Expanded Normal Procedures

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Normal Procedures

Before Starting Engines

Power Off

Cabin Door . . . . . CLOSED/KEYS

Check green indicators for proper door pin position. Ensure handle is vertical and in the detent position. Ensure aircraft keys are accounted for.

Passenger Briefing . . . . . COMPLETE

FAR 91.519 requires that the pilot-in-command or a crewmember brief the passengers on relevant safety items (e.g., seat belts, door operation, emergency exits, etc.).

An exception to the oral briefing rule is if the pilot-in-command determines passengers are familiar with the briefing content. A printed card with the FAR 91.519 required information should be available to each passenger to supplement the oral briefing.

Seats/Seat Belts/Pedals . . . . . SECURE/ADJUSTED

Seats:

- Adjust seat to align white ball in the center of the orange ball on the seat adjustment indicator.
- Adjust seat fore and aft; the handle is below the forward center of the seat.
- Adjust seat vertically; the handle is on the aisle side forward corner.

Seat Belts:

- Ensure seat belt and shoulder harness are secure and snug.

Rudder Pedals . . . . . ADJUSTED

Adjust rudder pedals. Depress the tab on the inboard side of the pedal, move the pedal forward or aft into one of the three positions, and then release the tab.

Oxygen Masks/Systems . . . . . CHECKED NORMAL/ LEFT/RIGHT

Oxygen Pressure Gage . . . . . 1600 TO 1800 PSI

Oxygen Mask Controller . . . . . SECURE

Oxygen Control Valve . . . . . NORMAL

Regulator 100%

Ensure flow by donning the mask, adjusting the fit, and breathing several times. Stow crew masks in the quick hooks (or mask holder for EROS mask).

CBs and Switches . . . . . CHECKED LEFT/RIGHT

Visually ensure all circuit breakers are in and check all switches are in OFF or NORM position in preparation for the engine start.

Generator Switches . . . . GEN (OFF FOR EPU START)

Fuel Boost Pump . . . . . NORM

Crossfeed . . . . . OFF

Gyro Slave Switches LH & RH . . . . . AUTO

Anti-Skid . . . . . ON

Ground Idle Switch . . . . . NORM

Control Lock . . . . . UNLOCK

Rotate the handle clockwise 45° from horizontal and push in to release. Check that the controls and throttles are free. Damage to the throttle may occur if the throttles are forced past the lock position and the control lock is engaged.

Landing Gear Handle . . . . . DOWN

Throttles/Engine Sync . . . . . CUTOFF/OFF

Flap Selector/Indicator . . . . . CHECKED/MATCH

Ensure flap handle and flap position indicator are aligned.

Windshield Bleed Air Manual Valves . . . . . OFF

Power On

Standby Gyro . . . . . TEST/ON/UNCAGED

Accomplish the standby gyro check with the battery switch OFF to ensure the gyro receives emergency power.

Standby Gyro Switch . . . . . TEST

Momentarily place switch in the TEST position. Verify the green light illuminates.

Standby Gyro Caging Knob . . . . . UNCAGED

Gyro Horizon . . . . . NO FLAG

Battery Switch – EMER . . . . . EMERGENCY BUS ITEMS CHECKED

Ensure power to Emergency bus items:

- cockpit flood lights
- COMM 1
- LH & RH fan speed indicator
- NAV 2
- copilot's HSI (**single EFIS**)
- copilot's attitude indicator (**single EFIS**)
- directional gyro 2 (**single EFIS**)
- copilot's RMI (**dual EFIS**)
- NAV 2 repeater (**dual EFIS**)
- directional gyro 1 (**dual EFIS**)
- audio panel (**unit 0032 and subsequent**).

Battery Switch – BATT . . . . . 24V MIN (28V EPU)

Minimum battery voltage for start is 24V DC.

Landing Gear Lights . . . . . THREE GREEN/NO RED

Verify three green lights illuminated and red unlocked light extinguished.

Parking Brake/Chocks . . . . . SET/REMOVED

Power brakes must be operational in order to set parking brake. Depress the brake pedals and pull the parking brake handle to trap pressure.

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

Depress TEST button until green light illuminates.

Rotary Test Switch . . . . . CHECKED

Rotate the TEST switch to each of the following positions and verify the proper response:

- OFF – red light above rotary test switch extinguishes and test system is inoperative.
- FIRE WARN – both ENGINE FIRE PUSH annunciators illuminate.
- LDG GEAR – three green safe and red GEAR UNLOCKED annunciators illuminate; the gear horn sounds. Check that the horn silences by pressing the horn silence button on the landing gear panel. The horn can be silenced only if the flap position is 15° or less.
- BATT TEMP – BATT O'TEMP annunciator flashes and battery temperature gage shows 160° to demonstrate circuit integrity. MASTER WARNING annunciator also illuminates. Cancel MASTER WARNING by pressing annunciator.
- STICK SHAKER (cone type AOA sensor) – the angle of attack indicator drives to zero and the flag appears. The flag disappears and the indicator moves to 1.0. As the indicator moves, the EADI fast/slow indicator and the AOA indexer (**if installed**) should correspond to indicator position. At approximately 0.82 the stick shaker activates for a few seconds. This cycle repeats as long as the rotary test switch remains in this position.
- STICK SHAKER (vane type AOA sensor) – the stick shaker operates. The AOA indicator goes past the red area and the EADI fast/slow indicator moves past slow. The AOA indexer (**if installed**) flashes.

- T/REV – the left and right ARM, LOCK, and DEPLOY annunciators illuminate and the MASTER WARNING annunciator illuminates. Cancel MASTER WARNING by pressing annunciator.
- W/S TEMP – the W/S AIR O'HEAT annunciator illuminates when the windshield bleed air switch is selected to HIGH or LOW
- OVER-SPEED – the audible overspeed warning sounds
- ANTI-SKID – the anti-skid system initiates a self-test. ANTI-SKID INOP annunciator illuminates and remains illuminated for three or four seconds after the test switch is placed in OFF. The annunciator extinguishes if the system checks operational. If the system fails the check, the annunciator remains illuminated.
- ANNU – all annunciators and the MASTER WARNING annunciators illuminate. The turbine speed indicator self tests with its red lights illuminating and the displays flashing all eights (888). When the avionics power switches are on, the altitude alert and autopilot/flight director mode selector panel lights illuminate. EFIS and FMS lights also illuminate. The MASTER WARNING annunciators cannot be reset while the rotary selector switch is in this position.

DOOR WARNING LIGHT . . . . . OUT

ENGINE INSTRUMENTS . . . . . NO FLAGS

FUEL QUANTITY . . . . . CHECKED

Check that proper fuel quantity is indicated on the fuel gages and tanks are balanced. Maximum imbalance is 200 lbs.

Starting Engines

Rotating Beacon . . . . . BEACON

Flood/Center Panel Lights . . . . . FULL BRIGHT

Freon Air/Avionics Power Switches . . . OFF/BOTH OFF

First Engine . . . . . START

START Button . . . . . PRESS

Momentarily pressing the START button begins engine rotation by closing the start relay. When the relay closes, the START button illuminates white and the ignition system then arms for actuation. The engine instrument floodlight and the associated FUEL BOOST ON annunciator illuminate. The FUEL LOW PRESS annunciator extinguishes as boost pump pressure increases.

Throttle . . . . . IDLE AT 8 TO 10% N_2

Lift the cutoff latch and advance the throttle to IDLE. Fuel flow initiates and the ignition system activates. The associated ignition light illuminates.

ITT . . . . . CHECK

Abort start if there is no ITT indication within 10 seconds or ITT exceeds 550°C. Maximum start ITT is 700°C.

N_1 Speed . . . . . CHECK

Check for an N_1 indication between 20 and 25% N_2. Abort start if there is no N_1 indication by 25% N_2.

Engine Instruments . . . . . CHECK NORMAL

Monitor the engine instruments during acceleration. Abort start for abnormal indication.

