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# Expanded Normal Procedures

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## Checklist Usage

Tasks are executed in one of two ways:

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

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

A challenge-response review of the checklist follows execution of the tasks; the pilot not flying (PNF) calls the item, and the appropriate pilot responds by verifying its condition (e.g., “Cowl 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.

## Before Starting Engines

**CAUTION:** If operation of the vent blower fan is desired prior to starting engines, do not attempt to open the cabin door or the emergency exit until vent blower has been turned off for at least 45 seconds.

**Preflight Check . . . . . COMPLETE**

**Oxygen System Ready Control . . . . . PULL ON**

**Oxygen Mask (pilot and copilot) . . CHECK, SELECT 100%**

The masks are in cups on the outboard edge of each seatback.

**WARNING:** Beards and mustaches should be carefully trimmed so that they will not interfere with the proper sealing of an oxygen mask. The fit of the oxygen mask around the beard or mustache should be checked on the ground for proper sealing. Studies conducted by the military and FAA conclude that oxygen masks do not seal over beards and mustaches.

**Circuit Breakers and Guarded Switch (CB panels) . . . SET**

Visually verify that all circuit breakers are set. Always use a flashlight at night.

**Nonessential Bus Switches . . . . . ON**

**Radio Master Switches . . . . . OFF**

**Defog Blower (pilot and copilot) . . . . . OFF**

**AHRS Battery Test Switch. . . . . PUSH**

Hold the test switch for 5 seconds to ensure the AHRS BAT TEST annunciator illuminates.

**Hydraulic Pressure**

**Switch . . . . . (GUARD DOWN). . . . . NORM**

**Landing Gear Handle . . . . . DOWN**

Verify that the landing gear handle is down and landing gear circuit breakers are in.

**Emergency Landing Gear Door Close Handle . . . SAFETIED**

Ensure the handle is safety wired or that the safety wire has not been broken.

**Emergency Landing Gear Down Handle . . . . . SAFETIED**

Ensure the handle is safety wired or that the safety wire has not been broken.

**Engine Start Select . . . . . OFF**

**Thrust Levers . . . . . FREE MOVEMENT,  
THEN CUTOFF**

**Roll Trim Select Switch . . . . . BOTH**

**Roll and Rudder Trim Disconnect Switch . . . . . NORM**

**Pitch Trim Switch . . . . . NORM**

**Engine Synchronizer Switch . . . . . OFF**

**Flap Handle . . . . . (UP) . . . . . 0°**

**Landing Select  
Switch . . . . . (GUARD DOWN) . . . . . FLAP 30°**

**Emergency Brake Handle . . . . . SAFETIED**

Ensure the handle is safety wired or that the safety wire has not been broken.

**Cabin Dump Valve . . . . . SAFETIED**

Ensure the handle is safety wired or that the safety wire has not been broken.

**Cabin Pressure Source Selector . . . . . OFF**

**Cockpit Temperature Controls . . . . . SET**

**Manual Pressurization Control Knob . . . . . FULL INC**



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<b>Cabin Temperature Controls</b> . . . . .	<b>SET</b>
<b>Refrigeration Air Conditioning</b> . . . . .	<b>OFF</b>
<b>Fuel Counter</b> . . . . .	<b>ZERO</b>
<b>Master Generator</b>	
<b>Switches</b> . . . . . (GUARD DOWN). . . . .	<b>NORM</b>
<b>Indicator Lights Switch</b> . . . . .	<b>AS DESIRED</b>
<b>Instrument Light Switches</b> . . . . .	<b>AS DESIRED</b>
<b>Exterior Light Switches</b> . . . . .	<b>OFF</b>
<b>Landing Light Switches</b> . . . . .	<b>RETRACT/OFF</b>
<b>Horizontal Stabilizer Deice</b>	
<b>Backup Switch (if installed)</b> . . . . .	<b>SAFETIED</b>
Ensure the switch guard is safety wired or that the safety wire has not been broken.	
<b>Anti-Ice/Deice Switches</b> . . . . .	<b>OFF</b>
<b>Heater Switches</b> . . . . .	<b>OFF</b>
<b>Wiper Switches (if installed)</b> . . . . .	<b>OFF</b>
<b>Inverter Switches</b> . . . . .	<b>ON</b>
<b>Ignition Switches</b> . . . . .	<b>STBY</b>
<b>Jet Pump Switches</b> . . . . .	<b>NORM</b>
<b>Fuel Crossfeed Switch</b> . . . . .	<b>NORM</b>
<b>Standby Power</b> . . . . .	<b>ON</b>
STBY PWR annunciator illuminates ON.	
<b>Battery</b> . . . . .	<b>ON</b>
The STBY PWR annunciator may illuminate either ON or ARM.	

## **Battery Feed Test . . . . . PUSH**

The STBY PWR annunciator illuminates ON, and the FDR FAIL LIGHT illuminates.

## **Battery . . . . . EMER, THEN ON**

The FDR FAIL LIGHT will extinguish and the STBY PWR annunciation may be either ON or ARM.

On airplanes with the Fairchild F1000 Flight Data Recorder, the two annunciator lights, FDAU and DFDR will illuminate for 5 seconds when battery power is first switched on.

## **SPKR Switches . . . . . ON OR DON HEADSET**

## **INTPH Switches . . . . . ON**

## **Emergency Lights . . . . . (GUARDUP) . . . . . TEST/ON**

The EMER LT NOT ARM annunciator illuminates. Verify all emergency lights illuminate.

## **Master Test . . . . . TEST**

**NOTE:** When checking the stall warning systems, the master test switch must remain in the L or R STALL position until the column shaker and stall annunciator lights/horn actuate twice to check the altitude compensator. The first shaker actuation will occur at approximately 0.5 units on the AOA indicator and the second at approximately 0.7 units. The stall annunciator lights/horn will actuate when the AOA indicator approaches 1.0 unit.

It is permissible to recheck the STBY PWR during the TAXI procedures if the no-go light illuminates during the initial standby power check. It will be necessary to reset a generator if the master test switch is rotated out of the OFF position subsequent to engine starting.

**Airspeed/Landing Gear Aural Warnings . . . . . TEST**

Warning tones activate.

**Indicator Lights . . . . . TEST**

**Fuel System . . . . .CHECK**

a. FUEL PRESS LO Annunciators . . . . . ILLUMINATED

b. Left Fuel/Hydraulic Valve . . . . . CLOSE

L H/V and L F/V CLOSE lights illuminate

c. Left Boost Pump. . . . . ON

The L and R FUEL LO annunciators remain illuminated and the L BOOST PUMP light illuminates.

d. Left Fuel/Hydraulic Valve . . . . . OPEN

L H/V and L F/V OPEN lights illuminate. L FUEL PRESS LO annunciator extinguishes. R FUEL PRESS LO annunciator remains illuminated.

e. Left Boost Pump. . . . . AUTO

The L and R FUEL PRESS LO annunciators illuminate and the L BOOST PUMP light extinguishes.

f. Repeat steps “b.” through “e.” for the right engine.

**Boost Pumps . . . . . AUTO**

**Fuel Transfer . . . . .ON MOMENTARILY**

Check that both pumps operate and then position switches to auto.

