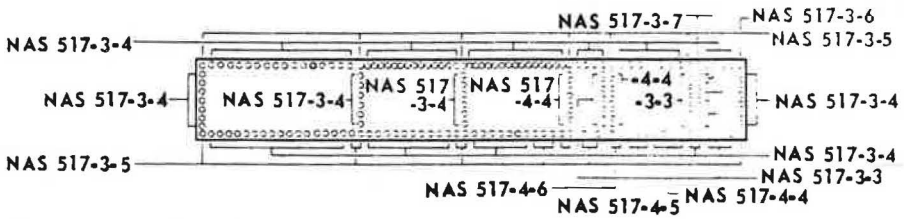
DETAIL X PANEL NO. 1356



DETAIL Y PANEL NO. 1381

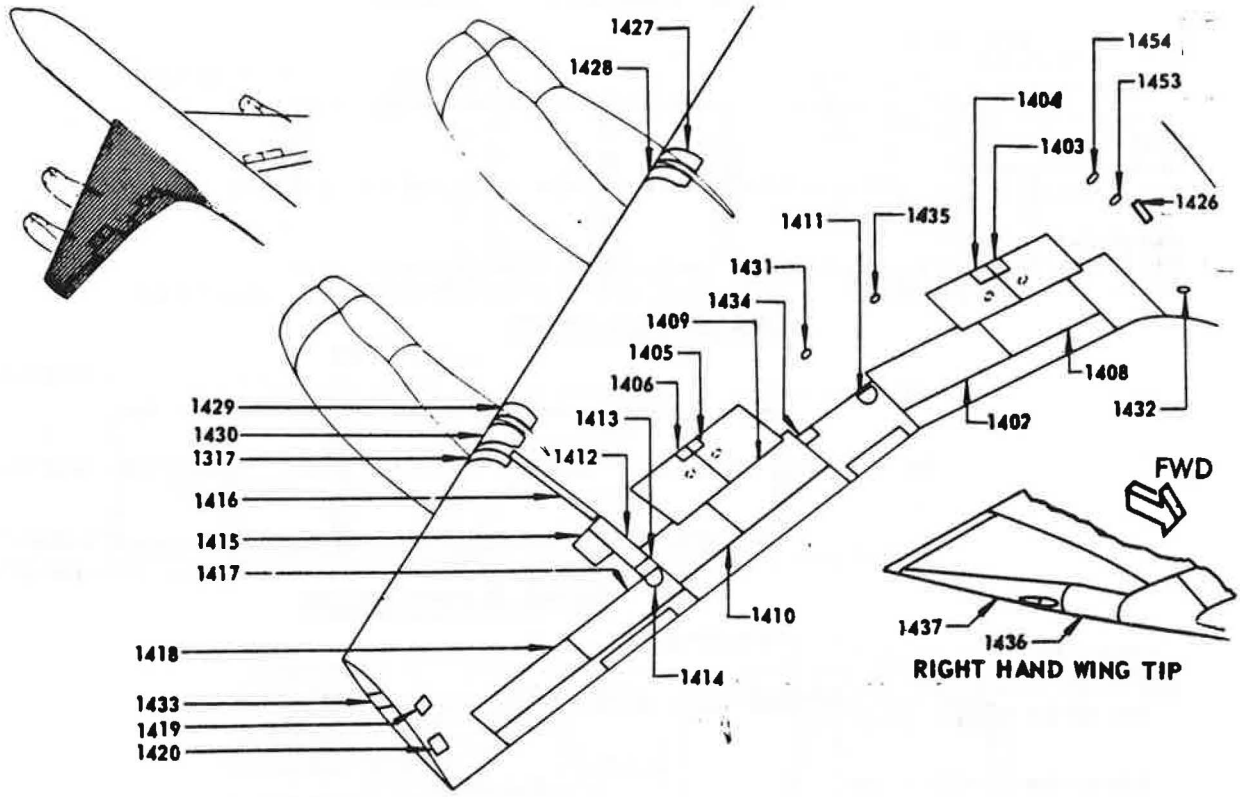


DETAIL Z PANEL NO. 1386



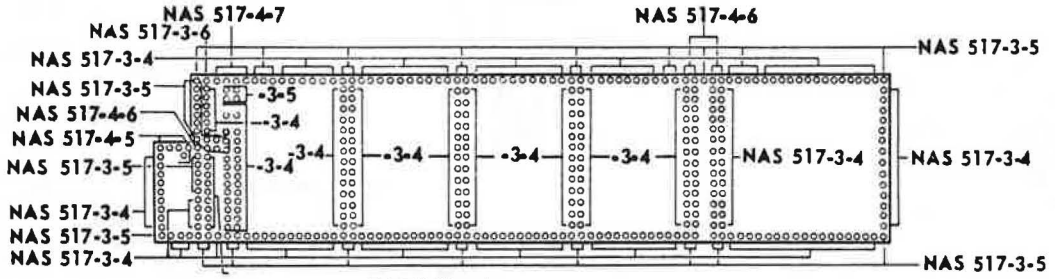
DETAIL AA PANEL NO. 1387

Wing Lower Surface Access Panels
Figure 2 (Sheet 10 of 10)

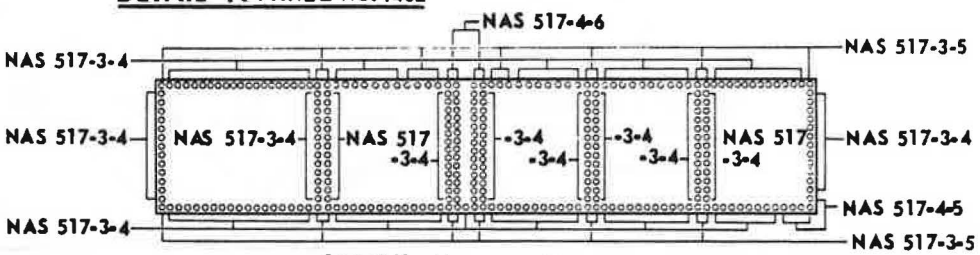


PANEL NO.	TITLE	FASTENERS
1402	INBOARD FLAP ACCESS PANEL	(DETAILED)
1403	INBOARD SPOILER ACCESS PANEL	(35 NAS 1103-5W, 4 NAS 1104-5W)
1404	INBOARD SPOILER ACCESS PANEL	(35 NAS 1103-5W, 4 NAS 1104-5W)
1405	OUTBOARD SPOILER ACCESS PANEL	(35 NAS 464P3A5, 4 NAS 464P4A5)
1406	OUTBOARD SPOILER ACCESS PANEL	(35 NAS 464P3A5, 4 NAS 464P4A5)
1408	INBOARD FLAP ACCESS PANEL	(DETAILED)
1409	OUTBOARD FLAP ACCESS PANEL	(DETAILED)
1410	OUTBOARD FLAP ACCESS PANEL	(DETAILED)
1411	INBOARD AILERON MAST FAIRING	(8 NAS 517-3-3)
1412	OUTBOARD AILERON CONTROL ACCESS PANEL	(28 NAS 514P428-16)
1413	OUTBOARD AILERON MAST FAIRING	(13 NAS 514P428-10)
1414	OUTBOARD AILERON CONTROL MAST FAIRING	(5 NAS 514P1032-12)
1415	OUTBOARD AILERON CONTROL ACCESS PANEL	(28 NAS 517-4-2)
1416	PRODUCTION BREAK GAP COVER	(24 NAS 517-3-14)
1417	OUTBOARD AILERON ACCESS PANEL	(DETAILED)
1418	OUTBOARD AILERON ACCESS PANEL	(DETAILED)
1419	RAM AIR DUCT ACCESS PANEL	(10 BAC B30BF-3K2)
1420	WING TIP ACCESS PANEL	(17 BAC B30BF-3K2)
1426	UPPER WING PANEL ACCESS DOOR	(4 NAS 333-PA4)
1427	INBOARD STRUT LEADING EDGE GAP COVER	(*)
1428	INBOARD STRUT LEADING EDGE GAP COVER	(*)
1429	OUTBOARD STRUT LEADING EDGE GAP COVER	(*)
1430	OUTBOARD STRUT LEADING EDGE GAP COVER	(*)
1431	(FORWARD OF INBOARD AILERON) INSPECTION PANEL	(16 NAS 517-3-5)
1432	FILLET FLAP ACCESS PANEL	(4 NAS 514P1032-7)
1433	WING TIP COMPASS ACCESS PANEL	(14 BAC B30BF-3K2)
1434	INBOARD AILERON SNUBBER ATTACH BOLT ACCESS PANEL	(7 NAS 517-3-4)
1435	AILERON QUADRANT PIN ACCESS PANEL	(3 NAS 517-3-1)
1436	WING TIP ANTENNA ACCESS PANEL	(16 NAS 517-3-1, 2 NAS 517-3-6)
1437	WING TIP CAP	(89 AN 507-DD832-10)
1453	LANDING GEAR TORQUE BOX ACCESS DOOR	(4 NAS 514P1032-16)
1454	LANDING GEAR TORQUE BOX ACCESS DOOR	(4 NAS 514P1032-16)

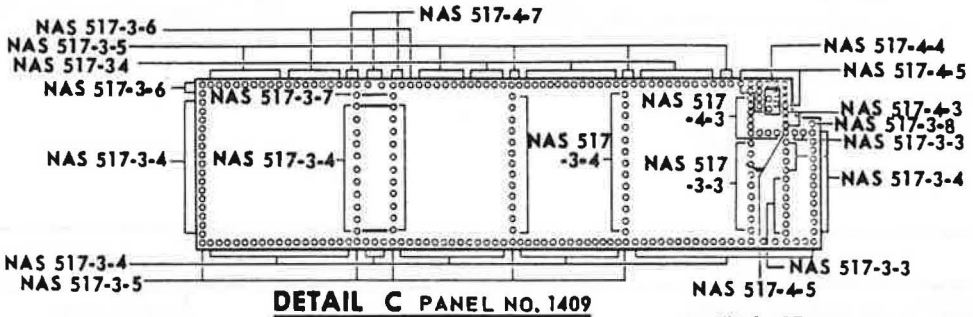
* QUICK RELEASE FASTENERS



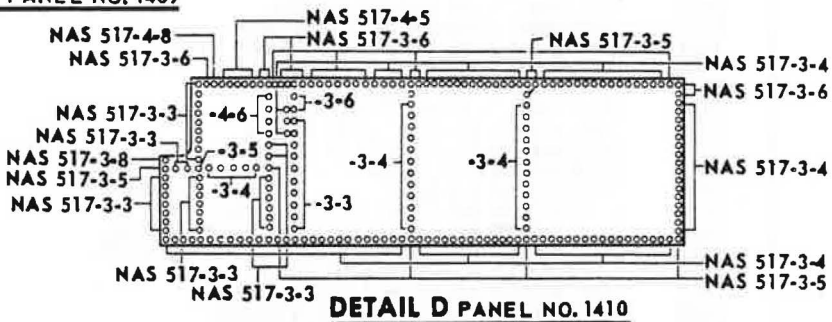
DETAIL A PANEL NO. 1402



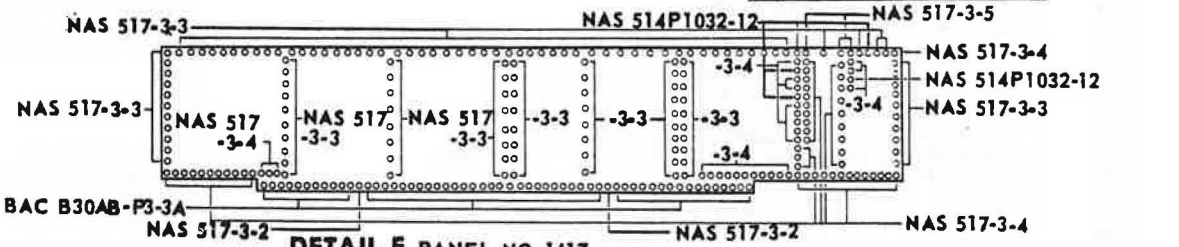
DETAIL B PANEL NO. 1408



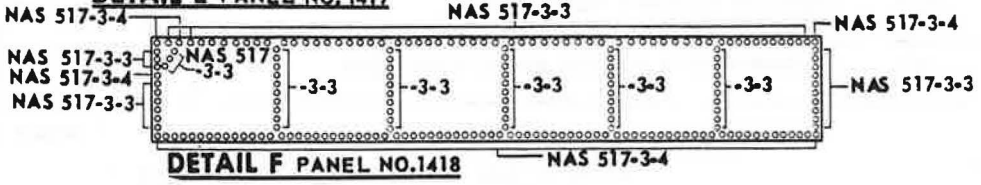
DETAIL C PANEL NO. 1409



DETAIL D PANEL NO. 1410

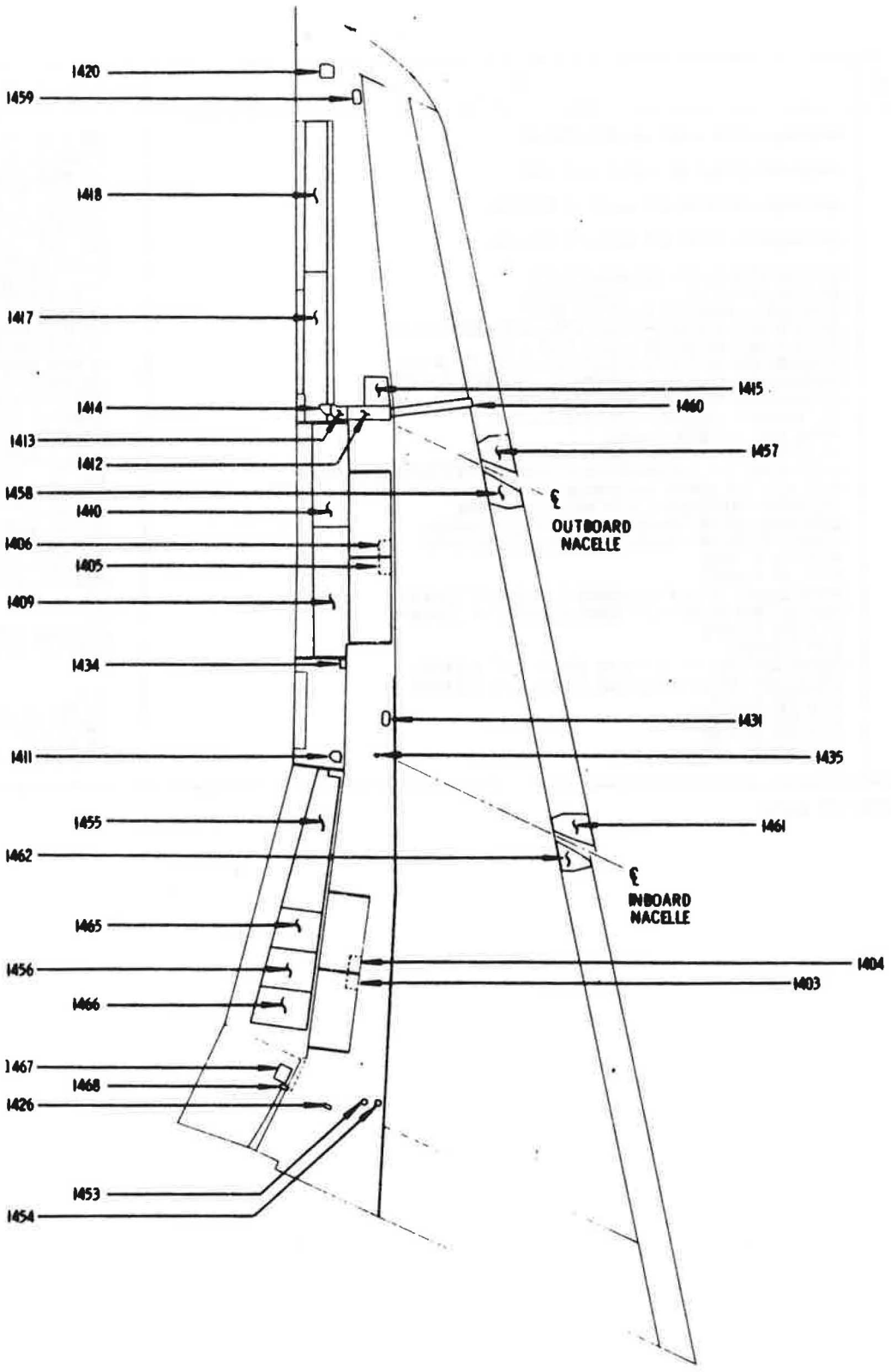


DETAIL E PANEL NO. 1417



DETAIL F PANEL NO. 1418

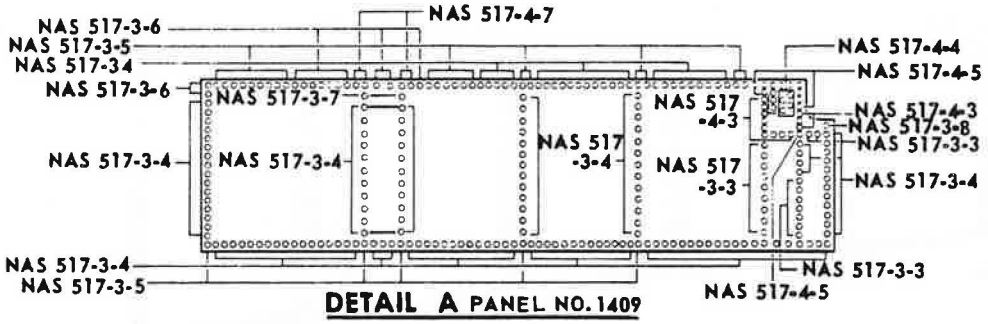
Wing Upper Surface Access Panels
Figure 3 (Sheet 2 of 6)



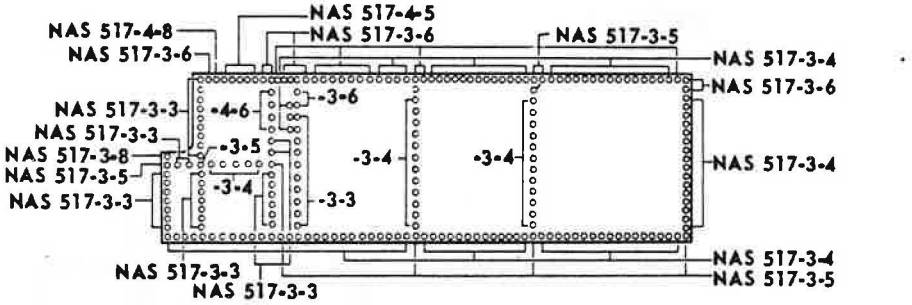
Wing Upper Surface Access Panels
Figure 3 (Sheet 3)