Annunciators . . . . . CHECK

The engine start cycle terminates at approximately 38% N_2. The START button light, ignition light, instrument floodlights, and FUEL BOOST ON annunciator extinguish as hydraulic flow increases during start. If the GEN switch is in the GEN position, the GEN OFF annunciator extinguishes when generator output voltage exceeds battery voltage.

If automatic start sequencing does not terminate, the FUEL BOOST ON annunciator and ignition and associated lights remain illuminated. At 38% N_2, the speed sensor discontinues motoring the starter/generator. Depress the STARTER DISENGAGE button to terminate the automatic start sequence.

Cross Generator Start/GND IDLE HIGH . . . 52 TO 53% N_2

After engine reaches approximately 46% N_2 ground idle RPM, place the ground idle switch in the HIGH position. Verify N_2 increases to 52% (flight idle). A 52% N_2 reading indicates the ground idle system is working and that proper RPM, which ensures correct torque on the operating generator drive, is available for a cross generator start.

For a cross generator start, wait until turbine RPM reaches 52% N_2 and the generator is on line. Start the second. Both starter buttons illuminate during a cross generator start. A cross generator start reduces battery heat by eliminating a charging cycle.

For an external power start, both generator switches may be off until start is complete. Do not turn on any electrical equipment until both GEN OFF annunciators are extinguished. The Citation V has an overcurrent and overvoltage protection system for GPU usage.

CAUTION: Turbine speed greater than 53% N_2 on the operating engine produces a generator output that may damage the generator drive during the second engine start.

Second Engine . . . . . START

Proceedings for second engine start are the same as for the first engine start.

Engine Instruments/Annunciators . . . . . CHECKED

Verify all engine instruments are within normal range. Check that engine annunciators are extinguished.

External Power (if applicable) . . . . . DISCONNECTED

Verify the ground power unit is off by confirming a 24V DC battery reading on the voltmeter.

Generator Switches . . . . . GEN

L/R generator annunciators are extinguished and the ammeters show shared load.

Volt/Ammeters . . . . . CHECKED

Voltmeter indicates 28.5V DC and ammeters indicate a shared load within 10%.

Left Generator . . . . . OFF

Right generator powers the main DC buses. Voltmeter shows 28.5V DC under increased load.

Voltmeter Selector . . . . . LEFT GEN

Voltmeter shows 28.5V DC without load.

Left Generator . . . . . ON

Generator again shares the load.

Right Generator . . . . . OFF

Left generator powers the main DC buses. Voltmeter shows 28.5V DC under increased load.

Voltmeter Selector . . . . . RIGHT GEN

Shows 28.5V DC without a load.

Left Generator . . . . . ON

Check for a shared load on ammeters within 10%.

Battery Switch . . . . . EMER

Voltmeter drops toward 24V DC, indicating BATT relay open.

Battery Switch . . . . . BATT

Battery Temperature . . . . . CHECKED

Avionics Power . . . . . AC/ON

Before Taxi

Anti-Ice/Deice (if applicable) . . . . . CHECKED

CAUTION: Limit ground operation of pitot/static heat to two minutes to prevent damage to the angle-of-attack system.

Windshield Bleed Air:

W/S BLEED AIR Switch . . . . . LOW

W/S BLEED Air Valves . . . . . MAX

Check for bleed air noise.

If temperature is above -18°C, turn the W/S bleed air switch to LOW. If temperature is -18°C or below, turn W/S BLEED air switch to HIGH. Check that windshield bleed air valves are in MAX.

Engine Anti-Ice:

Ground Idle Switch . . . . . HIGH

Left Turbine (N_2) . . . . . SET 70% OR ABOVE

Left Engine Anti-Ice Switch . . . . . ON

Note decrease in N_1 and N_2 and an increase in ITT. Left ignition light illuminates.

ENG ANT-ICE LH Fail Annunciator . . . EXTINGUISHED

Annunciator should extinguish within two minutes or less.

Right Engine Anti-Ice Switch . . . . . XFD

Opens anti-ice crossfeed valve and disables cowling and stator anti-ice sensor on right engine.

ENG ANTI-ICE RH Fail Annunciator . . . EXTINGUISHED

Indicates anti-ice crossfeed valve is operating properly.

Right Turbine (N_2) . . . . . SET 70% OR ABOVE

Right Engine Anti-Ice Switch . . . . . ON

ENG ANTI-ICE RH Fail Annunciator . . . EXTINGUISHED

Left Engine Anti-Ice Switch . . . . . XFD

ENG ANTI-ICE LH Fail Annunciator . . . EXTINGUISHED

Throttles . . . . . IDLE

Ground Idle Switch . . . . . AS REQUIRED

Ground idle switch should be HIGH for anti-ice operation on the ground.

Engine Anti-Ice Switches . . . . . AS REQUIRED

Icing conditions are defined as visible moisture with an ambient air temperature between +10 and -30°C. Engine anti-ice is required when operating in icing conditions. For ground operation in icing conditions, the ENG ANTI-ICE fail annunciators must be extinguished for a minimum of one minute out of four (with the engine anti-ice switches ON).

Surface Deice:

CAUTION: Do not operate deice boots when ambient temperature is below -40°C.

Turbine (N_2) . . . . . SET 60% OR ABOVE

Below 60% N_2, the SURFACE DEICE annunciator may not illuminate.

SURFACE DEICE Switch . . . . . AUTO

Momentarily place the SURFACE DEICE switch in AUTO and observe that wing and empennage boots inflate properly as follows:

The lower wing and left horizontal stabilizer boots inflate for six seconds with the SURFACE DEICE annunciator illuminating. The system then rests for six seconds with the SURFACE DEICE annunciator extinguished. The upper wing and the right horizontal stabilizer boots then inflate for six seconds with the SURFACE DEICE annunciator illuminating. The cycle does not repeat.

Throttles . . . . . IDLE

Coffee/Freon Air . . . . . AS REQUIRED

Overhead Fan . . . . . AS REQUIRED

ATIS/CLEARANCE/FMS . . . . . CHECKED/SET

Radios/Avionics . . . . . CHECKED/SET

Altimeters/Altitude Alerter . . . . . CHECKED/SET

Radar . . . . . STANDBY

Pressurization Source Selector . . . . . CHECKED

Source Selector . . . . . LH/CHECK AIRFLOW

Source Selector . . . . . RH/CHECK AIRFLOW

Source Selector . . . . . NORM OR GND

Pressurization/Rate Control . . . . . SET

Set pressurization controller to cruise altitude plus 1,000 ft and set rate knob in white arc.

Flaps . . . . . CHECKED/SET FOR TAKEOFF

Extend flaps to LAND and check indicator movement. Check that the HYD PRESS ON annunciator illuminates when the flap handle is moved. Verify flap trim interconnect operation between 15 and 25°. Retract flaps to T.O. & APPR (15°) or to T.O. (7°) as appropriate.

Speedbrakes . . . . . CHECKED

Speedbrakes . . . . . EXTEND

Check that the HYD PRESS ON annunciator illuminates until speedbrakes are extended. The annunciator extinguishes when the SPD BRAKE EXTENDED annunciator illuminates. Observe upper speedbrake panels extension.

Speedbrakes . . . . . RETRACT

Check that the HYD PRESS ON annunciator illuminates and then extinguishes and the SPD BRAKE EXTENDED annunciator extinguishes. Visually check that the upper speedbrake panel stows properly.

Flight Controls . . . . . FREE AND CLEAR

Inverters/EFIS Test . . . . . CHECKED

AC TEST Switch . . . . . INV 1/HOLD

Selecting the INV 1 position turns off the No. 1 inverter and illuminates the INVERTER FAIL NO. 1 annunciator. The AC FAIL and MASTER WARNING annunciators should illuminate. Press the MASTER WARNING annunciator and note that the MASTER WARNING and AC FAIL annunciators extinguish. Confirm EFIS is still operational (AC powered by No. 2 inverter).

