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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 – RETRACTED, Flaps – RETRACTED, APR – OFF).

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 monitoring (PM) 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.

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## Normal Procedures

### Flight Compartment

**Preflight Inspection . . . . . COMPLETED**

Gear and ADG Pins . . . . . REMOVED

Ensure that the landing gear and ADG pins, all flight instrument covers, inlet covers, and plugs are removed and properly secured.

**Cabin . . . . . CHECKED**

Ensure pin is removed from emergency exit and all required safety equipment is checked.

**Documents . . . . . ON BOARD**

**NOTE:** ARROW – Airworthiness, Registration, Radio Station License, Weight and Balance. For the “O” check for the Aircraft Flight Manual (AFM) and supplements, Operation Manuals, pertinent Flight Management System Pilot’s Operating Manuals, RVSM documentation and other documents to insure compliance with regulatory needs.

**Circuit Breakers . . . . . CHECKED**

Verify that all circuit breakers are in.

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

Check that the landing gear handle is in the DN position.

**Thrust Levers . . . . . SHUTOFF**

Verify that both thrust levers are in SHUTOFF position.

**Flap Lever/Flap Position . . . . . MATCHED**

Ensure flap selector switch is in the detent for the flap setting observed during the walk-a-round. The flap position indicator reads zero without electrical power.

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**Manual Landing Gear Release Handle . . . . . STOWED**

Verify that the Manual Landing Gear release handle is in the stowed (down) position.

**ADG Manual Release . . . . . STOWED**

Verify that the ADG manual release handle is in the stowed position.

**ADG Lamp . . . . . TESTED**

With the ADG LAMP switch in the LAMP position, a ground is applied to the light circuit and the test light illuminates. This also confirms the battery is connected.

**All Generator Switches (3) . . . . . OFF**

**10th and 14th Stage Bleeds . . . . . OFF**

“Braille check” the switchlights. Insure the switchlights are out as opposed to recessed.

**NOTE:** In regard to the 14th stage switchlights, the AFM only specifies that after engine start the valves are exercised closed then open. Following the checklist as printed here places the switchlights in the closed position although the 14th stage valves remain open until the engine is started. The BLEED CLOSED legends will remain extinguished until each engine provides its 14th stage air.

**Overhead Switches . . . . . OFF**

Visually check all systems switches and switchlights on the overhead panel are in the OFF position. This is a good time to do the same thing for all other cockpit switches and switchlights.

## Expanded Normal Procedures

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*Go to EXTERNAL AIR START (2B-50), if required.*

**NOTE:** The italic **Go to EXTERNAL AIR START** (above) indicates leaving the normal flow. At the completion of the procedure, you will be directed to return to an italic **Resume from EXTERNAL AIR START** later in the Normal Checklist.

### **Battery Master Switch . . . . . ON**

With BATTERY MASTER switch ON the BATTERY light should remain extinguished. The battery CHARGER light will illuminate if there is no AC power on the aircraft. Check the ESS AC Power FAIL (amber) and ALTN (green) both illuminated indicating the auto-transfer function is working properly. (Note some but not all 8 and 10 channel annunciators illuminate and the left MASTER CAUTION (M/C) flashes. Press either MASTER CAUTION (M/C) switchlights to reset and extinguish the 8/10 annunciators.

**CAUTION:** BATTERY MASTER Switch must remain ON throughout the flight, except when an abnormal checklist directs otherwise.

### **External Power . . . . . AS REQUIRED**

Seldom used external DC power when connected to the aircraft will (without BATTERY MASTER Switch On) cause the IN USE light to illuminate on the ELECT PWR Panel.

When acceptable AC ground power (115 ±9V AC and 400 ±25 Hz) is connected to the aircraft a green AVAIL light on the overhead ELECT PWR Panel illuminates. However voltage and frequency should be checked before connecting AC external power by rotating the AC meter selector to EXT PWR position. Selecting the GPWR switch to ON connects the external AC power to the electrical system powering all busses if the flaps are zero. The AVAIL light extinguishes and the amber IN USE light illuminates.