PANEL NO.	TITLE	FASTENERS
1403	INBOARD SPOILER ACCESS PANEL	(35 NAS 1103-5W, 4 NAS 1104-5W)
1404	INBOARD SPOILER ACCESS PANEL	(35 NAS 1103-5W, 4 NAS 1104-5W)
1405	OUTBOARD SPOILER ACCESS PANEL	(35 NAS 464P3A5, 4 NAS 464P4A5)
1406	OUTBOARD SPOILER ACCESS PANEL	(35 NAS 464P3A5, 4 NAS 464P4A5)
1409	OUTBOARD FLAP ACCESS PANEL	(DETAILED)
1410	OUTBOARD FLAP ACCESS PANEL	(DETAILED)
1411	INBOARD AILERON MAST FAIRING	(8 NAS 517-3-3)
1412	OUTBOARD AILERON CONTROL ACCESS PANEL	(28 NAS 514P428-16)
1413	OUTBOARD AILERON MAST FAIRING	(13 NAS 514P428-10)
1414	OUTBOARD AILERON CONTROL MAST FAIRING	(5 NAS 514P1032-12)
1415	OUTBOARD AILERON CONTROL ACCESS PANEL	(28 NAS 517-4-2)
1417	OUTBOARD AILERON ACCESS PANEL	(DETAILED)
1418	OUTBOARD AILERON ACCESS PANEL	(DETAILED)
1420	WING TIP ACCESS PANEL	(17 BAC B30BF-3K2)
1426	UPPER WING PANEL ACCESS DOOR	(4 NAS 333-PA4)
1431	(FORWARD OF INBOARD AILERON) INSPECTION PANEL	(16 NAS 517-3-5)
1434	INBOARD AILERON SNUBBER ATTACH BOLT ACCESS PANEL	(7 NAS 517-3-4)
1435	AILERON QUADRANT PIN ACCESS PANEL	(3 NAS 517-3-1)
1453	LANDING GEAR TORQUE BOX ACCESS DOOR	(4 NAS 514P1032-16)
1454	LANDING GEAR TORQUE BOX ACCESS DOOR	(4 NAS 514P1032-12)
1455	ACCESS PANEL	(DETAILED)
1456	ACCESS PANEL	(DETAILED)
1457	OUTBOARD STRUT LEADING EDGE GAP COVER	(*)
1458	OUTBOARD STRUT LEADING EDGE GAP COVER	(*)
1459	ACCESS PANEL	(12 BAC B30BF-3K2)
1460	GAP COVER	(DETAILED)
1461	INBOARD STRUT LEADING EDGE GAP COVER	(*)
1462	INBOARD STRUT LEADING EDGE GAP COVER	(*)
1465	ACCESS PANEL	76 NAS517-3-5
1466	ACCESS PANEL	162 NAS517-3-5
1467	ACCESS PANEL	17 NAS517-3-3
1468	ACCESS PANEL	17 NAS517-3-4

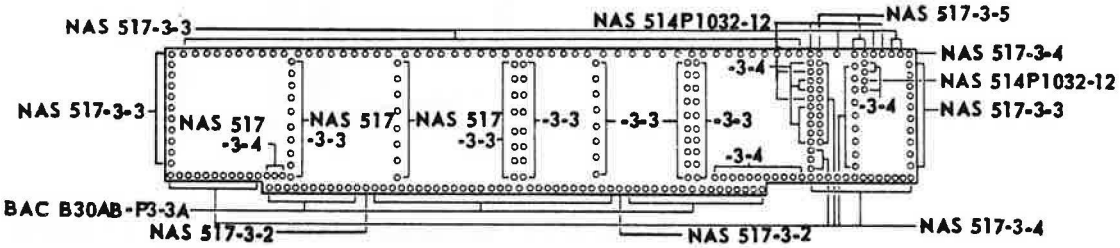
(*) QUICK RELEASE



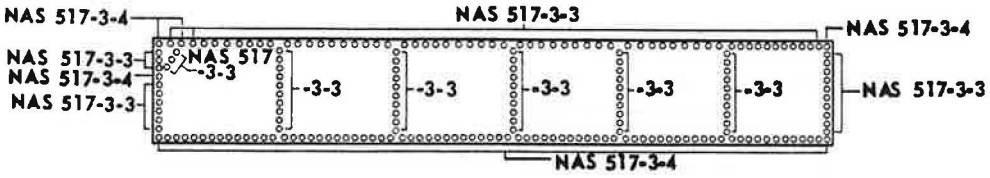
DETAIL A PANEL NO. 1409



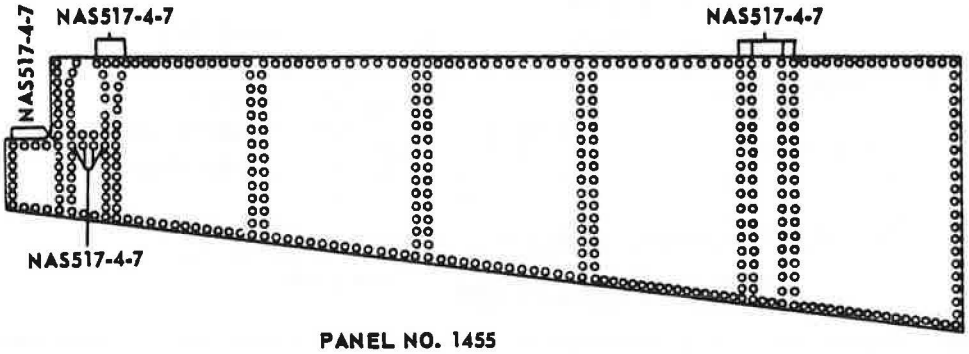
DETAIL B PANEL NO. 1410



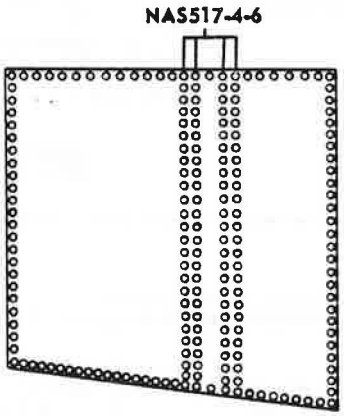
DETAIL C PANEL NO. 1417



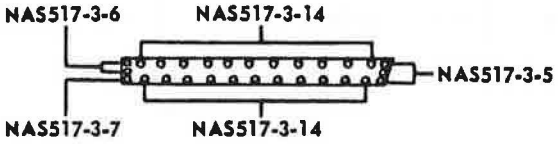
DETAIL PANEL NO. 1418



PANEL NO. 1455
(ALL FASTENERS ARE NAS517-3-5 EXCEPT AS NOTED)
DETAIL E

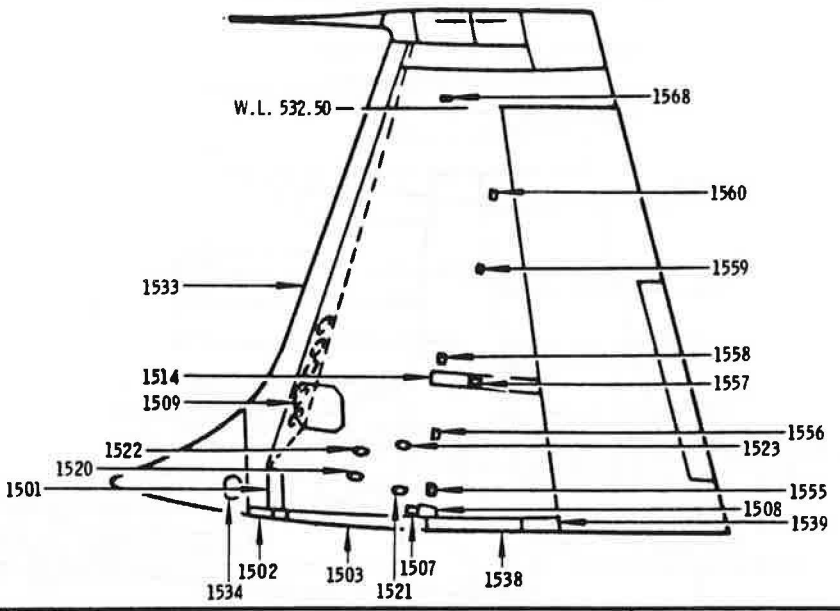


PANEL NO. 1456
(ALL FASTENERS ARE NAS517-3-5 EXCEPT AS NOTED)
DETAIL F

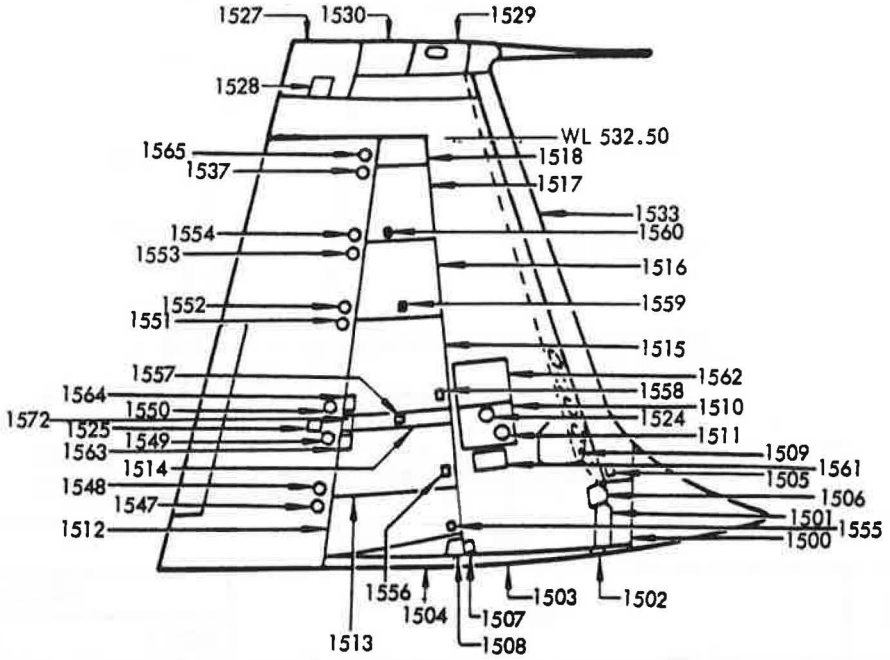


PANEL NO. 1460
DETAIL G

Wing Upper Surface Access Panels
Figure 3 (Sheet 6)

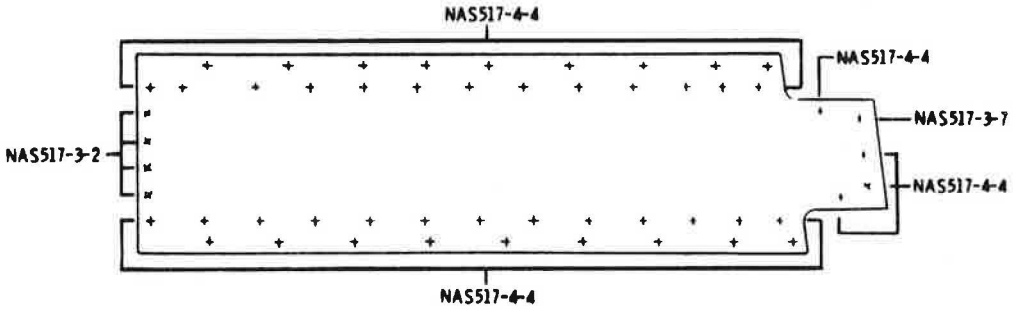


PANEL NO.	TITLE	FASTENERS	
		QTY	TYPE
1500	SKIN PANEL	74	NAS517-3-4
1501	LOWER FAIRING SKIN PANEL	37	NAS517-3-4
1502	FIN TO FUSELAGE FORWARD FAIRING	9	NAS517-3-2
1503	FIN TO FUSELAGE MIDFAIRING	29	NAS517-3-4
1504	FIN TO FUSELAGE AFT FAIRING	25	NAS517-3-4
		3	NAS517-4-7
1505	FIN LEADING EDGE ACCESS PANEL	20	NAS517-3-1
1506	FRONT SPAR ACCESS PANEL	44	NAS517-3-4
1507	REAR SPAR ACCESS PANEL	39	NAS517-3-6
1508	REAR SPAR ACCESS PANEL	30	NAS517-3-6
1509	ANTENNA PANEL	37	NAS517-3-9
		47	NAS516-4-6
		2	NAS517-4-7
1510	RUDDER TAB CONTROL QUADRANT ACCESS PANEL	87	NAS517-4-8
1511	ON 1510 RUDDER CONTROL QUADRANT ACCESS PANEL	3	NAS517-3-1
1512	RUDDER BALANCE BAY ACCESS PANEL	25	NAS517-3-3
		96	NAS517-4-6
		3	NAS517-5-9
1513	RUDDER BALANCE BAY ACCESS PANEL	85	NAS517-4-4
		31	NAS517-3-3
		1	NAS517-5-8
1514	LEFT RUDDER TAB CONTROL ACCESS PANEL	5	NAS517-3-2
		47	NAS517-4-4
1514	RIGHT RUDDER TAB CONTROL ACCESS PANEL		DETAILED
1515	RUDDER BALANCE BAY ACCESS PANEL	30	NAS517-3-3
		54	NAS517-4-4
		1	NAS517-5-7
1516	RUDDER BALANCE BAY ACCESS PANEL	51	NAS517-3-4
		30	NAS517-4-7
1517	RUDDER BALANCE BAY ACCESS PANEL	49	NAS517-3-4
		24	NAS517-4-7
1518	RUDDER HINGE SKIN PANEL	31	NAS517-3-5
1520	FIN INTERSPAR ACCESS PANEL	46	NAS517-3-2
1521	FIN INTERSPAR ACCESS PANEL	46	NAS517-3-2
1522	FIN INTERSPAR ACCESS PANEL	46	NAS517-3-2
1523	FIN INTERSPAR ACCESS PANEL	46	NAS517-3-2
1524	RUDDER CONTROL QUADRANT ACCESS PANEL		(*)
1525	RUDDER CONTROL TAB ROD AND BELLCRANK ACCESS PANEL	8	NAS517-3-2
1527	LORAN ANTENNA ACCESS PANEL	108	NAS517-3-4
1528	LORAN DISCONNECT ACCESS PANEL	16	NAS517-3-4
1529	FIN TIP LIGHTNING ARRESTER ACCESS PANEL	41	NAS517-3-4

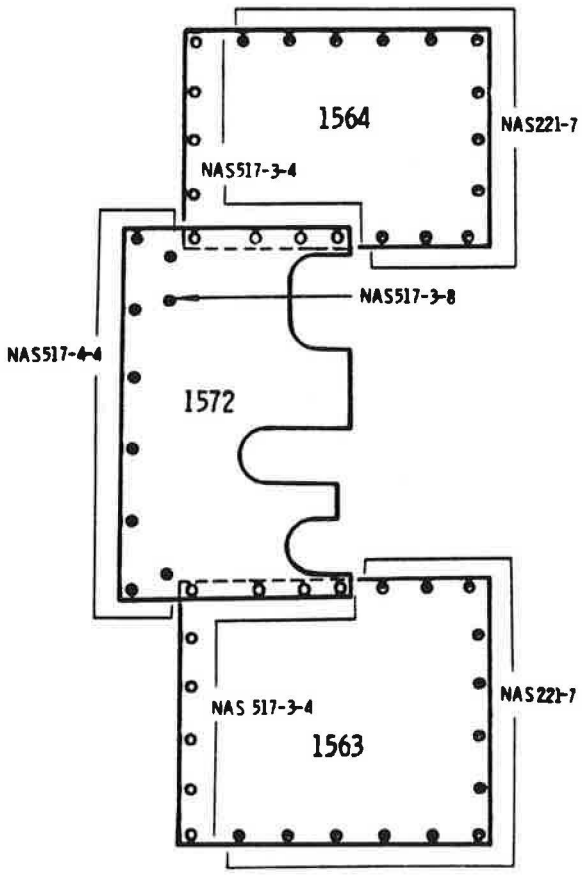


PANEL NO.	TITLE	FASTENERS	
		QTY	TYPE
1530	HIGH FREQUENCY ANTENNA COUPLER ACCESS DOOR	22	NAS517-3-4
1531	HIGH FREQUENCY ANTENNA COUPLER PANEL	32	NAS517-3-4
1532	LORAN COUPLER ACCESS PANEL	17	NAS517-3-4
1533	FIN LEADING EDGE	208	NAS517-6-7
		4	NAS517-4-10
1534	DORSAL FIN ACCESS PANEL	23	NAS517-3-0
1537	INSPECTION PANEL	6	NAS514P1032-8
1538	FIN TO FUSELAGE AFT FAIRING	20	NAS517-3-4
		4	NAS517-3-2
1539	FIN TO FUSELAGE AFT FAIRING	6	NAS517-3-2
		3	NAS517-3-4
		3	NAS517-4-7
1547	INSPECTION PANEL	6	NAS514P1032-8
1548	INSPECTION PANEL	6	NAS514P1032-8
1549	INSPECTION PANEL	6	NAS514P1032-8
1550	INSPECTION PANEL	6	NAS514P1032-8
1551	INSPECTION PANEL	6	NAS514P1032-8
1552	INSPECTION PANEL	6	NAS514P1032-8
1553	INSPECTION PANEL	6	NAS514P1032-8
1554	INSPECTION PANEL	6	NAS514P1032-8
1555	INSPECTION PANEL	6	NAS517-3-0
1556	INSPECTION PANEL	6	NAS517-3-0
1557	INSPECTION PANEL	4	NAS517-3-0
1558	INSPECTION PANEL	6	NAS517-3-0
1559	INSPECTION PANEL	6	NAS517-3-0
1560	INSPECTION PANEL	6	NAS517-3-0
1561	RUDDER TRIM SCREW INSPECTION PANEL	36	NAS517-4-8
1562	RUDDER Q-SPRING ACCESS PANEL	83	NAS517-4-8
1563	RUDDER HINGE ACCESS PANEL		DETAILED
1564	RUDDER HINGE ACCESS DOOR		DETAILED
1565	INSPECTION PANEL	6	NAS514P1032-8
1568	ACCESS PANEL	17	NAS517-3-2
1572	RUDDER NOSE FAIRING		DETAILED