AC TEST Switch . . . . . INV 2/HOLD

Selecting the INV 2 position turns off the No. 2 inverter and illuminates the INVERTER FAIL NO. 2 annunciator. The AC FAIL and MASTER WARNING annunciators should illuminate. Press the MASTER WARNING annunciator and note that the MASTER WARNING and AC FAIL annunciators extinguish. Confirm EFIS (dual EFIS configuration) is still operational (AC powered by No. 1 inverter).

AC TEST Switch . . . . . RELEASE

EFIS Test Button . . . . . PRESS

Verify the following:

- radio altimeter test value on pilot display is 50 ft
- all digit readouts replaced with dashes (except radio altimeter)
- all flags in view

- command cue, if selected, biased from view
- on **optional dual EFIS** the comparator monitor annunciators illuminate ATT, HDG, and ILS if ILS sources are selected on both sides
- test pass light in upper left corner of EADI illuminates.

Autopilot/Flight Director . . . . . CHECKED/SET

Autopilot . . . . . ENGAGE

TEST EACH FLT Button . . . . . PRESS/HOLD FOR 5 SECONDS

The AP TORQUE and AP ROLL MONITOR annunciators illuminate and then the autopilot disengages. The AUTOPILOT OFF annunciator illuminates and the autopilot warning horn sounds for one second.

Autopilot . . . . . ENGAGE

Position the elevator and ailerons in neutral for the following check.

Pitch Wheel . . . . . ROTATE UP/DOWN

Column must move in direction of pitch wheel movement.

Turn Knob . . . . . ROTATE LEFT/RIGHT

Control wheel must move in direction of turn knob.

Flight Director HDG Mode . . . . . ENGAGE

Move the heading cursor to the left or right of lubber line. Note that the control wheel follows.

Flight Director ALT Mode . . . . . ENGAGE

Adjust pilot's altimeter by changing the altimeter setting in the Kollsman window. With a lower altitude selected on the pilot's altimeter, the control column moves aft. After selecting a higher altitude the control column moves forward.

Flight Director ALT Mode . . . . . DISENGAGE

Altimeter . . . . . RESET

Control Wheel . . . . . PULL AFT

Ensure elevator trim wheel, after a short delay, starts trimming nose down.

Control Wheel . . . . . PUSH FORWARD

Ensure elevator trim wheel, after a short delay, starts trimming nose up.

Autopilot . . . . . DISENGAGE

Check all of the normal autopilot disconnects:

- pilot's and copilot's AP/TRIM DISC switches
- pilot's and copilot's electric trim
- go-around button.

Re-engage autopilot between each disconnect test.

Flight Director . . . . . HDG/ALT SEL

Electric Elevator Trim . . . . . CHECKED

Copilot's Electric Trim Switch . . . . . CHECK

Left Half of Switch . . . . . ENGAGE

Engage nose-up then nose-down. Verify that electric trim does not move.

Right Half of Switch . . . . . ENGAGE

Engage nose-up then nose-down. Verify that electric trim does not move.

Trim . . . . . OPERATE NOSE UP

Manual trim wheel rotates nose-up.

AP/TRIM DISC Switch . . . . . PUSH

Check that trim stops.

Trim . . . . . OPERATE NOSE DOWN

Manual trim wheel rotates nose-down.

AP/TRIM DISC Switch . . . . . PUSH

Check that trim stops.

Pilot's Electric Trim Switch . . . . REPEAT ABOVE TEST

Pilot's Electric Trim Switch . . . . . OVERRIDES COPILOT'S SWITCH

Trim . . . . . SET

Rudder and Aileron Trim . . . . . SET AT NEUTRAL

Elevator Trim . . . . . ENSURE IN TAKEOFF RANGE

Taxi/Before Takeoff

Exterior Lights . . . . . AS REQUIRED

Passenger Advisory . . . . . PASS SAFETY

This position advises the passengers to fasten safety belts and stop smoking for takeoff. It also illuminates cabin exits and baggage area lights.

Ground Idle . . . . . AS REQUIRED

Brakes . . . . . CHECKED

CAUTION: If during taxiing a hard brake pedal/no braking condition occurs, operate the emergency brake system. Maintenance is required before flight.

Flight Instruments . . . . . CHECKED

Warning Flags . . . . . NONE VISIBLE

EHSIs/HSIs/RMIs/Compass . . . . . AGREE

Altimeters (both) . . . . . CHECK/AGREE

Flight Instruments . . . . . CHECK

Check for correct indications during turns.

Thrust Reversers . . . . . CHECKED

T/R Levers . . . . . IDLE

Check that the ARM and UNLOCK annunciators illuminate and the DEPLOY annunciator illuminates within 1.5 seconds of the UNLOCK annunciator illuminating.

Emergency Stow Switches . . . . . EMER

The UNLOCK and DEPLOY annunciators extinguish. The ARM and HYD PRESS ON annunciators remain illuminated.

T/R Levers . . . . . DOWN

The ARM and HYD PRESS ON annunciators remain illuminated.

Emergency Stow Switches . . . . . NORMAL

The ARM and HYD PRESS ON annunciators extinguish.

CAUTION: Do not attempt to fly the aircraft if the thrust reverser preflight test is unsuccessful.

Pressurization Source Selector . . . . . NORMAL

If the source selector is left in GND, excessive air extraction occurs on the right engine and the engine does not develop full takeoff thrust.

Cabin Temperature Control . . . . . AUTOMATIC

The ACM over-temperature protection circuit operates only in the AUTOMATIC mode.

Anti-Skid (when stopped) . . . . . ON

Takeoff Data/Crew Brief . . . . . SET/COMPLETE

Review and bug appropriate takeoff speeds.

Refer to Standard Operating Procedures for detailed explanation of items on the takeoff briefing.

Takeoff

Ignition . . . . . ON

Turning the ignition system on for takeoff may prevent a flameout if an engine problem arises during takeoff.

Pitot Heat . . . . . PITOT & STATIC

CAUTION: Limit ground operation of pitot/static heat to two minutes to preclude damage to the angle-of-attack system.

Anti-Ice . . . . . AS REQUIRED

Exterior/Landing Lights . . . . . ON

For flights 30 minutes before sunset to 30 minutes after sunrise, turn on navigation lights. Do not operate anti-collision lights in fog, clouds, or haze. The light beam reflection can cause disorientation or vertigo.

Radar . . . . . ON

Radar switch is in ON but radar remains in standby with aircraft weight-on-wheels (squat switch protection). Simultaneously, pressing both range buttons on the radar control panel overrides squat switch protection.

Transponder . . . . . ALT

Check that all annunciators are extinguished except possibly GROUND IDLE and ENG ANTI-ICE (if that system was selected with low engine power).

Verify flight director is in GO AROUND mode with HDG and ALT SEL functions selected.

F.A.T.S. . . . . SET

Final checks before application of takeoff power.

Flaps . . . . . SET

Annunciators . . . . . CHECKED

Trims . . . . . THREE SET

Speeds . . . . . TAKEOFF BUGS SET

After Takeoff/Climb

Landing Gear/Lights . . . . . UP/OFF

When a positive rate-of-climb is indicated, pull the gear handle out and move it to the UP position to begin the retraction cycle. Handle movement illuminates the GEAR UNLOCKED and HYD PRESS ON annunciators. Check that both annunciators extinguish to indicate the landing gear is up and locked.

Flaps . . . . . UP

At a comfortable altitude with the wings level and a minimum airspeed of V_2 +10, depress the flap handle to clear the detent then move full forward. Check that the position indicator to the left of the handle moves to the FLAPS UP position. The HYD PRESS ON annunciator should remain illuminated any time the flaps are in transit and extinguish when they reach the selected position.

Yaw Damper . . . . . ENGAGED

Check that the YAW DAMPER ENGAGE light illuminates. The yaw damper improves aircraft control and passenger comfort.

Ignition . . . . . NORM

When clear of any bird hazard and the cockpit workload permits, place IGNITION switches in NORM.

Climb Power . . . . . SET

Use indicated temperature and the climb thrust chart to determine N_1.