**Fuel Crossfeed. . . . .CHECK**

Delay 3-5 seconds between changing fuel crossfeed modes.

a. Fuel Crossfeed. . . . . L TANK

b. Check the following:

• L BOOST PUMP light . . . . . ILLUMINATES

- RH JET PUMP light. . . ILLUMINATES MOMENTARILY
- XFEED light. . . . . ILLUMINATES MOMENTARILY
- FUEL XFEED light . . . . . ILLUMINATES
- FUEL XFEED ON Annunciator . . . . . ILLUMINATES
- c. FUEL PRESS LO Annunciators . . . . . EXTINGUISHED
- d. Fuel Crossfeed. . . . . NORM
- e. Check the following:
  - FUEL XFEED light . . . . .EXTINGUISHES
  - XFEED light. . . . . ILLUMINATES MOMENTARILY
  - RH JET PUMP light. . . ILLUMINATES MOMENTARILY
  - L BOOST PUMP light . . . . .EXTINGUISHES
  - FUEL XFEED ON Annunciator . . . . .EXTINGUISHES
- f. FUEL PRESS LO Annunciators . . . . . ILLUMINATED
- g. Repeat steps “a.” through “f.” for the right tank.

## **Trim System . . . . .CHECK**

### Pitch Trim

- a. Copilot Depress Trim  
Arming Button for 5 Seconds . . . . .CHECK  
Ensure there is no motion and the aural tone sounds.
- b. Pilot repeats step “a.” on pilot's side.
- c. Copilot Not Depressing Trim Arming Button,  
move Trim Switch to NOSE UP for 5 Seconds . . .CHECK  
Ensure there is no motion and the aural tone sounds.
- d. Pilot repeats step “c.” on pilot's side.
- e. Copilot Not Depressing Trim Arming Button,  
move Trim Switch to LWD and RWD . . . . .CHECK  
Ensure there is no motion.

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- f. Pilot repeats step “e.” on pilot's side.
- g. Copilot Move Trim to  
NOSE UP and Hold . . . . . CHECK NOSE  
UP MOVEMENT
  - Pilot Push TRIM INT/AP DISENG Switch . . . . .CHECK  
Ensure there is no motion.
- h. Pilot Move Trim to  
NOSE DOWN and Hold . . . . . CHECK NOSE DOWN  
MOVEMENT
  - Copilot Push TRIM  
INT/AP DISENG Switch . . . . .CHECK  
Ensure there is no motion.
  - Copilot Release TRIM INT/AP DISENG  
Switch, then Pilot Select  
PITCH TRIM EMER . . . . .CHECK  
Ensure there is no motion.
- i. EMER PITCH TRIM Switch . . . . . N.DN & N.UP  
Check for motion.
- j. PITCH TRIM Selector. . . . . NORM
- k. PITCH TRIM SPEED . . . . . TEST
- l. PITCH TRIM. . . . . SET FOR TAKEOFF  
ROLL TRIM
- m. Copilot Move Trim to RWD. . . . .CHECK FOR MOTION
  - Pilot Push TRIM INT/AP DISENG  
Switch . . . . . CHECK FOR  
NO MOTION
- n. Pilot Move TRIM to LWD . . . . .CHECK FOR MOTION
  - Copilot Push TRIM INT/AP  
DISENG Switch . . . . . CHECK FOR  
NO MOTION

- o. Pilot Move TRIM to RWD  
and Copilot Select  
ROLL & RUD TRIM DISC ..... CHECK FOR  
NO MOTION
- p. ROLL & RUD TRIM DISC Switch..... NORM
- q. ROLL TRIM .....SET NEUTRAL  
Rudder Trim
- r. RUD TRIM Knob Centered. .... DEPRESS  
Check for no motion.
- s. Without Depressing, Turn  
RUD TRIM Knob ..... NOSE L AND R  
Check for no trim motion.
- t. Depress and Turn  
RUD TRIM Knob ..... NOSE L AND R  
Check for trim motion.
- u. Push TRIM INT/AP DISENG  
Switch When Trim is In-transit .....CHECK  
There will be an interruption of trim motion.
- v. Place ROLL & RUD TRIM DISC  
Switch to DISC While Rudder Trim  
is In-transit .....CHECK  
There will be an interruption of trim motion.
- w. ROLL & RUD TRIM DISC Switch..... NORM
- x. RUD TRIM .....SET NEUTRAL

**Cockpit Voice Recorder ..... TEST**

If BEFORE STARTING ENGINES procedures are not to be immediately followed by STARTING ENGINES:

**Standby Power..... OFF**

**Battery ..... OFF**

**Before Starting Engines Check ..... COMPLETE**

## Starting Engines

**NOTE:** A GPU start is recommended at ambient temperatures below approximately 5°F (-15°C) External power requirements are 28V DC, 1,000-1,500 amperes output.

**WARNING:** Verify cabin door security by attempting to turn the handle to the unlocked position without depressing the release button. Return handle to the locked position to prevent warning light illumination. Confirm the eight (8) lock pins on the forward and aft sides of the door are properly engaged, as indicated by the white flags fully covering the red background.

Only a crewmember should close and lock the door.

**Cabin Door . . . . . LOCKED**  
**Passenger Briefing . . . . . COMPLETE**  
**Control Lock. . . . . REMOVE AND STOW**  
**Seats, Seat Belts and Shoulder Harnesses**  
**(pilot and copilot). . . . . FASTENED AND ADJUSTED**  
**Parking Brake. . . . . SET**

**NOTE:** When the engines are not running, the parking brake must be set from the pilot's side only. Pumping the brake pedals may be necessary. Malfunction of the mixing valve may prevent the brakes from being set.

**Standby Power . . . . . ON**  
**Battery . . . . . ON**  
**SPKR Switches . . . . . ON or DON HEADSET**  
**INTPH Switch . . . . . ON**







<b>EFC AUX PWR ON Annunciator</b> . . . . .	<b>ILLUMINATED</b>
<b>Engine Start</b> . . . . .	<b>DEPRESS</b>
a. Start Button. . . . .	ILLUMINATED
b. PUSH TO DISENG Button . . . . .	ILLUMINATED
c. N <sub>2</sub> . . . . .	ROTATION
<b>Thrust Lever</b> . . . . .	<b>IDLE AT 8% N<sub>2</sub></b>
Place thrust lever to IDLE when N <sub>2</sub> accelerates through 8%.	
<b>ENG EFC OFF Annunciator</b> . . . . .	<b>EXTINGUISHED</b>
Ensure ENG EFC OFF annunciator extinguishes above 26% N <sub>2</sub> .	
<b>Starter</b> . . . . .	<b>DISENGAGE</b>
Ensure starter disengages prior to 45% N <sub>2</sub> .	
<b>Engine Instruments</b> . . . . . (52-54% N <sub>2</sub> ) . . . . .	<b>MONITOR</b>
<b>Engine Start Select</b> . . . . .	<b>OFF</b>
<b>EFC AUX PWR ON Annunciator</b> . . . . .	<b>EXTINGUISHED</b>
<b>Ignition and Boost Pump Lights</b> . . . . .	<b>EXTINGUISHED</b>
<b>FUEL/H PMP PRESS LO Annunciators</b> . . . . .	<b>EXTINGUISHED</b>
<b>Ground Power Unit (if used)</b> . . . . .	<b>DISCONNECT</b>
<b>Generator Reset Switches</b> . . . . .	<b>NORM</b>
<b>DC Amperes and Voltage</b> . . . . .	<b>CHECK</b>
<b>Standby Power Annunciator</b> . . . . .	<b>ARM</b>
<b>Starting Engines Check</b> . . . . .	<b>COMPLETE</b>

## Before Taxi

**NOTE:** Do not taxi until AHRS ALIGNING - DO NOT TAXI annunciators extinguish on both pilot's and copilot's panels.

For maximum heating or cooling, the cabin pressure source selector should be in the BOTH HIGH position.

Except during taxi conditions in visible moisture at 41°F (5°C) or colder, the engine EFC system may be selected OFF during ground operation provided the engine speed is manually maintained at a minimum of 46% N<sub>2</sub>. With the EFC system selected OFF, a potential exists for the generators to drop off line with the thrust levers at idle.