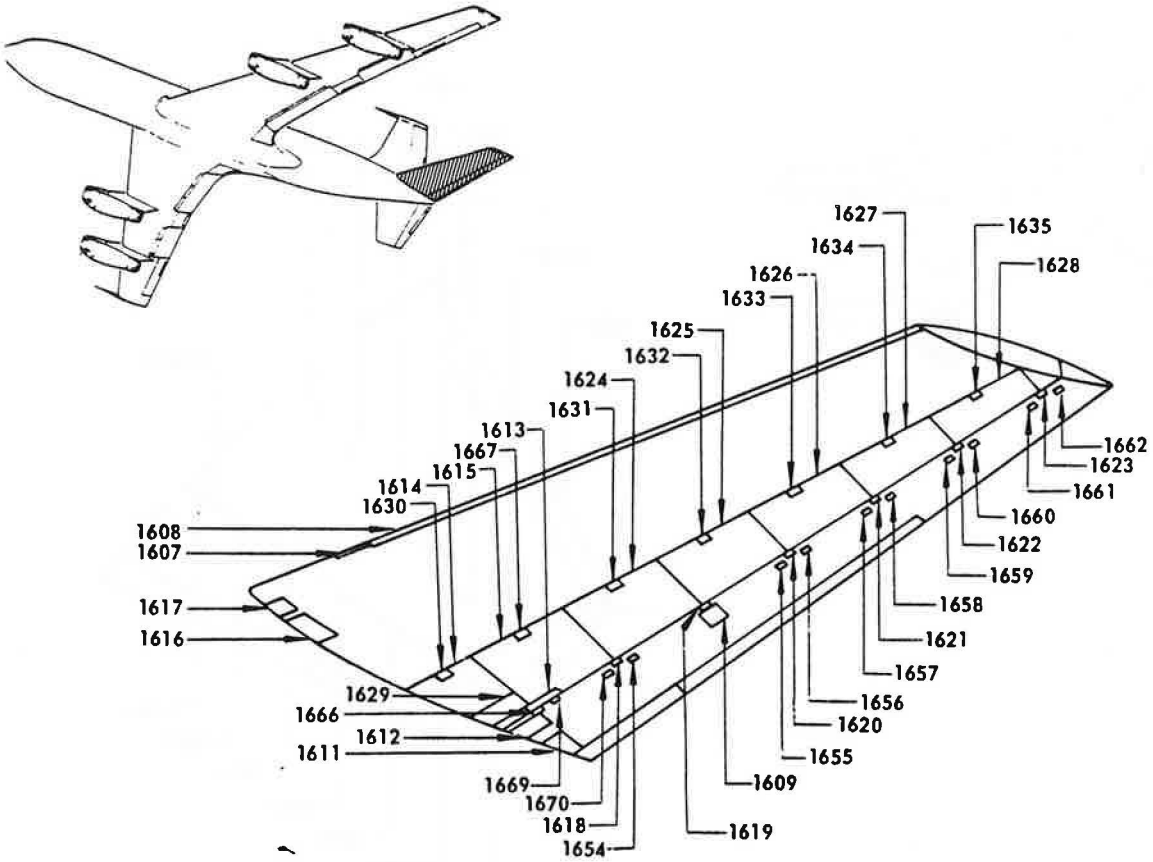
Fin and Rudder Access Panels
Figure 4 (Sheet 2)



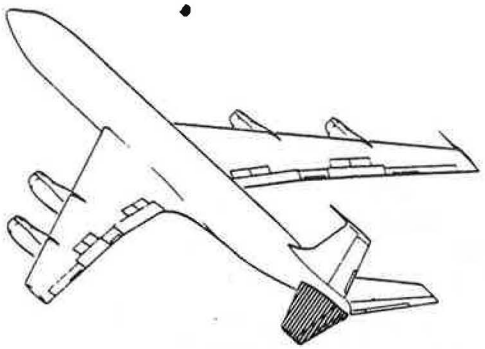
DETAIL A PANEL NO. 1514 (RIGHT)

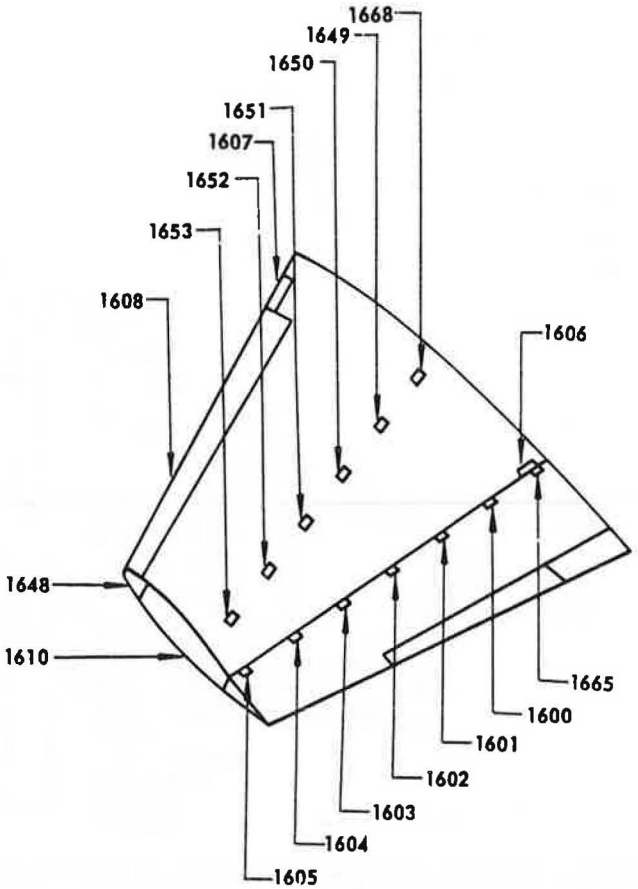


DETAIL B



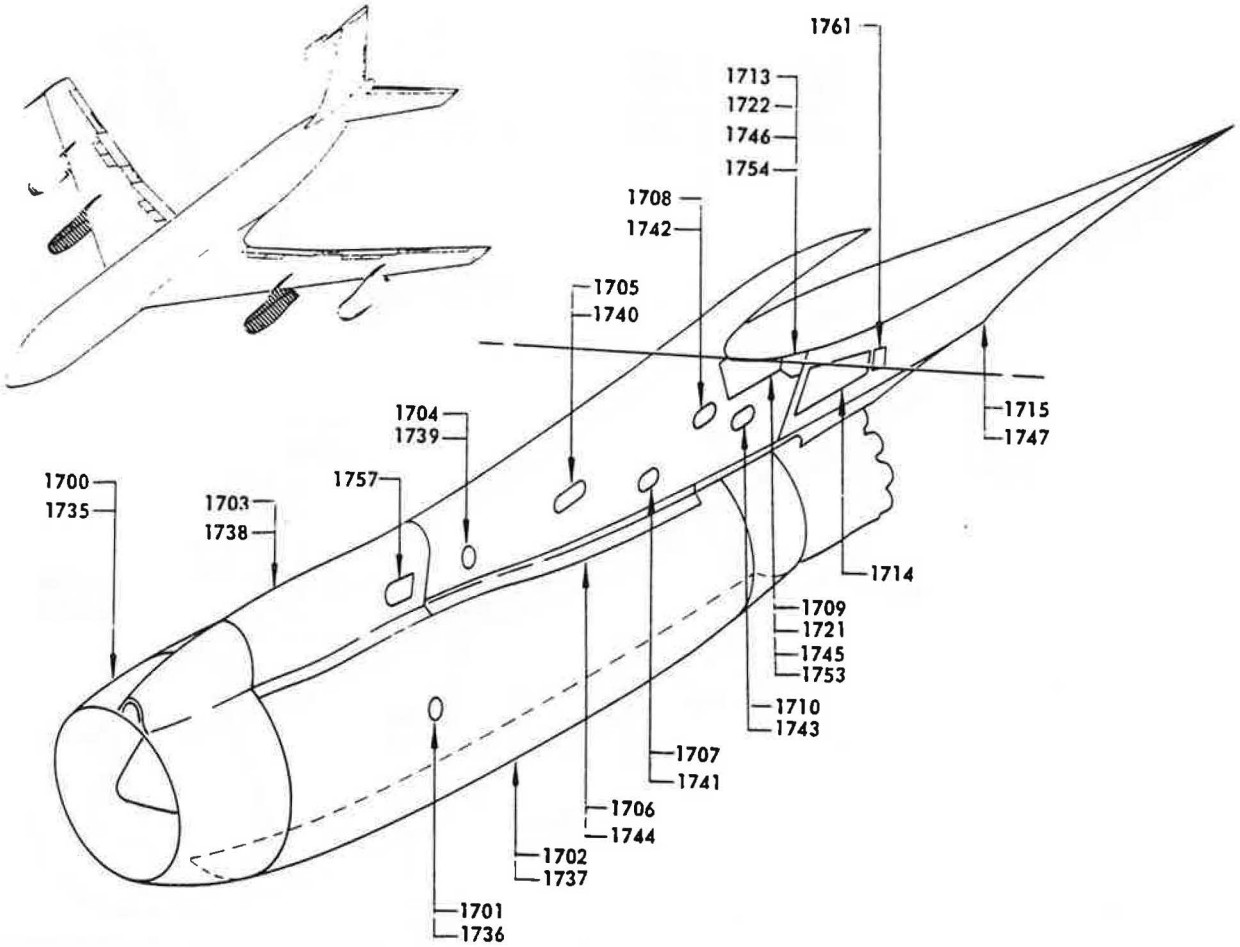
PANEL NO.	TITLE	FASTENERS
1600	ELEVATOR HINGE ACCESS PANEL	(4 NAS 514P1032-8)
1601	ELEVATOR HINGE ACCESS PANEL	(2 NAS 514P1032-8, 2 NAS 514P428-8)
1602	ELEVATOR HINGE ACCESS PANEL	(4 NAS 514P1032-8)
1603	ELEVATOR HINGE ACCESS PANEL	(2 NAS 514P1032-8, 2 NAS 514P428-8)
1604	ELEVATOR HINGE ACCESS PANEL	(2 NAS 514P1032-8)
1605	ELEVATOR HINGE ACCESS PANEL	(2 NAS 514P1032-8)
1606	ELEVATOR THRUST HINGE ACCESS PANEL	(9 NAS 517-3-4, 2 NAS 517-4-11)
1607	LEADING EDGE INBOARD ACCESS PANEL	(34 NAS 517-3-4)
1608	LEADING EDGE OUTBOARD ACCESS PANEL	(266 NAS 584-9, 8 NAS 585-12)
1609	ELEVATOR ACCESS PANEL	(35 NAS 517-3-4)
1610	STABILIZER TIP CAP	(42 NAS 517-3-7, 3 NAS 517-3-3)
1611	ELEVATOR CONTROL ROD FAIRING	(33 NAS 517-3-5)
1612	ELEVATOR TRIM TAB CONTROL ACCESS PANEL	(L-38 NAS 517-3-6, 1 NAS 517-4-5) (R-40 NAS 517-3-5, 7 NAS 517-4-6)
1613	ELEVATOR THRUST HINGE ACCESS PANEL	(9 NAS 517-3-4, 2 NAS 517-4-11)
1614	ELEVATOR TAB CONTROL ACCESS PANEL	(137 NAS 517-3-7)
1615	ELEVATOR BALANCE PANEL	(187 NAS 517-3-7)
1616	STABILIZER FRONT SPAR INBOARD ACCESS PANEL	(35 NAS 517-3-5)
1617	STABILIZER FRONT SPAR INBOARD ACCESS PANEL	(30 NAS 517-3-5)
1618	ELEVATOR HINGE ACCESS PANEL	(4 NAS 514P1032-8)
1619	ELEVATOR HINGE ACCESS PANEL	(4 NAS 514P1032-8)
1620	ELEVATOR HINGE ACCESS PANEL	(4 NAS 514P1032-8)
1621	ELEVATOR HINGE ACCESS PANEL	(4 NAS 514P1032-8)
1622	ELEVATOR HINGE ACCESS PANEL	(4 NAS 514P1032-8)
1623	ELEVATOR HINGE ACCESS PANEL	(4 NAS 514P1032-8)
1624	ELEVATOR BALANCE PANEL	(128 NAS 517-3-6)
1625	ELEVATOR BALANCE PANEL	(103 NAS 517-3-5)
1626	ELEVATOR BALANCE PANEL	(84 NAS 517-3-5)
1627	ELEVATOR BALANCE PANEL	(69 NAS 517-3-5)





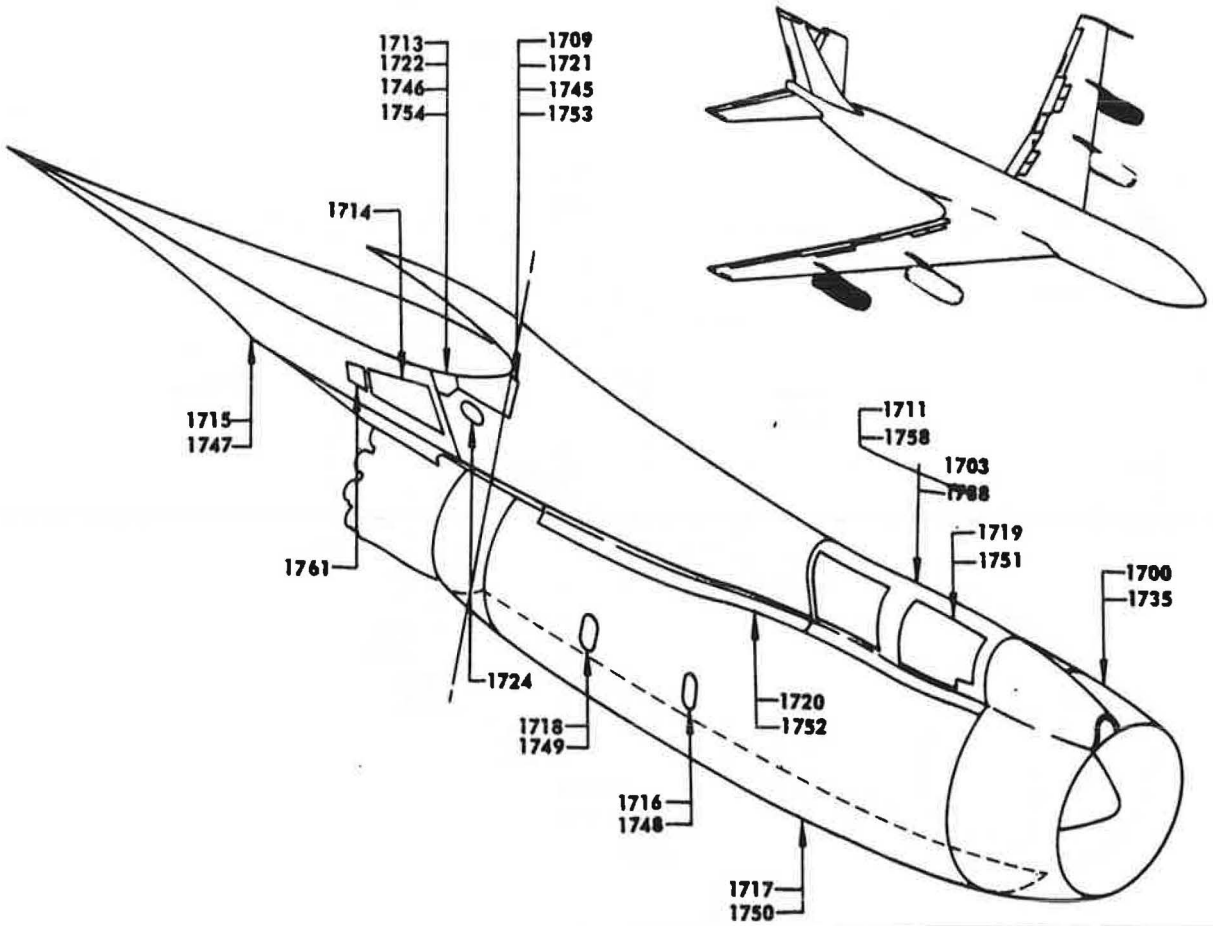
PANEL NO.	TITLE	FASTENERS
1628	ELEVATOR BALANCE PANEL	(62 NAS 517-3-5, 8 NAS 517-3-7)
1629	ELEVATOR TAB CONTROL ACCESS PANEL	(32 NAS 517-3-7)
1630	INSPECTION PANEL	(6 NAS 517-3-0)
1631	INSPECTION PANEL	(6 NAS 517-3-0)
1632	INSPECTION PANEL	(6 NAS 517-3-0)
1633	INSPECTION PANEL	(6 NAS 517-3-0)
1634	INSPECTION PANEL	(6 NAS 517-3-0)
1635	INSPECTION PANEL	(6 NAS 517-3-0)
1648	STABILIZER TIP LEADING EDGE	(11 NAS 517-3-3, 2 NAS 517-3-12)
1649	INSPECTION PANEL	(6 NAS 517-3-0)
1650	INSPECTION PANEL	(6 NAS 517-3-0)
1651	INSPECTION PANEL	(6 NAS 517-3-0)
1652	INSPECTION PANEL	(6 NAS 517-3-0)
1653	INSPECTION PANEL	(6 NAS 517-3-0)
1654	INSPECTION PANEL	(6 NAS 517-3-0)
1655	INSPECTION PANEL	(6 NAS 517-3-0)
1656	INSPECTION PANEL	(6 NAS 517-3-0)
1657	INSPECTION PANEL	(6 NAS 517-3-0)
1658	INSPECTION PANEL	(6 NAS 517-3-0)
1659	INSPECTION PANEL	(6 NAS 517-3-0)
1660	INSPECTION PANEL	(6 NAS 517-3-0)
1661	INSPECTION PANEL	(6 NAS 517-3-0)
1662	INSPECTION PANEL	(6 NAS 517-3-0)
1665	ELEVATOR HINGE ACCESS PANEL	(4 NAS 514P1032-8)
1666	ELEVATOR HINGE ACCESS PANEL	(3 NAS 514P1032-8)
1667	INSPECTION PANEL	(6 NAS 517-3-0)
1668	INSPECTION PANEL	(6 NAS 517-3-0)
1669	ELEVATOR INSPECTION PANEL	(6 NAS 514P1032-8)
1670	ELEVATOR INSPECTION PANEL	(6 NAS 514P1032-8)

Stabilizer and Elevator Access Panels
Figure 5 (Sheet 2 of 2)



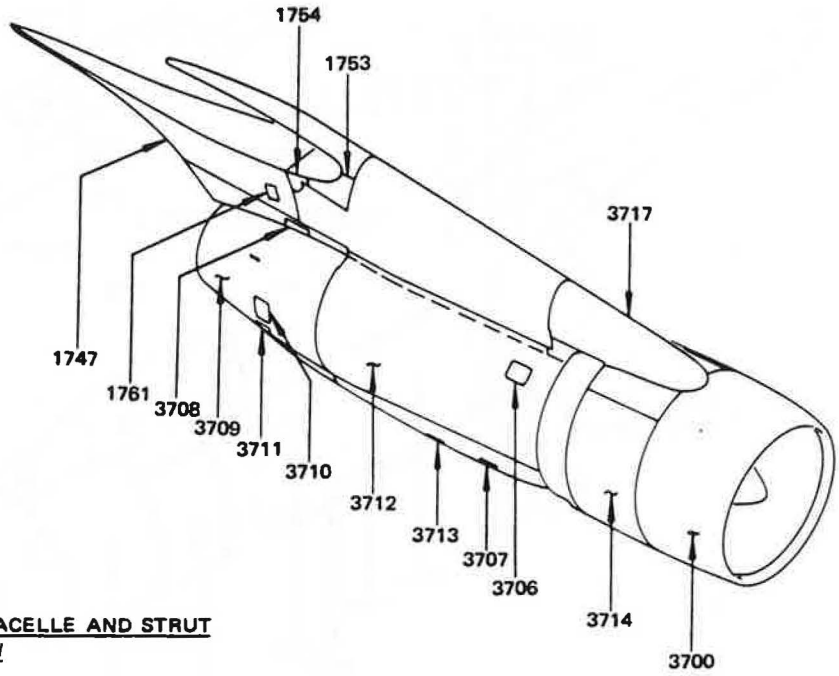
PANEL NO.	TITLE	FASTENERS
1700	NAC 2 AND 3 ENGINE NOSE COWL	(14 66-1782 BOLTS)
1701	NAC 2 AND 3 ENGINE OIL TANK ACCESS PANEL	(*)
1702	NAC 2 AND 3 LEFT COWL PANEL	(7 LATCHES)
1703	NAC 2 AND 3 FORWARD FAIRING	(*)
1704	NAC 2 AND 3 STRUT ACCESS PANEL	(*)
1705	NAC 2 AND 3 STRUT ACCESS PANEL	(*)
1706	NAC 2 AND 3 MID FAIRING	(10 NAS 517-3-2, 9 AN4-5A)
1707	NAC 2 AND 3 STRUT ACCESS PANEL	(*)
1708	NAC 2 AND 3 STRUT ACCESS PANEL	(*)
1709	NAC 2 AND 3 STRUT TO WING ACCESS PANEL	(*)
1710	NAC 2 AND 3 STRUT ACCESS PANEL	(*)
1711	NAC 2 AND 3 TURBOCOMPRESSOR ACCESS PANEL	(*)
1713	NAC 3 STRUT FITTING ACCESS PANEL	(4 NAS 514P1032-8,*)
1713	NAC 2 STRUT FITTING ACCESS PANEL	(5 NAS 514P1032-8)
1714*	NAC 3-FIRE EXTINGUISHER ACCESS PANEL	(*)
1715	NAC 2 AND 3 STRUT TRAILING EDGE FAIRING	(57 NAS 517-3-3)
1716	NAC 2 AND 3 FORWARD GROUND FIRE EXTINGUISHING ACCESS PANEL	(CLIPPED)
1717	NAC 2 AND 3 RIGHT COWL PANEL	(7 LATCHES)
1718	NAC 2 AND 3 AFT-GROUND FIRE EXTINGUISHING ACCESS PANEL	(CLIPPED)
1719	NAC 2 AND 3 TURBOCOMPRESSOR OIL SERVICING ACCESS PANEL	(*)
1720	NAC 2 AND 3 MID FAIRING	(10 NAS 517-3-2,9 AN4-5A)
1721	NAC 2 STRUT TO WING ACCESS PANEL	(*)
1721	NAC 3 STRUT TO WING ACCESS PANEL	(*)
1722	NAC 2 STRUT FITTING ACCESS PANEL	(4 NAS 514P1032-8, *)
1722	NAC 3 STRUT FITTING ACCESS PANEL	(5 NAS 514P1032-8)
1724	NAC 2 AND 3 STRUT ACCESS PANEL	(*)

