
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, Gear – RETRACT, Yaw Damper – ENGAGE).

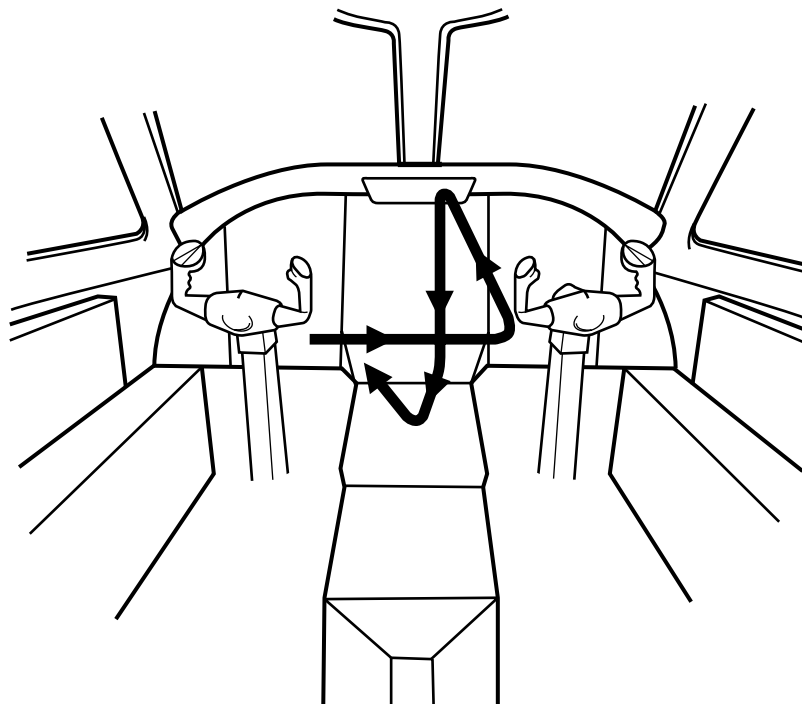
Placing items in a flow pattern or series provides organization and serves as a memory aid.

A challenge-response review of the checklist follows execution of the tasks; the PNF calls the item, and the appropriate pilot responds by verifying its condition (e.g., “Engine Anti-Ice” [*challenge*] – “ON” [*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

Before Starting Engines

Checklists follow a general pattern (i.e., flow pattern) in the cockpit (e.g., left to right, up, then down).

Oxygen Systems **CHECKED/AUTO**

Ensure crew oxygen masks are checked, adjusted, set to 100%, and stowed. Observe that the pressure gage on the lower left instrument panel indicates 1,600 to 1,850 PSI, and that the passenger system is in AUTO.

Circuit Breakers **CHECKED**

Verify that all operative equipment circuit breakers are in.

Gyro Slave Switches **AUTO**

Check both the left and right gyro slave switches are in AUTO.

Standby Attitude Indicator **TESTED/ON/CAGED**

Handle the attitude indicator caging mechanism gently to prevent damage. Turn the standby attitude indicator switch ON. Uncage the indicator and verify that no OFF flag is visible. Move the indicator switch to TEST and observe that the test light illuminates, then move the switch to TEST and observe that the test light illuminates, then move the switch back to ON and cage the attitude indicator.

NOTE: Leave the standby attitude indicator on to arm the AHRS auxiliary power battery pack (**unit 179 and subsequent and aircraft with SPZ-8000 Digital Automatic Flight Control System**).

Emergency Light Switch **ARMED**

Battery Switch EMER

Check that emergency items receive power.

Battery Switch BATT/VOLTS (1 AND 2) CHECKED

Check for a minimum of 24V on the voltmeter. Move the battery disconnect switch alternately to 1 and 2 and observe individual battery voltages.

Parking Brake SET/PRESSURE CHECKED

If APU hydraulic pressure is not available, turn the AUX hydraulic switch to ON and check the hydraulic pressure gage for pressure. Set the parking brake by applying pressure to the top of the rudder pedals and pulling up on the parking brake handle at the aft end of the center pedestal. Turn the AUX hydraulic switch OFF, if used.

Ground Power ON

Connect the ground power unit, if applicable. Ensure the voltmeter reads 28V.

Ground Recognition Light ON

Turn on the recognition light to advise that the engines are about to be started.

Environmental Control Panel SET

Set all switches to the 12 o'clock position or as desired.

ENG BLD AIR (L/R) ON

ISOL VALVE SHUT

CKPT and CAB PACs ON

Select PACs OFF when operating at airports at or above 12,000 ft.

CKPT and CAB TEMP SEL NORMAL RANGE

If APU is to be used for Engine Start:

APU **STARTED**

Use manufacturer's supplemental information for start procedures depending on APU installation, start techniques and procedures may vary.

Hydraulic Pressure **CHECKED**

If installed, ensure APU hydraulic pump output equals 2,900 to 3,100 PSI on the hydraulic pressure indicator.

Environmental Control Panel **SET**

Set the control panel as desired to use the APU bleed air for heating or cooling as necessary. APU is often more efficient for environmental control because of the increased volume.

APU Bleed Air Valve **OPENED/CLOSED**

If desired, open the APU bleed air valve to allow the APU air into the vessel.

W/S Ice Detect Lights CHECKED

Verify on and unobstructed. The day/night dim switch must be ON to test this light.

Fuel Totalizer/Quantity CHECKED/SET

Check fuel quantity on the fuel gage.

Set aircraft weight on the totalizer by pushing the left switch down to the GW position and inserting the gross weight with the knob to the right of the switches.

Fuel Temperature CHECKED

Check that fuel temperature is within limits for the type fuel aboard.

Ignition NORMAL

Check that left and right ignition switches are set to NORMAL. Activation occurs on engine start when the start button is pressed and the throttle is out of cutoff.

Generator Switches ON (OFF FOR GPU START)

Place the generator switches in the following positions depending on engine start.

Battery Start and Cross Generator Start GEN

External Power for Both Engine Starts OFF

APU for Both Engines OFF

Some APU generators can be used with aircraft generators.

Anti-Skid ON

Fuel Switches CHECKED/SET

Check operation of the wing fuel transfer by moving the transfer switch alternately left and right and observing the WING FUEL XFER OPEN light and appropriate boost pump light for illumination when selected. Check that the fuselage transfer switch is OFF. Check that the LH and RH FUEL BOOST pump switches are in NORMAL.

Fuel Computers NORMAL

Check the LH and RH FUEL COMP switches are selected to NORMAL for starting engine in the normal mode.

Avionics (and inverters on units 001 to 178) ON

Turn the avionics and inverters ON. They are checked when the gyros spin up. For **units 179 to 199; 203 to 206**, the avionics master switch controls the DC avionics and the AC inverters.

TOLD Card/Bugs COMPLETED/SET

Refer to Flight Planning chapter for explanation of proper TOLD card preparation.

Rudder Bias TESTED/NORM

Hold the rudder bias switch in test and observe that the RUDDER BIAS HTR gage on pilot's left instrument panel reads 7 amps minimum.

Passenger Advisory Lights PASS SAFE

The PASS SAFE position illuminates the NO SMOKING, FASTEN SEAT BELT and EXIT signs in the cabin.

Warning Systems CHECKED

Check the warning system indicators by turning the rotary selector switch to the respective position.