**CAUTION:** Engine anti-ice systems must be ON for taxi and takeoff when in visible moisture at 41°F (5°C) or colder. Except for a preflight check, do not operate system during ground operations at temperatures above 50°F (10°C).

- Refrigeration Air Conditioning . . . . . AS REQUIRED
- Radio Masters . . . . . ON
- AC Voltages . . . . .CHECK
- Master Test (Generators). . . . . TEST
- Standby Gyro . . . . . UNCAGE
- Cabin Pressure Source . . . . . SELECT  
Select either BOTH HIGH or BOTH NORM.
- Engine Anti-Ice. . . . . AS REQUIRED

**Windshield Anti-Ice . . . . . OFF or LOW**

**NOTE:** In misting conditions on airplanes without windshield wipers, Windshield Anti-Ice on LOW will improve visibility.

**Cabin Sign . . . . . SAFETY**

**Galley Power . . . . . AS REQUIRED**

**Before Taxi Check . . . . . COMPLETE**

## Taxi

**Wheel Brakes . . . . . CHECK**

**Speedbrakes . . . . . CHECK**

a. Speedbrake Emer  
Retract . . . . .(GUARD UP) . . . . . EMER RET

b. Speedbrakes . . . . .EXTEND  
Ensure there is no movement.

c. Speedbrake Emer  
Retract. . . . . (GUARD DOWN). . . . . NORM

d. Speedbrakes . . . . . NOTE EXTENSION

e. SPD BRAKE EXT Annunciator. . . . . ILLUMINATED

f. Speedbrakes . . . . . RETRACT

**Flight Controls . . . . .CHECK**

**Anti-Skid . . . . .CHECK**

a. Wheel Brakes . . . . .APPLY WHILE ROLLING

b. Anti-Skid . . . . . TEST

Check for brake release, then switch OFF. Recover brake effectiveness. Check that the ANTI-SKID FAIL annunciator illuminates.

**CAUTION:** When turning the anti-skid switch from TEST to ON, pause momentarily in OFF position to allow for system cycling. The anti-skid test should not be performed in a congested area.

- c. Anti-Skid . . . . . ON

Check that the ANTI-SKID FAIL annunciator extinguishes and there is normal braking.

### **Thrust Reversers . . . . .CHECK**

- a. Thrust Reversers . . . . .DEPLOY

- b. Check ARM, UNLOCK, and  
DEPLOY Annunciators . . . . . ILLUMINATED

- c. EMER STOW . . . . . PUSH

- d. Check:

EMER STOW Lights . . . . . ILLUMINATED

UNLOCK and DEPLOY  
Annunciators . . . . . EXTINGUISHED

- e. EMER STOW . . . . . PUSH

- f. Check:

EMER STOW Lights . . . . . EXTINGUISHED

ARM, UNLOCK and DEPLOY  
Annunciators . . . . . ILLUMINATED

- g. Thrust Reversers . . . . .STOW

- h. Check all Thrust Reverser Lights  
and Annunciators . . . . . EXTINGUISHED

**NOTE:** It is desirable to perform thrust reverser check into the wind. Do not exceed five seconds with the buckets deployed.

**Jet Pumps.....CHECK**

- a. Jet Pumps ..... OFF
- b. Jet Pump Lights ..... ILLUMINATED MOMENTARILY
- c. FUEL PRESS LO  
Annunciators ..... ILLUMINATED MOMENTARILY
- d. Boost Pump Lights ..... ILLUMINATED
- e. FUEL PRESS LO Annunciators ..... EXTINGUISHED
- f. Jet Pumps ..... NORM
- g. Jet Pump Lights ..... ILLUMINATED MOMENTARILY
- h. Boost Pumps ..... OFF, THEN AUTO
- i. Boost Pump Lights ..... EXTINGUISHED
- j. FUEL PRESS LO Annunciators ..... EXTINGUISHED

**Fuel Crossfeed..... NORM**

**Fuel Quantity and Balance ..... RECHECK**

**Engine Instruments.....CHECK**

**Flight Instruments.....CHECK**

**Cabin Pressure Control..... SET CRUISE ALTITUDE**

**Flaps..... SET FOR TAKEOFF**

**Rudder Boost.....CHECK**

- a. Rudder Boost ..... OFF
- b. Verify RDR BST FAIL Annunciator ..... ILLUMINATED
- c. Rudder Boost ..... ARM
- d. Verify RDR BST FAIL Annunciator .... EXTINGUISHED

### Autopilot . . . . . CHECK AND DISENGAGE

**NOTE:** TRIM FAIL annunciations may occur during this pre-flight test if the autopilot drives the trim to full travel. If this occurs, disengage the autopilot, neutralize the trim and continue the preflight check.

- a. Autopilot . . . . . ENGAGE  
Verify that the pilot's PFD displays the following messages:
  - ROLL (Green)
  - PTCH (Green)
  - ALTS (White)
  - AP ← (Green)
- b. Center button on pilot's  
Manual Trim Switch . . . . . ACTUATE  
Verify AP disconnect with YD remaining engaged then re-engage the autopilot.
- c. Pilot's A/P DISENG pushbutton . . . . . DEPRESS  
Verify that AP and YD disconnect then re-engage the autopilot.
- d. Center button on copilot's  
Manual Trim switch. . . . . ACTUATE  
Verify AP disconnect with YD remaining engaged then re-engage the autopilot.
- e. Copilot's A/P DISENG pushbutton . . . . . DEPRESS  
Verify that AP and YD disconnect, then engage the autopilot.
- f. Go-around Button. . . . . DEPRESS  
Verify the AP disengages with the YD remaining engaged

- g. Reset all trims to the takeoff position.

**WARNING:** During normal preflight checks, it is likely that the pitch and roll trims will be run to their extreme positions. Therefore, all trims must be returned to the proper settings prior to takeoff.

- h. Primary Flight Controls. . . . .CHECK

Move the primary flight controls through the full range of travel in the pitch, roll and yaw axes. Verify proper movement and freedom of travel.

**Trim. . . . . SET FOR TAKEOFF**

**Engine EFC System. . . . . TEST**

- a. Engine EFC's . . . . . ON

- b. Thrust . . . . . 66% N<sub>2</sub>

- c. Engine EFC Test . . . . . PUSH

Check that the ENG EFC OFF annunciators illuminate and that the engine N<sub>2</sub> decreases at least 3%.

- d. Thrust . . . . . (<52%) . . . . . IDLE

- e. Engine EFC . . . . . OFF, THEN ON

Check that the ENG EFC OFF annunciators extinguish and that the engine N<sub>2</sub> recovers to 52%.

