Falcon 900B

Cockpit Reference Handbook

CAE SimuFlite

January 2013

Revision 1

Notice: This Falcon 900B Cockpit Reference Handbook is to be used for aircraft familiarization and training purposes only. It is not to be used as, nor considered a substitute for, the manufacturer's Pilot or Maintenance Manual.

CAE SimuFlite

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Introduction

CAE SimuFlite created this reference handbook for cockpit use. It is an abbreviated version of the SimuFlite Initial Pilot Training Manual and includes international flight planning information. Please refer to the front of each chapter for a table of contents.

The **Procedures** chapter contains four elements: Preflight Inspection, Expanded Normal Procedures, a sample Standard Operating Procedure (SOP), and Maneuvers.

The **Limitations** chapter contains general, operational, and aircraft system limitations.

The alphabetically arranged **Systems** chapter includes text for particular systems and relevant color schematics.

The **Flight Planning** chapter includes a sample loading diagram and center-of-gravity determination chart. International flight planning information includes a checklist, a glossary of frequently used international flight operation terms, and sample flight plan forms (ICAO and FAA) with completion instructions.

The **Servicing** chapter contains servicing specifications and checklists for fueling, defueling, and other servicing procedures.

The **Emergency Information** chapter provides basic first aid instructions.

Information in the **Conversion Tables** chapter may facilitate your flight planning and servicing computations.

Operating Procedures

This chapter contains four sections: Preflight Inspection, Expanded Normal Procedures, a sample Standard Operating Procedure (SOP), and Maneuvers. Although these procedures are addressed individually, their smooth integration is critical to ensuring safe, efficient operations.

Preflight Inspection contains an abbreviated checklist for interior and exterior inspections as well as a preflight cockpit check.

Expanded Normal Procedures presents checklists for normal phases of flight. Each item, when appropriate, is expanded to include cautions, warnings, and light indications.

Standard Operating Procedures details Pilot Flying (PF)/Pilot Monitoring (PM) callouts and verbal or physical responses.

Maneuvers contains pictorial representations of specific maneuvers.

Preflight Inspection

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General

All Surfaces . . . . FREE FROM SNOW/ICE/FROST

Protective Covers/Plugs . . . . REMOVED/STOWED

Remove safety covers from the engines, static ports, pitot probes, stall vane, AOA, and Rosemount probe.

All Intakes/Exhausts. . . . . CLEAR

Fasteners/Panels . . . . ALL SECURE

Verify that all fasteners and panels are secure. Remove keys from locks.

General Condition . . . . UNDAMAGED

NOTE: If night flight is anticipated, check actual operation of navigation and strobe lights.

Interior Inspection

Oxygen: Pressure - Valve . . . . CHECKED

Check that the pressure reducing valve is open, as indicated by the knob; if it is not, open it gradually. Check that the pressure gauge indicates sufficient pressure for the planned flight.

> **CAUTION:** Both the gauge near the cylinder and the copilot's console gauge may indicate bottle pressure, regardless of valve position.

First Aid Kit . . . . CHECKED

Crash Axe (optional) . . . . STOWED

Cabin and Cockpit Fire Extinguishers . INSTALLED/CHECKED

Check that the safety pins are in place.

Emergency Exit Safety Device . . . . REMOVED

Documents. . . . . ON BOARD

Ensure that the documents are on board. Also check that the key is present and has not been left in an exterior lock.

Survival Equipment . . . . STOWED

Check that life jackets and life rafts are present in sufficient quantities for the number of people on board.

All Circuit Breakers . . . . ENGAGED

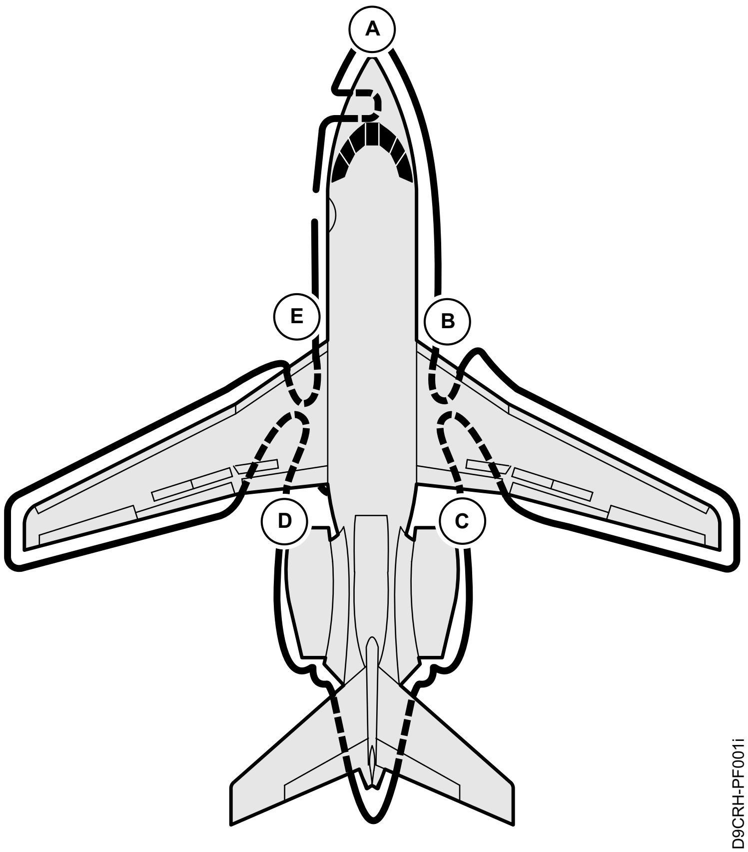
Check that all circuit breakers are set in.

Park Brake . . . . SET

Pull the parking brake handle to the first detent without releasing the lock; this produces moderate braking.

Smoke Goggles . . . . CHECKED

Preflight Inspection Walkaround Path



Exterior Inspection

A Forward Fuselage

Normal Static Ports: Cover/Condition. . REMOVED/CHECKED

Normal Pitot Probe: Cover/Condition . . REMOVED/CHECKED

Standby Pitot Probe:
Cover/Condition . . . . REMOVED/CHECKED

Left Stall Vane: Cover/Condition . . . . . REMOVED/CHECKED

Ensure that it moves freely.

Left Standby Static
Port: Cover/Condition. . . . . REMOVED/CHECKED

Cockpit Windows . . . . .CHECKED/CLEAN

Windshield Wipers . . . . STOWED

Check that they are stowed behind the fairings.

Nose Landing Gear:

No Hydraulic Leaks, Tire Condition. . . . . CHECKED

Check condition of tires (wear, flat spots, tearing, inflation pressure).

Shock Absorber Height . . . . CHECKED

Torsion Link Pin. . . . . INSTALLED

Check that the two arms of the torsion link pin are properly coupled for nosewheel steering.

Antiskid Tachometer Connector . . . . .CONNECTED

Chock . . . . .AS REQUIRED

Taxi Light: Condition . . . . CHECKED

Nose Wheel Well:

Maintenance Access Door . . . . .CLOSED

Nose Cone Closed and Locked . . . . CHECKED

Ensure that the 5 latches are fastened.

Temperature Probe: Cover/Condition . .REMOVED/CHECKED

Right Standby Static
Port: Cover/Condition . . . . .REMOVED/CHECKED

Right Stall Vane: Cover/Condition . . . . .REMOVED/CHECKED

Ensure that the stall vane moves freely.

Normal Pitot Probe: Cover/Condition. . .REMOVED/CHECKED

Normal Static Ports: Cover/Condition . .REMOVED/CHECKED

AOA/Cover (optional). . . . . CONDITION/REMOVED

Front Toilet Service Door . . . . LOCKED/CHECKED

Belly Anticollision Light . . . . CHECKED

Antennas . . . . CHECKED

Ice Detection Light . . . . CHECKED

Landing Light . . . . CHECKED

Check that the glass is clean and not cracked.

Parking Brake Accumulator Pressure . . . . CHECKED

Fuel Vent Valve outlet: No Leaks . . . . CHECKED

Overwing Emergency Light . . . . CHECKED

Check that the glass is clean and not cracked.

Emergency Exit . . . . CHECKED

Check that the emergency exit is flush with the fuselage. Ensure that the red capsule is present on the upper section of the emergency exit.

B Right Wing

Right Engine Air Inlet . . . . COVER REMOVED/CHECKED

Center Engine Air Inlet. . . . . . . COVER REMOVED/CHECKED

Ditching Light . . . . CHECKED

Check overall condition and tightness.

Leading Edge Condition . . . . CHECKED

Gravity Filler Cap . . . . CHECKED

No Fuel Leaks . . . . CHECKED

Check beneath the wing for fuel leaks. If fuel is seen to drip, see ground servicing manual DTM605.

Navigation/Strobe Lights - Wing Tip Fairing. . . . UNDAMAGED

Check that the glass is clean and not cracked.

Static Dischargers (4) . . . . CHECKED

Aileron/Flaps/Airbrakes . . . . CHECKED

Right Landing Gear:

No Hydraulic Leaks, Tire Condition. . . . . CHECKED

Check condition of tires (wear, flat spots, tearing, inflation pressure).

Shock Absorber Height . . . . CHECKED

Brake Wear . . . . CHECKED

Check the brake units for condition and hydraulic leaks.

Chock . . . . .AS REQUIRED

C Rear Fuselage and Cone/Tail Surfaces

Nacelle Ventilation - Drains . . . . CHECKED

Check for leaks at the nacelle drain.

Right Engine Tail Pipe . . . . CHECKED

Engine Pylon Static Discharger . . . . CHECKED

Fuel Coupling Access Door . . . . .CLOSED

Fueling Control Door . . . . .CLOSED

Heat Exchanger Air Inlet . . . . CHECKED

Check manually that flapper air inlet door is free to move.

Lavatory Drain Access Doors (2). . . . . .CLOSED

External Power Connector Access Door . . . . .CLOSED

Hydraulic #2 Ground Coupling Access Door . . . . .CLOSED

Aft Compartment:

Fire Extinguisher Pressures . . . . CHECKED

Hydraulic Systems (2): Quantity/Leaks. . . . . CHECKED

Batteries: Connected/Condition . . . . CHECKED

Engine maintenance Panel . . . . CHECKED

Aft Compartment Door . . . . .CLOSED

Before closing the door of the aft compartment, ensure that all objects contained therein (maintenance ladder, etc.,) are correctly secured.

APU Air Inlet and Exhaust Gas Outlet . . . . CHECKED

Center Engine Tail Pipe . . . . CHECKED

Center Engine Static Discharger. . . . . IN PLACE

Thrust Reverser, Stowed Position . . . . CHECKED

Ensure that the clamshell doors are retracted and flush with the rear cone profile.

Right Tailplane:

Leading Edge and Elevator Condition. . . . . CHECKED

Static Dischargers (3) . . . . .IN PLACE

Vertical Stabilizer:

Leading Edge and Rudder Condition . . . . CHECKED

White Navigation Light . . . . CHECKED

Static Dischargers (2) . . . . .IN PLACE

Left Tailplane:

Leading Edge and Elevator Condition. . . . . CHECKED

Stabilizer Trim Position . . . . CENTER MARK

Static Dischargers (3) . . . . .IN PLACE

Left Engine Tail Pipe . . . . CHECKED

Engine Pylon Static Discharger . . . . CHECKED

Hydraulic #1 Ground Coupling Access Door . . . . .CLOSED

Baggage Compartment Door. . . . . .CLOSED

Door Control Access Panel. . . . . .CLOSED

Latch Positions (4) . . . . CHECKED

NOTE: Never close the door manually. Comply with the instructions given on the relevant placard when closing the door.

Water Tank Filling Panel . . . . .CLOSED

Nacelle Ventilation - Drains . . . . CHECKED

Check for leaks at the nacelle drain.

D Left Wing

Left Landing Gear:

No Hydraulic Leaks, Tire Condition. . . . . CHECKED

Check condition of tires (wear, flat spots, tearing, inflation pressure).

Shock Absorber Height . . . . CHECKED

Brake Wear . . . . CHECKED

Check the brake units for condition and hydraulic leaks.

Chock . . . . .AS REQUIRED

Flaps/Airbrakes/Aileron . . . . CHECKED

Static Dischargers (4) . . . . CHECKED

Navigation/Strobe Lights - Wing Tip Fairing. . . . UNDAMAGED

No Fuel Leaks . . . . CHECKED

Check beneath the wing for fuel leaks. If fuel is seen to drip, see Ground Servicing DTM605.

Gravity Filler Cap . . . . CHECKED

Leading Edge Condition . . . . CHECKED

Left Engine Air Inlet and Cover . . . . COVER REMOVED/ CHECKED

E Left Forward Fuselage

Fuel Vent Valve Outlet: No Leaks . . . . CHECKED

Ice Detection Light . . . . CHECKED

Landing Light . . . . CHECKED

Check that the glass is clean and not cracked.

Cabin Entry Door . . . . CHECKED

Check condition of seal.

Expanded Normal Procedures

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Checklist Usage

Tasks are executed in one of two ways:

- as a sequence that uses the layout of the cockpit controls and indicators as cues (i.e., "flow pattern")
- as a sequence of tasks organized by event rather than panel location (e.g., After Takeoff: Landing Gear – UP, Flaps – UP).

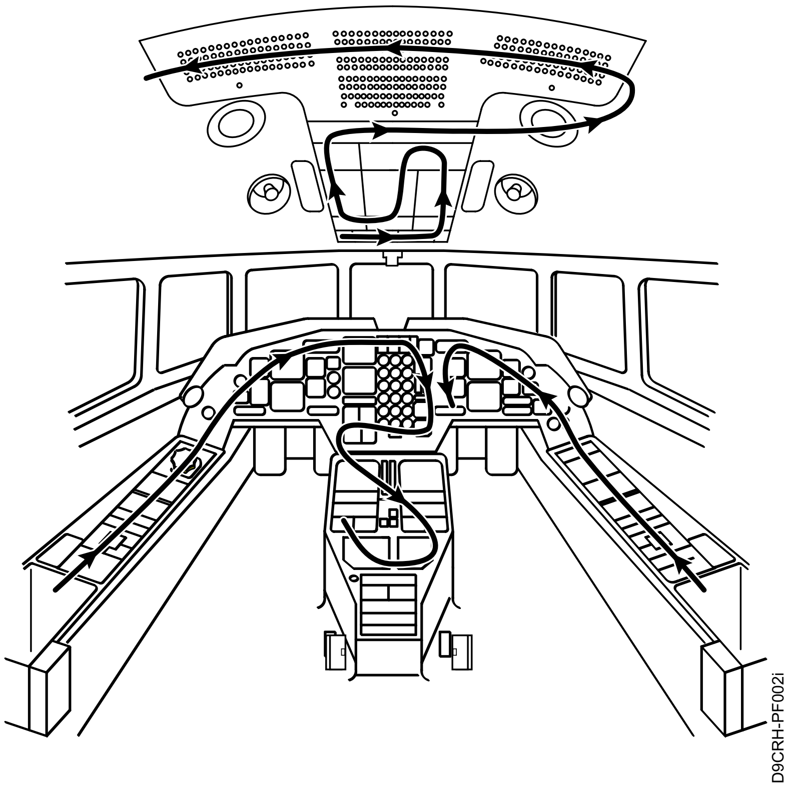
Placing items in a flow pattern or series provides organization and serves as a memory aid.

A challenge-response review of the checklist follows execution of the tasks; the pilot not flying (PNF) calls the item, and the appropriate pilot responds by verifying its condition (e.g., "Radar" [challenge] – "OFF" [response]).

Two elements are inherent in the execution of normal procedures:

- use of either the cockpit layout or event cues to prompt the correct switch and/or control positions
- use of normal checklists as "done" lists.

Cockpit Flow Pattern



Normal Procedures

Power Off Cockpit Flow Check

General Instructions for Using Control Switches

Generally, the switches must be maneuvered as follows to energize the equipment:

Forward for the pedestal switches.

Upward for the instrument panel switches.

Rearward for the overhead panel switches.

The movement is identical for all three panels. For this reason, ON and OFF inscriptions are not marked on all switches.

LH Side Console

Oxygen Mask . . . . CHECKED

Depending on whether or not it is the first flight of the day, perform either the normal or the shortened oxygen test.

IRS . . . . OFF

Audio Control Panel:

SPK, ST. . . . . DEPRESSED

Microphone VHF 2 . . . . DEPRESSED

All Other Pushbuttons . . . . RELEASED

Volume Potentiometer . . . . AS DESIRED

VHF 2 is normally the primary communication mode. It is not necessary to depress the Audio VHF 2 as all mike buttons automatically activate their respective audio. C’PIT button provides “hot” interphone. Best result obtained if individual radio volumes are full up and speaker/headphone volume is controlled on this unit.

Pilot Instrument Panel

Clock . . . . CHECKED

Standby Horizon Indicator . . . . .CAGED

Cage the standby horizon by pulling the knob and turning it clockwise. The flag must come into view. Caging the horizon allows it to be reset on the ground when the electrical systems are energized.

Center Instrument Panel

FUEL SHUT OFF Switches . . . . GUARDED

In this position, the fuel shutoff valves are open and fuel will be supplied to the engines.

Fire Extinguisher Switches (5) 0

The five fire extinguisher control switches must be safetied in the 0 position with lock wire.

Normal L/G Control . . . . DOWN

GEAR PULL Handle . . . . PUSHED IN

MMO Switch (if installed) . . . . GUARDED

Emergency Pressurization Panel:

UP/DN Control . . . . FULLY DN (GREEN RANGE)

AUTO/MAN Selector . . . . AUTO

NORM/EMERG Selector . . . . NORM

DUMP Control . . . . OFF/GUARD DOWN

Automatic Pressure Controller: PROG or FL . . AS REQUIRED

THRUST REVERSER Switch . . . . NORM (guard down)

Temperature Controllers -
Selector and Knob . . . . AUTO/12 O’CLOCK

The AUTO position shall be selected on both air conditioning CREW and PASSENGER switches. When set to the 12 o’clock position, the temperature controller regulates the temperature at 20°C, which should provide maximum user comfort. The selector range allows accurate setting of cabin temperature from 14 to 30°C. However, the desired temperature cannot be obtained unless the air conditioning is operative.

ST-BY PUMP . . . . OFF

If the standby pump switch is in the AUTO position, the standby pump starts operating on the ground if the hydraulic pressure in system No. 2 is below 1,500 PSI. Setting the selector to OFF prevents the standby pump from running on the batteries.

Brake Selector Switch . . . . #1/ASKID ON

This is the normal position of the selector when the system is functioning correctly.

Center Pedestal

Power Levers . . . . CUT-OFF

If the power levers are not in this position, the engines cannot be started. Exert a forward pressure on the three levers to ensure that they are in the CUT-OFF notch. If they are, they will not move.

VHF 1. . . . . OFF

AIRBRAKE Handle 0

NORMAL Tailplane C/B . . . . ENGAGED

If this circuit breaker is not engaged, the yoke rocker switches cannot be used normally.

Slat-Flap Handle . . . . CLEAN

EMERG SLATS . . . . GUARD DOWN

This switch controls emergency operation of the outboard slats, and when there is no system malfunction it should be in the off position with the guard down.

GPWS FLAPS O'RIDE . . . . GUARD DOWN

L/G Extension By Gravity Controls . . . . CHECKED

Check closure of the main L/G emergency extension control units and stowage of the nose L/G unlocking handle.

RH Side Console

Flight Data Recorder . . . . CHECKED

Oxygen Mask. . . . . CHECKED

Depending on whether or not it is the first flight of the day, perform either normal or shortened "in place" oxygen test.

Cockpit Voice Recorder . . . . CHECKED

Sky Printer (if installed) . . . . CHECKED

IRS. . . . . OFF

COND Control Lever . . . . NORM

The bleed air CREW and PASSENGER systems are isolated.

NOSE Control Lever (if installed). . . . . NORM

This interconnects the cabin and nose cone compartment.

Auto Load Shed . . . . AUTO

Audio Control Panel:

SPK and ST . . . . DEPRESSED

Microphone VHF 2 . . . . DEPRESSED

Volume Potentiometer. . . . . AS7 DESIRED

VHF 2 is normally the primary communication mode. It is not necessary to depress the Audio VHF 2 as all mike buttons automatically activate their respective audio. C'PIT button provides "hot" interphone. Best results are obtained if individual radio volumes are full up and speaker/headphone volume is controlled on this unit.

VHF 3 Switch (if installed) . . . . ON BAT

This check is to be performed once a day.

Transmission/Reception . . . . CHECKED

Oxygen Pressure. AS APPROPRIATE

Ensure that sufficient oxygen is available for the flight.

Passenger Oxygen . . . . NORMAL

If cabin altitude exceeds 11,500 ft during the flight, passenger oxygen masks will automatically deploy.

Copilot Instrument Panel

Clock . . . . CHECKED

ELT Switch . . . . AUTO

Overhead Panel

WIPER Switches (2) . . . . OFF

EXTERIOR and INTERIOR LIGHTS Switches (6) . . . . . . OFF

Placing the cabin switch in the CABIN position allows control of cabin lighting by passengers.

WINDSHIELD Heat Switches (3). OFF

CREW and PASSENGER
Air Conditioning Valve Switches . . . . AUTO

In this position, the air conditioning electric valves are controlled by a logic circuit.

BAG Switch . . . . NORM

The baggage compartment and passenger cabin air conditioning systems are interconnected.

Isolation Valve Knob . . . . HORIZONTAL

Place the knob in the horizontal position, which causes the air conditioning system to be supplied by the three engines, or the APU, if required.

BLEED AIR APU Switch . . . . OFF

Bleed Air HP and PRV Switches (3) . . . . ON

XTK Switch . . . . .NEUTRAL

BOOSTER Switches (3) . . . . OFF

X-BP Rotary Switches (3) . . . . .CLOSED

XTK 2 Switch (if installed) . . . . AUTO

ANTI-ICE Switches (4). . . . . OFF

PITOT Heating . . . . OFF

START Selector Switches (3) . . . . GRD START

Unless there are special conditions, the start selector switches should be in the GRD START position both on the ground and in the air. During starting, the ignitor plug ignition is automatically maintained until N_2 speed reaches 50%.

CMPTR 1 - 2 - 3 Switches . . . . AUTO

Power Selector Switch. . . . . NORMAL

The two-position selector permits selection of the power source used to start the engines. In the NORMAL position, power is supplied by the parallel-connected batteries as soon as the pilot switches them on.

IRS 1 - IRS 2 and IRS 3 and E BATT
(if installed) Battery Voltages . . . . 24V MINIMUM

This check is to be performed once a day.

GEN 1-2-3 Switches . . . . ON

If the GEN 1, GEN 2 and GEN 3 switches are not on, the engines cannot be started.

BAT 1 - BAT 2 Switches. . . . . OFF

APU GEN. . . . . PRESSED

Bus Tie. . . . . .FLIGHT NORM

The FLIGHT NORM position is vertical.

LH AV MASTER and RH AV MASTER . . . . OFF

This serves to prevent excessive current draw when the airplane electrical systems are energized by the batteries only (before engine/APU start up).

FMS Master Switches . . . . OFF

Lighting Rheostats (8) . . . . .FULLY CCW

All Circuit Breakers . . . . ENGAGED

Before Starting Engines

NOTE: Refer to the end of the Before Starting Engines checklist for instructions on starting in warm and very hot countries.

BAT 1/BAT 2 Switches . . . . ON

BAT 1/BAT 2 Annunciators . . . . OFF

Voltage . . . . CHECKED

HRZN Battery Voltage . . . . CHECKED

Perform this check only on the first flight of the day. The test is unsatisfactory if the indicated voltage is less than 24 V. Have fault corrected prior to takeoff.

Bus Tie . . . . TIED

In this position, the BUS TIED annunciator on the warning panel comes on.

Fire Detection . . . . TESTED

All the detection and warning systems are tested simultaneously by setting the test control on the warning panel to the FIRE position; the aural warning sounds.

If one of the systems is malfunctioning, the corresponding light does not come on.

During this test, the test control must be kept in the FIRE position until illumination of the smoke detection warning light FIRE BAG COMP, which may require waiting up to 4 seconds. The other lights must illuminate immediately.

As soon as the FIRE BAG COMP light illuminates, the test control may be released. Up to 10 seconds may be necessary for the light to go out. To silence the aural warning, press the HORN SIL button on the pedestal

Exterior Lights . . . . NAV

Warning Panel and Annunciators . . . . TESTED

In the LIGHTS position, the switch causes illumination of the lights on the warning panel, the hydraulic control and monitoring panel, the overhead panel, reverse thrust and engine temperature jewel lights for each ITT indicator, and the FAULT and TRANS lights on the fire panel. Besides testing light bulbs, many systems undergo operational TESTING (eg. wheel well overheat).

DIM/BRIGHT Switch . . . . AS APPROPRIATE

This selector permits adjustment of warning and indicator light and annunciator panel brightness, according to the exterior lighting conditions (day or night).

On the BRIGHT setting: normal light brightness.

On the DIM setting: lights are dimmed by a self-holding relay.

Landing Gear Panel . . . . TESTED

The TEST pushbutton on the configuration panel permits checks of the green and red lights and warning voice GEAR as well as the flashing GEAR HANDLE light.

ENG 2 FAIL, T/O CONFIG Lights,
Warning Voice "NO TAKEOFF". . . . . TESTED

Push the center power lever to the takeoff position, check that the lights come on and the warning voice is activated. Then return the lever to cut-off and check that the lights go out and the warning voice stop sounding.

NOTE: After starting APU, if OAT ≥ 104°F (40°C) and waiting for takeoff exceeds 20 minutes, cut off the batteries to avoid overheating due to battery recharging. On average, the rate of battery cooling on the ground is 1°F per minute.

If start is to be made with APU assistance:

BOOSTER 2 . . . . STBY

FUEL 2 Light . . . . OUT

The standby booster pump is checked for correct operation.

APU MASTER. . . . . PUSHED

This energizes the APU electrical circuit.

APU START Pushbutton . . . . PUSHED AND HELD 1 S

N_1-ITT Gauges – APU Generator Ammeter . . . . CHECKED

CAUTION: Discontinue APU start (STOP pushbutton) if ITT does not rise within 10 seconds. Wait 5 minutes prior to attempting a second start to allow gravity drain of fuel.

WARNING: After an APU shutdown or start interruption, a crewmember must be on board during the five (5) minutes following the restart.

Batteries. . . . . CHARGING

If the APU automatically shuts down, the APU MASTER light will flash and must be reset for subsequent attempts.

NOTE: After a battery start of the APU, an APU generator output momentarily exceeding the 300 A limit may be observed. This can be explained by the fact that the APU generator must simultaneously cover the airplane power load and battery charging. This output, in excess of 300 A (up to 350 A), is considered acceptable, as long as its duration does not exceed one minute. It is advisable to wait until the APU generator output current returns to a value of 300 A maximum before performing the following start. These comments are also valid for the engine generator, after a battery start of the first engine.

BLEED AIR APU Switch . . . . .AS REQUIRED

The APU manufacturer recommends operation for one minute prior to bleed air load.

If start is to be made with a ground power unit:

Power Selector Switch. . . . . EXT POWER

BAT 1 and BAT 2 Lights. . . . . ON

Batteries 1 and 2 are completely isolated and battery charging is not possible. The LH and RH main buses are automatically tied regardless of the bus tie rotary switch position. The BUS TIED light will be on.

If start is to be made without APU assistance and without a ground power unit:

Start engine No. 3 first.

NOTE: If the entry door is closed, open the LH DV window to prevent aircraft pressurization.

After APU start or engine No. 3 start or if a ground power unit is used:

LH AV. MASTER and RH AV. MASTER . . . . ON

OFF Lights . . . . OFF

LH FMS MASTER and RH FMS MASTER (if installed) . . ON

FMS MASTER Lights . . . . OFF

IRS (2 or 3) . . . . NAV

IRS/FMS . . . . NAV/INIT

Position Sensors . . . . CHECKED

Database Validity . . . . CHECKED

Cockpit Voice Recorder (if installed) . . . . TESTED

To do this, press the test pushbutton: The indicator needle deflects. A 400 Hz signal is audible in the headset.

Flight Data Recorder . . . . SET

Cabin and Cockpit Lighting . . . . AS REQUIRED

Seats and Rudder Pedals . . . . ADJUSTED/LOCKED

Park Brake . . . . INTERMEDIATE DETENT

#2 P. BK Annunciator . . . . ON, STEADY

Fuel Quantity Gauges . . . . CHECKED

Check that fuel quantity required is correct.

Fuel Used Counters. . . . . RESET TO 0

Pull the knob on each fuel flow indicator to set the fuel used indication to zero.

Airplane Weight (if installed) . . . . SET

Rotate the knob until the airplane weight is displayed. Pull the knob to zero fuel used.

Standby Horizon . . . . UNCAGED

No Smoking and FASTEN BELTS Signs . . . . ON

AFT CABIN ISOL Annunciator (if installed) . . . . OFF

Illumination of the passenger No Smoking and FASTEN BELTS signs is indicated by the No Smoking and FASTEN BELTS pushbutton lights coming on and the sounding of a gong.

During takeoff and landing, the mid-cabin partition door (if installed) must be opened and latched. If not, AFT CABIN ISOL annunciator is on when switching on the No Smoking sign.

EMERG LIGHTS . . . . ON/ARMED

In the ON position, check that emergency lighting comes on. ARMED is the normal in-flight position. The emergency lighting comes on automatically if the main buses lose power.

STBY PUMP Light . . . . OFF

Hydraulic Reservoirs 1 and 2 – Fluid Quantity . . IN GREEN

At zero pressure, with the accumulators empty, the minimum indication on the gauge should be above 3/4. After starting, the volume absorbed by the accumulator causes the levels to drop slightly, but they must remain in the green.

STBY PUMP . . . . ON, THEN AUTO

The standby pump starts operating because the pressure in system 2 is less than 1,500 PSI.

Hydraulic Pressure #2. . . . . 1,500 - 2,150 PSI

Check operation of the standby pump.

Airbrake . . . . .EXTEND TO 1 OR 2

STALL 2 Pushbutton . . . . PUSHED

Perform this check only on the first flight of the day.

Stall Warning and IGN Lights . . . . CHECKED

The outboard slats extend.

Airbrake Light . . . . FLASHING

The airbrakes retract.

Slats Light On . . . . .GREEN, FLASHING

When the STALL 2 pushbutton is released, the green flashing light will go out and the red light will come on; the outboard slats remain extended and will not retract until engine 1 or 3 is started.

Airbrake Handle . . . . .RETRACT “0”

Flashing AIRBRAKE light out.

Pitch Trim . . . . .TESTED

Deactivation by Crossed Relays . . . . CHECKED

This check is to be performed only on the first flight of the day.

The check consists of simulating runaway operation of the pitch trim by inputting a pitch-down (or pitch-up) command with the rocker switch on the pilot's control wheel and countering with a reverse pitch-up (or pitch-down) input on the copilot's control wheel.

This action should stop pitch trim operation.

During operation, check that:

- The aural warning (clacker) sounds.
- The trim indicator functions (STAB) and shows the correct values.

Repeat the operation, starting with the copilot's control wheel.

TAILPLANE EMERG. . . . . CHECKED

This check is to be performed only on the first flight of the day.

Actuate the control lever and check that the NORMAL circuit breaker located just below it trips.

Check tailplane travel using the emergency control.

NORMAL Circuit Breaker . . . . ENGAGED

This check is to be performed only on the first flight of the day.

Takeoff Trim . . . . SET

Bring the tailplane back into the green takeoff band by using the rocker switch on the control wheel. Any position within the green band may be selected to accomodate a specific airplane CG.

Aileron and Rudder Trims. . . . . . CHECKED AND SET TO 0

Check operation of the aileron and rudder trims by actuating the double toggle switch of each control simultaneously. Check travel on the AILERON-RUDDER trim indicator on the instrument panel. Return the trims to zero. Check that when only one of the control levers is actuated, the corresponding trim indicator does not move.

Emergency Aileron Trim . . . . CHECKED

This check is to be performed only on the first flight of the day.

Carry out an operational check of the emergency trim and check that the ailerons leave the neutral position and the AIL ZERO light comes on.

Return the ailerons to the neutral position and check that the AIL ZERO light goes out and the position indicator is in the neutral position for takeoff.

STBY PUMP . . . . OFF

ADC 1 then ADC 2 Pushbuttons. . . . . PUSHED

These test pushbuttons allow the various functions of the air data computers and the V_{MO}/M_{MO} warnings to be checked.

Predetermined values appear on the indicators associated with the air data computer:

- Altitude: 1,000 ft
- VSI: 5,000 ft/min, or flag V/S and VS pointer goes out on A/C equipped with TCAS II COLLINS and two LCD VSI.
- IAS: 350 kt
- V_{MO}: 300 kt
- Mach: 0.79
- TAT: -16°C
- SAT: -45°C
- TAS: 466 kt

V_{MO}/M_{MO} Aural Warnings . . . . CHECKED

VHF 1. . . . . ON

Altimeters and ASEL . . . . SET

Set the QNH and QFE values given by the control tower on the altimeters. Set the ASEL on the EADI by means of the ALT SEL knob on the EFIS remote control unit.

Index . . . . SET

Radio Altimeter . . . . TESTED AND DH SET

Perform the RA and EFIS test by pressing the test pushbutton on the remote control unit, then set the decision height. The test results in display of a height of 100 ft and appearance of all the comparators for the first 4 seconds, then extinction of the comparators and illumination of the flags on the EADIs and EHSIs.

Told Card and Bugs . . . . .COMPLETE AND SET

GPWS (if installed). . . . . TESTED

To initiate the test, press the PULL-UP/TEST/FAIL pushbutton light.

Hold the pushbutton in for the duration of test until the PULL-UP light goes out.

Battery Temperature Monitor . . . . TESTED

Press the TEST pushbutton on the battery temperature indicator.

Check that the HOT BAT annunciator on the warning panel and the WARM and HOT lights on the battery temperature indicator come on. Press the LESS 50°F pushbutton and check the temperature indicators for correct operation.

Cabin Pressure Controller . . . . SET AND TESTED

Press the TEST pushbutton only once. Do not restart a test procedure before the ongoing AUTO TEST is complete.

Cabin Altitude Aural Warning . . . . CHECKED

Sounding of the aural warning and illumination of the CABIN light.

LAND ELV window display:

In PROG or LDG Mode 18,800

In FL mode FL880

QNH Window Display: hPa (or mbar) or In. Hg88.88

Cabin Entry Door . . . . CLOSED

Check that the colored markers on the upper crank pins and the locking indicator on the step threshold are aligned.

> **NOTE:** To avoid possible cabin pressure surges upon closure of passenger entry door, it is recommended that during door closure, either leave the cockpit sliding window open or, close the passenger air conditioning valve.

Cabin Light . . . . OFF

This light should be out, indicating that the cabin access door and the toilet service door (for aircraft incorporating forward toilets) are both properly closed and latched.

DOOR LIFT Light (if installed) . . . . OFF

Starting Instructions

Starting instructions in warm ambient conditions:

If the battery temperature is below 135°F, battery start of APU and/or engines can be performed in compliance with the following:

- The battery temperature must not increase by more than 20°F and stabilize below 155°F after APU/engine start.
- The battery charging current must decrease and remain stable after engine starting.

After APU starting, if the airplane is equipped with the conditioning battery system (SB F900-125) and if the battery temperature approaches 155°F (68.3°C), switch on COND BATT switch to cool down the batteries.

If the temperature reaches 155°F, the battery must be cut off, monitored while it cools, and sent for bench testing.

CAUTION: In order to avoid battery overheating, caused by hot air coming from the ECU exhaust during the use of the APU on the ground for airplane pre-conditioning, close the main entrance door, the pilot sliding window and the rear compartment door.

Starting instructions in hot ambient conditions:

If the battery temperature exceeds 135°F (57.2°C), the APU and/or engine starting must be performed using the ground power unit.

After Start

- Check that the battery temperature does not increase.
- Check that the battery charging current decreases and remains stable at about zero.

If, after APU and/or engine starting, battery temperature reaches 160°F (71.1°C) and the red HOT light of the battery temperature indicator and the red HOT BAT light on the warning panel are on, the battery or batteries must be cut off, monitored while they (it) cool(s), and sent for bench testing.

Starting Engines

Before starting the engines, ensure that danger areas to the front and rear of engines are clear of all personnel and equipment.

Engine 2 Start

Avionics Masters . . . . OFF

Park Brake . . . . FULL AFT

#2 P. BK Light. . . . . ON STEADY

All Door Lights . . . . OUT

Anti-collision Lights . . . . RED

Operation of the anti-collision lights (belly and fin) warns the ground crew that the engines are about to be started. Subsequently, anti-collision lights warn all that you have an engine operating.

BOOSTER 2 . . . . NORM

FUEL 2 Light . . . . OUT

Power selector switch for:

Battery Start or APU Assist Start. . . . . NORMAL

For an APU powered start, the batteries are assisted by the APU generator.

GPU Start . . . . EXT POWER

The batteries are isolated from the electrical system and the GPU supplies the starting bus.

BAT 1/BAT 2 Lights . . . . ON

Start Button . . . . PUSHED FOR 2 S

Push the PRESS TO START button for approximately 2 seconds to allow the contacts of the relays that initiate the starting sequence to close. The remainder of the starting sequence runs automatically.

At 12 to 15% N_2 speed and indication of N_1 rotation:

Power Lever . . . . IDLE

In this position, fuel is admitted into the combustion chamber and the ignition circuit is energized.

IGN 2 Light . . . . ON

Illumination of the IGN 2 light confirms operation of the ignition circuit.

ITT, N_1, FUEL FLOW, Oil Pressure . . . . RISE

Check that the ITT, N_1 and oil pressure rise within 10 seconds after ignition. This indicates that combustion is occurring (ITT), that the fan (N_1) is being driven, and that the oil system is functioning correctly.

When N_2 Reaches 50%

IGN 2 Light . . . . OFF

The light goes out automatically at approximately 50% N_2 speed.

When N_2 Stabilizes:

PUMP 2 Light . . . . OFF

The PUMP 2 light goes out when engine 2 hydraulic pump delivers a pressure of more than 1500 PSI.

Hydraulic Pressure #2. . . . . GREEN BAND

OIL 2 Light . . . . OFF

Extinguishing of this light indicates correct lubrication of engine 2.

GEN 2 Light:

If NORMAL Start. . . . . OFF

Generator No. 2 supplies the electrical system. Check voltage and current flow by setting the switch on the overhead panel to the GEN 2 position.

If EXT POWER Start . . . . ON

The generator is isolated from the airplane electrical system in order to prevent GPU/generator interaction.

Idle Speed Parameters . . . . CHECKED

- ITT
- N_1
- Oil temperature
- Oil pressure

Power Selector Switch . . . . NORMAL

For a GPU assisted start, either return the power selector switch to the NORMAL position now, or continue to start all engines using GPU power.

If normal selected now, check GEN 2 light out when GPU is disconnected.

Ground Power Unit (as applicable) . . . . REMOVED

NOTE: It is important to select normal prior to ground power removal to prevent a power surge.

Engines 3 and 1 Start

BOOSTER . . . . ON

GEN 2 Ammeter . . . . 300 A MAX

When starting engines 3 and 1 without the assistance of a GPU, it is recommended to wait until generator No. 2 current decreases to 300 A max, which indicates that the batteries are sufficiently charged. This precaution must be taken to avoid running down the batteries to the point where they can no longer be cut in. (The BAT 1 and BAT 2 annunciators stay on in this case.)

Use same starting procedure as for engine 2.

Starting Problems

Discontinue start whenever:

- ITT does not rise within 10 seconds. Combustion is not occurring.
- Oil pressure does not rise within 10 seconds after light-off.
- N_1 remains close to zero when N_2 = 20%.

  If starting is performed immediately after an engine shutdown, N_1 may remain close to zero when N_2 = 20%. Due to heterogeneous cooling of its components, the compressor/LP turbine (N_1) assembly may be temporarily jammed. In this case, a new start attempt may be performed at a later time.

- ITT is rising rapidly and approaching the 978°C limit:
- N_2 speed does not increase smoothly and rapidly to idle after light-off.

Power Lever . . . . CUT-OFF

This shuts off fuel supply to the engine.

Start Selector Switch . . . . MOTOR START STOP

Ignition is cut off and the starting sequence is interrupted.

Press the start button and perform a dry motoring for approximately 15 seconds whenever fuel is suspected to have accumulated in the tail pipe.

IF THE IGN LIGHT REMAINS ON EVEN THOUGH N_2 SPEED IS GREATER THAN 50% (and all idle parameters are within limits):

Start Selector Switch . . . . MOTOR START STOP

IGN Light . . . . OFF

The engine starter stops operating.

The igniters are no longer energized, since the ignition power supply has been cut off.

Start Selector Switch . . . . GND START

If unsuccessful:

Associated GEN Switch . . . . OFF

Associated IGNTR Circuit Breaker . . . . PULLED

This cuts off the power supply to the starting and ignition circuit of the corresponding engine.

NOTE: Check MMEL for two generator operation.

After Start Check

Avionics Masters . . . . ON

APU . . . . SHUTDOWN

If cabin cooling or heating is needed, APU shutdown may be delayed until just prior to takeoff.

BLEED AIR APU Switch . . . . OFF

> **NOTE:** The APU manufacturer recommends that the APU be shut down at the existing load condition.

APU STOP Pushbutton . . . . . PUSHED AND HELD FOR 1 S

This provides a test of the overspeed protection that should normally cause shutdown of the APU.

When OIL light on, APU MASTER . . . . OFF

In all cases, the APU MASTER pushbutton will be pressed off to ensure shutdown of the APU.

If N_1 does not drop immediately after pressing the APU STOP pushbutton, take the following immediate action:

APU MASTER . . . . .PRESS OFF

Pilot Sliding Window . . . . CLOSED/CHECKED

Close the LH direct vision window and check that it is locked (green mark on tip of handle in view)

Bus Tie . . . . FLIGHT NORM

This is the normal in-flight position; the two main buses are untied and the BUS TIED annunciator is out.

Voltages . . . . CHECKED

Check the voltages of the main buses.

Generator Loads . . . . CHECKED

Check the loads on the generators by setting the selectors respectively to GEN 3, GEN 1 and GEN 2. Select BAT 1 and BAT 2 to verify charge.

Windshield Pilot And Copilot . . . . NORM

Windshield Side . . . . ON

> **NOTE:** At ambient temperatures below -15°C, preheat all windows for 15 minutes prior to taxi.

All warning panel annunciators should be off, except:

L. AOA, R. AOA, L. PITOT, STBY PITOT, R. PITOT, MACH TRIM, AOA PROBE (if installed) . . . . ON

Angle-of-attack and PITOT probe heating will not be switched on until just before takeoff to avoid overheating.

Hydraulic Pressure, Systems 1 and 2 . . . . IN GREEN

Hydraulic Fluid Quantity . . . . IN GREEN

STBY PUMP . . . . ON

This will allow for normal flap retraction if #2 engine fails on takeoff.

Antiskid. . . . . TEST

Brake Selector . . . . #1/ASKID ON

Press the brake pedals:

L and R Lights . . . . ON

Press the test pushbutton without releasing the brake pedals:

L and R Lights . . . . OFF

Release the test pushbutton while keeping the brake pedals pressed. After 4 seconds:

L and R Lights . . . . ON

Release the brake pedals:

L and R Lights . . . . OFF

Isolation Valve Knob . . . . ISOLATION

This check is to be performed only on first flight of the day.

ISOL Light . . . . ON

This light indicates that the bleed air isolation valve is in the closed position. The No. 2 engine bleed air is isolated from No. 1 and No. 3 engine bleed air.

Isolation Valve Knob . . . . HORIZONTAL

ISOL Light . . . . OFF

Computer manual mode . . . . CHECKED

This check is to be performed only on the first flight of the day.

Check each computer in turn. While guarding the power lever, select MAN and observe a slight change in engine RPM and an illuminated CMPTR light. Gradually advance the throttle to approximately 40% N_1. Retard throttle and observe engine response.

Engine CMPTR Switch . . . . AUTO

CMPTR Light . . . . OFF

Check that the N_1 speeds return to their initial idle value.

Airbrakes . . . . EXTENDED

This check is to be performed only on the first flight of the day.

Place the handle in position 2.

STALL 1 Test Button . . . . PUSHED

This check is to be performed only on the first flight of the day.

Stall Warning and IGN Lights . . . . CHECKED

The outboards slats extend.

Slat Light On . . . . GREEN AND FLASHING

This indicates that the outboard slats are extended.

AIRBRAKE Light . . . . AMBER AND FLASHING

The STALL 1 test has caused automatic retraction of the airbrakes.

Airbrakes . . . . RETRACTED

Return the airbrake handle to the 0 position and check that the AIRBRAKE flashing amber light goes out.

Slats-flaps. . . . . SET FOR TAKEOFF

Set the slats-flaps handle for takeoff.

Check that the flap indication on the configuration panel is correct.

Check that the double red pointer on the configuration panel illuminates while the slats are moving, until the green symbol indicating that they are extended lights up, at which point the double pointer goes out.

STALL 1 Then STALL 2 Test Buttons. . . . . PUSHED

Stall Warning and IGN Lights . . . . CHECKED

Slat Light On . . . . GREEN AND FLASHING

These tests cover all the systems, apart from the stall vanes. Each test causes:

- Retraction of the inboard slats; the green oval flashes.
- Automatic ignition of the igniters; IGN lights on.
- Sounding of the aural warning..

CAUTION: If the APU is still providing bleed air, turn off APU BLEED switch for anti-ice check.

ANTI-ICE: WING (or WING-BRK) . . . . .ON 5 S MAX

This check is to be performed only on first flight of the day.

Observe that the 3 ITTs are rising.

ANTI-ICE: WING (or WING-BRK) . . . . OFF

ANTI-ICE: ENG 1 - ENG 2 - ENG 3 . . . . ON

This check is to be performed only on first flight of the day.

Observe that the 3 ITTs are rising.

ANTI-ICE: ENG 1 - ENG 2 - ENG 3 . OFF OR AS REQUIRED

In icing conditions (visibility less than 1 mile), and temperatures below +10°C, the engine anti-ice system must be switched on.

Whenever temperature is below +10°C, the engine anti-ice system should be turned on if the ceiling is below 2,000 ft.

M TRIM Pushbutton . . . . PUSHED

An automatic test runs when the pushbutton is pressed. If the test is negative, the MACH TRIM light on the warning panel stays on.

YD Pushbutton . . . . ON

No RUDDER NOT CENTERED Message
in ID 802 . . . . CHECKED

AP Transfer By L AFCS and
R AFCS Pushbuttons on ID 802 . . . . CHECKED

Press the R AFCS pushbutton of the ID 802. Check switching over to the other AP computer by display on the ID 802 of the message: R AFCS MASTER for 5 seconds. Then press L AFCS to return to the normal operating position.

Radar/Transponder . . . . STBY

Switch to STBY for the warm-up period, which lasts approximately one minute.

VHF 2 - ADF 1 and 2 - NAV 1 and 2 - HF 1 and 2 . . . ON/SET

Set the radio navigation switches to ON, and select the airfield and ATC zone frequencies. Adjust the audio output volume on each unit.

E- BAT . . . . ON

Flight Recorder . . . . CHECKED

Date, Time. . . . . SET

EFIS Display Controllers. . . . . SET

Select the desired mode: ROSE, ARC or NAV on the EHSIs.

COND BATT Switch (SB F900-125 Complied With) . . . OFF

COND BATT Light. . . . . OFF

IRS NAV Ready Light. . . . . ON

Taxi

Taxi Light . . . . ON

Park Brake Handle. .FULL FORWARD

Unlock the handle by pressing UNLOCK PUSH and ease it fully forward.

#2 P. BK Light . . . . OFF

#2 and #1 Brake Operation . . . . CHECKED

Set the BRAKE selector on the hydraulic control panel to the # 2 and # 1 positions in turn, while testing braking with the brake pedals:

- #2 OFF, the #2 P. BK light comes on
- #1 ON, the green L and R lights come on..

> **NOTE:** Refrain from pressing brake pedals during switch movement.

Brake Selector . . . .#1 ASKID ON

Select system 1, which is the normal position and the only position where the antiskid system will function.

Headings and Horizons. . . . . CHECKED

Check and compare the indications given by the EHSIs, the standby horizon and the DDRMIs.

Reverser emergency stowage . . . . TESTED

Engine 2 at Idle Power . . . . CHECKED

Idle power must be stabilized.

Reverser Lever . . . . .REVERSER IDLE

TRANSIT Light On Then Out . . . . CHECKED

DEPLOYED Light . . . . ON

Deploy the thrust reversers and check that the TRANSIT light comes on then goes out, and that the DEPLOYED light comes on. Maintain the idle setting.

THRUST REVERSER Switch .STOW

DEPLOYED Light . . . . OUT

TRANSIT Light On Then Off . . . . CHECKED

Setting the switch to the STOW position causes emergency retraction of the clamshell doors.

The red REV UNLOCK light will illuminate during stow.

Reverser Lever . . . . STOWED

THRUST REVERSER Switch . . . . .NORM-GUARDED

Return the switch to NORM and lower the guard.

All Flags . . . . OUT OF VIEW

Flight Controls . . . . FREE

Check the flight controls for full and free movement in all three axes.

Flight Instruments . . . . SET FOR TAKEOFF

Check that avionics, radios and flight instruments are properly set for departure.

APU and APU BLEED . . . . OFF

F.A.S.T. . . . . .CHECK

Flaps, airbrakes, speeds, and trim.

Before Takeoff

DV Window . . . . CLOSED/CHECKED

Radar/Transponder . . . . ON

Landing Lights . . . . ON

The landing lights must not be kept on for more than 15 minutes while the aircraft is on the ground.

If, for any reason this limit is reached, the landing lights must be switched off and left to cool for 45 minutes to prevent damage.

Anti-collision Lights . . . . ALL

This switches on the anti-collision and strobe lights.

Ignition (if necessary) . . . . AIRSTART

If the runway is covered with water, or in case of heavy precipitation, or the presence of birds, the start selector switches must be in the AIR START position (providing constant ignition) so that immediate relight is possible should one of the engines flame out.

IGN Lights (All 3). . . . . ON

Pitot Heat . . . . ON

L. PITOT, R. PITOT, ST BY PITOT,
AOA PROBE Annunciators (If Installed) . . . . OFF

At this stage, switching on pitot heating will not cause over-heating if takeoff is immediate.

Extinction of these lights indicates that power supply to the probe heating circuits is normal.

All Warning Annunciators. . . . . OFF

Takeoff is prohibited if one light remains on after the crew has taken corrective action, unless the detected failure is authorized in the Master Minimum Equipment List.

Takeoff

> **NOTE:** Rapid displacement of the power levers on the ground may cause the ENG 2 FAIL light to illuminate temporarily during engine acceleration.

Prior to brake release:

Throttles . . . . .FULL FORWARD

Takeoff N_1/ITT . . . . CHECKED

Advance power levers slowly to the full forward position. When engine speed has stabilized, check that indicated N_1 speeds are equal to or higher than the takeoff N_1 speed given in the Performance section of the Airplane Flight Manual.

N_1 speed may exceed the calculated value and should only be of concern if less than the calculated value.

Ascertain that ITT does not reach takeoff limits.

On airplanes incorporating SB F900-42, immobilization against full engine power using the brake pedals (park brake released) is ensured by simultaneous application of pressure from hydraulic systems 1 and 2. This dual braking pressure is indicated by:

- Normal illumination of the green L and R indicator lights on the hydraulic panel for the normal system 1 brake pressure.
- Steady illumination of the amber #2 P. BK annunciator on the warning panel for system 2 brake pressure.

After brake release:

Check that the L and R lights on the hydraulic panel and #2 P. BK annunciator on the warning panel are out, to ensure that there is no residual pressure in braking systems No. 1 and 2.

#2 P. BK Annunciator . . . . OFF

This provides confirmation that there is no residual pressure in braking system No. 2.

Acceleration . . . . CHECKED

When brakes are released, check that the acceleration reading on the EADI conforms to the value given in the ACCELERATION AT BRAKE RELEASE chart in the Performance Manual, section 3.

Use Steering System . . . . AS NECESSARY

At 80 KIAS:

Time . . . . CHECKED

Check that airspeed has reached 80 KIAS after the time indicated in the Performance Manual chart.

Airspeed Indicators . . . . CROSS-CHECKED

The copilot calls out when his EADI or airspeed indicator reads 80 kt to allow the pilot to check that this complies with the given values.

At V_1 . . . . CALLED OUT

The copilot calls out when his EADI or airspeed indicator indicates the previously determined V_1 speed.

At V_R/V_2. . . . . .CALL ROTATE

When a Positive Rate of Climb is Established:

Landing Gear . . . . RETRACTED

When a positive rate of climb is indicated on the VSI, retract the landing gear.

Check that indications are correct: the green down-locking lights go out and simultaneously the three red landing gear-in-transit lights come on and the red light in the landing gear control handle starts flashing; then these lights go out. Do not use the brake pedals, as the wheels are automatically braked at reduced pressure (momentary illumination of L and R lights during landing gear retraction).

ANTI-ICE: WING (or WING-BRK) . . . . ON/OFF

Wing anti-icing can be switched on without risk of damage once the landing gear is retracted. This also limits engine air bleed during the first phase of takeoff. The performance loss caused by switching on the anti-icing system will have been calculated before takeoff.

Outside of the flat rating area defined on N_1 setting tables, ascertain that ITT does not reach takeoff limits.

At V_2 + 25 kt:

Slat-flap Handle. . . . . CLEAN

Check on the configuration panel that all the lights go out or are out at the end of the sequence, and that the flap position indicator is at 0°.

In all cases, comply with speed limitations applicable when slats and flaps are extended (V_{FE}).

After Takeoff

Start Selector Switches . . . . GRD START

If constant ignition has been selected at takeoff, it must be switched off at the start of the climb by setting the selectors to GRD START.

IGN Lights (All 3). . . . . OFF

No Smoking and FASTEN BELTS. . . . . AS REQUIRED

In turbulent conditions, keep these ordinance signs on.

Mid-cabin Partition Door(s). . . . . . CLOSED, AS REQUIRED

Climb Power . . . . SET

Take into account the limitation on use of takeoff thrust (5 min maximum). Set the N_1 speed indicated in the Flight Manual charts.

ST-BY Pump . . . . AUTO

AUTO will prevent unneeded operation of the ST-BY hydraulic pump if during flight the engine #2 pump should fail. If airbrakes are selected, the ST-BY pump will operate.

Cabin Pressure and Temperature Controllers . . CHECKED

Check the cabin vertical speed indicator, cabin altitude, and the differential pressure indicator to ensure that cabin pressurization is correct.

Ensure that the automatic temperature regulation system provides a comfortable temperature for passengers; adjust the controller setting if required.

At Transition Altitude

Landing and Taxi Lights . . . . OFF

The taxi light goes off automatically when the nose landing gear door closes, therefore switching it off is an additional safety measure.

Altimeters . . . . SET

The altimeters should be set to 29.92 inches of mercury or 1013 hPa (or mbar).

Cruise

Excess fuel in the center tank group as compared with the side groups should be absorbed at the beginning of the cruise and, in any case, before a remaining quantity of 3 x 2,000 lb is reached. After shutdown of No. 2 engine and, regardless of the flight conditions, fuel in the center group of tanks must not be kept at a higher level than in side tanks.

Engine Parameters . . . . CHECKED

Fuel Quantities. . . . . EQUALIZED (if necessary)

To prevent problems that might be caused by an aft CG location at the end of the flight.

X-BP 1-2 and 2-3 . . . . OPEN

The two side engines are supplied from fuel tank 2.

Fuel Quantity Indicators . . . . MONITOR

As soon as the fuel levels are equalized:

X-BP 1-2 and 2-3 . . . . .CLOSED

Descent

Pressure Controller . . . . SET

At the start of descent, the crew must set the destination airfield altitude (LAND ELV display window) if this has not already been done. Barometric correction must be made (selection of QNH). In "LDG" mode, the mode selector must be actuated early enough for the cabin altitude to reach the set altitude (-300 ft) while remaining within the rate-of-descent limits. The LDG mode rate-of-descent is -300 ft/min. The PROG mode default rate is -450 ft./min.

Landing Parameters . . . . CALLED OUT – SET

> **CAUTION:** When landing in wind or gusty conditions, V_{REF} must be increased by half the headwind component, plus the full gust component. The total correction must not exceed 20 kt.

See Headwind Component Chart.

Anti-icing . . . . ON/OFF

Altimeters . . . . SET

Set QNH or QFE as instructed by local Air Traffic Control.

QFE can only be selected if the pressure altitude of the destination airfield is inside the altimeter setting limits.

Landing Lights . . . . ON

Radioaltimeter DH . . . . SET

Set the decision height according to the local regulations (approach map, crew qualifications, etc.,).

FASTEN BELTS . . . . ON

No Smoking Lights . . . . ON

AFT CABIN ISOL Light (If Installed) . . . . OFF

Passenger Door Curtain . . . . OPEN

Open the passenger door curtain to permit use of the passenger door as an emergency exit if necessary,

During this operation, ensure that the passengers have attached their seat belts correctly and that the passenger seats are in the required position for takeoff/landing, i.e.,

- Seat backrests in "full upright" position.
- Seats positioned up against the corresponding side console, orientated as required for locking in the takeoff/landing position (for swivel seats).

Approach (40° Flaps + Slats Landing)

ST-BY Pump . . . . ON

X-BP (All 3) . . . . CLOSED

Fuel crossfeed valves must be closed for takeoff and landing.

Slat-flap Handle . . . . .APPROACH POSITION

40° Flaps + Slats Landing

> **NOTE:** Airbrakes may be used during landing approach, provided airspeed is at least V_{REF} + 10 kt.

Landing Gear . . . . DOWN/CHECKED

Extend the landing gear and check that the extension sequence runs correctly.

- The landing gear should be extended in the middle of the downwind leg of a normal visual pattern, and when the airplane is 1 dot below the glideslope during an ILS approach.

Hydraulic Pressure . . . . CHECKED

Antiskid. . . . . .TESTED

Braking Selector . . . . #1/ASKID ON

Press the brake pedals:

L and R Lights . . . . .REMAIN OFF

Press the test pushbutton:

The L and R lights come on after one second, and go out one second later.