Selector ROTATE

SMOKE FIRE WARN:

LH/RH Eng Fire Lights ON

Fire Bell SOUNDS FOR 3 SECONDS

Smoke Detect Light ON

Master Warning Lights ON

Fire Detect Fail Light ON

LDG GR:

Green Safe Lights (3) ON

Red Unlocked Light ON

Warning Horn SOUNDS

BATT TEMP:

BATT O'TEMP 1/2 Annunciators FLASH
Master Warning Lights ON
Opt Bat Temp Gage Lights ON
Opt Bat Temp Gage -188

ENG INSTR:

LH/RH Ignitor Lights ON
Digital Turbine Speed Indicator 88.8
Red/Green Lights ON

TRIM/FLAP:

Flap INOP/O'HT Light ON/OFF
No Takeoff Warning Horn SOUNDS

PR TRIM FAIL Light ON

It may be necessary to actuate the primary trim momentarily to arm the system.

Master Warning Lights ON
The warning lights may be cancelled.

W/S TEMP:

W/S AIR Annunciator ON

On **units 001 to 188 (except 183) with SB650-30-08; 183; and 189 and subsequent**, the W/S AIR annunciator does not illuminate; the W/S O'HT and master warning lights illuminate. The master warning may be cancelled.

OVER SPD:

V_{MO}/M_{MO} Warning Horns SOUND

TAS/SAT/TAT Indicator
(if installed) 466 KTS/-45°C/-16°C

AOA/THU REV:

- L/R T/R ARM, UNLOCK, DEPLOY Lights ON
- Master Warning Lights ON
The warning lights may be cancelled.
- Stall Warning Light ON
- Flap SPD BK/SP and AOA Probe Lights ON
- Angle-of-Attack/FD OFF Flaps APPEAR
Angle-of-Attack pointer slews to approximately 0 scale and pauses.
- Flap SPD BK/SP, AOA Probe and Stall Warning . . . OFF
- Angle-of-Attack/Flight Director Flags DISAPPEAR
- Fast/Slow Indicator FAST
Indicator pointer moves up scale. At approximately 0.75, the stick shakers operate. Pointer continues to 1.0.
- Fast/Slow Indicator SLOW
- Indicator OFF Flag APPEARS
The OFF flag disappears and the pointer returns through zero to its position before the test.

ANNU:

- All Annunciators ON
- Master Warning Lights ON
Master warning lights will not cancel.

When Both Avionic Power Switches Are On:

- Altitude Alert Horn SOUNDS
- Altitude Alert/Flight Director Lights ON

OFF:

Red Light OFF
The TEST light extinguishes when the selector returns to OFF.

Avionics and Inverters TESTED/SET

Test and set radios, NAVs, and flight instruments. For **Citation III units 001 to 178 and Citation VI**, check inverter auto changeover by moving the inverter test switch alternately to INV 1 and INV 2 and checking that the appropriate inverter fail light illuminates; the failed side continues to receive power. For **Citation III units 179 to 199; 203 to 206**, move the manual crossover switch from NORM to 2 to 1 and 1 to 2 and check that the inverter fail light illuminates on the failed side; no power should be lost. Return to NORM.

EFIS TEST – SPZ 8000 System:

Warning System TEST Switch ANNUN

Verify the following lights illuminate:

- CMPTR WARN
- AHRS BASIC – AHRS AUX PWR
- EFIS FAN FMS1 SX/FMS2 SX
- AP OFF – YD OFF
- six triangle-shaped lights on the GC-810.

Warning System TEST Switch OFF

EFIS TEST Button PUSH

Verify flags, cautions, and flight director command bars are presented and that radio altimeter tests to 50 ft for Collins or 100 ft for Honeywell.

EFIS TEST Button RELEASE

EFIS TEST – SPZ 650 System with Honeywell EFIS Display:

EFIS TEST Button PUSH

Verify the following:

- Radio altimeter tests on both the pilot’s and copilot’s displays (100 ft for Honeywell radio altimeter, 50 ft for the Collins radio altimeter).
- All digital readouts are replaced with dashes (except radio altimeter).
- All flags are in view.
- Command cue (if selected) is bias from view.
- Check comparator monitor for illuminated ATT, HDG, and ILS lights. Both NAV receivers must be tuned to a localizer frequency.
- Test PASS light illuminates in upper corner of EADI.

Windshield Defog Fan ON/CHECKED/OFF

Verify airflow from fan.

Pressurization Panel CHECKED/SET

AUTO SCHED or ALTITUDE SELECT AS DESIRED

MAN/NORM MAN THEN NORM

The pressurization system conducts a system self-test. A FAULT light illuminates and then extinguishes in approximately two seconds to verify system is functional.

Pressurization SET

If using AUTO SCHED, set landing field elevation, altimeter setting and cabin rate of change on the “pip” mark. If using ALTITUDE SELECT, select the cabin altitude desired for flight.

Expanded Normal Procedures

Cabin Altitude Warning Horns CHECK
Check the cabin altitude warning horns by pressing the TEST/MUTE button on the cockpit center pedestal. This verifies warning horn operation. A beat frequency indicates that both horns are activated.

Speedbrake/Spoiler System CHECKED

With APU hydraulic pressure available, the speedbrake/spoiler system and aileron boost may be checked prior to engine start.

Speedbrake Lever FULL AFT
Speedbrakes Indicator 100%
SPEED BRAKE Annunciator ON
Speedbrakes (4) VERIFY UP
Spoiler Lever UP
SPOILERS UP Lights ON
SPOILERS UP Annunciator ON
Speedbrakes/Spoilers (8) VERIFY UP
Spoiler Hold Down ON
SPOILERS UP Lights OFF
Speedbrake Indicator ZERO
SPOILER HOLD DOWN Annunciator ON
SPOILERS UP Annunciator OFF
SPEED BRAKE Annunciator OFF
Speedbrakes/Spoilers VERIFY DOWN
Auxiliary Hydraulic Pump NORM
Aux Hyd Pump On or Aux Hyd Press Light ON
Left/Right Roll Control Spoilers UP

Auxiliary Hydraulic Pump OFF
Aux Hyd Pump On or Aux Hyd Press Light OFF
Left/Right Roll Control Spoilers DOWN
Spoiler Hold Down OFF
SPOILERS UP Lights ON
Speedbrake Indicator 100%
SPOILER HOLD DOWN Annunciator OFF
SPOILERS UP Annunciator ON
SPEED BRAKE Annunciator ON
Speedbrakes/Spoilers (8) UP
Spoiler Lever DOWN
Speedbrake Lever FULL FORWARD
SPOILERS UP Light OFF
Speedbrake Indicator ZERO
SPOILERS UP Annunciator OFF
SPEED BRAKE Annunciator OFF
Speedbrakes/Spoilers (8) VERIFY DOWN
Aileron Boost CHECKED/ON
Aileron Boost Switch RESET, THEN ON
AIL BOOST OFF Annunciator ON
Aileron Boost VERIFY NO HYDRAULIC BOOST

Expanded Normal Procedures

Pilot's Control Wheel POSITION AND HOLD/
VERIFY/RELEASE AND NEUTRALIZE

Position and hold the pilot's control wheel; it should travel fully against the left or right roll stop. Verify that the appropriate aileron and roll control spoiler is up. Release the control wheel and allow it to return to the neutral position. Verify left/right ailerons are approximately centered and left and right roll control spoilers are down.

AIL BOOST Switch RESET/ON

AIL BOOST OFF Annunciator OFF

If the aileron boost system does not turn on, and the AIL BOOST OFF annunciator remains illuminated, repeat steps starting with the pilot's control wheel position/hold.

AIL BOOST Switch OFF

A one-second aural tone should sound. Check AIL BOOST OFF annunciator illuminates.

AIL BOOST Switch ON

Check AIL BOOST OFF annunciator extinguishes.

Auxiliary Hydraulic Power NORM

Place the AUX HYD PWR switch to NORM after checks are complete.

Engine Sync OFF

Ensure switch is in OFF for engine start.

Flaps CHECKED/SET

Observe flap indicator as flaps are set to T.O. setting.