**Engine EFCs. . . . . AS DESIRED**

**Anti-Ice/Deice Systems (if required) . . . . .CHECK**

**Engine and Wing Anti-Ice Systems Check**

- a. Thrust Levers . . . . . 60-70% N<sub>2</sub>

- b. Engine Anti-Ice . . . . . ON

- c. Wing Anti-Ice . . . . . ON



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- d. Engine ITT . . . . . CHECK INCREASE
- e. ENG ICE TEMP LO  
Annunciator . . . . . ILLUMINATED MOMENTARILY
- f. Engine Anti-Ice Lights . . . . . ILLUMINATED
- g. Ignition Lights . . . . . ILLUMINATED
- h. Wing Anti-Ice Light . . . . . ILLUMINATED  
The Wing Anti-Ice light will illuminate after the wings heat to temperature.
- i. Engine Anti-Ice . . . . . AS REQUIRED
- j. Wing Anti-Ice . . . . . OFF
- k. Thrust Levers . . . . . IDLE

### **Horizontal Stabilizer Anti-Ice System Check**

**RK-1 thru RK-107 not modified by KIT 128-4014-1, 128-4014-3, 128-4014-5 or 128-4016-1.**

- a. H Stab Anti-Ice . . . . . TEST
- b. STB ANTI ICE FAIL Annunciator . . . . . ILLUMINATED
- c. H Stab Anti-Ice Light . . . . . EXTINGUISHED
- d. H Stab Anti-Ice . . . . . OFF

### **Horizontal Stabilizer Deice System Check**

**RK-1 thru RK-107 not modified by KIT 128-4014-1, 128-4014-3, 128-4014-5 or 128-4016-1.**

- a. H Stab Deice . . . . . TEST AND HOLD
- b. H Stab Deice Light . . . . . COUNT 12 OR MORE FLASHES
- c. STB DEICE FAIL Annunciator . . . . . EXTINGUISHED
- d. H Stab Deice Fail Test . . . . . PRESS AND HOLD
- e. STB DEICE FAIL Annunciator . . . . . ILLUMINATED
- f. H Stab Deice Fail Test . . . . . RELEASE

g. H Stab Deice . . . . . OFF

**CAUTION:** DO NOT operate wing or horizontal stabilizer ice protection systems on the ground except for preflight check and landing rollout.

### Horizontal Stabilizer Deice System Check

**RK-108 and after, RK-1 THRU RK-107 modified by KIT 128-4014-1, 128-4014-3,128-4014-5 or 128-4016-1.**

- a. Flaps . . . . . (UP) . . . . . 0°
- b. H Stab Deice . . . . . TEST AND HOLD
- c. H STAB ICE FAIL Annunciator . . . . . EXTINGUISHED
- d. H Stab Deice Light . . . . . ILLUMINATED

After Approximately 10 Seconds:

- e. H STAB ICE FAIL  
Annunciator . . . . . ILLUMINATED FOR 3 SECONDS
- f. H Stab Deice Light . . . . . EXTINGUISHED
- g. H STAB ICE FAIL Annunciator . . . . . EXTINGUISHED
- h. H Stab Deice Light . . . . . ILLUMINATED
- i. H Stab Deice . . . . . OFF
- j. H Stab Deice . . . . . TEST AND HOLD
- k. Flaps. . . . . SELECT 30°
- l. LDG FLAP DELAY Annunciator . . . . . ILLUMINATED
- m. Flaps Travel . . . FLAPS STOP AT APPROXIMATELY 10°
- n. H Stab Deice . . . . . OFF
- o. LDG FLAP DELAY Annunciator . . . . . EXTINGUISHED
- p. Flap Travel . . . . . FLAPS MOVE TO 30°
- q. Flaps. . . . . SET FOR TAKEOFF

## Avionics ..... SET

### FMS Programming

Pertinent information (station identifier, waypoint, bearing, and waypoint distance) is entered into the flight plan from either CDU. Programming may be accomplished before takeoff or during flight. To enter RNAV approach waypoints:

- a. Flight Plan Page ..... ENTER

Enter the flight plan page on the CDU.

- b. ADD WPTS ..... SELECT

- c. Associated Nav aids ..... ENTER

Enter the nav aid associated with the RNAV approach and verify the nav aid position.

- d. ADD RAD/DIS OFFSET ..... SELECT

- e. Radial and Distance Offset ..... KEY IN

Key in the radial and distance offset of the initial approach fix and select OFFSET COMPLETE.

The CDU will display the initial approach fix position and offers the select RNAV APCH. Verify the initial approach position and select RNAV APCH.

- f. Waypoint Name ..... ENTER

Enter a waypoint name of up to 5 alphanumeric characters and select NAME COMPLETE.

- g. Radial and Distance Offset ..... ENTER

Enter the radial and distance offset of the next RNAV approach fix.

- h. Waypoint Name ..... ENTER

Enter the waypoint name for the next RNAV approach fix.

- i. Repeat the last two steps for as many waypoints as required.

After keying in the radial distance offset of the missed approach fix, select END RNAV APCH.

j. Waypoint Name . . . . . ENTER

Enter the waypoint name for the missed approach fix. The flight plan shows the last waypoint followed by the message END RNAV APCH.

## **TCAS (if installed) . . . . . TEST**

To initiate the TCAS test mode, press the TST key on the ATC page of the RTU. TCAS TEST will be displayed on the MFD, ND (if installed) and PFD. When the test mode is completed, the TCAS aurally announces TCAS SYSTEM TEST OK or TCAS SYSTEM TEST FAIL.

**NOTE:** Use of the TCAS test mode during flight inhibits TCAS operation for approximately 10 seconds.

## Ground Operation

TCAS . . . . . STBY

Maintain the TCAS in the STBY mode until just prior to takeoff, then select the TCAS mode as desired.

Select the TCAS STBY mode immediately after clearing the runway following a landing.

**V<sub>1</sub>, V<sub>R</sub>, V<sub>2</sub>, AOA, N<sub>1</sub>, Flap Setting . . . . . CONFIRM**

**Crew Briefing . . . . . COMPLETE**

**Taxi Check . . . . . COMPLETE**

## Before Takeoff

Engine EFCs. . . . . ON

**NOTE:** Check for recovery of N<sub>2</sub> 52% to 54% and ENG EFC OFF lights extinguished.

Anti-Collision Lights . . . . . ON

Landing Lights . . . . . AS REQUIRED

Engine Anti-Ice. . . . . AS REQUIRED

Radar. . . . . AS REQUIRED

If ECS OFF takeoff is planned:

Cabin Pressure Source . . . . . OFF

Rate Control . . . . . 11 O’CLOCK POSITION

Manual Pressure Control . . . . . FULL DECREASE

Vent Blower . . . . . ON

Before Takeoff Checklist. . . . . COMPLETE

## Line Up

Windshield Anti-Ice	LOW
AOA Heat	ON
Pitot Heat	ON
Static Heat	ON
Ignition Switches	ON
Transponder	ON
Refrigeration Air Conditioning	AS REQUIRED
Recognition Lights	AS REQUIRED
Annunciators	CLEAR
Line Up Check	COMPLETE

**NOTE:** When taking off at an airport above 9,000 feet pressure altitude, CABIN PRESS LO annunciator may be illuminated. After takeoff, the cabin altitude should be set to extinguish the light.

## Takeoff

Thrust	APPROXIMATELY 90% N <sub>1</sub>
Engine Instruments	CHECK
Wheel Brakes	RELEASE
Thrust	TAKEOFF

Set thrust to TAKEOFF prior to 60 KIAS.

Nose-up Pitch Attitude at Rotation (V <sub>R</sub> )	(AS DESIRED)	13°-15°
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## After Takeoff

**Landing Gear** . . . . . **UP**

While the gear retracts, watch for proper indication. Monitor the hydraulic pressure gage to detect a hydraulic failure.

**NOTE:** If takeoff was made on a snow or slush covered runway, cycle landing gear one or two times at a safe altitude to shed any ice accumulation.

**Yaw Damp** . . . . . **ON**

**Landing Lights** . . . . . **RET/OFF**

**Flaps** . . . . . **(UP)** . . . . . **0°**

**Thrust** . . . . . **SET MCT**

**Engine Sync** . . . . . **AS REQUIRED**

**Ignition Switches** . . . . . **STBY**

**Anti-Ice/Deice Systems**  
**(above 400 ft AGL)** . . . . . **AS REQUIRED**

**CAUTION:** Do not operate anti-ice/deice systems at Ram Air temperatures greater than 50° F (10°C) unless in actual icing conditions, as indicated by illumination of the ICING annunciator (if installed) or airframe ice accumulation. Ice protection systems should be on prior to encountering actual icing. Turn systems off when clear of icing conditions.