# **CAE SimuFlite**

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**Navigation Lights . . . . . ON**

**Fire Warning/Fault/Squibs . . . . . TESTED**

Before proceeding press either MASTER CAUTION (M/C) switchlight to reset the flashing left MASTER CAUTION (M/C). The right switchlight is active but does not flash with battery power only. This action clears the 8 and 10 channel and master caution annunciators so that other warning tests can be easily observed on the 8 and 10 channel panels.

**Fire Warning Test Switch . . . . . WARN TEST/HOLD**

The fire bell sounds, the red ENG FIRE PUSH (2), APU FIRE PUSH (1) switchlights and three green BOTTLE ARMED PUSH TO DISCH switchlights illuminate (“3 red, 3 green”); pressing the white TONE MUTED switchlight illuminates the white light and silences the bell. Releasing the Fire Warning Test switch extinguishes the fire push switchlights and also silences the fire bell.

**Fire Warning Test Switch . . . . . FAULT TEST/HOLD**

Three amber FIRE WARN FAIL lights illuminate causing the FIRE FAULT light to illuminate on the 8 channel annunciator. Prolonging the test for more than 4 seconds causes the left M/C light to Flash until the FAULT TEST switch is released.

**SQUIB Switchlights (3) . . . . . PRESS IN TURN**

Verify firex bottles (2 engines) LOW PRESS & 1 APU LO PRESS amber lights are extinguished. Pressing BOTTLE 1, APU, & BOTTLE 2 firex SQUIB Test switchlights (in turn) tests the continuity of the electrical circuitry and should illuminate the split legend L SQUIB/R SQUIB switchlights for BOTTLE 1 and BOTTLE 2 and the SQUIB switchlight for the APU bottle.



## Expanded Normal Procedures

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### **APU Bleed Air . . . . . OFF**

Verify that the APU BLEED AIR OPEN Switchlight is de-selected (out) and the light is extinguished.

**NOTE:** The APU BLEED AIR switchlight electrically commands the APU Load Control Valve (LCV) open or closed. APU bleed air is required to open the LCV.

### **APU Power/Fuel . . . . . ON**

As the switchlight is pressed look for the amber PUMP INOP light to illuminate momentarily, then extinguish; the white SOV CLOSED light extinguishes; and the AUXILIARY BATTERY ON light (co-pilot's console) illuminates.

### **Battery Voltage . . . . . CHECKED ABOVE 22V**

With the DC METERING selector in the BATT VOLTS position, check that the DC VOLTS are more than 22V on the DC VOLTS indicator.

### **APU . . . . . START**

APU START/STOP Switchlight . . . . . PRESS

STARTER Light . . . . . ILLUMINATES

SOV CLOSED Light . . . . . REMAINS EXTINGUISHED

At 60% RPM . . . . . STARTER LIGHT EXTINGUISHES

At 95% RPM . . . . . APU GEN OFF LIGHT ILLUMINATES

At 95% RPM + 4 Seconds . . . . . APU RDY ILLUMINATES

ELEC Light on 8-Channel Annunciator . . . . . ILLUMINATES

Master Caution (M/C) Switchlight . . . . . FLASHES

Four seconds after ELEC 8-channel annunciator illuminates, the M/C switchlight (left) flashes.

#### **NOTE:**

▪ **SB 601-0418** provides for the APU Electronic Control Unit (ECU) to receive a source of voltage from the #2 IRS battery for improved cold weather APU starting.

▪ **S/Ns 5001 to 5134 and S/Ns 3001 to 3066 with SB 601-0099** have an auxiliary battery that supplies power to the APU ECU for cold wx starting.

# CAE SimuFlite

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## APU Generator . . . . . TESTED/ON

AC Meter Selector rotate to . . . . . APU

APU Generator Switch . . . . . TEST/HOLD

Check APU voltage output and frequency unloaded (115 ±9V AC, 400 ±25Hz). While holding the APU GEN switch in TEST the APU GEN OFF light (and coincidentally 8-10 channel ELECT light) should extinguished.