Throttles CUTOFF

Secondary and Primary Trim CHECKED/SET

Secondary Trim Check:

Secondary Trim Switch ON

Lift guarded cover and move switch to ON.

Primary Trim Fail Light ON

Master Warning Light ON

The SEC TRIM FAULT annunciator may also illuminate.
Engage secondary trim momentarily to extinguish.

Master Warning PUSH TO CANCEL

Left Half of Switch ENGAGE

Engage nose-up and then nose-down. Verify stabilizer does not move.

Left Half of Switch DISENGAGE

Right Half of Switch . . . REPEAT SAME AS LEFT HALF

Entire Switch ENGAGE

- Verify movement to nose-up and then nose-down.
- Stabilizer should follow trim commands.
- Verify trim audio clacker sounds approximately one second after initiating the trim.

Secondary Trim Switch DISENGAGE

Close the guarded cover.

Primary Trim Check:

Check copilot's wheel and then pilot's wheel.

Left Half of Switch ENGAGE

- Engage nose-up then nose-down.
- Verify by the indicator that stabilizer does not move.

Expanded Normal Procedures

Left Half of Switch DISENGAGE

Right Half of Switch . . . REPEAT SAME AS LEFT HALF

Entire Switch ENGAGE

- Engage nose-up then nose-down.
- Stabilizer should follow the trim command.
- Verify trim auto clacker sounds approximately one second after initiating the trim.

AP/TRIM/NWS Disconnect Button . . . DEPRESS/HOLD
Verify primary trim stops.

AP/TRIM/NWS Disconnect Button RELEASE
Ensure the primary trim starts to run.

Primary Trim Switch DISENGAGE
Repeat check on pilot's side. Observe warning.

WARNING: If the trim continues to move or the clacker continues to sound after disengagement, the primary trim system has failed.

Pilot Side REPEAT

Primary Trim Switch SET TAKEOFF TRIM
Verify primary trim fail light extinguishes.

Trim THREE SET
Visually check all three trim indicators are set for takeoff.

Starting Engines

Preflight Inspection COMPLETED

The area behind the aircraft should be cleared and engine inlets inspected for foreign objects.

Cabin Door CLOSED/LOCKED

Check that the 11 green alignment indicators are in position and the DOOR UNLOCKED annunciator is out.

Passenger Briefing COMPLETED

According to FAR Part 91.519 requirements, the pilot-in-command or a crewmember briefs the passengers on smoking, use of safety belts, location and operation of the passenger entry door and emergency exits, location and use of survival equipment, and normal and emergency use of oxygen equipment. For flights over water, the briefing should include ditching procedures and use of flotation equipment.

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

Seats, Belts, and Pedals ADJUSTED/SECURED

APU Bleed Air Valve CLOSED

Close valve to APU starts to remove APU bleed air due to load on APU.

Isolation Valve CLOSED

This is for APU starts.

Avionics and Inverter Switches OFF

Radios and inverters should be OFF to prevent the possibility of equipment damage from voltage variances during engine start.

Engine Instruments CHECKED

The engine instrument warning indicators should not be showing.

NOTE: If the aircraft is cold soaked below -18°C (dual battery installation) or 0°C (single battery installation), pre-heat the engines prior to engine start. Use of a ground external power unit or the onboard auxiliary power unit is also recommended. With the use of the onboard auxiliary power unit, allow the generator output to decrease below 50A before starting the aircraft engine.

Engines STARTED

The first engine start may be left or right; however, during boarding or deplaning, the left engine should not be operating.

ENGINE START Button PRESS MOMENTARILY

With the ENGINE START button momentarily depressed, the START button and engine instrument floodlights illuminate. This also activates the fuel boost pump and the respective FUEL BOOST ON annunciator; engine rotation commences.

Above 10% N₂, N₁ rotation should occur.

Throttle IDLE

Take the throttle out of cutoff when turbine RPM (N₂) is greater than 10%, with indication of fan RPM (N₁) rotation.

The illumination of the ITT gage green ignition light indicates that 28V DC is present at the ignition unit.

Engine Instruments MONITOR

ITT CHECK FOR RISE

If no rise within 10 seconds or if approaching 890°C, abort start.

Oil Pressure CHECK FOR INDICATION
Indication should occur within 10 seconds after engine light-off.

At 20% N₂:

N₁ CHECK FOR INCREASING ROTATION

If No N₁ Increase ABORT START

If engine increases speed rapidly during start, at idle, or at any steady state setting without throttle movement, shut engine down.

At Approximately 48% N₂:

Ignition Lights OFF

FUEL BOOST ON Annunciator OFF

Start Button Light OFF

Engine Instruments CHECK

Hydraulic Pressure CHECK (2,900 PSI MINIMUM)

The hydraulic pressure may be in the yellow arc during single-engine ground operation when turbine (N₂) RPM is below 65%.

Hydraulic Pressure Low Light for Operating Engine OFF

Generator Light OFF

If starting with the generator switches OFF, the annunciator remains illuminated.

If Cross Generator Starting Second Engine:

Operating Engine SET 61% N₂

Generator GEN

It is recommended that the generator amperage be less than 200A prior to starting second engine.

Expanded Normal Procedures

Starting Second Engine:

Other Engine START

Repeat engine start procedures beginning with ENGINE START button.

If GPU or APU Used for Start:

Generators GEN

Hydraulic Pressure CHECKED

Pressure should be 2,900 PSI minimum.

Before Taxi

Ground Power Unit (if applicable) DISCONNECTED

Verify GPU unit is clear and will not interfere with aircraft.

APU OFF

DC Amps and Volts CHECKED

Battery Switch OFF/CHECK VOLTAGE DROP/BATT

Turn the BATT switch to OFF and observe 24V minimum on the voltmeter with the voltage select switch in BATT position. Turn the BATT switch back to BATT.

Generators CHECK

Alternately select the left and right generators to OFF and back to ON. In OFF, check the voltage of the OFF generator with the voltage select switch and note that the operating generator assumes the load on the ammeter. When the select switch is in BATT, the voltmeter reads bus voltage of the ON generator. Both generators should read 28V in the ON or OFF position.

**Avionics (and Inverter Switches
on Units 001 to 178) ON**

Auto Temp AS DESIRED

Select desired temperature on the environmental panel.

Emergency Pressurization CHECKED

Throttles IDLE

Left Engine Bleed Switch EMER
The LH EMER PRESS ON annunciator illuminates. Ensure emergency bleed air valve is open (audible).

Left Engine Bleed Switch ON
The LH EMER PRESS ON annunciator extinguishes and the emergency bleed airflow stops.

Right Engine Bleed Switch REPEAT STEPS
USED FOR LH

Cockpit Auxiliary Heater CHECKED AND OFF

Fan/Heat Switch HI
Verify there is a minimum of a 50-amp load increase per generator. Verify increased airflow is present.

Fan/Heat Switch OFF

Ground Idle NORMAL

Fuel Control Man Governors . . CHECKED AND NORMAL

If engine accelerates uncontrollably, switch computer immediately back to NORM and shut engine down.

LH FUEL COMP Switch MAN
Check for a change in idle N_1 RPM.

Left Throttle ADVANCE
Check for an increase in the N_2 RPM; if no change, shut engine down.

LH FUEL COMP Switch NORM

RH FUEL COMP Switch REPEAT STEPS USED
FOR LH

Speedbrake/Spoiler System CHECKED

Perform check if not already accomplished in Before Starting Engines check.

Aileron Boost CHECKED AND ON

Perform check if not already accomplished in Before Starting Engines check.

AUX HYD PWR Switch NORMAL

Autopilot (Except SPZ 8000) CHECKED

Stabilizer Trim ACTUATE

Momentarily actuate either primary trim switch in either direction to engage the trim clutch.