### Engine Anti-Ice System Operation

- a. Thrust . . . . . **90% N<sub>1</sub> OR LOWER**
- b. Engine Anti-Ice . . . . . **ON**
- c. Engine ITT . . . . . **CHECK INCREASE**

d. Thrust . . . . . AS REQUIRED

Refer to the Takeoff Thrust Setting or Maximum Continuous Thrust setting graphs.

e. ENG ICE TEMP LO

Annunciators . . . . . ILLUMINATED MOMENTARILY

f. Engine Anti-Ice Lights . . . . . ILLUMINATED

g. Ignition Lights . . . . . ILLUMINATED

## **Wing Anti-Ice System Operation**

a. Thrust . . . . . 90% N<sub>1</sub> OR LOWER

b. Wing Anti-Ice . . . . . ON

c. Engine ITT . . . . . CHECK INCREASE

d. Thrust . . . . . AS REQUIRED

Refer to the Takeoff Thrust Setting or Maximum Continuous Thrust Setting graphs.

e. Wing Anti-Ice Light . . . . . EXTINGUISHED,  
THEN ILLUMINATED

## **Horizontal Stabilizer Anti-Ice System Operation**

**RK-1 thru RK-107 not modified by KIT 128-4014-1, 128-4014-3, 128-4014-5 or 128-4016-1**

a. H Stab Anti-Ice . . . . . ON

b. H Stab Anti-Ice Light . . . . . ILLUMINATED

## **Horizontal Stabilizer Deice System Operation**

**RK-1 thru RK-107 not modified by KIT 128-4014-1, 128-4014-3, 128-4014-5 or 128-4016-1**

a. H Stab Deice . . . . . ON

b. H Stab Deice Light . . . . . FLASHES

There will be as many as 6 short flashes followed by cycling of approximately 15 seconds on and 1 second off.



**Horizontal Stabilizer Deice System Operation**

**RK-108 and after, RK-1 thru RK-107 modified by KIT 128-4014-1, 128-4014-3, 128-4014-5 or 128-4016-1**

- a. H Stab Deice . . . . . ON
- b. H Stab Deice Light . . . . . ILLUMINATED

**Cabin Sign . . . . . AS REQUIRED**

**Refrigeration Air Conditioning . . . . . AS REQUIRED**

If ECS (OFF) Takeoff Was Made and Above 1500 Feet AGL:

**Cabin Pressure Source . . . . . SELECT**

Select either BOTH HIGH or BOTH NORM.

**Vent Blower . . . . . OFF**

**Manual Pressure Control . . . . . FULL INCREASE**

**Takeoff Check . . . . . COMPLETE**

**NOTE:** Operate manual pressure controller slowly to avoid sudden cabin pressure changes.

## MAXIMUM CONTINUOUS THRUST

### ECS ON/Anti-Ice OFF

PA/ RAT	-50	-40	-30	-20	-10	0	10	20	30	40
<b>10,000</b>	100.2	102.4	102.0	100.5	99.2	97.9	96.7	95.6	94.5	93.4
<b>6,000</b>	91.5	93.4	95.4	97.3	99.2	98.0	96.8	95.6	94.5	93.4
<b>2,000</b>	86.7	88.5	90.3	92.3	94.0	95.9	96.8	95.6	94.5	93.4

### Engine Anti-Ice ON/ECS ON

PA/ RAT	-50	-40	-30	-20	-10	0	10	20	30	40
<b>10,000</b>	100.2	100.8	98.6	97.2	96.1	95.2	94.4	–	–	–
<b>6,000</b>	91.5	93.4	95.4	97.2	96.1	95.2	94.4	–	–	–
<b>2,000</b>	86.7	88.5	90.3	92.3	94.1	95.2	94.4	–	–	–

### Engine and Wing Anti-Ice ON/ECS ON

PA/ RAT	-50	-40	-30	-20	-10	0	10	20	30	40
<b>10,000</b>	100.2	98.8	96.7	95.3	94.2	93.4	92.7	–	–	–
<b>6,000</b>	91.5	93.5	95.4	95.4	94.2	93.4	92.7	–	–	–
<b>2,000</b>	86.7	88.5	90.3	92.3	94.1	93.4	92.7	–	–	–

### ECS OFF and Anti-Ice OFF

PA/ RAT	-50	-40	-30	-20	-10	0	10	20	30	40
<b>10,000</b>	100.2	102.4	102.6	101.2	99.8	98.6	97.4	96.3	95.2	94.1
<b>6,000</b>	91.5	93.5	95.4	97.4	99.2	98.6	97.4	96.3	95.2	94.1
<b>2,000</b>	86.7	88.5	90.5	92.3	94.1	95.9	97.4	96.3	95.2	94.1





## Approach

**Crew Briefing . . . . . COMPLETE**

**FMS . . . . . VERIFY**

Prior to commencing the approach, verify that the flight plan is properly loaded. The NAV tuning mode will change to MAN mode prior to using an RNAV waypoint. The Navigator mode will change to MAN LEG advance if using AUTO LEG or SEL CRS.

Prior to the first RNAV waypoint:

Verify that either NAV is tuned to RNAV reference facility.

Manually advance the waypoint when over the existing TO waypoint (DME = 0.0).

Due to the earth's magnetic field drift, the course displayed on the PFD may differ from the published course slightly. Manually changing the course to match the published course is not approved.

The airplane course will be direct to the initial approach fix from the previous waypoint. It may be necessary to intercept the final approach course outside the initial approach fix or to hold outside the initial approach fix. To accomplish this:

Enter the SYSTEM CONTROL page and select SEL CRS.

Rotate the CRS knob to the desired course.

Re-select MAN LEG advance on the SYS CTRL page.

**Fuel Management . . . . . CHECK**

**V<sub>REF</sub>, V<sub>AC</sub>, N<sub>1</sub>, AOA, LDG DIST . . . . . CONFIRM**

**Cabin Sign . . . . . SAFETY**

**Windshield Anti-Ice . . . . . LOW**

**Hydraulic/Nitrogen Pressure . . . . . CHECK**

**Engine Sync . . . . . OFF**

**Flaps . . . . . 10°**

**WARNING:** During flight in icing conditions, wait at least 15 seconds after selecting 10 degrees flaps before selecting 30 degrees flaps. This delay provides the stabilizer deice system the time required to remove any ice accumulation from the stabilizer leading edge.

If icing conditions are encountered for more than 20 minutes after initial selection of 10 degrees flaps, land using 10 degrees flaps.

If a missed approach is executed and the flight diverted to an alternate airport, the landing must be made using 10 degrees flaps unless a Ram Air temperature of 41°F (5°C) or greater is observed during APPROACH and BEFORE LANDING.

Do not operate anti-ice/deice systems at Ram Air temperatures greater than 10°C unless in actual icing conditions, as indicated by illumination of the ICING annunciator (if installed) or airframe ice accumulation.

**NAV Systems . . . . . CHECK**

Ensure that the pilot and copilot NAV systems are tuned to the same localizer and signal is valid.

**CAT II. . . . . VERIFY**

With valid radio altimeter and airplane below 2,500 ft AGL, depress CAT II button above each PFD. Verify that both green OK annunciators illuminate.

## Expanded Normal Procedures

**Approach Speed . . . . .CHECK**

Initial approach speed should be  $V_{REF} + 30$  KIAS with 10 degrees flap and landing gear up.