Release the brake pedals:

L and R Lights . . . . .REMAIN OFF

Airbrake Handle . . . . NORMAL

Check that the airbrakes are retracted.

Ignition (if necessary) . . . . AIRSTART

IGN Lights (All 3). . . . . ON

Slat-flap Handle . . . . 40° FLAPS + SLATS

During a normal visual pattern, this action should be performed at the beginning of the final turn, and during an ILS approach, as soon as the three green lights come on after extension of the landing gear, while allowing speed to decrease gradually to V_{REF} + wind correction factor. In a normal visual pattern, the final turn must be completed by 500 ft AGL.

Autopilot . . . . DISENGAGED

The autopilot must be disengaged at the minimum authorized engagement height given in the Airplane Flight Manual.

Three-Engine Go-Around From 40° Flaps and Slats Landing Configuration

Take-off thrust . . . . SET

Take-off thrust is to be selected as soon as the go-around decision is made.

Go-around attitude . . . . SET

Go-around attitude is 14° and is transmitted to the flight directors by pressing the GA pushbutton on one of the control wheels.

Airbrake handle. 0

Slat-flap handle . . . . 20° FLAPS AND SLATS

If the flaps were in the FLAPS 40° position when the go-around was initiated, the 20° FLAPS and SLATS configuration must be adopted as rapidly as possible to maintain the minimum required climb gradient.

When a positive rate-of climb is established:

Landing gear . . . . UP

Indicated airspeed. . . . . V_{ref} -5KT

After Landing

Thrust Reverser Stowage . . . . CHECKED

Reverser Lever . . . . .REVERSER IDLE

Engine 2 at Idle Power . . . . CHECKED

Check that engine 2 is effectively at idle power before ordering reverser stowage. This avoids excessive loads being applied to thrust reverser actuating mechanism.

Reverser Lever . . . . .STOW

TRANSIT and REV UNLOCK
Lights On then Out . . . . CHECKED

ANTI-ICE: WING . . . . OFF

Wing anti-icing must be switched off immediately after landing. Leaving the anti-ice system switched on can result in damage because there is no airflow to cool the leading edge slats.

Windshield Heat (3) . . . . OFF

Pitot Heat (3). . . . . OFF

Ignition Switches . . . . .GRD START

If constant ignition has been selected, return to the normal position for the next ground start.

IGN Annunciators (All 3). . . . . OFF

Landing Lights . . . . OFF

Check that the LDG light goes out.

Anticollision Lights . . . . RED

This will turn off wingtip strobe lights, retaining beacons.

Slat-flap Handle . . . . .CLEAN

Check on the configuration panel that all the lights are out and the flap position indicator is at 0°. The handle may be moved directly to clean.

Airbrake Handle . . . . .POSITION 0

Check that the AIRBRAKE light is out.

All Trims . . . . SET FOR TAKEOFF

This simplifies airplane preparation for the next flight and constitutes an additional safety measure.

Radar/Transponder . . . . OFF/STBY

Bus Tie . . . . TIED

This simplifies preparation for a quick turn and is essential for APU start.

The BUS TIED light on the warning panel comes on.

APU (As Applicable) . . . . ON

To provide air conditioning if required.

Monitor the APU tachometer to check rise in speed and ITT, and check the APU generator current on the ammeter.

BLEED AIR APU Switch . . . . AS REQUIRED

Wait one minute prior to APU bleed.

Shutdown

Taxi Light . . . . OFF

Park Brake . . . . INTERMEDIATE DETENT

#2 P. BK Annunciator . . . . ON, STEADY

In this position, moderate pressure is applied to the brake units, which holds the airplane stationary.

STBY PUMP . . . . OFF

This prevents the standby pump from operating on the batteries after the engines have been shut down.

LH AV. MASTER and RH AV. MASTER . . . . OFF

OFF Lights . . . . ON

LH FMS MASTER and RH FMS MASTER (if installed) . OFF

FMS MASTER Lights . . . . ON

IRS . . . . OFF

Check that the mode selector is set to OFF.

Standby Horizon . . . . CAGED

Cage the standby horizon by pulling the knob and turning it clockwise. The flag must come into view. Caging the horizon allows it to be reset on the ground when the electrical systems are energized for the next flight.

VHF 1. . . . . OFF

E-BAT . . . . OFF

ANTI-ICE: ENG . . . . OFF

After 2 minutes of engine operation at idle speed:

Power Levers . . . . CUT-OFF

Override the idle stop and pull the power levers fully back. This cuts off fuel supply to the engines.

BOOSTER (All 3) . . . . OFF

EXTERIOR and INTERIOR LIGHTS. . . . . OFF

Emergency Lights . . . . OFF

Passenger Ordinance Signs . . . . OFF

APU (as applicable) . . . . SHUTDOWN

APU STOP Pushbutton. . . . PUSHED AND HELD FOR 1 S

This ensures normal APU shutdown by simulating an overspeed signal and provides a test of overspeed protection.

Check that N_1 drops.

If N_1 does not drop immediately after pressing the APU STOP pushbutton, set the APU MASTER pushbutton light to OFF; this ensures APU shutdown by closing the APU firebreak solenoid valve.

APU MASTER Pushbutton. . . . . OFF

In all cases, the APU MASTER pushbutton will be pressed off to ensure shutdown of the APU.

BAT 1-BAT 2 . . . . OFF

Detailed Normal

Operation in Cold Weather

NOTE: Do not set the parking brake; chock the main landing gear wheels. In driving snow, head the airplane into the wind if possible.

Parking

- Parking the airplane for a duration in excess of 24 hours in temperatures lower than -40°C is prohibited (Aviation Register requirement).
- If airplane must be parked on snow or ice, use steel mats under main landing gear wheels. If precautions are not taken to prevent tires from freezing to the ramp, make sure the tires are cleared before moving the airplane.
- The tire pressures refer to section 4, TIRE SERVICING.
- When an airplane takes off for a destination (intermediate or final destination) where the temperature is very much less (difference $\geq$ 45°F [25°C]) than that of the departure airport, the pressure must be increased prior to departure, so that the tires are inflated at their nominal pressure for the coldest airport (intermediate or final destination).
- The pressure will be increased by 3.7% for a temperature difference of 18°F (10°C).
- The water system must be drained and toilet(s) emptied after landing, before freezing can occur.
- Seals and bearing surfaces of all doors and the emergency exit must be smeared with silicone grease.
- The oxygen controller must be set to CLOSED position and the bottle valve closed.
- At temperatures below +5°F (-15°C), it is necessary to remove the airplane main batteries (if they are not covered by heating blankets) and keep them in heated premises.

Fuel

- Particular attention should be paid to fuel drains when the airplane is due to fly in cold climates.
- As water may freeze as it settles out of the fuel when the airplane is parked in the cold, draining must not be carried out until the airplane has been parked on heated areas of the airfield or in a heated hangar.
- While moisture in the fuel is not exclusively a cold weather problem, it does frequently cause trouble during engine starts in below freezing weather.

> **NOTE:** Use of anti-ice additives (mixed before fueling) conforming to specifications MIL-I-27686D or E are authorized in jet engine fuels in a concentration not exceeding 0.15 percent by volume.

Refer to **Table 2B-A** for the freezing points of the various types of authorized fuel:

Type of Fuel	Freezing Point	
	°C	°F
JET A	-40	-40
JET A1	-47	-53
JET B	-50	-58
JP 4	-58	-72
JP 5	-46	-51

Table 2A-A; Fuel Freezing Points

Snow Accumulation

NOTE: Snow accumulating on the airplane will shift the CG aft. If the CG was already aft, the airplane may tip backward due to snow accumulation. Since the density of the snow varies, airplane tipping may occur for different thicknesses of snow.

If it is not possible to shelter the airplane, the following preventive measures should be taken:

- Moor the airplane to the ramp using the forward mooring device (ring screwed into the forward jacking point). See chapter, SERVICING.
- Avoid critical load distributions which could displace the CG further aft than normal.
- Ballast the airplane forward (more fuel = more forward).

To determine the CG, refer to Loading Manual.

WARNING: Failure to remove snow, ice or frost accumulated on the airplane on ground may result in serious aerodynamic disturbances and structural damage in flight. Takeoff distance and climb performance can be adversely affected to a dangerous level, depending on the weight and distribution of accumulated snow or ice. These risks should be avoided by removing snow and ice from wings, fuselage, and tail units before attempting to takeoff.

Snow removal from the control surfaces must be complete to ensure proper travel.

As control surface movement can be seriously affected by freezing of hinge points, airplane should not be dispatched before a careful visual check has been made of wings, control surfaces and hinge points, and it has been definitively established that frost or snow deposits are cleared from these areas.

The use of heated air for snow removal should be carefully controlled to avoid the water, resulting from melted snow, from running and refreezing on a more critical point of the airplane, where it will be even more difficult to remove. The heat should be applied for a long enough time to thoroughly dry the area. Particular care should be taken to prevent water freezing in the vicinity of the movable control surfaces. Removal of loose snow from the fuselage should be accomplished before heating the cabin interior. Prolonged heating of the fuselage while covered with snow should be avoided. Melting and refreezing of snow on the fuselage can be a real problem. Removal of as much snow as possible before pre-heating will minimize the amount of water run-off.

The areas including the normal and standby static ports and pitot probes, the stall vanes and temperature probe should be especially watched for ice or frost formation.

Unobstructed static ports are vital to maintain reliable airspeed, altitude, and rate-of-climb readings. Ice formations near the pitot heads can disrupt the local airflow sufficiently to cause inaccurate airspeed readings.

Snow on the nose radome should be removed completely to prevent it from blowing back onto the windshield or into the engines. The following openings should be checked for snow or ice blockage: ram air inlet and exhaust outlets, overboard drains and air vents, static ports and pitot heads.

NOTE: At temperatures lower than -31°F (-35°C) the engines must be heated (maximum air temperature: 158°F [70°C]).

NOTE: Snow blowing into the inlet of a cooling engine (after shutdown) may melt and run down into the lower portion of the compressor section. If enough of this water freezes later, it can block the compressor blades.

NOTE: At any temperature lower than 32°F (0°C) the fan should be turned by hand to make sure it is free to rotate before attempting to start the engine.

Preheating

Ground Preconditioning

The crew compartment and passenger cabin should be preheated, both for crew and passenger comfort and for proper operation of instruments. Amount of pre-heating required will depend on OAT and length of time airplane has been cold soaked.

The APU or center engine may be used to preheat the airplane.

To ground precondition the airplane, proceed as follows:

- Open the flood ducts.
- Start the APU.
- Open BLEED APU, PASSENGER and CREW.
- Place the AUTO-MANUAL switches on the passenger and crew conditioning panels in the AUTO position.
- Observe temperature control valves move toward warmer position.

Preheating of Cockpit Windows

When the airplane has been left on the ground for several hours or overnight in ambient temperatures of 5°F (-15°C) or below, cockpit windows must be heated as follows:

- Place both WINDSHIELD PILOT/COPILOT switches in the NORM position (medium heating).
- Also switch on the side window heating switch SIDE.

CAUTION: The MAX position of the WINDSHIELD PILOT/COPILOT switches must be used only in icing conditions in-flight, when NORM position is insufficient.

Keep the heating on for 15 minutes before leaving the ramp.

Do not use the airplane batteries to preheat cockpit windows.

Monitor the ammeter to ensure that the generator in operation is not overloaded (Maximum 300 A).

Starting

Starting in Cold Ambient Temperatures

Ambient temperature higher than +5°F (-15°C):

- It is not necessary to pre-heat engines and batteries. Start should be made normally.

Ambient temperature between +5°F (-15°C) and -31°F (-35°C)

- It is not necessary to pre-heat the engines. The batteries must be pre-heated.
- When on an airfield with no preheating facilities, the batteries should be placed in heated premises.
- It is, however, possible to use a ground power unit rated to 1000 A.

Ambient temperature lower than -31°F (-35°C):

- It is necessary to pre-heat batteries, engines and the APU using heating devices.
- The preparation of an engine consists of rotating the fan 15 complete turns to free it, blowing hot air on the hinges before opening the cowlings and blowing hot air on the accessory gear box and the oil tank for 10 to 15 minutes.

Special Cases

Starting time

Depending on the ambient temperature, APU and engine starts can be slightly slower than normal starts.

Oil pressure

Fairly high oil pressure peaks may be observed during engines start.

Oil temperature

Try not to exceed idle when the oil temperature is less than +86°F (+30°C). However, if the ambient temperature conditions do not allow this temperature to be reached, idle may be exceeded.

Flight Controls Check

After start, cold and viscous hydraulic fluid in the servo-actuators may render control surface displacement sluggish. Move control surfaces to circulate and warm hydraulic fluid.

Before leaving the parking, full control surface travel should be verified as follows:

a. Rudder.
b. Aileron.
c. Horizontal stabilizer.
d. Elevator.

This verification will have to be repeated at the holding point, just before lining up for takeoff.

Taxi

Before using taxiways and runways known to be totally or partially covered with snow, ice, or frost, request braking conditions from ground control or tower. When taxiing, directional control is achieved using the steering wheel and differential thrust.

If, during taxiing, the brakes are locked by ice built up during a halt, apply braking pressure repeatedly at maximum pressure.

While taxiing at normal speed, apply moderate brake pressure, sufficient to bring the airplane to a complete stop. Repeat the same procedure three times to generate a small amount of heat in the disk brakes.

Do not bring the airplane to a complete stop more than 5 times; otherwise, over-heating of the brakes could result.

Taxi strips and ramps should be cleared of loose ice and snow to reduce the possibility of engine damage due to ingestion of chunks of ice or hard snow. High engine power should be avoided to prevent blowing ice or hard snow against parked airplanes.

Under certain atmospheric conditions, at temperatures of -31°F (-35°C) and below, freezing fog may form behind the airplane as a result of jet engine operation.

The wing flaps should be left in the retracted position until line-up for takeoff, but they must be extended before takeoff.

The wing anti-icing system must not be used during ground operation due to the risk of distortion to the leading edges in the absence of cooling airflow. It may however be used at idle for short periods under careful supervision.

When taxiing on slippery surfaces (wet or snow covered runways, etc.,) discontinue operation of the steering wheel if its use no longer has effect. This indicates that the nosewheel is skidding, which may cause damage at large turning angles, when a rougher area is reached.

Takeoff and Landing With Standing Water or Snow (Dry, Wet) or Slush on Runway

Takeoff on icy runways is not recommended due to the sometimes excessive increase in the airplane stopping distance.

Check especially that brakes are released before starting takeoff on a wet, snow covered runway. Verify the current conditions of the entire runway as closely as possible to the planned departure time. Depth of standing water, slush or wet snow should be measured in a sufficient number of places to be representative of the entire length of runway required, particularly the high speed portion of takeoff roll.

Precipitation Limits

At takeoff, water ingestion by the lateral engines is minimal and does not affect their operation. Ground water is not projected into the center engine air intake.

For takeoff and landing, the engine ignition system must be turned on continuously (start selectors in AIRSTART position) to preclude the possibility of flame-outs.

Certification flight tests have shown satisfactory operation of engines and systems with puddles reaching 195 ft (60 m) in length for a depth of 3/4 in (20 mm).

Standing water on runway should not exceed an equivalent water depth of 1/2 in (12.7 mm). See Performance Manual, Supplement 3.

Takeoff

The influence of precipitation on takeoff performance varies with the thickness and density of the deposit.

Information relating to the influence of standing water or of snow (dry, wet) or slush on performance will be supplied subsequently.

During takeoff, as soon as the rudder becomes effective and before V_R, gently raise the nose of the airplane to decrease the load on the nosewheel and reduce snow projections.

> **NOTE:** After takeoff from a snow- (dry, wet) or slush-covered runway, delay landing gear retraction for 15 seconds, provided that obstacle clearance requirements are respected in case of one engine failure (with gear extended, the second segment climb is 1.7% less). If necessary, and at airspeed below 190 kt, cycle the gear up and down prior to final retraction.

Climb

For airplanes equipped with a brake heating system, retract the landing gear and turn the brake heating system on as follows:

ANTI-ICE: WING-BRK Switch . . . . WING-BRK

ANTI-ICE: Green WING-BRK Light . . . . ON

Leave the switch in this position for at least 10 minutes. After this time, depending on atmospheric conditions, the WING-BRK switch should be set to WING or OFF.

Descent

For airplanes equipped with a brake heating system, (A/C without, see approach below), if takeoff was from a snow (dry, wet) or slush covered runway, switch the system on during descent:

ANTI-ICE: WING-BRK Switch . . . . .WING-BRK

ANTI-ICE: Green WING-BRK Light. . . . . ON

The brake heating system should be switched off after landing gear extension. Depending on atmospheric conditions, the WING-BRK switch should be set to WING or OFF.

> **CAUTION:** In icing conditions, when the brake heating system is used, the minimum required N_1 speed with two or all engines operating must be increased by 1%.

Approach

Landing Gear . . . . DOWN/CHECKED

If takeoff was from a snow- (dry, wet) or slush-covered runway, and wing and BRK heating is not installed:

Deactivate antiskid system:

Brake Selector . . . . #1/ASKID OFF

Apply maximum brake pressure several times.

Re-activate antiskid system:

Brake Selector . . . .#1/ASKID ON

Perform antiskid test as usual.

Landing

During landing, keep the nose high as long as possible to avoid snow projections.

CAUTION: This procedure will noticeably increase the landing distance. If reverse thrust must be used, wait until the nose wheels have touched down before increasing engine power.

On slippery runways, the antiskid system will permit the best performance by preventing wheel locking, which could substantially hinder airplane deceleration.

However, the braking efficiency on a very slippery runway (ice) can be very much less than on a dry runway. Use of the thrust reverser is necessary.

Crosswind on Non-dry Runways

When taking off or landing on a runway covered with water, wet snow or slush, extreme care should be exercised even when crosswind is not as strong as demonstrated maximum crosswind (see Airplane Flight Manual).

Use the nose wheel steering as necessary while keeping the nose wheel firmly on the ground until directional control is ensured by the rudder.

Direction Control on Iced Surfaces

Applying nose-down elevator while taxiing on iced surfaces may be helpful. This loads the nose wheel and increases directional stability.

Turns must be made at a very low speed. Although the antiskid system is designed to prevent wheel locking, it is recommended that you be prepared to release the brakes before the airplane starts skidding on ice or snow.

Ground Deicing and Anti-icing

Regulations prohibit takeoff when snow, ice or frost is adhering to wings and control surfaces of the airplane.

The pilot-in-command (PIC) has the ultimate responsibility to determine before takeoff that the airplane is in a condition for safe flight.

Standard practice is to deice and, if required, anti-ice the airplane before takeoff by using of Freezing Point Depressant (FPD) fluids Type I and Type II.

One or Two Step Process

CAUTION: If feasible, do not operate engines during airplane deicing. If engine operation is required, do not spray deicing/anti-icing fluid directly into engine inlets, exhausts, sensors, scoops, vents, drains, etc. In this event, close the engine air conditioning bleed valves.

CAUTION: Do not let the anti-icing fluid go into the brake units.

WARNING: Do not operate APU while airplane deicing is in progress. Ingestion of combustible deicing fluid may result in an uncontrolled overspeed.

One Step

Deicing/anti-icing uses a heated, diluted deicing/anti-icing fluid, both to remove ice, snow and/or frost from airplane surfaces and to protect the airplane from further accumulation.

Two Step

Deicing/anti-icing uses hot water or a hot mixture of water-diluted deicing fluid, followed immediately by treatment with anti-icing fluid. The two-step process is generally accomplished using Type II FPD fluid.

CAUTION: Undiluted (NEAT) Type II FPD fluid must be very cautiously used.

For detailed information regarding FPD fluid application, refer to DASSAULT AVIATION Maintenance Manual.

Holdover Times

Holdover timetables are only estimates and vary depending on many factors, which include:

- temperature
- precipitation type
- wind
- aircraft skin temperature.

Holdover times are based on mixture ratio. Times start when the last application has begun. Guidelines for holdover times anticipated by SAE Type I or Type II/IV and ISO Type I or Type II/IV fluid mixtures are a function of weather conditions and outside air temperature (OAT).

The freezing point of either type of fluid mixture must be at least 10°C (18°F) below OAT.

NOTE: Holdover time is the estimated time that an anti-icing/deicing fluid protects a treated surface from ice or frost formation.

Preflight Deicing/Anti-icing Inspection

Perform preflight deicing inspection IMMEDIATELY following deicing operation or during the anti-icing process.

Deicing/Anti-icing Inspection Checklist

All items below should be free of snow, ice and/or frost accumulation.

1. Wing and wing leading edge upper and lower surfaces. Conduct a hands-on inspection to verify that all surfaces are clean.
2. Vertical and horizontal stabilizers, including leading edges, side panels and upper/lower surfaces.
3. Flaps, flap tracks and flap drives.
4. Airbrakes.
5. Ailerons, elevator and rudder.
6. Engine inlet.
7. Cockpit windows.
8. Antennas.
9. Fuselage.
10. Stall vanes, temperature probe, pilot probes and static ports.
11. APU air intake, inlets and exhausts.
12. Landing gear.

Pre-Takeoff Inspection

Pre-takeoff inspection should be conducted within five (5) minutes of takeoff.

Perform a visual inspection of wing surfaces, leading edges, air intakes, and other components that are in view from either the cockpit or cabin.

Require the assistance of trained and qualified ground crew to assist in this inspection; if in doubt, deice again prior to takeoff.

Crosswind

The maximum demonstrated 90° crosswind component on a dry runway is 30 kt.

In a crosswind, use the nosewheel steering while firmly holding the nose wheel against the ground:

- during takeoff, until the rudder becomes effective.
- during landing, as soon as possible after touch-down.

Recommend turning yaw damper off.

The ailerons must be held in neutral position.

The technique of "control wheel into wind" used with other types of aircraft does not apply to the MYSTERE-FALCON 900, which has a wide gear track and low wing very small dihedral (0°30').

As a rule, when on the ground with sufficient air speed, an airplane has a tendency to veer to the side where the control wheel is applied, mainly due to the weight transfer on that side. Therefore, turning the control wheel into the wind will increase the normal tendency of the airplane to nose into wind. Therefore, there is no need to turn the control wheel into wind. This only results in more difficult control of the airplane during crosswind conditions.

In conclusion, the following instructions should be followed:

During takeoff:

- Use full rudder and nosewheel steering as necessary while holding the nose wheel firmly against the ground.
- Reduce from full rudder as necessary.
- Maintain the ailerons neutral until liftoff, then apply a small amount of aileron into the crosswind.
- After airborne, smoothly remove cross control and fly runway heading.

During landing:

- Fly the airplane to the touchdown point
- Lower the nose gear to the runway as soon as possible after touch-down and hold firmly.
- Use nose wheel steering to assist rudder, as necessary.
- Maintain the ailerons neutral.

Taxiing in Case of High Crosswind

If crosswind exceeds 40 to 50 kt, risks of nose gear lift-off may exist, particularly with a low weight and aft CG location airplane.

In this case, the following is recommended:

- taxi carefully at constant speed (to avoid stops).
- trim the airplane nose down.

In case of nose gear lightening:

- apply brakes immediately.
- increase N_1 significantly.
- set the elevator in nose down position.
- resume taxiing while keeping high N_1.
- apply brakes to adjust speed.
- reposition the airplane into the wind as soon as possible.

Operation With Anti-icing

HP Bleed Air System Cutoff

Switching the anti-icing system on while engines are at a high power setting or increasing engine power while the anti-icing system is in operation, may lead, at altitudes greater than or equal to 15,000 ft, to the interturbine temperature (ITT) exceeding the limit value on all three engines.

This ITT rise may occur about 15 seconds after the anti-icing system is switched on or after the engine power increase. That is, at the time when the crew is satisfied with the engine parameters check, and have transferred their attention elsewhere.

For an altitude of 15,000 ft or greater, with anti-icing system on, switch off HP bleed air (HP 1, PVR 2 and PVR 3):

- During an engine power increase to an N_1 of 95% or greater, or
- In case the engine ITT reaches the upper limit for an N_1 that is more than 5% below the normal climb N_1 book value with anti-icing off.

After an engine acceleration with anti-icing on or switching the anti-icing on when the engines are at a climb power setting, pay special attention to the ITT values for 20 to 30 seconds and switch off the HP bleed air systems as required.

When the engine parameters are stabilized, bring the HP bleed air system back into operation.

Activation of the Anti-icing Systems

Upon activation of the engine anti-icing systems only, depending on the position of the engine power levers, a noticeable drop in center engine N_1 can occur, which may necessitate readjustment of the engine power setting.

This is due to the higher anti-icing air bleed on this engine (S-duct).

When all the anti-icing systems (engine + wing) are in operation, the repartition of air bleed between the 3 engines becomes balanced, as does engine N_1.

Steps to be Taken in the Event of Wind Shear

Wind shear is a rapid variation in the direction and velocity of wind at very low altitude. Wind shear may or may not be accompanied by a downburst or microburst (violent downward blasts of air).

A microburst with a low or zero wind variation may also be encountered. These phenomena are generally called wind shear.

The main cause of wind shear is thunderstorm cells.

If a wind shear is encountered, 30 seconds to 1 minute maximum will be required to cross it.

> **NOTE:** If wind shear is anticipated:
>
> - Do not take off – wait.
> - Do not land – wait or fly to an alternate airport.

Pitot reaction time must be very quick (3 to 5 seconds) as studies of accidents that have occurred or been avoided show. If the pilot takes 15 seconds or more to understand the situation, it will be too late.

Survival or accident depends, therefore, on the pilot's reaction time; this makes a wind shear warning system, with a very low reaction time, attractive.

During or after takeoff:

- If acceleration is much too low before V_1, abort takeoff.
- If acceleration is too low above V_1, set maximum power and takeoff just before the end of the runway, at an IAS between V_1 and V_R if necessary, with the necessary pitch attitude.

  Retract the landing gear immediately. Respect the stall audio warning limit.
- After takeoff: do not reduce power; increase if possible.

Absolutely do not let the airplane descend, even if the indicated airspeed should drop.

During these maneuvers, it may be necessary to use unusual pitch attitudes: 20 to 30° depending on the weight and the configuration of the airplane.

Respect the stall audio warning limit.

During approach and landing:

As soon as a wind shear encounter is imminently anticipated, apply thrust for go-around:

Maximum Thrust . . . . SET

Landing Gear . . . . UP

Level off and absolutely do not let the airplane descend, using the elevators rather than the stabilizer trim.

Respect the stall audio warning limit.

Wind shear is occasionally preceded by an opposite phenomenon, consisting of a negative wind gradient and upward winds. In this case the IAS increase abruptly by 10, 20 kt or more and the airplane is found to be above the glide slope.

Do not make the mistake of reducing power (to return to the approach ILS) while pitching down (to retrieve the glide slope). The airplane would, in this case, be in the worst condition for a WIND SHEAR encounter.

The comparison, during approach, of the IAS and the GS can be very helpful. With the EFIS, this comparison is made automatically by the blue wind arrow on the HSI. In addition, the IAS trend is given.

Operation on High Elevation Airfields

Operation of the airplanes on fields at pressure altitudes between 10,000 and 14,000 ft, leads to an unusual sequence of events in the procedure (i.e., descent, landing, takeoff, climb).

Descent

10 minutes before landing:

Passenger Oxygen Controller . . . . CLOSED

Only the pilot oxygen system is supplied.

Crew Oxygen Mask (Pilot Or Copilot) . . . . DONNED

LDG Pressurization Mode . . . . SELECTED

Landing Field Pressure Altitude + QNH . . . . SET

When landing, select the LDG mode if the present altitude is more than or equal to 8,000 ft and set the landing field altitude and QNH.

Landing Parameters . . . . CALLED OUT/SET

FASTEN BELTS . . . . ON

Anti-icing . . . . AS REQUIRED

At a cabin altitude of 10,000 ft ± 500 ft, the CABIN light comes on and the warning audio operates.

HORN SIL Pushbutton . . . . PRESSED

The audio warning sound is cut off by pressing the HORN SIL pushbutton on the pedestal.

> **WARNING:** In the event of depressurization, set the oxygen controller to OVERRIDE, for automatic presentation and supplying of passenger oxygen masks.

Operation on High Elevation Airfields (continued)

Preflight Cockpit Check (Electrical Power Off)

RH Side Console

Passenger Oxygen Controller . . . . CLOSED

Check the oxygen controller is in the CLOSED position.

Prestart Check

As the airfield elevation is above 10,000 ft, when BAT 1 and BAT 2 switches are set to on:

The CABIN light comes on and the audio warning operates:

HORN SIL Pushbutton. . . . . PUSHED

It cuts off the audio warning sound.

LDG Pressurization Mode . . . . SELECTED

Takeoff Field Altitude + QNH. . . . . SET

The selected mode is preserved for landing.

Cabin Access Door . . . . CLOSED

Check that the colored markers on the upper crank pins and the locking indicator on the step threshold are aligned.

Index Mark And Latches . . . . CHECKED

Crew Oxygen Mask (Pilot And Copilot) . . . . DONNED

After Takeoff

PROG Pressurization Mode . . . . SELECTED

If circling, stay in LDG mode without modifying the display.

8,000 ft is automatically displayed in the LAND ELV window.

During the climb as soon as the cabin altitude is down to 9,500 ft:

CABIN Light . . . . OUT

Passenger Oxygen Controller . . . . NORMAL

It is the normal in-flight position that allows automatic oxygen flow in case of depressurization.

Cruise

PROG Pressurization Mode . . . . CHECKED

Altitude O + QNH: 1,013 or Altitude + QNH
of the Inbound Airfield . . . . DISPLAYED

In case of landing on the start airfield at the end of the cruise, return to LDG mode and display altitude and QNH of the airfield (procedure applicable for all airfields with an altitude exceeding 8,000 ft).

Noise Levels

Measuring Point	EPNdB	Stage 3 Noise Limit
Takeoff With cut-back	79.8	89
Approach	91.7	98
Approach (Sideline)	91.2	94

Table 2A-E; Correlation Between Noise Levels

Low Noise Takeoff with Cut-Back

Maintain takeoff thrust up to a height of 1,800 ft above the takeoff surface, with high lift devices in the takeoff configuration and maintaining a steady speed equal to V_2 + 10 kt.

When a height of 1,800 ft is reached, set the cut-back N_1 speed.

This N_1 speed setting, which enables a level flight to be maintained with one engine inoperative, ensures a climb gradient of 4.8% or more.

As soon as possible, resume climb and increase thrust to the maximum continuous power setting.

N_1 Setting After Cut-back								
SAT (°C)	Pressure-Altitude (ft)							
	0	2,000	4,000	6,000	8,000	10,000	12,000	14,000
32	80.7	82.9	85.3	87.7	90.2	92.6		
30	80.5	82.6	85.0	87.5	89.9	92.3		
28	80.2	82.4	84.8	87.2	89.6	92.0	94.5	
26	79.9	82.1	84.5	86.9	89.3	91.7	94.2	
24	79.7	81.8	84.2	86.6	89.0	91.4	93.9	
22	79.4	81.6	83.9	86.3	88.7	91.1	93.5	96.1
20	79.1	81.3	83.6	86.0	88.4	90.7	93.2	95.8
18	78.9	81.0	83.3	85.7	88.1	90.4	92.9	95.5
16	78.6	80.7	83.1	85.4	87.8	90.1	92.6	95.2
14	78.3	80.4	82.8	85.1	87.5	89.8	92.3	94.8
12	78.0	80.2	82.5	84.8	87.2	89.5	91.9	94.5
10	77.8	79.9	82.2	84.5	86.8	89.2	91.6	94.2
8	77.5	79.6	81.9	84.2	86.5	88.9	91.3	93.8
6	77.2	79.3	81.6	83.9	86.2	88.6	91.0	93.5
4	76.9	79.0	81.3	83.6	85.9	88.2	90.6	93.2
2	76.7	78.7	81.0	83.3	85.6	87.9	90.3	92.8
0	76.4	78.5	80.7	83.0	85.3	87.6	90.0	92.5
-2	76.1	78.2	80.4	82.7	85.0	87.3	89.7	92.2
-4	75.8	77.9	80.1	82.4	84.7	87.0	89.3	91.8
-6	75.5	77.6	79.8	82.1	84.4	86.6	89.0	91.5
-8	75.2	77.3	79.5	81.8	84.0	86.3	88.7	91.1
-10	75.0	77.0	79.2	81.5	83.7	86.0	88.3	90.8

NOTE: Enter this chart at:
- Cut-back altitude = field pressure altitude + 1,800 ft.
- Cut-back SAT = field SAT - 3°C.

Table 2A-F; N_1 Setting After Cut-back

Use of Thrust Reverser to Back Up Airplane

The thrust reverser can be used to back up the airplane if the following instructions are respected.

Before Backing Up

Ensure that a ramp guide is present.

Side Engine(s) (If Operating) . . . . IDLE

Braking System . . . . CHECKED

Ensure that the brake selector is in the correct position, i.e.,

- # 1 ASKID ON if one or both side engines are operating
- # 2 ASKID OFF if only the center engine is operating.

Park Brake Handle . . . . FULLY FORWARD

#2 P. BK Annunciator . . . . OFF

Operate the brake pedals and check that:

- The L and R brake lights come on if the brake selector is in the # 1 ASKID ON position; or
- The #2 P. BK annunciator comes on if the selector is in the # 2 ASKID OFF position.

Release the brake pedals; place feet "on deck."

Thrust Reverser Control Lever . . . . REVERSER IDLE

Ensure that engine 2 is effectively at idle power before setting the reverser lever to reverser idle; this is to avoid excessive loads being applied to the thrust reverser actuating mechanism.

TRANSIT Light Illuminated Then Off. . . . . CHECKED

DEPLOYED Light Illuminated . . . . CHECKED

Back-up Phase

Thrust Reverser . . . . AS REQUIRED

Reverser thrust must be applied very progressively.

Use the nosewheel steering system. Turn the handwheel in the direction you want the tail to go.

CAUTION: Perform the back-up maneuver very slowly.

CAUTION: Do not brake using either the brake pedals or the park brake.

Stopping the Airplane

Thrust Reverser Control Lever. . . . . REVERSER IDLE

Thrust Reverser . . . . STOWED

TRANSIT Light Off . . . . CHECKED

When the airplane is at rest:

Park Brake . . . . INTERMEDIATE DETENT

#2P. BK Light . . . . .ILLUMINATED STEADY

Information Concerning the Radio-navigation

Do not use the ADF readings when the H.F. radio is transmitting in the range of 2 to 9 MHZ.

Information Concerning the EFIS

Blinking/Blanking of EADI/EHSI/MFD Displays

On airplanes equipped with symbol generator SG-820 and MG-820, blinking or blanking of EADI/EHSI/MFD displays may occur due to overload of the symbol generator.

During approaches, in order to decrease display processor load, avoid the use of the following display modes:

- EHSI Rose with preselect Loc course in Nav source FMS,
- EHSI in Arc with NAV/WR, and/or
- MFD MAP/PLAN with WR.

B-RNAV Operations

Introduction

In order to improve traffic within European airspace (ECAC area), EUROCONTROL establishes new operational criteria for the use of navigation system, designated by basic radio navigation (B-RNAV). First of all on April 23rd, 1998, RNAV capability with 5 NM precision during 95% of the time will be mandatory on all tracks of ATS routes.

Definitions

R-NAV: A method that permits aircraft navigation along any desired flight path within the coverage of either one or several items of data given by different systems.

RNP (Required Navigation Performance): Navigation requiring a track-keeping accuracy equal or better than ±5 NM for 95% of the flight time for the aircraft in the considered airspace.

B-RNAV: Navigation designed by EUROCONTROL for an ECAC area. The main performance requirements for airborne RNAV equipment are:

- navigation precision on path of 5 NM during 95% of flight time (RNP 5 capability ICAO definition).

- necessary coverage provided by satellite or ground-based navigation aids and airborne equipment available during 99.99% of flight time.
- other limitations (see required functions).

B-RNAV Area: Designed routes published by ECAC. To be able to fly within this B-RNAV area, capability of the aircraft must be demonstrated. The operator must refer to overflight country requirements to have limitations (e.g., above FL 245 in French airspace).

B-RNAV Route: A published track which does not use necessary ground-based navigational aids; used by airplanes with RNP 5 navigation requirements.

Use in Operations

Before penetration in B-RNAV area, the crew must check that at least one approved B-RNAV system is operating and placed position-relative to track to the pilot navigation display situated in his primary field of view. Crew must make sure that classic ground-based navigation aids are available.

During all flights in B-RNAV area, accurate classic navigation aids must be selected in order to be able to revert to an alternative route or cross-checked navigation. If GPS is used, periodically monitor RAIM validity.

B-RNAV equipment choice and using procedure are the responsibility of the operator. Only one approved B-NAV equipment is required to fly B-NAV area.

General Operations

- A cross-check must be effective after waypoints entry.
- Aircraft position must be checked before penetration in B-RNAV area.
- Aircraft position must be checked at each waypoint.
- Position relative to track must be checked.

Use of Inertial System

The position must be updated systematically:

- before entering B-RNAV area,
- at least every 2 hours on track,
- before beginning descent, or
- if an important drift is detected.

INS system may be used for a maximum of 2 hours from the last alignment/position update performed on the ground.

> **NOTE:**
> - See AFM for INS limitations.
> - Manual in-flight updating position is not allowed.

GPS Use

After NOTAM GPS consultation, Global Positioning System may be used as B-RNAV stand-alone navigation system if:

- the aircraft is equipped with several systems (e.g., GPS + DME/DME or GPS + INS or FMS with GPS sensors), or
- the aircraft is equipped with an autonomous receiver (GPS stand-alone) with RAIM (Receiver Autonomous Integrity Monitoring); use before the flight an algorithm providing integrity of RAIM function. Make sure that RAIM function will not be lost continuously for 5 minutes or more otherwise the flight must be cancelled or delayed.

> **NOTE:** Where a navigation database is installed, data base validity should be checked before flight (current AIRAC cycle).

FMS Use

FMS position depends on system structure and could be associated with INS systems, GPS, DME/DME, or VOR/DME.

System Failure Procedure

To determine whether the system will keep its B-RNAV capability with one or several functions out of order, the crew must refer to approved documentation (AFM/LMER).

If one B-RNAV system is operating on board continue flight in B-RNAV area.

If failure forbids flight progress in compliance with B-RNAV requirements:

- Before entering B-RNAV area: contact ATC and do not enter in B-RNAV airspace.
- Inside B-RNAV airspace: contact ATC, continue dead reckoning navigation and prepare to join a route with traditional ground-based navigation aids, given by ATC.

Use of GPS stand-alone in the event of loss of the RAIM detection function:

- If loss of the RAIM is detected outside B-RNAV airspace, do not enter in B-RNAV area.
- If loss of the RAIM appears within B-RNAV area, continue GPS navigation and cross-check position with traditional means of navigation.

Standard Operating Procedures

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General Information

SimuFlite strongly supports the premise that the disciplined use of well-developed Standard Operating Procedures (SOP) is central to safe, professional aircraft operations, especially in multi-crew, complex, or high performance aircraft.

If your flight department has an FAA-accepted or approved SOP document, we encourage you to use it during your training. If your flight department does not already have one, we welcome your use of the SimuFlite SOP.

Corporate pilots carefully developed this SOP. A product of their experience, it is the way SimuFlite conducts its flight operations.

Definitions

LH/RH: Pilot Station. Designation of seat position for accomplishing a given task because of proximity to the respective control/indicator. Regardless of PF or PM role, the pilot in that seat performs tasks and responds to checklist challenges accordingly.

PF: Pilot Flying. The pilot responsible for controlling the flight of the aircraft.

PIC: Pilot-in-Command. The pilot responsible for the operation and safety of an aircraft during flight time.

PM: Pilot Monitoring. The pilot who is not controlling the flight of the aircraft.

Flow Patterns

Flow patterns are an integral part of the SOP. Accomplish the cockpit setup for each phase of flight with a flow pattern, then refer to the checklist to verify the setup. Use normal checklists as “done lists” rather than “do lists.”

Flow patterns are disciplined procedures; they require pilots who understand the aircraft systems/controls and who methodically accomplish the flow pattern.

Checklists

Use a challenge-response method to execute any checklist. After the PF initiates the checklist, the PM challenges by first reading out loud the title of the checklist, then reading the checklist item aloud. The PF is responsible for verifying that the items designated as PF or his seat position (i.e., LH or RH) are accomplished and for responding orally to the challenge. Items designated on the checklist as PM or by his seat position are the PM's responsibility. The PM accomplishes an item, then responds orally to his own challenge. In all cases, the response by either pilot is confirmed by the other and any disagreement is resolved prior to continuing the checklist.

After the completion of any checklist, the PM states “_______ checklist is complete.” This allows the PF to maintain situational awareness during checklist phases and prompts the PF to continue to the next checklist, if required.

Effective checklists are pertinent and concise. Use them the way they are written: verbatim, smartly, and professionally.

Omission of Checklists

While the PF is responsible for initiating checklists, the PM should ask the PF whether a checklist should be started if, in his opinion, a checklist is overlooked. As an expression of good crew resource management, such prompting is appropriate for any flight situation: training, operations, or checkrides.

Challenge/No Response

If the PM observes and challenges a flight deviation or critical situation, the PF should respond immediately. If the PF does not respond by oral communication or action, the PM must issue a second challenge that is loud and clear. If the PF does not respond after the second challenge, the PM must ensure the safety of the aircraft. The PM must announce that he is assuming control and then take the necessary actions to return the aircraft to a safe operating envelope.

Abnormal/Emergency Procedures

When any crewmember recognizes an abnormal or emergency condition, the PIC designates who controls the aircraft, who performs the tasks, and any items to be monitored. Following these designations, the PIC calls for the appropriate checklist. The crewmember designated on the checklist accomplishes the checklist items with the appropriate challenge/response.

> **NOTE:** “Control” means responsibility for flight control of the aircraft, whether manual or automatic.

The pilot designated to fly the aircraft (i.e., PF) does not perform tasks that compromise this primary responsibility, regardless of whether he uses the autopilot or flies manually.

Both pilots must be able to respond to an emergency situation that requires immediate corrective action without reference to a checklist. The elements of an emergency procedure that must be performed without reference to the appropriate checklist are called memory or recall items. Accomplish all other abnormal and emergency procedures while referring to the printed checklist.

Accomplishing abnormal and emergency checklists differs from accomplishing normal procedural checklists in that the pilot reading the checklist states both the challenge and the response when challenging each item.

When a checklist procedure calls for the movement or manipulation of controls or switches critical to safety of flight (e.g., throttles, engine fire switches, fire bottle discharge switches), the pilot performing the action obtains verification from the other pilot that he is moving the correct control or switch prior to initiating the action.

Any checklist action pertaining to a specific control, switch, or piece of equipment that is duplicated in the cockpit is read to include its relative position and the action required (e.g., "Left Throttle – IDLE; Left Boost Pump – OFF").

Time Critical Situations

When the aircraft, passengers, and/or crew are in jeopardy, remember three things:

- FLY THE AIRCRAFT – Maintain aircraft control.
- RECOGNIZE CHALLENGE – Analyze the situation.
- RESPOND – Take appropriate action.

Rejected Takeoffs

The aborted takeoff procedure is a pre-planned maneuver; both crewmembers must be aware of and briefed on the types of malfunctions that mandate an abort. Assuming that the crew trains to a firmly established SOP, either crewmember may call for an abort.

The PF normally commands and executes the takeoff abort for directional control problems or catastrophic malfunctions. Additionally, any indication of one of the following malfunctions prior to V_1 is cause for an abort:

- engine failure
- fire
- loss of directional control

In addition to the above, the PF usually executes an abort prior to V_1 for any abnormality observed.

When the PM calls an abort, the PF announces “Abort” or “Continue” and executes the appropriate procedure.

Critical Malfunctions in Flight

In flight, the observing crewmember positively announces a malfunction. As time permits, the other crewmember makes every effort to confirm/identify the malfunction before initiating any emergency action.

If the PM is the first to observe any indication of a critical failure, he announces it and simultaneously identifies the malfunction to the PF by pointing to the indicator/annunciator.

After verifying the malfunction, the PF announces his decision and commands accomplishment of any checklist memory items. The PF monitors the PM during the accomplishment of those tasks assigned to him.

Non-Critical Malfunctions in Flight

Procedures for recognizing and verifying a noncritical malfunction or impending malfunction are the same as those used for time-critical situations: use positive oral and graphic communication to identify and direct the proper response. Time, however, is not as critical and allows a more deliberate response to the malfunction. Always use the appropriate checklist to accomplish the corrective action.

Radio Tuning and Communication

The PM accomplishes navigation and communication radio tuning, identification, and ground communication.

For navigation radios, the PM tunes and identifies all navigation aids. Before tuning the PF's radios, he announces the NAVAID to be set. In tuning the primary NAVAID, in particular, the PM coordinates with the PF to ensure proper selection sequencing with the autopilot mode. After tuning and identifying the PF's NAVAID, the PM announces “(Facility) tuned and identified.”

The Falcon 900 EFIS will only display the NDB needle on the HSI, if adequate signal exists. Therefore, there is no requirement to monitor the signal once identified. Use the marker beacon audio as backup to visual annunciation for marker passage confirmation.

In tuning the VHF radios for ATC communication, the PM places the newly assigned frequency in the head not in use (i.e., preselected) at the time of receipt. After contact on the new frequency, the PM retains the previously assigned frequency for a reasonable time period.

Altitude Assignment

The PM sets the assigned altitude in the altitude alerter and points to the alerter while orally repeating the altitude. The PM continues to point to the altitude alerter until the PF confirms the altitude assignment and alerter setting.

Pre-Departure Briefings

The PIC should conduct a pre-departure briefing prior to each flight to address potential problems, weather delays, safety considerations, and operational issues.

Pre-departure briefings should include all crewmembers to enhance team-building and set the tone for the flight. The briefing may be formal or informal, but should include some standard items. The acronym AWARE works well to ensure that no points are missed. This is also an opportunity to brief the crew on any takeoff or departure deviations from the SOP that are due to weather or runway conditions.

NOTE: The acronym AWARE stands for the following:

- Aircraft status
- Weather
- Airport information
- Route of flight
- Extra

Advising of Aircraft Configuration Change

If the PF is about to make a change to aircraft control or configuration, he alerts the PM to the forthcoming change (e.g., gear, speedbrake, and flap selections). If time permits, he also announces any abrupt flight path changes so there is always mutual understanding of the intended flight path.

Time permitting, a PA announcement to the passengers precedes maneuvers involving unusual deck or roll angles.

Transitioning from Instruments to Visual Conditions

If visual meteorological conditions (VMC) are encountered during an instrument approach, the PM normally continues to make callouts for the instrument approach being conducted. However, the PF may request a changeover to visual traffic pattern callouts.

Phase of Flight SOP

Holding Short

PF		PM	
CALL	" Before Takeoff checklist."		
		ACTION	Complete Before Takeoff checklist.
		CALL	"Before Takeoff checklist complete."

Takeoff Briefing

ACTION Brief the following:

- Assigned Runway for Takeoff
- Initial Heading/Course
- Initial Altitude
- Airspeed Limit (If applicable)
- Clearance Limit
- Emergency Return Plan
- SOP Deviations

Consider the following:

- Impaired Runway Conditions
- Weather
- Obstacle Clearance
- Instrument Departure Procedures
- Abort

Cleared for Takeoff

PF		PM	
		ACTION	Confirm Assigned Runway for Takeoff and Check Heading Indicator Agreement.
		CALL	"Assigned Runway Confirmed, Heading Checked."

Holding Short (continued)

PF		PM	
ACTION	Confirm Assigned Runway for Takeoff and Check Heading Indicator Agreement.		
CALL	“Assigned Runway Confirmed, Heading Checked.”		
CALL	“Takeoff Checklist.”		
		ACTION	Complete Takeoff Checklist.
		CALL	“Takeoff Checklist Complete.”

Takeoff Roll

PF		PM	
Setting Takeoff Power			
CALL	"Max power."	**CALL**	"Max power."
Initial Airspeed Indication			
		CALL	"Airspeed alive."
ACTION	Visually confirm positive IAS indication.		
At 80 KIAS			
		CALL	"80 knots crosscheck."
ACTION	Move left hand to yoke (unless nose wheel steering needed for crosswind).		
CALL	"My yoke."		
		CALL	"Your yoke."
At V_1			
		CALL	"V_1."
ACTION	Move hand from power levers to yoke.		
CALL	"My yoke." (If left hand is still on nose steering wheel.)		
		CALL	"Your yoke."
At V_R			
		CALL	"Rotate."
ACTION	Rotate to a precomputed pitch altitude for takeoff.		

Climb

PF	PM
At Positive Rate of Climb	
	CALL "Positive rate."
Only after PM's call, **CALL** "Gear up."	
	CALL "Gear selected up." When gear indicates up, "Gear indicates up."
After Gear Retraction	
	ACTION Immediately accomplish attitude correlation check. ▪ PF's and PM's ADI displays agree. ▪ Pitch and bank angles are acceptable.
	CALL "Attitudes check." Or, if a fault exists, give a concise statement of the discrepancy.

Climb (continued)

PF		PM	
At V_2 + 25 kt (Min.) and 400 Ft. Above Airport Surface (Min.)			
CALL	"Clean wing."		
		CALL	"Slats + 7° selected." When S + 7 indicated,
		CALL	Clean wing selected, When Slats & Flaps full up,
		CALL	"Indicated"
At 1.5 V_S (Minimum)			
CALL	"Climb power."		
		ACTION	Set climb power.
		CALL	"Climb power set."
At 1,500 ft (Minimum) Above Airport Surface and Workload Permitting			
CALL	"After Takeoff checklist."		
		ACTION	Complete After Takeoff checklist.
		CALL	"After Takeoff checklist."
At Transition Altitude			
CALL	"29.92 set." "Transition Altitude checklist."	**CALL**	"29.92 set."
		ACTION	Complete Transition Altitude checklist.
		CALL	"Transition Altitude checklist complete."

PF	PM
At 1,000 ft Below Assigned Altitude	
	CALL "_____ (altitude) for _____ (altitude)." (e.g., "9,000 for 10,000.")
CALL "_____ (altitude) for _____ (altitude)." (e.g., "9,000 for 10,000.")	

Cruise

PF		PM	
At Cruise Altitude			
CALL	"Cruise checklist."		
		ACTION	Complete Cruise checklist.
		CALL	"Cruise checklist complete."
Altitude Deviation in Excess of 100 ft			
		CALL	"Altitude."
CALL	"Correcting."		
Course Deviation in Excess of One Half Dot			
		CALL	"Course."
CALL	"Correcting."		

Descent

PF		PM	
Upon Initial Descent from Cruise			
CALL	"Descent checklist."		
		ACTION	Complete Descent checklist.
		CALL	"Descent checklist complete."
At 1,000 ft Above Assigned Altitude			
		CALL	"_____ (altitude) for _____ (altitude)." (e.g., "10,000 for 9,000.")
CALL	"_____ (altitude) for _____ (altitude)." (e.g., "10,000 for 9,000.")		
At Transition Level			
CALL	"Altimeter set _____."	**CALL**	"Altimeter set _____."
At 10,000 ft			
		CALL	"10,000 ft."
CALL	"Check. Speed 250 knots."		

Maintain sterile cockpit below 10,000 ft above airport surface.

Descent (continued)

PF	PM

At Appropriate Workload Time

REVIEW	**REVIEW**

Review the following:

- approach to be executed
- FMS consideration
- field elevation
- appropriate minimum sector altitude(s)
- inbound leg to FAF, procedure turn direction and altitude
- final approach course heading and intercept altitude
- timing required
- DA/MDA
- MAP (non-precision)
- VDP
- special procedures (DME step-down, arc, etc.,)
- type of approach lights in use (and radio keying procedures, if required)
- missed approach procedures
- runway information conditions

ACTION Brief the following:

- configuration
- approach speed
- minimum safe altitude
- approach course
- FAF altitude
- DA/MDA altitude
- field elevation
- VDP
- missed approach
  - heading
  - altitude
  - intentions
- abnormal implications

Accomplish as many checklist items as possible. The Approach checklist must be completed prior to the initial approach fix.

Precision Approach

PF		PM	
Prior to Initial Approach Fix			
CALL	"Approach checklist."		
		ACTION	Complete Approach checklist up to slat and flap selection.
CALL	"Slats and flaps 7."		
		CALL	"Slats and flaps selected 7." When slats light is on and flaps indicate 7 degrees, "Slats and flaps indicate 7."
CALL	"Slats and flaps 20."		
		CALL	"Slats and flaps selected 20." When slats light is on and flaps indicate 20 degrees, "Slats and flaps indicate 20."
After Initial Convergence of Course Deflection Bar			
CALL	"Localizer/course alive."	**CALL**	"Localizer/course alive."
At initial Downward Movement of Glideslope Raw Data Indicator			
CALL	"Glideslope alive."	**CALL**	"Glideslope alive."
When Annunciators Indicate Localizer Capture			
CALL	"Localizer captured."	**CALL**	"Localizer captured."

Precision Approach (continued)

PF		PM	
At One Dot From Glideslope Intercept			
		CALL	"One dot to go."
CALL	"Gear down."		
		CALL	"Gear selected down." When gear indicates down, "Gear indicates down."
CALL	"Landing checklist."		
		ACTION	Complete Landing checklist except for full flaps and autopilot/yaw damper.
When Annunciator Indicates Glideslope Capture			
CALL	"Glideslope captured."	**CALL**	"Glideslope captured."
CALL	"Slats and flaps 40."		
		CALL	"Slats and flaps selected 40." When slats light is on and flaps indicate 40 degrees, "Slats and flaps indicate 40."

If the VOR on the PM's side is used for crosschecks on the intermediate segment, the PM's localizer and glideslope status calls are accomplished at the time when the PM changes to the ILS frequency. This should be no later than at completion of the FAF crosscheck, if required. The PM should tune and identify his NAV radios to the specific approach and monitor.

Precision Approach (continued)

PF	PM
At FAF	
CALL "Outer marker." or "Final fix."	
	ACTION ▪ Start timing. ▪ Visually crosscheck that both altimeters agree with crossing altitude. ▪ Set missed approach altitude in altitude alerter. ▪ Check PF and PM instruments. ▪ Call FAF inbound.
	CALL "Outer marker." or "Final fix." "Altitude checks."
At 1,000 ft Above DA(H)	
	CALL "1,000 ft to minimums."
CALL "Check."	

Precision Approach (continued)

PF	PM
At 500 ft Above DA(H)	
	CALL “500 ft to minimums.”
CALL “Check.”	

> **NOTE:** An approach window has the following parameters:
> - within one dot deflection, both LOC and GS
> - IVSI less than 1,000 fpm
> - IAS within V_{AP} ± 10 kt (no less than V_{REF} or 0.6 AOA, whichever is less)
> - no flight instrument flags with the landing runway or visual references not in sight
> - landing configuration, except for full flaps (non-precision or single engine approaches)
>
> When within 500 ft above touchdown, the aircraft must be within the approach window. If the aircraft is not within this window, a missed approach must be executed.

PF	PM
At 200 ft Above DA(H)	
	CALL “200 ft to minimums.”
CALL “Check.”	
At 100 ft Above DA(H)	
	CALL “100 ft to minimums.”
CALL “Check.”	

Precision Approach (continued)

PF		PM	
At point Where PM Sights Runway or Visual References			
		CALL	"Runway (or visual reference) ____ o'clock."
CALL	"Going visual. Land." or "Missed approach."		
		ACTION	As PF goes visual, PM transitions to instruments.
At DA(H)			
		CALL	"Minimums. Runway (or visual reference) ____ o'clock."
ACTION	Announce intentions.		
CALL	"Going visual. Land." or "Missed approach."		
		ACTION	As PF goes visual, PM transitions to instruments.

Precision Missed Approach

PF		PM	
At DA(H)			
		CALL	"Minimums. Missed approach."
CALL	"Missed Approach."		
ACTION	Apply power firmly and positively. Activate go-around mode and initially rotate the nose to the flight director go-around altitude.	**ACTION**	Assist PF in setting power for go-around.
CALL	"Slats and flaps 20."		
		CALL	"Slats and flaps selected 20." When flaps indicate 20 degrees, "Slats and flaps indicate 20."
At Positive Rate of Climb			
		CALL	"Positive rate."
CALL	"Gear up."		
		CALL	"Gear selected up." When gear indicates up, "Gear indicates up."
		ACTION	Announce heading and altitude for missed approach.
At V_{REF} +25 and 400 ft Above Airport Surface			
		CALL	"Clean wing." When slats light is out and flaps indicate UP, "Clean wing."
CALL	"Clean wing."		

Precision Missed Approach (continued)

PF		PM	
At 1,500 ft (Minimum) Above Airport Surface and Workload Permitting			
CALL	“After Takeoff checklist.”		
		ACTION	Complete After Takeoff checklist.
		CALL	“After Takeoff checklist complete.”

Precision Approach Deviations

PF	PM
± One Half Dot – Glideslope	
	CALL "One half dot (*high, low*) and (*increasing, holding, decreasing*)."
CALL "Correcting."	
± One Half Dot – Localizer	
	CALL "One half dot (*right, left*) and (*increasing, holding, decreasing*)."
CALL "Correcting."	
V_{AP} ± ____________	
	CALL "Speed (*plus or minus*) _____ (knots) and (*increasing, holding, decreasing*)."
CALL "Correcting."	
At or Below V_{REF}	
	CALL "V_{REF}." or "V_{REF} minus _____ (*knots below V_{REF}*)."
CALL "Correcting."	
Rate of Descent Exceeds 1,000 FPM	
	CALL "Sink _____ (amount) hundred and (*increasing, holding, decreasing*)."
CALL "Correcting."	

Non-Precision Approach

PF		PM	
Prior to Initial Approach Fix			
CALL	"Approach checklist."		
		ACTION	Complete Approach checklist except for flaps and slats.
		CALL	"Approach checklist complete."
CALL	"Slats and flaps 7."		
		CALL	"Slats and flaps selected 7." When slats light is on and flaps indicate 7 degrees, "Slats and flaps indicate 7."
CALL	"Slats and flaps 20."		
		CALL	"Slats and flaps selected 20." When slats light is on and flaps indicate 20 degrees, "Slats and flaps indicate 20."
At Initial Convergence of Course Deviation Bar			
CALL	"Localizer/course alive."	**CALL**	"Localizer/course alive."
When Annunciators Indicate Course Capture			
CALL	"Localizer/course captured."	**CALL**	"Localizer/course captured."