TEST EACH FLT Button PRESS/HOLD

AUTOPILOT OFF and AP TORQUE Lights ON

Warning Horn SOUNDS

VG PITCH and VG ROLL Lights ON

TEST EACH FLT Button RELEASE

Autopilot ENGAGE

Verify proper response from control column and wheel during pitch wheel command and turn knob command. (Manual turn knob is not available on **aircraft with SPZ 8000**).

Autopilot DISENGAGE

AUTOPILOT OFF Light ON

Warning Horn SOUNDS

Nosewheel Steering ON

Check for an illuminated green ON light on the NOSEWHL STEERING switch.

Taxi

CAUTION: On aircraft with AHRS, movement of the aircraft is prohibited prior to completion of the AHRS ground alignment, which is approximately three minutes.

NOTE: Momentary positioning of the VERT GYRO switch to the FAST position displays the AHRS Time-to-Align on the EHSI. The compass card serves as the clock, with 180° being equal to three minutes, 0° being equal to zero seconds, and each degree representing one second.

Brakes CHECKED

Check the pilot's and copilot's brake pedals to verify brake action.

Nosewheel Steering CHECKED

Check nosewheel tiller and rudder pedals for operation.

Thrust Reversers CHECKED

Thrust Reverser Levers DEPLOY
Verify the ARM, UNLOCK, DEPLOY, and RUDDER BIAS annunciators illuminate.

STOW Switches EMER
Verify the DEPLOY, UNLOCK, and RUDDER BIAS lights extinguish and the ARM annunciator remains illuminated.

Thrust Reverser Levers STOW
The ARM lights remain illuminated.

Stow Switches NORM
Verify the ARM lights extinguish.

Flight Instruments CHECKED/SET

Airspeed Indicator ZERO

Vertical Gyro/ADI ERECT/NO FLAG

Turn-and-Bank Indicators PROPER INDICATIONS

Altimeters SET

Vertical Speed Indicators ZERO

Horizontal Situation Indicator NO FLAG

Radio Magnetic Indicators/HSI/
Compasses VERIFY INDICATIONS/
FREE TURNING

APR (if installed) CHECK

Both Throttles IDLE

APR ARM/DISARM Switch PUSH

Verify APR ARM light illuminates.

Throttle ADVANCE ONE ENGINE
5 TO 10% ABOVE IDLE SPEED

Verify that APR ON light illuminates.

Both Throttles IDLE

APR ARM/DISARM Switch PUSH

Verify that both left and right N₂ speeds decrease approximately one percent. The APR ARM and APR ON lights extinguish.

Before Takeoff

Trim 3 SET

Set the aileron and rudder to zero. Set stabilizer to takeoff setting (see Flight Planning chapter).

Flaps SET FOR TAKEOFF

Check the flap indicator for proper takeoff flap setting.

NOTE: If the flap handle is not positioned to a detent, the system will show FLAPS INOP. Position the flap handle to the respective detent and reset the flap system (**units 001 to 206 with SB650-27-37 or 27-39**).

NOTE: SB650-27-37; DC Flap System Installation for Service Test Airplanes (**units 97, 108, 127, 150, 162, and 219**).

SB65-27-39; DC Flaps System Installation (**units 001 to 199 and 203 to 206 without SB650-27-37**).

Control Lock OFF

In windy conditions, control locks may be engaged with nose-wheel steering (tiller) and limited throttle control available.

Flight Controls FREE

Check that all controls are free, correct, and have full travel.

Anti-Ice CHECKED/AS REQUIRED

Windshield Alcohol ON/OFF

Verify fluid flow before switching to switch OFF.

W/S BLD Switch LOW

Windshield Manual Valves MAX

- Listen for airflow.
- Verify W/S AIR annunciator illuminates (except on **units 183, 189 and subsequent, aircraft with SB650-30-08**).
- The windshield bleed air nozzles must be free of water before flight to prevent inflight freezing that could prevent needed air flow. After rain exposure or washing the aircraft, increase power to purge the nozzles of moisture and ensure adequate flow.

W/S BLD Switch OFF

Windshield Manual Valves OFF

Wing Anti-Ice LH/RH ON

- Check for a minimum of 10° ITT rise on each engine.
- Verify wing ANTI-ICE LH/RH lights illuminate.

Wing Anti-Ice LH/RH OFF

Engine Anti-Ice LH/RH ON

- Check for a rise on the DC ammeters.
- Check for a minimum of 10° ITT rise on each engine.
- Verify engine anti-ice LH/RH lights illuminate.
- Verify ignition lights illuminate.

Engine Anti-Ice LH/RH OFF

Stabilizer Deice LH/RH TEST

- Check that the STAB DE-ICE LH/RH lights illuminate.
- Verify ammeters indicate in the green arcs.
- Verify LH/RH volts are in the green arc.

Stabilizer Deice LH/RH OFF

Anti-Ice Systems AS REQUIRED

Expanded Normal Procedures

- Check OAT versus RAT. Turn on anti-ice when operating in visible moisture and ram air temperature (RAT) is between +10 and -30°C.
- Use anti-ice when on the ground if OAT is between +10 and -30°C and the temperature dew point spread is less than 4°C.

Avionics CHECKED

Set flight instruments and bearing pointers as desired. Tune the COMM/NAV/ADF radios to required frequency. Set VNAV controller. Set transponder to STBY. On **aircraft equipped with SPZ 8000 AFCS**, verify no flags in EADI and EADI displays.

Engine Instruments CHECKED

Fuel Quantity CHECKED

The minimum fuel load for takeoff is 350 lbs per wing tank.

Standby Attitude Indicator UNCAGED

APR ARM/DISARM Switch (if installed) PUSH

Verify APR ARM light illuminates.

NOTE: If APR ON light illuminates, verify that turbine speeds (N₂) are within 5%. Push APR ARM/DISARM switch to reset the system; verify APR ON light extinguishes.

If APR system is activated by manually pushing the APR ON switch, pushing the APR ON and APR ARM/DISARM switches disarms the system.

T.O. Data CONFIRMED

See Flight Planning chapter.

Crew Briefing COMPLETED

See Standard Operating Procedures chapter.

Takeoff

Transponder ON

Turn transponder from STBY to ON with the assigned code.

Ignition ON

Turn on the ignition to help preclude a flameout in case of foreign object/water ingestion. Verify the ignition lights illuminate.

Strobe and Exterior Lights ON

Anti-Ice OFF/ON

RAT and Pitot/Static Heat ON

Annunciator Panel NORMAL

The GROUND IDLE annunciator extinguishes when landing gear squat switches open at takeoff. The PAC HP VLV OPEN annunciators extinguish when one or both throttles are above the 55% N₁ setting (sea level).

Climb

Gear UP

With a positive rate-of-climb established, pull the gear handle out and place in the UP position. The green gear down lights (LH/NO/RH) extinguish with the unlocking of the gear downlocks. The red UNLOCK light illuminates until the gear reaches the up-and-locked position. Gear transit takes approximately six seconds.

CAUTION: Extreme transient pressures may be produced inside the main landing gear actuators if improper cycling of the landing gear is accomplished. If one or more gear is extended, ensure that gear control handle is set to DN before engaging the gear control CB. If gear control handle is set to UP when electrical power is applied (engaging CB), damage to actuator may occur.

Yaw Damper ON

Ensure pilot-in-command is aware that flight control inputs, such as yaw damper, are being engaged.

Flaps UP

Upon reaching a safe altitude and a minimum airspeed of $V_2 + 25$ KIAS with wings level, push the flap handle in and move it full forward to the UP detent. Observe the flap position indicator to the left of the handle moves to FLAPS UP.