* QUICK RELEASE FASTENERS

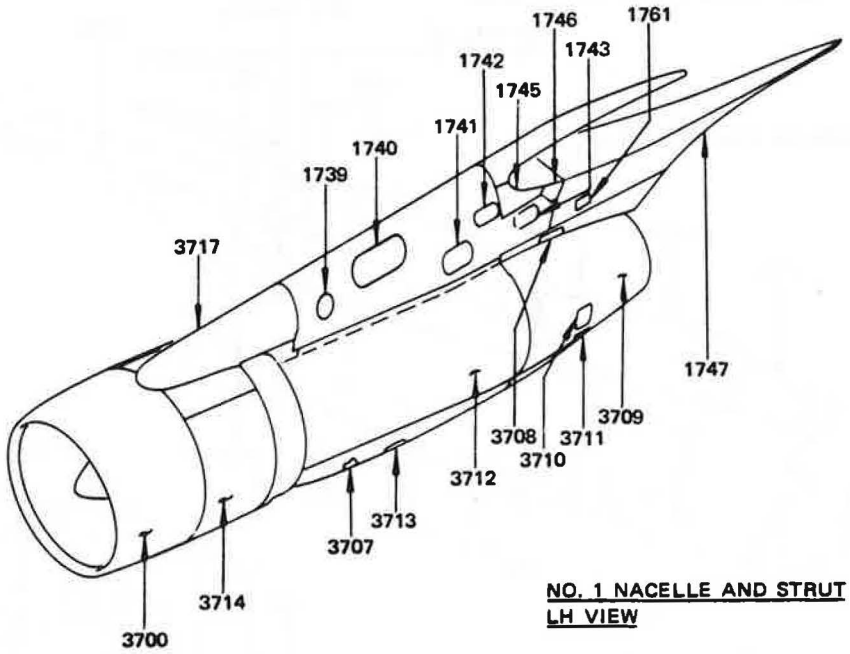


PANEL NO.	TITLE	FASTENERS
1735	NAC 1 AND 4 ENGINE NOSE COWL	(14 66-1782 BOLTS)
1736	NAC 1 AND 4 ENGINE OIL TANK ACCESS PANEL	(*)
1737	NAC 1 AND 4 LEFT COWL PANEL	(7 LATCHES)
1738	NAC 1 AND 4 FORWARD FAIRING	(*)
1739	NAC 1 AND 4 STRUT ACCESS PANEL	(*)
1740	NAC 1 AND 4 STRUT ACCESS PANEL	(*)
1741	NAC 1 AND 4 STRUT ACCESS PANEL	(*)
1742	NAC 1 AND 4 STRUT ACCESS PANEL	(*)
1743	NAC 1 AND 4 STRUT ACCESS PANEL	(*)
1744	NAC 1 AND 4 MID FAIRING	(10 NAS 517-3-2, 9 AN4-5A)
1745	NAC 1 STRUT TO WING ACCESS PANEL	(*)
1745	NAC 4 STRUT TO WING ACCESS PANEL	(*)
1746	NAC 1 STRUT FITTING ACCESS PANEL	(5 NAS 514P1032-8)
1746	NAC 4 STRUT FITTING ACCESS PANEL	(4 NAS 514P1032-8, *)
1747	NAC 1 AND 4 STRUT TRAILING EDGE FAIRING	(42 NAS 517-3-3)
1748	NAC 1 AND 4 FORWARD GROUND FIRE EXTINGUISHING ACCESS PANEL	(CLIPPED)
1749	NAC 1 AND 4 AFT GROUND FIRE EXTINGUISHING ACCESS PANEL	(CLIPPED)
1750	NAC 1 AND 4 RIGHT COWL PANEL	(7 LATCHES)
1751	NAC 1 AND 4 TURBOCOMPRESSOR OIL SERVICING ACCESS PANEL	(*)
1752	NAC 1 AND 4 MID FAIRING	(10 NAS 517-3-2,9 AN4-5A)
1753	NAC 1 STRUT TO WING ACCESS PANEL	(*)
1753	NAC 4 STRUT TO WING ACCESS PANEL	(*)
1754	NAC 1 STRUT FITTING ACCESS PANEL	(4 NAS 514P1032-8, *)
1754	NAC 4 STRUT FITTING ACCESS PANEL	(5 NAS 514P1032-8)
1757	NAC 1 ONLY EXHAUST DUCT FILLER PANEL	(*)
1758	NAC 1 AND 4 TURBOCOMPRESSOR ACCESS PANEL	(*)
1761	NAC 4 STRUT TRAILING EDGE ACCESS PANEL	(4 AN 507C524R-8)

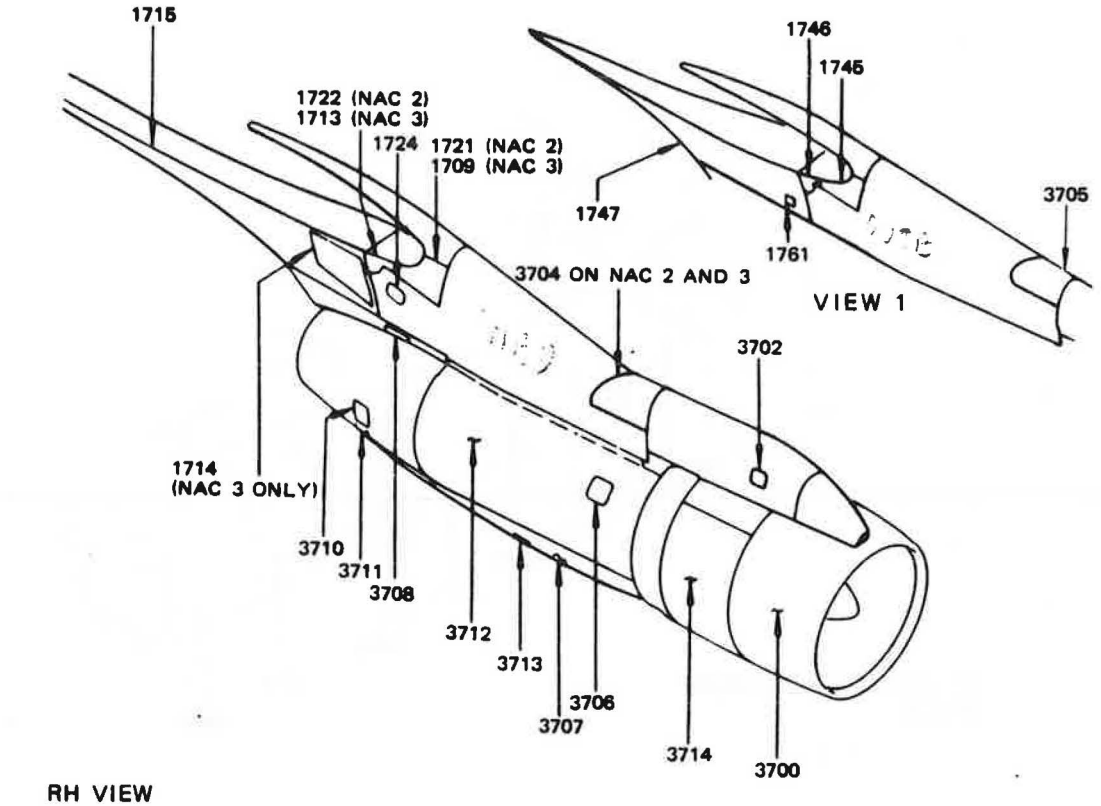
* QUICK RELEASE FASTENERS



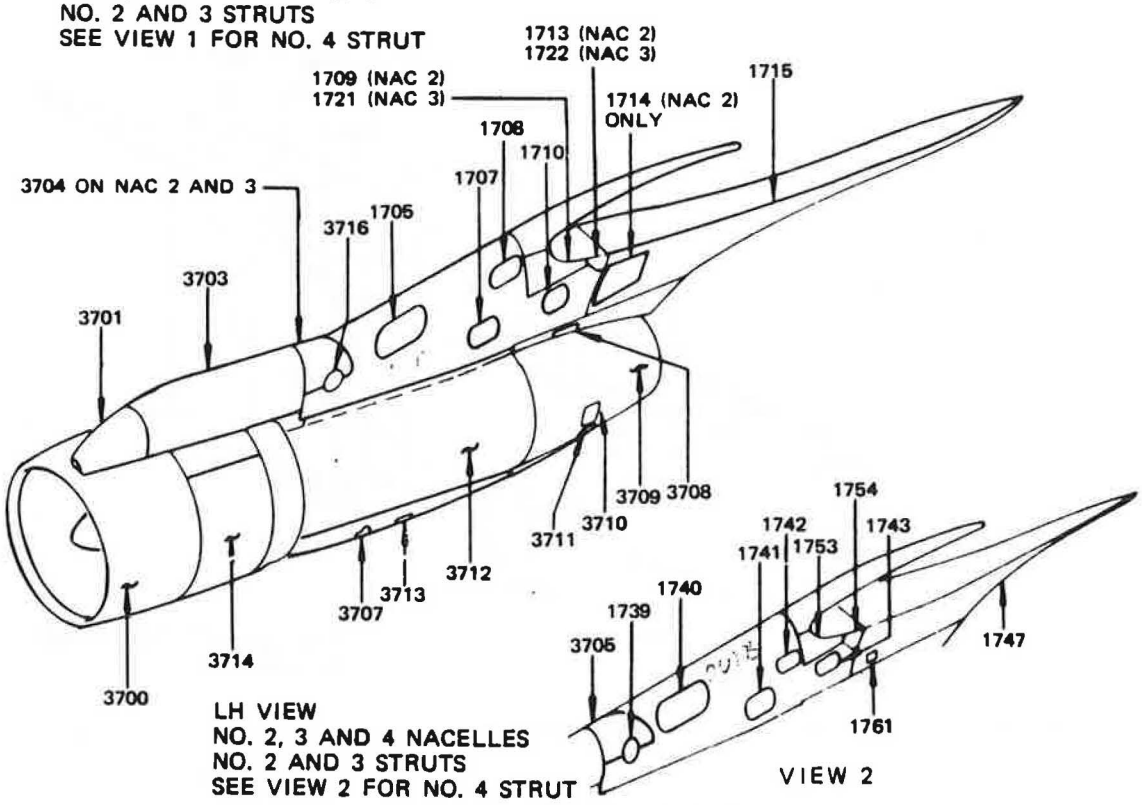
NO. 1 NACELLE AND STRUT
RH VIEW



NO. 1 NACELLE AND STRUT
LH VIEW



RH VIEW
NO. 2, 3 AND 4 NACELLES
NO. 2 AND 3 STRUTS
SEE VIEW 1 FOR NO. 4 STRUT



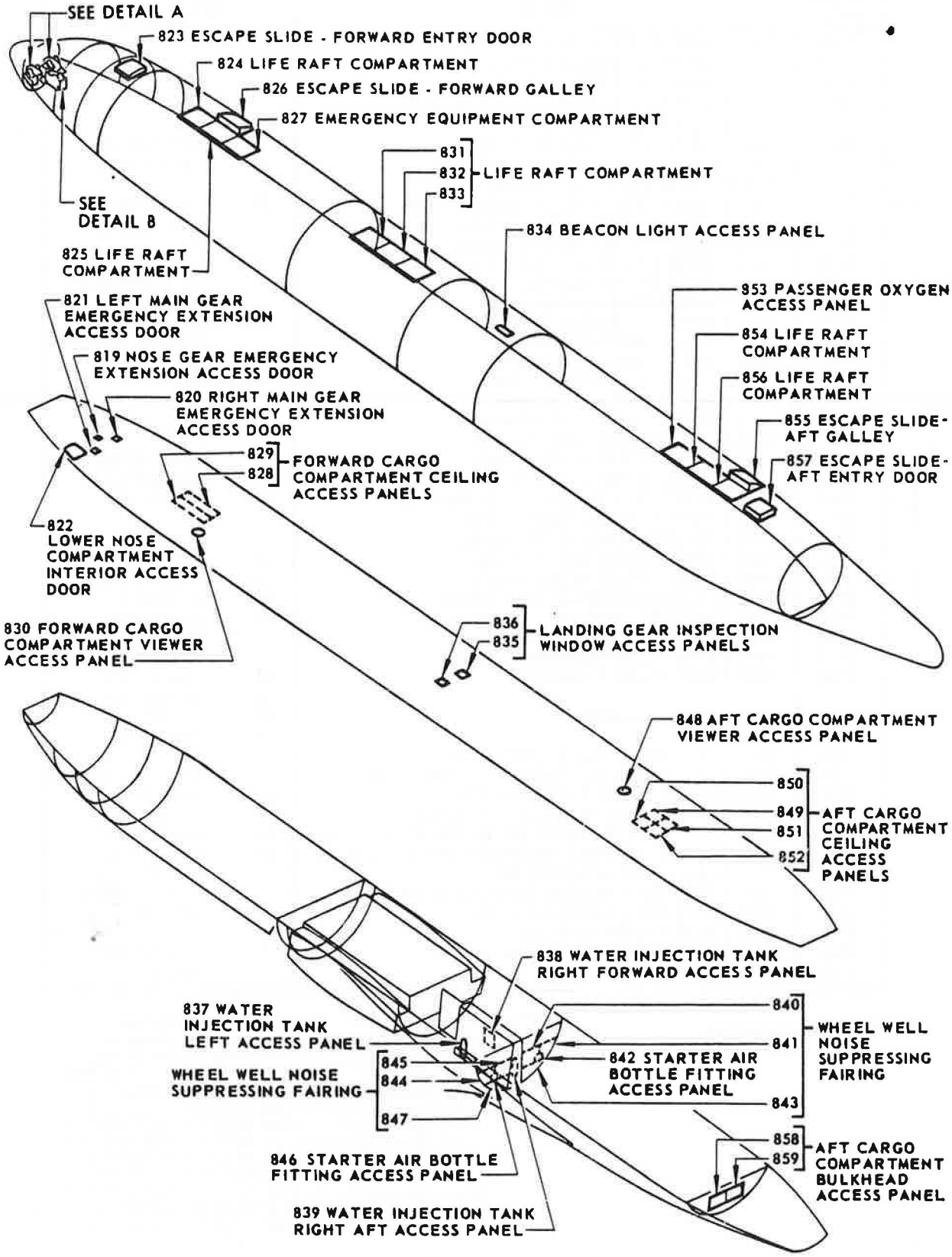
LH VIEW
NO. 2, 3 AND 4 NACELLES
NO. 2 AND 3 STRUTS
SEE VIEW 2 FOR NO. 4 STRUT

Nacelle Access Panels and Doors
Figure 6 (Sheet 4)