Non-Precision Approach (continued)

PF		PM	
Prior to FAF			
		CALL	"_____ (number) miles/minutes from FAF."
CALL	"Gear down."		
		CALL	"Gear selected down." When gear indicates down, "Gear indicates down."
CALL	"Landing checklist."		
		ACTION	Complete Landing checklist except for full slats and flaps, and autopilot/yaw damper.
At FAF			
CALL	"Outer marker." or "Final fix."	**CALL**	"Outer marker." or "Final fix."
		ACTION	■ Start timing. ■ Visually crosscheck that both altimeters agree. ■ Set MDA (or nearest 100 ft above) in altitude alerter. ■ Check PF and PM instruments. ■ Call FAF inbound.
		CALL	"Altimeters check."

Non-Precision Approach (continued)

PF	PM
At 1,000 ft Above MDA	
	CALL "1,000 ft to minimums."
CALL "Check."	
At 500 ft Above MDA	
	CALL "500 ft to minimums."
CALL "Check."	

NOTE: An approach window has the following parameters:

- within one dot CDI deflection or 5 degrees bearing
- IVSI less than 1,000 fpm
- IAS within V_{AP} ± 10 kt (no less than V_{REF} or 0.6 AOA, whichever is less)
- no flight instrument flags with the landing runway or visual references not in sight
- landing configuration, except for full flaps (non-precision or engine inoperative approaches)

When within 500 ft above touchdown, the aircraft must be within the approach window. If the aircraft is not within this window, a missed approach must be executed.

PF	PM
At 200 ft Above MDA	
	CALL "200 ft to minimums."
CALL "Check."	
At 100 ft Above MDA	
	CALL "100 ft to minimums."
CALL "Check."	

Non-Precision Approach (continued)

PF		PM	
At MDA			
		CALL	"Minimums. _____ (time) to go." or "Minimums. _____ (distance) to go."
CALL	"Check."		
At Point Where PM Sights Runway or Visual References			
		CALL	"Runway (or visual reference) _____ o'clock."
CALL	"Going visual. Land Flaps 40º." or "Missed approach."		

Non-Precision Missed Approach

PF		PM	
At MAP			
		CALL	"Missed approach point. Missed approach."
CALL	"Missed approach."		
ACTION	Apply power firmly and positively. Activate go-around mode and initially rotate the nose to the flight director go-around attitude.	**ACTION**	Assist PF in setting power for go-around.
CALL	"Slats and flaps 7."	**CALL**	"Slats and flaps selected 7." When flaps indicate 7 degrees, "Slats and flaps indicate 7."
At Positive Rate of Climb			
		CALL	"Positive rate."
CALL	"Gear up."		
		CALL	"Gear selected up." When gear indicates up, "Gear indicates up."
		ACTION	Announce heading and altitude for missed approach.

Non-Precision Missed Approach (continued)

PF		PM	
At V_{REF} + 25 and 400 ft Above Airport Surface (Minimum)			
CALL	"Clean wing."		
		CALL	"Clean wing." When slats light is out and flaps indicate UP, "Clean wing."
At 1,500 ft (Minimum) Above Airport Surface and Workload Permitting			
CALL	"After Takeoff checklist."		
		ACTION	Complete After Takeoff checklist.
		CALL	"After Takeoff checklist complete."

Non-Precision Approach Deviations

PF		PM	
± One Dot – Localizer/VOR			
		CALL	"One dot (*right, left*) and (*increasing, holding, decreasing*)."
CALL	"Correcting."		
± 5 Degrees At or Beyond Midpoint for NDB Approach			
		CALL	"_____ (degrees off course) (*right, left*) and (*increasing, holding, decreasing*)."
CALL	"Correcting."		
V_{AP} ± ____________			
		CALL	"Speed (*plus or minus*) _____ and (*increasing, holding, decreasing*)."
CALL	"Correcting."		
At or Below V_{REF}			
		CALL	"V_{REF}." or V_{REF} minus _____ (*knots below V_{REF}*)."
CALL	"Correcting."		
Rate of Descent Exceeds 1,000 FPM of Briefed Rate			
		CALL	"Sink _____ (amount) hundred and (*increasing, holding, decreasing*)."
CALL	"Correcting."		

Visual Traffic Patterns

PF		PM	
Before Pattern Entry/Downwind (1,500 ft Above Airport Surface)			
CALL	"Approach checklist."		
		ACTION	Complete Approach checklist to slats and flaps.
		CALL	"Approach checklist complete."
CALL	"Slats and flaps 7."		
		CALL	"Slats and flaps selected 7." When slats light is on and flaps indicate 7 degrees, "Slats and flaps indicate 7."
CALL	"Slats and flaps 20."		
		CALL	"Slats and flaps selected 20." When slats light is on and flaps indicate 20 degrees, "Slats and flaps indicate 20."

Visual Traffic Patterns (Continued)

PF		PM	
Downwind			
CALL	“Gear down.”		
		CALL	“Gear selected down.” When gear indicates down, “Gear indicates down.”
CALL	“Landing checklist.”		
		ACTION	Complete Landing checklist except for full slats and flaps.
At 1,000 ft Above Airport Surface			
		CALL	“1,000 ft AGL.”
CALL	“Check.”		
At 500 ft Above Airport Surface			
		CALL	“500 ft AGL.”
CALL	“Check.”		
At 200 ft Above Airport Surface			
		CALL	“200 ft AGL.”
CALL	“Check.”		

Landing

PF		PM	
Landing Assured (At Point on Approach When PF Sights Runway and Normal Landing Can be Made)			
CALL	"Going visual. Land. Slats and flaps 40."		
		CALL	"Slats and flaps selected 40." When flaps indicate 40 degrees, "Slats and flaps indicate 40."
ACTION	Push autopilot disconnect switch.	**ACTION**	Continue with: - speed check - vertical speed check - callouts - gear down verification - flap verification
CALL	"Autopilot off."		
		CALL	"Final gear and slats and flaps recheck." "Before Landing checklist complete."
At 100 ft Above Touchdown			
		CALL	"100 ft."
At 50 ft Above Touchdown			
		CALL	"50 ft."

Landing (continued)

PF	PM

At Touchdown

CALL "Airbrake position."

ACTION Extend airbrakes to position 2.

CALL "Airbrake position 2."

At Thrust Reverser Deployment

CAUTION: Nose wheel should be firmly on the ground and steering should be depressed before attempting to deploy the thrust reverser.

CALL "Reverser deployed."

At 80 KIAS

CALL "80 knots."

Maneuvers

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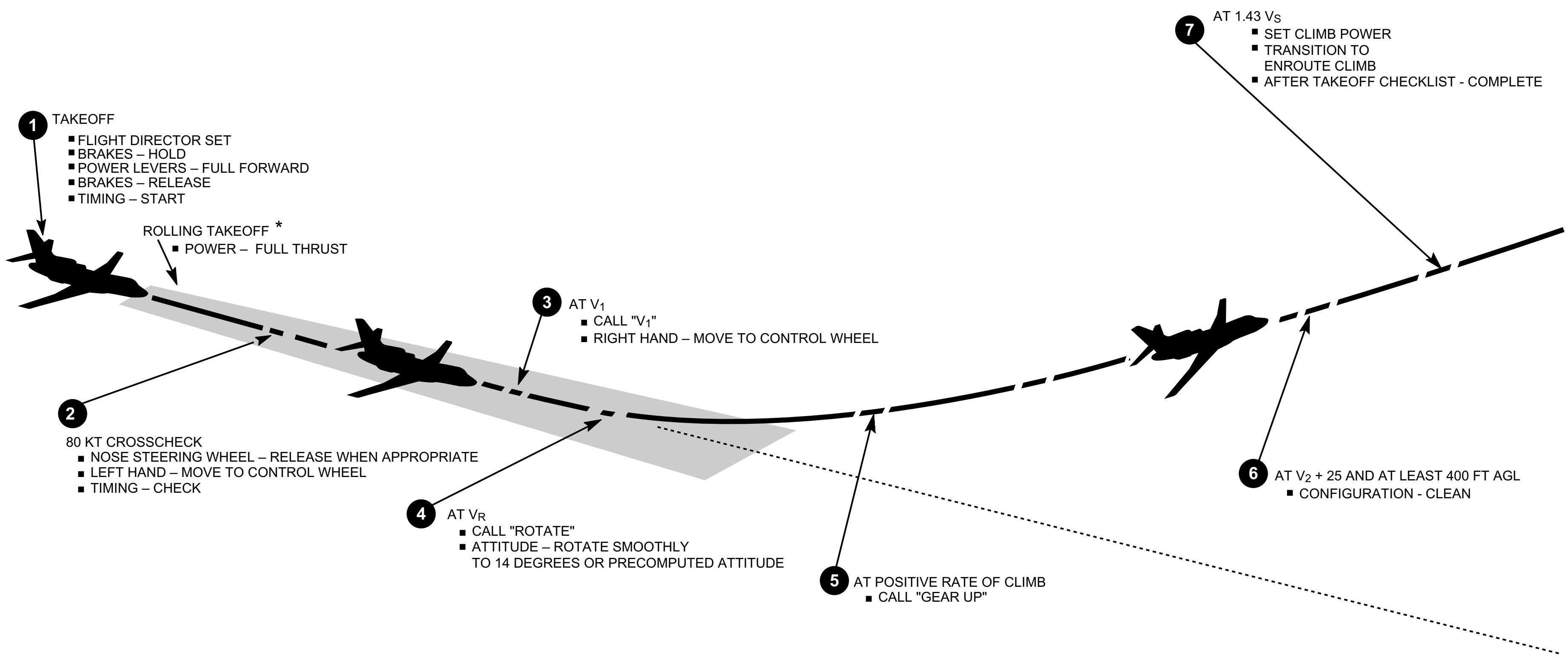
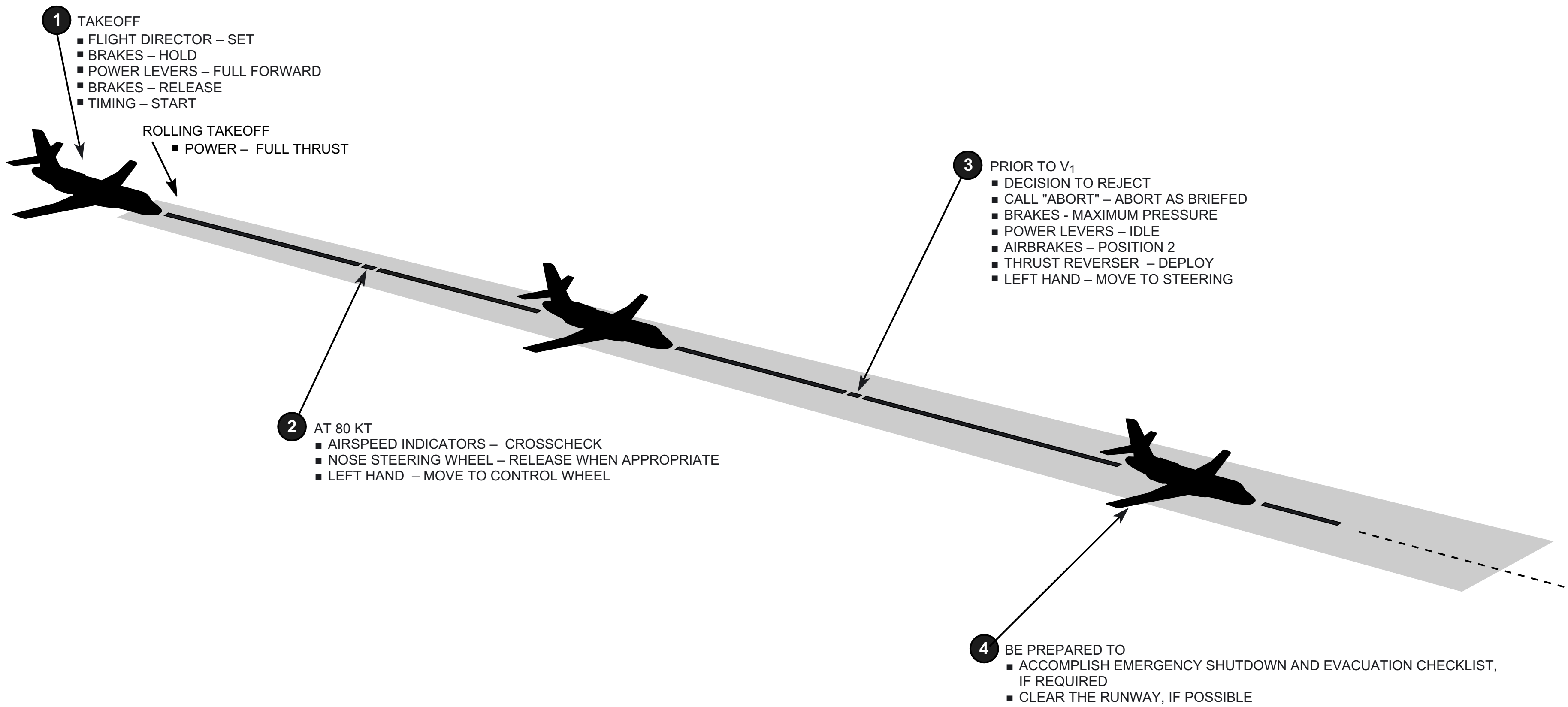
Normal Takeoff

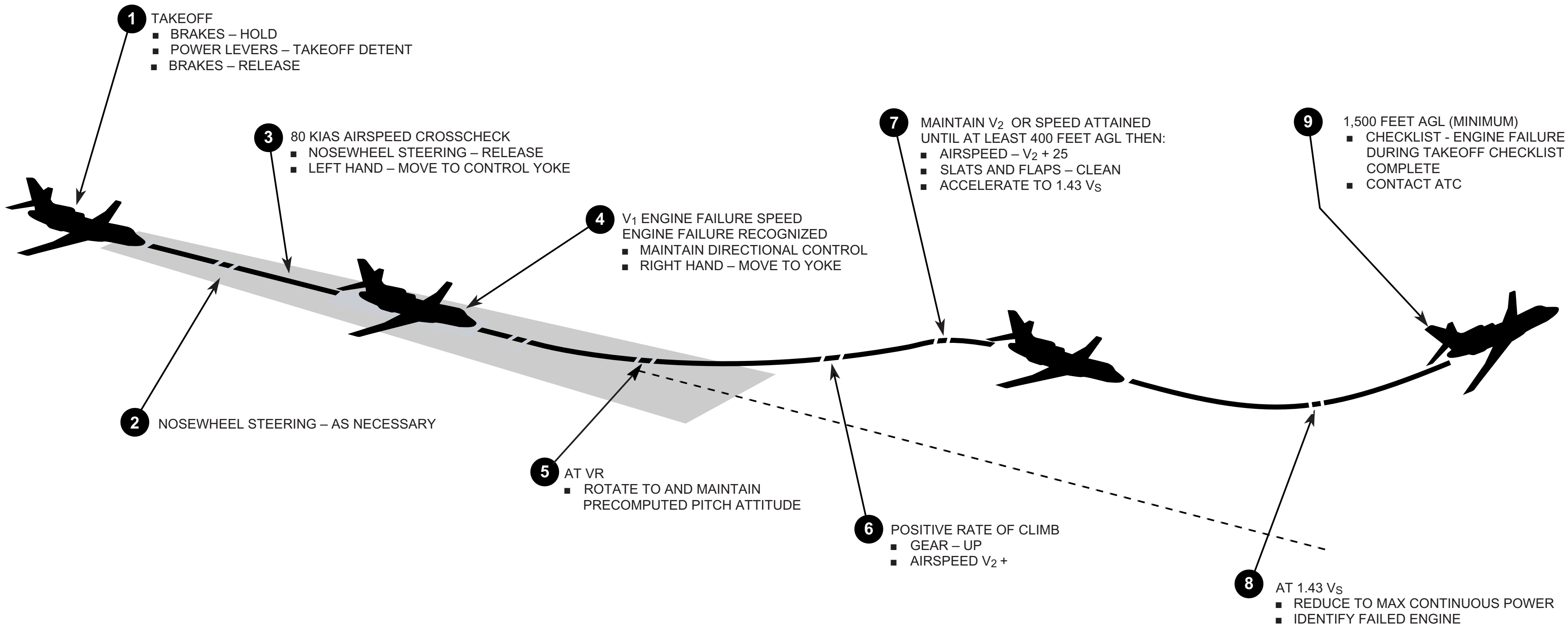


* NOTE: ROLLING TAKEOFF
THE AFM DOES NOT PRESENT ROLLING TAKEOFF DATA. HOWEVER, THE TAKEOFF WILL MEET RUNWAY REQUIREMENTS IF FULL TAKEOFF THRUST IS ACHEIVED AT A POINT WHERE THE REMAINING RUNWAY IS GREATER THAN THE BALANCED FIELD LENGTH REQUIRED.

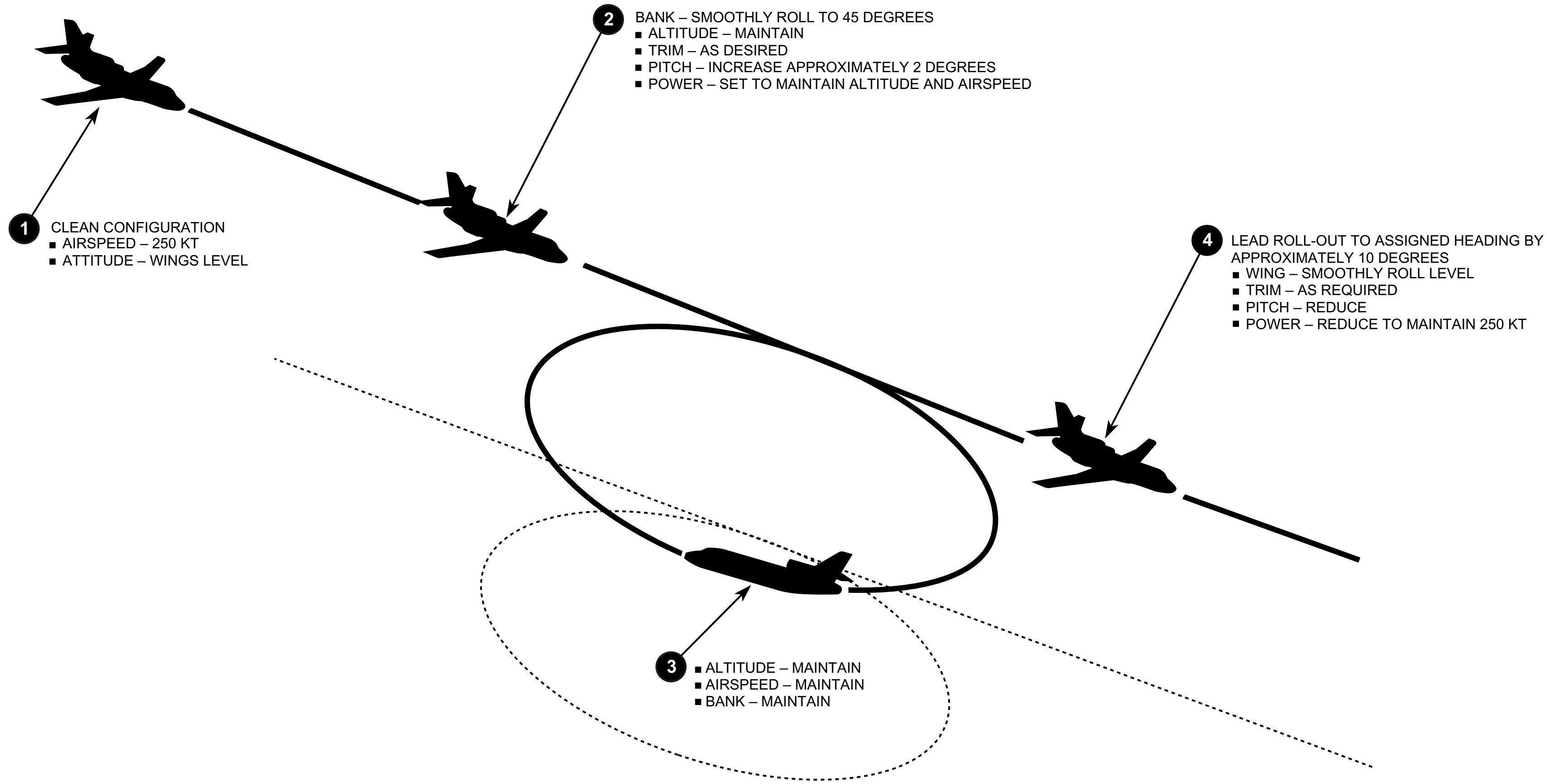
Rejected Takeoff



Takeoff with Engine Failure After V_1



Steep Turns



THIS MANEUVER MAY BE USED FOR A 180 OR 360 DEGREES TURN, AND MAY BE FOLLOWED BY A REVERSAL IN THE OPPOSITE DIRECTION.

TOLERANCES
- SPEED ± 10 KT
- ALTITUDE ± 100 FEET
- BANK ± 5 DEGREES
- HEADING ± 10 DEGREES

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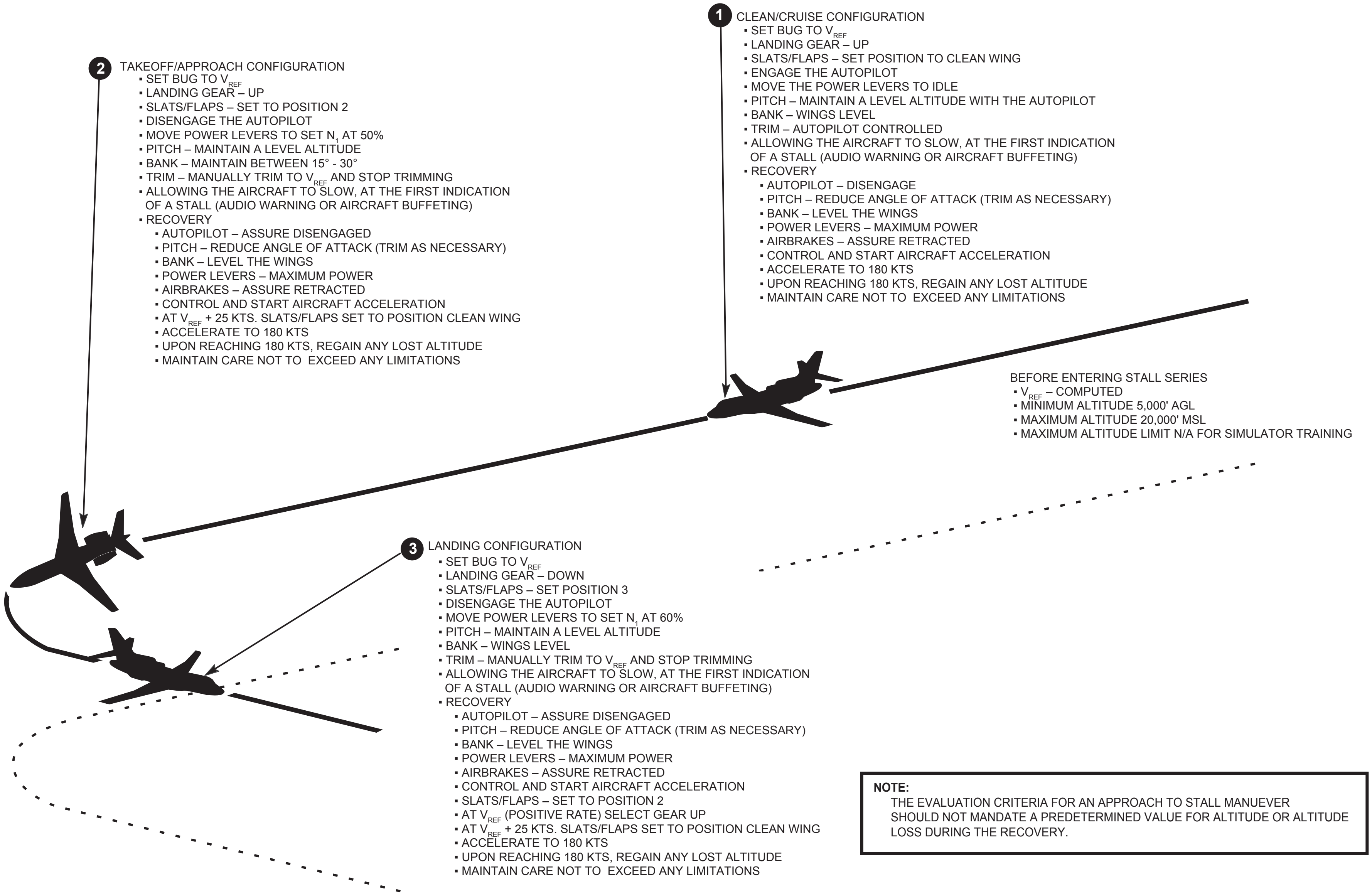
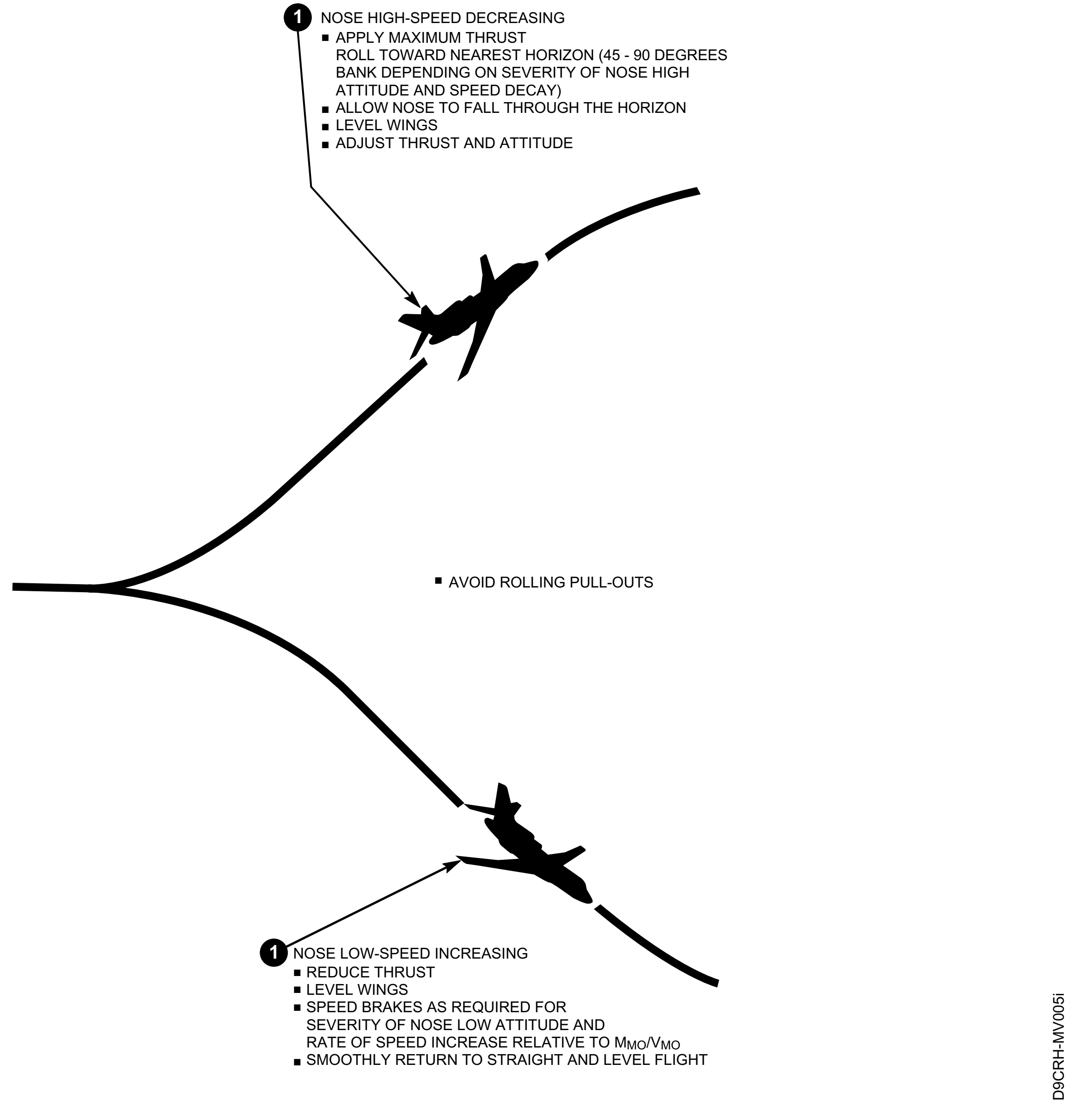
Stall Series

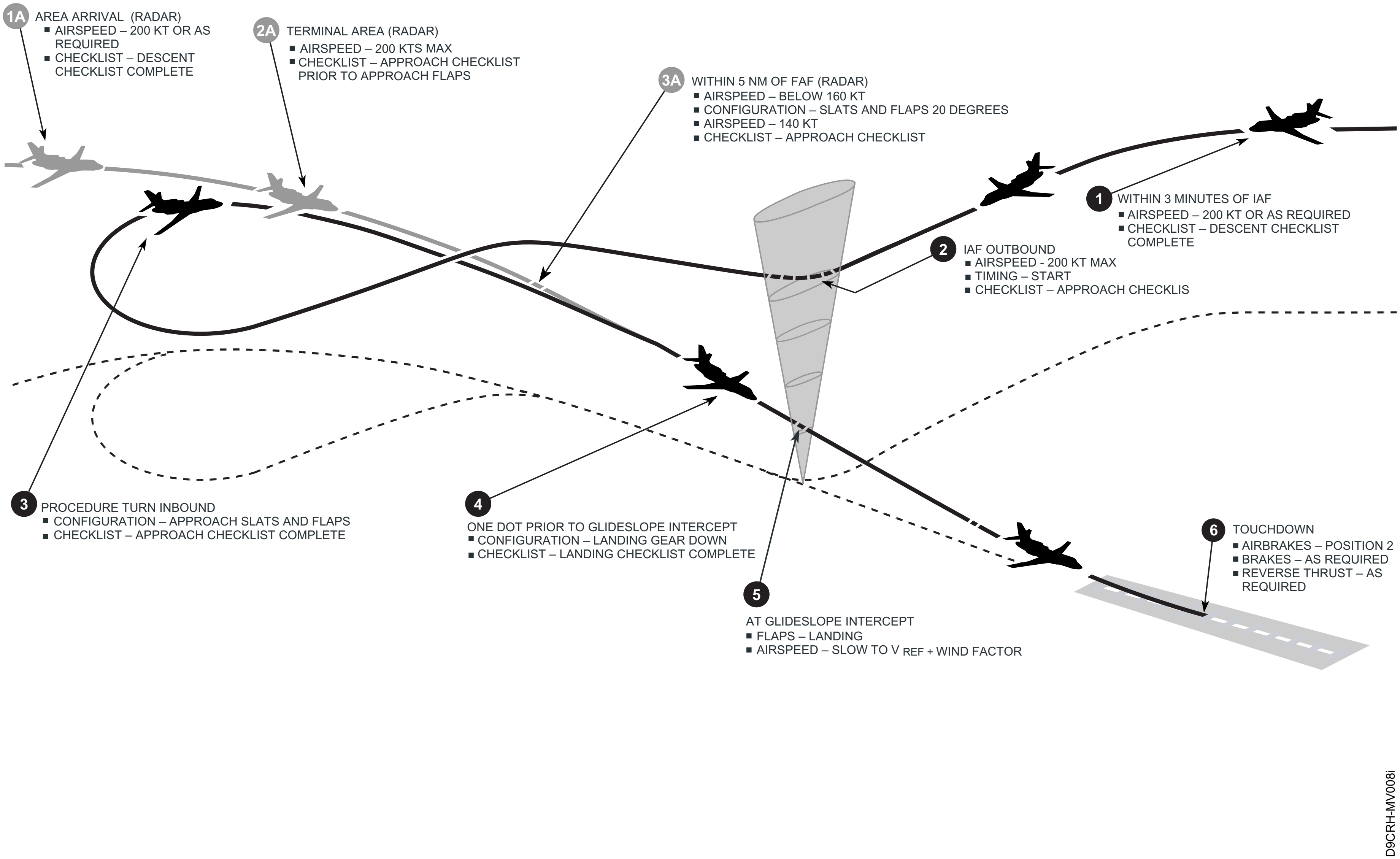


NOTE:
THE EVALUATION CRITERIA FOR AN APPROACH TO STALL MANUEVER SHOULD NOT MANDATE A PREDETERMINED VALUE FOR ALTITUDE OR ALTITUDE LOSS DURING THE RECOVERY.

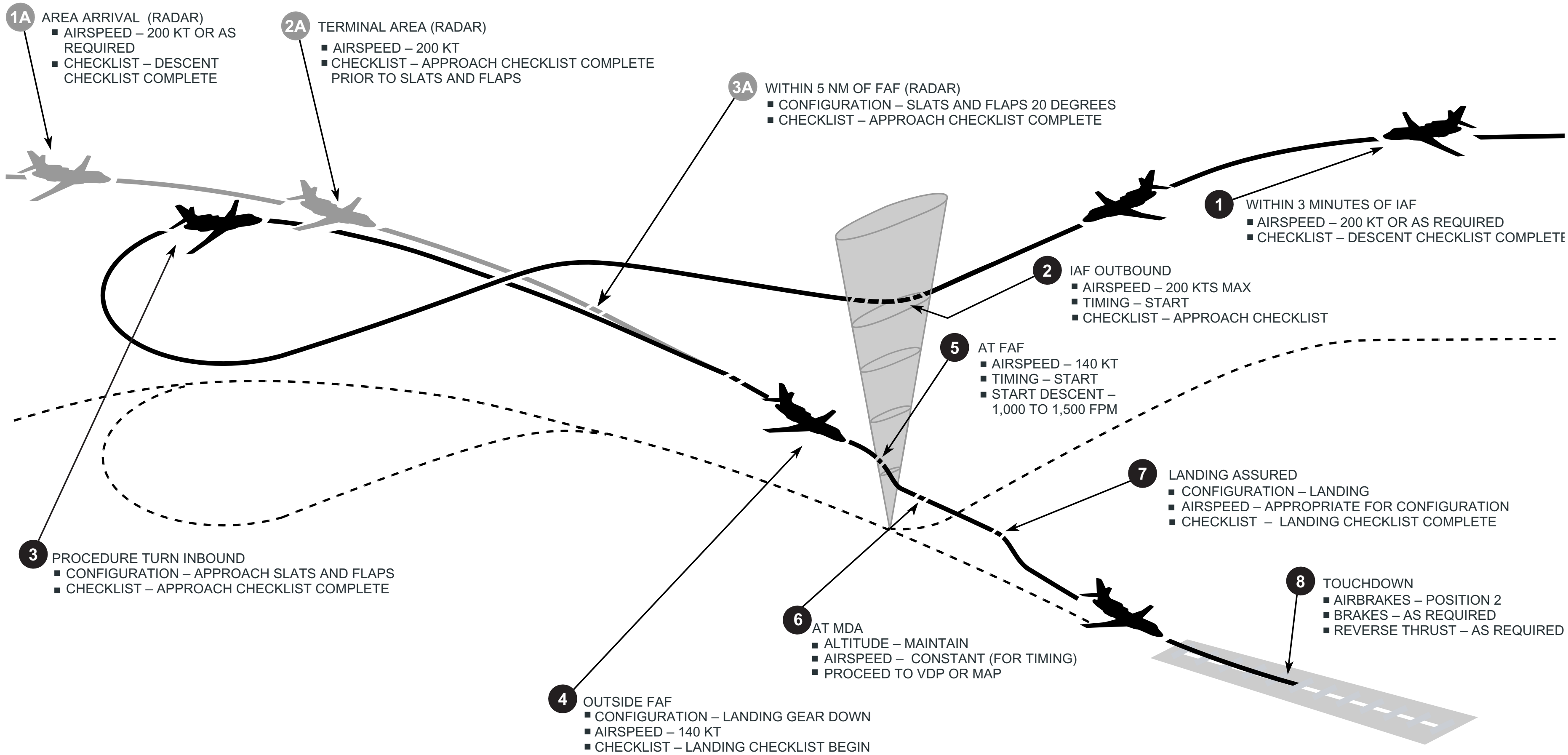
Recovery from Unusual Attitudes



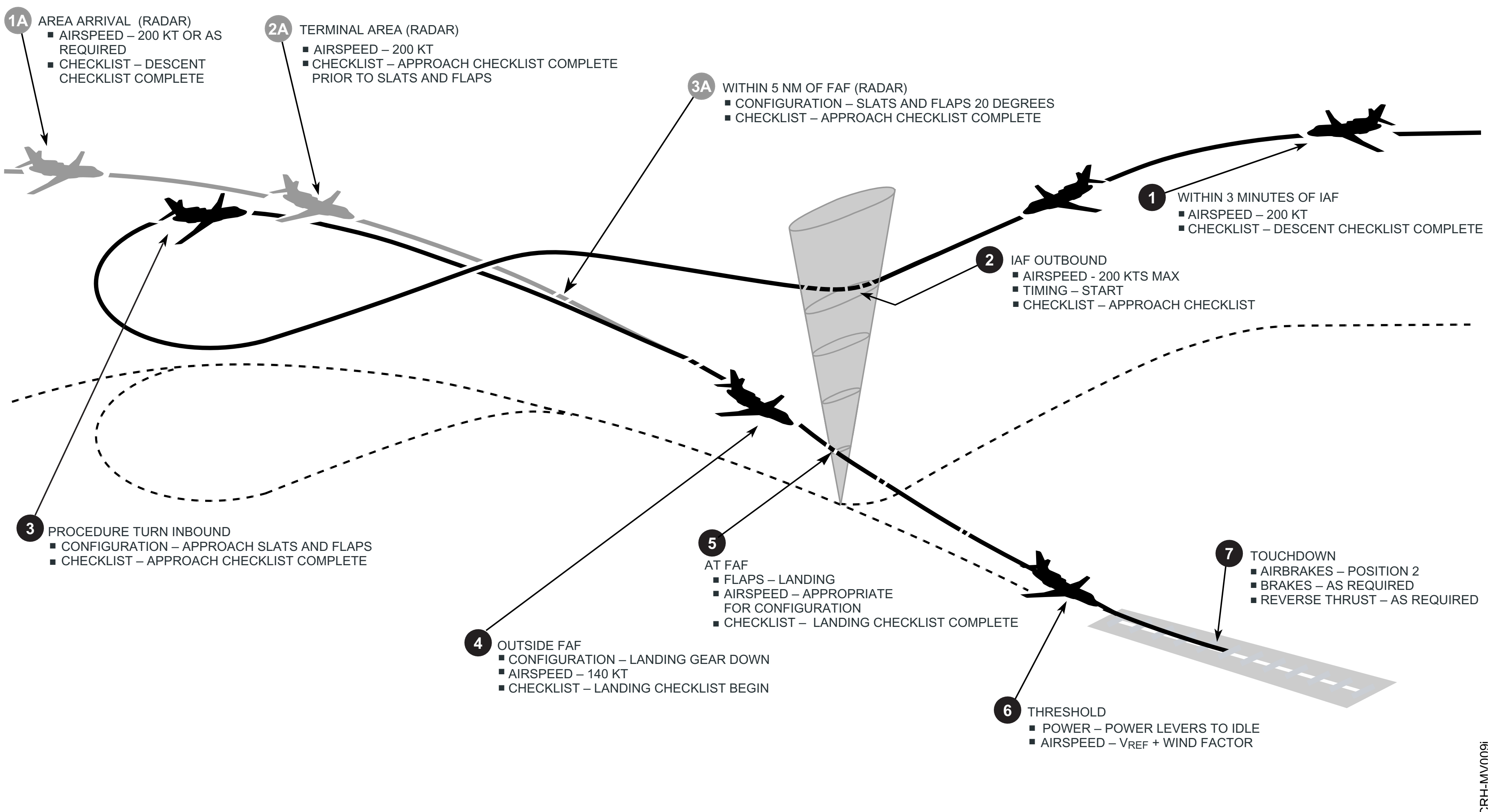
Precision Approach and Landing



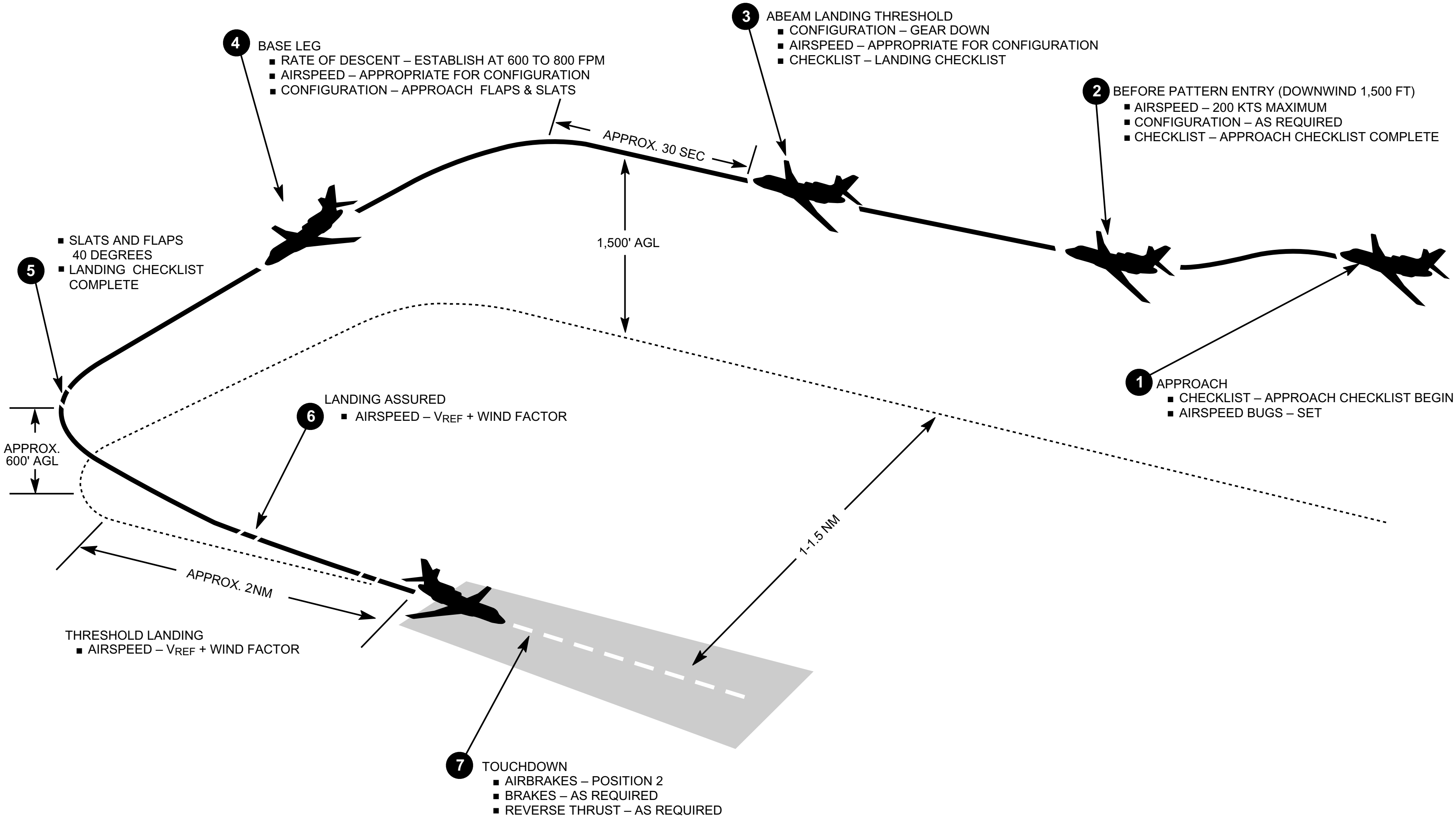
Non-Precision Approach and Landing



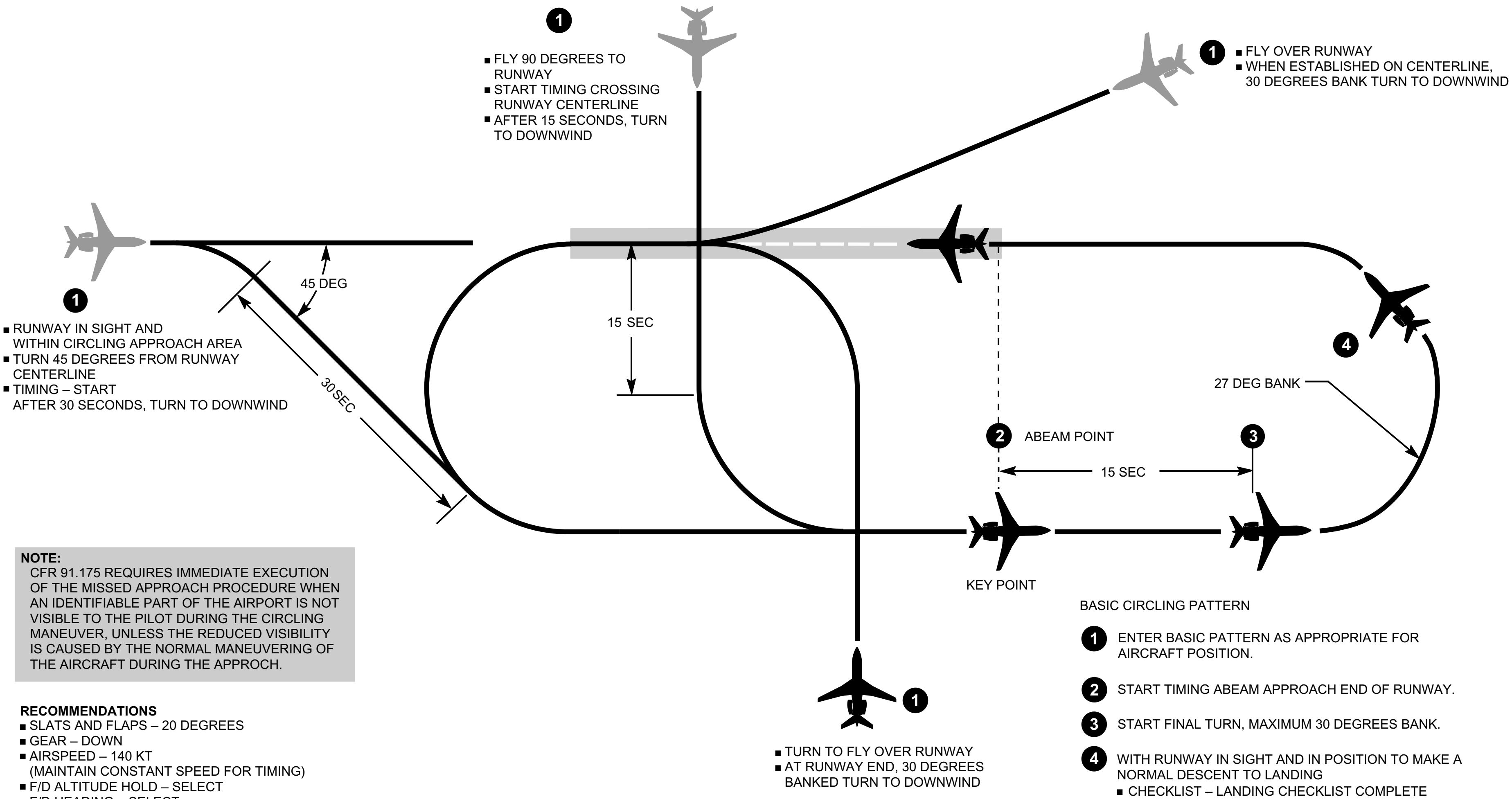
Non-Precision Approach and Landing (Constant Rate Descent)



Visual Approach and Landing



Circling Approach and Landing



NOTE:
CFR 91.175 REQUIRES IMMEDIATE EXECUTION OF THE MISSED APPROACH PROCEDURE WHEN AN IDENTIFIABLE PART OF THE AIRPORT IS NOT VISIBLE TO THE PILOT DURING THE CIRCLING MANEUVER, UNLESS THE REDUCED VISIBILITY IS CAUSED BY THE NORMAL MANEUVERING OF THE AIRCRAFT DURING THE APPROCH.

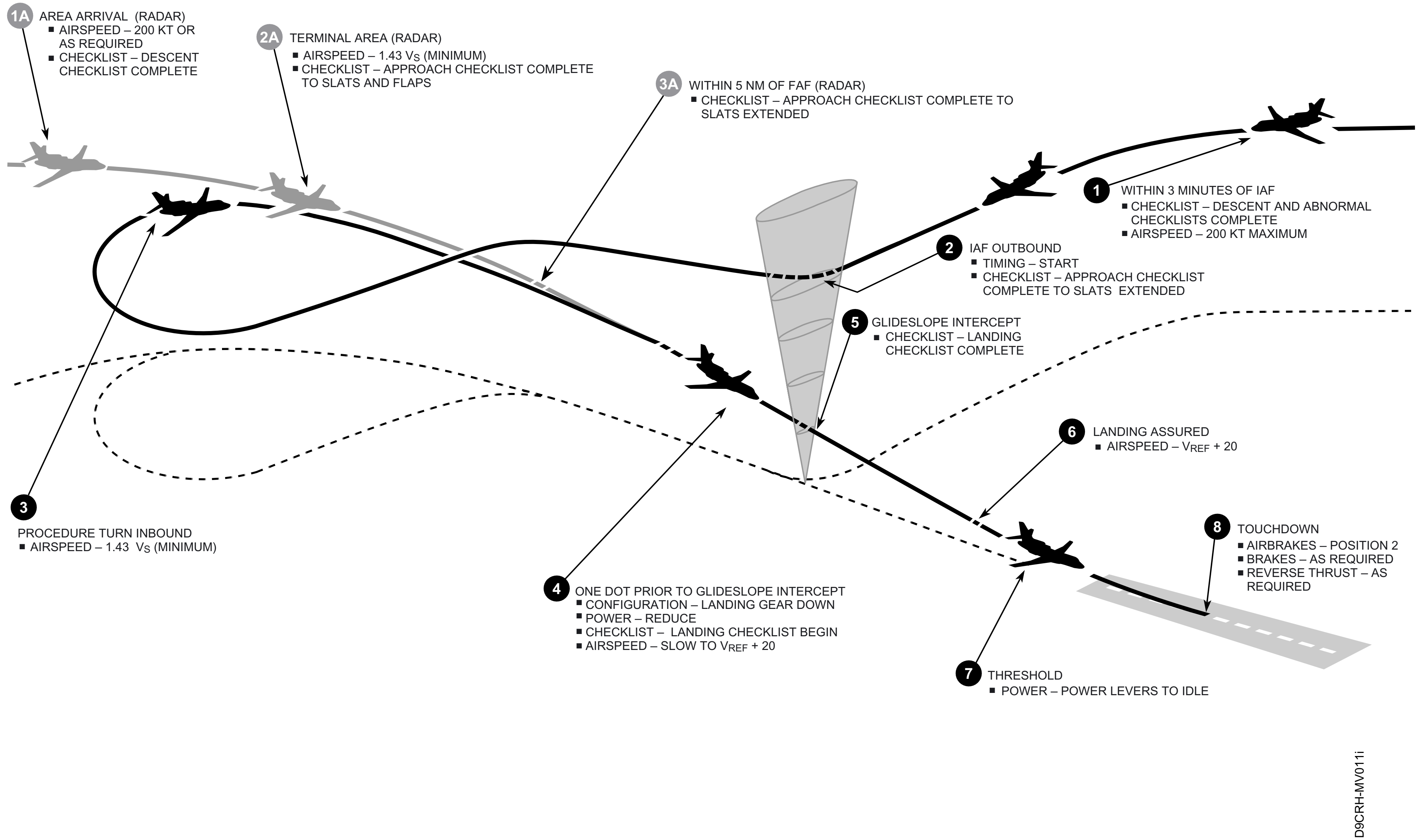
RECOMMENDATIONS
- SLATS AND FLAPS – 20 DEGREES
- GEAR – DOWN
- AIRSPEED – 140 KT (MAINTAIN CONSTANT SPEED FOR TIMING)
- F/D ALTITUDE HOLD – SELECT
- F/D HEADING – SELECT
- USE OF AUTOPILOT IS AS PER AFM GUIDELINES
- SLIGHT ADJUSTMENTS TO TIME OR HEADING MAY BE MADE TO ADJUST FOR WIND

BASIC CIRCLING PATTERN

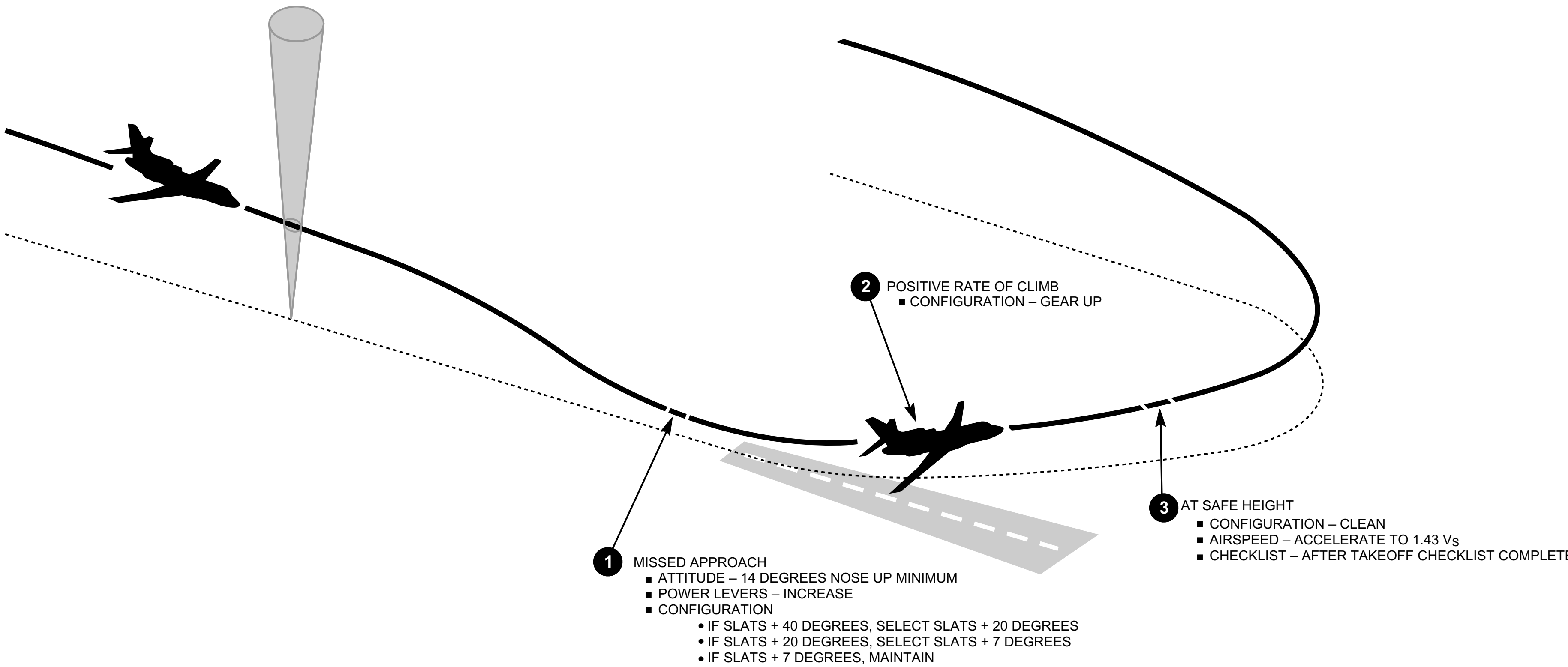
1. ENTER BASIC PATTERN AS APPROPRIATE FOR AIRCRAFT POSITION.
2. START TIMING ABEAM APPROACH END OF RUNWAY.
3. START FINAL TURN, MAXIMUM 30 DEGREES BANK.
4. WITH RUNWAY IN SIGHT AND IN POSITION TO MAKE A NORMAL DESCENT TO LANDING
   - CHECKLIST – LANDING CHECKLIST COMPLETE
   - DESCENT FROM MDA – BEGIN
   - SLATS AND FLAPS – 40 DEGREES
   - AIRSPEED – V_{REF} + WIND FACTOR
   - IF NOT IN A POSITION TO MAKE A NORMAL LANDING, GO-AROUND – EXECUTE
   - AT THRESHOLD, AIRSPEED – V_{REF} + WIND FACTOR.

D9CRH-MV015i

No-Flap Approach and Landing



Go-Around / Balked Landing



Limitations

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General Limitations

Authorized Operations

This airplane is certificated in the transport category and is eligible for the following kinds of operations when the appropriate instruments and equipment required by the airworthiness and/or operating regulations are installed and approved and are in operable condition:

- Day and night VFR.
- IFR and automatic approaches to CAT I and II weather minimums.
- Extended overwater.
- Icing conditions.
- The overflight of polar regions is limited to north and south latitudes less than 85°.

RVSM

Reduced Vertical Separation Minimum (RVSM) requirements are met, provided the airplane complies with S8 F900-186.

In addition to S8 F900-186, specific approval from the registration Authority is needed prior to RVSM operation.

Minimum Equipment List for RVSM operations is provided in MYSTERE-FALCON 900 MMEL:

For DGAC-registered airplanes . . . . REVISION 6 or later

Other registration . . . . Refer to the appropriate authorities

B-RNAV

Basic RNAV (B-RNAV) operation requirements are met, provided the airplane is equipped with:

- FMS HONEYWELL FMZ 2000

and no DR or DGRAD is present on FMS CDU, and it has one of the following navigation modes:

- GPS type HG 2021 GB/GD
- DME/DME
- VOR/DME
- IRS (2-hour time limit after last IRS alignment).