Airspeed in excess of the minimum retraction airspeed accentuates the pitch change during retraction.

NOTE: If the flap handle is not positioned to a detent, the system will show FLAPS INOP. Position the flap handle to the respective detent and reset the flap system (**units 001 to 206 with SB650-27-37 or 27-39**).

NOTE: SB650-27-37; DC Flap System Installation for Service Test Airplanes (**units 97, 108, 127, 150, 162, and 219**).

SB65-27-39; DC Flaps System Installation (**units 001 to 199 and 203 to 206 without SB650-27-37**).

APR ARM/DISARM Switch (if installed) PUSH

Verify APR ARM light extinguishes.

Engine Sync OFF/FAN/TURB

The left engine is the master; adjust right throttle until pointer is close to the left engine RPM before selecting FAN or TURB.

Climb Power SET

Check climb power setting chart for proper RPM versus altitude and temperature. Do not exceed 890°C ITT. Adjust throttle as necessary. Use of engine anti-ice reduces allowable fan speed and dictates close monitoring of ITT and RPM limits.

Pressurization CHECKED

Check cabin altitude, cabin rate of climb, and differential pressure indicators for proper pressure schedule. For operations from airports at or above 12,000 ft, turn on the cabin/cockpit PAC. (See Before Landing Checklist).

When cabin altitude decreases to less than 12,000 ft, turn passenger oxygen to AUTO.

NOTE: For airports above 12,000 ft, the cabin will initially pressurize at a rate greater than 3,000 FPM until the cabin altitude comes into the range of the pressurization controller (approximately 10,000 ft cabin altitude).

Baggage Heater OFF/ON

Observe generator load limits when operating the baggage heaters.

Passenger Advisory Lights AS REQUIRED

Selecting the passenger advisory light switch to SEAT BELT leaves the cabin advisory light illuminated and extinguishes the NO SMOKING and emergency EXIT lights.

Ignition NORMAL

Fuselage Fuel Transfer OFF/ON

- Do not start fuel transfer until fuel in each wing tank is approximately 2,900 lbs.
- Start fuel transfer at or prior to wing fuel quantity reaching 2,500 lbs per side (5,000 lbs total).
- Switch on transfer pumps prior to 30,000 ft.

Altimeters SET (TRANSITION LVL)

Set the altimeters to 29.92 at the transition altitude and crosscheck.

Recognition Lights OFF

Do not operate the anti-collision lights in conditions of fog, clouds, or haze, because the light beam reflection may cause disorientation or vertigo.

Cruise

Thrust SET

Upon reaching level flight, climb thrust can be maintained until the desired cruise airspeed is achieved; the thrust can then be adjusted to maintain the airspeed obtained from the AFM.

If engine RPM does not automatically synchronize at the desired cruise setting, turn off the engine synchronizer, synchronize the engines with the throttles, and turn the synchronizer switch back to FAN or TURB.

Avoid severe turbulence but, if encountered, turn on ignitors, and maintain airspeed at approximately 200 KIAS or 0.75 Mach, whichever is less.

Pressurization CHECKED

Verify the pressurization system is maintaining the selected pressurization schedule.

Fuselage Fuel Transfer OFF (XFER COMP)

The FUS TANK LOW annunciator illuminates at the end of fuel transfer and the FUS TANK FUEL PUMP 1 and 2 annunciators extinguish when the pumps automatically stop. The FUS TANK LOW annunciator extinguishes when the FUS FUEL XFER switch is turned OFF.

Oxygen Masks AS REQUIRED

Descent

Defog Fan AS REQUIRED

- Position windshield defog control (**units 179 and subsequent**) to NORM 30 minutes prior to descent.
- Select the HI position on defog fan switch 15 minutes prior to descent or 30 minutes prior to descent into high humidity conditions.
- Turn windshield anti-ice ON 30 minutes prior to descent.
- Select 75° or warmer on the cockpit PAC.
- Turn the auxiliary heater ON if windshield starts to fog over.

Windshield Bleed Air AS REQUIRED

Turn windshield bleed air valves to MAX.

Pressurization CHECKED AND SET

Select altitude of destination and field barometric pressure on the pressurization controller.

Anti-Ice AS REQUIRED

With evidence of icing on descent, maintain sufficient power for anti-icing.

Turn on all anti-ice systems when operating in visible moisture and the ram air temperature is between +10 and -30°C. Under extreme conditions, airframe ice may form between +10 and -40°C outside air temperature (static air temperature).

To reduce the time requirement for the thermal bleed air anti-ice systems to reach operating temperature, it is recommended that they be turned on prior to reducing engine power for descent.

Keep engine power above flight idle to keep the wing, windshield, and engine anti-ice lights extinguished.

Oxygen Masks STOWED

TOLD Card/Bugs COMPLETED AND SET

Set the V_{REF} , V_{AC} , (V_{APP}), V_{FR} ($V_{REF} + 25$ KIAS), V_{ZF} ($V_{REF} + 40$ KIAS), and N_1 speeds. Brief crew on expected approach. (See Standard Operating Procedures chapter).

Altimeters SET (TRANSITION LVL)

Set altimeters at transition level and crosscheck.

Recognition Lights ON

Approach

Avionics and Flight Instruments . . . CHECKED AND SET

Fuel Transfer (Wing and Fuselage) OFF

Exterior Lights AS REQUIRED

Engine Sync OFF

Before Landing

When landing at airports above 8,000 ft, turn off the passenger oxygen prior to cabin altitude reaching 12,000 ft, and turn the cabin/cockpit PACs OFF. To reduce the depressurization transient, first increase cabin altitude.

Flaps AS REQUIRED

Flaps may be extended to 7° or 20° below 210 KIAS. Check indicator to verify position.

Ignition ON

Turning the ignition ON may preclude flameout due to a bird strike or other foreign object ingestion during approach and landing.

Passenger Advisory Lights PASS SAFE

Illuminate the NO SMOKING, FASTEN SEAT BELT, and EMERGENCY EXIT signs.

Gear DOWN

Pull gear handle out and place to DOWN position to extend landing gear. The red UNLOCK light illuminates while the gear is extending. Check for the three green gear down lights. The gear down lights illuminate and the UNLOCK light extinguishes when the gear is full down.

Maximum Landing Gear
Operating Speed (V_{LO}) 210 KIAS

Maximum Gear Extended Speed (V_{LE}) 210 KIAS

Nosewheel Steering ARMED

Depress the nosewheel steering switch to arm and verify the ARMED light is on.

Annunciator Panel CHECK

Expanded Normal Procedures

Flaps LDG FLAP SCHEDULE

Flaps may be extended to 20° below 210 KIAS or to FULL below 170 KIAS. Verify position on the indicator.

Autopilot and Yaw Damper OFF

After Landing

It is recommended the checklist be delayed until the aircraft is clear of the runway.

Nosewheel Steering **ON**

Verify the nosewheel steering light ON is illuminated.

Flaps **UP**

Do not retract flaps to UP after landing on runways covered with snow or slush until flap tracks have been inspected and found free of any snow or slush accumulation.

Thrust Reversers **STOWED**

CAUTION: Do not advance throttles until the thrust reverser UNLOCK lights extinguish.

Spoilers/Speedbrakes **RETRACTED**

Anti-Ice **OFF**

Windshield Bleed Air **AS REQUIRED**

In humid conditions, leave windshield anti-ice ON, increase engine power as required for external defogging, and close copilot's windshield bleed air valve for improved pilot's external defogging.

Landing and Strobe Lights **OFF**

Ignition **NORMAL**

Baggage Heater **OFF**

Expanded Normal Procedures

Control Lock AS REQUIRED

With strong or gusty wind conditions, it is advisable to lock the flight controls during taxi.