### APPROACH/MISSED APPROACH REFERENCE LANDING SPEEDS

FLAPS	WEIGHT X 1000 (LB)						
	16.1	15.7	15	14	13	12	11
$V_{REF}$ at 30°	118	117	114	110	106	102	97
$V_{AC}$ 10°	140	139	136	132	128	124	119

**Approach Check . . . . .COMPLETE**

## Before Landing

**Landing Gear . . . . .DOWN**

Extend the landing gear when the glideslope indicator shows the airplane two dots above the glideslope. Extend the flaps to 20 degrees when one dot above glideslope. Extend flaps to 30 degrees when glideslope is captured. Smoothly decrease airspeed from initial approach speed ( $V_{REF} + 30$  KIAS) to final approach speed ( $V_{REF} + 10$  KIAS). Cross threshold at  $V_{REF} - 5$  to 10 KIAS.

**NOTE:** Exceeding the localizer or glideslope deviation will cause annunciation on the PFD. The localizer or glideslope pointer will alternate from green to yellow and flash.

**Refrigeration Air Conditioning . . . . .OFF**

**Recognition Light . . . . .OFF**

**Landing Lights . . . . .AS REQUIRED**

**Ignition Switches . . . . .ON**

**Flaps** ..... **30°**  
**Yaw Damp.** ..... **OFF**

**NOTE:** Increase final approach speed to  $V_{REF} + 5$  knots for autopilot coupled approaches.

**Auto Pilot Off** ..... **200 FT AGL**

## Landing

**Thrust** ..... **IDLE**  
**Brakes (after touchdown)** ..... **APPLY**  
**Speedbrakes** ..... **EXTEND**  
**Thrust Reversers** ..... **DEPLOY**  
**Reverser Lights** ..... **VERIFY**  
**Reverse Power** ..... **AS REQUIRED**

**NOTE:** If a go-around becomes necessary after the thrust reversers are deployed, place the reverser levers to the stow position before advancing the thrust levers.

**Landing Check** ..... **COMPLETE**

## Balked Landing

**Thrust** ..... **TAKEOFF N<sub>1</sub>**  
**Climb Airspeed** ..... **V<sub>REF</sub>**

When positive climb is established:

**Flaps** ..... **10°**  
**Landing Gear** ..... **UP**  
**Yaw Damp.** ..... **ON**  
**Flaps** ..... **0°**  
**Landing Lights** ..... **RET/OFF**



## After Landing

Engine EFCs. . . . . AS REQUIRED

Anti-Collision Lights . . . . . OFF

### Anti-Ice/Deice Systems:

Wing, Engine and H Stab . . . . . OFF

Windshield. . . . . OFF or LOW

**NOTE:** In misting conditions on airplanes without windshield wipers, Windshield Anti-Ice on LOW will improve visibility.

AOA Heat . . . . . OFF

Pitot Heat . . . . . OFF

Static Heat . . . . . OFF

Ignition Switches . . . . . STBY

Radar. . . . . STBY

Transponder . . . . . STBY

Speedbrakes . . . . . RETRACT

Defog Blower . . . . . OFF

Flaps . . . . . RETRACT

Trim . . . . . SET FOR TAKEOFF

Refrigeration Air Conditioning . . . . . AS REQUIRED

After Landing Check . . . . . COMPLETE

## Shutdown

**Parking Brake. . . . . AS REQUIRED**

**NOTE:** If the engines are not running, the parking brake must be set from the pilot's side only. Pumping the brake pedals may be necessary. A malfunction of the mixing valve may prevent the brakes from being set.

**Standby Power. . . . . OFF**

**Standby Gyro . . . . . CAGE**

**Cabin Pressure Source. . . . . OFF**

**Oxygen System . . . . . OFF**

**Refrigeration Air Conditioning. . . . . OFF**

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

**Emergency Lights. . . . .(GUARD UP) . . . . . OFF**

**Interior Lights. . . . . OFF**

**Cabin Lights. . . . . OFF**

**Windshield Anti-Ice . . . . . OFF**

**Galley Power . . . . . OFF**

**Radio Masters . . . . . OFF**

**Thrust Levers. . . . . CUTOFF**

**Battery . . . . . OFF**

**Control Lock. . . . . INSTALL**

**Shutdown Check . . . . . COMPLETE**

## Turnaround

Prior to Boarding or Deplaning:

**L Thrust Lever** ..... **CUTOFF**

**Cabin Pressure Source** ..... **OFF**

**Brake Energy and  
Turnaround Charts** ..... **CHECK**

See Approach and Landing Performance in AFM.

**WARNING:** Ice and frost accumulations have been observed on the upper inboard wing root sections after extended flight at high altitude, followed by rapid descent and landing in areas of high humidity conditions. During rapid turnarounds, upper wing surfaces should be inspected. If ice or frost is present, it must be removed prior to departure.

Restarting L Engine:

**Radio Masters** ..... **OFF**

**Left Engine EFC** ..... **OFF, THEN ON**

**Refrigeration Air Conditioning** ..... **OFF**

**Perform STARTING ENGINE Procedures**

Before Taxi:

**Refrigeration Air Conditioning** ..... **AS REQUIRED**

**Radio Masters** ..... **ON**

**Cabin Pressure Source** ..... **SELECT**

Select either BOTH HIGH or BOTH NORM.

**Engine EFCs** ..... **AS DESIRED**

**Engine Anti-Ice** ..... **AS REQUIRED**

**Windshield . . . . . OFF or LOW**

**NOTE:** In misting conditions on airplanes without windshield wipers, Windshield Anti-Ice on LOW will improve visibility.

Taxi:

**Wheel Brakes . . . . . CHECK**

**Flight Controls . . . . . CHECK**

**Fuel Crossfeed . . . . . NORM**

**Fuel Quantity and Balance . . . . . CHECK**

**Engine Instruments . . . . . CHECK**

**Flight Instruments . . . . . CHECK**

**Cabin Pressure Control . . . . . SET CRUISE ALTITUDE**

**Flaps . . . . . SET FOR TAKEOFF**

**Trim . . . . . SET FOR TAKEOFF**

**Avionics . . . . . SET**

**V<sub>1</sub>, V<sub>R</sub>, V<sub>2</sub>, AOA, N<sub>1</sub>, Flap Setting . . . . . CONFIRM**

**Crew Briefing . . . . . COMPLETE**

**Perform Before Takeoff and Line Up Procedures.**

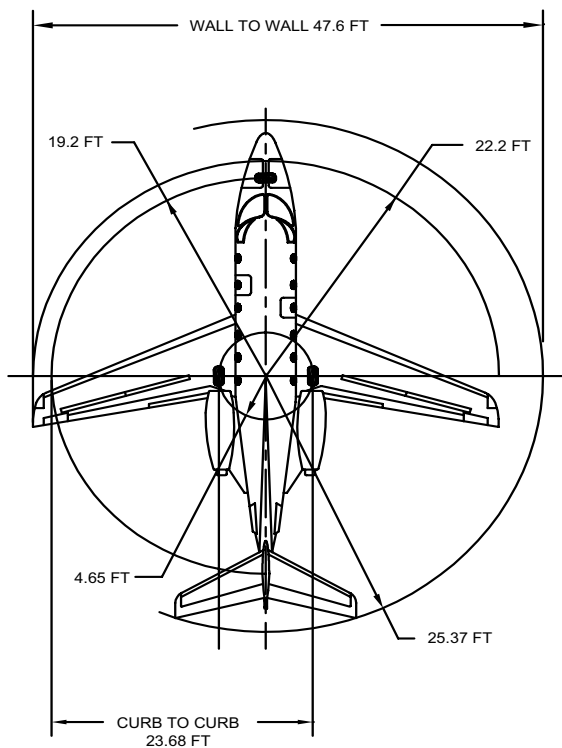
**Turnaround Check . . . . . COMPLETE**

### Towing/Taxiing

On hard surfaces, the aircraft can be towed or pushed backwards using a tow bar (P/N 45A91715-1) attached to the nosewheel. Turning angle of the nosewheel with tow bar is 90 degrees either side of center. When the aircraft is on a soft surface (such as sand, soft ground, or mud), towing adapter belts (P/N 45A99601-1) and tow cables must be attached to each main gear for towing.