Engine Sync . . . . . AS DESIRED

With N_1 speeds matched within 1.5% or N_2 speeds matched within 1%, place the engine synchronizer selector in FAN or TURB. Check that the engine instruments remain within normal operating limits. Selecting FAN synchronizes the left and right fan (N_1) speeds resulting in a quieter passenger cabin while selecting TURBINE matches left and right engine turbine (N_2) speeds resulting in a quieter cockpit.

NOTE: N_1 RPM increases with altitude. Throttle adjustments may be necessary to maintain specified thrust setting.

Pressurization/Cabin Temperature . . . . CHECKED/SET

The controller was programmed before taxi. Adjust the rate knob to achieve a comfortable cabin rate-of-climb (usually between 300 and 500 FPM). Observe differential pressure/cabin altitude and cabin vertical speed indicators. A thorough understanding of the differential pressure/cabin altitude indicator assists the crew in smooth operation of the pressurization system.

Anti-Ice/Deice . . . . . AS REQUIRED

Select anti-ice systems on as required for climb. Use of engine anti-ice reduces allowable fan speed and dictates close monitoring of ITT and RPM limitations.

Passenger Advisory . . . . . AS REQUIRED

Place the passenger advisory switch in SEAT BELT to keep the FASTEN SEAT BELT sign illuminated and extinguish the NO SMOKING and emergency exit lights. If no turbulence is expected, place the switch in OFF to extinguish the FASTEN SEAT BELT sign and emergency exit lights.

Flood Cooling (by 10,000 ft) . . . . . OFF

If installed, flood cooling must be off before passing through 10,000 ft.

Transition Level

Altimeters . . . . . SET

Set altimeters to 29.92 inches Hg and cross-check.

Recognition Lights . . . . . OFF

Freon Air (by 18,000 ft) . . . . . OFF/FAN

Turn freon air conditioning off to prevent compressor motor arcing.

Cabin Temperature (by FL 310) . . . . . AUTO

Selecting AUTO above 31,000 ft reduces the possibility of an ACM overheat and normally maintains a comfortable cabin temperature. With low airspeed and high power settings, an ACM overheat is possible with an excessively cold setting in MANUAL.

Cruise

Cruise Power . . . . . SET

Maintain climb thrust until acceleration until attaining the desired cruise speed. If engine RPM does not automatically synchronize at the desired cruise setting, turn engine synchronization OFF. This allows the synchronizer actuator to center. Roughly synchronize the engines with throttles and place the engine synchronizer switch in FAN or TURB.

Engine Instruments . . . . . CHECKED

Fuel Quantity/Crossfeed . . . . . CHECKED

Ensure proper consumption rate. Balance fuel as required to remain within the 200 lbs wing fuel tank imbalance.

Pressurization/Oxygen . . . . . CHECKED/AS REQUIRED

Reset cabin altitude and/or rate as required. Maintain the TEMPERATURE CONTROL knob in the 12 to 2 o'clock position for a comfortable cabin temperature.

Check oxygen system pressure and masks:

- below FL 350 masks must be ready in their "quick-donning" position
- above FL 350 with only one pilot in the cockpit, that pilot must be wearing an oxygen mask
- above FL 410, at least one pilot must wear an oxygen mask.

Anti-Ice/Deice . . . . . AS REQUIRED

Check the anti-ice systems for proper operation before entering areas where icing may be encountered. The engine bleed air anti-ice must be activated when operating in visible moisture at temperatures between +10 and -30°C indicated OAT and any time icing occurs. Normally operate pitot and static anti-ice during all phases of flight.

CAUTION: Do not operate the deice boots when indicated OAT is below -40°C.

Descent (15 Minutes Prior)

Defog Fan . . . . . HI

Turn on the DEFOG fan and close the foot warmers approximately 15 minutes before descent to reduce condensation on the windshield and cockpit side windows.

Foot Warmer . . . . . CLOSED LEFT/RIGHT

Closing foot warmers increases the flow of air available for windshield defogging and isolates dry conditioned air between the cockpit side windows to inhibit condensation formation.

Flow Distribution . . . . . CKPT

Bias the FLOW DISTR selector toward CKPT for maximum defog capability.

Pressurization/Temperature . . . . . CHECKED/SET

After beginning descent, set destination field pressure altitude +200 ft on the controller CABIN dial. Monitor differential pressure/cabin altitude and cabin vertical speed indicators. A high cabin altitude and low differential pressure indicates insufficient rate-of-descent. Depressurization occurs when cabin and aircraft altitude are identical. High cabin descent rates may be uncomfortable and may result in programmed cabin altitude being reached well before landing. Spreading the cabin descent requirement over the majority of the let-down provides optimum comfort for the passengers and crew.

Windshield Bleed Air Switch/Manual Valves . . LOW/MAX

Windshield bleed air can be used to externally warm the windshield in extreme conditions. Normally, the W/S BLEED switch LOW position provides adequate temperature.

Anti-Ice/Deice . . . . . AS REQUIRED

A minimum of 70% N_2 is required to keep the engine anti-ice system operating properly. When operating in visible moisture with indicated OAT between -30 and +10°C, ensure pitot/static and engine anti-ice is on and operating. Use windshield bleed air as required.

Transition Level

Altimeters . . . . . CHECKED/SET

When cleared below or passing through the transition altitude, set the reported or landing field barometric pressure on both altimeters. Cross-check settings.

Exterior/Recognition Lights . . . . . ON

Freon Air . . . . . AS REQUIRED

Turning on the Freon air conditioning system can aid windshield defogging.

Approach/In Range

Seats/Seat Belts/
Shoulder Harnesses . . . . . SECURED LEFT/RIGHT

Check that the seats are locked in the desired position. Ensure seat belts and shoulder harnesses are secure and snug.

Passenger Seats . . . . . UPRIGHT/OUTBOARD

Cabin and Emergency Exits . . . . . CLEAR

Ensure there is unobstructed access to the normal and emergency exits.

Avionics/Flight Instruments . . . . . CHECKED/SET

Tune navigation equipment and identify. Set courses and program the flight director as required.

Crossfeed . . . . . OFF

Check that the CROSSFEED knob is in OFF and the INTRANSIT and FUEL BOOST ON annunciators are extinguished.

Passenger Advisory . . . . . PASS SAFETY

Anti-Skid . . . . . ON

Ground Idle . . . . . AS REQUIRED

Use HIGH if ground icing is anticipated or for touch and go landings. If the GROUND IDLE annunciator illuminates in flight, select HIGH and ensure that N_2 does not decrease below 52%. Engine acceleration from below 52% N_2 may be excessive for some flight conditions.

Engine Sync . . . . . OFF

Altimeters/Radar Altimeter . . . . . CHECKED/SET

Landing Data/Bugs . . . . . CHECKED/SET

Complete the approach side of TOLD card. Set airspeed bugs to V_{REF}.

Crew Brief . . . . . COMPLETE

Check standard operating procedure for a list of items that should be included in the approach briefing.

Ignition . . . . . ON

Flaps . . . . . T.O. & APPR

Flaps may be extended to T.O. & APPR below 200 KIAS. Check indicator to verify position.

Pressurization . . . . . SET FOR LANDING

Check pressurization and verify that it is set for landing. Check that cabin differential pressure is near zero. If still excessive, adjust rate so the cabin ascends. Differential pressure should be zero for landing. Any existing pressure is dumped on touchdown. If landing above 12,000 ft pressure altitude, turn the OXYGEN CONTROL VALVE to CREW ONLY and the PRESS SOURCE selector to OFF to prevent passenger oxygen mask deployment.

Landing

Landing Gear/Lights . . . . . DOWN AND LOCKED/ON

Pull the landing gear handle out then move to DOWN. While the gear is extending, the HYD PRESS ON and GEAR UNLOCKED annunciators illuminate. When the landing gear reaches the down and locked position, the three green gear lights illuminate and the HYD PRESS ON and GEAR UNLOCKED lights extinguish.

Annunciator Panel/Flight Director . . . . . CHECKED/SET

Ensure the annunciator panel is clear and flight director is appropriately set.