Cockpit Auxiliary Heater OFF/COOL

Turn off cockpit auxiliary heater and allow to cool for at least two minutes before turning off the battery during shutdown.

Ground APU Start (Ground Use Only)

If APU FAIL light is illuminated, do not attempt APU start.

Aircraft Generator(s) (if applicable) GEN

BATT Switch OFF

Check for a minimum of 24V from the battery.

APU Master Switch ON

APU FAIL Light VERIFIED OFF

APU Test Button DEPRESSED/VERIFIED

Depress the test button; the fire bell sounds and the following lights illuminate:

- Fire warning
- APU FAIL
- APU RELAY ENGAGED
- BLEED VAL OPEN
- READY TO LOAD.

APU Test Button RELEASED

APU Generator OFF

APU Bleed Air Valve Switch CLOSED

APU START/STOP Switch STARTED

Actuate the start switch momentarily and release.

APU RELAY ENGAGED Light ON

The light illuminates, then extinguishes prior to illumination of the READY TO LOAD light.

READY TO LOAD Light ON

BATT Switch BATT

START is complete.

Ground or Inflight APU Start

With main generators on and operating, the main engine start lights illuminate when starting the auxiliary power unit on the ground. In flight, only the battery provides starter power.

Right Engine Fuel Boost Pump

(Unit 179 and Subsequent) ON

APU STRTR DISENGAGE Switch . . . VERIFIED NORMAL

APU Master Switch ON

APU FAIL Light VERIFIED OFF

APU Test Button DEPRESSED

Depress the test button; the fire bell sounds and the following lights illuminate:

- Fire warning
- APU FAIL
- APU RELAY ENGAGED
- BLEED VAL OPEN
- READY TO LOAD

APU Test Button RELEASED

APU Generator OFF

With one or both main generators operating above idle RPM, the APU generator does not provide current to the DC bus. No amperage is indicated on the APU ammeter, and the APU relay engaged light is extinguished. This mode of operation is the generator standby mode.

The APU generator is automatically current-limited for approximately three minutes after starting the APU or either main engine.

APU Bleed Air Valve Switch CLOSED

APU START/STOP Button STARTED

Depress start button only momentarily and release.

APU RELAY ENGAGED Light ON

The light illuminates, then extinguishes prior to illumination of the READY TO LOAD light.

READY TO LOAD Light ON

This light illuminates when APU start is complete.

APU Generator RESET THEN ON

For **unit 179 and subsequent**, set to ON.

APU Ammeter CHECKED

150 amps maximum.

APU Bleed Air Valve Switch OPEN AS DESIRED

Right Engine Fuel Boost Pump

(On Unit 179 and Subsequent) NORM

PAC Isolation Valve OPEN

Normal maximum RPM speed and EGT are 103% RPM and 688°C.

APU Electrical and Bleed Air Operation

- READY TO LOAD Light VERIFIED ON**
- APU Generator ON**
- APU RELAY ENGAGED Light ILLUMINATED**
- Battery DC Volts and APU Amperes CHECKED**
- Hydraulic Pressure CHECKED**
Pressure should be 2,900 to 3,100 PSI; HYD PRESS LOW
RH annunciator is extinguished.
- Temperature Select Switches AS DESIRED**
Manual hot temperature control may cause the air distribution
ducts to overheat and illuminate the DUCT O'HEAT lights.
- PAC Select Switches ON**
- Isolation Valve OPEN**
- Engine Bleed Air Switches ON**
- APU Bleed Air Valve Switches AS DESIRED**

Shutdown

NOTE: If the brakes are hot, do not set parking brake.

Parking Brake SET

Pressing both brake pedals down and pulling up on the parking brake handle on the center pedestal sets the parking brakes. Do not leave the aircraft unattended without chocks or the parking brake set.

Standby Attitude Indicator OFF AND CAGED

Cage the indicator by pulling the knob and rotating it clockwise.

Emergency Light Switch OFF

**Avionics (and Inverter Switches
on units 001 to 178) OFF**

Passenger Advisory Lights OFF

Aux Hydraulic Pump OFF

Windshield Bleed Air OFF

Defog Fan OFF

Throttles OFF

Throttles are positioned to OFF after two minutes of being below 38% fan (N₁) RPM. This allows temperatures in the engine to stabilize prior to shutdown.

APU Bleed Air Valve CLOSED

APU Generator OFF

Expanded Normal Procedures

APU	SHUT DOWN
APU Generator	OFF
APU Relay Engage Light	OFF
APU Start/Stop Switch	STOP
Depress only momentarily.	
APU Master Switch	OFF
Isolation Valve	SHUT
PAC Select Switches	AS DESIRED
Environmental Control Panel	SET
Exterior Lights	OFF
Battery Switch	OFF
Position the battery switch to the center (OFF) position. Exercise care not to place the switch in EMER. Most Emergency bus items drain the battery significantly over an extended period of time.	
Control Lock	ENGAGED

Postflight/Parking

Head the aircraft into the prevailing wind when it is parked for an extended period. Generally, however, short term parking direction depends on the best position for convenience and ease of maintenance.

Park on a hard, level surface.

Parking Brake SET

Gust Lock ENGAGED

Wheel Chocks IN PLACE

Minimum 4-inch chocks are recommended. When refueling, leave a gap between chocks and tires to allow the tires to compress without trapping the chocks.

Aircraft/Engines CHECK GENERAL CONDITION

If engine restarts are required within 20 to 45 minutes after engine shutdown, rotate the fan by hand several times or motor the fan for five seconds by the starter, approximately 10 minutes after shutdown.

Engine Oil Quantity CHECKED

Visually check oil level at the oil sight gage within one hour of engine shutdown.

Left and Right Main Gear INSPECTED

Inspect for problems on the following items:

- hydraulic leaks
- tire inflation
- brake lines
- anti-skid.

Oxygen Masks UNPLUGGED

To prevent possible oxygen loss because of mask leakage, unplug oxygen masks between flights.

Optional EROS Oxygen Mask REMOVED (IF REQUIRED)

Remove the EROS masks from the aircraft if ground cold-soak conditions of -15°C or colder are anticipated. Keep masks in 0°C or warmer ambient conditions.

Exiting Aircraft BATT SWITCH ON

For deplaning at night, the battery switch may be left in BATT to make available all cabin lighting until passengers and cabin baggage are disembarked. Turning the EXTERIOR WING INSP LIGHTS switch ON provides 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 and turns on the emergency exit lights.

If the aircraft is to be parked for an extended period, disconnect the batteries to prevent battery depletion. Batteries can be depleted through drainage by the voltmeter or a malfunctioning entrance door or compartment light switch.

Pitot Tube Covers INSTALLED

When securing the aircraft, install the pitot tube covers.

Battery, Passenger Advisory, and Courtesy Light . . OFF

Check that the battery, passenger advisory and courtesy light switches are OFF. Closing the door extinguishes the integral courtesy light.

Engines INSTALL COVERS

Allow engines to cool down at least 20 minutes before installing engine inlet and exhaust covers.

Parking Brake RELEASED

Do not use the parking brake for an extended period.

Doors CLOSED/LOCKED

All doors and the nose compartment should be key-locked. Install a locking pin in the internal emergency exit door handle to prevent access from the outside. This pin must be removed prior to the next flight.

Static Ground Cable CONNECTED

Mooring (Winds in Excess of 40 Knots)

CAUTION: After any wind storm, check the aircraft for structural damage.

Moor the aircraft if it remains outside for an extended period of if winds up to 70 knots are forecast. Hangar the aircraft when wind velocities of 70 knots or more are forecast.