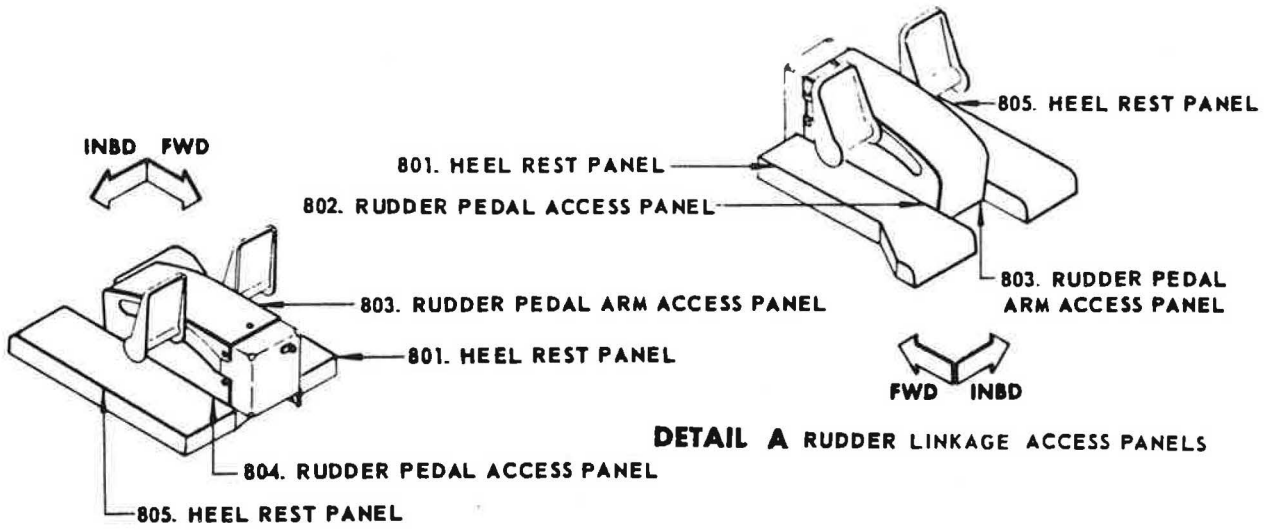
PANEL NO.	TITLE	FASTENERS	
1705	NAC 2 AND 3 STRUT ACCESS PANEL		(*)
1707	NAC 2 AND 3 STRUT ACCESS PANEL		(*)
1708	NAC 2 AND 3 STRUT ACCESS PANEL		(*)
1709	NAC 2 AND 3 STRUT TO WING ACCESS PANEL		(*)
1710	NAC 2 AND 3 STRUT ACCESS PANEL		(*)
1713	NAC 3 STRUT FITTING ACCESS PANEL	4	NAS514P1032-8*
1713	NAC 2 STRUT FITTING ACCESS PANEL	5	NAS514P1032-8
1714	FIRE EXTINGUISHER ACCESS PANEL		(*)
1715	NAC 2 AND 3 STRUT TRAILING EDGE FAIRING	57	NAS517-3-3
1721	NAC 2 STRUT TO WING ACCESS PANEL		(*)
1721	NAC 3 STRUT TO WING ACCESS PANEL		(*)
1722	NAC 2 STRUT FITTING ACCESS PANEL	4	NAS514P1032-8*
1722	NAC 3 STRUT FITTING ACCESS PANEL	5	NAS514P1032-8
1724	NAC 2 AND 3 STRUT ACCESS PANEL		(*)
1739	NAC 1 AND 4 STRUT ACCESS PANEL		(*)
1740	NAC 1 AND 4 STRUT ACCESS PANEL		(*)
1741	NAC 1 AND 4 STRUT ACCESS PANEL		(*)
1742	NAC 1 AND 4 STRUT ACCESS PANEL		(*)
1743	NAC 1 AND 4 STRUT ACCESS PANEL		(*)
1745	NAC 1 STRUT TO WING ACCESS PANEL		(*)
1745	NAC 4 STRUT TO WING ACCESS PANEL		(*)
1746	NAC 1 STRUT FITTING ACCESS PANEL	5	NAS514P1032-8
1746	NAC 4 STRUT FITTING ACCESS PANEL	4	NAS514P1032-8*
1747	NAC 1 AND 4 STRUT TRAILING EDGE FAIRING	42	NAS517-3-3
1753	NAC 1 STRUT TO WING ACCESS PANEL		(*)
1753	NAC 4 STRUT TO WING ACCESS PANEL		(*)
1754	NAC 1 STRUT FITTING ACCESS PANEL	4	NAS514P1032-8*
1754	NAC 4 STRUT FITTING ACCESS PANEL	5	NAS514P1032-8
3700	NAC 1, 2, 3 AND 4 ENGINE NOSE COWL	20	66-12864-1
3701	NAC 2 AND 3 FORWARD INLET FAIRING	6	MS200004H9
3702	NAC 2 AND 3 OIL ACCESS DOOR		(*)
3703	NAC 2 AND 3 FORWARD FAIRING		LATCHES
3704	NAC 2 AND 3 SADDLE FAIRING	17	NAS517-3-2
		3	NAS517-3-3
3705	NAC 4 SADDLE FAIRING	15	NAS517-3-2
		4	NAS517-3-3
3706	NAC 1, 2, 3, AND 4, ENGINE OIL ACCESS DOOR		(*)
3707	NAC 1, 2, 3, AND 4, ENGINE SURGE BLEED DOOR		SPRING LOADED
3708	NAC 1, 2, 3, AND 4 AFT ACCESS DOOR	16	NAS517-3-2
3709	NAC 1, 2, 3, AND 4 THRUST REVERSER SLEEVE		MECHANICAL
3710	NAC 1, 2, 3, AND 4 THRUST REVERSER SIDE ACCESS DOOR	16	NAS517-3-3
3711	NAC 1, 2, 3, AND 4 THRUST REVERSER LWR ACCESS DOOR	16	NAS517-3-2
3712	NAC 1, 2, 3, AND 4 AFT COWL PANEL		LATCHES
3713	NAC 1, 2, 3, AND 4 PRESSURE VENTING DOOR		SPRING LOADED
3714	NAC 1, 2, 3, AND 4 FWD COWL PANEL		LATCHES
3715	NAC 1 AND 4 INTERPHONE JACK		
3716	NAC 2 AND 3 STRUT ACCESS PANEL	5	NAS514P428-8
3717	NAC 1 FORWARD FAIRING		LATCHES

1 BACK DRAWING
* QUICK RELEASE

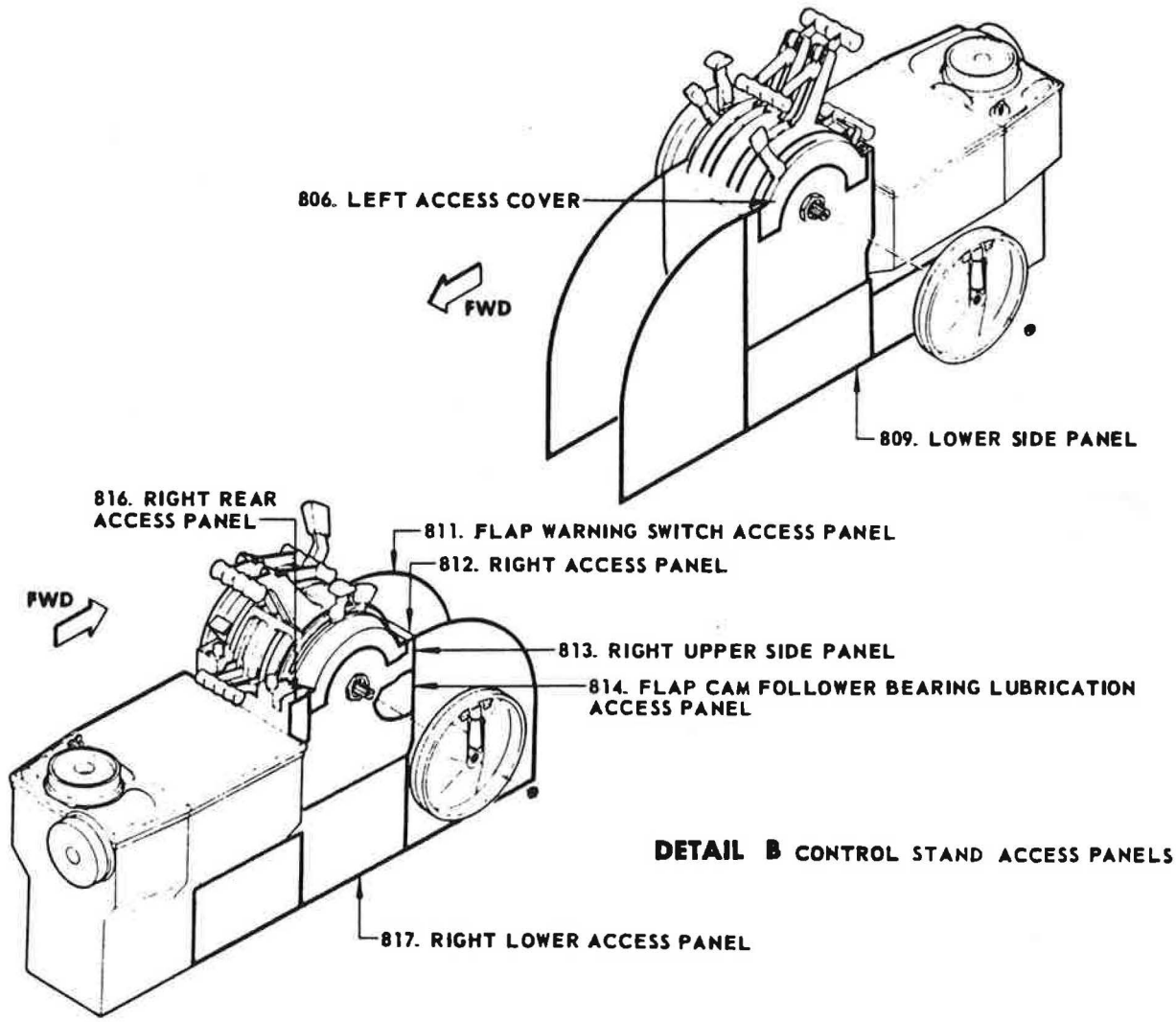
2 ON AIRPLANES WITH STRAP NOTE THE FOLLOWING:
PANEL 1746 (NACELLE 1) - STRAP FASTENER: NAS517-3-5
PANEL 1747 (NACELLE 1) - STRAP FASTENER: NAS517-3-5
PANEL 1753 (NACELLE 1) - STRAP FASTENER: QUICK RELEASE
PANEL 1713 (NACELLE 2) - STRAP FASTENER: NAS517-3-5
PANEL 1715 (NACELLE 2) - STRAP FASTENER: NAS517-3-5
PANEL 1722 (NACELLE 2) - STRAP FASTENER: QUICK RELEASE
PANEL 1722 (NACELLE 3) - STRAP FASTENER: QUICK RELEASE
PANEL 1715 (NACELLE 3) - STRAP FASTENER: NAS517-3-5
PANEL 1713 (NACELLE 3) - STRAP FASTENER: NAS517-3-5
PANEL 1754 (NACELLE 4) - STRAP FASTENER: QUICK RELEASE
PANEL 1747 (NACELLE 4) - STRAP FASTENER: NAS517-3-5
PANEL 1746 (NACELLE 4) - STRAP FASTENER: NAS517-3-5



Interior Access Panels and Doors
Figure 7 (Sheet 1)



DETAIL A RUDDER LINKAGE ACCESS PANELS



DETAIL B CONTROL STAND ACCESS PANELS

SCANNED
043944

CLEANING AND WASHING - MAINTENANCE PRACTICES

1. Cleaning Airplane Exterio

A. General

(1) The airplane should be washed frequently in order to maintain its appearance and minimize corrosion. The painted area of the airplane should be polished at periodic intervals to remove chalking of paint and restore its gloss.

(2) Lubricate airplane components whenever necessary after washing.

(3) To prevent corrosion, do not use high pressure spray of detergents on units having holes which drain internal cavities.

(4) To prevent leakage around doors and hatches, do not spray a jet of water directly on the seal.

B. Equipment and Materials

(1) The equipment and materials listed in Fig. 1 are recommended.

(2) Other materials may be added at the discretion of the airline provided the materials meet the requirements of D6-17487 (Certification Testing of Airplane Maintenance Materials).

(3) Rain Repellent Remover Pad - Leeder 257-G (Ref 13-1-5).

C. Prepare for Cleaning

(1) Alkaline emulsion cleaners are prepared by vigorously mixing or air-agitating the specified mixture until a creamy emulsion is formed.

(2) For general exterior cleaning, dilute cleaner per Fig. 1.

CAUTION : USE IN MORE CONCENTRATED FORM THAN THAT SPECIFIED MAY, IN SOME INSTANCES, CAUSE CRAZING OF ACRYLIC OR SOFTENING OF SOME PAINTS. PLASTIC IS CRAZED BY THE UNDILUTED CONCENTRATE.

CATEGORY	TYPE OF CLEANING SUITED FOR	CLEANER DESIGNATION	COMPANY	DILUTION RATIO: 1 VOL CLEANER - THE FOLLOWING VOLUMES OF WATER	DILUTION RATIO: 1 VOL CLEANER - THE FOLLOWING VOLUMES OF STODDARD SOLVENT	USAGE LIMITATIONS
MANUAL ALKALINE CLEANERS	GENERAL CLEANING NONADHERENT CARBON AND EXHAUST DEPOSITS	280	CEE BEE DOWNEY, CALIF	4 10		NOT TO BE USED ON EXTERIOR DECORATIVE PAINT (BMS 10-4 ALKYD ENAMEL POLISHES AND STEAM CLEANERS SHOULD NOT BE USED ON LACQUER COATED SURFACES OF WINGS AND STABILIZERS
		28	KELITE LOS ANGELES, CALIF	4-10		
		JET CLEAN C	TURCO LOS ANGELES, CALIF	5-20		
		204	OAKITE NEW YORK, N Y.	4 10		
		2271A	PENNSALT LOS ANGELES, CALIF.	3 10		
		NO. 1	TEC MONTEREY PARK, CALIF	4-10		
		CALLA 301	MIDWAY SUPPLY RIVERDALE, CALIF.	4-10		
		C-11C2	DUBOIS CINCINNATI, OHIO	4-10		
		5288	GREATER MOUNTAIN CHEMICAL SALT LAKE CITY, UTAH	3 7		
		B-82	PACIFIC CHEMICAL SEATTLE, WASH			
		AERO-WASH A	WYANDOTTE CHEMICAL CORP WYANDOTTE, MICH	3 7		
MANUAL ALKALINE EMULSION CLEANERS	GENERAL CLEANING NONADHERENT CARBON AND EXHAUST DEPOSITS OILY SOILS OR DEPOSITS	MANUAL ALKALINE AS LISTED ABOVE		2	5-6	SOLVENTS PRESENT MAY CAUSE SWELLING OF RUBBER SEALS; THEREFORE RINSE IMMEDIATELY AFTER CLEANER CONTACT ON ACTUATORS, VALVES, PUMPS AND TUBE FITTINGS.
HEAVY DUTY MANUAL CLEANERS	GENERAL CLEANING NONADHERENT CARBON AND EXHAUST DEPOSITS OILY SOILS OR DEPOSITS	AIRSHOW W	BRULIN INDIANAPOLIS, INDIANA	1 5	6-12	RESTRICT FROM BEARINGS OR CONTROL CABLES, OR RELUBRICATE AFTER CLEANER CONTACT
		NAVEE 427	PENETONE TENAFLY, N.J.	3 5		
		GREAS-OLVE	WYANDOTTE LOS NIETOS, CALIF			
		T 776	DUBOIS CINCINNATI, OHIO			
		JET MULSO NO 2	PUREX CORP LTD WILMINGTON CALIF	NOT DILUTED		KEEP CLEANER OFF BEARINGS AND CONTROL CABLES OR RELUBRICATE AFTER CLEANER CONTACT.
HEAVY DUTY CLEANERS ABRASIVE CONTAINING	GENERAL CLEANING CARBON AND EXHAUST DEPOSITS AND STAINS EMBEDDED IN PAINT	MAJOR CLEAN	CEE BEE DOWNEY, CALIF	NOT DILUTED		ABRASIVE PRESENT CAN REDUCE LUSTER ON FRESH ALKYD PAINT AND CLAD ALUMINUM AND WILL SUBSTANTIALLY REDUCE CORROSION RESISTANCE ON ANODIZED ALUMINUM

Recommended Equipment and Materials
Figure 2 (Sheet 1)

CATEGORY	TYPE OF CLEANING SUITED FOR	CLEANER DESIGNATION	COMPANY	DILUTION RATIO: 1 VOL CLEANER - THE FOLLOWING VOLUMES OF WATER	DILUTION RATIO: 1 VOL CLEANER - THE FOLLOWING VOLUMES OF STODDARD SOLVENT	USAGE LIMITATIONS
POLISH	BRIGHTENING OF CLEANED CLAD ALUMINUM OR PAINT. THE LISTED POLISHES ARE IN THE ORDER OF INCREASING ABRASIVENESS			NOT DILUTED		POLISHES SHOULD NOT BE USED ON LACQUER COATED SURFACES OF WINGS AND STABILIZERS.
		MET ALL	ANTON NEW YORK, N.Y.			
		CYCLO FREE-FLIGHT	CYCLO MFG DENVER, COLO			
		BRILLIANT SHINE	E.W. BENNET SAN FRANCISCO, CALIF.	NOT DILUTED		SATIN-APPEARANCE PRODUCING ON CLAD ALUMINUM. POLISHES SHOULD NOT BE USED ON LACQUER COATED SURFACES OF WINGS AND STABILIZERS
		KLAD POLISH NO. 70995C WADPOL K2 SUPER-SHIME	R.M. HOLLINGS HEAD CAMDEN, N.J. A. VALOY IND LONDON, ENG. (THROUGH DEHAVILLAND AIRCRAFT, FLUSHING, N.Y.)			
	CLEANING, ACRYLIC WINDOWS	PLEXI GLO	MCALEER MFG. CO ROCHESTER, MICH			USE ONLY ON ACRYLIC WINDOWS
WINDOW CLEANERS	GENERAL CLEANING	ALIPHATIC NAPHTHA (TT-N-95, TYPE II)		NOT DILUTED		ACRYLIC WINDOWS AND GLASS WINDOWS
		SIMONIZE LIQUID CLEANER	SIMONIZ CO CHICAGO, ILL.			ACRYLIC WINDOWS ONLY
		MEGUIARE "MIRROR GLAZE" PLASTIC CLEANER	MIRROR BRIGHT POLISH CO PASADENA, CALIF.			
		GLYST CONCENTRATE	TURCO PRODUCTS LOS ANGELES CALIF			GLASS WINDOWS ONLY
		GLASSWAX	GOLD SEAL CO BISMARCK, N DAK			

Recommended Equipment and Materials
Figure 1 (Sheet 2)

(3) For removing exhaust stains and other heavy duty applications, use Cee Bee Major Clean, as directed in Fig. 1.

CAUTION : THE UNDILUTED CONCENTRATE SHOULD NOT BE ALLOWED TO COME IN CONTACT WITH PLASTIC WINDOWS AND/OR COVERS. THE ABRASIVE IN THIS CLEANER WILL SCRATCH PLASTIC.

THE USE OF THIS CLEANER ON ANY LACQUER COATED SURFACES OF THE WINGS AND STABILIZERS IS NOT RECOMMENDED.

NOTE : To prevent buildup of exhaust stains it is recommended that this cleaner be used every 1 to 7 days.

(4) Close all openings.

(5) Cover the tires and avoid allowing tires to stand in pools of cleaning solution any longer than required for the washing operation.

(6) Cover lubricated parts.

(7) Cover static vents.

(8) Cover pitot probes - Cover PIN HTC 73-75 PPCW.

CAUTION : MAKE SURE THE PITOT PROBE COVERS ARE IN GOOD WORKING CONDITION WITH NO EVIDENCE OF DAMAGE. ESPECIALLY FRAYING AROUND THE COVER OPENINGS. FRAYED FIBERS FROM THE COVER COMBINED WITH SUBSTANCES SUCH AS DIRT, GREASE AND FLUIDS CAN CAUSE OBSTRUCTION IN THE PROBE.

(9) If installed, mask off VHF antenna erosion shoe with polyethylene sheeting or aluminum foil tape.

D. Clean Airplane Exterior

(1) Method of application

(a) Use nonatomizing spray equipment.

(b) Use soft bristle fiber brushes.

1) Presoften brushes by soaking in the cleaning solution.

(c) In addition to manual application, option is given for applying manual alkaline cleaners by foaming equipment and all of the cleaners by mechanized brushing or spraying. Frequent mechanized cleaning should by used whenever possible for maximum cleaning effectiveness, and for minimizing hardening and imbedding of soils.

CAUTION : THE USE OF MECHANIZED EQUIPMENT MAY REMOVE PROTECTIVE CLAD ON THIN CLAD SHEET MATERIALS.

(2) Application of cleaner.

CAUTION : THE USE OF CLEANER AT CONCENTRATES GREATER THAN ONE PART CLEANER TO FIVE PARTS WATER ON LACQUER COATED SURFACES OF WINGS AND STABILIZERS IS NOT RECOMMENDED.

(a) Apply the cleaner using one of the above mentioned methods.

NOTE : Do not apply the cleaner to excessively large areas which cannot be adequately brushed and thoroughly rinsed before the cleaner dries on the surface.

(b) Allow cleaner to soak for 1 to 15 minutes.

NOTE : Do not allow cleaner to dry on the surface before rinsing as staining can result.

(c) Reapply the solution with a brush and scrub where necessary.

(d) Pressure wash all surfaces contacted by the cleaner thoroughly with fresh water, preferably warm (120° to 140°F).