APU Generator Switch . . . . . ON

**NOTE:** Before applying bleed air load on the APU, allow APU RPM to stabilize at 100% for 2 minutes.

## Electrical Power Panels . . . . . CHECKED

The AC and DC POWER and METERING panels are checked to verify all lights (except the two engine driven generator GEN OFF lights) are extinguished (all buses and TRUs should be powered). Verify the green ALTN and amber FAIL lights for the AC Essential power transfer are extinguished. Check the ELECT PWR panel on the overhead and verify battery CHARGER and BATTERY lights are extinguished, and the status of the ground power if required. Battery Bus voltage may temporarily exceed 28V during charging.

IRUs (3) . . . . . NAV

Master Avionics Switches (6) . . . . . PRESS ON

LASERTRAK . . . . . PRESS ON

**NOTE:** Powering-up the IRUs, AVIONICS, and Lasertrak at this time (after the AC generator is online) allows the FMS and IRUs to warm up in preparation for initializing later in the checklist. Some installations may not have 3 IRUs and may have different switches/configurations for controlling the avionics. If IRU is being aligned above 70° N Latitude, set MSU to ALIGN.

## Expanded Normal Procedures

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### Warning Lights . . . . . TESTED

WARN LTS or WARNING LT TEST Switch . . . TEST/ON

HOLD any one of the three test switches (WARN LTS (facia panels) or WARNING LT TEST Switch (center pedestal) to the TEST or ON position and verify that the master caution related lights illuminate. Check annunciator lights on all panels for brightness and that all bulbs within a light/switchlight are illuminated. Occasionally bulbs do not illuminate properly and need to be touched or “flicked” to illuminate.

RECALL/TEST Switch  
(8-10 Channel Panel) . . . . . HOLD TO TEST

Hold in TEST position to verify all 8-10 panel annunciator legends (including the spares) and the left and right M/C (not flashing) switchlight bulbs illuminate; then release the switch.

M/C Switchlights . . . . . PRESS TO RESET

BRT/DIM Switch . . . . . AS REQUIRED

**NOTE:** Depending on aircraft completion design, warning/caution lights, except the Overhead Panel lights, may test when the Center Pedestal WARNING LT TEST switch is held to ON. The Overhead Panel annunciator lights, in this configuration, are tested using the WARN LTS test switch on either pilot’s facia panel.

## **CAE SimuFlite**

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### ■ **Bleed Air Leak Detect Panel . . . . . TESTED/RESET**

- SYSTEM TEST Switch  
(above the CBP-B) . . . . . PRESS AND HOLD
- Bleed Air Magnetic Trip/Fault Indicators . . . . . TRIPPED  
Verify white and black “flags” in the panel’s eight magnetic trip indicators.
- DUCT FAIL lights (6 red) . . . . . ILLUMINATED
- SYSTEM TEST Switch . . . . . RELEASE  
Verify the six warning lights extinguish.
- IND RESET . . . . . PRESS  
Verify the eight magnetic trip/fault indicators are black (reset) and warning lights extinguish.

**NOTE:** On the Center Instrument Panel the BLEED AIR LEAK DETECT test switchlight DUCT FAIL (flashing) and 5DUCT FAIL lights on the Overhead Panel illuminate (Wing Anti-Ice, L & R 10th and L & R 14th). The 10th and 14th Stage DUCT FAIL(s) are switchlights that control their respective Bleed Valves.

**NOTE:** If any FUS or WING annunciator (4 on the Bleed Air Leak Detect Panel) fails to provide the indication specified, flight into known icing conditions is prohibited. The WING ANTI-ICE control switch must be set to OFF for flight. This note refers to the Magnetic Trip annunciators being black and white when tested and reverting to black when IND RESET switch is pressed.

### ■ **DUCT MON Switch (Loops A & B) . . . . . TESTED/BOTH**

Move the DUCT MON test switch to A and B in turn, allowing a couple of seconds in each position to test the systems. Verify that both 10th stage bleed air DUCT FAIL (red) lights remain extinguished. Return the DUCT MON switch to BOTH.

### ■ First Flight of Day

## Expanded Normal Procedures

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### **APU Bleed Air . . . . . ON**

Having allowed 2 minutes for the APU to stabilize at 100% RPM.