> **NOTE:** When GPS remains the unique means of B-RNAV navigation source (GPS ° stand-alone), use of GPS Integrity Monitoring (RAIM) Prediction program is mandatory before B-RNAV operation.

> **NOTE:** At least one VOR/DME must be available as NAV source (DC820) on PFD.

RNP10

In accordance with FAA Order 8400.12A, paragraph 12b, RNP10 airworthiness requirements are met, provided the airplane is equipped with dual operative:

- FMS NZ2000 software 4.1 or later and either of the following modes:
  - GPS
  - IRS (6.2 hours after last alignment or 5.7 hours after radio updating).

This does not constitute an operational approval.

> **NOTE:** DME/DME and VOR/DME FMS navigation modes are B-RNAV/RNP5 approved and, therefore, are RNP10 compliant under radio navaids coverage.

Number of Occupants

Minimum Flight Crew

The minimum crew is one pilot and one copilot.

Maximum Passengers

The total number of persons carried shall not exceed nineteen (19), nor that for which approved seating accommodation is provided.

Noise Levels

ICAO Annex 16 Requirements

The noise levels of the airplane are no greater than the noise limits prescribed in ICAO, Annex 16, Volume 1, Part 2, Chapter 3.

The noise levels in **Table 3-A** are measured and demonstrated in accordance with ICAO Annex 16, Volume 1, Appendix 2 (1^{st} edition 1981).

FAR 36 Requirements

The noise levels of the airplane (**see Table 3-A**) are in accordance with FAR, part 36, Amdt 36-12 (June 29, 1981) and are no greater than the Stage 3 noise limits.

Noise Reference Point	Noise Levels (EPNdB)	Noise Limits (EPNdB)
Point A (Takeoff) – With cut-back	78.9	89
Point B (Approach)	91.7	98
Line C (Sideline)	91.2	94

Table 3-A; Falcon 900B Noise Levels

Performance Conditions For Noise Levels

Compliance with ICAO, Annex 16, Chapter 3 and with FAR, part 36, Amdt 36-12 (June 29, 1981) was shown with the following procedures:

- Takeoff configuration: 20° FLAPS + SLATS at a weight of 45,500 lb (20,633 kg). Specific cutback conditions for measuring point A are:
  - Level flight, one engine inoperative.
  - Height H = 1,800 ft.
  - N_1 reduction: 16%.
- Approach configuration: 40° FLAPS + SLATS at a weight of 42,000 lb (19,051 kg)

Operational Limitations

Weight Limitations

On aircraft without SB F900-139:

Maximum Ramp Weight . . . . 45,700 lb (20,730 kg)

Maximum Takeoff Weight . . . . 45,500 lb (20,639 kg)

Maximum Landing Weight . . . . 42,000 lb (19,051 kg)

> **NOTE:** In case of landing at a weight beyond the maximum landing weight, read and record the vertical speed at touchdown.

Maximum Zero Fuel Weight. . . . . 28,220 lb (12,800 kg)

Minimum Flight Weight . . . . 20,700 lb (9,390 kg)

On aircraft with SB F900-139:

Maximum ramp weight. . . . . 46,700 lb (21,183 kg)

Maximum takeoff weight . . . . 46,500 lb (21,092 kg)

Maximum landing weight . . . . 42,000 lb (19,051 kg)

NOTE: In case of landing at a weight beyond the Maximum landing weight, read and record the vertical speed at touchdown.

Maximum zero fuel weight . . . . 30,870 lb (14,000 kg)

Minimum flight weight . . . . 20,700 lb (9,390 kg)

Limitations Due to Performance

The maximum takeoff weight and the maximum landing weight given as structural limitations may have to be reduced to comply with performance and operating requirements (refer to AFM, page 1-05-1).

Datum

The zero moment is 23.44 inches ahead of the main wheels.

Loading

The airplane must be loaded in compliance with the center of gravity limits (refer to AFM). Information for determination of airplane weight and balance are included in Loading Manual DTM9821.

The weights indicated below must not be exceeded when loading the airplane:

- Baggage compartment: 2,866 lb (1,300 kg), not to exceed 123 lb/sq ft (600 kg/m2).

Airspeed Limitations

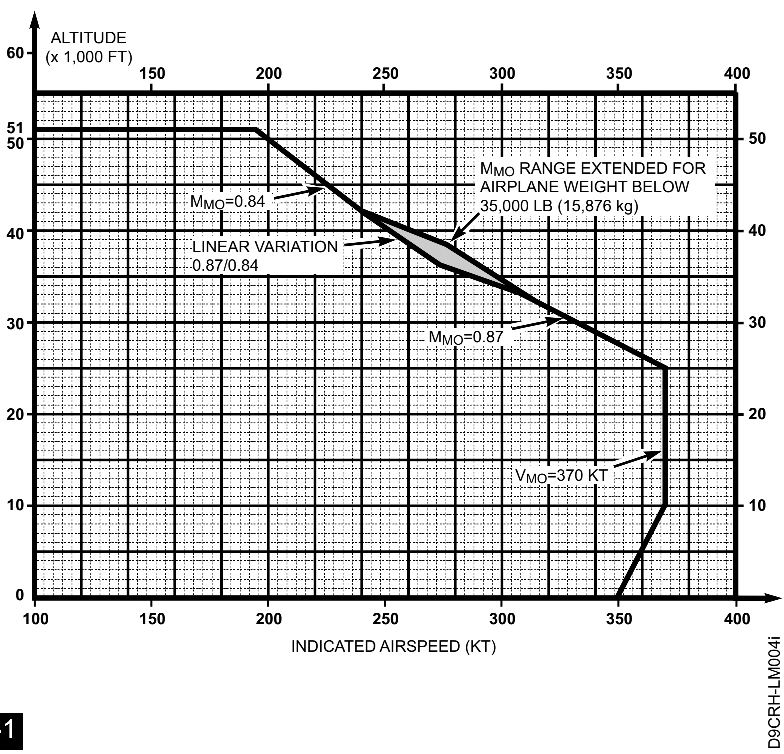
Unless otherwise specified, limits are expressed in terms of indicated values.

Instrument error is assumed to be zero.

V_{MO}/M_{MO}, Maximum Operating
Limit Speed . . . . See V_{MO}/M_{MO} graph (**Figure 3-1**)

> **CAUTION:** The maximum operating limit speed V_{MO}/M_{MO} must not be deliberately exceeded in any regime of flight (climb, cruise, descent) unless a higher speed is authorized for flight test or pilot training.

V_{MO}/M_{MO} Envelope



3-1

V_A, Maneuvering Speed. . . . . 228 KIAS

CAUTION: Full application of rudder and aileron controls, as well as maneuvers that involve angles-of-attack near the stall, must be confined to speeds below V_A.

V_{FE}, High Lift Devices Operating or Extended Limit Speeds:

Slats Extended + Flaps 7°. 200 KIAS

Slats Extended + Flaps 20°. . . . . 190 KIAS

Slats Extended + Flaps 40°. . . . . 180 KIAS

CAUTION: Above 20,000 ft, do not establish or maintain a configuration with the flaps or the slats extended.

V_{LO}/M_{LO}, Maximum Landing Gear Operating Speed:

V_{LO} . . . . 190 KIAS

M_{LO} 0.70

V_{LO}/M_{LO} is the maximum speed at which it is safe to extend or retract the landing gear.

V_{LE}/M_{LE}, Maximum Landing Gear Extended Speed:

V_{LE} . . . . 245 KIAS

M_{LE} 0.75

V_{LE}/M_{LE} is the maximum speed at which the airplane can be safely flown with the landing gear extended and locked.

V_{MCA}, Minimum Control Speed:

V_{MCA} . . . . .83 KCAS

V_{MCA} (For aircraft with
SB F900-100 (TFE731-5BR)) . . . . 85.5 KCAS

Miscellaneous Limit Speeds:

Windshield Wiper Operating Speed . . . . 215 KIAS

Direct Vision Window Opening Speed . . . . 215 KIAS

Tire maximum operating speed:

Airplanes Fitted With Tires
Approved For 210 MPH . . . . 182 kt (Ground Speed)

Airplanes Fitted With 6 Tires
Approved For 225 MPH . . . . 195 kt (Ground Speed)

Stall Speed . . . . See CAUTION

CAUTION: Do not intentionally fly the airplane slower than initial stall warning onset.

Takeoff and Landing Limitations

Weights . . . . See AFM, page 1-05-1

Airport Pressure Altitude . . . . -1,000 ft + 14,000 ft

Runway Slope . . . . ±2.5%

Tailwind component at takeoff:

Airplanes fitted with tires approved for 210 mph:

Pressure altitude of airport from -1,000 ft to 10,000 ft. . 10 kt

Pressure altitude of airport more than 10,000 ft . . . . 4 kt

Airplanes fitted with 6 tires approved for 225 mph . . . . 10 kt

Tailwind component at landing:

Airplanes fitted with tires approved for
210 mph and/or 225 mph . . . . 10 kt

Runway . . . . Paved and hard-surfaced

Reduced Thrust Takeoff

Refer to AFM Annex 1.

Autopilot Coupled Approach to CAT II

The performance of CAT II approaches requires that the following instruments or equipment be in proper operating condition:

- 2 ILS receivers.
- 2 EFIS (Electronic Flight Instrument System), one on each side (including 2 symbol generators, 2 EADIs and 2 EHSIs).
- 1 radioaltimeter.
- 2 IRSs.
- 2 ADCs (Air Data Computers).
- AP/FD system including:
  - 1 AP computer.
  - 3 servomotors.
  - 1 annunciator (ID 802).
  - 1 standby horizon.
  - 3 engines operating.

The airplane is not approved for use in automatic approaches to CAT II landing minimums with one engine inoperative. However, for safety reasons it may be preferable to initiate or continue the approach down to CAT II minimums rather than divert to another airport.

CAT II approaches must not be considered if dual sources of electrical power are not available.

Operation on Dry, Unpaved Runways

See AFM Annex 7.

Maneuvering Flight Load Factor Limitations

- Flaps up: + 2.53 to -1.
- Flaps down: + 2 to 0.

These load factors limit the angle of bank permitted in turns and limit the severity of pull-up maneuvers.

Operation Limitations on Runways Contaminated by Standing Water, Slush, Loose Snow, Compacted Snow or Ice

Operational Limitations Takeoff and Landing

Maximum equivalent water depth . . . . 12.7 mm (0.5 in.)

Maximum safe crosswind on icy runway . . . . 5 kt

Takeoff with antiskid inoperative is not permitted.

Recommended Operational Limitations Takeoff and Landing

Takeoff and landing with tailwind are not recommended.

Takeoff and landing on runways with downhill slope is not recommended.

Runway Surface Condition

Operation on runways contaminated with water, slush, snow or ice implies uncertainties with regard to runway friction and contaminant drag and therefore to the achievable performance and control of the airplane during takeoff, since the actual conditions may not completely match the assumptions on which the performance information is based. In the case of a contaminated runway, the first option for the pilot is to wait until the runway is cleared. If this is impracticable, he may consider a takeoff, provided that he has applied the applicable performance adjustments and any further safety measures he considers justified under the prevailing conditions.

Such measures could include special crew training, additional distance factoring and more restrictive wind limitations.

Systems Limitations

Avionics Systems

Instrument Color Markings

Maximum operating limit . . . . Red line

Precautionary range . . . . Amber band or arc

Normal operating range . . . . Green band or arc

Automatic Pilot (Sperry DFZ 800)

The autopilot must not be engaged for takeoff or landing.

The autopilot is certified to the minimum height as follows:

Radioaltimeter operative . . . . 50 ft

Radioaltimeter inoperative . . . . 150 ft

Minimum decision height . . . . 200 ft

Minimum height for autopilot operation
except during approach . . . . 1,000 ft

Minimum height for use during an FMS approach . . . . . . 300 ft

CAUTION: For airplanes equipped with FMS computer software 9004, 9102, or 9112, disengage VNAV mode prior to APP mode engagement. Ensure proper ASEL capture.

TCAS II System

- Pilots are authorized to deviate from their current ATC clearance to the extent necessary to comply with a TCAS II resolutionary advisory (RA).

- Following a TCAS II "clear of conflict" advisory, the pilot should expeditiously return to the applicable ATC clearance unless otherwise directed by ATC.

> **NOTE:** In some conditions, TCAS can show two symbols for the same intruder. This error should not last for more than a short time.

Electrical System

Maximum voltage of DC system 32V

Maximum generator output:

Transient (1 minute max.) 350A

Up to 43,000 ft 300A

Above 43,000 ft 260A

Battery temperature (before SB F900-94-1):

Amber light (WARM) at or above . . . . 120°F (48.9°C)

Red light (HOT) at or above . . . . 150°F (65.5°C)

Battery temperature (after SB F900-94-1):

Amber light (WARM) at or above . . . . 120°F (48.9°C)

Red light (HOT) at or above . . . . 160°F (71.1°C)

Flight Controls

- Airbrakes must not be extended in flight within 300 ft AGL.

Fuel System

Fuel used must conform to the following specifications. This table is representative of the fuel definition on the date: December, 1987.

Designation	Specification			Freezing Point (°C)	Additives		NATO Code
	Garrett	Equivalence			Anti-ice	Anti-static	
Kerosene	EMS 53111	ASTM D 1655	JET A	-40	*	*	–
		CAN 2-3.23	JET A		*	Yes	–
	EMS 53112	ASTM D 1655	JET A1	-47	*	*	–
		CAN 2-3.23	JET A1		*	Yes	–
		DERD 2494	AVTUR		No	Yes	F35
		DERD 2453	AVTUR/FSii		Yes	Yes	F34
		MIL-T-83133	JP8	-50	Yes	*	F34
		AIR 3405C	–		No	*	F34
		AIR 3405C	–		Yes	*	F34
Wide Cut Fuel	EMS 53113	ASTM D 1655	JET B	-50	*	*	–
		CAN 2-3.23	JET B		*	Yes	–
		MIL-T-5624	JP4	-58	Yes	Yes	F40
		AIR 3407B	–		Yes	Yes	F40
		DERD 2486	AVTAG		No	No	–
		DERD 2454	AVTAG/FSii		Yes	Yes	F40
		CAN 2-3.23	–		Yes	Yes	F40
High Flash Point Fuel	EMS 53116	AIR 3404C	–	-46	No	*	F43
		AIR 3404C	–		Yes	*	F44
		DERD 2498	AVCAT		No	No	F43
		MIL-T-5624	JP5		Yes	No	F44
		DERD 2452	AVCAT/FSii		Yes	No	F44
		CAN 3GP24	–		No	*	F43
		CAN 3GP24	–		Yes	*	F44
CIS Fuels	GOST 10 227-86	T1	–	-60	–	–	–
		TS1 Regular	–	-60	–	–	–
		TS1 Premium	–	-60	–	–	–
		T2	–	-60	–	–	–
		RT	–	-65	–	–	–

*Information to be checked with the fuel supplier.

Table 3-B; Authorized Fuels

Fuel Distribution

The total quantity of fuel for the Falcon 900B is distributed as follows:

	liter	kg	US Gal	lb
LH wing + LH centerwing tanks	3,422	2,748	904	6,058
RH wing + RH centerwing tanks	3,422	2,748	904	6,058
Front and rear fuselage tanks	3,925	3,152	1,037	6,949
Airplane total capacity	10,769	8,648	2,845	19,065

Table 3-C; Fuel Distribution

Pressure Fueling System

- Maximum feed pressure: 50 PSI/3.5 bars/350 kPa.

Fuel Additives

The following additives are authorized for use in the fuel:

- Anti-icing additive, conforming to AIR 3652 or MIL-I-27686 D or E specifications (JP4/JP8) or MIL-I-85470 (JP5) specifications or equivalent at a concentration not in excess of 0.15% by volume.
  - I fluid GOST 8313-88.
  - I.M. fluid TU6-10-1458-79 (I fluid mixed 1:1 with methanol (GOST 2222-78E)).
  - TGF-M fluid TU6-10-1457-79 (TGF fluid mixed 1:1 with methanol (GOST 2222-78E)).
- SOHIO Biobor JF biocide additive, or equivalent, is approved for use in the fuel at a concentration not to exceed 270 ppm.

- Anti-static additive, provided the quantity added does not exceed:
  - 1 ppm for SHELL ASA3.
  - 3 ppm for STADIS 450.
  - 5 ppm for SIGBOL TU38-101741-78.

Landing Gear and Brakes

- Nose wheels must be equipped with chined tires.
- Brake kinetic energy limit is 18,000 kJ per brake.
- Airbrakes must not be extended in flight within 300 ft AGL.

Ice and Rain Protection

Icing Conditions

Icing conditions exist when the OAT on the ground and for takeoff, or TAT in flight, is 10°C or below and visible moisture in any form is present (such as clouds, fog with visibility of one mile or less, rain, snow, sleet or ice crystals).

Icing conditions also exist when the OAT on the ground and for takeoff is 10°C or below when operating on ramps, taxiways or runways where surface snow, ice, standing water, or slush may be ingested by the engines or freeze on engines, nacelles or engine sensor probes.

Engine Anti-ice

The engine anti-ice system must be used on the ground and in flight when icing conditions exist or are anticipated.

The engine anti-ice system must not be used with total air temperature in excess of +10°C.

Wing Anti-ice

The wing anti-ice system must not be used with total air temperature in excess of +10°C.

The wing anti-ice system must not be used on the ground except for maintenance checks conducted in accordance with Maintenance Manual instructions.

Hydraulic Systems

- Hydraulic fluid approved for use must conform to MIL-H-5606 specification (NATO codes H515 or H520).

Pressurization System

- Maximum differential pressure (pressure relief valve setting) is 9.6 PSI.

Powerplant

AlliedSignal TFE731-5AR-1C Engine

Thrust Ratings (uninstalled, sea Level, ISA)

Takeoff . . . . .4,500 lb (2,002 daN)

Maximum continuous. . . . . .4,500 lb (2,002 daN)

Thrust Setting

The engine low pressure rotor speed N_1 is used as the thrust setting parameter.

The takeoff and maximum continuous thrust must be based on the N_1 values given in section 5 of the AFM.

Maximum Engine Rotor Speeds: N_1 and N_2

Condition of Use	N_1	N_2
Takeoff – Maximum continuous	100%	101%
Transient (5 seconds maximum allowable)	103%	103%

100% N_1 = 21,000 rpm - 100% N_2 = 29,989 rpm

Table 3-D; N_1 and N_2 Maximum Engine Rotor Speeds

Maximum Interstage Turbine Temperature (ITT)

Condition of Use	Thrust Setting	ITT
Starting, ground/air	Normal	952°C
Takeoff (without increased thrust)	Normal (5 minutes max.)	952°C
	Transient (5 seconds max.)	984°C
Takeoff (with increased thrust). See AFM annex 3.	Normal (5 minutes max.)	974°C
	Transient (5 seconds max.)	984°C
Maximum Continuous		924°C

Table 3-E; Maximum Interstage Turbine Temperature (ITT)

AlliedSignal TFE731-5BR-1C Engine

Thrust Ratings (uninstalled, sea level, ISA)

Takeoff . . . . .4,750 lb (2,114 daN)

Maximum continuous. . . . . .4,634 lb (2,062 daN)

Thrust Setting

The engine low pressure rotor speed N_1 is used as the thrust setting parameter.

The takeoff and maximum continuous thrust must be based on the N_1 values given in section 5 of the AFM.

Maximum Engine Rotor Speeds: N_1 and N_2

Condition of Use	N_1	N_2
Takeoff – Maximum continuous	100%	100.8%
Transient (5 seconds maximum allowable)	103%	103%

100% N_1 = 21,000 rpm - 100% N_2 = 30,540 rpm

Table 3-F; N_1 and N_2 Maximum Engine Rotor Speeds

Maximum Interstage Turbine Temperature (ITT)

Condition of Use	Thrust Setting	ITT
Starting, ground/air	Normal	978°C
Takeoff (without increased thrust)	Normal (5 minutes max.)	978°C
	Transient (5 seconds max.)	1006°C
Takeoff (with increased thrust). See AFM annex 3A.	Normal (5 minutes max.)	996°C
	Transient (5 seconds max.)	1006°C
Maximum Continuous		968°C

Table 3-G; Maximum Interstage Turbine Temperature (ITT)

Increased Thrust Performance

Increased thrust is established when the following conditions are met:

- The field pressure altitude is close to 5,000 ft and the total air temperature (TAT) exceeds 18.5°C.
- The PWR INC (power increase) switch is pressed.
- The power levers are in the takeoff position.
- See AFM Annex 3.

Starting Time

Ground start and starter assist airstart:
from 10% N_2 speed to light-off. . . . . 10 seconds max.

Windmilling airstart:
from windmilling N_2 speed to 60% N_2 . . . . . . 45 seconds max.

Ground start:
from light-off to idle . . . . 60 seconds max.

Flight With One Engine Computer in Manual Mode

Operation in other than ferry status requires that Garrett Test Kit (P/N 831-027-1) procedures be complied with prior to flight (see AFM Annex 8).

Thrust Reverser

- The thrust reverser is approved for ground use only.

Lubrication

Approved Oils:

Type II oil conforming to EMS 53110 specifications:

- Aeroshell/Royco Turbine Oil 500 and 560
- Castrol 5000
- Exxon/Esso 2380 Turbo Oil
- Mobil Jet Oil II
- Mobil 254

These brands may be mixed.

NOTE: The OIL 1, OIL 2 and OIL 3 lights in the warning panel illuminate for an oil pressure below 25 PSI.

Oil Pressure

Thrust Setting	Minimum Pressure	Maximum Pressure
Takeoff or maximum continuous	38 PSI	46 PSI
Idle	25 PSI	46 PSI
Transient		55 PSI (less than 3 minutes)

Table 3-H; Oil Pressure Limits

Oil Temperature

From sea level to 30,000 ft .127°C max.

Above 30,000 ft . . . . .140°C max.

Transient all altitudes. . . . . 149°C max. (less than 2 min.)

Minimum for exceeding idle power . . . . 30°C

Auxiliary Power Unit AlliedSignal GTCP 36-150 (F)

- The APU must be operated on the ground only.
- Operation of the APU is not authorized when passengers are in the cabin and no crew member is monitoring.

Maximum N_1 speed 110%

Condition	Temperature Limit
Starting	Between 870°C and 985°C maximum (less than 10 sec.)
Stabilized	679°C

Table 3-I; Exhaust Gas Temperature Limit (T5)

> **NOTE:** The duration of operation while in the amber range (679°C/732°C) must be as short as possible.

- Maximum generator output:

  Transient (1 minute max.) 350A

  Stabilized. 300A

Systems

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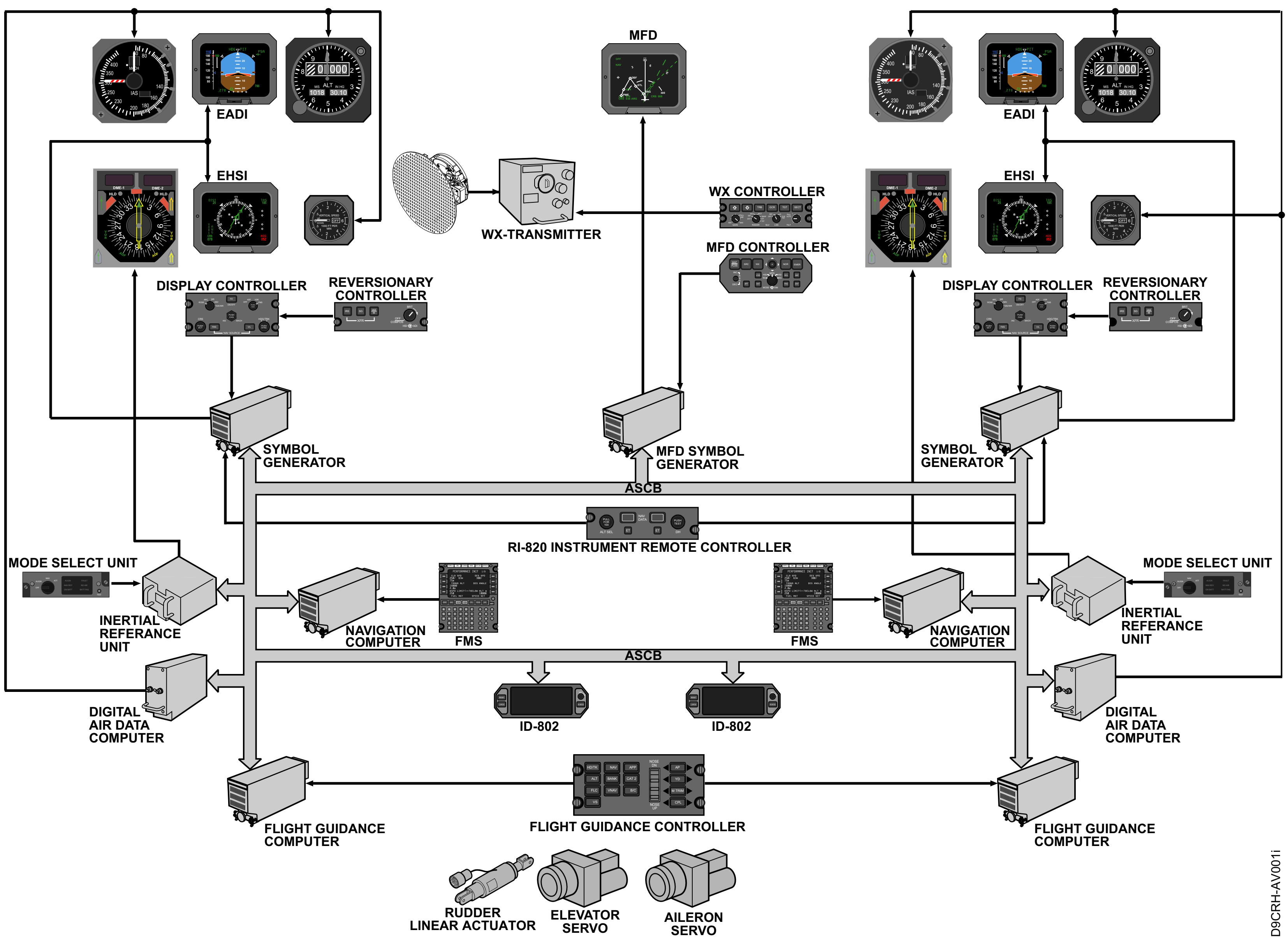
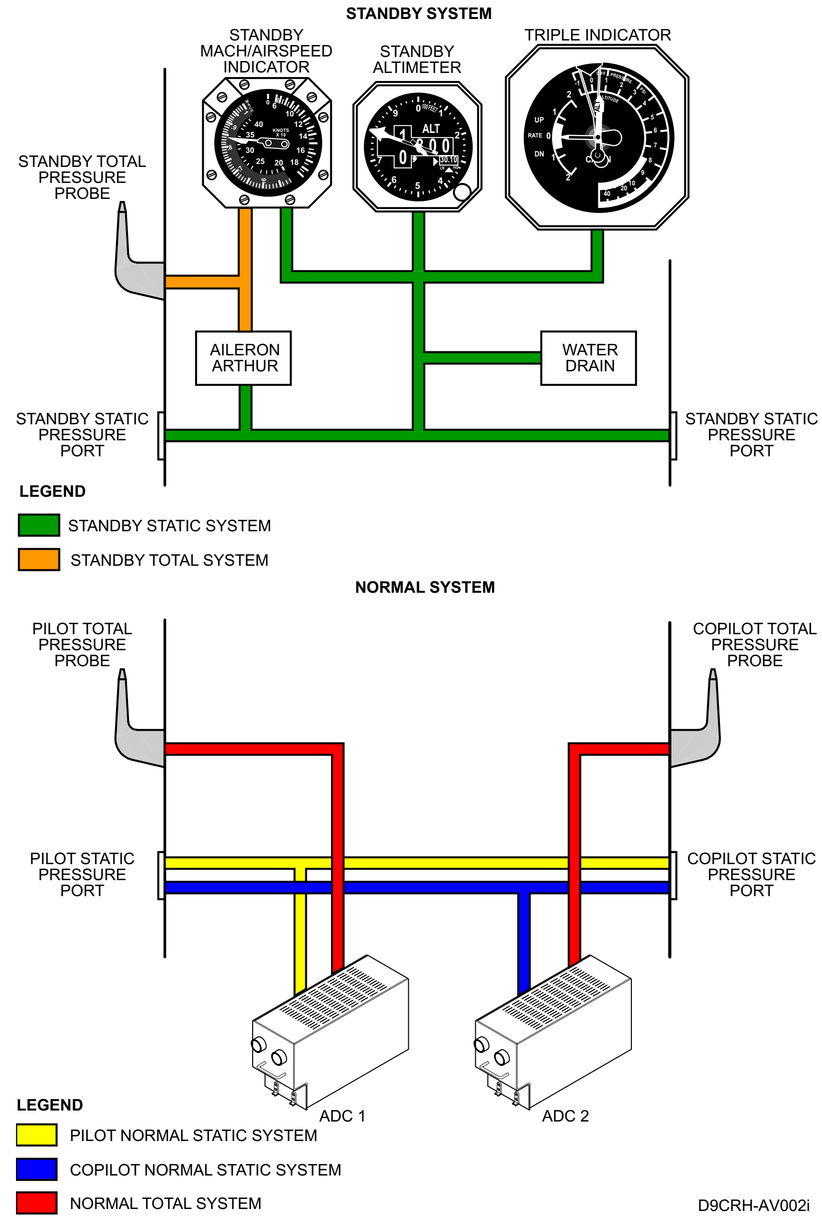
Avionics Integrated System



Pitot-Static System



SPZ-8000 Digital Automatic Flight Control System (DAFCS)

The SPZ-8000 Digital Automatic Flight Control System (DAFCS) consists of the following subsystems:

- Dual LASEREF® III Inertial Reference System (IRS)
- Dual Air Data System (ADS)
- Radio Altimeter System
- Electronic Flight Instrument System (EFIS)
- Dual Flight Guidance System (FGS)
- Dual FMZ-2000 Flight Management System (FMS)
- PRIMUS® 870 Weather Radar System
- Multifunction Display (MFD) System
- Lightning Sensor System (LSS) (optional)

The DAFCS is a complete automatic flight control system that executes flight director guidance, autopilot, yaw damper, and trim functions. The automatic path mode commands are generated by the flight guidance computer, which integrates the attitude and heading reference, air data, and EFIS into a complete aircraft control system that stabilizes and controls the aircraft to ensure optimum performance throughout the aircraft flight regime.

Electronic Flight Instrument System (EFIS)

The EFIS displays all the information needed to fly the aircraft in a given phase of flight on color cathode ray tubes (CRT).

Flight, navigation and radar information that is normally spread across the instrument panel is shown on the EFIS.

Flight data (attitude, speed, steering commands) is displayed on the Electronic Attitude Director Indicator (EADI). Navigation data such as heading, course, and course deviation, is displayed on the Electronic Horizontal Situation Indicator (EHSI).

The EADI shows the aircraft attitude display with lateral and vertical computed steering signals to provide the pilot commands required to intercept and maintain a desired flight path.

The EHSI combines numerous displays to provide a map-like display of the aircraft position. The indicator displays aircraft displacement relative to VOR radials, localizer, and glideslope beam. The EHSI can be displayed in Rose, ARC, WR (Weather), NAV (Navigation) and NAV/WR modes.

The optional Multifunction Display (MFD) system expands the navigation mapping capabilities of the EFIS. The MFD area can display map formats without the essential heading and NAV data that is already displayed on the EHSI. Information that can be added to the traditional map display of waypoint locations includes waypoint and VOR identifiers and the takeoff waypoint time-to-go.

Air Data Indicators

- Standby Mach/Airspeed Indicator
- Standby Altimeter
- Vertical Speed indicator
- Total and Static Temperature Measurement System (ID-802)

  The system determines the total air temperature (TAT) and static air temperatures (SAT). It consists of an outside temperature probe, the air data computers and the ID advisory for temperature data display.
- Speed and Mach Limit Alarm

  This system triggers an audio warning when the aircraft speed or mach number exceeds the V_{MO}-M_{MO}.

- Altitude Warning

  The purpose of this system is to provide the pilot with a visual and audio (gong) warning indication of a deviation from the altitude selected at the PFD through the ASEL control of AP control unit.

Communication Systems

The aircraft communication system provides for:

- communication between the crew members.
- communication between crew members and passengers, ground stations, other aircraft or ground crew.

The headphone boom mic or the oxygen mask mic transmits when the pilot or copilots control wheel push-to-talk (PTT) button is pushed.

VHF Communications

The VHF system enables two-way air-to-air or air-to-ground communications within the 118 to 151.975 MHz wave band.

HF Communications

The HF 1/HF 2 system enables radio-communication within the frequency range of 2 to 29.9999 MHz at 100 Hz intervals.

SELCAL System

The SELCAL system automatically alerts the pilots to ground station calls incoming through transceiver HF 1 or HF 2, thus ensuring permanent availability of radio-contact between ground stations and crew or passengers.

Interphone

The aircraft is equipped with an audio system which, after selection at the Intercom Control System, enables the pilot and copilot to:

- dialogue with each other via the permanent interphone.
- communicate with the ground crew, either at the nose area or aft compartment.

Laseref® III Inertial Reference System

The LASEREF® III Inertial Reference System that is installed in the SPZ-8000 Digital Automatic Flight Control System (DAFCS) is a dual inertial reference system (IRS). An optional third IRS is also available.

The IRS is an all attitude inertial sensor system which provides aircraft attitude, heading, and flight dynamics information to the flight instruments and MFD, flight control (autopilot/yaw damper and flight director), weather radar antenna platform, and other aircraft systems and instruments.

Standby Horizon Indicator

The standby horizon indicator consists of an independent vertical gyro providing for aircraft attitude data, in roll and pitch.

In case of aircraft power supply failure, a standby battery automatically takes over energization of the standby horizon. The auto feature is disabled on landing by an AIR/GND switch.

Weather Radar

The radar system consists of the two optional WC-870 Weather Radar Controllers. Each WC-870 Controller sets the modes, range, and antenna tilt used to display radar information on its respective EHSI. If both controllers are on, the pilot’s controller selects his display using the left-to-right sweep. The co-pilot’s controller manages the right-to-left sweep. The pilot's controller also determines settings for display on the MFD. If one WC-870 Controller is off, the other controller will set the radar modes, range, and antenna tilt and display a SLV slave annunciation on the OFF controller. The controller also contains the optional Lightning Sensor System (LSS) mode selector.

Forced Standby

As an option, the radar can be wired to force the standby mode when on the ground. In forced standby, normal radar can be restored by simultaneously pushing both range select buttons.

Radio Altimeter System

The radio altimeter measures the height of the aircraft above the ground in flight where this height is less than 2500 ft.

In the event of radio altimeter failure, the RA flag appears on the EADI.

Flight Management System

The purpose of the FMS is to compute the aircraft position with a view to plotting aircraft horizontal and vertical navigation, according to a flight plan defined by the pilot. The database internal to each FMS contains all navaids and all the world's airports and associated runways.

The navigation database must be refreshed every 28 days by means of the diskette drive.

Autoflight

The DFZ 800 AP/FD system provides the following functions:

- Flight Director produces flight orders and transmits them to the EFIS (electronic flight instrument system), which displays them to the pilot and copilot as steering bars.
- Autopilot produces flying orders and transmits them to the control surfaces by means of servo-actuators. The autopilot also has an automatic pitch trim function.
- Yaw Damper operates by generating an order positioning a linear actuator mounted in series with the rudder linkage. The yaw damper can be either activated separately from the autopilot (when the latter is not in operation), or else automatically (as soon as the autopilot is engaged).

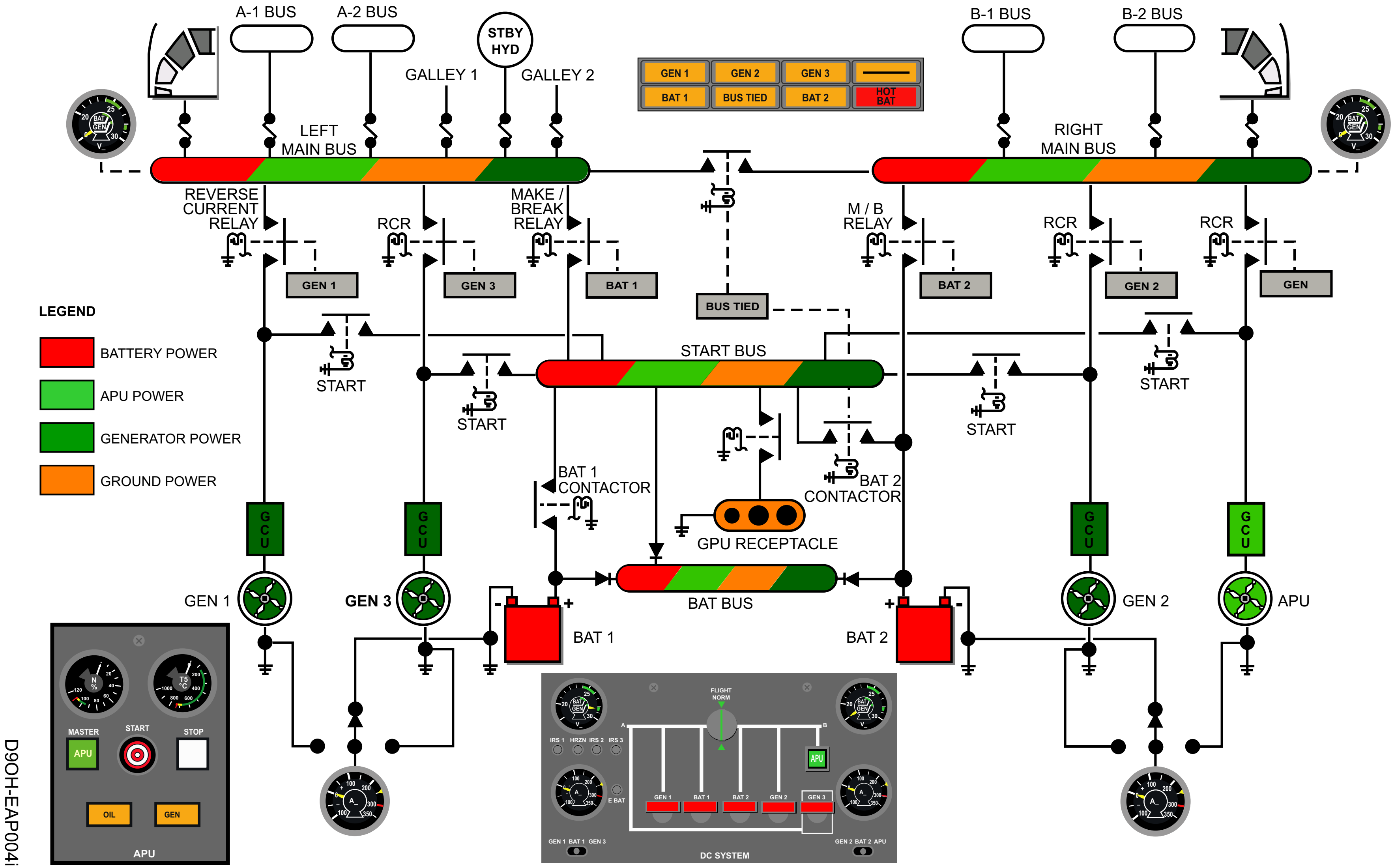
Enhanced Ground Proximity Warning System

The enhanced ground proximity warning system (EGPWS) is also a wind shear alert system. The EGPWS provides the crew with visual and/or aural warnings if there is any risk (GPWS function) or future risks (enhanced function) of collision with the terrain.

Emergency Locator Transmitter

When activated, the ELT transmits a modulated omnidirectional signal on the international VHF (121.5 MHz) and UHF (243 MHz) emergency frequencies.

DC Electrical System



Electrical System

A 28V DC generation system supplies electrical power. The power supply consists of three engine-driven 300 A starter generators. The APU drives a fourth 300 A generator. Two batteries are used for starting the engines on the ground and in flight. A ground power unit receptacle enables use of a ground power unit to supply the aircraft and to start the engines if desired.

The DC system is composed of LH and RH subsystems. These subsystems are completely independent of each other and can be interconnected under certain circumstances. The various aircraft systems supplied are divided between the two subsystems so that the aircraft remains safe in the event that one of the subsystems fails.

The lighting system is divided into three subsystems: interior, exterior and emergency. The interior lighting includes cockpit, passenger cabin, and baggage and rear compartments. The exterior lighting includes navigation, anti-collision/strobe, landing, taxi, wing ice detection and fin logo (optional). The emergency lighting illuminates the cockpit and aircraft exit paths with self-contained batteries.

DC Power Supply

The LH main bus is supplied from:

- battery 1
- generators 1 and 3
- external power receptacle.

The RH main bus is supplied from:

- battery 2
- generator 2
- APU generator (on the ground)

Protection and Regulation

Make-and-Break Relays

The battery make-and-break relays, located in the main electrical box, connect the batteries to the LH and RH main buses. These relays are normally controlled by the BAT 1 and BAT 2 cockpit switches.

The make-and-break relays will trip when a reverse current from the main buses to the batteries reaches an excessive level, or battery voltage drops to approximately 8 V.

Reverse Current Relays

The generator reverse current relays, located in the main electrical box, automatically connect the generators to the main buses when the generator voltage exceeds the bus voltage. These relays are normally controlled by GEN 1, GEN 2, GEN 3, and APU cockpit switches. The relays will automatically open and disconnect their generator from its bus for:

- Differential Fault (short)*
- Generator Overvoltage*
- Reverse Current
- Mechanical Generator Failure

  * The first two will also trip the cockpit switch.

Generator Control Unit (GCU)

The generator control units, located in the rear compartment, control all generator functions:

- regulation to 28V DC
- equalization of generator output
- protection against overvoltage
- maximum output power limitation (375 A).

Ground Power

A ground power unit can be used to supply power to the aircraft and start the engines. The receptacle is located to the rear of the aircraft on the RH side. The corresponding circuit includes an overvoltage protection system. The batteries and generators are isolated from the aircraft system when a ground power unit is used to supply the aircraft system. To use ground power, first connect the unit to the aircraft, and energize it. Then select EXT PWR on the overhead panel. To discontinue the use of ground power, first select normal with the DC power selector, then de-energize the connector and remove the plug.

DC Load Distribution

DC power is distributed from the LH and RH main buses located in the main electrical box. A bus tie relay keeps the main buses independent.

The LH main bus supplies:

- primary buses A1 and A2
- pilot's windshield heat
- standby electric hydraulic pump
- galley power.

The RH main bus supplies:

- primary buses B1 and B2.
- copilot windshield heat.

Circuit breakers are located on panels in the cockpit ceiling.

The columns of circuit breakers correspond to groups per system. A colored line frames the circuit breaker groups that correspond to a given system. All circuit breakers are collared. The collar colors are:

White . . . . A buses

Green . . . . B buses

Red . . . . both A and B buses

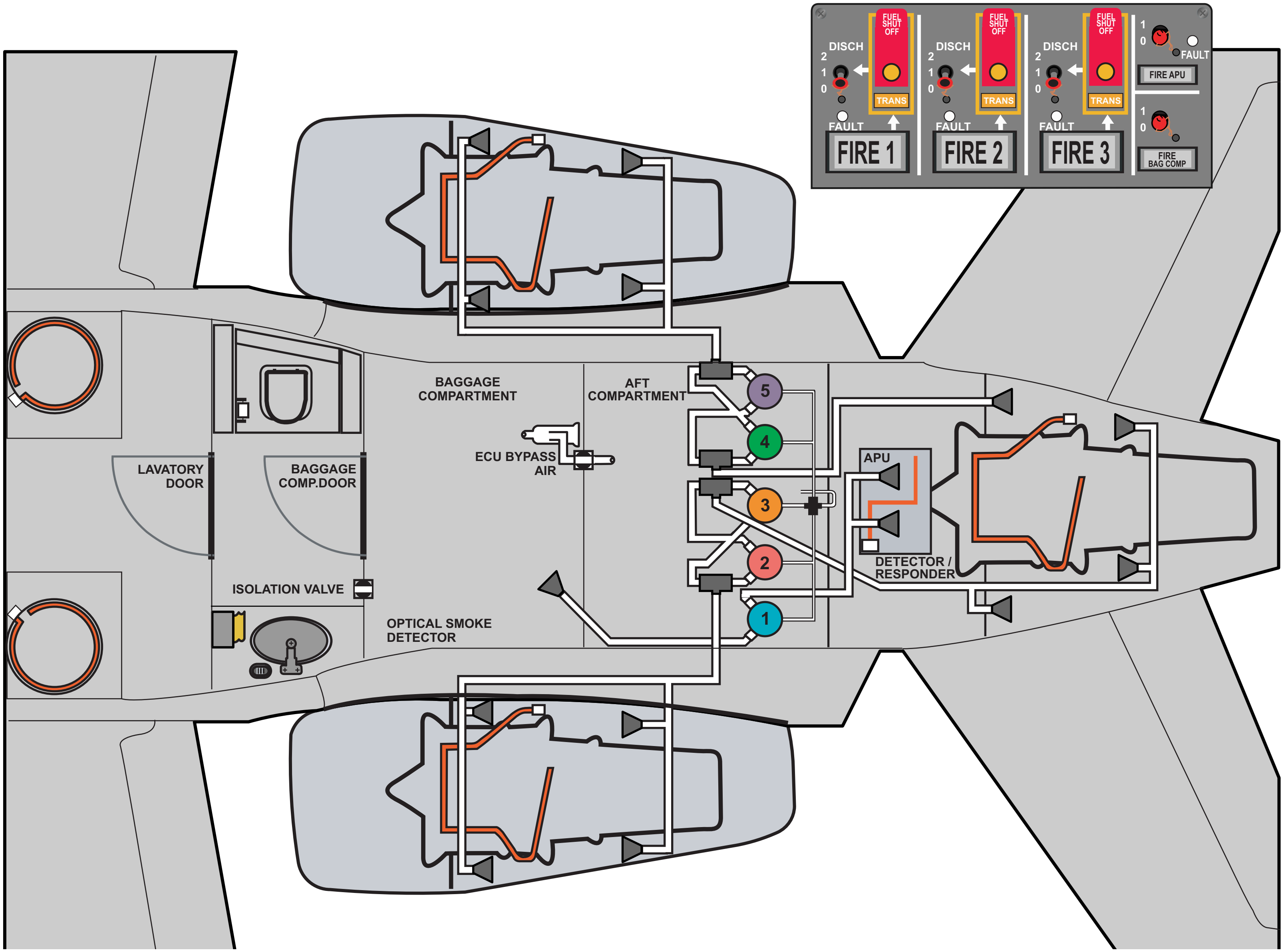
Yellow . . . . emergency battery

Emergency Lighting

The emergency lighting system is designed to light the emergency exits in the event of complete electrical failure.

The emergency lighting system is supplied by three separate battery supply boxes, each supplying a part of the system. The system can be supplied in this way for ten minutes.

Fire Protection System



Fire/Overheat Detection System

Detection and warning systems alert the crew to the presence of fire, overheating, or smoke (in the baggage compartment). For each zone, the fire panel or warning panel lights illuminate. Except for wheel wells, the audio warning sounds when overheat, fire and/or smoke exist in a monitored area.

Fire detection equipment is installed in the engine, APU and lavatory compartments. Equipment in the main landing gear wells detects brake overheating.

Systron-Donner System

The continuous-loop type of fire detector consists of stainless steel tubes of differing lengths. These tubes are permanently connected to a detector and the whole assembly is hermetically sealed. The fine-bore tube encloses a metal wire saturated with a gas. The tube is also filled with a different gas, which maintains a partial pressure in the detector to verify its integrity.

In a general overheat, the gas expands. When the expansion reaches a predetermined level, it triggers the warning pressure switch in the detector unit. In a local overheat situation (i.e., bleed air leak), the saturated wire will release a large quantity of gas to immediately activate the pressure switch.

> **NOTE:** When the temperature returns to normal, the titanium wire reabsorbs the gas and the detector returns to its original state, making repeated operation possible.

If the tube is not perfectly sealed, the gas will escape and cause illumination of the FAULT light on the corresponding cockpit warning panel.

Smoke Detection

An optical smoke detector provides fire protection in the baggage compartment.

An optional optical smoke detector is installed on the ceiling of each lavatory compartment (forward and aft). The smoke detectors are connected to the two FWD LAV SMOKE and AFT LAV SMOKE indicator lights installed on the copilot instrument panel.

Warning System

The warning system activated by the detectors consists of a set of lights and a cancellable audio warning.

The red fire lights are grouped on the instrument panel. They can be tested by a toggle switch that is identified TEST FIRE and located on the warning panel. This switch also tests the detection and extinguishing systems.

One of two red warning lights (LWHL-OVHT and RWHL-OVHT) on the warning panel comes on to indicate an overheat in either the LH or RH main gear well. The TEST LIGHTS switch verifies proper system, operation.

Fire Extinguishing System

The engine extinguishing system is equipped with four dual-head bottles. This arrangement overcomes the problem of a malfunction of one of the bottles. It also enables the use of two extinguisher bottles in succession to fight a fire in the No. 1 or No. 3 engine compartment (1 + 1), or the use of all four extinguisher bottles to fight a fire in the No. 2 engine compartment (2 +2).

The APU and baggage compartments are each equipped with an extinguishing system supplied from a single extinguisher bottle. This extinguisher is fitted with two heads: one for use of the extinguisher in the APU and the other for use of the extinguisher in the baggage compartment.

Three engine discharge switches each have three positions, 0, 1 and 2. Position 2 on each engine switch and the single discharge position on the APU and the baggage switches are powered by the battery bus, thus allowing all-bottle discharge with the battery switches off (crash landing).

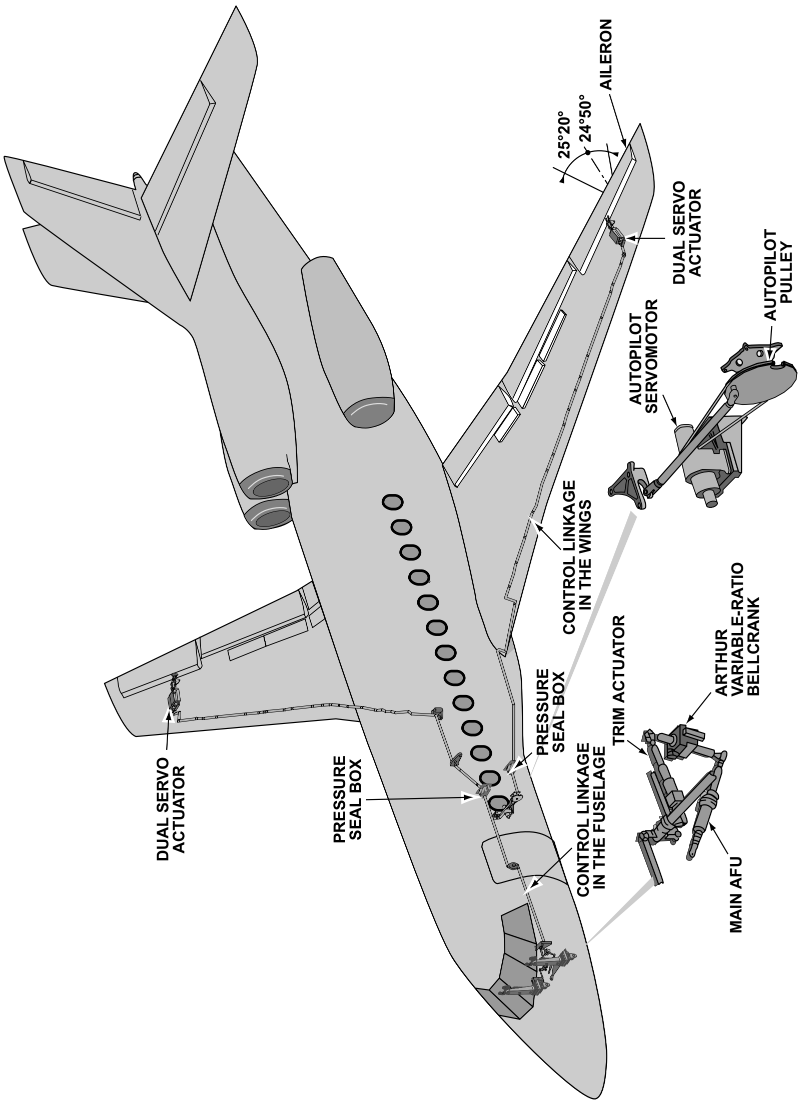
One of four fault lights on the fire control panel comes on to indicate a loss of partial pressure in the corresponding detection tube. Illumination, therefore, warns of degraded detection ability.

The fire control panel has three FUEL SHUT OFF switches held in the down position by a red cover. These switches control dual motor fuel shutoff valves. One motor is powered by the A and one by the B bus. A TRANS amber light is associated with each switch. This light illuminates to indicate that the corresponding fuel shutoff valve does not agree with the switch position.

Portable Fire Extinguishers

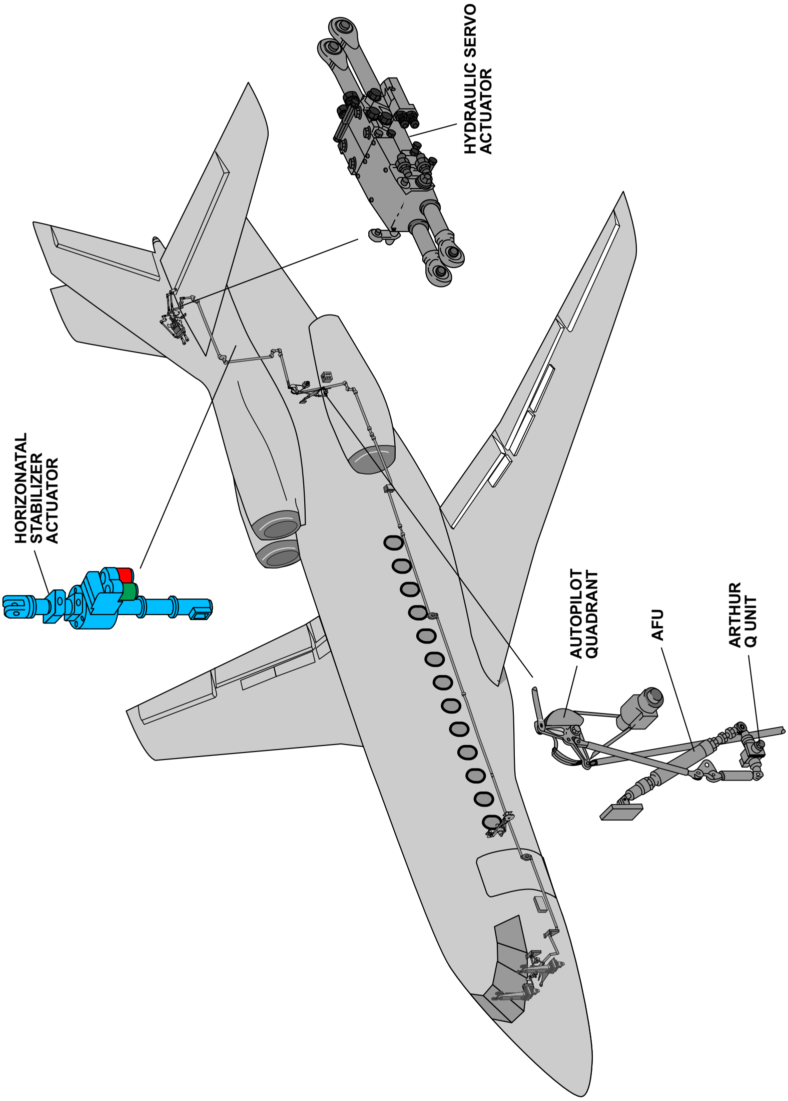
Two portable extinguishers are available for use by the crew and passengers. A further optional portable extinguisher may be installed on the forward RH side of the passenger cabin.