Flaps . . . . . LAND

Select flaps to LAND position for all normal landings. Flaps may be extended to LAND below 173 KIAS. Depress the flap handle then move it to the LAND position. Ensure flap indicator moves to correspond with handle position. The HYD PRESS ON annunciator should illuminate whenever the flaps are moving.

Autopilot/Yaw Damper . . . . . OFF

Depress the AP/TRIM DISC switch on either control wheel. With the yaw damper off, the pilot has complete rudder authority and nosewheel steering for landing.

Landing With Thrust Reversers

Throttles . . . . . IDLE

Suggested crosswind technique involves flying a crab down final approach and aligning the longitudinal axis of the aircraft to runway centerline with the rudder just before touchdown. The wide expanse of cockpit visibility makes small crab angles difficult to detect; therefore, devote particular attention to this area to achieve smooth crosswind landings.

Eight seconds after touchdown, the engines spool down from flight idle (approximately 52% N_2) to ground idle (46% N_2) if the flight idle switch is in the NORM position. The GROUND IDLE annunciator illuminates.

Brakes (after touchdown) . . . . . CONTINUOUS MAXIMUM APPLIED

To obtain maximum braking performance from the anti-skid system, apply continuous maximum effort (no modulation) to brake pedals.

CAUTION: If, during taxiing, a hard brake pedal/no braking condition occurs, operate the emergency brake system. Maintenance is required before flight.

Speedbrakes (after touchdown) . . . . . EXTENDED

Touchdown, preceded by a slight flare, should occur on the main wheels. Check thrust at idle and extend speedbrakes while lowering the nose wheel.

Thrust Reversers
(after nose wheel on ground) . . . . . DEPLOYED

Apply wheel brakes and deploy the thrust reversers. The aircraft pitches slightly upward during deployment; therefore, use slight nosedown elevator pressure during thrust reverser deployment, especially at high speeds such as a refused takeoff or no-flap landing.

The nose wheel must be on the ground before actuation of the thrust reversers to reduce the possibility of pitch-up and lift-off and to improve directional control. Do not exceed approximately 15 lbs of force on the thrust reverser levers during deployment to prevent jamming of the throttle lockout cams.

Reverser Indicator . . . . . CHECK ILLUMINATION

The ARM, UNLOCK, and DEPLOY annunciators illuminate.

Reverser Power . . . . . AS REQUIRED

Do not exceed 79% N_1 when OAT is below -18°C or 86% N_1 at or above -18°C. Once the thrust reversers are deployed, move the levers aft to maximum reverse thrust. Stops on the levers provide 86% N_1 on a -18°C day at sea level so the pilot can keep his attention on the landing rollout. The factory setting results in lower than 86% N_1 at warmer temperatures and may be reset for higher N_1 if temperatures are predominantly warmer. Do not exceed 86% N_1.

At 60 KIAS:

Thrust Reverser Levers . . . . . IDLE REVERSE

With the thrust reverser levers in the IDLE REVERSE detent, leave the reversers deployed for aerodynamic drag. Commence thrust reversing and braking according to runway length. With excess runway, normally begin braking after thrust reverser deceleration is below 60 knots.

Use caution on runways with small loose gravel that may be ingested in the engine at idle reverse at low taxi speed.

CAUTION: Do not use the thrust reversers for touch and go landings; a full stop landing must be made once the reversers are selected.

CAUTION: Do not advance throttles until the reverser UNLOCK annunciators extinguish. There is danger of the throttle being rapidly returned to idle position, which could cause injury.

After Landing

Accomplish this checklist after the aircraft is clear of the runway.

Thrust Reversers . . . . . STOWED

Flaps/Trim . . . . . UP/SET

Check that the HYD PRESS ON annunciator extinguishes after the flaps are up. Taxiing with flaps extended on a snow- or slush-covered taxiway could result in obstruction of the flaps.

Speedbrakes . . . . . RETRACTED

> **CAUTION:** Operation of the PITOT & STATIC heat on the ground for over 2 minutes may result in damage to the angle-of-attack system.

Check that the SPD BRAKE EXTENDED and HYD PRESS ON annunciators extinguish.

Ignition . . . . . NORM

Pitot Heat/Anti-Ice . . . . . OFF

W/S BLEED AIR may be used as required in falling precipitation. Turn engine anti-ice ON and operate the engines at or above 70% N_2 for a maximum of one minute out of every four minutes if taxiing in visible moisture with temperatures between +10 and -30°C. Ensure the PITOT & STATIC switch is off.

Exterior Lights . . . . . AS REQUIRED

Recognition light life is shortened considerably if used during ground operations.

Ground Idle . . . . . **AS REQUIRED**

Radar . . . . . **OFF/STANDBY**

Transponder . . . . . **OFF/STANDBY**

Shutdown

Parking Brake . . . . . **SET**

Do not set the parking brake if brakes are very hot. This can increase heat transfer from the brakes to the wheel, causing the fusible plug to melt and deflate the tire.

AC Power/Master Avionics . . . . . **OFF**

Exterior Lights . . . . . **OFF**

Standby Gyro . . . . . **CAGED AND OFF**

Pull out the standby attitude indicator caging knob and rotate it clockwise to cage then turn switch off.

Overhead/Defog Fans . . . . . **OFF**

Throttles . . . . . **OFF**

Allow ITT to stabilize for at least one minute at minimum value. Lifting the latch and placing the throttle full aft terminates fuel flow to the engine combustion section. A canister collects manifold fuel on shutdown. During the next flight, this fuel returns to the fuel cell. Repeated starts for ground operations cause the canister to overflow through the lower nacelle after the third shutdown.

Rotating Beacon . . . . . **OFF**

Passenger Advisory . . . . . OFF

Control Lock . . . . . AS REQUIRED

Parking Brake/Chocks . . . . . AS REQUIRED

Battery . . . . . OFF

Move the BATT switch to OFF. Exercise care not to place it in EMER. Emergency bus items will drain the battery over an extended period.

For deplaning at night, leave the battery switch in BATT for cabin lighting until passengers and cabin baggage are deplaned. Turn the EXTERIOR WING INSP LIGHTS switch to ON to provide additional illumination in front of the cabin door. An illuminated courtesy light switch on the forward door post is wired to the Hot Battery bus to turn on the emergency exit lights and one aft cabin baggage compartment light.

Parking

Normally park the aircraft facing a direction that facilitates servicing, regardless of the prevailing wind. If not already accomplished, ensure the following are completed.

Aircraft . . . . . PARKED

Park on hard, level surface.

Parking Brake/Control Lock . . . . . AS REQUIRED

Setting the parking brake is optional. The aircraft may be relocated without anyone entering the aircraft if the parking brake is not set.

Main Gear . . . . . CHOCKED

Static Ground Cable . . . . . CONNECTED

Engine/Protective Covers . . INSTALLED AS REQUIRED

Foul Weather Window/Door . . CLOSED AS NECESSARY

Mooring

If extended parking plans or impending weather necessitates mooring the aircraft, attach ¾-inch ropes (or an equivalent substitute) to the nose gear and main gear struts. This procedure requires tie-down eyelets set into the apron; there is no procedure for mooring at unprepared facilities.

Aircraft . . . . . PARKED

Park on hard, level surface; head into the wind.

Parking Brake/Control Lock . . . . . AS REQUIRED

Setting the parking brake is optional. The aircraft may be relocated without anyone entering the aircraft if the parking brake is not set.