### **APU BLEED AIR Switchlight . . . . . PRESS ON/OPEN**

Green OPEN switchlight illuminates; note a rise in APU EGT and verify adequate pressure on the L 10 TH STG pressure gauge (approximately 45 PSI).

### **Isolation Valve . . . . . OPENED**

### **ISOL Switchlight . . . . . PRESS OPEN**

10th Stage green OPEN switchlight illuminates and pressure, approximately 45 PSI, is indicated on the R 10 TH STG pressure gauge.

### **ACUs . . . . . ON**

### **L & R ACUs . . . . . PRESS ON ONE AT A TIME**

White OFF legends extinguished.

**NOTE:** Ensure the bleed air pressure drops and EGT rises as each ACU is selected ON. The bleed air pressure drop should be similar for each ACU. The APU EGT should remain in the green.

### **External Power . . . . . OFF/DISCONNECTED**

Overhead (ELECT PWR panel) verify GPWR switch is OFF and the AVAIL and IN USE lights are extinguished.

## **CAE SimuFlite**

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**S/Ns 5001 to 5134, (also 3001-3066)  
and AC without SB 601-0419**

**Cockpit Heat . . . . . NORMAL/CHECKED**

CKPT HEAT (Overhead Panel) . . . . . NORMAL

Footwarmer/Demist Pull Knobs . . . . . PULL

Verify increased airflow as directed to windshields and  
down toward feet.

While the knobs are still pulled out:

CKPT HEAT Switch . . . . . OFF

Listen for footwarmer/demist airflow to cease.

Footwarmer/Demist knobs . . . . . PUSH IN

Footwarmer/Demist System . . . . . SET AS DESIRED

**NOTE:** The CAE SFI Challenger simulator does not direct  
airflow as described in this procedure (airflow is assumed).

## Expanded Normal Procedures

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**S/Ns 5142, 5160, and subsequent and 5135 to 5141  
and 5143 to 5159 with SB 601-0419 (see Note)**

**Cockpit Heat . . . . . ON/CHECKED**

COCKPIT HEAT . . . . . ON

Switch is located on the TEMPERATURE CONTROL panel (co-pilot's console). When selected ON the fan and electric heater are activated. Check for airflow.

AIR Knob . . . . . PULL/PUSH

Verify appropriate airflow to windshield and footwarmer areas.

- IN — Footwarmer only
- MID — Footwarmer and windshield vents
- Fully OUT — Windshield vent only

COCKPIT HEAT Switch . . . . . OFF

Verify airflow ceases.

AIR KNOB/Demist System . . . . . SET AS DESIRED

**Cockpit Temperature Selectors . . . . . NORMAL/SET**

**NOTE:** Cockpit Heat: **S/Ns 5142, 5160 and subsequent, AND aircraft with SB 601-0419** (Footwarmer/Windshield Vent System – New Electrical Heater and Ducts). Both the Cockpit Heat switch and a single Pull/Push diverter knob are located forward of the TEMPERATURE CONTROL Panel (copilot's console). With a single knob configuration, PUSH in for footwarmer only, PULL midway out for both and PULL all the way out for windshield/demist only.

**NOTE:** Cockpit Heat in the CAE SFI Challenger simulator nearly emulates both configurations by having two Cockpit Heat Switches instead of one, and by having separate knobs for the Windshield and Footwarmer control rather than one knob as in the later 3Rs.

# **CAE SimuFlite**

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**Resume here from EXTERNAL AIR START.**

**Inertial Reference System . . . . . ALIGN/NAV**

MSU Selectors (3) . . . . . ALIGN or NAV

MSU Annunciators . . . . . ILLUMINATE

Turn each (3) IRS MSUs to NAV. Self-test causes ALIGN and ON BATT lights to illuminate for one minute; NO AIR illuminates momentarily causing the amber COOL AIR FAIL lights to illuminate on their respective instrument panels (followed by the NAV light on the 10 channel and M/C).