Roll Control



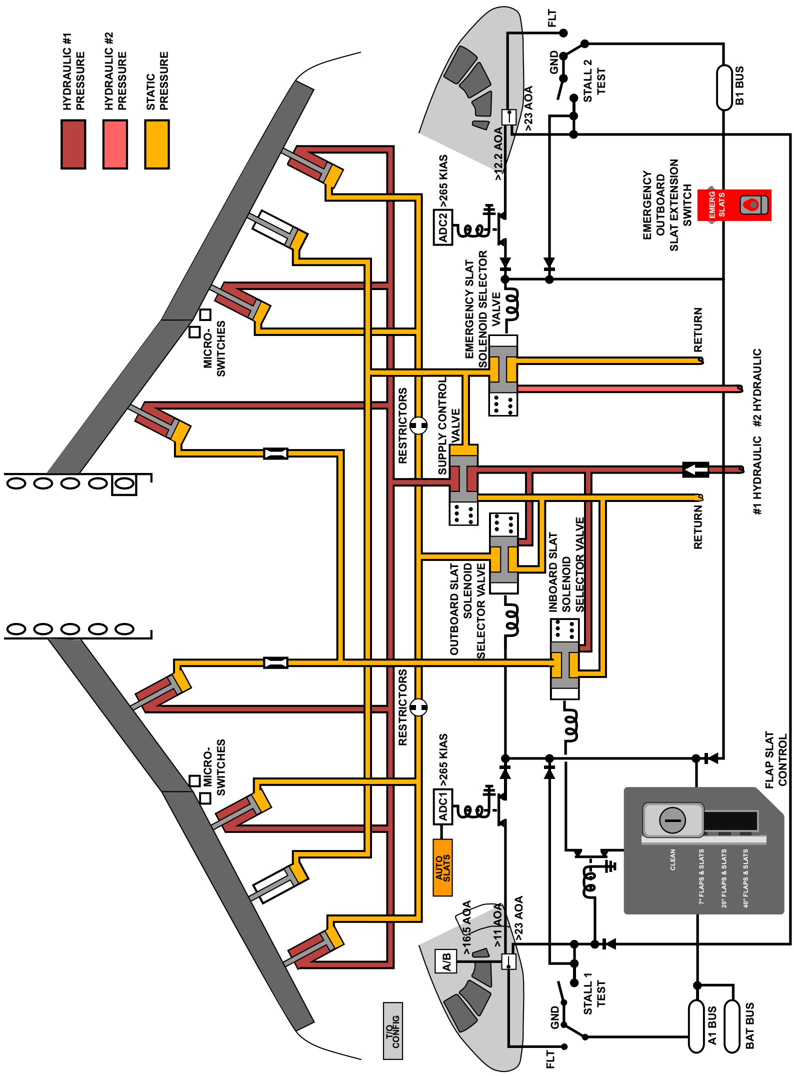
D9CRH-FC001i

Pitch Control



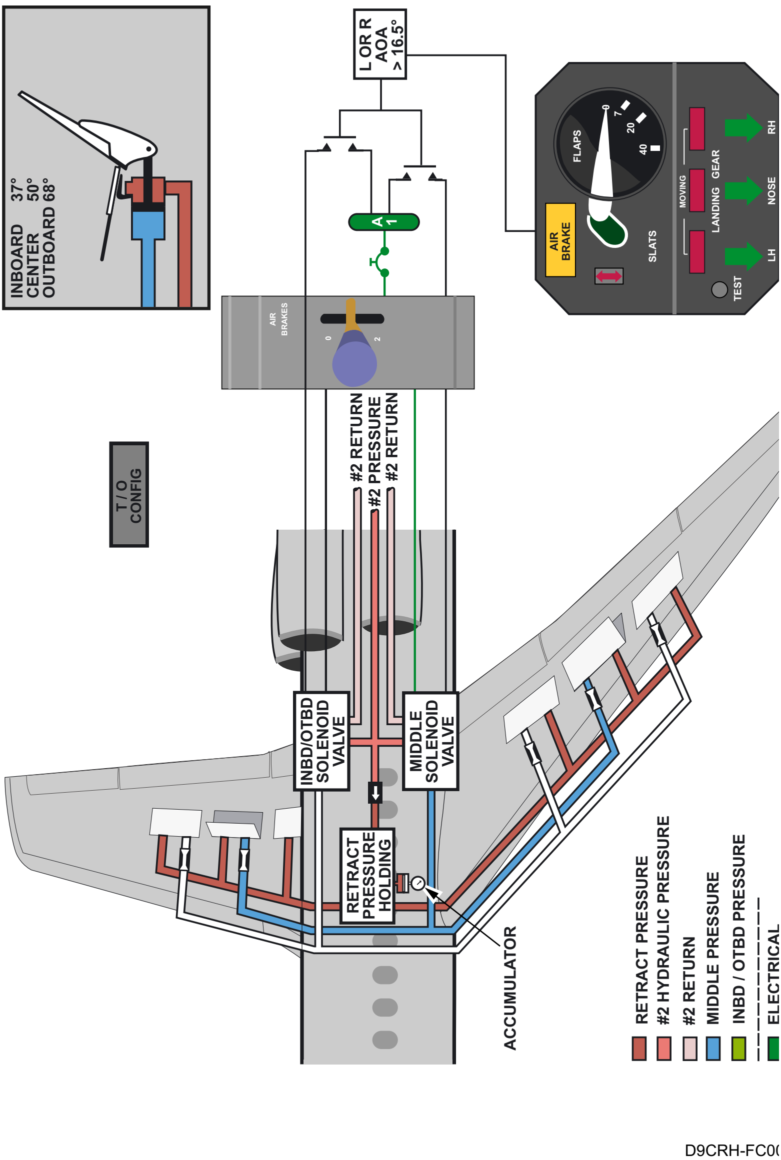
D9CRH-FC002i

Slats



D9CRH-FC003i

Airbrakes


INBOARD 37°
CENTER 50°
OUTBOARD 68°
L OR R AOA > 16.5°
A 1
AIR BRAKES
0
2
FLAPS
0
7
20
40
AIR BRAKE
SLATS
MOVING
LANDING GEAR
LH
NOSE
RH
TEST
T / O CONFIG
#2 RETURN
#2 PRESSURE
#2 RETURN
INBD/OTBD SOLENOID VALVE
MIDDLE SOLENOID VALVE
RETRACT PRESSURE HOLDING
ACCUMULATOR
RETRACT PRESSURE
#2 HYDRAULIC PRESSURE
#2 RETURN
MIDDLE PRESSURE
INBD / OTBD PRESSURE
ELECTRICAL
D9CRH-FC0(

Flight Controls

The aircraft is controlled, in flight, through the primary and secondary flight controls. The primary flight control surfaces are the ailerons, elevators, and the rudder. The secondary flight control surfaces are the leading edge slats, trailing edge flaps, moveable stabilizer, and the airbrakes.

The primary flight control system is a fully boosted nonreversible system. The control linkage, consisting of rigid rods and bellcranks, connects the cockpit controls to the aileron, rudder, and elevator hydraulic servo-actuators.

Primary Flight Controls

The Falcon 900B primary flight controls consist of:

- two ailerons for roll control
- a rudder for yaw control
- an elevator for pitch control.

Ailerons

The ailerons are controlled from the pilot and copilot control wheels via rigid rods (fixed or adjustable length) hinged on bellcranks and ball-bushings. The linkage is routed along the right-hand side of the fuselage and in front of the wing front spar to the servo-actuators.

Each aileron is actuated by a servo-actuator with dual mobile barrels. Each barrel is supplied by a different hydraulic system. A neutral return spring (artificial feel unit [AFU]) and a trim actuator are incorporated in the linkage. The trim actuator can alter the length of control linkage, thus moving the ailerons and producing a new control wheel neutral.

An emergency trim function is provided through a seperate emergency trim actuator.

An autopilot aileron servomotor also provides for aileron control.

ARTHUR Variable Bellcrank

Within the AFU system, the ARTHUR variable bellcrank adjusts the travel of the main AFU according to the IAS. This has the effect of stiff controls at high airspeeds and loose controls at low airspeeds.

The aileron ARTHUR is controlled by standby pitot/static inputs and the variable bellcrank is adjusted:

- electrically for aircraft $\geq$ 165
- hydraulically for aircraft < 165, from main hydraulic system 2.

Continuous monitoring of the variable bellcrank position is provided by the ADC. If the difference between the two sets of data exceeds a given threshold, the AIL FEEL warning light illuminates after a three-second time delay.

Trim Position Indication

This indicator, installed on the center console, is common to the three axes. For the aileron it is graduated from 0 to 50 (RH) and from 0 to 50 (LH). It indicates, in percentage, the ratio of aileron deflection to maximum deflection. It receives data from the aileron trim actuator.

Warning Lights

The amber lights on the warning panel associated with the ailerons are:

- AIL FEEL amber light
- AIL ZERO amber light.

The AIL FEEL amber light indicates a discrepancy between the ADC airspeed value and the actual position of the ARTHUR variable bellcrank.

The AIL ZERO amber light indicates that the aileron emergency trim actuator is not in the neutral position.

Rudder

The rudder is controlled from the pilot and copilot rudder pedals through a rigid linkage. The rudder is actuated by a nonreversible, dual-barrel servo actuator, each barrel being supplied by a different hydraulic system. Rudder travel is ±29º.

A return-to-neutral spring (artificial feel unit [AFU]) is incorporated in the linkage.

Yaw Damper

This slaved actuator, located in the vertical stabilizer, is series-mounted on the main control linkage at the level of the last link rod next to the servo actuator.

The yaw damper is controlled by the autopilot, but may be selected without autopilot operation.

Elevators

The elevator is controlled from the pilot and copilot control columns through a rigid linkage.

Inputs from the pilot to the Dual Barrel Hydraulic servo actuator are modified by a return-to-neutral spring (AFU) and an elevator Arthur unit, providing progressively stiffer feel as airspeed increases.

This Arthur unit uses #1 hydraulic pressure for movement, and a position sensor on the stabilizer trim actuator for airspeed sensing, to vary the mechanical advantage over the AFU to produce artificial feel. For slow speed safety, the Arthur unit has an internal spring to return the unit to the low speed feel position in case of #1 hydraulic failure. The Arthur unit also reverts to low speed, if not already there, with slat extension. The ADC monitors the Arthur unit position and, if a discrepancy exists, warns the pilot with illumination of the PITCH FEEL light on the master warning panel.

The elevator control features an independent trim circuit for setting the horizontal stabilizer angle. improper T.O. trim is included in the T.O. CONFIG warning.

Secondary Flight Controls

The Falcon 900B secondary flight controls consist of:

- a horizontal stabilizer for additional and independent trim of the elevator control
- trailing edge flaps designed to increase aerodynamic lift during slow flight
- four leading edge slats for proper aerodynamic lift and optimal aerodynamic flow over the ailerons during slow flight
- six airbrake panels for aerodynamic braking.

Horizontal Stabilizer

The elevator control features an additional and independent trim system allowing adjustment of the horizontal stabilizer leading edge.

Horizontal stabilizer movement is provided by two electric motors and a jack screw. One normal trim motor is controlled by the pilot's trim switches, the autopilot, and the Mach trim amplifier. An identical, emergency trim motor is controlled by the emergency trim lever on the pedestal.

Horizontal stabilizer movement is indicated by an audio-warning signal (rattle sound), with either motor operating.

Flaps

Each wing is fitted with two flaps, the setting of which is controlled by the pilot via the lever on the slats/flaps control box.

The maximum extension of the flaps is 40°.

A flaps position indicator allows flap position checking.

Each wing trailing edge has one inboard and one outboard flap panel. The flaps are of the dual-slot type. Flap travel is guided by rollers moving along tracks. The inboard flaps are positioned by two screw jacks, while the outboard flaps are positioned by a single screw jack, plus an inboard flap connecting rod. These screw jacks are nonreversible. Torque rods fitted with universal joints transmit torque from a #2 hydraulic system motor in the left wheel well.

Controls and Indications

The flap system is controlled through the slats/flaps control box which provides for selection of the flap operating angles in relation to the various phases of flight.

The flaps position indicator located on the slats/flaps/airbrakes configuration panel displays flap position through data transmitted by the left flap position potentiometer. A separate position potentiometer on the right flaps provides comparison for the flap asymmetry circuit.

A FLAP ASYM warning light, associated with its system, is found on the warning panel.

Slats

The aircraft is fitted with leading edge slats which provide proper aerodynamic lift and optimal aerodynamic flow in critical phases of flight. The slats are actuated by hydraulic actuators. Slat travel guidance occurs through tracks bearing on rollers.

There are four slat operating modes:

- normal mode, controlled by the pilot via the lever on the slats/flaps control box.
- emergency mode, controlled by the pilot via the EMERG/ SLATS switch on the center pedestal.
- automatic mode, outboard slats extension approaching stall is commanded by the stall vanes; extension is at 11° aircraft angle-of-attack.
- automatic inboard slat retraction beyond stall also commanded by stall vane sensors; retraction is at 23° aircraft angle-of-attack and lowers the nose. The outboard slats remain extended.

The slats are operated by hydraulic actuators. Two identical actuators control the extension and normal retraction of the outboard slats on each wing. One actuator controls extension and retraction of the inboard slats on each wing.

The slats are extended in an electrical sequence, outboard slats first, then inboard slats. The slats are also retracted in an electrical sequence, inboard slats and flaps first, then outboard slats.

The movement of the inboard slats is hydraulically separated from the movement of the outboard slats. There is one solenoid selector valve for the inboard slats and another for the outboard slats.

A check valve located in the valve box is designed to maintain retract pressure on the slat actuator in the event of failure of the #1 hydraulic system.

Outboard Slat Emergency Solenoid Selector Valve

Emergency extension of the outboard slats is controlled by an EMERG SLATS switch, which is held in normal position by a guard.

In event of failure of the No. 1 hydraulic system or the normal electrical control, setting the switch to EMERG SLATS actuates the emergency solenoid selector valve. This causes the following:

- supply of system 2 hydraulic power to the two separate and dedicated outboard slat emergency actuators, causing extension of the outboard slats.
- movement of the supply slide valves, relieving the retract pressure on the normal actuators.

Stall Vanes

In the automatic in-flight operating mode, slat control depends on the aircraft AOA. Two stall vanes, one on each side of the front fuselage, detect changes to AOA and provide an audio warning to the pilots when a near-stall attitude is reached.

In addition to the warning, an AOA of >11° prompts automatic extension of the outboard slats. If the slats are already extended, an AOA of >23° will prompt retraction of the inboard slats. Speed recovery to normal AOA will automatically reconfigure the wing to pre-stall condition. If the airbrakes are extended and an AOA of 16.5° is detected by either stall vane, the airbrakes will automatically retract and the airbrake light will flash. Speed recovery will not automatically re-extend the airbrakes.

Indications

When the red light on the configuration panel is on, it indicates that the slats are retracting or extending.

When the green light on the configuration panel is on steady, it indicates that all slats are extended.

When the green light on the configuration panel flashes, it indicates either that only the outboard slats are extended or that the inboard slats are retracting.

Airbrakes

The aircraft is fitted with airbrakes providing for aerodynamic braking, supplied from hydraulic system No. 2. There is no mechanical synchronization between the airbrakes.

The maximum displacement angle for each airbrake panel is:

- inboard airbrake panels: 37°
- middle airbrake panels: 50°
- outboard airbrake panels: 68°.

Airbrake Solenoid Selector Valve

The airbrakes are controlled through two solenoid selector valves:

- one solenoid selector valve for operation of the middle airbrakes
- one solenoid selector valve for operation of the inboard and outboard airbrakes.

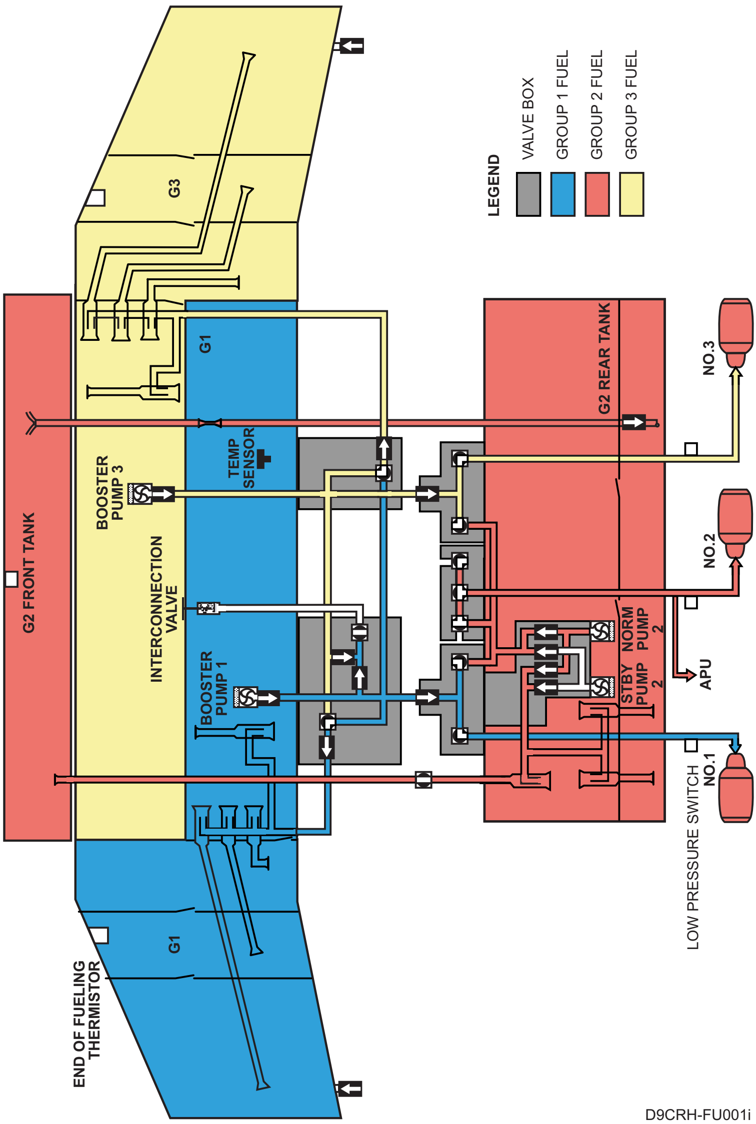
Airbrake Pressure Holding Valve

The airbrake pressure holding valve and accumulator, located in the RH main landing gear compartment, maintains a residual pressure on the “retracted” chamber side when the pressure drops in hydraulic system No. 2.

Indications

Six microswitches are installed on the wings and control the AIRBRAKE and the T/O CONFIG warning lights.

Fuel System



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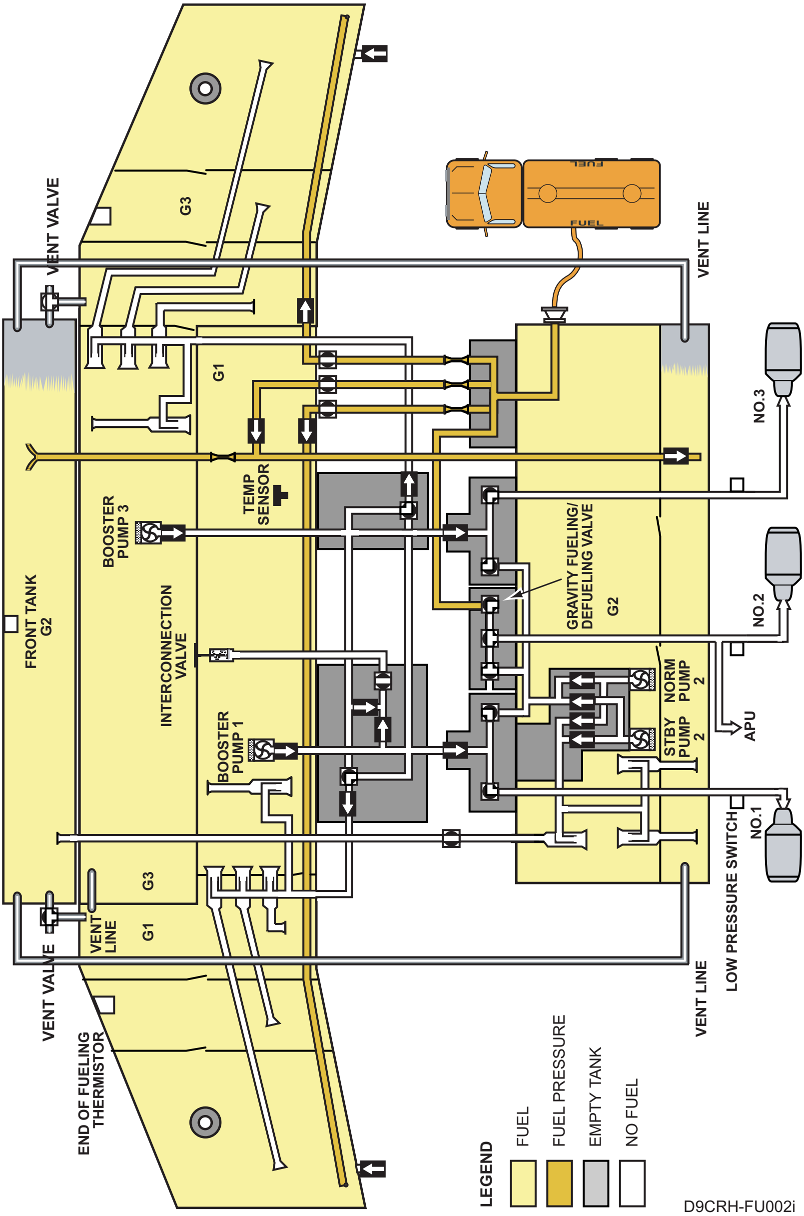
Fueling and Defueling



Fuel Storage

The aircraft fuel tanks are:

- left wing (group 1)
- center, (front, rear) (group 2)
- right wing (group 3).

Fuel Tanks

Wing Tanks

The wing tanks, group 1 and group 3, are an integral part of the wing structure, and each wing tank has a single booster pump.

Although single point refueling is the refueling method of choice, each of the wing tanks can be filled through a filling port located on the top surface. Internal baffles in the tanks retard sloshing and allow normal fuel flow by gravity but only toward the inboard sections of the wing.

The outboard end of each wing is equipped with a negative pressure relief valve.

Each wing tank contains a boost pump located in the inboard section of each tank. Jet pumps help move fuel inboard and towards the pump well.

Sump drains at each wing root provide for evacuation of water and sediment. A special coating is applied to the tank inner surfaces to minimize bacterial growth and corrosion.

Center Tank

The center tank (group 2) is divided into two separate tanks.

The front tank is located immediately forward of the wing. The rear tank is aft and between the main landing gear.

The front and rear tanks are interconnected by four pipes, two pipes designed to allow the circulation of air and, two larger pipes to allow transfer of fuel between the two tanks.

The tanks are equipped with sump drains.

The center tank is equipped with two identical booster pumps, both located in the aft tank. The pump well is fed by four jet pumps which suck up the fuel from different locations of the center tank.

Tank Capacities

The capacities and weights shown in **Table 4E-A** represent the quantities of fuel usable in flight.

		liters	US gallons	lb
Left Wing (Group 1)		3424	904.6	6061.6
Right Wing (Group 3)		3424	904.6	6061.6
Center (Group 2)	**Front**	2042	539.6	3615.5
	Rear	1879	496.4	3325.7
Aircraft Total Capacity		10769	2845.2	19064.4

Table 4E-A; Falcon 900B Fuel Tank Capacities

Tank Pressurization

LP bleed air from the No. 1 and 2 engines pressurizes the fuel tanks.

The bleed air is reduced to about 3 psi and is indicated on a gauge in the aft compartment.

The tanks are automatically pressurized as soon as either engine is started. This system is completely automatic.

Even though the fuel system is designed to use boost pump pressure, tank pressurization will supply adequate engine fuel, especially at lower altitudes.

During refueling, venting occurs through two electrically controlled valves located forward of the wing roots. These vent valves open and close in the following sequence: left, right.

Quantity Indication

The quantity indication system is divided into three subsystems, one for each wing group and one for the center group.

Each subsystem consists of capacitance probes, an amplifier and a cockpit indicator.

The G1 and G3 centerwing probes and the G2 rear tank probe each include a level detector.

On aircraft < 179, when the level in one of these tanks is lower than 1000 lb of fuel remaining in the tank group, the corresponding LEVEL light comes on.

The three LEVEL lights are located on the overhead panel.

On aircraft ≥ 179, when the level in one of these tanks is less than 1000 lb, a LVL message concerning the corresponding tank displays on the FUEL page of the EID (Engine Instrument Display).

Each tank group has a second level detector. When the level in one of these tanks drops below 200 lb, the LO FUEL 1, 2 or 3 light will come on.

Transfer System

Front-to-Rear Tank Fuel Transfer (Group 2)

In addition to the two air pressurization interconnection pipes, two fuel pipes connect the front tank to the rear tank.

The RH pipe is used for gravity transfer of fuel from the front tank until the fuel level reaches one-third of its capacity. This pipe is also used during fueling.

The LH pipe, assisted by a jet pump in the rear tank, is used for assisted gravity transfer. Fuel is sucked up from the low point of the front tank. This LH pipe is fitted with an electric transfer valve XTK2 on early aircraft (prior to S/N 78), unless SB F900-48 has been implemented.

Aircraft Fitted with Fuel Transfer Valve XTK2 (Early Aircraft Without SB F900-48)

The transfer valve permits sequential consumption of the fuel in the front and rear fuselage tanks.

The electric transfer valve XTK2 permits one-third of the capacity of the front tank to be conserved during consumption in order to guarantee a forward center of gravity.

A three-position XTK2 AUTO/OPEN/CLOSED switch on the overhead panel controls the electric transfer valve XTK2. It operates as follows:

- In the AUTO position, the transfer valve XTK2 is controlled by the transfer control logic circuit.
- In the OPEN position, the transfer valve XTK2 is open, regardless of the transfer control logic circuit.
- In the CLOSED position, the transfer valve XTK2 is closed, regardless of the transfer control logic circuit.

When the XTK2 switch is in the AUTO position, the transfer valve XTK2 is controlled by the transfer control logic circuit as follows:

To burn FWD fuel early, the transfer valve XTK2 opens when:

- The front fuselage tank contains more than 1,200 lb, or
- The rear fuselage tank contains less than 1,100 lb.

To preserve some FWD fuel, the transfer valve XTK2 closes when:

- The front fuselage tank contains less than 1,200 lb, and
- The rear fuselage tank contains more than 1,400 lb.

Because the transfer valve XTK2 opens for a rear tank level of less than 1,100 lb, all fuel is consumed from group 2.

The monitoring logic circuit causes the XTK2 CLOSED or XTK2 OPEN warning panel light to come on, should automatic transfer fail. If the XTK2 CLOSED light illuminates, this indicates that the transfer valve XTK2 is closed when it should be open. If the XTK2 OPEN light illuminates, this indicates that the transfer valve XTK2 is open when it should be closed.

The transfer valve XTK2 is fitted with a manual handle which can be used to open and close the valve manually from the passenger cabin.

Engine Supply System

General

Engines 1 and 3 are normally fed fuel from the fuel group 1 and group 3 boost pumps located in pump wells near the center of the fuselage.

Engine 2 is fed fuel from tank group 2 through a normal or an identical standby boost pump located in a pump well in the aft tank of group 2. The standby boost pump is a backup for the normal pump.

All four boost pumps are centrifugal pumps, driven by a three-phase AC motor. A DC/AC convertor is built into the pumps. The pumps are designed to allow fuel passage when not operating.

Crossfeed

Booster Crossfeed

Interconnections between the different fuel supply systems enable any operating pump of a given engine to also supply fuel to another engine whose pump has failed.

Crossfeed is possible between:

- Systems 1 and 3 (X-BP 1-3)
- Systems 1 and 2, or 3 and 2 (X-BP 1-2 or 2-3).

X-BP 1-3 Crossfeed

This crossfeed enables the fuel contained in one of the wing groups to be consumed by both engines 1 and 3 using a single boost pump. An amber X-BP light on the overhead fuel panel illuminates when the crossfeed is open.

Group 1 and Group 3 Tank Interconnection Valve (XTK)

The interconnection valve, located at the bottom of the partition separating the two wing groups, is composed of a valve and a control piston subjected to fuel pressure. A microswitch causes the XTK light on the overhead panel to illuminate when the valve is open.

A three-position switch on the overhead panel allows boost fuel pressure to press against a piston and open the XTK valve, interconnecting the G1 and G3 tanks. This switch also directs the operating boost pump to supply only the jet pumps in the failed boost pump group. The effect is to artificially raise the fuel level at the partition incorporating the XTK valve, and the fuel gravity flows toward the operating boost pump side. The XTK switch will function only when X-BP 1-3 is open.

X-BP 1-2 or 2-3 Crossfeed

When X-BP 1-2 or 2-3 are open, interconnection is established between the fuel supply system of the corresponding engine (No. 1 or 3) and that of the No. 2 engine.

The valves are controlled by two rotary selector switches on the overhead panel. When the valve of one manifold is open, the corresponding X-BP light on the overhead panel comes on.

When the control switch for booster pump No. 2 is set to NORMAL, the opening of either the X-BP 1-2 or the X-BP 2-3 crossfeed valve causes both group 2 booster pumps to be energized. Thus, consumption of fuel from group 2 takes precedence over that in the corresponding wing group, without the need to cut out the corresponding side pump.

Fuel Shutoff Valves

Three fuel shutoff switches which control fuel shutoff valves are located on the fire panel. The shutoff valves are simultaneously operated by dual electric motors supplied by separate (A bus, B bus) power sources. The shutoff valves are located in the fuel tank area.

Indicating Pressure Switches

Each engine contains a fuel feed pressure switch located at the engine. These switches control the FUEL 1, FUEL 2 and FUEL 3 lights on the warning panel. The lights will illuminate when the pressure in the corresponding system drops below 4.6 psi.

Indications

Fuel Flow/Fuel Used Indicators (Aircraft < 179)

The fuel flow indicators give, in pounds per hour, the instantaneous fuel flow and the total amount of fuel consumed by each engine.

A button located on the instrument front will:

- reset when pulled out
- digital display of instantaneous fuel flow for 30 seconds when pushed in.

The FUEL FLOW TEST button, located on the maintenance panel, is used to test instrument operation (needle slews to 1200 lb/min).

Fuel Flow Data (Aircraft ≥ 179)

The following data are displayed on the EID (Engine Instrument Display):

- on FUEL page
  - FU data, quantity of fuel used by each engine (lb). The display can be reset by depressing the FU-RST pushbutton on the main menu for more than three seconds.

- as a permanent display
  - FF PPH data, instantaneous fuel flow for each engine (pound per hour).
  - FQ data, total amount of fuel used (lb).
  - FR data, total amount of remaining fuel (lb).
  - GW message, aircraft total weight (lb).

Fueling Light

This light is located on the warning panel and comes on to signal that one of the following has occurred:

- One of the two vent valves is not closed.
- The defueling/refueling valve is not closed.
- The access door to either the refueling connector or the refueling control panel is open.
- Either the DEFUELING or the GRAVITY FUELING switch is still set to ON.
- The lever, near the refueling connector, and which controls the vent valves, is still raised.

Fuel Shutoff Valve Position Lights

These amber lights, located next to the control switches on the fire panel and identified TRANS, come on to signal a discrepancy between the position of one of the valves and that of its control switch. The lights also come on during opening or closing of the valves.

Fuel Temperature Indicator

Aircraft < 179

This indicator, located on the overhead panel, is installed on aircraft that have serial numbers lower than 70 and on aircraft with option 28-40-01.

Aircraft $\geq$ 179

Read the fuel temperature directly on the FUEL page of the EID. A FUEL TEMP LOW message is displayed in the EID message window if the fuel temperature is less than -40°C (-40°F).

Refueling/Defueling System

General

The aircraft is equipped with:

- a pressure refueling system, designed to refuel the tanks at a maximum pressure of 50 PSI, with automatic stop at the end of refueling.
- a partial refueling system, which will fill each tank to one-third of the set value and then automatically shut off.
- a gravity refueling system, as a standby for the pressure refueling system.

Pressure Refueling

NOTE: Whenever a change of fuel is made or a mixture of fuels used, the engine computer must be adjusted accordingly, as indicated in the GARRETT Maintenance Manual.

The battery bus energizes the pressure refueling electrical circuit. No action is required from the cockpit.

The system chiefly comprises:

- a refueling connector
- a control panel
- two vent valves
- three refueling solenoid valves
- a test circuit.

Refueling Connector

Pressure refueling occurs via a refueling connector. A door fitted with a microswitch provides access and causes the FUELING light on the warning panel to come on.

The connector is of the self-blanking type, the valve clapper being pushed open by the fueling nozzle. The vent valve control lever is fitted next to the refueling connector in such a way that it has to be moved for the fuel nozzle to be connected. The lever acts on a microswitch to control the opening and closing of the two vent valves.

Control Panel

This panel incorporates the various control and monitoring switches and lights for the refueling system. The access door causes the FUELING light on the warning panel to come on when open.

The control panel has the following controls:

- three fueling switches with associated FULL lights. These switches open the refueling valves.
- a DEFUELING switch, for defueling through the refueling connector.
- four VENT VALVE TEST CLOSED and OPEN test sockets.
- a TEST pushbutton for testing the refueling automatic stop function and valve closing.
- a red STOP FUELING light which, when on, indicates that refueling cannot take place.

> **NOTE:** If the STOP FUELING light comes on during refueling, stop refueling operations immediately.

- a green FUELING OK light which comes on to indicate that both vent valves are open, and fueling can take place.

- a two-position FULL/PARTIAL switch. This switch enables full or partial fueling of the tanks.
- a refueling quantity selector, used to preset a desired total quantity of fuel for less than full refueling. The refueling valves will automatically close when the total quantity of fuel in the tanks corresponds to the preset level.

Vent Valves

These two valves are located in the wing-to-fuselage fairings each side above the upper surface of the wing fuel tanks. They are three-way, two-position valves controlled by an electrical switch. In the open position, each valve vents either the LH or RH wing and the front group 2 tank via vertical pipes leading to the lower surface of the fairings. These valves open and close in a specific sequence: first the left, then the right.

Refueling Solenoid Valves

These three valves are located on the refueling manifold and permit fuel to flow to their respective tank groups. They are controlled by the three LEFT, CENTER and RIGHT switches on the refueling control panel. They will open only when the vent valves are themselves open.

The full detectors for each tank group control valve closing automatically.

Test Circuit

A test pushbutton, located on the refueling control panel, can be used to check the automatic refueling stop system and the full detectors for proper operation. During pressure refueling, when the test pushbutton is pressed, the amber FULL light located next to the associated switch on the refueling panel will illuminate and fuel should stop flowing in five seconds.

Partial Refueling

The refueling control panel access door also provides access to a partial refueling selector. A dial allows selection of the desired amount of total fuel.

The selector is operational only when the FULL-PARTIAL switch is set to PARTIAL.

The quantity selected is divided equally between the three groups of tanks.

The system is entirely automatic and the refueling valves close as soon as the probes of each group of tanks detect a quantity equal to one third of the quantity selected.

CAUTION: Since fuel quantity amplifiers and gauges are active when the switch is in the partial position, care must be taken to protect the batteries from excessive drain.

Gravity Refueling

The aircraft is equipped for gravity refueling via filling ports located on each wing.

Refueling the center group of tanks requires pressurization of the refueling system by:

- opening one or both of the X-BP 1-2 or 2-3 crossfeeds.
- activating the No. 1 and/or No. 3 booster pump.
- opening the defueling/refueling valve with the GRAVITY FUELING switch on the copilot side maintenance panel (thus, also opening the vent valves).

It is then possible to open the center refueling valve, controlled by the switch on the refueling control panel, and to refuel group 2 tanks with boosted fuel from each wing tank.

CAUTION: Use of the gravity refueling system requires aircraft power from the APU or GPU. The quantity indication system can monitor refueling. The end-of-refueling thermistors of the center system are operational.

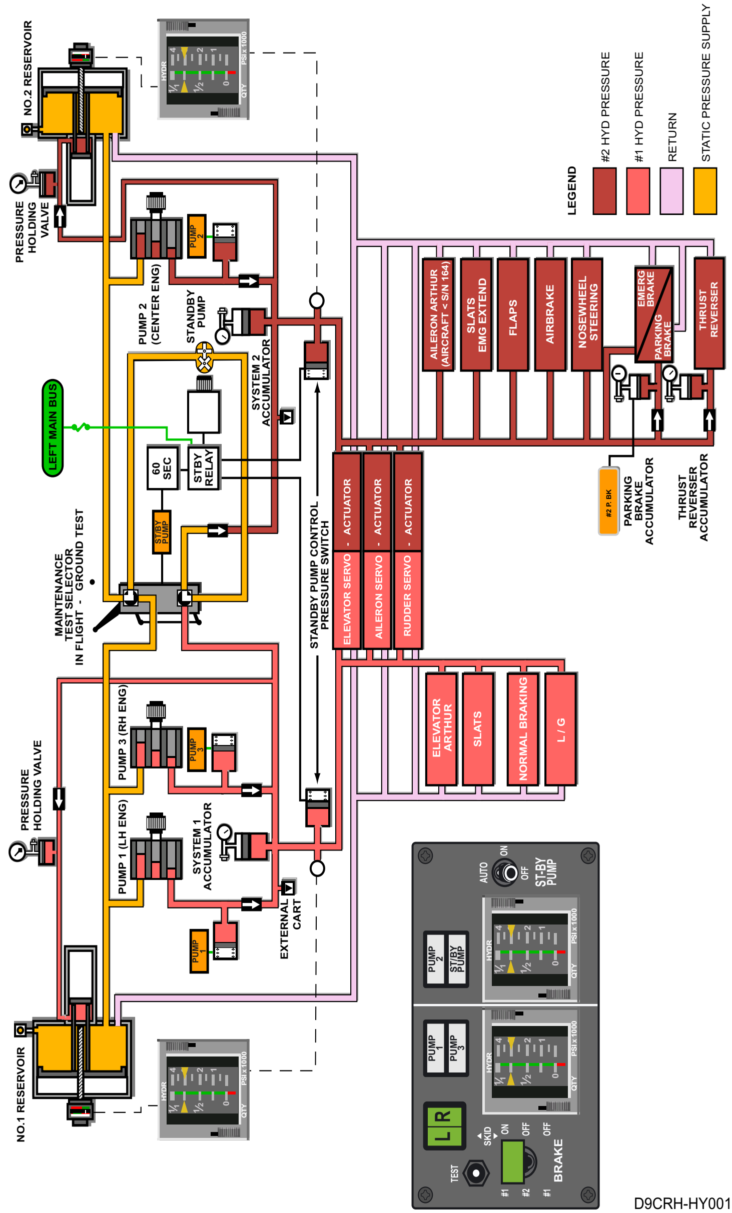
Defueling

Apart from its center system gravity refueling function, the defueling/refueling valve can also be used for defueling through the fueling manifold and pressure refueling connector. For this function, the DEFUELING switch on the refueling panel controls the valve.

The opening of the defueling/refueling valve interconnects the X-BP 1-2, 2-3 crossfeed system and the refueling system. Activation of the booster pumps and opening of the X-BP crossfeed valves enables all the tanks to be defueled to a truck.

The FUELING light on the warning panel is on during defueling.

Hydraulic System



Hydraulic Systems

General

The main hydraulic power supply system consists of two independent, simultaneously operating systems, 1 and 2.

A standby electric pump can replace the system 2 engine pump.

The standby pump can be used on the ground as a test supply for hydraulic system 1 or 2.

An indicating and warning circuit enables checking of the hydraulic systems for operation.

Main Hydraulic Power Supply

Each engine drives a constant pressure/variable volume pump that produces 3000 psi of pressure and has a delivery rate at maximum speed of 7.6 gal/min.

The engine-driven pumps for hydraulic system 1 are mounted on the No. 1 and No. 3 engines. The No. 2 engine drives the pump for hydraulic system 2. All three hydraulic pumps are identical.

The pumps draw hydraulic fluid for distribution from their respective system reservoirs. The flowrate is automatically controlled according to system requirements.

Hydraulic system 1 supplies:

- One barrel of each flight control servoactuator, and
- Slats
- Landing gear
- Arthur (elevator)
- Brakes.

Hydraulic system 2 supplies:

- The second barrel of flight control servoactuators, and
- Flaps
- Airbrakes
- Thrust reverser
- Brakes (emergency)
- Arthur (aileron)
- Outboard Slats (emergency)
- Steering

The two systems are similar and include all components required to store, filter, pressurize and monitor the hydraulic fluid.

Hydraulic Reservoirs

The hydraulic reservoirs, located in the aft compartment, supply hydraulic fluid to their respective engine-driven pumps and receive system return fluid.

The hydraulic system 1 reservoir and the hydraulic system 2 reservoir are identical in design but have different capacities. The system 1 reservoir is larger.

Each reservoir is a horizontal cylinder-with-piston assembly. Fluid above the piston is kept pressurized by a small actuator attached to the piston and receiving system pressure. The resultant reservoir pressure is about 40 psi and is maintained after shutdown by a pressure holding accumulator. Both hydraulic systems are airless and must be serviced by special means.

Accumulators

Each system has an oleo-pneumatic accumulator designed to dampen the pressure surges and provide reserve power, available instantaneously.

The No. 2 system includes two additional pressure-holding accumulators that provide a reserve for the parking brake system and the thrust reverser.

Warning Lights

Each hydraulic pump has a warning light on the hydraulic control panel (aircraft < 179) or on the warning panel (aircraft ≥ 179). If a pump fails, a pressure switch downstream of the pump closes at 1500 psi and illuminates the associated PMP or, on aircraft > 179, HYDR# or PUMP# light.

Standby Hydraulic Pump Supply

In addition to the engine-driven pumps, there is an electrically powered hydraulic pump in the aft compartment. Power for the standby pump is supplied directly from the left main bus. The pump is normally used as an airborne backup for the engine 2 pump powering system 2. A manual selector valve in the aft compartment allows maintenance personnel to use the standby pump to power system 1. If the selector valve is not in FLIGHT position, the STBY PMP annunciator on the hydraulic panel illuminates continuously.

Operation of the standby pump is controlled by the STBY PUMP switch. The switch has three positions, OFF, ON and AUTO.

When set to the OFF position, the standby pump is not activated.

When set to the ON position, the pump cycles on and off between 1500 psi and 2150 psi, as activated by a pressure switch in the operating system.

When set to the AUTO position, the standby pump automatically cycles between the same limits, controlled by the same pressure switch when:

- the pressure drops below 1500 psi, and
- the airbrake control handle is not in the 0 position.

AUTO is the normal flight position.

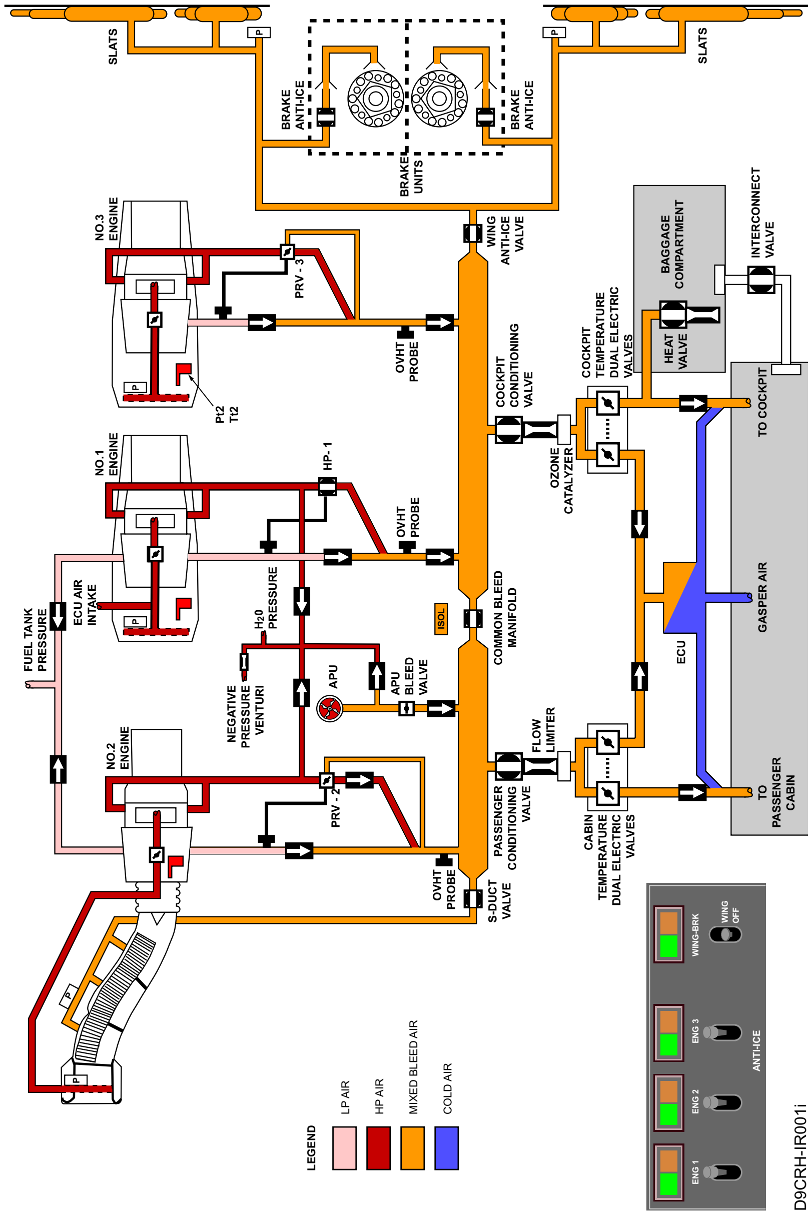
NOTE: The AUTO position mimics the ON position when the aircraft is on the ground.

Warning Light

The ST/BY PUMP warning light illuminates:

- when the selector in the rear compartment is set to GROUND TEST.
- when the operating cycle of the pump is longer than one minute due to possible pressure switch failure or loss of fluid.

Anti-icing System



Bleed Air Anti-icing

Hot air from the common bleed manifold is used to anti-ice the wing leading edge (slats) and the S-duct associated with the #2 engine. Each engine inlet is anti-iced with hot bleed air from its own engine.

Wing Anti-icing

Hot air routed from the common bleed manifold, on the No. 1 and 3 engine side of the electric isolation valve, anti-ice the wing leading edge slats. Hot air flows into the system through a wing electric anti-icing valve. Manifolds connected to the supply line by telescopic tubes supply the hot air to each slat. The slats are anti-iced equally, whether in the retracted or extended configuration.

At each wing root, a small quantity of air is tapped to heat the fixed wing box structure.

Two pressure switches (one on the RH wing and one on the LH wing) detect the pressure of anti-icing air.

Controls and Indications

The WING switch located on the overhead panel controls the wing anti-icing system. The switch has two positions (on and off) and a third WING-BRK position on aircraft with SB F900-32; it controls:

- the opening and closing of the wing anti-icing valve
- the regulated opening (or full opening) of the No. 1 and 3 engines HP bleed valves when the temperature of the corresponding LP bleed air is less than 190°C (374°F)
- With SB F900-32, wing air is diverted to the brake heating system, inside closed wheel wells.

A double amber/green WING light indicates system operation.

WING Light	Switch Position	Condition
Amber	ON	Air pressure < 4 psi
Green	ON	Air pressure > 4 psi
Amber (flashing)	ON	Excessive anti-icing
Amber (flashing)	OFF	Valve in disagreement with switch

Table 4G-A; Wing Light Switch Logic

Engine Air Intake Anti-icing

For each engine, the anti-icing system comprises:

- an HP air system that anti-ices the air intake lip of the corresponding engine.
- electrical heating of PT2/TT2 probe.

Additionally, for the No. 2 engine, an air system supplied by the common bleed manifold anti-ices the S-duct.

Engines 1 and 3 Anti-icing

Description

HP air anti-ices the side engines through an electric pressure regulating valve which opens variably, producing a working pressure of approximately 65 PSI.

A perforated tube distributes hot air all around the air intake. The air exits through louvers on the cowling.

Pressure switches at 4 psi and 90 psi monitor proper operation.

The LH engine air system also ensures anti-icing of the air inlet to the heat exchanger in the leading edge of the pylon.

Controls and Indications

The ENG 1 and ENG 3 switches, located on the overhead panel, control anti-icing of the air intake for the No. 1 and 3 engines. They have two positions (on and off). They control:

- the air intake anti-icing pressure regulating valve
- the PT2/TT2 sensor heating resistor.

The ENG 1 and ENG 3 double amber/green lights indicate system operation.

ENG Light	Switch Position	Condition
Amber	ON	< 4 psi - low pressure
Green	ON	> 4 psi - minimum pressure
Amber (flashing)	ON	90 psi - too much pressure
Amber (flashing)	OFF	Valve position disagreement

Table 4G-B; ENG Lights Switch Logic

No. 2 Engine Air Intake and S-Duct Anti-icing

Description

The No. 2 engine air intake anti-icing system is similar to that of the No. 1 and 3 systems. It includes a pressure regulating valve, an LP pressure switch calibrated at 4 psi, an HP pressure switch calibrated at 90 psi, and a perforated distribution line.

The common bleed air manifold supplies air to the S-duct. The system comprises:

- an electrically controlled anti-icing butterfly valve
- a set of four perforated distribution blankets installed along the upper section of the S-duct that externally heats the top surface of the S-duct.
- a pressure switch calibrated at 4 psi.

Controls and Indications

The ENG 2 switch on the overhead panel controls No. 2 engine air intake and S-duct anti-icing. This is a two-position switch that controls:

- opening and closing of the S-duct anti-icing valve
- activation and closing of the air intake anti-icing PRV
- electrical supply of the PT2/TT2 sensor heat
- full opening of PRV 2 when the temperature of LP 2 bleed air is less than 190°C.

The ENG 2 double amber/green light indicates essentially the same as the ENG 1 and ENG 3 lights.

HP Bleed Air System Cut-Off

In order to protect heated surfaces at high engine power settings, all 3 HP valves (HP-1, PRV2, PRV3), automatically close with high engine rpm and anti-ice operating. Engine acceleration with anti-ice on, or switching on anti-ice when the engines are near climb power, closes the HP valves for 18 seconds and then the system reverts to normal valve logic.

Electrical Anti-icing

Pitot/Static Probe Anti-icing

The pitot and static probes, angle-of-attack sensors and the outside temperature sensors are anti-iced electrically.

The pilot anti-icing system is for the:

- LH pitot probe
- One-half of the LH and RH static plates
- LH stall vane
- outside temperature sensor.

The copilot anti-icing system is for the:

- RH pitot probe
- One-half of the RH and LH static plates
- RH stall vane.

A separate system anti-ices the standby pitot probe.

For the three systems, the current through the heating resistors is monitored. Warning lights (L PITOT, R PITOT, ST BY PITOT, L AOA and R AOA) will come on in a case of incorrect current.

On aircraft ≥ 179, the illumination of the PROBE HEATING light on the warning panel results in the display of at least one of the following white messages on the engine instrument display (EID), according to the origin of the failure:

- PITOT HEAT 1: pilot pitot probe or pilot static probe
- PITOT HEAT 2: standby pitot probe
- PITOT HEAT 3: copilot pitot probe or copilot static probe
- AOA HEAT 1: pilot angle-of-attack sensor
- AOA HEAT 2: copilot angle-of-attack sensor.

Cockpit Window Anti-icing

The Falcon 900 is equipped with electric heating resistor networks for all cockpit windows. The aircraft is also equipped with a windshield pane defogging system supplied with air from the air conditioning system and the EFIS ventilation system. In addition, the aircraft has a defogging system for the aft cockpit windows and cabin windows.

A network of heating wires incorporated in the transparent part of each window heats the cockpit windows electrically.

Windshield

Two switches control windshield heating:

- WINDSHIELD PILOT for the pilot window and the left half of the center window
- WINDSHIELD COPILOT for the copilot window and the right half of the center window.

Each of these switches has three positions, OFF, NORM and MAX.

In the OFF position, the corresponding windshield panes are not heated.

In the NORM position, a regulator and temperature probes attempt to maintain the window at about 80°F.

In the MAX position, a resistor is introduced to restrict current flow to the center window, allowing a larger current flow to the forward window. The temperature range is unaffected.

If a fault affects one windshield regulator, it causes:

- transfer of the heating regulation function it was performing over to the other windshield heating control regulator
- illumination of the windshield XFR light.

Side Windows

The WINDSHIELD-SIDE switch controls heating of the forward and aft side windows.

This switch has two positions, OFF and ON.

- In the OFF position, the side windows (forward and aft) are not heated.
- In the ON position, 28V DC is supplied to each control regulator for the DV and aft windows on each side.

Each regulator receives temperature data from the corresponding monitoring probe, and attempts to control the temperature at 80°F.

Each regulator automatically cuts off heating to the corresponding windows in the event of a failure.

Windshield and Cabin Window Defogging

Defogging by the EFIS Ventilation System

As soon as the aircraft is energized, the EFIS blowers are activated and air is blown permanently through three ports in the glareshield at the root of the pilot, copilot and front windshield panels.

Cabin Window Defogging

The cabin windows are defogged as follows:

- The inner pane has a 1.5 mm diameter hole drilled into its lower part.
- The dummy Plexiglas window has a group of seven 1.5 mm holes drilled into its lower part.

These holes allow the drier cabin air to recirculate between the inner and outer panes.

Windshield Wipers

The pilot and copilot windshield panels are both equipped with electric wipers designed to maintain an area of clear visibility during takeoff, approach and landing in rain or snow.

When not in use, they are stowed into a recess at the bottom of the windshield. A three-position (FAST/SLOW/OFF) switch controls each wiper.

Main Landing Gear Brake Heating System (Optional)

The main landing gear brakes are heated with air that is taken from the wing anti-icing pipe and channelled through distribution pipes to a nozzle located between the two wheels.

The function is activated or deactivated for both landing gear wheel wells by means of the WING-BRK position of the wing ANTI-ICE switch that commands two electric valves.

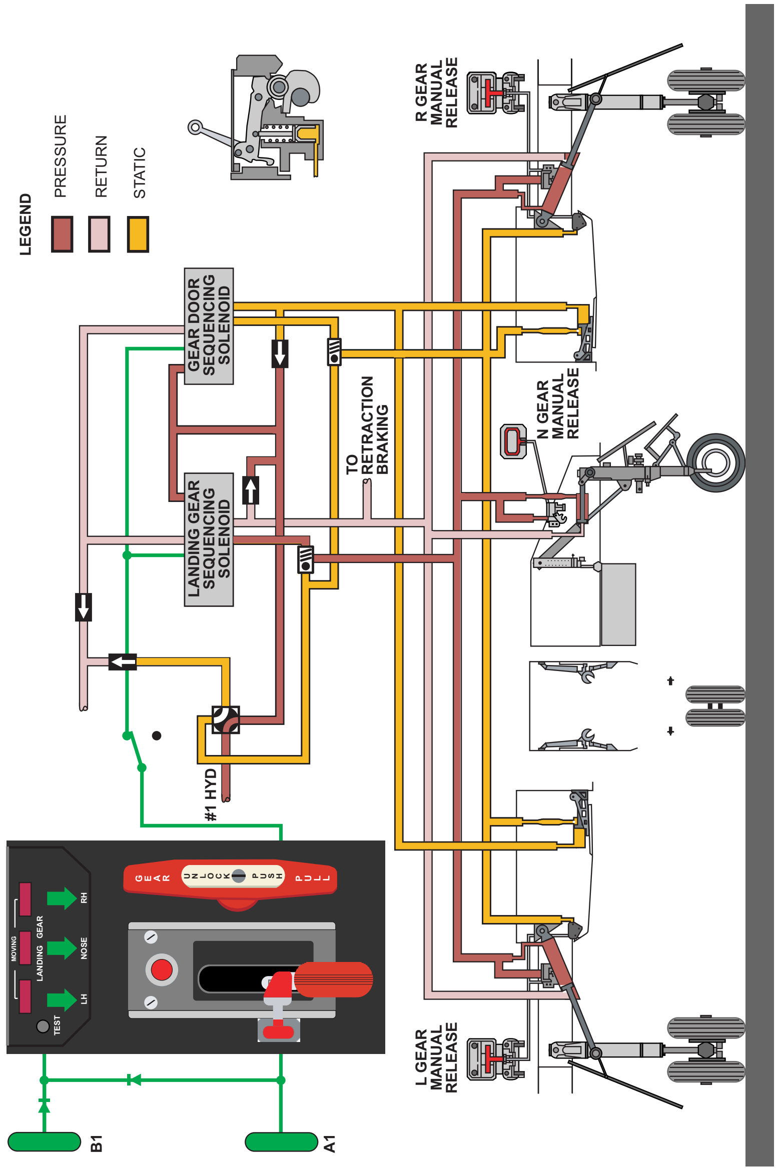
The wing anti-icing indicator lights are used to monitor correct operation.

NOTE: The brake heating system does not in any way affect the operation of wing anti-icing.

Water Pipes

The anti-iced elements of the drinking water system are mainly the front drain mast and rear drain mast.