Main Gear . . . . . CHOCKED

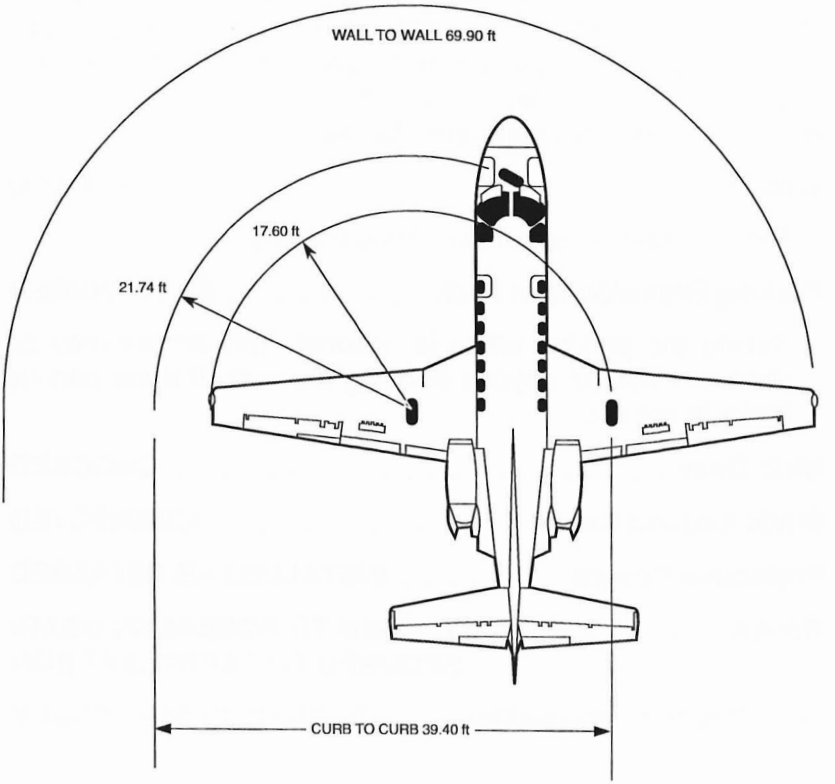
Static Ground Cable . . . . . CONNECTED

Protective Covers . . . . . INSTALLED AS REQUIRED

Ropes . . . . . ATTACHED TO NOSE/MAIN GEAR/ SECURED TO PARKING APRON

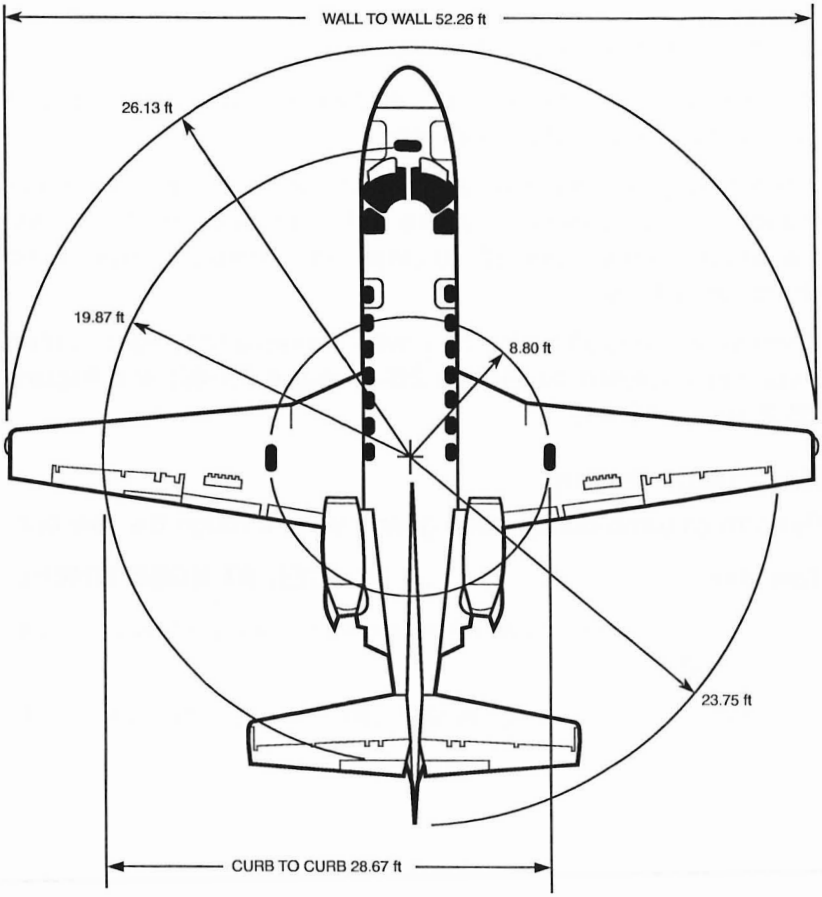
Foul Weather Window/Door . . CLOSED AS NECESSARY

Taxi Turning Distance



2B-1

Towbar Turning Distance



2B-2

Towing/Taxiing

Taxiing the aircraft may be accomplished on hard surfaces as well as on gravel or sod surfaces. Rudder pedal movement operates the nosewheel steering system.

On hard surfaces, the aircraft can be towed using a yoke-type tow bar attached to the nose gear.

While towing or taxiing an aircraft with a flat tire is not recommended, a situation may require it. In such a case, tow or taxi the aircraft forward enough to clear the immediate area; avoid sharp turns if towing.

Observe the aircraft taxi turning with brakes and towbar turning distances depicted on **Figure 2B-1**, (page 2B-40) and **Figure 2B-2**, (page 2B-41).

Nose Gear Towing

Perform all turns during nose gear towing through the tow bar.

Tow Bar . . . . . PLACED AT NOSE WHEEL

Insert tow bar into nosewheel axle and secure tow bar locking handle.

Tow Bar . . . . . CONNECTED TO TOWING VEHICLE

Pilotís Seat . . . . . OCCUPIED

Control Lock . . . . . OFF

Parking Brake . . . . . OFF

If the parking brake is not set, towing can be accomplished without entering the aircraft.

Chocks/Static Ground Cable/
Mooring Ropes . . . . . REMOVED

Wing/Tail Walkers . . . . . STATIONED (OPTIONAL)

In congested areas, wing/tail walkers ensure adequate clearance between the aircraft and adjacent equipment or structures.

Aircraft . . . . . TOW

Use smooth starts and stops.

When towing operation complete:

Nosewheel . . . . . CENTERED

Parking Brake . . . . . AS REQUIRED

Control Lock . . . . . AS REQUIRED

Main Gear Wheels . . . . . CHOCKED

Static Ground Cable . . . . . CONNECTED

Tow Bar . . . . . REMOVED

Main Gear Towing

Pilot's Seat . . . . . OCCUPIED

Main Gear Towing Adapters . . . . . INSTALLED

Cables . . . . . ATTACHED TO TOWING ADAPTERS/ TOWING VEHICLE

Use care to prevent crushing of wiring or linkage rods in the area. Make sure the cables are long enough to clear the aircraft and that the towing vehicle is on a hard surface.

Chocks/Static Ground Cable/ Mooring Ropes . . . . . REMOVED

Parking Brake . . . . . OFF

Control Lock . . . . . OFF

Aircraft . . . . . STEERED WITH BRAKES AND RUDDER PEDALS

Using a smooth and even pressure, apply aircraft brakes as required.

When towing operation is complete:

Nose Wheel . . . . . CENTERED

Parking Brake . . . . . AS REQUIRED

Control Lock . . . . . AS REQUIRED

Main Gear Wheels . . . . . CHOCKED

Static Ground Cable . . . . . CONNECTED

Tow Cables/Towing Adapters . . . . . REMOVED

Hot Weather Operations

Ground Cooling

Use GPU if available for maximum ground cabin cooling:

Temperature Control . . . . . FULL COLD

Press Source Selector . . . . . GND

Overhead Fan . . . . . HI

Defog Fan . . . . . HI

Freon Air Conditioner (if installed) . . . . . ON

Cold Weather Operations

NOTE: Flight crews should refamiliarize themselves seasonally with Cessna Maintenance Manual Chapter 12 and FAA Advisory Circular AC120-58, dated September 9, 1992 or later, for expanded deice and anti-ice procedures.

Ground Deice/Anti-Ice Operations

During cold weather operations, flight crews are responsible for ensuring the aircraft is free of ice contaminants.