COOL AIR FAIL lights . . . . . PRESS/RESET

**NOTE:** Some aircraft have only two IRUs. Additional tests follow which involve the cooling air for other avionics.

**FMS . . . . . INITIALIZE**

Date and Time . . . . . ENTER/VERIFY AND SET AS REQUIRED

FMS Database . . . . . VERIFY CURRENT

Position . . . . . INITIALIZE EACH FMS SEPARATELY

**NOTE:** Additional programming of the FMSs will be called for later in the checklist.

**Cool Air Panels . . . . . TESTED/RESET**

COOL AIR FAIL Lights (2) . . . . . PRESS TO RESET

COOL AIR FAIL Switchlights on pilot's and copilot's instrument panels extinguish.



## Expanded Normal Procedures

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### System Test Switches . . . . . PRESS IN TURN

On the AVIONICS COOLING Annunciator panels located on the forward bulkhead below CBPs A and B behind both pilots' seats, press each TEST button (2) in turn and verify the respective side COOL AIR FAIL light illuminates on the Instrument Panel.

### Magnetic Trip Indicators . . . . . TRIPPED

Black and white flags are visible on the Avionics Cooling panels.

### AVIONICS COOLING Annunciator Panel

### RESET Button (each panel) . . . . . PRESS TO RESET

Verify the trip indicators are black. Trip indicators that do not reset may indicate a failed cooling component and should be resolved before flight.

### COOL AIR FAIL Lights . . . . . RESET

COOL AIR FAIL lights should extinguish. If not, re-check the Avionics Cooling Panel for tripped indicators and the NO AIR lights on the MSUs. Resolve any avionics cooling faults prior to flight.

### Lights . . . . . AS REQUIRED

Cabin and Galley Master Power switches are located on the lower edge of the overhead Panel (eyebrow) in front of the co-pilot. Other fluorescent (flood) and backlighting control knobs and switches for panels throughout the cockpit are located predominantly on the Overhead Panel in the CAE SFI Challenger simulator. Lighting control for EFIS, MFD, FMS CDUs, and Radar is separate.

**NOTE:** To get the best performance and control from the fluorescent (flood) lights throughout the cockpit and cabin, it is recommended to select light switches and rheostats to full bright position to warm the lights prior to selecting a dimmed setting. In most cases, one-half to one minute works well.

# CAE SimuFlite

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## No Smoking/Seat Belt Signs . . . . . ON

The AUTO position will turn on the signs automatically, based on inputs from the cabin pressure, landing gear, and flaps systems. The ON position forces them on until otherwise selected.

**NOTE:** In the CAE SFI Challenger simulator, the No Smoking/Seat Belts switches are located on the lower edge of the Overhead Panel (eyebrow) in front of the copilot.

## Servo Monitor . . . . . CHECKED

The green MON SAFE light as well as the amber ROLL and YAW lights should be illuminated with no hydraulic pressure on the aircraft. The amber PITCH light should not be illuminated at any time. See note regarding **S/Ns 5174 and S/B 0493**.

**NOTE:** On **S/N 5174 and aircraft incorporating SB 601-0493** (Modification – Yaw Control System – Installation of Power Control Units, PN 600-75101-29 (provision for servo monitor check for A/C without rudder PCU jam detection switches). For this check, the ROLL and MON SAFE lights are illuminated and the PITCH light is extinguished. (AFM temporary Revision 18-1)

## Nose Door . . . . . CLEAR

Verify ground personnel are clear of the nose gear door before selecting the hydraulic system 3A pump to ON.

**CAUTION:** Pressurizing the number 3 hydraulic system with the NOSE DOOR OPEN light illuminated closes the doors and is a hazard to personnel.

## Expanded Normal Procedures

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**Nosewheel Steering . . . . . OFF**

**Hydraulic 3A Pump . . . . . ON/CHECKED**

ELECT PUMP 3A Switch . . . . . ON

ELECT PUMP 3A Light . . . . . EXTINGUISHES

Hydraulic System Pressure . . . . . 3,000 PSI

Hydraulic System Quantity . . . . . WITHIN GREEN ARC

System 3 normal quantity should be approximately 55-60 % with the landing gear down. After gear retraction system 3 quantity should indicate 80-85 %.

**NOTE:** On aircraft with **SB 601-0266** (Modification – Nose Gear Doors – External Ground Operation) the NLG DOOR SWITCH set to FLT/CLOSE DOOR allows doors to close when hydraulic system 3 is pressurized.