Landing Gear System



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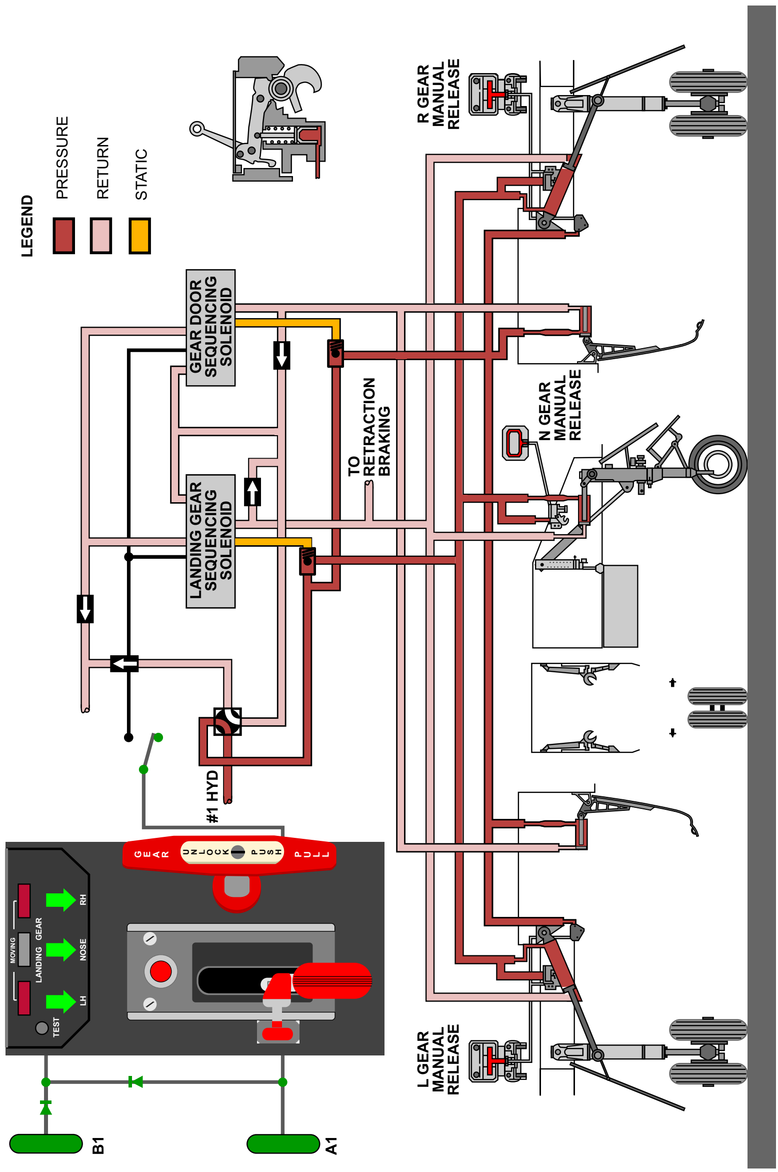
Emergency Extension



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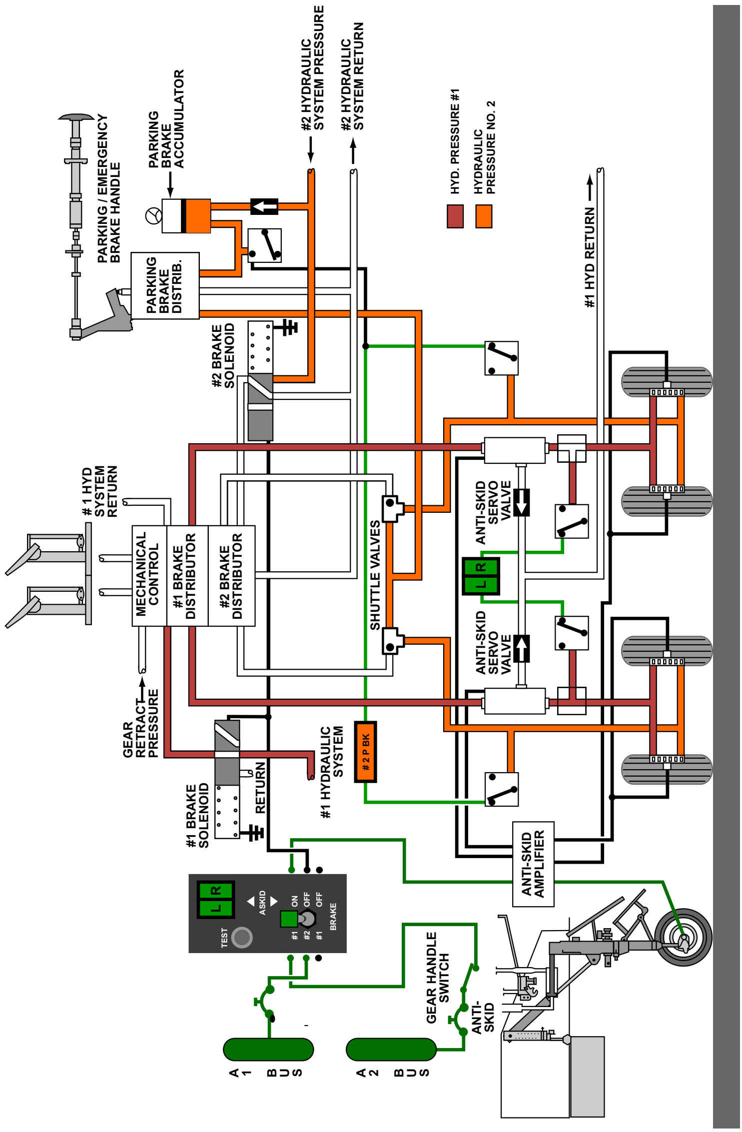
Brakes System

Brake Pedals Depressed and Park Brake Set



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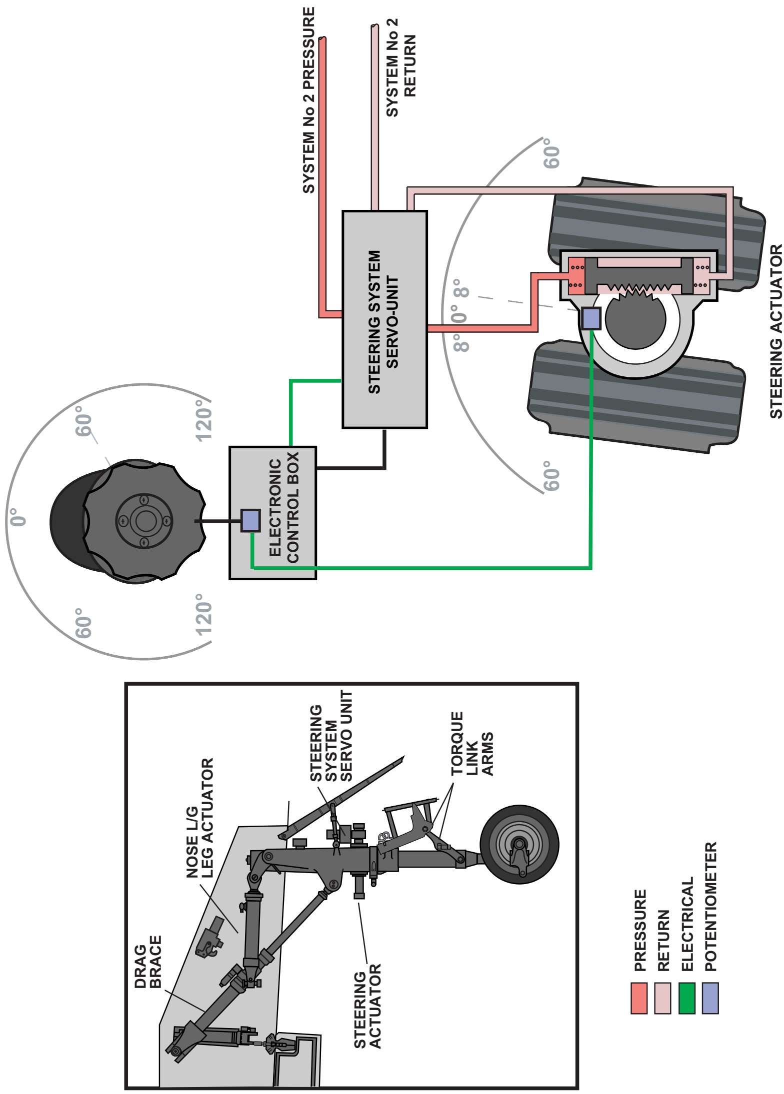
Nosewheel Steering



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Landing Gear

The landing gear system on the Falcon 900B consists of a standard tricycle design. Landing gear extension and retraction are electrically controlled and operated by hydraulic system 1.

Both an emergency (hydraulic/mechanical) gear extension system and a manual (free-fall) gear extension system are available.

Main Landing Gear and Doors

The main landing gear struts absorb shock forces generated during landing and taxiing. The strut is filled with hydraulic fluid and is serviced with nitrogen gas.

A bracing actuator ensures that the landing gear extends and retracts. A mechanical lock within the actuator provides positive downlock indication. Extend pressure is retained.

In the gear up position, the leg is locked by a gear uplock box and all retract pressure is removed.

The landing gear door double-acting actuator controls the opening and closing of the related main landing gear door. It has no internal locking system. Uplock is provided by a door uplock box.

Nose Landing Gear and Doors

The nose landing gear is fitted with a dual wheel arrangement and nosewheel steering system for taxiing. The nose landing gear actuator provides nose landing gear extension and retraction. The leg is braced in the extended position by a separate 45° telescopic tube, internally locked in the extended position. When the gear is retracted, the leg is held up by an uplock box similar to those used for the main gear.

Two lateral doors close the nose landing gear compartment after retraction. They are mechanically actuated by the nose gear.

Proximity Switches

A proximity switch is able to sense position without physical contact. These switches detect the shock absorber position (extended or not) and ensure the ground/flight functions required for certain aircraft systems.

The Flight/Ground proximity switches are located in the following locations:

- two switches on the LH main landing gear strut
- two switches on RH main landing gear strut, and
- two switches on nose landing gear strut.

Nose Gear Shock Absorber		LH Main Gear Shock Absorber		RH Main Gear Shock Absorber	
1	2	1	2	1	2
One of the two switches detects compression of the shock absorber:		One of the two proximity switches		One of the two proximity switches	
		combined with			
authorizes steering system energization.		Authorizes during flight: ■ standby horizon converter power supply ■ cabin/cockpit air conditioning valve opening.			
Both switches detect “shock absorber extended”:		Authorizes on the ground: ■ battery ventilation			

Table 4H-A; Proximity Switch Functions

<table>
<tr><th colspan="2">Nose Gear Shock Absorber</th><th colspan="2">LH Main Gear Shock Absorber</th><th colspan="2">RH Main Gear Shock Absorber</th></tr>
<tr><th>1</th><th>2</th><th>1</th><th>2</th><th>1</th><th>2</th></tr>
<tr>
<td colspan="2">■ cut off the ENG 2 FAIL warning light in flight
■ authorize maintenance tests of:
■ IRS 3
■ MFD
■ PMS
■ control operation of copilot chronometer recording total flight time.</td>
<td colspan="4">■ tests of:
■ FGC 1 and 2 (Flight Guidance Computer)
■ EFIS 1 and 2 (Electronic Flight Instrument System)
■ FMS 1 and 2 (Flight Management System)
■ ENG 2 FAIL warning, if the power lever is set to the TAKEOFF position and the power setting is less than 85% N_1.
■ closing of the exterior baggage compartment door.
■ selection of ground idle on three engines.
■ cycling of standby pump when selector is set to AUTO.
Prevents in flight:
■ deployment of the thrust reverser,
■ normal start.
Controls on the ground:
■ outflow valve opening and air conditioning valves.
Inhibits on the ground:
■ locking of the elevator Arthur unit electrical locks.
Energizes on the ground:
■ the light indicating illumination of the aft compartment dome lights.
Cancels on the ground:
■ automatic load shedding of electrical systems.</td>
</tr>
</table>

Table 4H-A; Proximity Switch Functions (Continued)

<table>
<tr><th colspan="2">Nose Gear Shock Absorber</th><th colspan="2">LH Main Gear Shock Absorber</th><th colspan="2">RH Main Gear Shock Absorber</th></tr>
<tr><th>1</th><th>2</th><th>1</th><th>2</th><th>1</th><th>2</th></tr>
<tr><td colspan="2"></td><td colspan="4">Controls operation of the pilot chronometer recording flight time.
Replaces the reference speed information by the main wheel rotation speed information to compute the memorized speed in antiskid system.</td></tr>
<tr><td colspan="4">One of the two proximity switches   One of the two proximity switches
combined with:
Prevents on the ground:
■ displacement of normal landing gear control handle.
Prevents during flight:
■ automatic slat extension by the test in flight.</td><td colspan="2"></td></tr>
</table>

Table 4H-A; Proximity Switch Functions (Continued)

Extension and Retraction

Sequenced Electrohydraulic Normal Control Mode

This mode controls opening of the main doors, extension and retraction of the landing gear, and closing of the main doors. An indication and warning system monitors the sequence of landing gear operations. Proximity switches throughout the landing gear system signal the completion of an action so that the next action in the sequence may begin.

Hydraulic Emergency Control Mode

An EMERG GEAR PULL handle is located on the instrument panel and is connected to the normal/emergency selector valve by a TELEFLEX flexible control. Rotating this selector valve disables the sequencing and directs #1 hydraulic fluid to the down side of all doors and gears. The indication and warning system is also active in these conditions.

> **NOTE:** This operation is not sequenced. There is no danger of the gear or wheels jamming on the main gear doors.

Mechanical Emergency Control Mode

This mode will overcome system 1 hydraulic failure. Three mechanical emergency controls, located in the cockpit, unlock the main door uplock boxes and landing gear leg uplock boxes to release the landing gear for free-fall extension. The indication and warning system is also active in this case.

After an emergency mechanical extension, the main doors are open and the LH and RH red and green indicator lights are illuminated.

Wheels and Wheel Brakes

Each landing gear is fitted with a dual aluminum-alloy wheel arrangement and tubeless tires.

The normal braking system is supplied by the No. 1 hydraulic system. It provides differential braking with an antiskid system. An auxiliary system provides automatic braking of the main gear wheels during retraction.

The main landing gears are each fitted with 4 stationary and 3 rotating carbon disk braking units installed on the axle of the landing gear legs inside the wheels. Each brake unit is equipped with five braking pistons operated by the #1 hydraulic system, and five separate pistons for emergency braking.

The emergency braking system is supplied by the No. 2 hydraulic system. This is a differential braking system without the antiskid function.

The parking brake system is also supplied by the No. 2 hydraulic system. Braking is progressive, but not differential. There is no antiskid function.

Each wheel drives an antiskid tachometer generator for sensing wheel speed.

Wheel and Braking System

The pilot pedals operate the normal and emergency brake distributor valves via a linkage rod. The copilot pedals act in parallel with and are joined to the pilot pedals by two flexible control cables.

A three-position BRAKE selector switch provides three progressive, differential braking modes:

- set to #1 ANTISKID ON, normal braking with antiskid system.
- set to #2 ANTISKID OFF, emergency braking with no antiskid system.
- set to #1 ANTISKID OFF, normal braking with no antiskid system.

Normal Braking with Antiskid System

When force is applied on the brake pedal, the #1 brake distributor valve delivers pressure to the brakes through servovalves. The latter partially bleeds off the braking pressure as commanded by the antiskid system so as to obtain optimum braking without wheel locking, whatever force is applied by the pilot and whatever the runway condition.

Emergency Braking

Emergency braking is operated after setting the BRAKE selector switch to #2 ANTISKID OFF.

The #1 brake solenoid valve is energized to closed and the #2 brake solenoid valve opens.

When the braking pedal is operated, the #2 brake distributor valve supplies the brakes from the #2 hydraulic pressure system via shuttle valves. In case of strong braking, the wheels can be locked, but the pressure available is approximately one-half that of the normal system.

Dual Braking

Aircraft with SB F900-42 incorporated have double braking to secure aircraft movement during pre-takeoff full power run-up. On ground with #1 anti-skid ON selected, engines 1 or 3 or both at full power, speed less than 10 KT, the emergency braking system is energized. Therefore, braking is simultaneously supplied by hydraulic systems 1 and 2.

Parking Brake

Pulling the PARK BRAKE handle causes the park brake distributor valve to deliver a progressive and nondifferential braking pressure to the brake units of the four wheels via tubing that is common to the emergency braking system downstream of the shuttle valves.

The handle has two locking detents.

When the handle is pulled to the first detent, the pressure applied to the wheel brakes provides for a park brake function. This position also allows for landing emergency braking without wheel locking.

When the handle is pulled to the second detent, the pressure applied to the wheel brakes holds the aircraft during engine run-up.

An energy storage accumulator traps hydraulic pressure and will provide approximately ten parking brake applications after engine shutdown.

Controls and Indications

The two L and R lights, located on the instrument panel, indicate that the LH and RH wheel braking systems have pressurized to 225 psi. These lights go out at brake release, or anytime #1 brake pressure has decreased to 135 psi. The lights illuminate during antiskid testing using the ANTISKID TEST button.

Steady illumination of the #2P BK light, located on the warning panel, indicates that an increasing pressure equal to or greater than 225 psi is applied to the emergency braking system via hydraulic system No. 2 or the parking brake.

Flashing of the #2P BK light (aircraft < 179) indicates that pressure has dropped in the parking brake accumulator. Only one setting of the parking brake remains in this instance.

On aircraft < 179 incorporating modification M880C, illumination of the #2P BK light while the aircraft is in the takeoff position activates the T/O CONFIG warning if the dual braking system is not activated.

On aircraft ≥ 179, when the aircraft is in the takeoff position, illumination of the #2P BK light activates a T/O CONFIG warning and the display of the PARK BRAKE white message on the EID (Engine Instrument Display).

Nosewheel Steering

The computer-managed nosewheel steering (NWS) electrohydraulic control orients the nose wheels in relation to pilot commands transmitted by the steering control box. The NWS control is pressure supplied by hydraulic system 2.

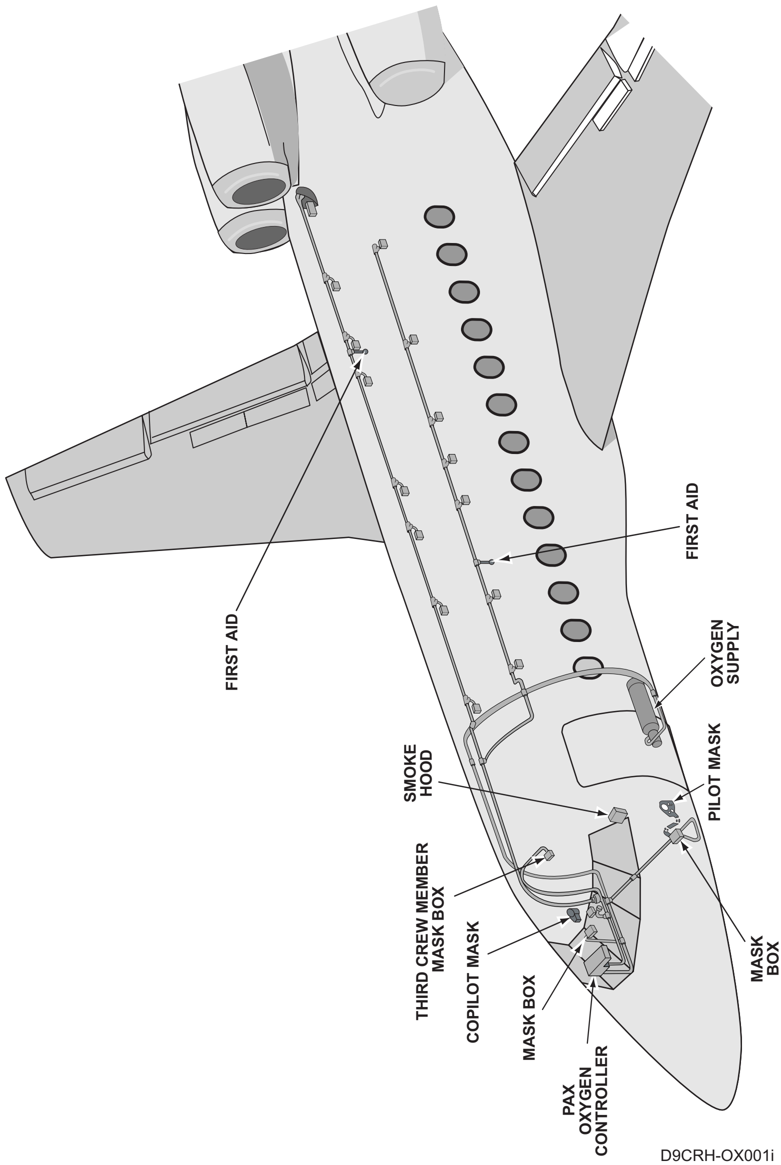
Rotation of the handwheel drives a potentiometer, which transmits a command voltage. The electronic control box compares this voltage with that transmitted by the steering potentiometer. Any difference detected is resolved by hydraulically repositioning the nose wheel.

Rotation of the handwheel from 0° to 60° corresponds to a wheel orientation from 0° to 8°. Rotation of the handwheel from 60° to 120° corresponds to a wheel orientation from 8° to 60°.

Shimmy Damping

Wheel oscillations due to shimmy are dampened through the antishimmy restrictor valves.

Oxygen System



Oxygen

The 2200-liter oxygen cylinder is located aft of the passenger door, under the LH floor. A filler connector enables the cylinder to be charged from the outside of the aircraft.

The system is pressurized by a two-position valve (ON and OFF) incorporated in the pressure reducing valve. When the pressure reducing valve is closed, the LP outlet is vented, thus allowing the valve position to be verified during the pilot mask preflight test.

Two cylinder high pressure gages allow verification of bottle pressure. One gage is located in the entryway and is used mostly for servicing. The second gage is located on the copilots side panel. Both gages will indicate cylinder pressure even with the valve closed.

The cylinder supplies the complete crew and passenger systems with oxygen and may be used until the pressure drops to a minimum pressure of 170 psi.

Crew System

The crew oxygen system supplies low pressure oxygen to the pilot and copilot through two crew masks. Each quick-donning crew mask has a miniature regulator and an inflatable harness. The miniature regulator allows either diluted or pure oxygen to be supplied to the masks.

The mask boxes are located on the pilot and copilot consoles. At the lower part of the box is a plug-in connector for the oxygen mask supply hose and for the microphone jack.

A pressure breathing feature ensures satisfactory oxygen supply up to 51,000 ft.

Passenger System

The passenger oxygen controller is located on the RH copilot console. It controls the functions of a supply system for passenger oxygen and first aid connectors.

A passenger distribution system provides oxygen to the passenger masks, first aid masks and third crewmember mask.

Each passenger mask box is equipped with a pressure-operated latch, an internal door that maintains the mask in the stowed position and a cover held by a magnet. The mask is connected to the box by an oxygen tube and a cord ended by a pin. Pulling this cord will actuate a small oxygen supply valve.

When the oxygen pressure on the latch builds up to 70 psi, the latch piston pushes the box cover open and releases the internal door. An elastic strap in the bottom of the box pushes the mask out of the box and causes it to fall and land in view of the passenger, at the end of its cord.

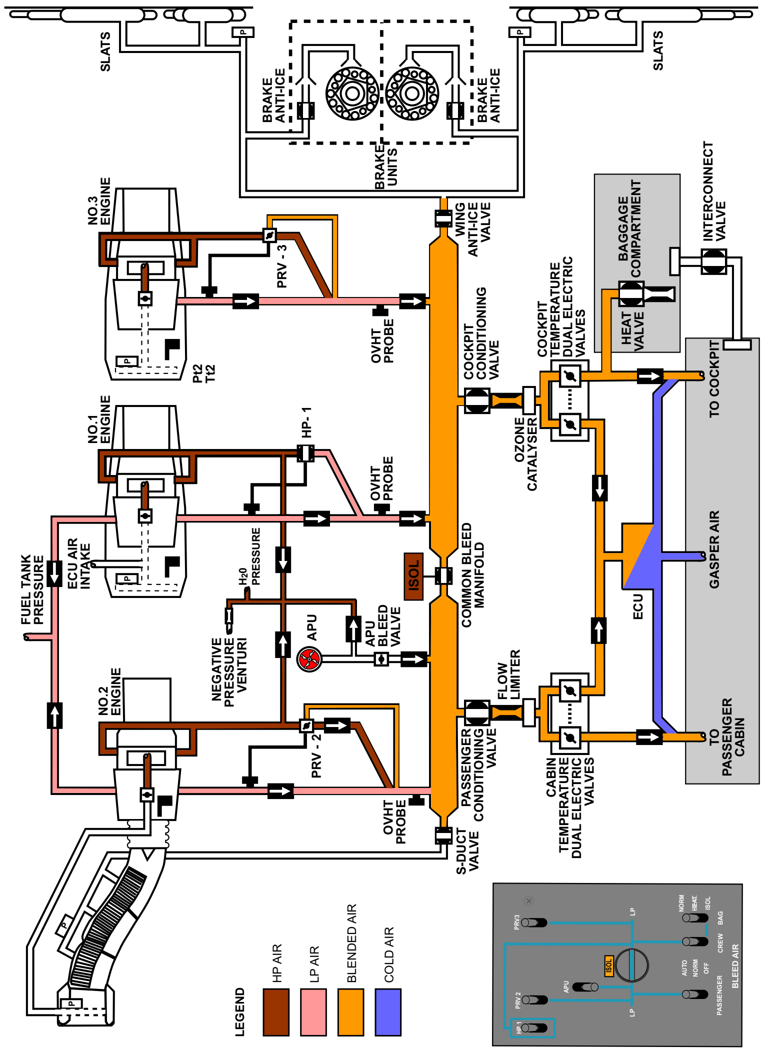
The oxygen flow rate depends on the supply pressure.

The masks are composed of a nose and mouthpiece, fitted with a breathe-in/breathe-out valve and an additional air valve. Oxygen is supplied through a 1-liter economizer bag.

The first aid masks are of the same design as the passenger masks and have an adjustable flow rate of 2 to 4 liters per minute. Adjustment is made at the mask connection.

The first aid masks can be used to assist a passenger who requires oxygen for medical reasons. When the controller selector is set to FIRST AID, the cabin manifold is supplied with 19 psi, well below passenger box trip pressure.

Pneumatic System



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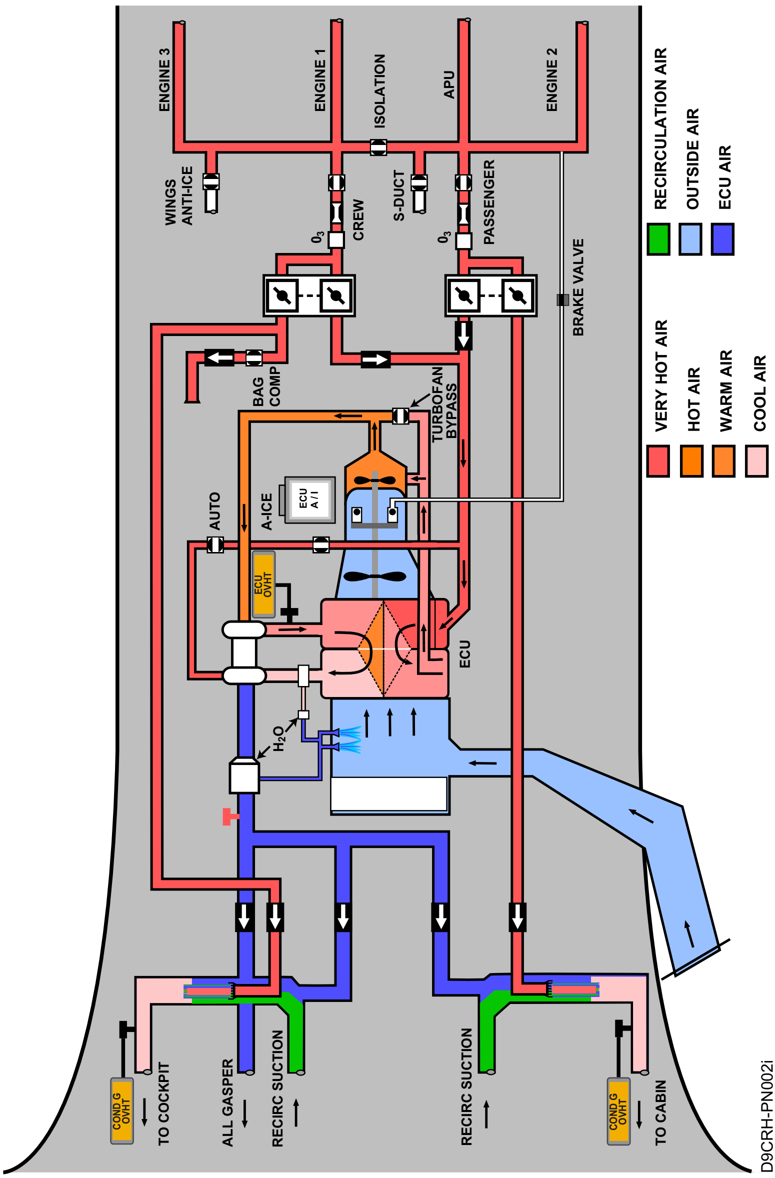
Air Conditioning System



The pneumatic system is made up of the air conditioning and pneumatic systems. These systems comprise:

- a collection and distribution system that supplies the cockpit and passenger cabin with conditioned air and cold air.
- a cabin and nose cone pressurization system.
- an environmental control unit (ECU) that generates cold air used for temperature control, for the gaspers (cabin and cockpit), the EFIS and the various systems according to the options.
- a temperature control system that mixes hot and cold air to obtain the required temperature.

The air conditioning system is used to maintain the cockpit, passenger cabin, baggage compartment and nose cone at a suitable pressure and temperature, whatever the flying conditions.

The pressurized air is provided from the engines, and or the auxiliary power unit (APU).

Pneumatic System

Bleed Air

Each engine provides low pressure (LP) bleed air (from the last stage of the LP compressor), and high pressure (HP) bleed air (from the HP compressor outlet).

Each engine has two LP bleed air ports (3 and 9 o’clock, the 3 is unused on Eng. 3) and one collected HP bleed air outlet. There are no LP bleed air shutoff valves.

The HP bleed air is controlled by electric valves activated from the cockpit.

When the aircraft is on the ground, bleed air from the APU is fed to the common bleed air manifold and is used to operate the cabin air conditioning system on the ground, without the need to start up the engines. This bleed air is also supplied to the jet pump that controls the cabin outflow valves.

Bleed Air Mixing and Distribution

At the outlet of each engine, airflows from the main HP and LP ports are mixed under the jet pump venturi effect so that the pressure obtained is greater than that of the LP bleed air. The mixed bleed air from each engine then flows into a common bleed manifold. Airflows are then mixed to supply the air system.

This common bleed manifold can be divided into two separate systems by closing an electric motor-operated isolation valve. This valve remains open as long as no fault is detected.

One side of the isolation valve, corresponding to the No. 1 and No. 3 engines, supplies bleed air to:

- the cockpit air conditioning system
- the wing anti-icing system.

The other side, corresponding to the No. 2 engine and APU, supplies bleed air to:

- the passenger cabin air conditioning system
- the No. 2 engine air intake S-duct anti-icing system.

A separate auxiliary HP bleed air system for each engine is completely independent. Each engine supplies bleed air to anti-ice its nacelle inlet. The No. 1 engine also supplies anti-icing for the air conditioning heat exchanger inlet. The second LP bleed air ports of the No. 1 and No. 2 engines are interconnected and supply bleed air to the fuel tank pressurization system, through a pressure regulator.

Overheat Monitoring

For each engine, downstream of the LP and HP mixing, a temperature sensor monitors the temperature of the pressurized air to be supplied to the air conditioning system and to the wing and S-duct anti-icing systems. The three sensors are connected to an overheating detection box, controlling a light on the warning panel.

Controls and Indications

The controls and indications for the bleed air system are located on the overhead panel and on the master warning panel. They activate the various bleed and pressure regulating valves and open or close the electric motor-operated isolation valve.

The BLEED OVHT annunciator light illuminates when the overheat detection box senses an excessive bleed air temperature. On A/C $\geq$ 179, messages are displayed on the EID (Engine Instrument Display) to indicate the cause of the overheating.

The BLEED APU light warns if the APU bleed valve should be closed, but is not.

The ISOL light extinguishes when the isolation valve is open normally and all the bleed air sources are interconnected. It will illuminate as soon as the isolation valve is completely closed.

Distribution

Main Distribution System

Operation Without Anti-icing Systems

With the engines at high power settings and the HP1, PRV2 and PRV3 switches set to AUTO, the common bleed manifold is supplied with LP bleed air only. The pressure in the LP system holds the two HP pressure regulating valves closed.

If the engine power settings are reduced, LP bleed air flow becomes insufficient. When the pressure drops, it causes the 2 HP pressure regulating valves to open and allow sufficient HP air to reestablish the required pressure for air conditioning and pressurization.

Operation With Anti-icing Systems (HP1 and PRV3 Dedicated to Wing Anti-ice)

With the wing anti-icing system activated and the HP1 and PRV3 switches set to AUTO:

- if LP 1 bleed air temperature is less than 190°C, the HP1 valve is full open and HP air blends into the LP system. If LP 1 bleed air temperature is greater than 190°C, the HP1 valve closes completely.

> **NOTE:** To prevent bleed air overheating with sudden full power application (go-around), HP1, PRV2 and PRV3 all close automatically for 18 seconds, then resume normal operation.

- if LP3 bleed air temperature is less than 190°C, PRV3 opens fully and admits maximum HP air flow into the LP system. If the LP 3 bleed air temperature is greater than 190°C, the solenoid valve is not excited and PRV3 operates as a pressure regulating valve.

(HP2 Dedicated to S-duct Anti-ice)

With ENG 2 anti-ice activated and PRV2 switch set to AUTO:

- if LP2 bleed air is less than 190°C, PRV2 is fully open and admits maximum HP airflow into the LP system venturi. If the LP2 air is greater than 190°C, the solenoid is not excited and PRV2 operates as a pressure-regulating valve.

Air Conditioning System

The air conditioning system maintains a suitable pressure and temperature in the cockpit, the cabin, the baggage compartment and the nose cone under any flight conditions.

Temperature Control Dual Valves

Two dual temperature control valves, one for the crew and one for the passenger cabin, determine routing of pressurization bleed air. Some air from both dual valves combine and is forced through the single ECU to become cold air. The remaining is allowed around the ECU to blend downstream with cold and recirculated air for cockpit and cabin air conditioning. The two butterflies in each valve are ganged together and driven with a single motor. As one is opened the other closes proportionately. The dual valves are controlled by the temperature control panel. Gages on the panel indicate the relative position of the respective dual valves. Temperature sensors and an amplifier schedule the valve's position, or manual control can be selected.

ECU

Hot bleed air from the "cold" side of both dual temperature control valves combines and enters the first stage of the heat exchanger (radiator). There the hot bleed air is initially cooled by outside air. The air follows one of two paths out of the heat exchanger. At zero or slow speeds, the bleed air is forced through a turbine further cooling it and providing torque for the outside air cooling air turbofan. Above 300 kt TAS the turbofan is braked and a turbine bypass valve opens. Whether through the turbine or bypass, air enters the compressor section of the turbocooler (air cycle machine), and is slightly heated by the compressor wheel. As it passes through the primary heat exchanger, it's cooled to approximately its dewpoint. The first of two water separators extracts moisture. The dried air passes through the turbine section of the turbocooler slowing and cooling the air to about 0°C. A temperature probe at the turbine outlet controls an anti-ice valve allowing a small amount of pre-ECU hot air to enter the turbine casing. The objective is to maintain a 3°C temperature into the low pressure water separator. The cold air is then split to blend with hot air that has been routed around the ECU by either crew or passenger dual temperature control valves

Water Separator and Injection

The HP water separator is mounted at the main heat exchanger outlet where it protects the turbocooler turbine. Moisture is removed from the air flow by centrifuging. The LP water separator reduces the water content in the cold air being delivered to the cabin. Water from the HP and LP water separators is collected in a drain bowl and injected into the cooling air flow over the main heat exchanger to optimize efficiency of the latter.

Distribution

In the cockpit, distributors direct conditioned air either downward towards the pilot's and copilot's feet or upward through two grilles on the upper surfaces of the glareshield. Selection of upward or downward air flow is controlled by two levers, one on either side of the instrument panel.

Conditioned air is distributed in the cabin through manifolds running down the bottom of the side walls. Two manual openings on the LH manifold allow for rapid cabin pre-conditioning.

Recirculation System

Two-way manifolds in the passenger cabin either return air for recirculation, or help distribute cold air when full cold is required.

Interconnect Valve

The cabin and cockpit systems are separate, but, should supply to one of the systems fail, one system can supply the other through an interconnection valve. On aircraft below S/N 163, the valve is controlled by a COND lever located on the copilot console. On aircraft S/N 163 and up, a manually controlled interconnection valve in the cabin supplies the faulty system.

Conditioning Valves

The conditioning valves are controlled by the PASSENGER and CREW three-position switches located on the overhead BLEED AIR panel.

In the OFF position, the valves receive a closing order and will either close or remain closed. In the ON position, they receive an opening order and will either open or remain open.

In the AUTO position when the aircraft is on the ground, the valve opens if no power lever is set to full power. If one power lever is set to full power, as for takeoff, the air conditioning electric valve closes. The valve then opens slowly after liftoff.

Temperature Controls and Indications

The dual temperature regulating electric valves divide the flow of hot bleed air into two separate lines, a hot bypass pipe and a cold pipe to the ECU.

In automatic mode, each dual electric valve has an operating range that runs from 0 (fully cold) to 55% heating. In manual mode, it is possible to set the position of the dual electric valves to provide from 0 to 100% heating, if a failure of the automatic system occurs.

Three lights on the warning panel illuminate to indicate failures within the air conditioning system. The ECU OVHT light will illuminate to indicate overheating at the turbo cooling unit compressor outlet. The COND'G OVHT light illuminates when one of two air conditioning thermal switches detects a temperature of incoming cabin or cockpit conditioning air $>$ 100°C (212°F). The NOSE CONE OVHT light illuminates to indicate that there is a overheating condition in the nose cone (temperature $>$ 70°C).

NOTE: On A/C ≥ 179, the ECU OVHT, COND'G OVHT, and NOSE CONE OVHT amber lights come on together with the MASTER CAUTION amber lights and the COND OVHT PAX or COND OVHT CREW white message is displayed on the EID (Engine Instrument Display).

Ozone Level Monitoring

Two ozone catalyzers reduce ozone content of the conditioned air.

Pressurization System

The pressurization system provides a comfortable pressure in the aircraft for passengers and crew, regardless of flight conditions.

Operational Mode

During automatic operation, three operating modes for cabin pressurization can be selected on the automatic pressurization controller:

A PROG (Program) mode is used for automatic programming of the system. It will maintain the compatibility of minimum cabin altitude with the aircraft altitude and cabin ΔP. It also maintains cabin rate-of-climb within the -450 to +650 ft/min limits.

The FL (Flight Level) mode inhibits the preset program. The controller seeks to establish, then maintain a cabin altitude equal to the altitude displayed on the front panel.

The LDG (Landing) mode can be used, after FL mode selection, to bring cabin altitude down to landing field altitude. The rate of descent is - 300 ft./min.

If the automatic system fails, the AUTO-MAN switch is set to the MAN position to cut off electrical power to the automatic controller. The manual regulator then allows the crew to set the desired rate of climb or descent.

Baggage Compartment Pressurization

The baggage compartment is pressurized by interconnection with the cabin. It is controlled by an isolation electric valve between the lavatory and baggage compartment. When not isolated, the baggage compartment pressure is more or less identical to that of the cabin.

Nose Cone Pressurization

For ground ventilation, an electric blower draws air from the nose gear well and delivers it in the bottom of the nose cone through a duct, the end of which is equipped with a flap. A proximity switch controls blower energization. Ventilation air is evacuated through a control valve back into the nose gear well.

When in flight with the cabin air conditioning system operating, cabin pressure causes air to flow into the nose cone through the manual isolation valve (A/C 1 to 68, except 54). Conditioned air is distributed in the nose cone. It is evacuated in the same way as air from the blower.

Controls and Indications

The automatic pressure controller, located on the center of the instrument panel, is a digital selector which automatically controls the cabin altitude and its rate of change on the ground and during flight, according to a preset program. The controller will lower the cabin to 300 feet below selected land elevation to assure a pressurized touchdown.

Emergency Pressurization Controller

Located on the copilot side of the instrument panel, the emergency pressurization controller includes:

- an AUTO-MAN switch for selection of automatic or manual pressurization mode.
- a NORM-EMERG switch for selection of normal or emergency conditioning and pressurization air for the cabin.
- a NORM-DUMP switch enabling rapid depressurization of the cabin if required.
- a manual regulator for cabin pressure, with an UP-DN control knob.

Emergency Air Supply

Should the normal cold air system fail and engine bleed air supply be cut off or lost through a rupture in the ECU, an emergency air supply system provides pressurized air for cabin pressurization. It is obtained by closing the cabin system air conditioning electric valve and setting the temperature regulating dual electric valve of the cockpit system to fully hot. These commands are given simultaneously by using the NORM/EMERG switch on the emergency pressurization controller. The cabin is then supplied with hot HP/LP bleed air, mixed in the cockpit distribution system venturi with cabin ambient air.

At altitude with only hot air, cabin temperature should be bearable. However, the cabin temperature may rise at low altitudes. The flow of hot air can be reduced by selecting MANUAL on the crew side, then moving the valve to the desired position. However, pressurization may be compromised.

Nose Control Lever

On A/C 1 to 68, except 54, the nose cone pressurization system is automatic with a single control, the NOSE lever, on the RH console. This lever can be used to cut off the supply of pressurized cabin air to the nose cone. A/C $\geq$ 69 and 54 are not equipped with this control.

BAG Switch

The BAG switch is a three-position switch located on the overhead BLEED AIR panel. In the NORM position, the baggage compartment isolation and heating valves are open. In the HEAT position, the baggage compartment heating valve is closed, and in ISOL, the baggage compartment heating and isolation valves are closed. Individual valve closing can be verified on the copilots sidewall maintenance panel.

Warning Lights

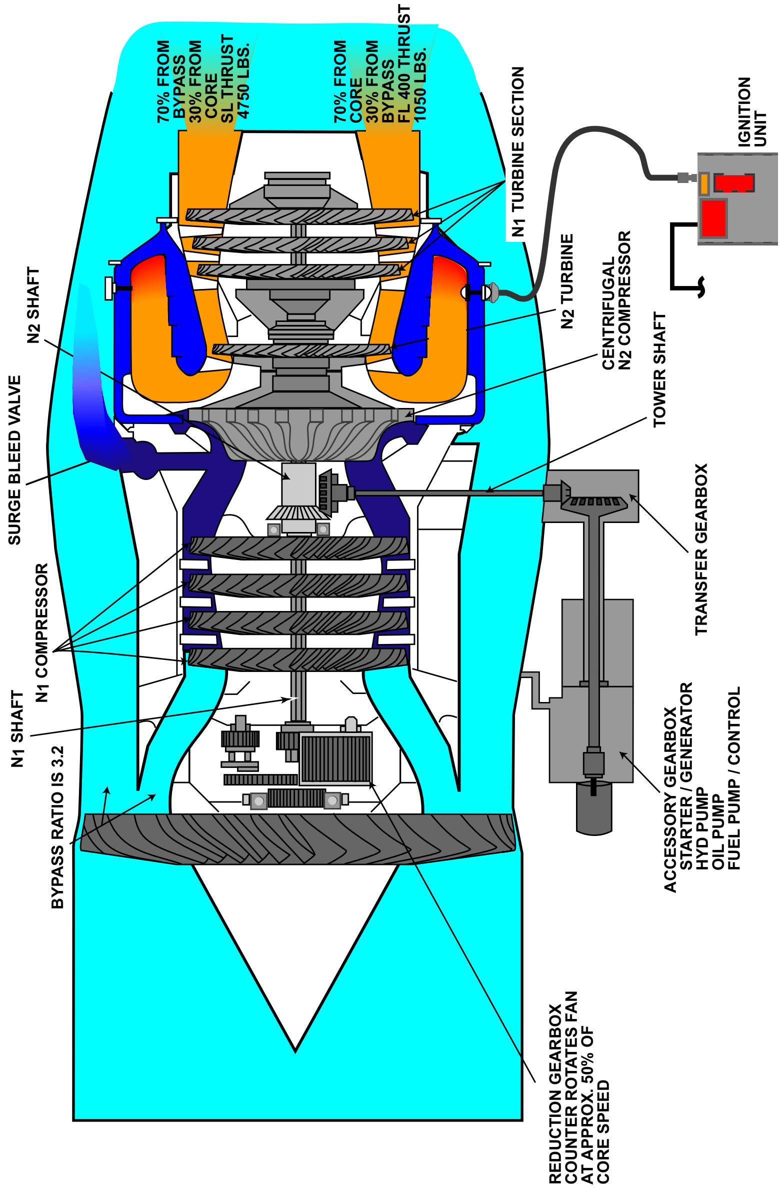
A warning is given in the event of excess cabin altitude. The warning consists of a red CABIN light on the warning panel and an audio warning.

Should the baggage compartment isolation electric valve be closed, the BAG ISOL light on the warning panel comes on to indicate to the crew that the baggage compartment is no longer pressurized.

If the temperature in the nose cone reaches 158°F (70°C), the NOSE CONE OVHT light on the warning panel will come on.

> **NOTE:** On A/C ≥179, the NOSE CONE OVHT amber light comes on together with the MASTER CAUTION amber lights.

Garrett TFE731-5BR-1C Engine



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Powerplant

Three Garrett TFE731-5BR-1C turbofan engines power the Falcon 900B. Each engine produces 4,750 lb of takeoff thrust at sea level. The TFE731 is a front fan and two-spool jet propulsion (HP and LP) type with a core mixer exhaust nozzle. The engines are mounted to the aircraft using two front mounts and one rear mount.

Engine Fuel and Control

Fuel Supply

The fuel supply for each engine is delivered from the aircraft fuel system through a fire shutoff valve, then through the corresponding pressurization, regulation and distribution systems.

Fuel control is performed by the engine computers. The purpose of the fuel regulation system is to control the quantity of fuel injected into the combustor as a function of the volume of air passing through the engine, regardless of the flight conditions, while maintaining operational safety. In case of computer malfunction, the engine can be operated in a manual mode, which cancels all computer commands except ultimate overspeed protection.

Oil System

The oil system is an integral part of each engine. The bearings of the two spools and the accessory gearbox module are lubricated with oil drawn from a 1.65 gal (6.25 liter) tank by a regulated-pressure pump. A cooling system is provided to maintain the oil temperature within operating limits.

The oil level and filter clogging indicators are located on a maintenance test panel in the aft compartment. They are energized directly by the battery bus once the aft compartment door is open.

Oil level and filter clogging can be checked without opening the engine cowlings.

The oil system is vented by a breather/pressurization valve. The valve vents all pressure below approximately 25,000 ft. Above FL 250, the valve maintains 4 psi pressure in the oil system to retard foaming and assist in oil recovery.

The OIL 1, OIL 2 and OIL 3 lights on the master warning panel illuminate if the corresponding engine oil pressure drops below 25 psi.

Ignition System

The ignition system is composed of an igniter unit, two igniter cables and two igniter plugs.

The igniter unit is asynchronous: the two igniter plugs are not excited at the same time. This enables aural checking of the two igniter plugs with the engine stopped; an irregular arcing sound is heard if both igniter plugs are operating or a regular sound if only one is working. The system is capable of continuous operation, should flight conditions require it.

Emergency Fuel Shutoff Valves

Emergency engine shutdown may be accomplished through three shutoff valves (one per engine). The valves are controlled by FUEL SHUT OFF guarded switches located on the fire panel. Any discrepancy between the fuel shutoff valve and switch positions is signalled by the amber TRANS light on the fire panel.

Each valve is operated by two separate electric motors. One is powered by the A bus and one by the B bus.

Engine Indicating

The engine instruments are located on the center portion of the instrument panel. Each engine has five corresponding indicators:

- N_1 indicator
- ITT indicator
- N_2 indicator
- fuel flow indicator
- oil temperature/pressure dual indicator.

Each engine has:

- a CMPTR amber light located on the warning panel. This light indicates failure of the computer or its peripheral circuits.
- an OIL amber light located on the warning panel. This light indicates either an oil pressure drop or chip detection. The oil pressure indicator is used to determine the cause.
- a red FIRE light located on the fire panel. This light indicates an engine fire or overheat.
- an IGN amber light located on the overhead panel. Illumination of this light indicates that the engine ignition system is energized.

Illumination of the red ENG 2 FAIL light indicates failure of the No. 2 engine at takeoff or unlatching of the No. 2 engine S-duct door; the latter is triggered directly either on the ground or in flight.

The amber PWR INC (power increase) pushbutton is used for power increase at high altitude and in hot weather. The pushbutton is located on the instrument panel and controls power increase activation for the three engines. Each use of power increase logs four cycles on the engine.

Starting

The engines are started by starter-generators operating in conjunction with a starter-generator control unit (GCU). The power required for starting is usually provided by the aircraft batteries, assisted by the APU starter-generator.

The two batteries supply the start bus in parallel during the starting sequence.

If necessary, all engines can be started using a ground power unit.

The starting cycle is fully automatic and is concluded when the engine reaches an N_2 speed greater than 50%. If a malfunction occurs during the starting sequence, the pilot may interrupt the cycle by momentarily selecting MOTOR-START STOP with the START switch. An inhibition system prevents the simultaneous starting of two engines.

In order to start an engine:

- Its GEN switch must be on.
- The LH and RH buses must be tied.
- The start switch must be in the GND START position.
- The throttle must be in the CUT OFF position.

Operating Conditions

The operating mode depends on the position of the three-position start switch on the overhead panel.

For starting on the ground, the switch is set to the GRD START position. The ignition system operates when the throttle is moved to the idle position. It is cut off as soon as N_2 reaches 50%.

The ignition system may also be started by the stall warning system.

For airstart (or for any other use of the ignition system), the switch is set to the AIR START position. The igniter units and their relays are energized as soon as the selector is set to this position whether in flight or on the ground.

In the MOTOR-START STOP position, the igniter units are isolated and cannot be energized. This position is usually selected to interrupt the start cycle, when necessary, or for engine motoring. The button must be held pushed in to continuously energize the start motor.

Starter-generators

The starter-generators used in the starting function operate as DC torque motors.

Hot Ambient Temperature Starting

Starting is allowed even if the WARM light of the battery temperature dual indicator is illuminated. However, if the battery temperature is 50°F above the outside ambient temperature, do not attempt any battery start; use a ground power unit.

After engine start, carefully monitor the battery temperatures and check that these temperatures are stable and do not increase. Do not take off if one of the temperatures increases.

If the temperature exceeds 120°F during starting, the temperature must be monitored for several minutes after start.

If the temperature exceeds 140°F, wait until it drops to 120°F before taking off.

If the temperature reaches 150°F before SB F900-94, or 160°F after SB F900-94, the battery must be isolated from the circuit and bench check performed.

NOTE: The average cooling-down rate is 1°F per minute.

Motoring

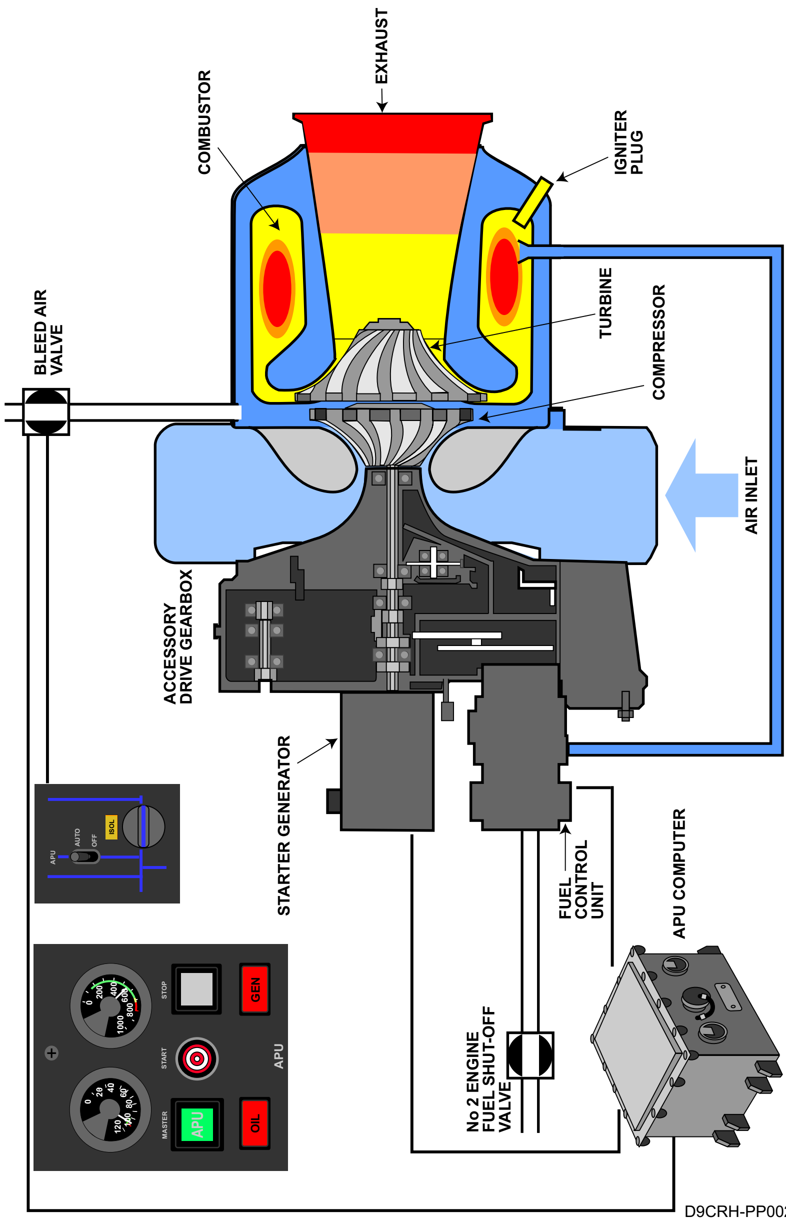
> **NOTE:** Wet motoring, after engine removal from storage, must not exceed 45 seconds. The maximum duration of dry motoring is 20 seconds.

When the start selector switch is set to MOTOR-START-STOP, self-holding of the starting relay is inhibited; consequently, the pushbutton must be kept depressed throughout the entire motoring operation.

The throttle lever can be kept in the STOP position for dry motoring, or set to the IDLE position for wet motoring.

> **NOTE:** In hot weather with temperatures above 30°C, the time between two successive starts must be doubled.

Auxiliary Power Unit



Auxiliary Power Unit

The Falcon 900B is equipped with a Garrett GTCP36-150 auxiliary power unit (APU).

The APU has the following functions:

- delivers bleed air to the air conditioning system for cabin preflight conditioning
- supplies electrical power to the right main bus for aircraft systems on the ground, and assists in engine starting
- recharges the batteries.

APU Electronic Control Unit (ECU)

The computer ensures automatic management of APU performance and safeties during its starting, operation and shutdown phases.

Fuel System

The APU receives fuel from the aircraft group 2 fuel system. The number 2 fuel shutoff valve interrupts fuel to the APU.

Oil System

The APU system is separate and uses the same lubricant as the engines.

Ignition System

The ignition unit controls energizing of the single igniter plug during starts.

Controls

The left and right buses must be tied and the APU light on the DC electrical panel must be pushed to start the APU.

The APU MASTER pushbutton light opens the APU fuel valve and energizes the APU computer. This pushbutton light will also shut down the APU, although this is not the preferred method. The APU MASTER pushbutton light flashes after automatic shutdown.

Illumination of the OIL light indicates low oil pressure.

The GEN light is illuminated when the APU generator is not connected to the bus.

The STOP pushbutton light simulates an overspeed condition, and ensures normal APU shutdown.

APU Bleed Air Valve

This electro-pneumatic valve is driven by a torque motor and is controlled by a switch on the APU panel in the cockpit. The electronic control unit enables valve opening only when APU speed is greater than 95% N_1 and helps maintain normal EGT.

The manufacturer recommends operating the APU for one minute prior to opening the APU bleed valve. Also, it is not necessary to cool the turbine area by turning off the APU bleed valve prior to shutdown. The APU design has eliminated any bearings in the hot section that require cooling.

APU Fault Panel

Located in the aft compartment, the APU fault panel displays:

- APU failures using 5 magnetic indicators: HIGH OIL TEMP, LOW OIL PRESS, OVER CURRENT, OVER SPEED and OVER TEMP.
- number of operating hours at N_1 > 95%, via the hourmeter.

Automatic Shutdown

Automatic shutdown is commanded by:

- a flight/ground proximity switch
- faulty generator excitation
- battery and engine generator switches off
- ECU overheating.

APU will also shut down in the case of:

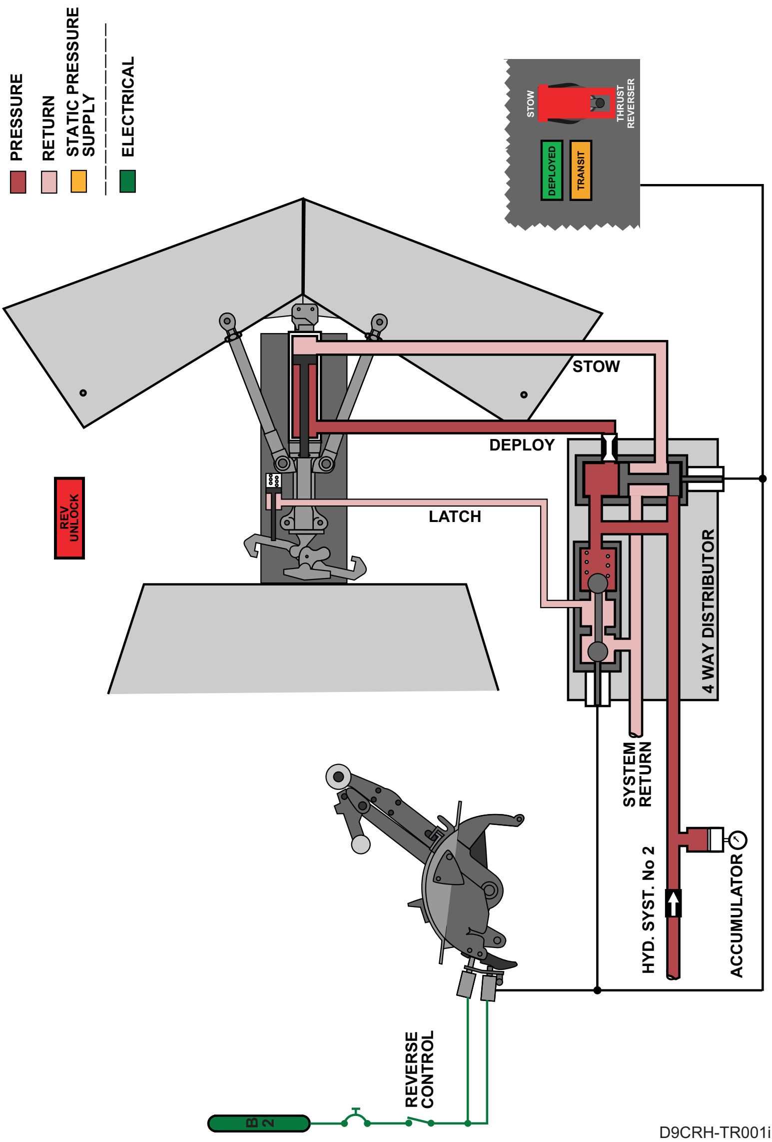
- overspeed
- overtemperature
- excessive generator output
- low oil pressure
- fire.

> **NOTE:** After auto shutdown, the APU master must be cycled OFF/ON if a start is attempted.

Operational recommendations:

- APU should be shut down from the loaded (APU bleed on) condition.
- After start, operate for one minute prior to bleed.
- No APU bleed air during anti-ice testing.
- Do not operate APU during deicing.

Thrust Reverser System



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Thrust Reverser System

The electrohydraulically actuated thrust reverser system is integral to the afterbody of engine No. 2. The system operates on the ground only to slow down the aircraft landing run by reversing engine thrust.

The thrust reverser is connected to the No. 2 hydraulic system. It includes a nitrogen accumulator, which, in case of failure of the aircraft hydraulic system, enables at least one deployment.

Controls and Indications

Instrument Panel

The TRANSIT and DEPLOYED lights on the instrument panel indicate operation and full deployment of the thrust reverser system.

Warning Panel

The REV UNLOCK light illuminates when the thrust reverser is not locked in the stowed position and it should be.

In case of failure of the normal control system, an emergency THRUST REVERSER switch enables direct retraction control regardless of flight conditions and control position.