Aircraft HEADED INTO EXPECTED WIND

When parking an aircraft for extended period of time, head the airplane into the average wind direction for the season of the year.

Control Lock ENGAGED

Parking Brake SET

Let hot brakes cool before setting. Engage surface control gust locks.

Do not set parking brakes for extended parking.

Main Gear/Nose Gear CHOCKED

Chock main wheels fore and aft, and tie the chocks together. Using one-inch rope, secure nose and main landing gear to the tie-down anchors. Do not wrap rope around hydraulic line or electrical wiring when securing the gear strut.

Tail SECURED

Using one-inch rope, secure tailskid to the tie-down anchors to the left and right with slack in the ropes (rope will shrink when wet).

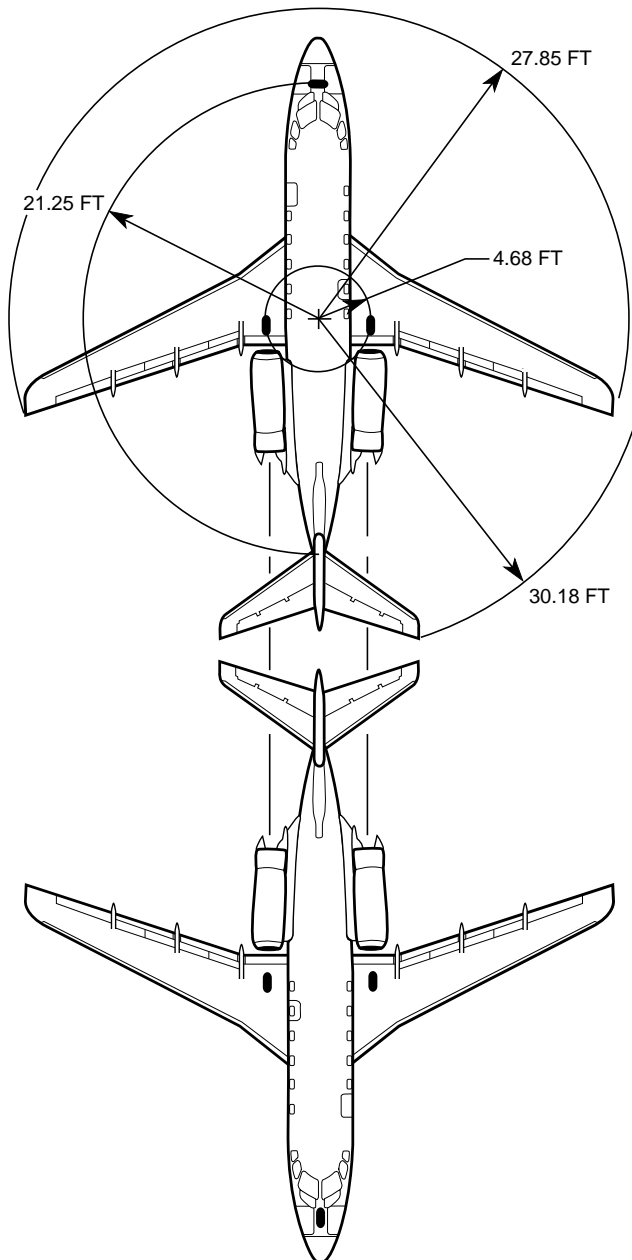
Aircraft GROUNDED

Secure aircraft to an approved ground.

Engine/Pitot Covers INSTALLED

Install engine inlet and exhaust covers and pitot covers.

Tow Bar Turning Radius



2B-1

Towing and Taxiing

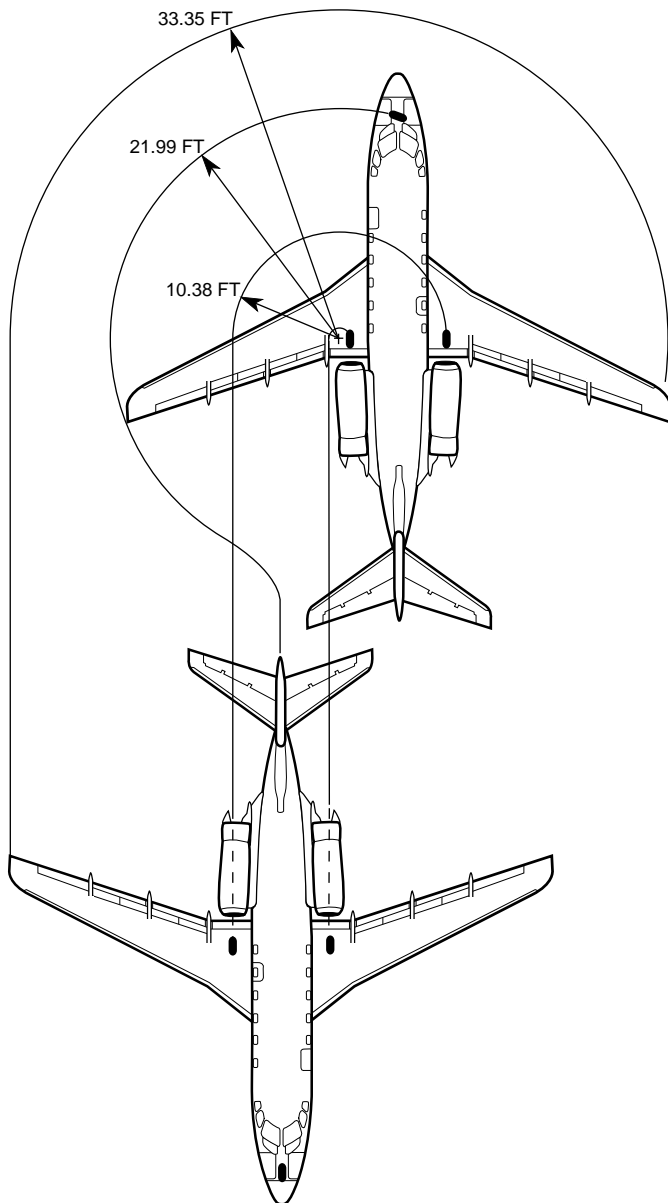
On hard surfaces, tow the aircraft using a yoke-type tow bar attached to the nose gear.

When the aircraft is on a soft surface (e.g., sand, soft ground, or mud), attach cables or ropes to each main gear for towing. When towing on soft surface, accomplish steering through the rudder pedals.

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.

Observe the tow bar turning radius (**Figure 2B-1**) and taxi turning radius (**Figure 2B-2**, following page).

Taxi Turning Radius



2B-2

Hot Weather Operations

Observe performance limitations computed from the AFM. Temperature affects engine thrust, braking, takeoff distance, and climb performance. In areas of high humidity, non-metallic materials are subject to moisture absorption and increase the weight of the aircraft. In very dry areas, protect the aircraft from dust and sand.

Preflight Inspection PERFORMED

Protective Covers REMOVED

Clean dust and dirt from landing gear shock struts. Check gear doors, position switches, and squat switches. Check tires and struts for proper inflation.

Remove dust and sand from engine inlet duct, tail pipe, and the visible components of the thrust reversers. During the inspection, be particularly conscious of dust and sand accumulation on components that are lubricated with oily or greasy lubricants.

Engine STARTED

Be careful of other personnel and equipment behind the aircraft during engine starts.

During engine starts at high outside temperatures, engine ITT is higher than normal, but should remain within limits.

Taxi EXHAUST/PROPWASH AVOIDED

If the airport surfaces are sandy or dust-covered, avoid the exhaust wake and propwash of other aircraft.

Takeoff Performance MONITORED

Ensure takeoff performance is adequate for the conditions and runway length.