For taxi operations, accomplish directional control with the nosewheel steering system. To prevent landing gear or engine damage, taxi the airplane on a smooth, hard surface that is free of loose gravel or debris. The maximum turning radius for the nosewheel steering system is 45 degrees either side of center.

## Aircraft Turning Radius – Towing



B4CRH-EXP0021









## Aircraft ..... TOWED

Observe the aircraft turning distances depicted in Minimum Turning Radii.

**NOTE:** To reduce stress on the nose landing gear in future moves, center the nosewheel before bringing the airplane to a full stop.

### When towing operation is complete:

Navigation lights ..... OFF

Battery Master Switch ..... OFF

Nosewheel ..... CENTERED

**CAUTION:** Do not set the parking brake if brakes are overheated or if outside temperature is at or below 32°F (0° C).

Parking Brake ..... SET

**NOTE:** If the engines are not running, the parking brake must be set from the pilot's side only. Pumping the brake pedals may be necessary. A malfunction of the mixing valve may prevent the brakes from being set.

Controls Gust Lock ..... INSTALLED

Wheels ..... CHOCKED

Tow Bar ..... REMOVED

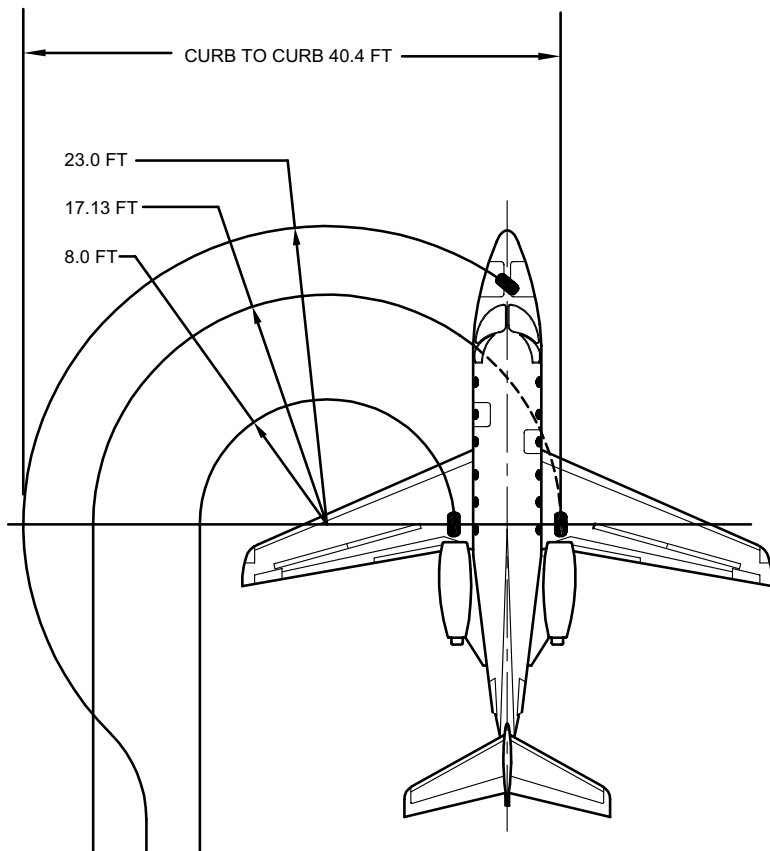
Torque Link Upper Pin ..... INSTALLED

Insert the disconnect pin through the torque link sleeve and nose gear shock strut.

Tow Cables and Adapters ..... REMOVED



## Aircraft Turning Radius – Taxiing



B4CRH-EXPN003i







## Install the Following Covers:

- Pitot tube cover
- AOA covers
- Engine intake covers
- Engine exhaust covers
- Windshield cover (if available)

**CAUTION:** When strong winds are anticipated, head air-  
plane into wind and maintain sufficient distance from other  
airplanes.

**NOTE:** For tie-down, use 3/4-inch (19 mm) manila rope or  
rope having over 2,000 lb. tensile strength.

**Mooring Fittings. . . . . INSTALLED**

**Mooring Cables . . . . . ATTACHED FROM  
AIRPLANE TO RINGS  
IN PARKING APRON**

Cables should be arranged in as nearly symmetrical pattern  
as possible.

For additional mooring security, tie each main landing gear  
and the nose gear using manila ropes.

**Door . . . . . CLOSED/LOCKED**



# Cold Weather Operations

## Deicing Supplemental Information

This section provides supplementary information on aircraft deicing, anti-icing/deicing fluids, deicing procedures, and aircraft operating procedures. Consult the Aircraft Flight Manual, aircraft maintenance manual, and FAA Advisory Circulars for deicing procedures, holdover times, recommendations, and hazards.

Federal Aviation Regulations (FARs) prohibit takeoff with snow, ice, or frost adhering to the wings, windshields, power plant, or flight controls. 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 serious aircraft performance degradation, loss of lift, and erratic engine and flight instruments.

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.

## Cold Soak Conditions

An aircraft is exposed to cold soak conditions when the average ambient temperature is below -4°F (-20°C) longer than four hours and it may be assumed that all aircraft components have stabilized at the ambient temperature.

If the local ambient temperature is predominantly below -4°F (-20°C), move the aircraft to a heated hangar if possible.

Ground icing may also occur at temperatures of 50°F (10°C) or colder with high humidity.

If icing or cold soak conditions may be encountered and a heated hangar is not available, prepare the aircraft for cold soak conditions.

- Drain the water system and toilet unit.
- Remove the aircraft batteries and store them in a warm environment. This ensures the temperature of each battery is above 14°F (-10°C) before takeoff, thus ensuring emergency flight time capability.
- Remove any packed snow from the landing gear bays, wheel wells, landing gear, and all control surfaces.
- Fit covers or blanks to the following:
  - engine intakes
  - jetpipe exhausts
  - nose and main gear wheels
  - pitot heads and static vents
  - windshield
  - ice detector head
  - dorsal air intake
  - stall warning vents
  - angle-of-attack probe.

## Ground Deice/Anti-Ice Operations

### Deicing Fluids

The approved deicing and anti-icing fluids are:

- SAE AMS 1424 Type I
- ISO 11075 Type I
- SAE AMS 1428 Type II
- ISO AMS 11078 Type II
- SAE AMS 1428 Type IV

Only the following Type IV anti-icing fluids are approved:

- Clariant Safewing MP IV 1957
- Clariant Safewing MP IV 2001
- UCAR ULTRA+ (approved for use down to -15°)
- Octagon Max Flight Type IV

These deicing fluids are a specially inhibited, glycol-based solution. While the fluid remains liquid, snow and ice will not adhere to it. The following precautions should be taken when using deicing and anti-icing fluids:

- avoid contact with skin and eyes
- replace clothing permeated with deicing/anti-icing fluid
- stay on the windward side of the airplane during application
- do not let solution come in contact with bearings; it may dilute the lubricant
- avoid applying solution to windows
- exercise caution when walking on surfaces that are coated with glycol
- keep the solution from entering air ducts or cabin heat and ventilation ducts, due to toxic fumes entering the cabin or cockpit during taxi or takeoff.

When necessary, the aircraft can be deiced by:

- placing the aircraft in a warm hangar until the ice melts
- mechanically brushing the snow or ice off with brooms, brushes, or other means
- a cold application of deicing fluid with normal spray equipment
- a heated application of glycol-based solution.