Flight Planning

Table of Contents

Frequent or Planned Destinations Record

Airport ________________________________ Ident. ____________
FBO ____________________ Freq. _______ Tel: (___) ________
Fax: (___) ________
Hotel ________________________________ Tel: (___) ________
Fax: (___) ________
Catering ______________________________ Tel: (___) ________
FSS __________________________________ Tel: (___) ________

Airport ________________________________ Ident. ____________
FBO ____________________ Freq. _______ Tel: (___) ________
Fax: (___) ________
Hotel ________________________________ Tel: (___) ________
Fax: (___) ________
Catering ______________________________ Tel: (___) ________
FSS __________________________________ Tel: (___) ________

Airport ________________________________ Ident. ____________
FBO ____________________ Freq. _______ Tel: (___) ________
Fax: (___) ________
Hotel ________________________________ Tel: (___) ________
Fax: (___) ________
Catering ______________________________ Tel: (___) ________
FSS __________________________________ Tel: (___) ________

Notes ____
____
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Flight Planning – General

Takeoff Weight Determination

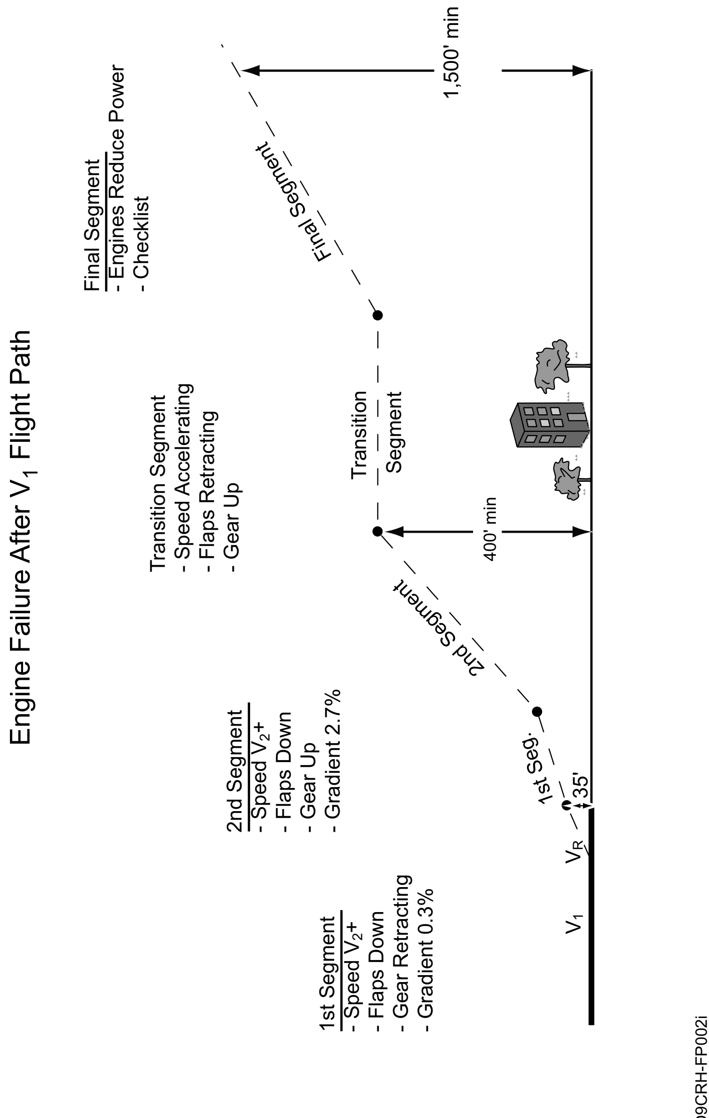
Charts in the Aircraft Flight Manual (AFM), Performance Section V, facilitate determination of the maximum takeoff gross weight permitted by CFR 25, as well as associated speeds and flight paths.

Takeoff weight, is limited by the more restrictive of the following with one engine inoperative:

- 20º FLAPS + SLATS
  - takeoff and accelerated-stop distances
  - climb gradient
- 7º FLAPS + SLATS
  - takeoff and accelerated-stop distances
  - climb gradient
  - brake energy.

Takeoff Profile

One Engine Inoperative



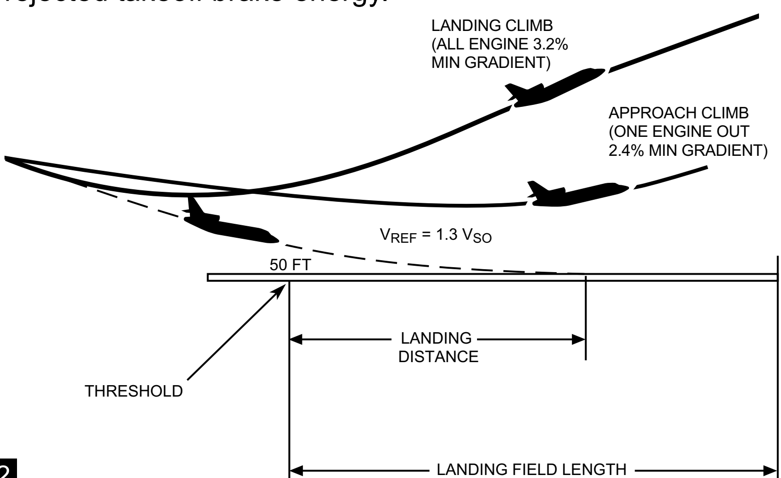
Maximum Allowable Landing Weight Determination

Charts in the Airplane Flight Manual (AFM), Performance Section V, facilitate determination of approach and landing climb performance, landing field requirements, and approach speed values.

Landing Path Profile

The maximum allowable landing weight (**Figure 5-2**) is limited by the most restrictive of the following:

- maximum landing weight limited by approach and landing climb gradient requirements
- one engine inoperative approach climb gradient
- landing distances
- all engines operating landing climb gradient
- landing speed
- landing brake energy
- rejected takeoff brake energy.



5-2

Weight and Balance Determination

To determine that an aircraft is within and remains within the gross weight and center of gravity limitations, follow the steps below to complete a loading schedule. Refer to the Performance Manual Section 2, Loading, for appropriate charts and diagrams.

1. Enter the basic weight and moment on the Loading Schedule (**Figure 5-3**).
2. Record empty weight and moment changes, if any, and add them to or subtract them from the basic weight and moment. Record results in the EMPTY WEIGHT row.
3. Enter weights for miscellaneous supplies and baggage in the appropriate rows (i.e., BAGGAGE + DOC, LOW PROFILE CABINET, GALLEY, etc). Use the weight and moment table on the left side of the accommodation diagram to determine moments; enter these in corresponding rows.
4. Assume standard weights for each passenger and each crewmember (170 lb). Line through the weight and moment areas of seats not occupied as well as other standard-weight items that are not loaded for the trip.
5. The baggage compartment is divided into two areas, the front and rear. The maximum load weight for the front baggage compartment is 1,213 lb and for the rear baggage compartment is 1,653 lb. Determine the weights and moments for the load distributed in each zone; record this data in the appropriate area.
6. Total the positive and negative moments beginning with the basic empty weight through baggage compartment. Write totals in the spaces below baggage total.
7. Subtract the small number from the large number and adopt the sign of the larger number. Write the result in the appropriate (+ or -) block of the ZERO FUEL WEIGHT row.
8. Enter the total weight in the ZERO FUEL WEIGHT row.

Loading Schedule

UNITS	WEIGHT (LB)	MOMENT 1,000 LB/MIN

COAT RACK OR JEPPESEN **92**						
Weight	10	20	40	60	80	100
Moment	-2.8	-5.6	-11.2	-16.8	-22.3	-27.9
120	130	MAXI 132			**25.6**	
-33.5	-36.3	-36.8				

RIGHT GALLEY						
Weight	10	20	40	60	**80**	100
Moment	4.3	8.5	-9	-13.5	**-18**	-22.5
120	140	160	180	200	220	240
-27	-31.5	-36	-40.5	-45	-53.5	-62

LEFT GALLEY						
Weight	10	20	**40**	60	80	100
Moment	-2.2	-4.5	**-8.9**	-13.4	-17.8	-22.3
120	140	160	180	200		
-26.7	-31.1	-35.6	-40	-44.5		

LOW PROFILE CABINET						
Weight	10	20	30	**40**	50	60
Moment	-0.9	-1.8	-2.7	**-3.6**	-4.5	-5.4

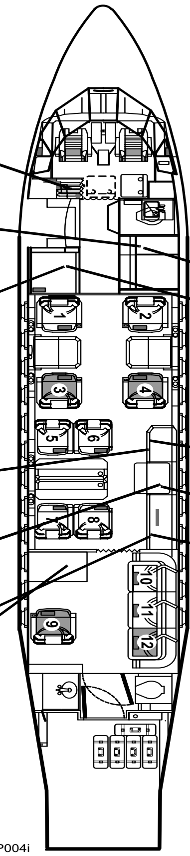
FOLDING SEAT CABINET						
Weight	**10**	20	40	60	80	
Moment	**-0.6**	-1.3	-2.6	-3.9	-5.2	

LOW PROFILE CABINET						
Weight	10	**20**	40	60	80	100
Moment	-0.4	**-0.7**	-1.5	-2.2	-3	-4

DESK CABINET						
Weight	50	60	70	80	90	100
Moment	0	0	0	0	0	0

FRONT BAGGAGE COMPARTMENT (fr25 to fr27)						
Weight	100	200	**300**	400	500	600
Moment	12.3	24.6	**36.9**	49.2	61.5	73.8
700	800	900	1,000	1,100	MAXI 1,213	
86.1	98.4	111	123	135.3	149	

REAR BAGGAGE COMPARTMENT (fr27 to fr30)						
Weight	50	100	150	200	300	400
Moment	7.8	15.7	23.6	31.4	47.1	62.8
500	600	700	800	900	1,000	1,100
78.5	94.2	109.9	125.6	141.3	157	172.7
1,200	1,300	1,400	1,500	1,600	MAXI 1,653	
188.4	204.1	219.8	236.5	252.2	259.5	



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5-3

FUEL: MOMENTS AT 0º PITCH ATTITUDE					
Weight	0	500	Weight	0	500
Moment	0	6.7	10,000	37.7	7.6
1,000	-12.0	-15	11,000	-19.3	-47.7
2,000	-16.3	-15.9	**12,000**	**-67.9**	-77.6
3,000	-34.5	-14.5	13,000	-87.7	-97
4,000	-14.5	-14.5	14,000	-106.4	-116.1
5,000	-14.5	-14.5	15,000	-126.2	-136.9
6,000	-14.5	-14.5	16,000	-148.9	-160.1
7,000	-14.5	-10.4	17,000	-173.8	-198.6
8,000	-1.8	9.8	18,000	225.5	282.5
9,000	22.6	35.8	19,000	-342.1	
			19,165	-347.2	

	WEIGHT lb	MOMENT 1,000 in. lb -	MOMENT 1,000 in. lb +
BASIC EMPTY WEIGHT	25,133		+107.7
CHANGE IN EMPTY WEIGHT			
EMPTY WEIGHT	25,133		+107.7
PILOT	170	52.9	
COPILOT	170	52.9	
3rd CREW MEMBER	~~170~~	~~46.7~~	
BAGGAGE + DOC	92	25.6	
RIGHT GALLEY	80	18.0	
LEFT GALLEY	40	8.9	
PASSENGERS 1-2	~~340~~	~~61.5~~	
PASSENGERS 3-4	340	46.6	
PASSENGERS 5-6	~~340~~	~~30.6~~	
LOW PROFILE CABINET	40	3.6	
PASSENGERS 7-8	~~340~~	~~14.3~~	
FOLDING SEAT	10	0.6	
LOW PROFILE CABINET	20	0.7	
PASSENGER 10	~~170~~		~~1.2~~
PASSENGERS 9 AND 11	170 ~~340~~		5.3 ~~10.5~~
PASSENGER 12	170		9.7
LIFE RAFTS	~~139~~		~~3.8~~
WATER	88		7.8
BAGGAGE COMPART. Front	300		36.9
BAGGAGE COMPART. Rear	500		78.5
TOTAL	800		115.4
		209.8	245.9
ZERO FUEL WEIGHT	27,323		36.1

FOR ZFW LIMIT CHECK
SEE CENTER OF GRAVITY CHART

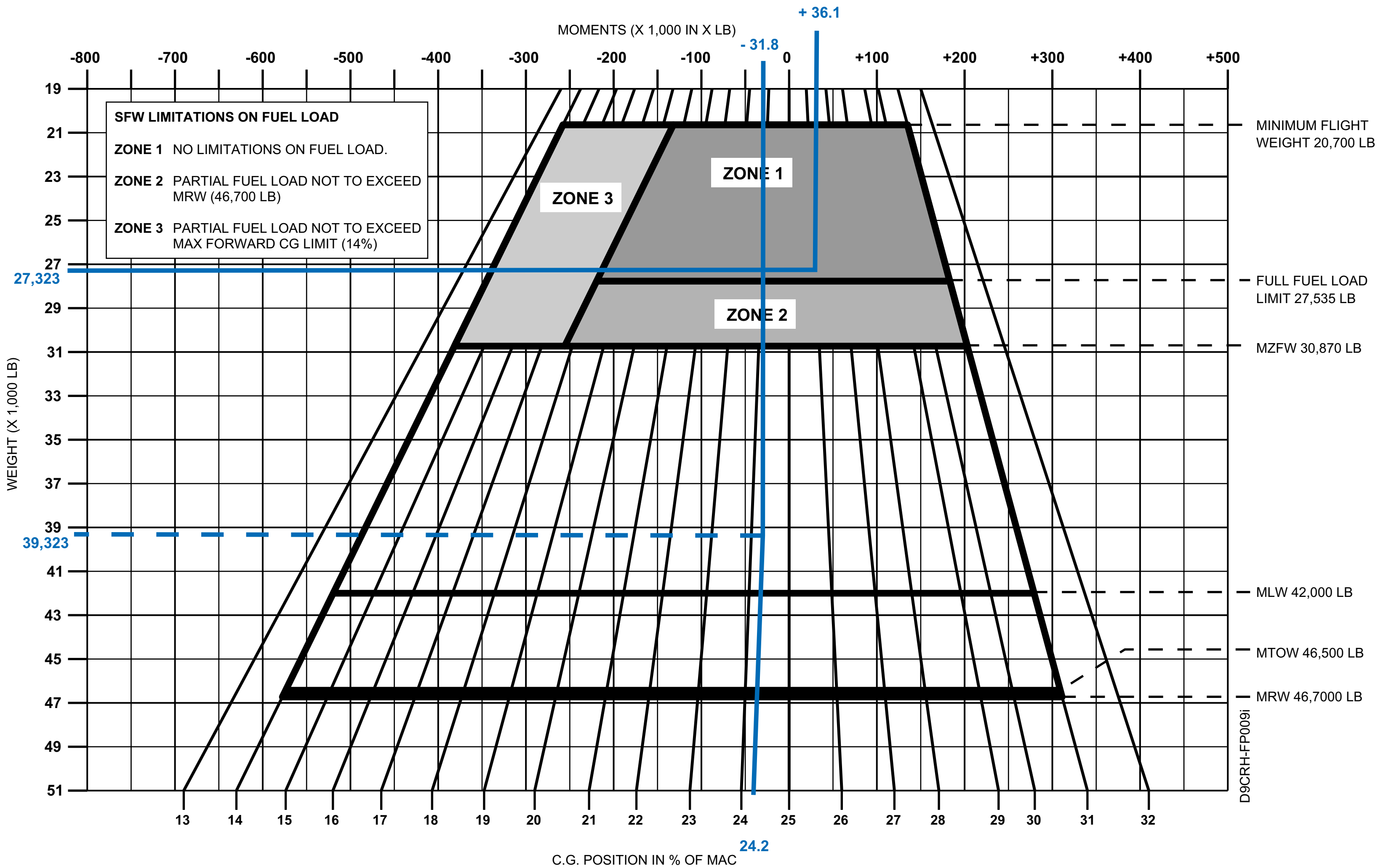
FUEL	**12,000**	**67.9**	
TAKEOFF WEIGHT	**39,323**	**31.8**	
C.G. POSITION	**24.2%**		

CHECK C.G. WITHIN LIMITS

9. The Weight and Balance Diagram (**Figure 5-4**) depicts an envelope, subdivided into zones, for zero fuel weight and moment. Enter the diagram at the top with the zero fuel moment, observing the proper sign, and on the left margin with the zero fuel weight. Follow the north/south graph lines. The result must fall within the envelope to be within zero fuel weight limits. The zone into which the zero fuel weight and moment fall determines possible fuel loading limitations. Zone limitations are defined at the top left of the diagram.
10. Record the fuel weight on the accommodation diagram FUEL row, and enter the moment from the fuel weight and moments in the appropriate negative MOMENTS column of the FUEL row.
11. Add the zero fuel total weight to the fuel weight; record the sum in the WEIGHT column of the TAKEOFF WEIGHT row. Add the zero fuel weight moment to the fuel moment, then record the result in the appropriate negative or positive MOMENTS column of the TAKEOFF WEIGHT row.

    Both the zero fuel weight moment and the fuel moment may be negative, positive, or a combination of both. Observe the positives and negatives when combining the zero fuel weight and fuel moments. The resultant sign determines the column into which the final moment is entered.
12. Plot the computed takeoff weight and moment on the Weight and Balance Diagram, following the north/south graph lines, to determine if the intersection is in the maximum takeoff weight envelope. From this intersection, parallel the GUIDE lines to the bottom margin to determine the center-of-gravity position in % of MAC. Enter the derived percent CG on the accommodation diagram CENTER OF GRAVITY (C.G.) POSITION row, center column.

Weight and Balance Diagram



5-4

International Flight Planning
Frequently Used International Terms

International Term	Explanation
ACC	Area Control Center
ADCUS	Advise Customs
AFIL	Air-Filed ICAO Flight Plan
ARINC	Aeronautical Radio Inc.
ATS	Air Traffic Services
BERNA	Swiss Radio Service
DEC	General Declaration (customs)
ETP	Equal Time Point (navigation)
FIC	Flight Information Center
FIR	Flight Information Region
GCA	Ground Controlled Approach
GEOMETER	A clear plastic attachment to a globe that aids in making surface measurements and determining points on the globe
IATA	International Air Traffic Association
ICAO	International Civil Aviation Organization
MET	See METAR
METAR	Routine Aviation Weather Reports
MNPS	Minimum Navigation Performance Specifications
NAT	North Atlantic
NOPAC	North Pacific

International Term	Explanation
OAG	Official Airline Guide
OKTA	Measure of cloud cover in eighths (five OKTAs constitute a ceiling)
OTS	Organized Track Structure
PPO	Prior Permission Only
PSR	Point of Safe Return (navigation)
QFE	Used in some nations; an altimeter setting that causes the altimeter to read zero feet when on the ground
QNE	Altimeter setting used at or above transition altitude (FL 180 in US); this setting is always 29.92
QNH	Altimeter setting that causes altimeter to read field elevation on the ground
SITA	Societe Internationale de Telecommunications Aeronautiques; international organization provides global telecommunications network information to the air transport industry
SPECI	Aviation selected special WX reports
SSR	Secondary Surveillance Radar
TAF	Terminal Airdrome Forecast
UIR	Upper Information Region
UTA	Upper Control Area
WWV/WWVH	Time and frequency standard broadcast stations

International Operations Checklist

Aircrews are required to carry all appropriate FAA licenses and at least an FCC Restricted Radio Telephone Operations license. In addition, passport, visas, and an International Certificate of Vaccination are often required. The International Flight Information Manual (IFIM) specifies passport, inoculation and visa requirements for entry to each country.

The IFIM is a collection of data from Aeronautical Information Publications (AIP) published by the civil aviation authorities (CAA) of various countries.

The following detailed checklist should be helpful in establishing international operations requirements and procedures. You may want to use it to prepare your own customized checklist for your organization's planned destinations.

I. DOCUMENTATION

PERSONNEL, CREW

- ❐ Airman's certificates
- ❐ Physical
- ❐ Passport
- ❐ Extra photos
- ❐ Visa
- ❐ Tourist card
- ❐ Proof of citizenship (not driver's license)
- ❐ Immunization records
- ❐ Traveler's checks
- ❐ Credit cards
- ❐ Cash
- ❐ Passenger manifest (full name, passport no.)
- ❐ Trip itinerary
- ❐ International driver's license

AIRCRAFT

- ❒ Airworthiness certificate
- ❒ Registration
- ❒ Radio licenses
- ❒ MNPS certification
- ❒ Aircraft flight manual
- ❒ Maintenance records
- ❒ Certificates of insurance (US military and foreign)
- ❒ Import papers (for aircraft of foreign manufacture)

II. OPERATIONS

PERMITS

- ❒ Flight authorization letter
- ❒ Overflights
- ❒ Landing
- ❒ Advance notice
- ❒ Export licenses (navigation equipment)
- ❒ Military
- ❒ Customs overflight
- ❒ Customs landing rights

SERVICES

Inspection

- ❒ Customs forms
- ❒ Immigrations
- ❒ Agricultural (disinfectant)

Ground

- ❒ Handling agents
- ❒ FBOs
- ❒ Fuel (credit cards, carnets)

- ❒ Maintenance
  - ❒ Flyaway kit (spares)
  - ❒ Fuel contamination check

Financial

- ❒ Credit cards
- ❒ Letters of credit
  - ❒ Banks
  - ❒ Servicing air carriers
  - ❒ Handling
  - ❒ Fuelers
- ❒ Traveler's checks
- ❒ Cash

COMMUNICATIONS

Equipment

- ❒ VHF
- ❒ UHF
- ❒ HF SSB
- ❒ Headphones
- ❒ Portables (ELTs, etc.,)
- ❒ Spares

Agreements

- ❒ ARINC
- ❒ BERNA (Switzerland)
- ❒ SITA
- ❒ Stockholm

NAVIGATION

Equipment

- ❐ VOR
- ❐ DME
- ❐ ADF
- ❐ Inertial
- ❐ VLF/OMEGA
- ❐ LORAN
- ❐ GPS

Publications

- ❐ Onboard computer (update)
- ❐ En route charts (VFR, IFR)
- ❐ Plotting charts
- ❐ Approach charts (area, terminal)
- ❐ NAT message (current)
- ❐ Flight plans
- ❐ Blank flight plans

III. OTHER PUBLICATIONS

- ❐ Operations manual
- ❐ International Flight Information Manual
- ❐ Maintenance manuals
- ❐ Manufacturer's sources
- ❐ World Aviation Directory
- ❐ Interavia ABC
- ❐ Airports International Directory
- ❐ MNPS/NOPAC
- ❐ Customs Guide

IV. SURVIVAL EQUIPMENT

- ❒ Area survival kit (with text)
- ❒ Medical kit (with text)
- ❒ Emergency locator transmitter
- ❒ Flotation equipment
  - ❒ Raft
  - ❒ Life Jackets

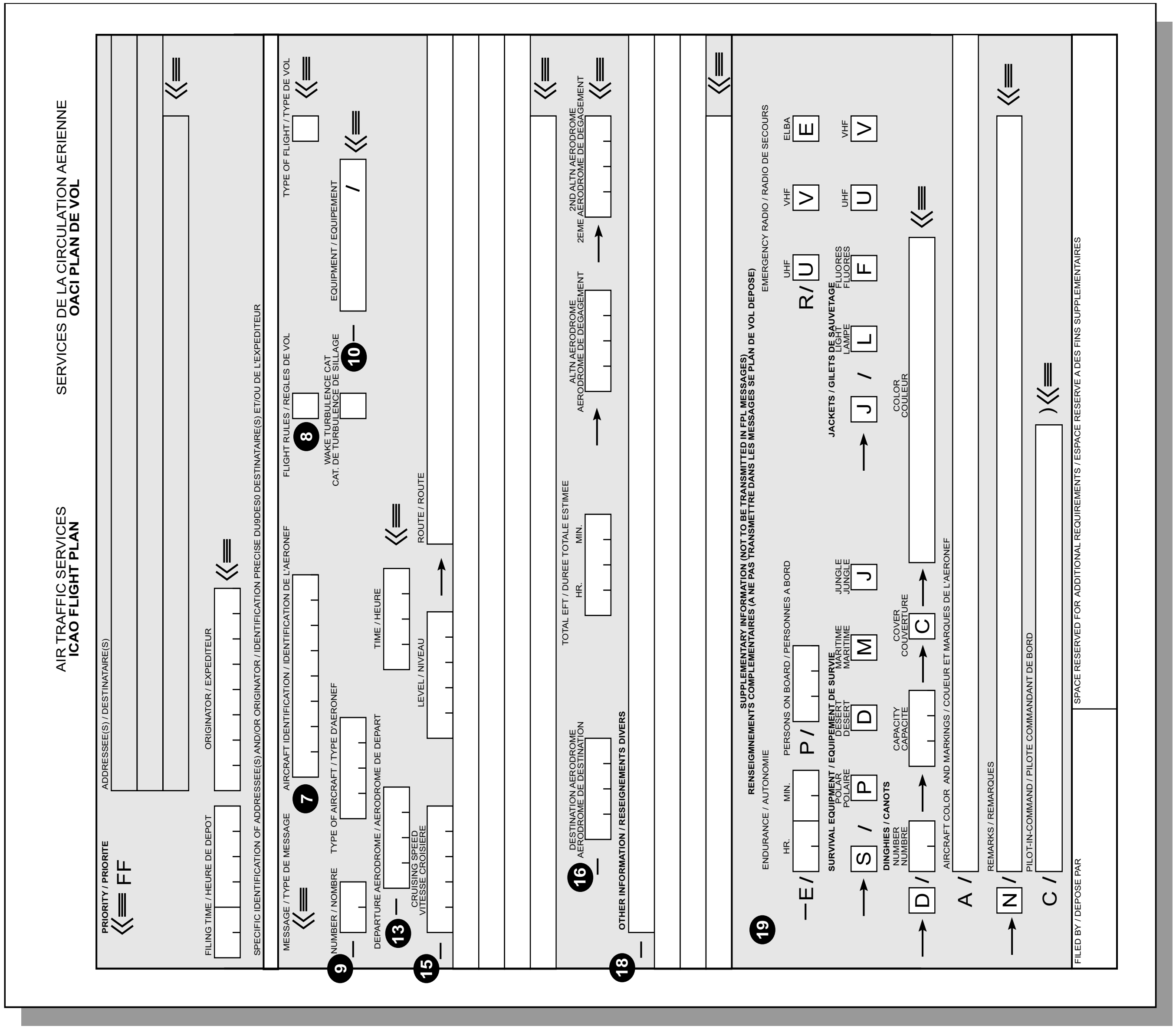
IV. FACILITATION AIDS

- ❒ US Department of State
- ❒ US Department of Commerce
- ❒ US Customs Service
- ❒ National Flight Data Center (FAA) Notams
- ❒ FAA Office of International Aviation
- ❒ FAA Aviation Security

IV. OTHER CONSIDERATIONS

- ❒ Preflight planner
- ❒ Aircraft locks
- ❒ Spare keys
- ❒ Security devices
- ❒ Commissary supplies
- ❒ Electrical adapters (razors, etc.,)
- ❒ Ground transportation
- ❒ Hotel reservations
- ❒ NBAA International Feedback cards
- ❒ Catering
- ❒ WX service
- ❒ Reservations
- ❒ Slot times

ICAO International Flight Plan Form



AIR TRAFFIC SERVICES
ICAO FLIGHT PLAN

SERVICES DE LA CIRCULATION AERIENNE
OACI PLAN DE VOL

PRIORITY / PRIORITE ≪≡ FF

ADDRESSEE(S) / DESTINATAIRE(S)

FILING TIME / HEURE DE DEPOT

ORIGINATOR / EXPEDITEUR

SPECIFIC IDENTIFICATION OF ADDRESSEE(S) AND/OR ORIGINATOR / IDENTIFICATION PRECISE DU9DES0 DESTINATAIRE(S) ET/OU DE L'EXPEDITEUR

MESSAGE / TYPE DE MESSAGE

7 AIRCRAFT IDENTIFICATION / IDENTIFICATION DE L'AERONEF

8 FLIGHT RULES / REGLES DE VOL — TYPE OF FLIGHT / TYPE DE VOL

9 NUMBER / NOMBRE — TYPE OF AIRCRAFT / TYPE D'AERONEF — WAKE TURBULENCE CAT. / CAT. DE TURBULENCE DE SILLAGE

10 EQUIPMENT / EQUIPEMENT

13 DEPARTURE AERODROME / AERODROME DE DEPART — TIME / HEURE

15 CRUISING SPEED / VITESSE CROISIERE — LEVEL / NIVEAU — ROUTE / ROUTE

16 DESTINATION AERODROME / AERODROME DE DESTINATION — TOTAL EET / DUREE TOTALE ESTIMEE HR. MIN. — ALTN AERODROME / AERODROME DE DEGAGEMENT — 2ND ALTN AERODROME / 2EME AERODROME DE DEGAGEMENT

18 OTHER INFORMATION / RESEIGNEMENTS DIVERS

SUPPLEMENTARY INFORMATION (NOT TO BE TRANSMITTED IN FPL MESSAGES)
RENSEIGMNEMENTS COMPLEMENTAIRES (A NE PAS TRANSMETTRE DANS LES MESSAGES SE PLAN DE VOL DEPOSE)

19 ENDURANCE / AUTONOMIE HR. MIN. — PERSONS ON BOARD / PERSONNES A BORD — EMERGENCY RADIO / RADIO DE SECOURS UHF VHF ELBA

–E/ P/ R/ U V E

SURVIVAL EQUIPMENT / EQUIPEMENT DE SURVIE POLAR POLAIRE DESERT DESERT MARITIME MARITIME JUNGLE JUNGLE — **JACKETS / GILETS DE SAUVETAGE** LIGHT LAMPE FLUORES FLUORES UHF VHF

S / P D M J — J / L F U V

DINGHIES / CANOTS NUMBER NOMBRE — CAPACITY CAPACITE — COVER COUVERTURE — COLOR COULEUR

D/ C

AIRCRAFT COLOR AND MARKINGS / COUEUR ET MARQUES DE L'AERONEF

A/

REMARKS / REMARQUES

N/

PILOT-IN-COMMAND / PILOTE COMMANDANT DE BORD

C/)

FILED BY / DEPOSE PAR

SPACE RESERVED FOR ADDITIONAL REQUIREMENTS / ESPACE RESERVE A DES FINS SUPPLEMENTAIRES

D9CRH-FP006i

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ICAO Flight Plan Form Completion – Items 7-19

Complete all ICAO flight plans prior to departure. Although the ICAO flight plan form is printed in numerous languages, the format is always the same.

Always enter cruising speed and cruising level as a group. In the body of the flight plan form, if one item changes, the other item must be re-entered to keep speed and level as a matched pair.

Always enter latitude and longitude as 7 or 11 characters. If entering minutes of one, enter minutes of the other as well, even if zeros.

Significant points should not be more than one hour apart.

Consider entering overflight/landing permissions after RMK/ in Item 18.

Item 7: Aircraft Identification (7 characters maximum)

Insert (A) the aircraft registration marking or (B) aircraft operating agency ICAO designator, followed by the flight identification.

A. Insert only the aircraft registration marking (e.g., EIAKO, 4XBCD, N2567GA) if one of the following is true:

- The aircraft's radiotelephony call sign consists of the aircraft registration marking alone (e.g., OOTEK).
- The registration marking is preceded by the ICAO telephone designator for the aircraft operating agency (e.g., SABENA OOTEK).
- The aircraft is not equipped with radio.

B. Insert the ICAO designator for the aircraft operating agency, followed by the flight identification (e.g., KL511, WT214, K7123, JH25) if the aircraft's radiotelephony call sign consists of the ICAO telephony designator for the operating agency, followed by the flight identification (e.g., KLM 511, NIGERIA 213, KILO UNIFORM 123, JULIETT HOTEL 25).

Item 8: Flight Rules and Type of Flight (1 or 2 characters)

Flight Rules: Insert one of the letters below (i.e., I, V, Y, or Z) to denote the intended flight rules category:

I IFR

V VFR

Y IFR first*

Z VFR first*

*Note: Specify in Item 15 (Route) the point(s) where a change in flight rules is planned.

Type of Flight: Insert one of the following letters to denote the type of flight, when so required by the appropriate ATS authority:

S scheduled air service

N non-scheduled air transport operation

G general aviation

M military

X other than the above

Item 9: Number (1 or 2 characters) and Type of Aircraft (2 to 4 characters) and Wake Turbulence Category (1 character)

Number of Aircraft: Insert number of aircraft if more than one.

Type of Aircraft: Insert the appropriate designator as specified in ICAO Doc 8643, Aircraft Type Designators. If no such designator has been assigned, or in case of a formation flight comprising more than one aircraft type, insert ZZZZ and then specify in Item 18 the number(s) and type(s) of aircraft, preceded by TYP/.

Wake Turbulence Category: Insert / + H, M, or L:

- **/H** Heavy – maximum certificated T/O mass of 136,000 kg (300,000 lb) or more.
- **/M** Medium – maximum certificated T/O mass of less than 136,000 kg but more than 7,000 kg (between 15,500 and 300,000 lb).
- **/L** Light – maximum certificated T/O mass of 7,000 kg or less (15,500 lb).

Item 10: Equipment

Radio Communication, Navigation, and Approach Aid Equipment: Insert one of the following letters:

- **N** if COMM/NAV/approach aid equipment is not carried or is inoperative.
- **S** if standard COMM/NAV/approach aid equipment (VHF RTF, ADF, VOR, ILS, or equipment prescribed by ATS authority) is on board and operative.

And/or insert one of the following letters to indicate that the corresponding COMM/NAV/approach aid equipment is available and operative:

A not allocated
B not allocated
C LORAN C
D DME
E not allocated
F ADF
G (GNSS)
H HF RTF
I Inertial Navigation
J (Data Link)
K (MLS)
L ILS
M Omega
O VOR
P not allocated
Q not allocated
R RNP type certification
T TACN
U UHF RTF
V VHF RTF
W when prescribed by ATS
X when prescribed by ATS
Y when prescribed by ATS
Z Other (specify in Item 18)

SSR Equipment: Insert one of the following letters to describe the operative SSR equipment on board:

- **N** None
- **A** Transponder Mode A (4 digits – 4096 codes)
- **C** Transponder Mode A and Mode C
- **X** Transponder Mode S without aircraft ID or pressure altitude transmission
- **P** Transponder Mode S with pressure altitude transmission, but without aircraft ID transmission
- **I** Transponder Mode S with aircraft ID transmission, but without pressure-altitude transmission
- **S** Transponder Mode S with both pressure-altitude and aircraft ID transmission.

Item 13: Departure Aerodrome (4 characters) and Time (4 characters)

Departure Aerodrome: Insert one of the following:

- ICAO four-letter location indicator of the departure aerodrome.
- If no location indicator is assigned, insert ZZZZ, then specify in Item 18 the name of the aerodrome, preceded by DEP/.
- If a flight plan is submitted while in flight, insert AFIL, then specify in Item 18 the four-letter location indicator of the ATS unit from which supplementary flight plan data can be obtained, preceded by DEP/.

Time: Insert one of the following:

- For a flight plan submitted before departure, the estimated off-block time.
- For a flight plan submitted while in flight, the actual or estimated time over the first point of the route to which the flight plan applies.

Item 15: Cruising Speed (5 characters), Cruising Level (5 characters), and Route

Cruising Speed: Insert the true airspeed for the first or whole cruising portion of the flight in one of the following forms:

- Kilometers per hour: K + 4 figures (e.g., K0830)
- Knots: N + 4 figures (e.g., N0485)
- Mach number: M + 3 figures (e.g., M082) if prescribed by ATS.

Cruising Level: Insert the planned cruising level for the first or whole portion of the planned route using one of the following forms:

- Flight level: F + 3 figures (e.g., F085, F330)
- Standard metric level in tens of metres: S + 4 figures (e.g., S1130), if prescribed by ATS.
- Altitude in hundreds of feet: A + 3 figures (e.g., A045, A100)
- Altitude in tens of metres: M + 4 figures (e.g., M0840)
- For uncontrolled VFR flights: VFR.

Route: Include changes of speed, level, and/or flight rules.

For flights along designated ATS routes:

- If the departure aerodrome is on or connected to the ATS route, insert the designator of the first ATS route.
- If the departure aerodrome is not on or connected to the ATS route, insert the letters DCT followed by the point of joining the first ATS route, followed by the designator of the ATS route.
- Insert each point at which a change of speed, change of level, change of ATS route, and/or a change of flight rules is planned. For a transition between lower and upper ATS routes oriented in the same direction, do not insert the point of transition.

- In each case, follow with the designator of the next ATS route segment, even if it is the same as the previous one (or with DCT if the flight to the next point is outside a designated route), unless both points are defined by geographical coordinates.

Flights outside designated ATS routes:

- Insert points not normally more than 30 minutes flying time or 200 nautical miles apart, including each point at which a change of speed or level, a change of track, or a change of flight rules is planned.
- When required by ATS, define the track of flights operating predominantly in an east-west direction between 70 degrees North and 70 degrees South by reference to significant points formed by the intersections of half or whole degrees of latitude with meridians spaced at intervals of 10 degrees of longitude.
- For flights operating in areas outside those latitudes, define the tracks by significant points formed by the intersection of parallels of latitude with meridians normally spaced so as not to exceed one hour's flight time. Establish additional significant points as deemed necessary.

  For flights operating predominantly in a north-south direction, define tracks by reference to significant points formed by the intersection of whole degrees of longitude with specified parallels of latitude that are spaced at 5 degrees.
- Insert DCT between successive points, unless both points are defined by geographical coordinates or bearing and distance.

Examples of Route Sub-entries

Enter a space between sub-entries.

1. ATS route (2 to 7 characters): BCN1, B1, R14, KODAP2A
2. Significant point (2 to 11 characters): LN, MAY, HADDY
   - Degrees only (7 characters – insert zeros, if necessary): 46N078W

- Degrees and minutes (11 characters – insert zeros, if necessary): 4620N07805W
- Bearing and distance from navigational aid (NAV aid ID [2 to 3 characters] + bearing and distance from the NAV aid [6 characters – insert zeros, if necessary]): a point 180 magnetic at a distance of 40 nautical miles from VOR "DUB" = DUB180040

3. Change of speed or level (max 21 characters):

   Insert point of change/cruising speed and level – LN/N0284A045, MAY/N0305F180, HADDY/N0420F330, DUB180040/M084F350.

4. Change of flight rules (max 3 characters):

   Insert point of change (space) change to IFR or VFR – LN VFR, LN/N0284A050 IFR.

5. Cruise climb (max 28 characters)

   Insert C/point to start climb/climb speed/levels –

   C/48N050W / M082F290F350

   C/48N050W / M082F290PLUS

   C/52N050W / M220F580F620

Item 16: Destination Aerodrome (4 characters), Total Estimated Elapsed Time (EET, 4 characters), Alternate Aerodrome(s) (4 characters)

Destination aerodrome: insert ICAO four-letter location indicator. If no indicator is assigned, insert ZZZZ.

Total EET: insert accumulated estimated elapsed time. If no location indicator is assigned, specify in Item 18 the name of the aerodrome, preceded by DEST/.

Alternate aerodrome(s): insert ICAO four-letter location indicator. If no indicator is assigned to alternate, insert ZZZZ and specify in Item 18 the name of the alternate aerodrome, preceded by ALTN/.

Item 18: Other Information

This section may be used to record specific information as required by the appropriate ATS authority or as per regional air navigation agreements. Insert the appropriate indicator followed by an oblique stroke (/) and the necessary information. See examples below.

- Estimated elapsed time/significant points or FIR boundary designators: EET/CAP0745, XYZ0830.
- Revised destination aerodrome route details/ICAO aerodrome location indicator: RIF/DTA HEC KLAX. (Revised route subject to re-clearance in flight.)
- Aircraft registration markings, if different from aircraft I.D. in Item 7: REG/N1234.
- SELCAL code: SEL/_____.
- Operator's name, if not obvious from the aircraft I.D. in Item 7: OPR/_____.
- Reason for special handling by ATS (e.g., hospital aircraft, one-engine inoperative): STS/HOSP, STS/ONE ENG INOP.
- As explained in Item 9: TYP/_____.
- Aircraft performance data: PER/_____.
- Communication equipment significant data: COM/UHF Only.
- Navigation equipment significant data: NAV/INS.
- As explained in Item 13: DEP/_____.
- As explained in Item 16: DEST/_____, or ALTN/_____.
- Other remarks as required by ATS or deemed necessary: RMK/_____.

Item 19: Supplementary Information

Endurance: insert fuel endurance in hours and minutes.

Persons on Board: insert total persons on board, including passengers and crew. If unknown at time of filing, insert TBN (to be notified).

Emergency Radio, Survival Equipment, Jackets, Dinghies: cross out letter indicators of all items not available; complete blanks as required for items available (jackets: L = life jackets with lights, J = life jackets with fluorescein).

ICAO Position Reporting Format

Outside the US, position reports are required unless specifically waived by the controlling agency.

Initial Contact (Frequency Change)

1. Call sign.
2. Flight level (if not level, report climbing to or descending to cleared altitude).
3. Estimating (next position) at (time) GMT.

Position Report

1. Call sign.
2. Position (If position is in doubt, use a phonetic identifier. For oceanic reports, report first the latitude, then the longitude (e.g., 50N 60W).)
3. Time (GMT) or (UST).
4. Altitude or flight level (if not level, report climbing to or descending to altitude).
5. Next position.
6. Estimated elapsed time (EET).

FAA Flight Plan Form

US DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION **FLIGHT PLAN**	(FAA USE ONLY) ☐PILOT BRIEFING ☐VNR ☐STOPOVER	TIME STARTED	SPECIALIST INITIALS

1. TYPE VFR IFR DVFR	2. AIRCRAFT IDENTIFICATION	3. AIRCRAFT TYPE/ SPECIAL EQUIPMENT	4. TRUE AIRSPEED	5. DEPARTURE POINT	6. DEPARTURE TIME PROPOSED (Z) / ACTUAL (Z)	7. CRUISING ALTITUDE

8. ROUTE OF FLIGHT

9. DESTINATION (Name of airport and city)	10. EST TIME EN ROUTE HOURS / MINUTES	11. REMARKS

12. FUEL ON BOARD HOURS / MINUTES	13. ALTERNATE AIRPORT(S)	14. PILOT'S NAME, ADDRESS & TELEPHONE NUMBER & AIRCRAFT HOME BASE 17. DESTINATION CONTACT/TELEPHONE (OPTIONAL)	15. NUMBER ABOARD

18. COLOR OF AIRCRAFT	CIVIL AIRCRAFT PILOTS. FAR Part 91 requires you to file an IFR flight plan to operate under instrument flight rules in controlled airspace. Failure to file could result in a civil penality not to exceed $1,000 for each violation (Section 901 of the Federal Aviation Act of 1956, as amended). Filing of a VFR flight plan is recommended as a good operating practice. See also Part 99 for requirements concerning DVFR flight plans.

FAA Form 7233-1 (8-82) CLOSE VFR FLIGHT PLAN WITH ____________ FSS ON ARRIVAL

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D9CRH-FP007i

FAA Flight Plan Form Completion Instructions

Block 1 Check the type of flight plan. Check both the VFR and IFR blocks if composite VFR/IFR.

Block 2 Enter your complete aircraft identification, including the prefix “N”, if applicable.

Block 3 Enter the designator for the aircraft, or if unknown, the aircraft manufacturer's name.

When filing an IFR flight plan for an aircraft equipped with TCAS, add the prefix T for TCAS. Example: T/G4/R.

When filing an IFR flight plan for flight in an aircraft equipped with a radar beacon transponder, DME equipment, TACAN-only equipment or a combination of both identify equipment capability by adding a suffix to the AIRCRAFT TYPE, preceded by an oblique stoke (/) as follows:

/X no transponder

/T transponder with no altitude encoding capability

/U transponder with altitude encoding capability

/D DME, but no transponder

/B DME and transponder, but no altitude encoding capability

/A DME and transponder with altitude encoding capability

/M TACAN only, but no transponder

/N TACAN only and transponder, but with no altitude encoding capability

/P TACAN only and transponder with altitude encoding capability

/C RNAV and transponder, but with no altitude encoding capability

/R RNAV and transponder with altitude encoding capability

/W RNAV but no transponder

/G Global Positioning System (GPS)/Global Navigation Satellite System (GNSS)-equipped aircraft with oceanic, en route, terminal, and GPS approach capability.

/E Flight Management System (FMS) with barometric vertical navigation (VNAV), oceanic, en route, terminal, and approach capability. Equipment requirements are:

(a) Dual FMS which meets the specifications of AC25-15, Approval of Flight Management Systems in Transport Category Airplanes; AC20-129, Airworthiness Approval of Vertical Navigation (VNAV) Systems for use in the US National Airspace System (NAS) and Alaska; AC20-130, Airworthiness Approval of Multi-Sensor Navigation Systems for use in the US National Airspace System (NAS) and Alaska; or equivalent criteria as approved by Flight Standards.

(b) A flight director and autopilot control system capable of following the lateral and vertical FMS flight path.

(c) Dual inertial reference units (IRUs).

(d) A database containing the waypoints and speed/altitude constraints for the route and/or procedure to be flown that is automatically loaded into the FMS flight plan.

(e) An electronic map.

/F A single FMS with barometric VNAV, en route, terminal, and approach capability that meets the equipment requirements of /E (a) above.

/**Y** LORAN, VOR/DME or INS with no transponder.

/**I** LORAN, VOR/DME or INS, transponder with mode C.

/**Q** Required Navigation Performance (RNP) and Reduced Vertical Separation Minima (RVSM) (indicate approval for application or RNP and RVSM separation standards). It should be noted that /Q is for automation purposes only and will not be filed by system users. FAA processors will convert the combination of /R+/W to =/Q.

Block 4 Enter your true airspeed (TAS).

Block 5 Enter the departure airport identifier code or, if code is unknown, the name of the airport.

Block 6 Enter the proposed departure time in coordinated universal time (UTC). If airborne, specify the actual or proposed departure time, as appropriate.

Block 7 Enter the appropriate IFR altitude (to assist the briefer in providing weather and wind information).

Block 8 Define the route of flight by using NAVAID identifier codes, airways, jet routes, and waypoints.

Block 9 Enter the destination airport identifier code or, if unknown, the airport name. Include the city name (or even the state name) if needed for clarity.

Block 10 Enter the estimated time en route in hours and minutes.

Block 11 Enter only those remarks pertinent to ATC or to the clarification of other flight plan information, such as the appropriate call sign associated with the designator filed in Block 2 or ADCUS.

Block 12 Specify the fuel on board in hours and minutes.

Block 13 Specify an alternate airport, if desired or required.

Block 14 Enter the complete name, address, and telephone number of the pilot in command. Enter sufficient information to identify the home base, airport, or operator. This information is essential for search and rescue operations.

Block 15 Enter the total number of persons on board (POB), including crew.

Optional Record a destination telephone number in block 17 to assist search and rescue contact should you fail to report or cancel your flight plan within ½ hour after your estimated time of arrival (ETA).

Block 18 Enter the aircraft's predominant colors.

Below Record the FSS name for closing the flight plan. If the flight plan is closed with a different FSS or facility, state the recorded FSS name that would normally have closed your flight plan. Information transmitted to the destination FSS consists only of that in Blocks 3, 9, and 10. Estimated time en route (ETE) will be converted to the correct estimated time of arrival (ETA).

ICAO Weather Format
(Sample METAR)

A routine aviation weather report on observed weather, or METAR, is issued at hourly or half-hourly intervals. A special weather report on observed weather, or SPECI, is issued when certain criteria are met. Both METAR and SPECI use the same codes.

A forecast highly likely to occur, or TREND, covers a period of two hours from the time of the observation. A TREND forecast indicates significant changes in respect to one or more of the following elements: surface wind, visibility, weather, or clouds. TREND forecasts use many of the same codes as TAFs.

Most foreign countries may append a TREND to a METAR or SPECI. In the US, however, a TREND is not included in a METAR or SPECI.

The following example indicates how to read a METAR.

KHPN 201955Z 22015G25KT 2SM
R22L/1000FT TSRA OVC010CB 18/16 A2990
RERAB25 BECMG 2200 24035G55

KHPN. ICAO location indicator.

201955Z. Date and time of issuance. METARs are issued hourly.

22015G25KT. Surface wind (same as TAF). If the first three digits are VAR, the wind is variable with wind speed following. If direction varies 60 degrees or more during the 10 minutes immediately preceding the observation, the two extreme directions are indicated with the letter V inserted between them (e.g., **280V350**).

NOTE: G must vary 10 kt or more to report gust.

2SM. Prevailing horizontal visibility in statute miles. In the US, this is issued in statute miles with the appropriate suffix (**SM**) appended. When a marked directional variation exists, the reported minimum visibility is followed by one of the eight compass points to indicate the direction (e.g., **2SMNE**).

R22L/1000FT. The runway visual range group. The letter **R** begins the group and is followed by the runway description (**22L**). The range in feet follows the slant bar (**1000FT**). In other countries, range is in meters and no suffix is used.

TSRA OVC010CB. Thunderstorms (**TS**) and rain (**RA**) with an overcast layer at 1,000 ft and cumulonimbus clouds.

> **NOTE:** More than one cloud layer may be reported.

18/16. Temperatures in degrees Celsius. The first two digits (**18**) are observed air temperature; the last two digits (**16**) are dew point temperature. A temperature below zero is reported with a minus (**M**) prefix code (e.g., **M06**).

A2990. Altimeter setting. In the US, **A** is followed by inches and hundredths; in most other countries, **Q** is followed by hectopascals (i.e., millibars).

RERAB25. Recent operationally significant condition. A two-letter code for recent (**RE**) is followed by a two-letter code for the condition (e.g., **RA** for rain). A code for beginning or ending (**B** or **E**) follows and a two-digit time in minutes during the previous hour. When local circumstances warrant, wind shear may also be indicated (e.g., **WS LDG RWY 22**).

> **NOTE:** In the US, a remark (RMK) code precedes supplementary data of recent operationally significant weather.

> **NOTE:** RMK [SLP 013] breaks down SEA LVL press to the nearest tenth (e.g., 1001.3 is reported as SLP 013).

BECMG AT 2200 24035G55. A TREND forecast. The becoming code (**BECMG**) is followed by a when sequence (**AT 2200**) and the expected change (e.g., surface winds at 240 degrees true at 35 kt with gusts up to 55 kt).

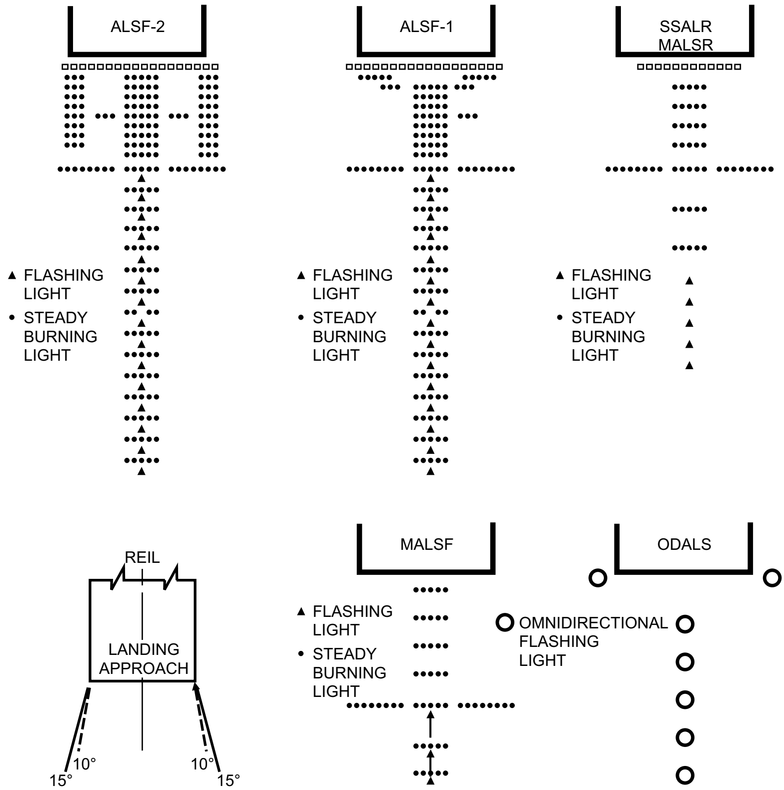
NOTE: For more information on METAR/TAF, consult the FAA brochure “New Aviation Weather Format METAR/TAF.” Copies may be obtained by writing to: FAA/ASY-20, 400 7th Street, S.W. Washington, DC 20590.

Aeronautical Lighting and Visual Aids

Approach Light Systems (ALS)

ALS provide the basic means to transition from instrument flight to visual flight for landing. Operational requirements dictate the sophistication and configuration of the approach light system for a particular runway.

ALS are a configuration of signal lights that start at the landing threshold and extend into the approach area to a distance of 2400-3000 feet for precision instrument runways and 1400-1500 feet for nonprecision instrument runways. Some systems include sequenced flashing lights which appear to the pilot as a ball of light traveling towards the runway at high speed (twice a second).



NOTE:
CIVIL ALSF-2 MAY BE OPERATED AS SSALR DURING FAVORABLE WEATHER CONDITIONS.

D9CRH-FP008i

5-7

In-runway Lighting

Runway Centerline Lighting System (RCLS). Runway centerline lights are installed on some precision approach runways to facilitate landing under conditions of adverse visibility. They are spaced at 50-foot intervals along the runway centerline. When viewed from the landing threshold, the runway centerline lights are white until the last 3,000 feet of the runway. The white lights begin to alternate with red for the next 2,000 feet; for the last 1,000 feet of the runway, all centerline lights are red.

Touchdown Zone Lights (TDZL). Touchdown zone lights are installed on some precision approach runways to indicate the touchdown zone when landing under conditions of adverse visibility. They consist of two rows of transverse light bars disposed symmetrically about the runway centerline. The system consists of steady-burning white lights which start 100 feet beyond the landing threshold and extend to 3,000 feet beyond the landing threshold or to the midpoint of the runway, whichever distance is less.

Taxiway Lead-off Lights. Taxiway lead-off lights extend from the runway centerline to a point on an exit taxiway to expedite movement of aircraft from the runway. These lights alternate green and yellow from the runway centerline to the runway holding position or the ILS/MLS critical area, as appropriate.

Land and Hold Short Lights. Land and hold short lights are used to indicate the hold short point on certain runways that are approved for Land and Hold Short Operations (LAHSO). Land and hold short lights consist of a row of pulsing white lights installed across the runway at the hold short point. Where installed, the lights will be on anytime that LAHSO is in effect. These lights will be off when LAHSO is not in effect.

Taxiway Lights

Taxiway Edge Lights. Taxiway edge lights are used to outline the edges of taxiways during periods of darkness or conditions of restricted visibility. These fixtures emit blue light.

> **NOTE:** At most major airports these lights have variable intensity settings and may be adjusted at pilot request or when deemed necessary by the controller.

Taxiway Centerline Lights. Taxiway centerline lights are used to facilitate ground traffic under conditions of low visibility. They are located along the taxiway centerline in a straight line on straight portions, on the centerline of curved portions, and along designated taxiing paths in portions of runways, ramp, and apron areas. Taxiway centerline lights are steady burning and emit green light.

Clearance Bar Lights. Clearance bar lights are installed at holding positions on taxiways in order to increase the conspicuity of the holding position in conditions of low visibility. They may also be installed to indicate the location of an intersecting taxiway during periods of darkness. Clearance bars consist of three in-pavement, steady-burning yellow lights.

Runway Guard Lights. Runway guard lights are installed at taxiway/runway intersections. They are used primarily to enhance the conspicuity of taxiway/runway intersections during conditions of low visibility, but may be used in all weather conditions. Runway guard lights consist of either a pair of elevated flashing yellow lights installed on either side of the taxiway or a row of in-pavement yellow lights installed across the entire taxiway at the runway holding position marking.

> **NOTE:** Some airports may have a row of three or five in-pavement yellow lights installed at taxiway/runway intersections. They should not be confused with clearance bar lights described in the paragraph “Runway Guard Lights.”

Runway Edge Lighting. Runway edge lights are used to outline the edges of runways during periods of darkness or in restricted visibility conditions. The runway edge lights are white, except on instrument runways where yellow replaces white on the last 2,000 feet or for half the runway length, whichever is less, to form a caution zone for landings. The lights marking the ends of the runway emit red light toward the runway to indicate the end of the runway to a departing aircraft and emit green outward from the end of the runway to indicate the threshold to landing aircraft.

Stop Bar Lights. Stop bar lights, when installed, are used to confirm the ATC clearance to enter or cross the active runway in conditions of low visibility (below 1,200 feet Runway Visual Range). A stop bar consists of a row of red, unidirectional, steady-burning, in-pavement lights installed across the entire taxiway at the runway holding position, and elevated steady-burning red lights on each side. A controlled stop bar is operated in conjunction with the taxiway centerline lead-on lights which extend from the stop bar toward the runway. Following the ATC clearance to proceed, the stop bar is turned off and the lead-on lights are turned on. A sensor or backup timer automatically resets the stop bar and lead-on lights

CAUTION: Pilots should never cross a red illuminated stop bar, even if an ATC clearance has been given to proceed onto or across the runway.

NOTE: If, after crossing a stop bar, the taxiway centerline lead-on lights inadvertently extinguish, pilots should hold their position and contact ATC for further instructions.

Servicing

Table of Contents

Daily Check

The inspection procedures in this chapter are to be carried out with the first daily preflight inspections.

> **NOTE:** The daily inspection is carried out after airplane partial or complete refueling operation is over.

Preflight Checks

Tire Inflation Pressure Check

Nosewheel Tires . . . . .148 PSI

Main Gear Tires

MTOW 45,500 lb . . . . .193 PSI

MTOW 46,500 lb . . . . .197 PSI

Refer to SB F900-139.

This check must be performed with tires at ambient temperature (airplane at standstill for three hours minimum, in the shade and unloaded).

If the drop in pressure, recorded over 24 hours, is greater than 5 percent of the rated pressure, see Ground Servicing manual DTM605 for the procedure to be followed.

If the ambient temperature prevailing at the arrival airport is lower than that of the departure airport by 25°C or more, it is recommended to overinflate the tire by 3.7 percent for each 10-degree decrement.

Brake Wear

> **NOTE:** Check brake wear with brakes cold and parking brake on.

Check for condition of the wear indicators (two per brake unit). Refer to Ground Servicing manual DTM605 for wear indicator recess dimensions.

Sump of Fuel Pump Compartments

> **NOTE:** For best results when draining water from fuel sumps, the aircraft should be at a standstill for a minimum of 6 hours. If not practicable, one hour minimum is acceptable.