Ground icing may occur at temperatures of +10°C or colder with high humidity. To comply with FAA regulations (clean wing concept) requiring critical component airframe deicing and anti-icing, Type I deice fluids and Type II anti-ice fluids can be used sequentially.

CAUTION: Type I and Type II fluids are not compatible and may not be mixed. Additionally, most manufacturers prohibit mixing of brands within type.

The pilot-in-command (PIC) or second-in-command (SIC) should supervise line personnel to ensure proper application of either fluid.

Deicing Supplemental Information

This section provides supplementary information on aircraft deicing, anti-icing/deicing fluids, deicing procedures, and aircraft operating procedures. Consult the AFM, Maintenance Manual Chapter 12 – Servicing, and FAA Advisory Circulars for deicing procedures, holdover times, fluid specifications, recommendations, and hazards.

Federal Aviation Regulations (FARs) prohibit takeoff with snow, ice, or frost adhering to the wings and control surfaces of the aircraft. It is the responsibility of the pilot-in-command to ensure the aircraft is free of snow, ice, or frost before takeoff.

Failure to adequately deice the aircraft can result in seriously degraded aircraft performance, loss of lift, and erratic engine and flight instrument indications.

Following extended high-altitude flight, frost can form at ambient temperatures above freezing on the wing's underside in the fuel tank areas. Refueling the aircraft with warmer fuel usually melts the frost.

Deicing

When necessary, use the following methods to deice the aircraft:

- placing the aircraft in a warm hangar until the ice melts
- mechanically brushing the snow or ice off with brooms, brushes, or other means
- applying a heated water/glycol solution (one-step procedure)
- applying heated water followed by an undiluted glycol-based fluid (two-step procedure).

Deicing Fluids

Two types of anti-icing/deicing fluids are in commercial use: SAE/ISO Types I and II. Type I fluids are used generally in North America. Type II fluids, also referred to as AEA Type II, are used generally in Europe.

Type I fluids are unthickened glycol-based fluids that are usually diluted with water and applied hot; they provide limited holdover time.

Type II fluids are thickened glycol-based fluids that are usually applied cold on a deiced aircraft; they provide longer holdover times than Type I fluids.

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 and ISO Type I or Type II 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.

Many factors influence snow, ice, and frost accumulation and the effectiveness of deicing fluids. These factors include:

- ambient temperature and aircraft surface temperature
- relative humidity, precipitation type, and rate
- wind velocity and direction
- operation on snow, slush, or wet surfaces
- operation near other aircraft, equipment, and buildings
- presence of deicing fluid and its type, dilution strength, and application method.

CAUTION: Type II FPD generally should not be applied forward of the wing leading edges. If used for deicing, do not apply forward of cockpit windows. Ensure that radome and cockpit windows are clean.

Deicing Procedures

One-step deicing involves spraying the aircraft with a heated, diluted deicing/anti-icing fluid to remove ice, snow, or frost. The fluid coating then provides limited protection from further accumulation.

Two-step deicing involves spraying the aircraft with hot water or a hot water/deicing fluid mixture to remove any ice, snow, or frost accumulation followed immediately by treatment with anti-icing fluid (usually Type II FPD fluid).

Deice the aircraft from top to bottom. Avoid flushing snow, ice, or frost onto treated areas. Start the deicing process by treating the horizontal stabilizer followed by the vertical stabilizer. Continue by treating the fuselage top and sides. Finally, apply deicing fluid to the wings.

CAUTION: If engines are running when spraying of deicing fluids is in progress, turn bleed air and air conditioning packs off.

Deicing fluid should not be applied to:

- pitot/static tubes, static ports, temperature probes, AOA vanes, or TAT probe
- gaps between control surfaces and airfoil
- cockpit windows
- passenger windows
- air and engine inlets and exhausts
- vents and drains
- wing and control surface trailing edges
- brakes.

CAUTION: Do not use deicing fluid to deice engines. Mechanically remove snow and ice from the engine inlet. Check the first stage fan blades for freedom of movement. If engine does not rotate freely, deice engine with hot air.

Spraying Technique – Type I

Spray Type I fluid on the aircraft (with engines off) in a manner that minimizes heat loss to the air. If possible, spray fluid in a solid cone pattern of large coarse droplets at a temperature of 160 to 180°F (**Figure 2B-3**, following page). Spray the fluid as close as possible to the aircraft surfaces, but no closer than 10 ft if using a high pressure nozzle.

Spraying Technique – Type II

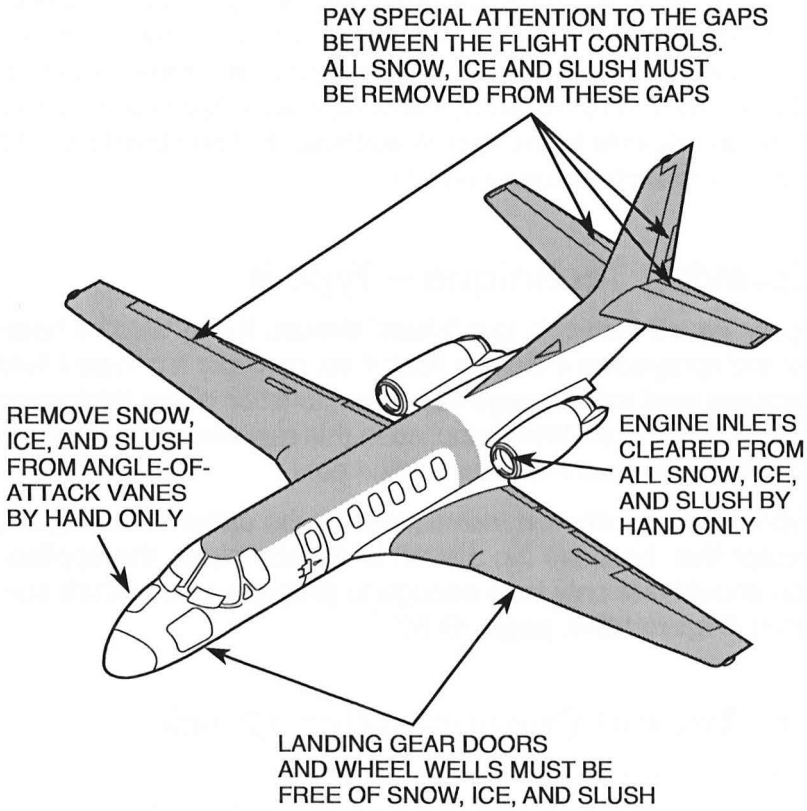
Apply Type II fluid cold to a "clean" aircraft. It may also be heated and sprayed as a deicing fluid; if so, consider it a Type I fluid because heat may change the characteristics of the thickening agents in the fluid. When applied in this manner, Type II fluid is not as effective as if it were applied cold.

Type II fluid application techniques are the same as for Type I, except that, because the aircraft is already clean, the application should last only long enough to properly coat aircraft surfaces (**Figure 2B-4**, page 2B-53).

Pre-Takeoff Contamination Check

In ground icing conditions, the PIC/SIC conducts a pre-takeoff contamination check within five minutes of takeoff, preferably just prior to taxiing onto the active runway. Critical areas of the aircraft (e.g., empennage, wing, windshield, control surfaces) must be checked to ensure they are free of ice, slush, and snow or that the deice/anti-ice fluids are still protecting the aircraft.