**NOSE DOOR OPEN Light . . . . . EXTINGUISHED**

When the No. 3 hydraulic system is pressurized, the nose gear doors close; the NOSE DOOR OPEN light extinguishes.

**Brake Pressure . . . . . CHECKED**

Inboard braking system pressure should be 3000 PSI (normal).

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

Toe Brakes . . . . . FULLY DEPRESS & HOLD

Parking Brake Handle . . . . . PULL and ROTATE 90°

Then relax pedal pressure; PARKING BRAKE light illuminates when set; the Anti-Skid relays lose power and causes the INBD FAIL and OUTBD FAIL lights on the console Anti-skid Panel to illuminate. With the Parking Brake set, the ANTI-SKID system master caution 10 channel annunciator and anti-skid testing is inhibited.



## Expanded Normal Procedures

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### S/Ns 5001 to 5134 (3As) without SB 601-0396

- **Takeoff Configuration Warning (TOCW) . . . . CHECKED**
  - Flaps . . . . . 0°
  - Thrust Levers . . . . . ADVANCE INTO TAKEOFF ANGLE  
During the check verify that both thrust levers individually advanced for takeoff cause the TOCW to SOUND until the flaps have reached the takeoff position.
  - Flaps . . . . . 20°/30°/45° AND BACK TO 20° IN TURN  
TOCW sounds until the flaps extend to 20°. The TOCW sounds when the flaps extend to the 30° and 45° positions, then stops when the flaps retract to 20°.
  - Flight Spoilers . . . . . EXTEND THEN RETRACT  
TOCW sounds as the flight spoilers extend. The warning stops after the flight spoilers retract.
  - Pitch Trim Channel 2 . . . . . ENGAGE  
Press the CHAN 1 INOP / CHAN 2 INOP Switchlight once to select channel 2 stabilizer trim.
  - Pitch Trim Switch . . . . . NOSE DN/NOSE UP/RELEASE  
Trim out of the green in both directions. As the STAB pointer moves out of the green band (nose up and nose down), the TOCW sounds. When the pointer enters the green band the warning ceases.
  - Flaps . . . . . 0°  
The TOCW sounds again as the flaps move from the take-off position.
  - Thrust Levers . . . . . SHUTOFF  
To verify that either thrust lever advanced for takeoff will cause the TOCW, retard levers separately, starting with the lever first advanced.

**NOTE: S/Ns prior to 5135 with SB 601-0396 and SN 5135 and subsequent (3Rs)** have a modified Aural Warning System – Takeoff Configuration Warning (TOCW) back-up which eliminates the AFM requirement for a daily check. However, CAE SFI Challenger operations recommend the following preflight test for the TOCW. ADVANCE AND RETARD EACH POWER LEVER IN-TURN TO ACTIVATE THE TOCW with the flaps set to zero.

- First Flight of Day

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## Stall Warning/Protection . . . . . ■ TESTED/ON

To ensure correct testing, AOA vanes should be set to zero on the preflight inspection.

PUSHER Switches . . . . . ON

STALL PROTECT FAIL Lights . . . . . EXTINGUISHED

Flaps . . . . . 0°

STALL PROTECTION

TEST Switches (both) . . . . . TEST (simultaneously)

HOLD pilot's and co-pilot's test switches to TEST throughout the remainder of the check. VERIFY both ALT COMP FAIL lights illuminate. STALL PROTECT FAIL lights may flash at this time or later during the test.

## Check the following functions as the SPS test indicator pointers move over the scale toward the red region:

SPS Test Indicator pointers . . . . . BLUE SECTOR

Ignition A and B ON (white) lights illuminated.

SPS Test Indicator pointers . . . . . YELLOW

Stick shakers operate

SPS Test Indicator pointers . . . . . RED SECTOR

Aural stall warning sounds, stick pusher activates and STALL PUSH lights flash.

SPS Test Indicator pointers . . . . . POINTERS STOP

STALL PROTECT FAIL lights flash.