Make sure the aircraft is not on a slope which might affect correct water drainage. The nose wheels must be higher than or level with the main landing gear wheels.

> **NOTE:** For airplanes with SB F900-135, use the level bubble located on the RH side of the nose gear well to check that the airplane is correctly configured (the bubble must be inside the level window).

Fuel sump is to be carried out without crew or passengers onboard and with a minimal quantity of fuel onboard.

Fuel tank venting

- Open the refueling door coupling.
- Lift the air vent valve control lever.
- Allow for complete depressurization (hissing noise).
- Lower the air vent valve control lever.
- Close the refueling door.

Fuel tank sump

- Push up the fuel tank draining tool to open the sump drain valve; do not turn the tool.
- Allow fuel to drain inside the tool for a few seconds.
- Repeat the operation for each sump drain valve until the tool holds approximately one liter (0.25 US gal) of fuel.
- Allow 10 minutes to settle.

- If the quantity of water per liter of fuel is greater than 10 cm^3 (0.5 cu. in.), repeat fuel sump operations.

> **NOTE:** In case of massive water contamination, the fuel tanks must be defueled or drained completely.

Drainage Points

Ensure the following drainage points are not blocked:

- Nose cone condensation drain (for aircraft without SB F900-122 only):
  - Using a rod, push the sealing piston at the base of the nose cone.
  - Allow the piston to re-seat after water has drained.
- Flapper drain holes
- CIRCLE SEAL DRAIN automatic drains (LH and RH) and permanent leak drain
- Fuselage drains
- Underneath APU compartment:
  - Hydraulic manifold drain
  - Fuel pressurization drains
  - APU manifold drain
- Below engine No. 2, ensure that there is no leakage past:
  - The cowling mating line.
  - The fuel drain manifold.
- Underneath engines No. 1 and 3, ensure that:
  - Drainage points are free of blockage, leakage, seepage or abnormal dripping.
  - The engine manifold fuel drain is not obstructed.

Heat Exchanger Additional Air Intake Door

Ensure that the air conditioning system heat exchanger additional air intake door moves freely.

> **NOTE:** The additional air intake door must be partially open (clearance between 4 and 7 mm (0.16 and 0.28 in.)).

APU Oil Level

Remove the oil filler cap/dipstick assembly and check the APU oil level.

> **NOTE:** The tank is full when the level reaches the upper point of the dipstick flat section.

Aft Compartment

Check the external condition of batteries:

- Lids are correctly positioned and locked.
- No traces of electrolyte spillage (on the tray and in the transparent vent line).
- Battery bolts are correctly tightened.
- Vent lines are free of cuts and correctly secured.
- Battery connectors are correctly latched and battery cable sleeves are in proper condition.
- Battery temperature probe connectors are securely attached.

Check the following on the rear maintenance panel:

For aircraft ≤ 178

- Check that OIL and FUEL clogging indicators are white.

  If one indicator shifts to red, actuate the RESET switch to set the indicator back to white, then start the relevant engine and monitor the indicator to check that the shift is effective and not due to an electrical failure. If the indicator shifts to red again, check or replace the monitored element in compliance with the maintenance manual.

For aircraft ≥ 179

- OIL BY-PASS, FUEL BY-PASS and CHIP DETECTOR magnetic indicators: the nine indicators must be white.

  If one indicator shifts to red, actuate the RESET switch to set the indicator back to white, then start the relevant engine and monitor the indicator to check that the shift is effective and not due to an electrical failure. If the indicator shifts to red again, check or replace the monitored element in compliance with the maintenance manual.

  Push and release the TEST pushbutton to check that magnetic indicators trip correctly to red. The magnetic indicators can be reset to white using the RESET pushbutton.

- Check the following on the APU warning panel (if installed):

  LOW OIL PRESS, OVER TEMP, OVER SPEED, OVER CURRENT and HIGH OIL TEMP magnetic indicators: the five magnetic indicators should be white. The overspeed indicator may be indicating red from previous shutdown.

- Check the pressure in the system 1 and 2 hydraulic accumulators and in the thrust reverser accumulator:
- Make sure there are no air bubbles in the de-aerators of hydraulic reservoirs 1 and 2.

> **NOTE:** In very cold weather conditions (sub-zero temperatures) and if bubbles are detected, check the charging pressures of the different accumulators.

- If air bubbles are detected, bleed the air from the relevant reservoir (refer to the maintenance manual).

Passenger Oxygen Pressure

Check passenger oxygen pressure as follows:

- Check that the pressure reducing valve is open. If not, open it gradually by turning one full clockwise turn, as indicated by the ON arrow at the front of the valve.
- Check that the pressure on the oxygen cylinder pressure gauge is at least equal to 1500 PSI. Refill with oxygen if required (refer to maintenance manual).

> **CAUTION:** The oxygen pressure gauges (at the level oxygen cylinder and on the passenger oxygen controller) indicate the pressure in the cylinder, whether the valve is open or closed.

Water System Inspection

Visually inspect the water system for looseness or water leaks as follows:

- Gain access to the water supply system in the front galley, toilet compartment (wash basin cabinet).
- Check water system assembly by feeling around each fluid connection and all equipment (filters, faucets, valves, lines, etc.,) for looseness or water leaks.

Toilets/Lavatory Draining

Check for proper draining of toilets and lavatory as follows:

- Galley and lavatory:
  - Open one faucet at the sink and check that water drains correctly.
  - Close the faucet.
- Toilets:
  - Perform a functional test of toilets and check that waste water drains correctly.

Post-flight Checks

> **NOTE:** The following checks are to be performed at the end of a flight, before the refueling operations, within 60 minutes after engine shutdown.

Water System Draining

Drain the water system with the temperature near 0°C (32°F). Refer to Water section, this chapter.

Magnetic Indicators Check

Check the magnetic indicators on the maintenance panel (cockpit) as follows:

- Check that all magnetic indicators on the maintenance panel are white.
- If they are not all white (except for the ANTISKID light), isolate the cause of tripping and repair and press the RESET pushbutton to reset the magnetic indicators.
- For the ANTISKID light and for airplanes without SB F900-33, if the indicator turns to red, reset by pressing the RESET pushbutton:
  - If the light remains red, there is an anomaly in the system and in the nose gear tachometer generators; perform troubleshooting procedures on their cables and the anti-skid control unit.
  - If the light goes back to white, no extra check is necessary.
- For airplanes with SB F900-33, if the ANTISKID light has switched over to red, troubleshooting is mandatory even if the light becomes white again after the RESET pushbutton has been pushed.

Engine Oil Level

> **CAUTION:** This check must be carried out within 10 to 60 minutes of engine shutdown.

Check the engine oil level on the mechanic's servicing compartment as follows:

- With the gauge supply switch in the ON position, set the ENG 1/ENG 2/ENG 3 selector to each position successively. For each engine, the pointer should move to indicate the oil level and the quantity to be added, as required. If in doubt, physically check the oil tank level.

  > **CAUTION:** Add oil only if the needle is below one quart.

- If the level is insufficient, top up oil.

Hydraulic Fluid Filter Clogging Indicators

Check the hydraulic fluid filter clogging indicators as follows:

- Check five filters (LH manifold) on hydraulic system No. 1 and four filters (RH manifold) on hydraulic system No. 2. A visible red index indicates a clogged filter.
- Replace the clogged filter elements.

Onboard Equipment

The airplane parking equipment is listed in the following table. This equipment forms part of the minimum flyaway kit and must be on board.

Designation	Reference	Qty
Normal static pressure port cover	FGFB910007	2
Angle of attack sensor cover	FGFB910008A1	2
Standby static pressure port cover	FGFB910009	2
Pitot probe cover or pitot probe cover	FGFB910013 or FGFB910013A1	3
ROSEMOUNT temperature probe cover	FGFB910011A1	1
Fuel tank draining tool	FGFB912001 A3	1
Electrostatic grounding set for gravity fueling	TF50B28201	1
Safety pins to hold thrust reverser doors in stowed position (in flight) (without SB F900-108)	BLC3RC6SF	2

Table 6-A; Flyaway Kit Contents

Parking and Mooring

If the airplane has to remain parked outside, and, in particular, overnight or in high wind, it is imperative to install the parking equipment both to ensure the safety of personnel moving around the airplane and to protect the airplane and exposed components.

> **NOTE:** When the airplane is parked outside under strong wind or at night, it is mandatory to install the parking and mooring elements to ensure both safety of personnel (protectors) and airplane integrity, together with protection of its protruding equipment.

Parking

Park the aircraft as follows:

- Park the airplane facing into wind, if necessary.
- Chock the main wheels.

> **NOTE:** The parking brake accumulator provides sufficient pressure for 24 hours in the "parking" position.

- Ensure that deflation of a tire or a shock absorber is not liable to damage the airframe.
- Remove all ground support equipment from the vicinity of the airplane.
- Check that the battery switches are off.
- Install the parking equipment contained in the flyaway kit.
- It is mandatory to install the air intake and exhaust blanking covers whenever the airplane is parked in one of these situations:
  - Under high winds
  - Outside overnight

Mooring

The airplane is moored by means of rings which are screwed into the three jacking fittings.

On snow-covered ground, one of the mooring rings is screwed into the front hoisting point to prevent the airplane from tipping backwards. Moor the aircraft with a taut rope or cable.

CAUTION: When parking the aircraft in freezing conditions, it is recommended to drain the entire water system. Pay special attention to the service line to the forward galley. At temperatures below -5ºF (-15ºC), batteries must be removed and stored in a heated area or heating blankets must be utilized.

Towing

Before towing the airplane, proceed as follows:

- Disconnect the tachometer generator connector (aircraft without SB F900-63).
- Disconnect the torsion link arm from the swiveling tube.
- Position the towing bar in the towing fittings.

An operator in the cockpit must ensure that:

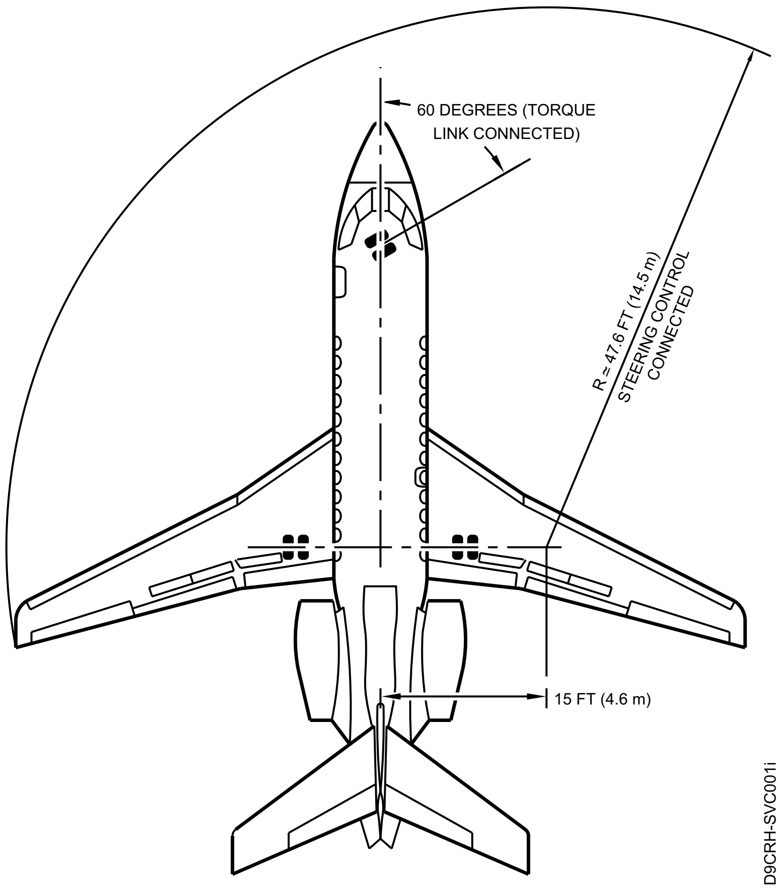
- The parking brake is not on (PARK BRAKE handle fully forward).
- The emergency parking accumulator is sufficiently inflated.

> **NOTE:** The total capacity of the "parking-emergency" accumulator allows approximately five consecutive full applications of the PARK BRAKE handle.

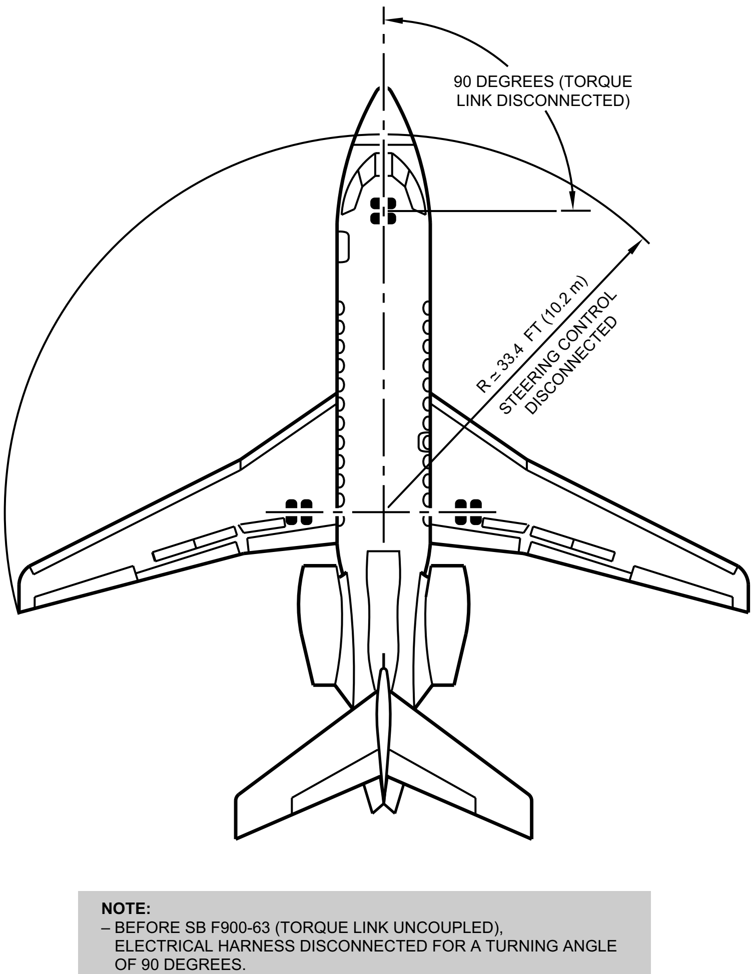
- Tow the airplane slowly, without jolting it.

> **CAUTION:** To maintain the integrity of the auxiliary shield door bracket when reconnecting the torque link, do not align the torque link arms while handling the door.

Taxiing Radius



Towing Radius



NOTE:
- BEFORE SB F900-63 (TORQUE LINK UNCOUPLED), ELECTRICAL HARNESS DISCONNECTED FOR A TURNING ANGLE OF 90 DEGREES.
- AFTER SB F900-63 (TORQUE LINK UNCOUPLED), ELECTRICAL HARNESS DISCONNECTED FOR A TURNING ANGLE > 100 DEGREES

Engine Lubrication

Approved Engine Oils

Use Type II oils:

- AEROSHELL/ROYCO Turbine Oil 500 and 560
- CASTROL 5000
- EXXON/ESSO 2380 Turbo Oil
- MOBIL Jet Oil II, and
- MOBIL 254 in accordance with AlliedSignal engines EMS 53110 type II.

Checking and Replenishing Engine Oil

The procedure for checking and replenishing the oil is the same for all three engines.

CAUTION: Checking and replenishing of engine oil must be performed within one hour of engine shutdown.

To check engine oil levels, proceed as follows:

- Open the rear compartment door.
- Set the oil gauge power switch to ON.
- Check the oil level of each engine on the OIL GAUGE on the maintenance panel in the rear compartment.
- Set the gauge power switch to OFF. Replenish engine oil if necessary.

To replenish engine oil, proceed as follows:

- Open the lower cowling of the side engines and RH cowling of the center engine.
- Check the oil level sight gauge and determine the quantity of oil lacking.

- Unsafety and unlock the oil tank plug as follows: press and rotate 1/4 turn counterclockwise to disengage the locking studs.

> **NOTE:** The left engine oil tank is not easily accessible; therefore, in this case, remove the plug from the end of the oil filling pipe on the LH hand side of the engine.

- Fit the pouring spout onto the oil can and fill to the 1 QT graduation or slightly above.
- Reinstall the oil tank plug and lock it. Ensure that the yellow marks (plug, oil tank) are aligned, then safety.
- Close the lower or RH cowling, depending on the engine in question, taking care to place the props on their stowage supports.
- Check that the indications on the oil level indicator panel in the rear compartment are the same.
- Set the gauge power switch to OFF.

Engine Oil Filter and Fuel Filter Clogging Indicators

Check that the OIL and FUEL clogging indicators on the engine monitoring panel in the rear compartment are white.

> **NOTE:** If either of the clogging indicators has flipped to red, actuate the RESET switch to return it to white, then start the engine in question and watch the indicator to make sure that flipping to red does not result from an electrical failure. If the indicator flips to red again, check or replace the monitored component in accordance with the maintenance manual.

Fuel

Types of Fuel

Fuel used must conform to the following specifications. The following table is representative of the fuel definition on the date: DECEMBER, 1987.

Designation	Specification			Freezing Point (°C)	Additives		NATO Code
	Garrett	Equivalence			Anti-ice	Anti-static	
Kerosene	EMS 53111	ASTM D 1655	JET A	-40	*	*	–
		CAN 2-3.23	JET A		*	Yes	–
	EMS 53112	ASTM D 1655	JET A1	-47	*	*	–
		CAN 2-3.23	JET A1		*	Yes	–
		DERD 2494	AVTUR		No	Yes	F35
		DERD 2453	AVTUR/FSii		Yes	Yes	F34
		MIL-T-83133	JP8	-50	Yes	*	F34
		AIR 3405C	–		No	*	F34
		AIR 3405C	–		Yes	*	F34
Wide Cut Fuel	EMS 53113	ASTM D 1655	JET B	-50	*	*	–
		CAN 2-3.23	JET B		*	Yes	–
		MIL-T-5624	JP4	-58	Yes	Yes	F40
		AIR 3407B	–		Yes	Yes	F40
		DERD 2486	AVTAG		No	No	–
		DERD 2454	AVTAG/FSii		Yes	Yes	F40
		CAN 2-3.23	–		Yes	Yes	F40
High Flash Point Fuel	EMS 53116	AIR 3404C	–	-46	No	*	F43
		AIR 3404C	–		Yes	*	F44
		DERD 2498	AVCAT		No	No	F43
		MIL-T-5624	JP5		Yes	No	F44
		DERD 2452	AVCAT/FSii		Yes	No	F44
		CAN 3GP24	–		No	*	F43
		CAN 3GP24	–		Yes	*	F44
CIS Fuels	GOST 10 227-86	T1	–	-60	–	–	–
		TS1 Regular	–	-60	–	–	–
		TS1 Premium	–	-60	–	–	–
		T2	–	-60	–	–	–
		RT	–	-65	–	–	–

*Information to be checked with the fuel supplier.

Table 6-B; Authorized Fuels

Fuel Additives

The following additives are authorized for use in the fuel:

- Anti-icing additive, conforming to AIR 3652 or MIL-I-27686 D or E specifications (JP4/JP8) or MIL-I-85470 (JP5) or equivalent at a concentration not in excess of 0.15% by volume.
  - I fluid GOST 8313-88
  - I-M fluid TU6-10-1458-79 (I-M fluid is I fluid mixed 1:1 with methanol (GOST 2222-78E).)
  - TGF-M fluid TU6-10-1457-79 (TGF-M fluid is TGF fluid mixed 1:1 with methanol (GOST 2222-78E).)
- SOHIO Biobor JF biocide additive, or equivalent, is approved for use in the fuel at a concentration not to exceed 270 ppm.
- Anti-static additive, provided the quantity added does not exceed:
  - 1 ppm for SHELL ASA3.
  - 3 ppm for STADIS 450.
  - 5 ppm for SIGBOL TU38-101741-78.
- PRIST anti-icing, biocide and fungicide additive is approved for use at a concentration not to exceed 0.15% by volume.

  If available, this additive may be used on a regular basis, as an aid in maintaining fuel system cleanliness.

> **NOTE:** Never pour undiluted additive into an empty fuel tank during gravity refueling.

Fuel Capacity and Weight

The total usable fuel quantity is 2,845 US gal (10,769 liters), that is, 19,065 lb (8,648 kg) at a density of 6.7 pounds per US gal.

The total quantity is distributed as follows:

	liter	kg	US Gal	lb
LH Wing + LH Centerwing Tanks	3422	2748	904	6058
RH Wing + RH Centerwing Tanks	3422	2748	904	6058
Front and Rear Fuselage Tanks	3925	3152	1037	6949
Airplane Total	10,769	8648	2845	19,065

Table 6-C; Fuel Quantity Distribution

Pressure Refueling

The airplane is normally refueled under pressure, but gravity refueling can be used if, for one reason or another, pressure refueling is not possible. The maximum pressure used for pressure refueling is 3.5 bars (50 PSI).

- Take the applicable safety measures. A fire extinguisher must be available near the airplane. When the tanks are to be completely filled, the airplane must be standing on even, horizontal ground, and the fuselage pitch angle must be as shallow as possible.

  The pressure refueling system allows selection of either partial or full refueling by means of the FULL-PARTIAL selector on the refueling panel.

Refueling to Full or “X” Gallons

Each tank is filled independently as determined by the settings of the refueling solenoid valve selectors.

CAUTION: The fuel truck-to-ground, airplane-to-fuel truck and coupling-to-airplane truck electrostatic connections must be made before connecting the coupling to the airplane.

- Open the refueling connector access door.
- Open the refueling control panel.
- Lift the vent valves control lever.
- The red STOP FUELING light is off.
- The green FUELING OK light comes on.
- Connect the fuel truck coupling.
- Check that the FULL-PARTIAL selector is set to FULL.
- Set the LEFT, CENTER and RIGHT switches to ON.
- Maximum fueling pressure is 50 PSI.
- After the start of refueling, press the TEST button on the refueling control panel.

  The three FULL lights should come on and the fuel truck should stop delivering fuel.

  If the test is not satisfactory, stop pressure refueling immediately and isolate the fault.

  NOTE: If the STOP FUELING light comes on during pressure refueling, stop refueling immediately.

- When the fuel truck stops delivering fuel, check that the three FULL lights are on; this indicates that the three tank groups are full.

- Disconnect the coupling.
- Lower the vent valve control lever and check that all the lights on the refueling control panel are out and all switches are off.
- In the cockpit:
  - Switch on the airplane electrical power.
  - Check that the FUELING light on the warning panel is out.

    If this light is on, it indicates that the aircraft is not OK for flight for one of the following reasons:

    - The refueling control panel door is not closed.
    - The refueling connector door is not closed.
    - One of the vent valves is not closed.
    - The GRAVITY FUELING switch on the maintenance panel is not set to OFF.
    - The DEFUELING switch is not set to OFF.

Preset Partial Refueling (Optional)

- Set the FULL-PARTIAL switch to PARTIAL.
- Set the quantity of fuel required on the refueling selector. One-third of the set amount will be the final reading in each tank group.
- Set the three LEFT, CENTER and RIGHT solenoid valve control switches to ON.
- Start delivering fuel from the fuel truck.

Refueling will automatically stop when the selected total quantity is delivered. The fuel quantity system amplifiers and cockpit gauges are powered through the partial position.

CAUTION: Battery drain is relatively high with PARTIAL selected and vent lever lifted.

NOTE: The test and resetting procedure is the same as that used for complete refueling.

Gravity Refueling

CAUTION: The fuel truck-to-airplane, fuel truck-to-ground, and airplane-to-fuel truck electrostatic connections must be made before placing the refueling gun in the refueling port.

Complete Refueling

- Insert the grounding fixture into the receptacle beside the refueling port. (This fixture is stowed on the refueling control panel.)
- Connect the electrical ground power unit or start the APU.

  CAUTION: In order to limit heating of the warning panel during refueling, set the BRIGHT-DIM switch to the DIM position.

- Set the GRAVITY FUELING switch on the maintenance panel behind the RH console in the cockpit to ON.
- Open the refueling panel access door and set the CENTER switch to ON.
  - The green FUELING OK light must be on.

  NOTE: If the FUELING OK light is off, check the residual pressurization on the aft compartment fuel pressure gauge and manually depressurize if necessary.

- Unlock and remove the gravity refueling port plugs.
- Start filling the LH wing tanks; monitor the LO FUEL 1 light on the warning panel.

- When the LO FUEL 1 light goes out, set the booster pump 1 switch to ON and the booster 1-2 rotary switch to the open position.
- Monitor No. 1 and No. 2 tank group fueling on the corresponding fuel quantity indicators.

> **NOTE:** If the LO FUEL 1 light comes on, set the booster 1-2 rotary switch to the closed position in order to avoid dry-running of booster pump 1.

- When front and rear fuselage fuel tanks are full, the group 2 FULL light on the refueling control panel comes on.
- Set the CENTER switch to the OFF position and close the refueling control panel access door.
- In the cockpit, set the No. 1 engine booster pump switch to OFF and the booster 1-2 rotary switch to the closed position.
- Fill the LH wing fuel tanks.
- Install and lock the LH gravity fueling port cap.
- Fill RH wing fuel tanks through the RH gravity fueling port.
- Install and lock the LH gravity fueling port cap when fueling is over.
- In the cockpit, set the GRAVITY FUELING switch to the OFF position and check that the FUELING light goes off on the warning panel.

Drainage of Fuel Pump Sumps (after the airplane has been stationary for at least 6 hours)

Depressurize the fuel tanks before draining the sumps. To do this:

- Open the refueling panel access door.

- Lift the vent valve control lever. (Venting is confirmed by extinction of the STOP FUELING light and illumination of the FUELING OK light.)
- Wait a few seconds, then lower the vent valve control lever.
- Close the refueling panel access door.

Proceed as follows:

- Insert the drain tool into the slot and push up. The tool may need to be turned by a quarter turn to the right or the left to open the sump.
- Let the fuel flow into the adapter for a few seconds.
- To close the sump, lower the adapter assembly and check that there are no leaks.
- Repeat the operation with the other sumps until approximately 1 liter (0.26 US gal) of fuel has been collected.
- Leave to settle for about 10 minutes.
- Check whether there is water in the fuel.

  If the quantity of water per liter of fuel exceeds 10 cm^3 (0.61 cu. in.), redrain the fuel sumps until all water has been removed.

> **NOTE:** If contamination is general, the entire circuit will have to be drained.

Fuel Leaks Check

This operation consists of a visual check for leaks in the areas defined by the structural wing, centerwing and fuselage tanks. If in any doubt, refer to the maintenance manual for a more detailed check.

Fuel Tank Pressurization Check

> **NOTE:** Carry out this check before opening the tank air vents.

Check the pressurization pressure gauge indication.

The indication must be in the green range (2.8 to 3.4 PSI).

Defueling

- Take the appropriate safety measures which are the same as for fueling.
- Connect the Ground Power UNit, or start the APU and energize the electrical system.
- Position the fuel truck and open the fueling connector door and the fueling control panel door.
- Move the vent valve lever and verify vent valve movement with STOP FUELING light out and fueling OK green light on.
- Attach the truck nozzle to the coupling.

Defueling All Tanks

- On the fueling panel, set the DEFUELING switch to ON.
- In the cockpit, set the BOOSTER switches 1 and 3 to ON and BOOSTER 2 to NORM.
- Open X-BP 1-2 or 2-3 rotary switches.

Defueling – Group 1 or Group 3 Only

- On the fueling panel, set the defueling switch to ON.
- In the cockpit, set BOOSTER 1 or 3 switch to ON.
- Set X-BP 1-2 or 2-3 (as appropriate) to OPEN.

Defueling – Group 2 Only

- On fueling control panel, set the DEFUELING switch to ON.
- In the cockpit, turn BOOSTER 2 switch to NORM.

After defueling is complete, turn off all fuel panel and cockpit switches. Disconnect truck nozzle and position the vent valve lever over coupling cover. Close both coupling and control panel access doors. Check that the fueling light on the Master Warning Panel is extinguished. Disconnect ground power

Hydraulic Checks

Check that there is no trace of hydraulic leakage

Leakage is characterized by dripping and may be classified as slight or heavy leakage.

Leakage Criteria on Hydraulic System Components

For components within the system, no external leakage is allowable.

If in doubt, proceed as follows:

Pressurize the system for a 5-minute period and look for the leak. When the leak has been traced, drop the pressure and, without wiping the area of the leak, observe the item of equipment for 15 minutes. No more than two drops of fluid should escape during that time.

> **NOTE:** Provided that this tolerance is not exceeded, the aircraft may be returned to its base for replacement of the item of equipment concerned. More extensive leakage will require replacement on the spot of the item concerned. The item installed to replace the defective item of equipment must show no signs of leakage.

Leakage Criteria on Landing Gear Hydraulic Components

- Shock absorbers
  - Charging valve

    No gas or fluid leakage is tolerated.
  - Sliding rod

    The shock absorber is considered satisfactory if leakage, over a width not exceeding 1/4 of the rod circumference, does not exceed 25 mm (1 in.) per minute at any point. The shock absorber must be replaced if this leakage rate is exceeded.
  - Actuating cylinder and telescopic tubes

    A band of fluid 2 to 3 mm wide (0.078 to 0.118 in.) is tolerated around the end of the sliding rod.

    A leak of one drop every two minutes onto the cylinder on the rod side is tolerated.
  - Uplock boxes, swivel couplings

    Permitted leakage: see hydraulic system leakage criteria.
  - Brake unit piston

    No leakage is acceptable.

Leakage Criteria on Flight Control Hydraulic Components

- Seepage from a sliding rod

  No more than one drop of fluid in 15 minutes.
- Other seepage

  No more than one drop of fluid in 30 minutes.

Leakage Criteria on Hydraulic Equipment Installed on Accessory Gearbox

- Max flow at pump drains

  Shutdown: 1 drop every 30 minutes.

  Running: 1 drop every minute.

- Max flow at engine drain

  Shutdown: 1 drop in 15 seconds.

  Running: 2 drops every minute.

Check of Hydraulic Filter Clogging Indicators

Check clogging indicators of the five system 1 filters (rack, LH side) and the four system 2 filters (rack, RH side).

Replace filtering elements of all filters found clogged (refer to procedure 29-010 of the Maintenance Manual).

Check for Air Bubbles in De-aerator of Hydraulic Reservoirs Systems 1 And 2

Check for air bubbles in hydraulic reservoir de-aerators of systems 1 and 2.

Tire Servicing

Check condition of tires for cuts, tearing, and cracks.

Check wear of tread. If the depth of the tread grooves is less than 0.5 mm (0.02 in.), remove the wheel for tire change.

Tire Pressure Adjustment Criteria

Check tire inflation pressure for main wheels and nose wheels in accordance with the following tables.

	Airplane on Jacks	Airplane on Wheels
Nose Gear	9.8 bars (142 PSI)	10.2 bars (148 PSI
Main Gear - MTOW 20,369 kg (45,500 lb)	12.8 bars (185 PSI)	13.3 bars (193 PSI)
Main Gear - MTOW 21,092 kg (46,500 lb) SB F900-139	13.1 bars (190 PSI)	13.6 bars (197 PSI)

Table 6-D; Tire Inflation Pressure – Paved Runway

> **CAUTION:** Taxiing and/or takeoff with a burst or deflated tire on the main or nose wheel is prohibited.

Water Replenishment

Replenishing the Water Tank

Inside the passenger cabin, ensure that:

MASTER Galley C/B (Circuit Breaker Panel) . . . . PUSHED IN

WATER PUMP C/B (Galley) . . . . PUSHED IN

The pump should not start (downstream pressure is too low, which makes the pump's internal safety device function).

The gauge should indicate EMPTY.

Drain Valve (Under Vanity Bowl) . . . . CLOSED (ON “C”)

At the exterior (WATER filling panel):

- Connect the filling connector to the mains water supply.
- Open the dual filling valve (handle pulled).
- Slowly open the mains cock.
- When the end-of-filling light comes on, or water flows out of the overflow, immediately close the dual filling valve (handle pushed in).
- Close the mains cock and disconnect the line.
- Drop pressure and drain the filling lines by opening, then closing, the dual filling valve (handle pulled and pushed in).

Pump Priming – Operation

Proceed as follows:

- Go to the rear of the passenger cabin.
- Check that the gauge reads FULL.

- Switch on the pump.
  - Open the drain valve (under vanity bowl), position 0.
  - The pump should not start (pump safety device operating).
- Press the priming pushbutton in the galley (ON position).
- Check that the pump starts and water flows at the rear drain mast.
- Close the drain valve (under vanity bowl), position C.
- Keep the pushbutton depressed.
- Monitor the rise in pressure on the galley pressure gauge.
- When the needle indicates 0.6 bar, release the pushbutton (AUTO position).
- The pump should carry on operating and pressure in the circuit should continue rising to approximately 1.4 bars.
- Prime the valves.
- Open the hot and cold water taps of the:
  - Rear vanity bowl
  - Galley
- Let air escape until water starts flowing.

Drainage

Proceed as follows:

- Open the dual filling valve (handle pulled).
- Switch on the pump (AUTO).
- Open the drain valve (under toilet cabinet), position 0.
- Check that the pump starts and the tank drains at the rear drain mast (automatic stoppage of pump when drainage is complete).

- Open the “hot” and “cold” taps of the toilet vanity bowl and galley sink to complete drainage.
- To complete drainage of the tank, switch on the pump by means of the pushbutton on the WATER filling panel.
- Close the dual filling valve (handle pressed in).
- Close the drain valve (under the vanity bowl), position C.

Fire Extinguisher Check

Ensure that the pressure in the rear compartment fire extinguishers is normal for the ambient temperature conditions.

See plate on extinguisher support.

°F	-40	-22	-4	14	32	50	68	86	104	122
°C	-40	-30	-20	-10	0	10	20	30	40	50
Min.	432	459	500	545	599	653	716	783	851	945
PSIG										
Max.	528	561	610	665	731	797	874	957	1039	1155

Table 6-E; Fire Extinguisher Pressure in Ambient Temperature

Extinguishers with pressures not within specified values are to be replaced.

Procedure for Flight With Thrust Reverser Immobilized

NOTE: The thrust reverser may be immobilized on the following conditions:

- That it is not damaged.
- That the safety pins are installed, the reverser is in the stowed position and it is de-energized (REVERSER CONTROL circuit breaker pulled).

Preliminary Steps

Proceed as follows:

- Stow the thrust reverser.
- Pull the REVERSE CONTROL circuit breaker on the ENGINES part of the center circuit breaker panel.
- Remove the upper and lower access doors (454CT) and (454EB) respectively.

Locking of Thrust Reverser

- Check that the upper and lower S-shaped claws are correctly positioned against the latches.
- Take the two thrust reverser safety pins from the flyaway kit.
- Pin the upper and lower latches to their respective supports.
- Check that the pins are correctly installed by pulling on the pin rings.
- Install the upper and lower access doors.
- Make a placard to indicate to the crew that the thrust reverser is inoperative and attach it to the "THRUST REVERSER" switch guard.

CAUTION: After repair, do not forget to put the safety pins back in the flyaway kit bag.

Emergency Information

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Credits: *The content of this section is reprinted from the Aeronautical Information Manual, Change 2, Effective: January 25, 2001 (www.faa.gov/ATpubs/AIM/index.htm).*

Emergency Information

Pilot Responsibility and Authority

The pilot in command of an aircraft is directly responsible for and is the final authority as to the operation of that aircraft. In an emergency requiring immediate action, the pilot in command may deviate from any rule in 14 CFR Part 91.

If the emergency authority of 14 CFR Section 91.3(b) is used to deviate from the provisions of an ATC clearance, the pilot in command must notify ATC as soon as possible and obtain an amended clearance.

Emergency Conditions

An emergency can be either a distress or urgency condition as defined in the Pilot/Controller Glossary. Pilots do not hesitate to declare an emergency when they are faced with distress conditions such as fire, mechanical failure, or structural damage. However, some are reluctant to report an urgency condition when they encounter situations which may not be immediately perilous, but are potentially catastrophic.

Pilots who become apprehensive for their safety for any reason should request assistance immediately. Safety is not a luxury! Take action!

Transponder Emergency Operation

When a distress or urgency condition is encountered, the pilot of an aircraft with a coded radar beacon transponder who desires to alert a ground radar facility should squawk MODE 3/ A, Code7700/Emergency.

Intercept and Escort Procedures

The concept of airborne intercept and escort is based on the Search and Rescue (SAR) aircraft establishing visual and/or electronic contact with an aircraft in difficulty, providing in-flight assistance, and escorting it to a safe landing. If bailout, crash landing or ditching becomes necessary, SAR operations can be conducted without delay. For most incidents, particularly those occurring at night and/or during instrument flight conditions, the availability of intercept and escort services will depend on the proximity of SAR units to suitable aircraft that are on alert for immediate dispatch. In limited circumstances, other aircraft flying in the vicinity of an aircraft in difficulty can provide these services.

If specifically requested by a pilot in difficulty or if a distress condition is declared, SAR coordinators will take steps to intercept and escort an aircraft. Steps may be initiated for intercept and escort if an urgency condition is declared and unusual circumstances make such action advisable.

Communication interface between interceptor aircrews and the ground controlling agency is essential to ensure successful intercept completion. Flight safety is paramount. An aircraft which is intercepted by another aircraft shall immediately:

- Follow the instructions given by the intercepting aircraft, interpreting and responding to the visual signals.
- Notify, if possible, the appropriate air traffic services unit.
- Attempt to establish radio communication with the intercepting aircraft or with the appropriate intercept control unit by making a general call on the emergency frequency 243.0 MHz and repeating this call on the emergency frequency 121.5 MHz, if practicable, giving the identity and position of the aircraft and the nature of the flight.

- If equipped with SSR transponder, select Mode 3/A Code 7700, unless otherwise instructed by the appropriate air traffic services unit. If any instructions received by radio from any sources conflict with those given by the intercepting aircraft by visual or radio signals, the intercepted aircraft shall request immediate clarification while continuing to comply with the instructions given by the intercepting aircraft.

Search and Rescue

Observance of Downed Aircraft

Determine if the crash is marked with a yellow cross; if so, the crash has already been reported and identified.

If possible, determine the type and number of the aircraft and whether there is evidence of survivors.

Fix the position of the crash as accurately as possible with reference to a navigational aid. If possible, provide a geographic or physical description of the area to aid ground search parties.

Transmit the information to the nearest FAA or other appropriate radio facility.

If circumstances permit, orbit the scene to guide in other assisting units until their arrival or until you are relieved by another aircraft.

Immediately after landing, make a complete report to the nearest FAA facility, or Air Force or Coast Guard Rescue Coordination Center. The report can be made by a long distance collect telephone call.

Two-way Radio Communications Failure

It is virtually impossible to provide regulations and procedures applicable to all possible situations associated with two-way radio communications failure. During two-way radio communications failure, when confronted by a situation not covered in the regulation, pilots are expected to exercise good judgment in whatever action they elect to take.

General. Unless otherwise authorized by ATC, each pilot who has two-way radio communications failure when operating under IFR shall comply with the following rules of 14CFR91.185.

VFR Conditions. If the failure occurs in VFR conditions, or if VFR conditions are encountered after the failure, each pilot shall continue the flight under VFR and land as soon as practicable.

> **NOTE:** This procedure also applies when two-way radio failure occurs while operating in Class A airspace. The primary objective of this provision in 14 CFR Section 91.185 is to preclude extended IFR operation by these aircraft within the ATC system. Pilots should recognize that operation under these conditions may unnecessarily as well as adversely affect other users of the airspace, since ATC may be required to reroute or delay other users in order to protect the failure aircraft. However, it is not intended that the requirement to "land as soon as practicable" be construed to mean "as soon as possible." Pilots retain the prerogative of exercising their best judgment and are not required to land at an unauthorized airport, at an airport unsuitable for the type of aircraft flown, or to land only minutes short of their intended destination.

IFR Conditions. If the failure occurs in IFR conditions, or if "VFR conditions" above cannot be complied with, each pilot shall continue the flight according to the following:

Route.

By the route assigned in the last ATC clearance received.

If being radar vectored, by the direct route from the point of radio failure to the fix, route, or airway specified in the vector clearance.

In the absence of an assigned route, by the route that ATC has advised may be expected in a further clearance.

or

In the absence of an assigned route or a route that ATC has advised may be expected in a further clearance, by the route filed in the flight plan.

Altitude. At the HIGHEST of the following altitudes or flight levels FOR THE ROUTE SEGMENT BEING FLOWN:

The altitude or flight level assigned in the last ATC clearance received.

The minimum altitude,

or

The altitude or flight level that ATC has advised may be expected in a further clearance.

NOTE: The intent of the rule is that a pilot who has experienced two-way radio failure should select the appropriate altitude for the particular route segment being flown and make the necessary altitude adjustments for subsequent route segments. If the pilot received an “expect further clearance" containing a higher altitude to expect at a specified time or fix, maintain the higher of the following altitudes until that time/fix:

- The last assigned altitude.

  or

- The minimum altitude/flight level for IFR operations.

Upon reaching the time/fix specified, the pilot should commence climbing to the altitude that the clearance advised should be expected. If the radio failure occurs after the time/fix specified, the altitude to be expected is not applicable and the pilot should maintain an altitude consistent with I or 2 above. If the pilot receives an "expect further clearance" containing a lower altitude, the pilot should maintain the highest of I or 2 above until that time/fix specified in subparagraph “Leave clearance limit,” below.

Leave Clearance Limit.

When the clearance limit is a fix from which an approach begins, commence descent or descent and approach as close as possible to the expect further clearance time if one has been received, or, if one has not been received, as close as possible to the Estimated Time of Arrival (ETA) as calculated from the filed or amended (with ATC) Estimated Time en Route (ETE).

If the clearance limit is not a fix from which an approach begins, leave the clearance limit at the expect further clearance time if one has been received, or upon arrival over the clearance limit if none has been received. Proceed to a fix from which an approach begins and commence descent or descent and approach as close as possible to the Estimated Time of Arrival, as calculated from the filed or amended (with ATC) Estimated Time en Route.

Transponder Operation During Two-way Communications Failure.

If an aircraft with a coded radar beacon transponder experiences a loss of two-way radio capability, the pilot should adjust the transponder to reply on MODE A/3, Code 7600.

Aircraft Rescue and Fire Fighting Communications

ARFF Emergency Hand Signals

RECOMMEND EVACUATION - Evacuation recommended based on ARFF IC's assessment of external situation.

Arm extended from body, and held horizontal with hand upraised at eve level. Execute beckoning arm motion angled backward. Nonbeckoning arm held against body.

NIGHT - same with wands.

RECOMMEND STOP - Recommend evacuation in progress be halted. Stop aircraft movement or other activity in progress.

Arms in front of head - Crossed at wrists.

NIGHT - same with wands.

EMERGENCY CONTAINED - No outside evidence of dangerous condition or "all-clear."

Arms extended outward and down at a 45 degree angle. Arms moved inward below waistline simultaneously until wrists crossed, then extended outward to starting position (umpire's "safe" signal).

NIGHT - same with wands.

Air Traffic Control Tower Light Gun Signals

Color and Type of Signal	Movement of Vehicles, Equipment and Personnel	Aircraft on the Ground	Aircraft in Flight
Steady green	Cleared to cross, proceed or go	Cleared for takeoff	Cleared to land
Flashing green	Not applicable	Cleared for taxi	Return for landing (to be followed by steady green at the proper time)
Steady red	STOP	STOP	Give way to other aircraft and continue circling
Flashing red	Clear the taxiway/runway	Taxi clear of the runway in use	Airport unsafe, do not land
Flashing white	Return to starting point on airport	Return to starting point on airport	Not applicable
Alternating red and green	Exercise extreme caution	Exercise extreme caution	Exercise extreme caution

Emergency First Aid

The ABCs of Emergency CPR

Establish victim's unresponsiveness.

Gently shake victim and shout, "Are you all right?"

Airway

- Open airway: lift chin, tilt head. (*With neck injury, lift chin but do not tilt head.*)
- Look for chest movement.
- Listen for sound of breathing.
- Feel for breath on your cheek.

Breathing

- Head tilt position – pinch victim's nose shut while lifting chin with your other hand.
- Give two full breaths while maintaining airtight seal with your mouth over the victim's mouth.

> **NOTE:** A pocket mask can be used instead, but proper head position and an airtight seal must be maintained.

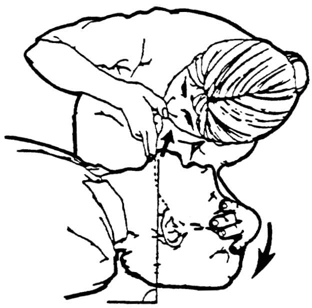
Circulation

Locate carotid artery pulse; hold 10 seconds. If no pulse:

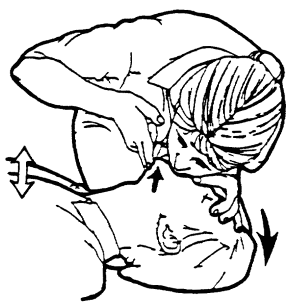
- Begin external chest compressions by locating hand position two fingers above notch and placing heel of hand on breastbone.
- Perform 15 compressions of 1½ to 2 inches at a rate of 80 to 100 compressions per minute. (Count, "One *and* two *and* three *and* . . . ," etc.) Come up smoothly, keeping hand contact with victim's chest at all times.
- Repeat the cycle of two breaths, 15 compressions, until victim's pulse and breathing return. If only the pulse is present, continue rescue breathing until medical assistance is available.

MedAire,™ Inc.
Inflight Medical Support

Airway



Breathing



Circulation

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Heart Attack

Signals

- Pressure, squeezing, fullness, or pain in center of chest behind breastbone.
- Sweating.
- Nausea.
- Shortness of breath.
- Feeling of weakness.

Actions for Survival

- Recognize signals.
- Stop activity and lie or sit down.
- Provide oxygen if available.
- If signals persist for longer than two minutes, get victim to medical assistance.

Choking

If victim can cough or speak:

- Encourage continued coughing.
- Provide oxygen if available.

If victim cannot cough or speak:

- Perform the Heimlich maneuver (abdominal thrusts):
    a. Stand behind the victim; wrap arms around victim's waist.
    b. Place fist of one hand (knuckles up) in upper abdomen*.
    c. Grasp fist with opposite hand.
    d. Press fist into upper abdomen* with quick, inward and upward thrusts.
    e. Perform maneuver until foreign body is expelled.
- Provide supplemental oxygen if available.

** If victim is pregnant or obese, perform chest thrusts instead of abdominal thrusts.*

D9CRH-EM002i

Emergency Equipment Record

Emergency Equipment	Location	Date Last Serviced
First Aid Kit	______	______
Fire Extinguisher(s)	______	______
	______	______
	______	______
Fire Axe	______	______
Life Raft	______	______
Life Vests	______	______
Therapeutic Oxygen	______	______
Overwater Survival Kit	______	______
Other	______	______
	______	______
	______	______

Conversion Tables

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Distance Conversion

Meters/Feet

<table>
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<tr><td>0.3048</td><td colspan="2">1</td><td>3.2908</td></tr>
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<tr><td>305</td><td colspan="2">1000</td><td>3291</td></tr>
</table>

Statute Miles/Kilometers/Nautical Miles

Statute Miles	Kilometers	Nautical Miles
0.62137	1	0.53996
1.24	2	1.08
1.86	3	1.62
2.49	4	2.16
3.11	5	2.70
3.73	6	3.24
4.35	7	3.78
4.97	8	4.32
5.59	9	4.86
6.21	10	5.40
12.43	20	10.80
18.64	30	16.20
24.85	40	21.60
31.07	50	27.00
37.28	60	32.40
43.50	70	37.80
49.71	80	43.20
55.92	90	48.60
62.14	100	54.00
124.27	200	107.99
186.41	300	161.99
248.55	400	215.98
310.69	500	269.98
372.82	600	323.98
434.96	700	377.97
497.10	800	431.97
559.23	900	485.96
621.37	1000	539.96

Kilometers/Nautical Miles/Statute Miles

Kilometers	Nautical Miles	Statute Miles
1.8520	1	1.1508
3.70	2	2.30
5.56	3	3.45
7.41	4	4.60
9.26	5	5.75
11.11	6	6.90
12.96	7	8.06
14.82	8	9.21
16.67	9	10.36
18.52	10	11.51
37.04	20	23.02
55.56	30	34.52
74.08	40	46.03
92.60	50	57.54
111.12	60	69.05
129.64	70	80.56
148.16	80	92.06
166.68	90	103.57
185.20	100	115.08
370.40	200	230.16
555.60	300	345.24
740.80	400	460.32
926.00	500	575.40
1111.20	600	690.48
1296.40	700	805.56
1481.60	800	920.64
1666.80	900	1035.72
1852.00	1000	1150.80

Weight Conversion

lb/kg

lb	kg lb	kg
2.2046	1	0.4536
4.40	2	0.91
6.61	3	1.36
8.82	4	1.81
11.02	5	2.27
13.23	6	2.72
15.43	7	3.18
17.64	8	3.63
19.84	9	4.08
22.0	10	4.5
44.1	20	9.1
66.1	30	13.6
88.2	40	18.1
110.2	50	22.7
132.3	60	27.2
154.3	70	31.8
176.4	80	36.3
198.4	90	40.8
220	100	45
441	200	91
661	300	136
882	400	181
1102	500	227
1323	600	272
1543	700	318
1764	800	363
1984	900	408
2205	1000	454

Fuel Weight to Volume Conversion

TURBINE FUEL Volume/Weight (up to 5 lb variation per 100 gallons due to fuel grade and temperature)								
US Gal	lb / US Gal	lb	Ltr	lb / Ltr	lb	Ltr	kg / Ltr	kg
0.15	1	6.7	0.57	1	1.8	1.25	1	0.8
0.30	2	13.4	1.14	2	3.6	2.50	2	1.6
0.45	3	20.1	1.71	3	5.4	3.75	3	2.4
0.60	4	26.8	2.28	4	7.2	5.00	4	3.2
0.75	5	33.5	2.85	5	9.0	6.25	5	4.0
0.90	6	40.2	3.42	6	10.8	7.50	6	4.8
1.05	7	46.9	3.99	7	12.6	8.75	7	5.6
1.20	8	53.6	4.56	8	14.4	10.00	8	6.4
1.35	9	60.3	5.13	9	16.2	11.25	9	7.2
1.5	10	67	5.7	10	18	12.5	10	8
3.0	20	134	11.4	20	36	25.0	20	16
4.5	30	201	17.1	30	54	37.5	30	24
6.0	40	268	22.8	40	72	50.0	40	32
7.5	50	335	28.5	50	90	62.5	50	40
9.0	60	402	34.2	60	108	75.0	60	48
10.5	70	469	39.9	70	126	87.5	70	56
12.0	80	536	45.6	80	144	100.0	80	64
13.5	90	603	51.3	90	162	113.5	90	72
15	100	670	57	100	180	125	100	80
30	200	1340	114	200	360	250	200	160
45	300	2010	171	300	540	375	300	240
60	400	2680	228	400	720	500	400	320
75	500	3350	285	500	900	625	500	400
90	600	4020	342	600	1080	750	600	480
105	700	4690	399	700	1260	875	700	560
120	800	5360	456	800	1440	1000	800	640
135	900	6030	513	900	1620	1125	900	720
150	1000	6700	570	1000	1800	1250	1000	800

Volume Conversion

Imp Gal/US Gal; US Gal/Liter; Imp Gal/Liter

Imp Gal	US Gal	Imp Gal	US Gal	US Gal	Ltr	US Gal	Ltr	Imp Gal	Ltr	Imp Gal	Ltr
0.83267	1	1.2010	0.26418	1	3.7853	0.21997	1	4.5460
1.67	2	2.40	0.52	2	7.57	0.44	2	9.09
2.49	3	3.60	0.79	3	11.35	0.66	3	13.64
3.33	4	4.80	1.06	4	15.14	0.88	4	18.18
4.16	5	6.01	1.32	5	18.92	1.10	5	23.73
5.00	6	7.21	1.59	6	22.71	1.32	6	27.28
5.83	7	8.41	1.85	7	26.50	1.54	7	31.82
6.66	8	9.61	2.11	8	30.28	1.76	8	36.37
7.49	9	10.81	2.38	9	34.07	1.98	9	40.91
8.3	10	12.0	2.6	10	37.9	2.2	10	45.6
16.7	20	24.0	5.3	20	75.7	4.4	20	91.0
24.9	30	36.0	7.9	30	113.5	6.6	30	136.4
33.3	40	48.0	10.6	40	151.4	8.8	40	181.8
41.6	50	60.1	13.2	50	189.2	11.0	50	227.3
50.0	60	72.1	15.9	60	227.1	13.2	60	272.8
58.3	70	84.1	18.5	70	265.0	15.4	70	318.2
66.6	80	96.1	21.1	80	302.8	17.6	80	363.7
74.9	90	108.1	23.8	90	340.7	19.8	90	409.1
83	100	120	26.4	100	379	22	100	455
167	200	240	53	200	757	44	200	909
249	300	360	79	300	1136	66	300	1364
333	400	480	106	400	1514	88	400	1818
416	500	601	132	500	1893	110	500	2273
500	600	721	159	600	2271	132	600	2728
583	700	841	185	700	2650	154	700	3182
666	800	961	211	800	3028	176	800	3637
749	900	1081	238	900	3407	198	900	4091
833	1000	1201	264	1000	3785	220	1000	4546

Temperature Conversion

°C	°F	°C	°F	°C	°F	°C	°F	°C	°F
-54	-65	-32	-26	-10	14	12	54	34	93
-53	-63	-31	-24	-9	16	13	55	35	95
-52	-62	-30	-22	-8	18	14	57	36	97
-51	-60	-29	-20	-7	19	15	59	37	99
-50	-58	-28	-18	-6	21	16	61	38	100
-49	-56	-27	-17	-5	23	17	63	39	102
-48	-54	-26	-15	-4	25	18	64	40	104
-47	-53	-25	-13	-3	27	19	66	41	106
-46	-51	-24	-11	-2	28	20	68	42	108
-45	-49	-23	-9	-1	30	21	70	43	109
-44	-47	-22	-8	0	32	22	72	44	111
-43	-45	-21	-6	1	34	23	73	45	113
-42	-44	-20	-4	2	36	24	75	46	115
-41	-42	-19	-2	3	37	25	77	47	117
-40	-40	-18	0	4	39	26	79	48	118
-39	-38	-17	1	5	41	27	81	49	120
-38	-36	-16	3	6	43	28	82	50	122
-37	-35	-15	5	7	45	29	84	51	124
-36	-33	-14	7	8	46	30	86	52	126
-35	-31	-13	9	9	48	31	88	53	127
-34	-29	-12	10	10	50	32	90	54	129
-33	-27	-11	12	11	52	33	91	55	131

International Standard Atmosphere (ISA)

Altitude/Temperature

Altitude (ft)	ISA (°C)	Altitude (ft)	ISA (°C)	Altitude (ft)	ISA (°C)	Altitude (ft)	ISA (°C)
S.L.	15.0	11,000	-6.8	22,000	-28.5	33,000	-50.3
1,000	13.0	12,000	-8.8	23,000	-30.5	34,000	-52.3
2,000	11.0	13,000	-10.7	24,000	-32.5	35,000	-54.2
3,000	9.1	14,000	-12.7	25,000	-34.5	36,000	-56.2
4,000	7.1	15,000	-14.7	26,000	-36.5	37,000	-56.5
5,000	5.1	16,000	-16.7	27,000	-38.4	38,000	-56.5
6,000	3.1	17,000	-18.7	28,000	-40.4	39,000	-56.5
7,000	1.1	18,000	-20.6	29,000	-42.4	40,000	-56.5
8,000	-0.8	19,000	-22.6	30,000	-44.4	41,000	-56.5
9,000	-2.8	20,000	-24.6	31,000	-46.3	42,000	-56.5
10,000	-4.8	21,000	-26.6	32,000	-48.3	43,000	-56.5

Altimeter Setting Conversion

Hectopascals or Millibars/Inches of Mercury

1 hectopascal = 1 millibar = 0.02953 inches of mercury

Hectopascals or Millibars	0	1	2	3	4	5	6	7	8	9
	Inches of Mercury									
880	25.99	26.02	26.05	26.07	26.10	26.13	26.16	26.19	26.22	26.25
890	26.28	26.31	26.34	26.37	26.40	26.43	26.46	26.49	26.52	26.55
900	26.58	26.61	26.64	26.67	26.70	26.72	26.75	26.78	26.81	26.84
910	26.87	26.90	26.93	26.96	26.99	27.02	27.05	27.08	27.11	27.14
920	27.17	27.20	27.23	27.26	27.29	27.32	27.34	27.37	27.40	27.43
930	27.46	27.49	27.52	27.55	27.58	27.61	27.64	27.67	27.70	27.73
940	27.76	27.79	27.82	27.85	27.88	27.91	27.94	27.96	27.99	28.02
950	28.05	28.08	28.11	28.14	28.17	28.20	28.23	28.26	28.29	28.32
960	28.35	28.38	28.41	28.44	28.47	28.50	28.53	28.56	28.58	28.61
970	28.64	28.67	28.70	28.73	28.76	28.79	28.82	28.85	28.88	28.91
980	28.94	28.97	29.00	29.03	29.06	29.09	29.12	29.15	29.18	29.21
990	29.23	29.26	29.29	29.32	29.35	29.38	29.14	29.44	29.47	29.50
1000	29.53	29.56	29.59	29.62	29.65	29.68	29.71	29.74	29.77	29.80
1010	29.83	29.85	29.88	29.91	29.94	29.97	30.00	30.03	30.06	30.09
1020	30.12	30.15	30.18	30.21	30.24	30.27	30.30	30.33	30.36	30.39
1030	30.42	30.45	30.47	30.50	30.53	30.56	30.59	30.62	30.65	30.68
1040	30.71	30.74	30.77	30.80	30.83	30.86	30.89	30.92	30.95	30.98
1050	31.01	31.04	31.07	31.10	31.12	31.15	31.18	31.21	31.24	31.27

Cabin Altitude