CAUTION : AVOID EXCESSIVE SPRAY ON ELECTRICAL CONDUITS, ELECTRICAL UNITS. JUNCTION BOXES OR READILY ABSORBENT MATERIALS. IF SPRAY ENTERS JUNCTION BOX, COVER MUST BE REMOVED AND INTERIOR UNITS DRIED.

(3) Clean skydrol contaminated areas.

(a) For Skydrol contamination cleaning, refer to Chapter 51, Chemical and Solvent Resistant Finish, under paragraph covering Surface Preparation for Epoxy Paint System.

(4) Clean stained areas (exhaust, carbon, and others tabulated in Fig. 1).

(a) Apply with a mop or nonatomizing spray.

(b) Allow cleaner to soak for 1 to 15 minutes.

(c) Flush thoroughly with a pressure water rinse.

(5) Clean acrylic windows (passenger cabin).

(a) Remove loosely adhering dirt and grit from the window by flushing with water filtered free of dirt and abrasive materials.

(b) Wash with nonabrasive soap and water. A soft, thoroughly clean cloth, sponge, or chamois may be used in washing, but only as a means of carrying the soapy water to the plastic. Go over the surface only with the bare hand so that any abrasive can be quickly detected and removed before it scratches the plastic surface.

NOTE : All rubbing operations on acrylic plastics shall be done with as light a pressure as possible.

(c) Dry the window with a clean damp chamois. A clean, soft cloth or tissue may be used it care is taken not to rub the plastic after the surface is dry.

CAUTION : RUBBING THE PLASTIC SURFACE WITH A DRY CLOTH WILL CAUSE SCRATCHES AND BUILD UP AN ELECTROSTATIC CHARGE WHICH ATTRACTS DUST PARTICLES.

(d) Remove oil and grease by rubbing lightly with a cloth wetted with any of the cleaners listed in Fig. 1.

CAUTION : DO NOT USE THE FOLLOWING MATERIALS ON ACRYLIC PLASTICS: GASOLINE, ALCOHOL, BENZINE, HEXANE, ZYLENE, ACETONE, CARBON TETRACHLORIDE, FIRE EXTINGUISHER OR DEICING FLUIDS, LACQUER THINNERS, OR WINDOW CLEANING SPRAYS BECAUSE THEY SOFTEN THE PLASTIC AND/OR CAUSE CRAZING.

(6) Clean glass windows (control cabin).

(a) Check that power is OFF in window heating circuit.

WARNING : OUTPUT VOLTAGE OF AUTOTRANSFORMER RANGES FROM 250 TO 350 VOLTS. BE CAREFUL WHEN WORKING ON CONTROL CABIN WINDOWS.

(b) Wash with a mild nonabrasive detergent soap solution. Apply detergent solution with a clean, soft cloth or sponge. Rub with as light a pressure as possible. Rinse and wipe dry. Avoid excessive rubbing when dry.

NOTE : In subfreezing temperatures, prewarm windows using electrical heating circuits.

(c) As an alternative to step (b) in subfreezing temperatures, clean windows with isopropyl alcohol.

WARNING : THIS CLEANER IS FLAMMABLE AND ITS USE REQUIRES SUBSEQUENT REAPPLICATION OF RAIN REPELLENT.

NOTE : If hardened rain repellent stains remain on the windshield or windows after normal washing, these may be removed with a rain repellent remover pad or by hand-scouring with a mild detergent solution and a plastic abrasive pad such as nylon knit over a foam core. Hand-polishing with an optical grade polishing compound applied with a wet outing flannel cloth may be used as an alternative method. Rinse the window with clean tap water after using either method.

Do not use the optical polishing compound with the plastic abrasive pad. Do not use household grade abrasive cleaners because of uncontrolled grit size.

(7) Clean leading edge flap well area.

(a) Use Greater Mountain Chemical 528-B

CAUTION : DO NOT STEAM CLEAN LEADING EDGE FLAP WELLS.

(b) Completely mask control cables, lubricated parts, all holes and cavities.

(c) Manually clean leading edge flap well area.

CAUTION : DO NOT ALLOW CLEANING MATERIAL TO CONTACT ACRYLIC MATERIALS. DO NOT ENTRAP ANY CLEANING MATERIAL ON AIRCRAFT STRUCTURE.

(d) Rinse thoroughly with water.

(e) Remove masking.

E. Put the Airplane Back In Its Usual Condition

CAUTION : THE USE OF MECHANIZED EQUIPMENT MAY REMOVE PROTECTIVE CLAD ON THIN CLAD SHEET MATERIALS.

(1) General

(a) The airplane can be cleaned either indoors or outdoors.

(b) Surface moisture on the airplane does not need to be dried off.

(c) Turn a can of Wadpol polish upside down for 15 minutes before opening, to make sure that the solvent has saturated the wadding evenly.

(2) Application of cleaner

(a) Tear off pieces of wadding and rub the painted surface vigorously until chalking is removed.

NOTE : The wadding can be used until it has completely crumbled.

(b) Wipe off the powdery residue with a clean, dry rag, using a buffing action.

(c) Shake the rag occasionally to remove the powder.

(d) Additional polishing can be done by hand or buffing machine.

CAUTION : DO NOT CLEAN THE ANTIGLARE AREAS IN FRONT OF THE CONTROL CABIN OR TEMPORARY MARKINGS WITH WADPOL POLISH.

F. Polish Airplane Exterior Unpainted Areas

NOTE : Use the polish full strength. Do not dilute in any manner. Keep polish container stoppered or covered when not in use.

CAUTION : THE USE OF MECHANIZED EQUIPMENT MAY REMOVE PROTECTIVE CLAD ON THIN CLAD SHEET MATERIALS.

(1) Apply polish to a small area at a time, i.e., 2 feet by 2 feet.

(2) Rub the polish covered area vigorously, using the same rag used to apply the polish.

(3) Rub in a fore and aft direction.

(4) When the polish becomes discolored (black) and starts to dry, wipe the rubbed area with a clean, dry cheesecloth to remove all residue.

(5) Repeat items (1) through (4) until the entire area requiring polishing has a bright uniform appearance.

G. Remove Polish Residue

(1) When the polish turns black and starts to dry, remove polish residue by the method below as applicable. Use only soft wipers and gentle wiping action to avoid scratching the metal. Keep solutions from becoming entrapped in faying surfaces.

(a) When the polish used is Jet Glo No. 2. remove most of the polish by flushing with water or with a wiper soaked in water. Remove remaining residue by manual cleaning. Rinse thoroughly with clean water preferably warm (120 F Max). Rinse at least three times. Apply the water by pressure spray or flushing where excess water may be used. For confined areas, touchup or where there in a possibility of water entrapment, rinse by swabbing with a clean wet cloth or sponge. Wring out the cloth or sponge with fresh water and repeat rinsing at least two times.

(b) When another of the polishes listed in Fig. 1 is used, remove most of the polish with BMB 3-2, Type 1 or Type 2 cleaning solvent, and finish by manual alkaline cleaning. Rinse as in step (a).

(c) When the polished surface contains line scratches or pits, remove most of the polish with TEC 901 solvent, and finish by manual alkaline cleaning. Rinse as in step (a).

2. Cleaning Airplane Interior (Ref 25-10-81, Interior Material, Maintenance Practices)

(b) Glyst Concentrate

(c) Glasswax, Gold Seal Co., Bismark, N. Dak.

(6) Isopropyl Alcohol MIL-F-5566.

C. Clean Airplane Interior

CAUTION: DO NOT USE ABRASIVE CLEANERS, PARTICULARLY THOSE CONTAINING BLEACHES ON ANY INTERIOR DECORATIVE SURFACE. THESE ABRASIVE CLEANERS WILL DESTROY SILK SCREENED DESIGNS. THEY WILL ALSO RUIN COLORED LEATHERS, PAINTED SURFACES AND PLASTIC SURFACES.

AVOID USING ORGANIC CHEMICALS, PARTICULARLY KETONES, ESTERS, ETHERS, AROMATIC AMINES, NITRO COMPOUNDS AND AROMATIC HYDROCARBONS, OR CLEANERS WHICH MAY CONTAIN THE ABOVE CHEMICALS. AVOID USING MATERIALS SUCH AS FIRE EXTINGUISHER FLUIDS, DEICING FLUIDS, PAINT STRIPPERS, LACQUER THINNERS OR HYDRAULIC FLUIDS.

(1) Clean rugs, leather, fabrics

(a) Mix two ounces of Orvus paste per gallon of water.

(b) Use only the foam for cleaning.

(c) Sponge foam on the surface. Do not get surface too wet.

(2) Clean painted surfaces.

(a) Mix two ounces Orvus paste per gallon of water.

(b) Wash the surfaces with a cloth.

(c) Rinse the surface with clean water and wipe dry.

NOTE: Heavy soils may be cleaned using concentrated Orvus paste.

(3) Clean galley and toilet metal areas.

(a) Clean with Bon Ami.

(b) Wipe with a damp cloth.

(4) Clean acrylic windows (passenger cabin).

CAUTION: DO NOT WIPE OR RUB SURFACE WITH A DRY CLOTH. THIS CAUSES SCRATCHES AND THE BUILDUP OF AN ELECTROSTATIC CHARGE WHICH ATTRACTS DUST PARTICLES.

(a) Wipe carefully with a soft damp cloth or sponge. Keep the cloth or sponge free of abrasive materials by rinsing it frequently in clean water.

NOTE: All rubbing operations on acrylic plastics shall be done with as light pressure as possible.

(b) Remove oil and grease by rubbing lightly with a cloth wetted with any of the cleaners listed in 2.B.(4).

CAUTION: DO NOT USE THE FOLLOWING MATERIALS ON ACRYLIC PLASTICS: GASOLINE, ALCOHOL, BENZINE, HEXANE, XYLENE, ACETONE, CARBON TETRACHLORIDE, FIRE EXTINGUISHER OR DEICING FLUIDS, LACQUER THINNERS, OR WINDOW CLEANING SPRAYS BECAUSE THEY SOFTEN THE PLASTIC AND/OR CAUSE CRAZING.

(5) Clean glass windows (control cabin).

(a) Wash with a mild nonabrasive detergent soap solution or any of other cleaners listed in paragraph 2.B.(5). Apply detergent solution by means of a clean, soft cloth or sponge. Rub with as light a pressure as possible. Rinse and wipe dry. Avoid excessive rubbing when dry.

NOTE: Windows with acrylic interior surfaces should be cleaned using the materials and methods listed for cleaning the interior surfaces of the passenger cabin acrylic windows. See paragraphs 2.B.(4) and 2.C.(4).

In subfreezing temperatures the windows should be prewarmed using the electrical heating circuits.

(b) As an alternative to step (a) in subfreezing temperatures, clean the windows with isopropyl alcohol.

CAUTION: ISOPROPYL ALCOHOL IS FLAMMABLE.

COLD WEATHER MAINTENANCE

1. General

A. Operating airplanes safely in cold weather conditions presents unique problems due to the effects of ice, snow, slush, frost, and low temperatures. Maintenance personnel must recognize the impact of cold weather on operations to minimize costs and lost time. This procedure provides information on protection against or removal of ice, snow, slush and frost from the airplane, and various other airplane related aspects of cold weather operation. The operator is responsible for selection and implementation of procedures suitable for existing climatic conditions.

B. The procedures for operation of equipment to be used during ice, snow and/or frost conditions must be developed by the operator to meet his unique requirements based on his cold weather expediences, equipment and materials availability, and the climatic conditions existing at his bases.

C. This procedure contains the following topics:

TOPIC	PARAGRAPH NO.
Equipment and Materials	2.
Guidelines	3.
General	3.A.
Specific Requirements	3.B
Control Surfaces	3.B.(1)
Wing Surfaces	3.B.(2)
Fuselage	3.B.(3)
Engines and APU	3.B.(4)
Brakes	3.B.(5)
Landing Gear and Door	3.B.(6)
Wing Fuel Tanks	3.B.(7)
Miscellaneous	3.B.(8)
Hot Water Deicing	4.
Hot Fluid Deicing	5.
Anti-icing	6.
Operation Checks	7.
Parking	8.
Engine Operation	9.
Fuel Icing	10.
Toilets and Potable Water	11.

D. Definitions

(1) Deicing consists of the application of heated water followed by anti-icing fluid or application of heated glycol/water mixture to remove accumulated ice, snow andlor frost from the airplane surface.

(2) Anti-icing consists of the application of undiluted glycol-based fluid to protect against ice, snow and/or frost from adhering to airplane surfaces.

NOTE : The degree of protection, or hold-over is dependent upon the weather conditions and fluid mixture selected and cannot be precisely determined. The expected protection time should be specified by the operator based on his experience. Under precipitation conditions, the airplane should be deiced as close to departure time as possible.

(3) The term anti-icing fluid refers to undiluted glycol-based fluid, and deicing fluid refers to diluted anti-icing fluid per Table.

E. Parking, for the purposes of the cold weather procedure, is considered short term with the airplane located in the loading area in preparation for departure. If the airplane remains in the loading area overnight in cold weather conditions, refer to par. 8 for Parking Guidelines. Cold weather operation does not include long term parking which is covered in Chapter 10.

F. Slush is partially melted ice and/or snow hense the anti-icing/deicing procedures for ice and snow removal apply to slush and no separate procedure is required.

G. Electronic equipment start-up for cold weather operation is the same as normal operation. No special procedure is required.

H. Engine start procedure for cold weather operation is given in Chapter 71.

I. APU starting procedure is provided in Chapter 49.

2. Equipment and Materials

A. Equipment required for selective application of:
(1) Hot water
(2) Deicing fluid
(3) Anti-icing fluid
(4) Hot Air

B. Materials
(1) Anti-icing/Deicing fluid MIL-A-8243 (or glycol equivalent) (Ref Chapter 20)
(2) Union Carbide Anti-lcing/Deicing Fluid, UCAR ADF 11 (Ref Chapter 20)
(3) Dow Chemical Anti-lcing/Deicing Fluid, 146AR (Ref Chapter 20)

NOTE : Alternate anti-icing/deicing fluids must meet requirements of Boeing document D6-17487, "Certification Test of Airplane Maintenance Material".

(4) Urea. DOD-U-10866 (Ref Chapter 20)

3. Guidelines

A. General

(1) There are many conditions influencing a decision concerning the method of ice and snow removal. Thus, the best method must be determined by the individual operator based on his experience and the prevailing local conditions. Figure 1 provides a summary of the guidelines to aid in determining an appropriate ice, snow or frost removal method based on the detailed guidelines in this procedure.

(2) A coating of undiluted anti-icing fluid, applied to dry surfaces, will offer a degree of protection from ice, snow and frost if the material in applied before such conditions begin. Similarly, when deicing fluid is applied to remove ice or snow, some protection may be afforded by the residual fluid on the airplane surfaces. Repeated application of anti-icing fluid, to maintain protection, may be required with the frequency of application determined by local conditions. Consideration should also be given to anti-icing on airplane landing in precipitation conditions where the air temperature is slightly above freezing. Since the airplane external surfaces may be below the freezing point, ice may form and adhere to the surface.

WARNING : ANTI-ICING/DEICING FLUID IS TOXIC AND CONTACT WITH SKIN OR EYES SHOULD BE AVOIDED. ADEQUATE PROTECTIVE CLOTHING SHOULD BE WORN BY PERSONNEL.

(3) If ice, snow or frost has accumulated on the aircraft, deicing must be accomplished prior to antiicing. Ice and snow removal requires sufficient fluid temperature and flow rate to flush the accumulation from airplane surfaces. If temperature is 28°F and stable or rising, deicing with hot water followed by anti-icing fluid is recommended. If temperature is below 28°F, apply deicing fluid. The application of anti-icing fluid is optional after deicing. If only snow is present on the airplane and the temperature is 34°F, or higher, and stable or rising, unheated water can be used to remove snow.

(4) Deicing fluid and hot water should be heated to 180-200°F, at the tank, for best results in ice or snow removal. A fine to medium spray is recommended for best dispersion of the fluid across a large area of ice or snow for maximum melting effect. A solid stream is recommended for flushing ice or snow from airplane surfaces. However, the maximum force on the surfaces, to prevent damage, must not exceed 10 psi on an area of 25 square inches.

CAUTION : DO NOT DIRECT SOLID FLUID STREAM NORMAL TO SURFACE. APPLY AT LOW ANGLE TO PREVENT DAMAGE TO AIRPLANE SURFACES. DO NOT USE HIGH PRESSURE SPRAY TO "BATTER" ICE. AND SNOW OFF AIRPLANE SURFACES.

(5) For deicing, refer to Table for anti-icing fluid dilution versus temperature data. The lower of the ambient temperature or airplane surface temperature should be used as the temperature for the table. If the melted ice or snow, mixed with anti-icing fluid refreezes on the airplane as it runs off, it indicates a greater concentration of anti-icing fluid is required.

(6) The impact of precipitation on anti-icing/deicing fluid is not presently predictable, Maintenance Personnel must recognize that requirement for an ice, snow and frost free wing at take-off can only be met by close inspection of aircraft at time of departure.

(7) Snow should be removed from parked airplanes at regular intervals to prevent a large build-up, and possible freezing to the airplane surface.

(8) Removal of snow may be facilitated by brushing snow from wings and horizontal stabilizers with long handled brooms. Fuselage can be cleared by use of ropes or fabric fire hose laid over fuselage and see-sawed aft over fuselage.

CAUTION : PROTRUDING EQUIPMENT MAY BE DAMAGED BY MOVEMENT OF ROPES OR FABRIC HOSE.

(9) Prior to moving an airplane from heated hangar to an outside location during icing conditions, the airplane should be anti-iced. This reduces the possibility of ice or snow melting upon contact with the warm airplane and then refreezing.

(10) Unheated water deicing should be accomplished in a heated hangar, if possible, and the airplane should remain in the hangar until the surfaces are dry. It will be necessary to check those areas where water could be trapped and freeze. Application of anti-icing fluid will minimize the drying requirements.

(11) General Precautions

(a) Do not spray anti-icing/deicing fluid directly at or into pitot inlets TAT probes or static ports.

(b) Do not spray heated deicing fluid or hot water directly on cold windows.

(c) Do not spray anti-icing/deicing fluid directly into engine, APU, scoops, vents, drains, etc.

(d) Check that ice and/or snow is not forced into areas around flight controls during ice and snow removal.

(e) Remove all ice or snow from the door and girt bar areas before closing any door.

(f) Cargo doors should be opened only when necessary. Cargo containers should be cleared of ice or snow prior to loading. Apply anti-icing fluid on pressure relief doors, lower door sills and bottom edge of door prior to closing doors for flight.

(g) Do not use hard or sharp tools to scrape or chip ice from airplane surface.

(12) When slush is present on runways, inspect the aircraft when it arrives at the ramp for slush accumulation on the airplane or damage to airplane surfaces.

(a) Check leading edges, flaps, flap wells, vertical stabilizer, rudder, underside and upper surface of horizontal stabilizers and elevators for ice accumulation and skin panel damage. Deice as required.

(b) Check landing gear wheel well areas for accumulation of ice, slush and snow. Deice as required.

(c) Check skin panels aft of wheel wells for edge deformation.

(13) Check Anti-icing/Deicing fluid concentration before application to airplane.