■ First Flight of Day

## Expanded Normal Procedures

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AP/SP DISC Pushbuttons . . . . PRESS/HOLD/RELEASE  
(in turn)

PRESS/HOLD each control yoke's AP/SP DISC button in turn and verify that the Stick Pusher disengages (yoke returns to neutral position). When each AP/SP DISC pushbutton is released, the pusher is again engaged and pushes the control yoke forward.

G Switch . . . . . TEST/HOLD/RELEASE

While still holding both the SPS TEST switches to TEST, select and hold the STALL PROTECTION G SWITCH to TEST. The Stick Pusher disengages and the yoke returns to neutral position. Finally release the G switch and the pusher re-engages and moves the yoke forward.

STALL PROTECTION TEST Switches . . . . . RELEASE

Ensure the above functions cease.

**NOTE: Aircraft with SB 601-0510**, modification – Stall Protection System – Dormant Failures in SPS Computer: When the pointer is in the blue sector, the STALL PROTECT FAIL lights flash and the IGN ON lights illuminate. Additionally, the pointer sweeps counter-clockwise past the red sector then returns to and remains in the red sector during the remainder of the test.

**Hydraulic B Pumps . . . . . OFF**

**If chocks not installed:**

Hydraulic 3A Pump . . . . . ON

Check INBD brake pressure 3000 PSI. If 3A or 3B pumps remain off the inboard brake pressure will decrease over time.

# CAE SimuFlite

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## Cabin Pressurization . . . . . CHECKED/SET

MODE Switch . . . . . AUTO

Manual Regulator . . . . . 3 O'CLOCK

R Rate . . . . . SET TO DETENT

B Barometric Pressure . . . . . QNH

A Altitude . . . . . LANDING FIELD ELEVATION

All Lights . . . . . EXTINGUISHED

If AUTO FAULT light illuminates during APU start, select MAN, then reset to AUTO. The AUTO FAULT light will extinguish when MAN is selected, re-illuminate momentarily when AUTO is re-selected, and remain extinguished if the self-test passes.

**NOTE:** If the destination airport elevation is greater than 8,000 feet, select 8,000 feet for the duration of climb and cruise and set destination altitude at the start of descent.

**CAUTION:** When using the MAN function of the CABIN PRESSURIZATION MODE selector, EMER DEPRESS must be ON to avoid pressurizing the aircraft on the ground.

## Windshield/Anti-Ice/ADS Heaters . . . CHECKED and OFF

Left and Right WSHLD Heat Switches . . . . . LOW

Four NO HEAT lights extinguish.

WSHLD Heat Switches . . . . . HIGH

Lights remain extinguished.

WSHLD heat TEST pushbutton . . . . . PUSH TO TEST

The test pushbutton is located right of the WSHLD heat switches. Verify all four green TEST lights on for at least one second. If the TEST pushbutton is held longer than 4 or 5 seconds the TEST lights extinguish.



## Expanded Normal Procedures

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WSHLD Heat Switches . . . . . OFF

Four amber NO HEAT lights illuminate causing the 10 Channel ANTI-ICE and 4 seconds later the flashing M/C.

Left or Right M/C Switchlight . . . . . PUSH

Reset the M/C Flasher after acknowledging the ANTI-ICE annunciator. It is not necessary to wait for the M/C to flash. Cancellation may be accomplished as soon as the pilots acknowledge the 8/10 Channel annunciator light.

### ANTI-ICE WING TEST

(L HEAT/R HEAT) Switchlight . . . . . PRESS

While pressing the split legend L HEAT/R HEAT Switchlight, verify flashing red Wing Anti-Ice OVHT light (center instrument panel), and the red OVHT light (ANTI-ICE panel), amber L FAIL, R FAIL, white L HEAT, R HEAT and the 10 channel ANTI-ICE and M/C lights illuminated. Release switchlight and verify these lights extinguish. M/C light should extinguish when the TEST switch is released.

ADS Heater Knob . . . . . ALL ON

The first detent powers all heaters. Verify the HTR FAIL light and both PITOT HEAT lights extinguish (center instrument panels). Verify a load on the % HTR CURRENT meter.