Type I Fluid Spray Pattern

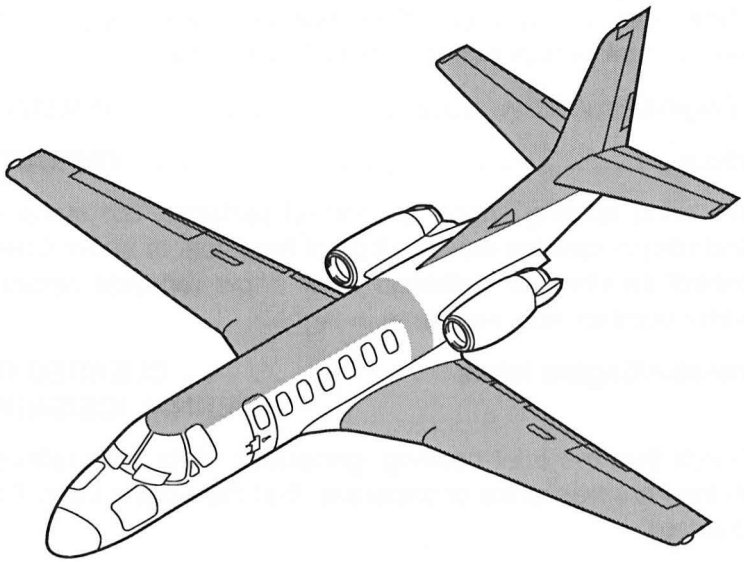


NOTE: SHADED AREAS INDICATE ESSENTIAL AREAS TO BE DEICED.

NOTE: MINIMUM DIRECT SPRAY AREAS INCLUDE ENGINE INLETS, ENGINE EXHAUST, RAM AIR INLETS, BRAKES, PITOT HEADS, STATIC PORTS,WINDSHIELD, CABIN WINDOWS, AND AOA VANES.

2B-3

Type II Fluid Spray Pattern



NOTE: SHADED AREAS INDICATE ESSENTIAL AREAS TO BE ANTI-ICED.

NOTE: MINIMUM DIRECT SPRAY AREAS INCLUDE ENGINE INLETS, ENGINE EXHAUST, RAM AIR INLETS, BRAKES, PITOT HEADS, STATIC PORTS,WINDSHIELD, CABIN WINDOWS, AND AOA VANES.

2B-4

Preflight

During preflight preparation, inspect areas where surface snow or frost can change or affect normal system operations. Supplemental preflight checks include the following.

All Engine/Protective Covers . . . . . REMOVED

Surface . . . . . CHECKED

The wing leading edges, all control surfaces, tab surfaces, and control cavities must be free of frost, ice, or snow. Check control cavities for drainage after snow removal because water puddles may re-freeze in flight.

Generator/Engine Inlets . . . . . CLEARED OF INTERNAL ICE/SNOW

Check that the inlet cowling, generator inlets, and tailcone air inlet are free of ice or snow and that the engine fan is free to rotate.

Fuel Tank Vents . . . . . CHECKED

Check the fuel tank vents; remove all traces of ice or snow.

Fuel Drains . . . . . ALL WATER DRAINED

Pitot Heads And Static Ports . . . . . CLEARED OF ICE

Water rundown resulting from snow removal may re-freeze immediately forward of the static ports. This causes an ice buildup that results in disturbed airflow over the static ports. The disturbed airflow can cause erroneous static readings even though the static ports themselves are clear.

Landing Gear Doors . . . . . CHECKED

Make sure the landing gear doors are unobstructed and free of impacted ice or snow.

Air Conditioning Inlets and Exits . . . . . CLEARED

Verify that the air inlets and exits are clear of ice or snow.

Aircraft Deicing . . . . . COMPLETED

For different deicing fluids, protection (holdover) time varies considerably. Furthermore, this time depends on meteorological conditions.

Preliminary Cockpit Preparations . . . . . COMPLETED

Battery . . . . . INSTALLED/PREHEATED/24V DC

Engine . . . . . PREHEATED

Engine preheating is best accomplished by installing the engine covers and directing hot air through the oil filler access door.

External Power Start

If aircraft is cold-soaked below -10°C, use a GPU and/or preheat procedure for starting.

Engine Start

During cold weather starts, initial oil pressure may be slow in rising; the OIL PRESS WARN annunciator may remain illuminated longer than normal.

After Engine Start

Instruments . . . . . OBSERVED FOR NORMAL OPERATION

The engine instruments display approximately normal indications within a short time after reaching idle.

Engine Oil Pressure . . . . . CHECKED

During cold weather starts, the oil pressure may temporarily exceed maximum pressure limits until the oil temperature rises. At low ambient temperatures, tolerate a temporary high pressure above maximum limits, but delay takeoff until the pressure drops into normal limits.

Anti-Ice . . . . . AS REQUIRED

During operation from snow-covered runways, turn on engine anti-ice during taxi and takeoff. Precede takeoff by a static engine run-up to as high a power level as practical to ensure observation of stable engine operation prior to brake release.

If severe icing conditions are present, turn on engine anti-ice immediately after engine start. During prolonged ground operation, perform periodic engine run-up to reduce the possibility of ice buildup. For sustained ground operation, operate the engines at a power setting high enough to extinguish the engine anti-ice annunciators for one out of every four minutes.

Flight Controls . . . . . CHECKED

Check for freedom of movement when the aircraft has been exposed for an extended period of time to snow, freezing rain, or other conditions that can restrict flight control movement. Increased control forces can be expected at low temperatures because of the increased resistance in cables and the congealed oil in snubbers and bearings. It may be desirable to accomplish an additional control check prior to taxi.

Wing Flaps . . . . . CHECKED

Pressurization/Temperature Control Switches . . . . SET

Set for maximum cabin heat.

Temperature Control . . . . . MANUAL HOT

Overhead Fan . . . . . HI

Press Source Selector . . . . . GND

Reduce temperature control as desired prior to takeoff.

Windshield Bleed Air . . . . . LOW OR HI

Use windshield bleed air and defog fan to clear the windshield.

Taxi/Before Takeoff

Flaps . . . . . T.O. OR T.O. & APPR

Before Takeoff Checklist . . . . . COMPLETED

To ensure the aircraft is configured for takeoff, recheck the flap position and trim indicators.

Takeoff

If engine anti-ice is used for takeoff:

Thrust . . . . . ANTI-ICE SETTINGS

Takeoff Field Length . . . . . ADJUSTED

Adjust in accordance with AFM.

If aircraft slides on ice or snow during engine power check:

Brakes . . . . . RELEASED

Takeoff Roll . . . . . BEGUN

Continue engine check during early part of takeoff roll. During takeoffs on icy runways, expect a lag in nosewheel steering and anticipate corrections. A light forward pressure on the control column increases nosewheel steering effectiveness.

In Flight

Pitot Heat . . . . . ON

Windshield Bleed Air . . . . . LOW OR HI

This keeps the windshield clear (HI at -18°C [0°F] OAT or below). Speedbrakes plus increased power settings provide additional bleed air.

Windshield Alcohol . . . . . AS REQUIRED

Use alcohol if windshield bleed air fails. The alcohol lasts approximately 10 minutes and is distributed to the pilot's windshield only. Be conservative; it may be required for approach.

Engine Anti-Ice . . . . . ON

Use when operating in visible moisture with outside air temperatures between -30°C and +10°C; use anti-ice thrust settings.

Surface Deice . . . . . AUTO

Use when wing ice buildup is estimated between ¼ and ½ inch, as seen with the wing inspection light (if necessary); use the stall strip as the gage.

Taxi-in and Park

Engine Anti-Ice . . . . . AS REQUIRED

If severe icing conditions are present, turn on engine anti-icing. During prolonged ground operation, perform periodic engine run-ups to reduce the possibility of ice buildup. For sustained ground operation, operate the engines at a power setting high enough to extinguish the engine anti-ice annunciators for one out of every four minutes.

Windshield Bleed Air . . . . . LOW OR HI

Use windshield bleed air and the defog fan to clear the windshield.

Securing Overnight or for Extended Period (Aircraft Unattended)

Wheel Chocks . . . . . CHECKED IN PLACE

Parking Brake . . . . . OFF

This eliminates the possibility of the brakes freezing.

Engine/Protective Covers . . . . . INSTALLED

Water Storage Containers . . . . . DRAINED

Toilets . . . . . DRAINED

Battery . . . . . REMOVED

If the ni-cad battery will be exposed to temperatures below -18°C (0°F), remove the battery and store in an area warmer than -18°C (0°F) but below 40°C (104°F). Subsequent re-installation of the warm battery enhances starting capability.

Doors . . . . . CLOSED AND LOCKED