B. Specific Requirements

(1) Control Surfaces

(a) Wing flaps, slats, and spoilers should be retracted during periods of snowfall and icing conditions. If it is necessary to operate these controls, ensure they are clear of accumulation before retraction.

NOTE : If an airplane arrives at the gate with flaps in a position other than fully retracted during a period of ice or snow conditions, those flaps which are extended must be inspected for ice or snow accumulation before retracting.

(b) All control surfaces must be free of ice, snow, or frost. Following deicing operation check associated hinges, tracks and actuators for trapped moisture which could freeze. Apply anti-icing fluid for protection.

(c) Balance panel bays (Fig. 3) must be free of ice and snow to permit free movement of the surfaces through their full travel. Following any deicing operation, these bays must be checked for ice, snow or pockets of water which could later freeze. Drains from balance panel bays should be checked to verify they are open. Prior to airplane operation, move control surfaces slowly through full travel to determine freedom of movement.

CAUTION : BALANCE PANEL SEALS WILL BE DAMAGED IF THE CONTROLS ARE OPERATED WHILE THEY ARE FROZEN. IF THERE IS REASON TO SUSPECT THE BALANCE PANEL SEALS ARE FROZEN, DO NOT APPLY FORCE, AND IF BY VISUAL INSPECTION BALANCE PANEL SEALS ARE FOUND TO BE FROZEN, DO NOT APPLY FORCE WITHOUT FIRST DEICING THE SEALS USING DEICING FLUID.

(d) Position horizontal stabilizer (Fig. 2) and ailerons to slope downward so that water or fluid will not run into balance panel bays.

(e) Open leading edge devices and check for ice or snow.

(2) Wing Surfaces

(a) Wing surfaces must be free from ice, snow, and frost.

CAUTION : BE CAREFUL WHEN REMOVING ICE AND SNOW FROM WING AND TAIL SURFACES WHERE VORTEX GENERATORS ARE INSTALLED. FAILURE TO COMPLY COULD RESULT IN DAMAGE.

NOTE : Coatings of frost up to 1/8 inch in thickness on lower wing surfaces (in spar region) caused by very cold fuel is permissible; however, all leading edge devices, control surfaces, tab surfaces, upper wing surfaces and balance panel cavities must be free of ice, snow or frost.

(b) Leading edge surfaces must be free of ice, snow or frost. Check areas between stationary and movable surfaces for ice formation.

(3) Fuselage

(a) Fuselage should be free of ice and snow to reduce weight.

CAUTION : BE CAREFUL WHEN REMOVING ICE AND SNOW FROM FUSELAGE WHERE LIGHTS AND ANTENNA ARE LOCATED. FAILURE TO COMPLY MAY RESULT IN DAMAGE TO EQUIPMENT.

(b) All snow must be removed from the nose radome area to prevent snow blowing back and obscuring pilots vision on takeoff.

(c) Do not apply hot deicing fluid or hot water directly on pilots windshield or passenger window. Fluid my be allowed to run over windows after application to top of cabin as fluid will be cooled before reaching windows.

(4) Engine and APU

(a) For personnel safety, engines and APU should not be operating during the anti-icing/deicing operations. However, if necessary, anti-icing/deicing may be accomplished with the engines and/or APU operating at idle speed if care is exercised to avoid spraying anti-icing/deicing fluids directly into the engine and/or APU inlet.

WARNING : PERSONNEL MUST OBSERVE DANGER AREAS IN FRONT OF OR IN BACK OF OPERATING ENGINE (REF CH. 70) AND IN APU EXHAUST STREAM (CHAPTER 49). INJURY OR LOSS OF LIFE MAY OCCUR TO PERSONNEL IN THESE AREAS.

(b) If engines/APU are operating, close cabin air conditioning pack valves to prevent fumes from entering cabin when applying, anti-icing or deicing fluid in the area of the engines/APU inlets.

CAUTION : CLEAR APU INLET AREA BEFORE STARTING APU. APU MAY BE DAMAGED BY ACCUMULATED ICE OR SNOW ENTERING INLET.

(C) Do not spray anti-icing/deicing fluid directly into the engine or APU inlet ducts, exhausts, engine thrust reverser, engine inlet, strut mounted probes or engine bleed air ducts.

(5) Brakes

(a) When deicing or anti-icing the airplane, protect the wheels and brakes from fluid contamination with the methods below:

1) Do not direct a spray of deicing or anti-icing fluids at the wheels or brakes.

2) Use suitable covers on the wheels and brakes when operationally feasible.

3) Apply the parking brake to reduce incidental contamination of brake friction surfaces when operationally feasible.

NOTE : The brakes do not need to be reapplied if the wheels have not rotated since the last brake application.

(b) Manually remove snow or ice accumulation from the wheels, brakes or tires. A hot air blower may be used for this purpose.

(6) Landing Gear and Doors

(a) Landing gear moving parts and position indicating switches may become coated with ice andlor snow which will prevent normal operation. Care must be exercised when applying anti-icing/deicing fluids not to dilute or remove lubricants. Unlubricated parts may seize or fail pre maturely if not properly serviced.

(b) Remove ice and snow from landing gear doors (inside and out), door latches, uplock mechanism, uplock hook, downlock mechanism, bungee springs, lock actuators and position indicating switches. Apply anti-icing fluid as a protection coating following deicing at airline option.

(c) Check nose gear steering cables for ice accumulation and clear as necessary.

(d) Check landing gear alternate extension system control cables for ice formation in exposed and unheated areas.

(e) Clear ground landing gear areas of ice and snow in order to minimize the possibility of tires freezing to the ground or of aircraft sliding due to wind or engine operation.

CAUTION : DO NOT ATTEMPT TO MOVE AIRPLANE IF TIRES ARE FROZEN TO GROUND AND ENSURE WHEELS ROTATE WHEN AIRPLANE IS MOVED.

1) Use warm air, deicing fluid, or urea to free tires from the ground or to remove frozen deposits.

2) The use of salt is not recommended as it may be deposited on metal parts and result in corrosion.

(7) Wing fuel tanks

(a) Frost may form under the wings in the fuel tank areas in temperatures above freezing. This is caused by atmospheric moisture condensing on the cold surfaces where fuel temperatures are below freezing. The frost will generally melt when warmer fuel is added. If the frost persists and is greater than 1/8 inch thick, it must be removed before takeoff.

(8) Miscellaneous

(a) Pitot Probe, Static Ports, and Total Air Temperature (TAT) Probes (Fig. 3).

1) Check and remove any ice adhering to the surface within four feet of pitot probe, static port, and TAT probe inlets.

2) Do not spray anti-icing/deicing fluid directly at or into pitot inlets, static ports or TAT probes.

3) If static openings become clogged with ice, gently apply warm air until the ice melts.

4) If excessive fluid was applied to fuselage in vicinity of static ports, check the nearest in-line drain to clear water which may have accumulated.

(b) Drains

1) Check that all waste water and condensate drains on the airplane are free of ice or obstructions. Plugging of drains is not necessary during deicing or anti-icing operation, however, fluid spray must not be directed at these drain areas.

(a) Lift Transducer (Fig. 3).

1) Check that sensors are free of ice and/or snow and sensors move freely. Apply deicing fluid as required.

(d) Windshield Wiper Blades

1) Remove accumulated ice from windshield wiper blades.

4. Hot Water Deicing

A. Hot water at 180-200°F maximum tank temperature can be used effectively to remove ice and snow from airplane surfaces when the ambient temperature is 28°F, stable or rising.

B. To prevent water from refreezing anti-icing fluid should be applied to the surface immediately following hot water deicing.

C. Freezing of residual water in devices used for hot water deicing may be minimized by adding 10% glycol to the hot water tank.

5. Hot fluid deicing

A. Deicing fluid, heated to 180-200°F tank temperature is effective for ice and snow removal from airplanes when the temperature in below 28°F. A mixture of water and anti-icing fluid (mixed per Table) will welt ice and snow and the cleared surface may retain some anti-ice protection. If the removed material/deicing fluid refreezes before running off the airplane, it indicates that an incorrect anti-icing fluid dilution was used. Application of additional anti-icing fluid will be required to obtain greater protection.

6. Anti-icing

A. Anti-icing fluid film prevents adherence of ice to cleared airplane surfaces for a period or time. Undiluted fluid is usually applied cold to the surfaces or the airplane.

B. The length of time of hold-over protection realized from anti-icing is dependent on the amount of precipitation, temperature, wind and other variables. Since the protection provided is variable, frequent inspections must be made to determine when additional applications are needed.

7. Operation Checks

A. Prior to engine start checks must be made to ensure the systems will function properly.

(1) Operate all control surfaces. An observer on the ground should verify movement to full travel. If there is reason to suspect frozen seals or obstructions (ice, snow) in the balance panel bays, move the control surfaces manually prior to moving with power.

(2) Check pitot probe, engine inlet or strut mounted probe and static port openings for obstructions of ice or snow.

(3) Check landing gear and wheel wells for packed ice or snow.

(4) Check that all inlets are free from ice, snow.

(5) Check that all drains are clear and free from obstructions.

(6) Check engine compressor rotation.

NOTE : Extensive damage may result during an engine start if fan (N1) rotation is prevented by ice. N1 rotation must be checked prior to any engine start whenever water may have accumulated in the engine at freezing temperatures. Rotation of the low pressure (LP) rotor fan blades can be seen from the ground. If wind does not rotate the fan, it may be turned by hand. If rotation is to be checked by motoring the engine, follow the procedure for motoring given in Chapter 71, Maintenance Practices.

(7) Check that all doors and off-wing escape slide compartment are free from ice.

8. Parking

A. The area in which an airplane is to be parked must be cleared of ice and snow. Chapter 10 provides detail parking procedures if weather conditions and length of parking duration warrant additional steps.

WARNING : IF SEVERE WINDS ARE EXPECTED, REFER TO CHAPTER 10 -MOORING, FOR STABILIZER POSITIONING.

B. When possible, face the airplane into the prevailing wind. Set the airplane control surfaces so that melting snow and rain will not run into balance bay areas where subsequent freezing can lock the control (Fig. 2).

(1) Position wing flaps to full up. This will lock the outboard ailerons in their faired neutral position.

(2) Position stabilizer to full leading edge up. Then, to prevent possible freezing of the stabilizer limit switch in its open position, back off trim control 1/2 unit.

C. Install all plugs and covers, where available, for intake or exhaust ducts and various appendages such as pitot tubes. Covers can be prevented from freezing to airplane by a light brush application of anti-icing fluid to the airplane surface before installing the cover.

CAUTION : EXAMINE ENGINE INTAKE AREAS IMMEDIATELY AFTER SHUTDOWN FOR PRESENCE OF ICE FORMATION WHICH SHOULD BE REMOVED WHILE ENGINE IS COOLING AND BEFORE ENGINE PROTECTIVE PLUGS AND COVERS ARE INSTALLED. IF PLUGS ARE INSTALLED BEFORE THE ENGINE HAS COOLED, RESIDUAL HEAT WITHIN THE ENGINE WILL MELT THE ICE TO WATER WHICH RUNS TO THE BOTTOM OF THE FAN SECTION. THIS REFREEZES AS THE ENGINE COOLS AND LOCKS THE FAN LOWER BLADE TIPS IN ICE.

9. Engine Operation

A. Detailed operation of the engines, in cold weather conditions, is given in Chapter 71 of the Maintenance Manual.

B. Chunks of ice and/or snow entering the engine inlet may damage internal engine parts. Remove all ice or snow from engine inlet ducts prior to starting engines.

C. Engine icing conditions way be anticipated when visible moisture such as clouds, fog, rain, snow, sleet or ice crystals are present during ground operations with static air temperature below 50°F. The engine/nacelle thermal anti-icing system should be used when these conditions exist.

D. Check that no ignitable accumulation of fluids exists around exhaust areas prior to starting engines.

10. Fuel Icing

A. Percentage of water in aviation fuels depends largely on fuel storage and handling conditions. Fuels exposed to dampness or ordinary atmospheric conditions contain a larger percentage of water than those kept in tightly sealed containers. This water content, under high humidity and fluctuating temperature conditions, may be several gallons in every thousand gallons of fuel. As temperatures are reduced, solubility of water in fuel is also reduced resulting in water separating from fuel. This water will collect at the lowest point in the tank and freeze if temperature is low enough. If water has collected and frozen in sumps (indicated by a lack of flow from drain valves), heat (explosion proof hot air) should be applied to underside of wing in area of tank sumps until fuel drained is free of water.

CAUTION : DO NOT ASSUME THAT ALL ICE HAS MELTED IF IT IS POSSIBLE TO DRAIN VALVE FROM DRAIN VALVE AFTER SEVERAL MINUTES OF HEATED AIR APPLIED TO EXTERIOR. ICE ADJACENT TO AFFECTED UNIT MAY MELT AND ALLOW SOME WATER AND FUEL TO FLOW FROM DRAIN, BUT A LUMP OF ICE CAN STILL REMAIN. IF FUEL DOES FLOW FROM DRAIN VALVE, CONTINUE TO APPLY HEATED AIR FOR A SHORT TIME, CHECKING. DRAIN VALVE FLOW FREQUENTLY. FUEL SHOULD BE CAUGHT IN A CONTAINER AND CHECKED FOR WATER UNTIL ALL WATER IS REMOVED.

HEAT APPLIED TO SUMP DRAIN VALVES FOR OUTBOARD MAIN AND RESERVE TANKS WILL NOT ELIMINATE ICE WHICH HAS FORMED IN TANK SUMP OR IN DRAIN LINE BETWEEN TANK SUMP AND VALVE. THIS ICE CAN BE ELIMINATED BY PLACING AIRPLANE IN WARM HANGAR LONG ENOUGH TO MELT ACCUMULATED ICE. SUMPS SHOULD THEN BE DRAINED UNTIL WATER IS REMOVED.

11. Toilets and Potable water

A. In an operating airplane, there is sufficient heat present to prevent water from freezing. When the airplane is shutdown and left in an unheated area, additional servicing will be required as follows a the cabin temperature is expected to fall below the freezing point.

(1) Potable Water

The potable water system must be drained of all water (Ref Chapter 38, Passenger Water System - Servicing).

(2) Toilets

(a) Anti-freeze fluid may be added to the toilet flushing water to prevent freezing. Care must be exercised in the selection of materials used. Foaming may occur as a reaction between the anti-freeze, and the flushing deodorizer detergent. Antifoam agents may also deteriorate in the presence of the deodorizing detergent and allow foaming to occur. Check fluid manufacturers' recommendations for compatibility.

(b) The toilet flushing system may be completely drained to, prevent freezing (Ref Chapter 12, Waste Water System - Servicing).

TABLE
FLUID DILUTION GUIDELINES FOR DEICING

MIXTURE SHOULD BE HEATED TO 180-200° F					
ANTI-ICING FLUID: SPECIFICATION MIL-A-8243 (APPROXIMATELY 90% GLYCOL)					
FOR AMBIENT TEMPERATURE		MIN ANTI-ICING FLUID BY VOLUME 1	WATER BY VOLUME	APPROXIMATE FREEZING POINT OF MIXTURE 1	
°F	°C	PERCENT	PERCENT	°F	°C
+30° AND ABOVE	-1° AND ABOVE	20%	80%	+10°	-12°
+20	-7°	30%	70%	0°	-18°
+10°	-12°	40%	60%	-15°	-26°
0°	-18°	45%	55°	-25°	-32°
-10°	-23°	50%	50%	-35°	-37°
-20°	-29°	55%	45%	-45°	-43°
-30°	-34°	60%	40%	-55°	-48°

1 Dilution versus freezing temperature data for MIL-A-8243 fluid. Alternate material may require greater concentration to obtain same mixture freezing point. Consuit the alternate materal manufacturer for freezing point data.

GUIDELINE TOPICS	SUMMARY OF GUIDELINES		
SNOW, ICE OR FROST REMOVAL/PROTECTION METHOD	34°F OR ABOVE TEMP STABLE OR RISING	28°F TO 34°F TEMP STABLE OR RISING	BELOW 28°F
UNHEATED WATER	ACCEPTABLE METHOD FOR REMOVING SNOW FROM SURFACES IN HANGAR OR OUTSIDE. ANTI-ICING FLUID APPLICATION OPTIONAL	NOT PERMITTED	NOT PERMITTED
HOT WATER DEICING (180-200°F AT TANK) FOLLOWED BY ANTI-ICING APPLICATION	ACCEPTABLE AS ICE, SNOW OR FROST REMOVAL METHOD IN HANGAR OR OUTSIDE. ANTI-ICING FLUID APPLICATION OPTIONAL	RECOMMENDED METHOD FOR ICE SNOW OR FROST REMOVAL IN HANGAR OR OUTSIDE	NOT PERMITTED
DEICING FLUID (180 TO 200°F AT TANK)	NOT RECOMMENDED (USE OF COSTLY FLUID ABOVE FREEZING NOT JUSTIFIED)	ACCEPTABLE METHOD FOR ICE, SHOW OR FROST REMOVAL OUTSIDE	RECOMMENDED METHOD FOR ICE, SNOW OR FROST REMOVAL OUTSIDE
ANTI-ICING FLUID (UNDILUTED)	NOT REQUIRED	APPLY IF NOT WATER METHOD USED	APPLY AS PROTECTION IF ICE, SNOW OR FROST CONDITION ANTICIPATED
		APPLY AS PROTECTION TO MINIMIZE ICE, SNOW OR FROST ACCUMULATION REAPPLY AS NECESSARY	REAPPLY AS NECESSARY

APU

MAY OPERATE WHEN DEICING BUT OBSERVE PRECAUTIONS.

WARNING : BECAUSE OF EXTREME DANGER TO PERSONNEL NEAR APU INLET AND EXHAUST WHEN APU IS OPERATING, DANGER ZONE DEFINED IN CHAPTER 10 MUST BE OBSERVED.

ENGINES

DO NOT OPERATE WHILE DEICING IF POSSIBLE.

IF THE ENGINE MUST OPERATE WHILE DEICING OBSERVE PRECAUTIONS.

WARMING : BECAUSE OF EXTREME DANGER TO PERSONNEL NEAR ENGINE INLET AND EXHAUST WHEN ENGINE IS OPERATING, DANGER ZONE DEFINED IN CHAPTER 10 MUST BE OBSERVED.

PRECAUTIONS

DO MOT RELEASE AIRPLANE FOR TAKEOFF WITH ICE, SNOW OR FROST ON CONTROL OR WING SURFACES EXCEPT FOR A MAXIMUM OF 1/8-INCH FROST ON LOWER WING SURFACE BETWEEN SPARS.

DO NOT SPRAY ANTI-ICING/DEICING FLUID DIRECTLY INTO ENGINE OR APU INLETS EXHAUSTS, ENGINE THRUST REVERSERS, PROBE INLET$, SCOOPS, VENTS, DRAINS, ETC

DO NOT SPRAY HOT FLUID DIRECTLY ON COLD WINDOWS.

DO NOT FORCE ICE OR SNOW INTO OPENINGS AROUND FLIGHT CONTROL SURFACES DURING REMOVAL PROCEDURE.

DO NOT CLOSE ANY DOOR UNTIL ALL ICE OR SNOW HAS BEEN REMOVED WITH DEICING FLUID.

CLOSE CABIN AIR CONDITIONING PACK VALVES IF ENGINES OR APU IS RUNNING.