Shutdown and Postflight

Protective Covers INSTALLED

Fuel Tanks PROTECTED WHILE REFUELING

Do not allow sand or dust to enter fuel tanks while refueling.

Reflective Objects REMOVED

Do not leave reflective objects in the cockpit or on the glareshield; reflected heat distorts the windshield optical properties.

Maximum Aircraft Operation Temperature

The maximum ambient temperature for aircraft operation at sea level is 52°C.

Maximum Fuel Temperature for Start, Takeoff, and Enroute

Fuel Type	Maximum Temperature (°C)
Jet A – JP-5	46
Jet A-1 – JP-8	46
Jet B – JP-4	42

Cold Weather Operations

Preflight

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

All Protection Covers REMOVED

Surface FREE OF FROST/ICE/SNOW

Verify that the wing leading edges, all control surfaces, tab surfaces, and balance panel cavities are free of ice and snow. Check control panel cavities for drainage after snow removal. Puddled water may re-freeze in flight.

APU Inlets CLEARED

Check that the APU exhaust door and tailcone exhaust door are clear of ice and snow.

Engine Inlets CLEARED

Check that the inlet cowling and APU air inlet are free of ice and snow and the engine fan is free to rotate.

Fuel Tank Vents FREE OF ICE/SNOW

Check vents. Remove all traces of ice and snow.

Pitot Heads and Static Ports CLEARED OF ICE

Water rundown resulting from snow removal may refreeze immediately forward of static ports. Such ice buildup results in disturbed airflow over the static ports and causes erroneous static readings, even though static ports themselves are clear.

Landing Gear Doors CHECKED

Verify that the landing gear doors are unobstructed and free of impacted ice or snow.

Aircraft Deicing COMPLETED

For different deicing fluids, the times of protection (holdover times) vary considerably. Furthermore, these times depend to a large extent on the meteorological conditions and methods of application.

CAUTION: Do not spray deicing fluid in areas where spray or fluid may enter the engine or APU air inlets. Deicing fluid may be used to clear these areas providing they are thoroughly wiped clean before starting.

Preliminary Cockpit Preparation COMPLETED

Battery INSTALLED/FULLY CHARGED

APU Start

APU PREHEATED

Minimum fuel temperature for APU start is -34°C. See Approved Fuels and Associated Limits table in Servicing chapter.

APU operation is prohibited in ambient temperatures of less than -54°C. The APU generator is approved for 350 amperes continuous operation in ambient temperatures up to ISA -5.0°C.

APU CHECKED FREE OF ICE/SNOW

The ground APU door and tailcone exhaust door must be clear of impacted ice or snow so they are unobstructed and free to open fully prior to APU start. If the APU door is not fully open, the electrical circuit to the APU master relay does not complete and the electronic sequencing prevents an APU start.

Engine Start

At an ambient temperature of -40°C or less, preheating of engine and oil is recommended. Heat the engine prior to start and use external power if the aircraft has been exposed to temperatures of -18°C or lower for a prolonged time period.

After Engine Start

Instruments NORMAL

The engine instruments should indicate approximately normal within a short time after reaching idle speed.

Engine Oil Pressure CHECKED

Power settings above idle are not recommended until engine oil temperature is 30°C or warmer. During cold starts, allow oil pressure transients up to 55 PSI for three minutes.

Anti-Ice AS REQUIRED

During operation from runways covered with slush or unpacked snow, turn on anti-ice for taxi and takeoff. Precede takeoff by a static engine runup to as high a power level as practical; observe stable engine operation prior to brake release. If severe icing conditions are present, turn on anti-icing immediately after engine start. During prolonged ground operation, perform periodic engine run-up to reduce the possibility of ice buildup.

Flight Controls FREE MOVEMENT CHECKED

Accomplish this check whenever aircraft is exposed for an extended period of time to snow, freezing rain, or other conditions that can restrict flight control movement. It may be desirable to accomplish an additional control check prior to taxi.

Wing Flaps Operation NORMAL

When operating the wing flaps during low temperatures, closely observe the flap position indicators for positive movement. If the flaps stop, immediately place the flap control lever in the same position as indicated.

Taxi-Out and Takeoff

Taxi

Exercise nosewheel steering in both directions during taxi to circulate warm hydraulic fluid through steering unit.

If the flaps are left up during taxi to avoid slush and ice, complete the Before Takeoff checklist after flaps are in takeoff configuration.

Use extreme caution when taxiing on ice-covered taxiways or runways because excessive speed or high crosswinds may start a skid. Make all turns at reduced speed.

Before Takeoff

Flaps TAKEOFF

Extend the flaps to the takeoff setting at this time if they were held because of slush or wet snow. Monitor flap operation closely and be ready to match control lever with indicator if flaps stop moving.

Before Takeoff Checklist COMPLETED

To ensure the aircraft is configured for takeoff, accomplish the complete Before Takeoff checklist.

Takeoff

Anti-Ice AS REQUIRED

If anti-ice power settings are used during takeoff, check takeoff performance computations for adjusted V_1 and takeoff field length.

If the aircraft starts to slide on ice or snow during engine power check, release brakes and begin takeoff roll. 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.

If the takeoff is rejected and a skid develops, reduce reverse thrust to idle reverse. Return engines to forward thrust at low power, if necessary, to return to the runway centerline. Use rudder pedal steering, if possible, for directional control. Nosewheel steering, rudder, and differential braking may also be used as necessary for directional control. Reduce brake pressure if excessive anti-skid cycling causes directional control problems.

Taxi-In and Park

Anti-Ice AS REQUIRED

In severe icing conditions, turn on anti-icing. During prolonged ground operation, perform periodic engine run-up to reduce the possibility of ice buildup.

Securing for Overnight or Extended Period (Aircraft Unattended)

Wheel Chocks IN PLACE

Parking Brakes OFF

Release parking brake to eliminate possibility of brakes freezing.

Protective Covers INSTALLED

Water Storage Containers DRAINED

Toilets DRAINED

Battery REMOVED

If the nickel-cadmium battery will be exposed to temperatures below -18°C (0°F), remove the battery and store in an area warmer than -18°C , but below $+40^{\circ}\text{C}$ (104°F). Subsequent re-installation of the warm battery enhances the starting capability.

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).

Three types of anti-icing/deicing fluids are in commercial use: SAE/ISO Types I, II and IV. Types II and IV fluids are designed for aircraft with rotation speeds (V_R) of 85 kts or greater.

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

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

CAUTION: Types I, II and IV fluids are not compatible and should not be mixed.

NOTE: Holdover time is the estimated time that an anti-icing/deicing fluid protects a treated surface from ice or frost formation. Refer to applicable publications for holdover times and deicing/anti-icing fluid information.

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.

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

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.

Deicing fluid should not be applied to:

- pitot/static tubes, static ports, temperature probes, AOA vanes, or TAT probe
- gaps between control surfaces and airfoils
- 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 for engines. After deicing engine, start engine(s) immediately to prevent any reicing condition. Select engine anti-ice on after engine start.

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.

After aircraft deicing and anti-icing, visually inspect the following areas to ensure that they are free from ice, snow, and frost accumulations:

- wing leading edges, upper and lower surfaces
- vertical and horizontal stabilizer leading edges, side panels, and upper and lower surfaces
- ailerons, elevator, and rudder

- flaps, flap tracks, and flap drive mechanisms
- ground and flight spoilers
- engine inlets and exhausts
- cockpit windows
- communication and navigation antennas
- fuselage
- AOA probes, pitot tubes, static ports, and SAT/TAS probe
- fuel tank vents
- cooling air inlets and exhausts
- landing gear including brakes, wheels, tires, struts, and doors.

When unsure of wing cleanliness, perform a “hands on” inspection to verify that all wing surfaces are clean of ice, snow, and frost.