## Removing Snow

Use a brush to remove dry snow from aircraft surfaces, or employ cold air blast. In either case, exercise care to prevent “trapping snow” in control surface gaps and hinges. If ambient conditions are above freezing, dry snow may be removed by applying a hot blast, then spraying the cleared surface with deicing fluid.

Use rubber squeegees to remove wet snow. Again, exercise care to prevent trapping snow in control surface gaps and hinges. If ice formed under the snow, apply deicing fluid.

For frozen snow and ice films, first clear loose snow, then apply deicing fluid. Brush the snow as fluid is applied to assist in breaking up deposits and to keep the fluid on the deposit. After all frozen deposits are removed, apply a light coating of fluid to keep the surface clear. Brush off or mop up any water resulting from melted ice as soon as possible.

After clearing snow, make sure the following are free of frost, ice, or frozen deposits:

- static vents pitot heads
- angle-of-attack probe (if installed)
- drain mast
- all intakes
- all control surfaces airbrakes
- landing gear.

## Removing Hoar Frost

To remove hoar frost, spray deicing fluid according to the fluid manufacturer's instructions. If the frost-forming conditions are severe, apply a light coat of concentrated fluid after defrosting to maximize the holdover period.

## Removing Sleet and Freezing Rain

To remove sleet or freezing rain, spray undiluted deicing fluid according to the fluid manufacturers' instructions. Use hot fluid when possible.

## Preflight Inspection

In ground icing conditions, conduct 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 deicing/anti-icing treatment is still effective.

During preflight inspection, inspect areas where surface snow or frost could change or affect normal system operations. The following are supplemental preflight checks.

**All Protective Covers/Blanks . . . . . REMOVED**

**All Surfaces . . . . . FREE OF FROST/ICE/SNOW**

The wing leading edges, all control surfaces, tab surfaces, flap jacks and balance panel cavities must be free of ice or snow. Check control balance cavities and drain holes for drainage after snow removal; puddled water may refreeze in flight.

**Engine Inlets. . . . . CLEAR OF INTERNAL ICE/SNOW**

Check that the inlet cowling is free of ice or snow and that the engine is free to rotate.

**Fuel Tank Vents . . . . . FREE OF ICE/SNOW**

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

**Pitot Heads and Static Ports . . . . . CLEAR OF ICE**

Water rundown from snow removal may refreeze immediately forward of static ports and cause an ice build-up. This build-up results in disturbed airflow over the static ports, which causes erroneous static readings, even though the static ports themselves are clear.

As snow on the windshield melts, it may also form sheet ice over a large area of the forward fuselage and obstruct the static ports.

**Landing Gear Door . . . . .CHECK**

Landing gear doors should be unobstructed and free of impacted ice or snow.

**Air Conditioning Inlets and Exits . . . . .CLEAR**

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

**Aircraft Deicing . . . . .COMPLETE**

For different deicing fluids, the times of protection (i.e., hold-over times) vary considerably. Furthermore, these times depend largely on the meteorological conditions and methods of application. Complete deicing prior to engine starting.

**Preliminary Cockpit Preparation . . . . .COMPLETE**

**Battery . . . . .INSTALLED/FULLY CHARGED**

If the temperature fell below -10°C (14°F), the battery may have been removed.



## After Engine Start

### **Instruments . . . . . MONITOR**

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

### **Engine Oil Pressure. . . . . CHECK**

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

### **Engine Anti-Ice. . . . . AS REQUIRED**

If the OAT is 5°C (41°F) or below with visible moisture, ignition and engine anti-ice switches should be turned on for taxi and takeoff. When not in icing conditions, the engine anti-ice must not be used when the temperature is above 10°C (50°F).

### **Flight Controls . . . . . CHECK FREEDOM OF MOVEMENT**

Accomplish a freedom of movement check whenever the aircraft has been exposed for an extended period of time to snow, freezing rain, or other conditions that could restrict flight control movement. Expect an increase in control forces at low temperatures because of increased resistance in cables and congealed oil in bearings; it may be desirable to accomplish an additional control check prior to taxi.

### **Flaps/Speedbrakes . . . . . CHECK OPERATION**

Cycle the flaps through their entire range; check for smooth operation.



## Exterior Deicing After Engine Start

- Power Levers . . . . . IDLE
- Engine Anti-Ice. . . . . ON
- Engine Ignition. . . . . ON
- Air Conditioning Switches . . . . . OFF

## Taxi/Before Takeoff

When significant quantities of precipitation in the form of snow, slush, or water are on the runway, takeoff performance may vary considerably; refer to the AFM.

### Taxi

- Nosewheel Steering. . . . . EXERCISE
- Brakes. . . . . APPLY

When taxiing in snow or slush, the manufacturer recommends that brake applications be made to enable the residual heat in the brake friction discs to dispose of any slush accumulation in the brake units.

## Before Takeoff

- Flaps . . . . . TAKEOFF

Extend the flaps to the takeoff setting at this time if they have been held due to slush or wet snow. Consider using a zero flap (0 degrees) takeoff configuration.

- Engine Oil Temperature. . . . . CHECK

Ensure the oil temperature gage needle is in the green arc.

- Before Takeoff Check . . . . . COMPLETE

To ensure the aircraft is configured for takeoff, complete the before takeoff checklist before releasing brakes.

## Takeoff

In icing conditions, ensure wing anti-ice, engine ignition, and engine anti-ice are on for takeoff.

If the aircraft starts to slide on ice or snow during the engine power check, release the brakes and begin the takeoff roll. Continue the engine check during the early part of the takeoff roll. A forward pressure on the control column increases nose-wheel steering effectiveness.

### Climb/Cruise/Descent

When engine anti-ice is selected on, engine idle RPM is higher (i.e., raised idle) to ensure adequate engine and intake ice protection. The thrust at a given RPM decreases; fuel flow and ITT increase. The penalties on sector fuel are large.

The following is the recommended procedure.

- Climb at 220 KIAS with normal climb power.
- If it is necessary to cruise into an icing layer, use long range cruise performance; it is more economical to cruise below an icing layer than in it.
- Thrust levers may be closed. Full airbrakes give a rate of descent of about 3,000 fpm. Higher airspeeds (up to  $V_{MO}/M_{MO}$ ) may be used if required for a higher rate of descent.
- Hold at recommended holding speed.

## Landing

Select engine ignition ON prior to landing; switch engine ignition OFF after landing.

If reverse thrust is not used, shutting down either engine after selecting speedbrakes helps deceleration. In a crosswind, shut down the downwind engine.

If available, use reverse thrust; however, select forward idle if directional control becomes difficult.

Ground clearance with flaps lowered is relatively small; when operating on a runway with deep puddles, slush, snow or ice, observe the following:

## Taxi-In/Park

If severe icing conditions are present, utilize engine anti-icing.

## Removing Salt and Chemical Agents After Landing

If salt or chemical agents were used to disperse snow and ice on the landing field, wash the affected areas with clean water as soon as possible. A wetting agent (e.g., TEEPOL or Com-prex A) may be added in small quantities.

If time or conditions prevent the removal of contaminants, make a note in the Technical Log so that appropriate action can be taken later.

## Securing for Overnight or Extended Stay

**Wheel Chocks . . . . . INSTALLED**

**Parking Brake . . . . . OFF**

Release the parking brake to eliminate the possibility of the brakes freezing.

**Protective Covers . . . . . INSTALLED**

**Water Storage Containers . . . . . DRAINED**

**Toilets . . . . . DRAINED**

**Batteries . . . . . REMOVED**

If the nickel-cadmium batteries will be exposed to temperatures below 14°F (-10°C) for more than 12 hours, remove the batteries and store them in a warmer environment.

**Galley Supplies That May Freeze . . . . . REMOVED**

**Doors . . . . . CLOSED/LOCKED**

***Intentionally Left Blank.***