OPERATING INSPECTION

CHECK ALL CONTROL SURFACE OPERATION BY CYCLING. GROUND OBSERVER SHOULD VERIFY FULL TRAVEL. IF THERE 15 REASON TO SUSPECT FROZEN SEALS OR OBSTRUCTIONS, OPERATE SURFACES MANUALLY BEFORE APPLYING POWER.

CHECK THAT PITOT AND STATIC OPENINGS ARE FREE OF OBSTRUCTION WITHIN 4 FEET.

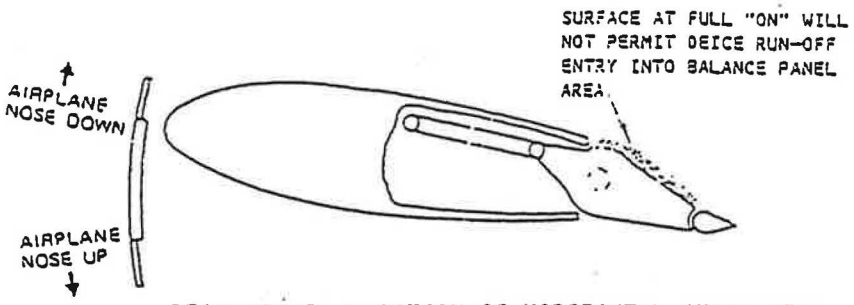
CHECK THAT LANDING GEAR AND WHEEL WELL AREA ARE FREE FROM ICE, SNOW, AND SLUSH.

CHECK THAT ALL INLETS AND EXHAUSTS ARE UNOBSTRUCTED.

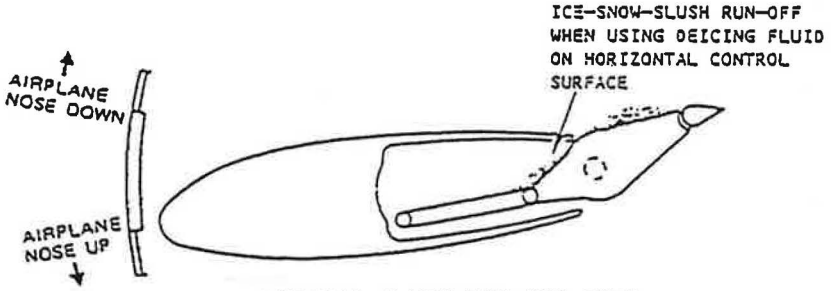
CHECK THAT ALL DRAINS ARE FREE FROM OBSTRUCTIONS.

CHECK THAT LIFT TRANSDUCER ARE FREE OF ICE AND/OR SNOW AND THAT SENSORS MOVE FREELY.

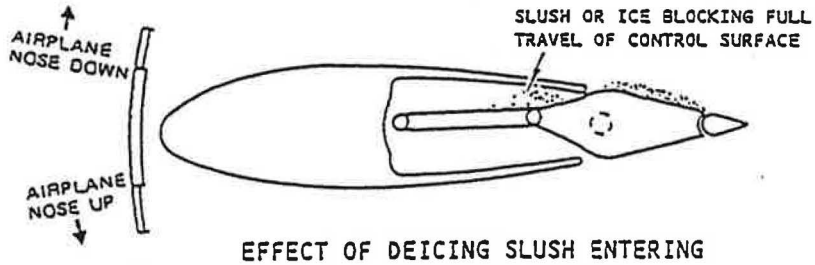
Guidelines Summary: Ice, Snow or Frost Conditions
Figure 1



RECOMMENDED POSITION OF HORIZONTAL STABILIZER DURING DEICING OPERATION

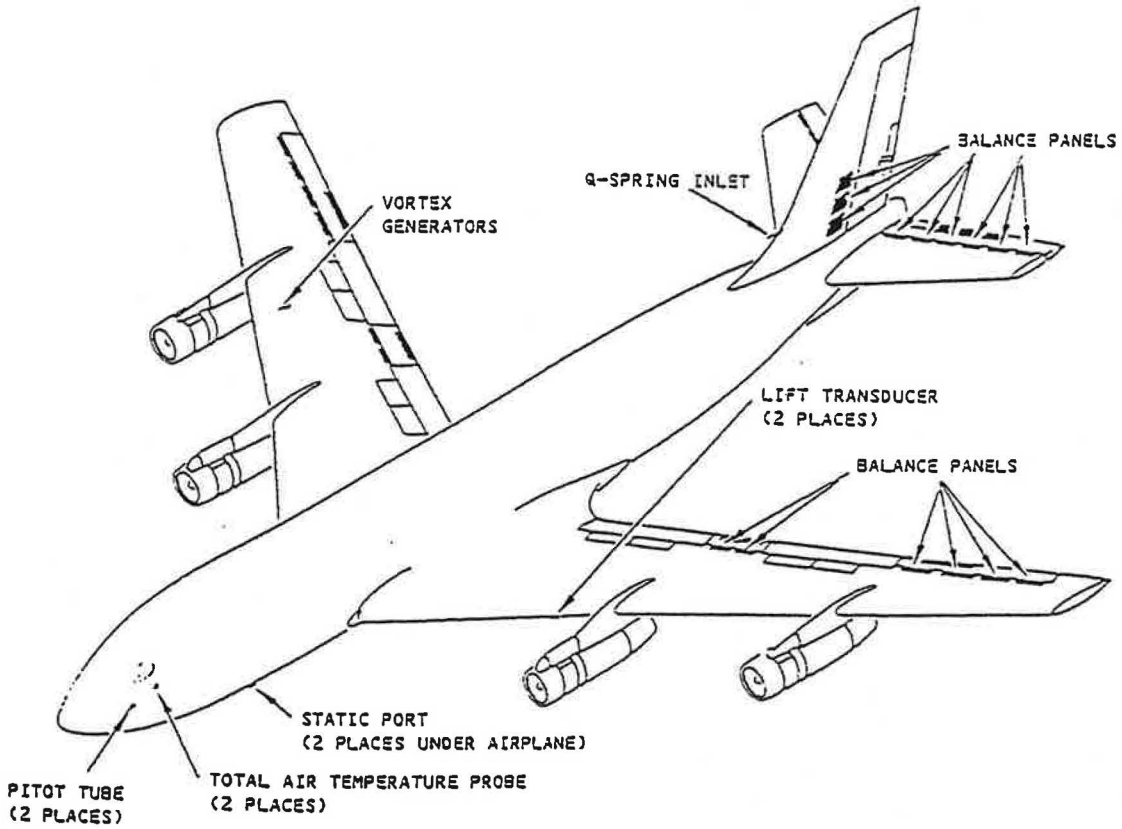


DEICING SLUSH RUN-OFF INTO BALANCE PANEL CAVITY



EFFECT OF DEICING SLUSH ENTERING BALANCE PANEL CAVITY

Horizontal Stabilizer Position
Figure 2



Balance Panel and Probe Location
Figure 3

TABLE 2 (TYPE II FLUIDS)
FLUID DILUTION GUIDELINES FOR DEICING

MIXTURE SHOULD BE HEATED TO 180-200°F				
FOR AMBIENT TEMPERATURE		CONCENTRATION (PERCENTAGE BY VOLUME) ANTI-ICING FLUID/WATER		
°F	°C	ONE STEP [1] PROCEDURE	TWO STEP [1] PROCEDURE	ANTI-ICING
+30° AND ABOVE	-1° AND ABOVE	50 / 50 INCLUDES ANTI-ICING IN REGARD TO WEATHER CONDITIONS	0 / 100 + ANTI-ICING	50 / 50 OR 75 / 25 OR 100 / 0 IN REGARD TO WEATHER CONDITIONS
32°	±0			
+20°	-7	75 / 25 INCLUDES ANTI-ICING IN REGARD TO WEATHER CONDITIONS	50 / 50 + ANTI-ICING	75 / 25 OR 100 / 0 IN REGARD TO WEATHER CONDITIONS
+17°	-14			
+2°	-17		75 / 25 + ANTI-ICING	100 / 0
-4°	-20			
-13°	-25			

[1] Refer to Paragraph 1.D for definitions for one-step, two-step, and anti-icing procedures

GUIDELINE TOPICS	SUMMARY OF GUIDELINES		
- SNOW, ICE OR FROST REMOVAL/PROTECTION METHOD	34°F OR ABOVE TEMP STABLE OR RISING	28°F TO 34°F TEMP STABLE OR RISING	BELOW 28°F
- UNHEATED WATER	- ACCEPTABLE METHOD FOR REMOVING SNOW FROM SURFACES IN HANGAR OR OUTSIDE. ANTI-ICING FLUID APPLICATION OPTIONAL	- NOT PERMITTED	- NOT PERMITTED
- HOT WATER DEICING (180-200°F AT TANK) FOLLOWED BY ANTI-ICING APPLICATION	- ACCEPTABLE AS ICE, SNOW OR FROST REMOVAL METHOD IN HANGAR OR OUTSIDE. ANTI-ICING FLUID APPLICATION OPTIONAL	- RECOMMENDED METHOD FOR ICE, SNOW OR FROST REMOVAL IN HANGAR OR OUTSIDE	- NOT PERMITTED
- DEICING FLUID (180 TO 200°F AT TANK)	- NOT RECOMMENDED (USE OF COSTLY FLUID ABOVE FREEZING NOT JUSTIFIED)	- ACCEPTABLE METHOD FOR ICE, SNOW OR FROST REMOVAL OUTSIDE	- RECOMMENDED METHOD FOR ICE, SNOW OR FROST REMOVAL OUTSIDE
-ANTI-ICING FLUID	- NOT REQUIRED	- APPLY IF HOT WATER METHOD USED	- APPLY AS PROTECTION IF ICE, SNOW OR FROST CONDITION ANTICIPATED
		- APPLY AS PROTECTION TO MINIMIZE ICE, SNOW OR FROST ACCUMULATION	- REAPPLY AS NECESSARY AFTER DEICING
		- REAPPLY AS NECESSARY AFTER DEICING	

APU - MAY OPERATE WHEN DEICING BUT OBSERVE PRECAUTIONS

WARNING: BECAUSE OF EXTREME DANGER TO PERSONNEL NEAR APU INLET AND EXHAUST WHEN APU IS OPERATING, DANGER ZONE DEFINED IN CHAPTER 10 MUST BE OBSERVED.

ENGINES - DO NOT OPERATE WHILE DEICING IF POSSIBLE

- IF THE ENGINE MUST OPERATE WHILE DEICING, OBSERVE PRECAUTIONS

WARNING: BECAUSE OF EXTREME DANGER TO PERSONNEL NEAR ENGINE INLET AND EXHAUST WHEN ENGINE IS OPERATING, DANGER ZONE DEFINED IN CHAPTER 10 MUST BE OBSERVED.

PRECAUTIONS - DO NOT RELEASE AIRPLANE FOR TAKEOFF WITH ICE, SNOW OR FROST ON CONTROL OR WING OR HORIZONTAL TAIL SURFACES EXCEPT FOR A MAXIMUM OF 1/8-INCH FROST ON LOWER WING SURFACE BETWEEN SPARS.

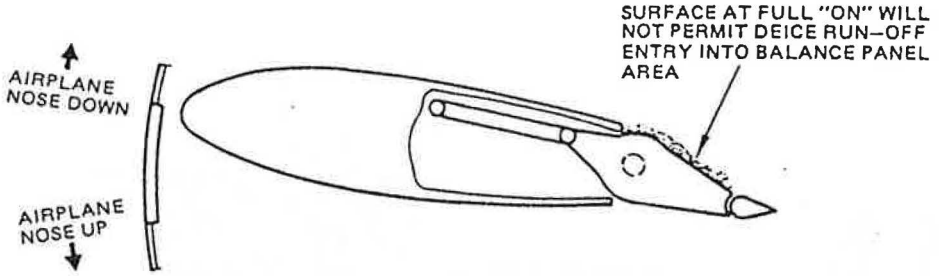
- FUSELAGE AND VERTICAL TAIL SURFACES SHOULD BE FREE FROM ICE AND SNOW. THIN HOAR FROST IS PERMISSIBLE ON THE UPPER FUSELAGE.
- DO NOT SPRAY ANTI-ICING/DEICING FLUID DIRECTLY INTO ENGINE OR APU INLETS, EXHAUSTS, ENGINE THRUST REVERSERS, PROBE INLETS, SCOOPS, VENTS, DRAINS, ETC.
- DO NOT SPRAY HOT FLUID DIRECTLY ON COLD WINDOWS
- DO NOT FORCE ICE OR SNOW INTO OPENINGS AROUND FLIGHT CONTROL SURFACES DURING REMOVAL PROCEDURE.
- DO NOT CLOSE ANY DOOR UNTIL ALL ICE OR SNOW HAS BEEN REMOVED WITH DEICING FLUID.
- CLOSE CABIN AIR CONDITIONING PACK VALVES IF ENGINES OR APU IS RUNNING.

OPERATING INSPECTION - CHECK ALL CONTROL SURFACE OPERATION BY CYCLING. GROUND OBSERVER SHOULD VERIFY FULL TRAVEL. IF THERE IS REASON TO SUSPECT FROZEN SEALS OR OBSTRUCTIONS, OPERATE SURFACES MANUALLY BEFORE APPLYING POWER.

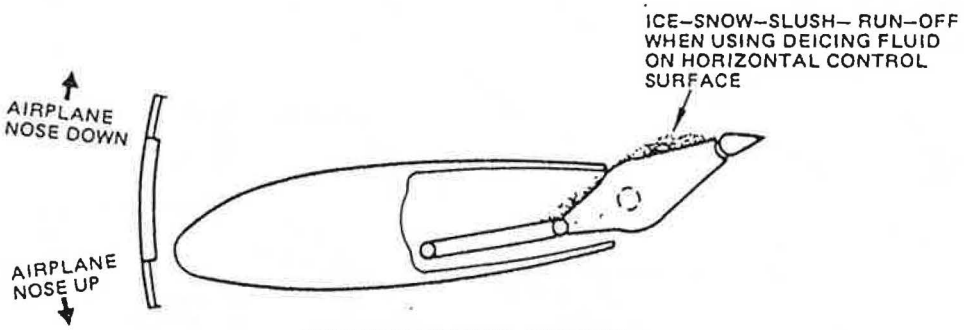
- CHECK THAT PITOT AND STATIC OPENINGS ARE FREE OF OBSTRUCTION WITHIN 4 FEET.
- CHECK THAT LANDING GEAR AND WHEEL WELL AREA ARE FREE FROM ICE, SNOW, AND SLUSH.
- CHECK THAT ALL INLETS AND EXHAUSTS ARE UNOBSTRUCTED.
- CHECK THAT ALL DRAINS ARE FREE FROM OBSTRUCTIONS.
- CHECK THAT ANGLE OF AIRFLOW SENSORS ARE FREE OF ICE AND/OR SNOW AND THAT SENSORS MOVE FREELY.

Guidelines Summary: Ice, Snow or Frost Conditions
Figure 201

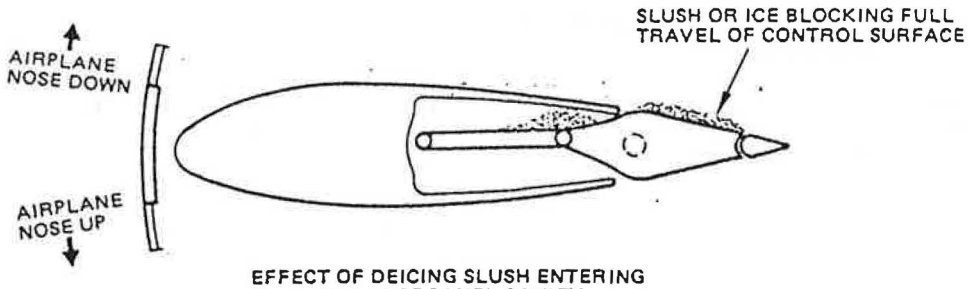
675362



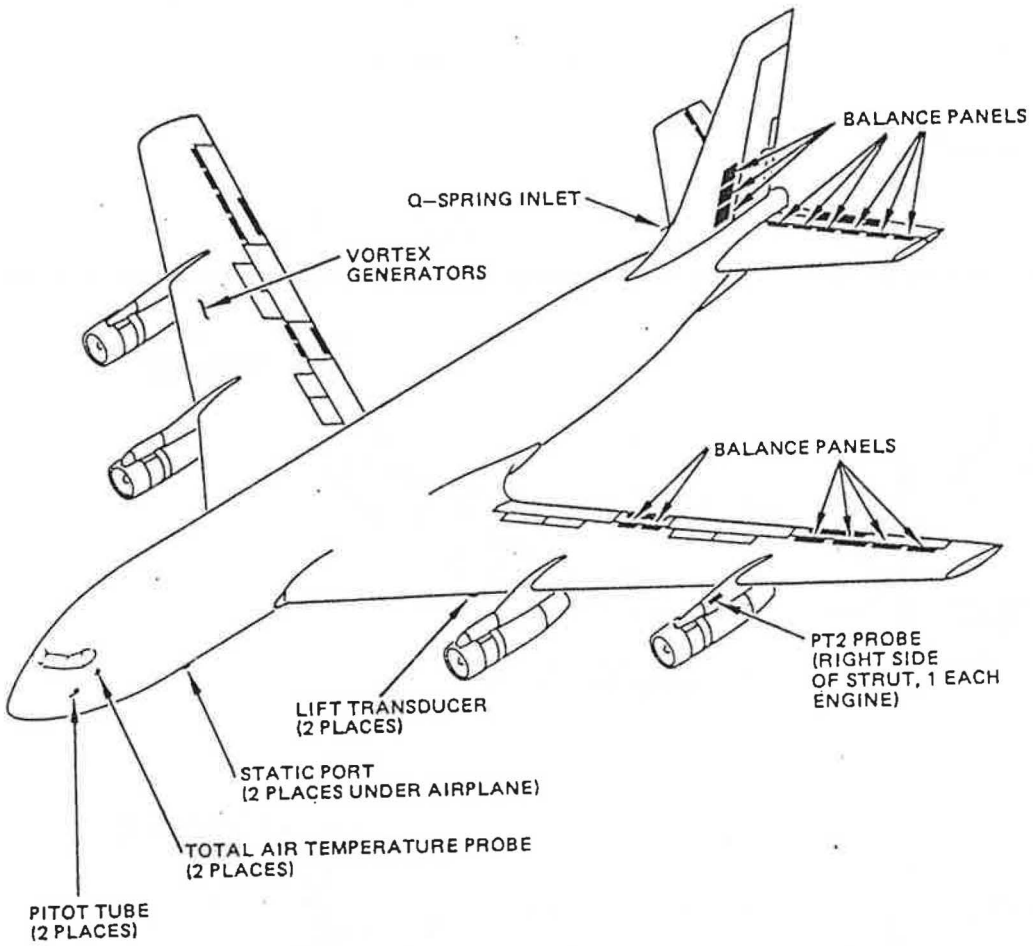
RECOMMENDED POSITION OF HORIZONTAL STABILIZER DURING DEICING OPERATIONS



DEICING SLUSH RUN-OFF INTO BALANCE PANEL CAVITY



EFFECT OF DEICING SLUSH ENTERING BALANCE PANEL CAVITY



Balance Panel and Probe Location
Figure 203
T.R. 12-136