ADS Heater Knob . . . . . ROTATE TO OFF

HTR FAIL (overhead panel) and both PITOT HEAT lights (instrument panels) will illuminate. 10 channel ANTI-ICE light illuminates.

M/C Switchlight . . . . . PRESS TO RESET

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## Emergency Lighting . . . . . CHECKED/ARMED

Emergency Lighting Switch . . . . . ON

In addition to 4 exterior emergency lights, there is provision for cabin emergency lighting. EMER LTS ON light, adjacent to switch, illuminates.

Emergency Lighting Switch . . . . . OFF

Lights extinguish; EMER LTS OFF light illuminates, and 8 channel EMER LGT/FLT REC light illuminates.

Emergency Lighting Switch . . . . . ARM

## Clocks . . . . . SET

To zero F.T. (Flight Time), press and hold the black PRESS TO RESET button adjacent to each digital clock and, at the same time, push the ZERO/RUN/STOP (bottom right switch on the clock) switch up to ZERO.

## ■ Aural Warnings . . . . . TESTED

TONE TEST Selector . . . . . SET/OFF

Rotate TONE TEST selector through the FIRE, OVSPD, FLAP OVSPD, ALT ADV, TOC, LDG GR, and SELCAL positions attempting to mute each in turn. Note that the various aural warning tones sound. Only FIRE and FLAP OVSPD are mutable.

## ■ SELCAL . . . . . AS REQUIRED

Move the TEST switch on the SELCAL panel to the TEST position and release the switch. The test simulates a SELCAL incoming call. Both SELCAL PRESS TO RESET (white) switchlights illuminate and the chime sounds. To extinguish the lights and reset for receiving press the PRESS TO RESET lights.

**NOTE:** The SELCAL annunciator and TEST panel is located above the EMERGENCY LIGHTING panel. In the course of the AURAL warning test and SELCAL test you will hear the SELCAL chimes twice.

## ■ First Flight of Day

## Expanded Normal Procedures

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### **Oxygen Masks/Oxygen Microphones . . . CHECKED/100%**

Oxygen Quantity . . . . . SUFFICIENT FOR FLIGHT

Oxygen Mask . . . . . SET TO 100%

Push down on the red N PUSH 100% lever on the left side of the mask.

RESET/TEST Sliding Handle . . . . . TEST

Pull back on the RESET/TEST handle and verify that the Flow Indicator opens momentarily and returns to black (closed).

EMERGENCY OXYGEN . . . . . TEST

While holding back on RESET/TEST sliding handle, PRESS the round EMERG Control and Press to Test Button on the oxygen mask and verify oxygen flowing and the flow indicator is yellow. Releasing the Press To Test Button stops flow and flow indicator goes black.

Oxygen Mask Microphone/communication . . TEST/CHECK

Move 3 “comm panel” switches forward to SPKR, HOT and OXY. Either by testing the oxygen mask for flow or tapping on the mask, listen for appropriate sounds from the cockpit speakers. Reset the “comm panel” as desired.

Passenger Mask deployment system . . PRESS TO TEST

Listen for air-flow.

### **Pilot’s and Copilot’s Static Selectors . . . . . GUARDED**

Two on captain’s side and 4 on the co-pilot’s side.

# **CAE SimuFlite**

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## **Engine Vibration Monitoring . . . . . TESTED**

CORE/FAN Switchlights . . . . PRESS and HOLD (in turn)  
L or R engine FAN VIBE indicator (in turn) points to 4.0 MILs. Two seconds later the CORE/FAN Switchlight illuminates. The ENGINE light on the 8 channel annunciator and 4 seconds later the M/C lights flash. Releasing the CORE / FAN switchlight ceases the test and allows the M/C system to return to no annunciations.

**NOTE:** This test function only simulates high vibration indication and does not verify the functionality of system transducers or cable assemblies. The proper operation of these components is verified by noting the vibration readings after engine start, and during accelerations and decelerations.

## **Engine Instruments . . . . . TESTED**

TEST Switch . . . . . TEST 1 and 2 IN TURN  
Engine instrument power supplies are independently checked with TEST 1, then TEST 2 on the engine instrument control panel. TEST 1 checks the channel 1 power supply; TEST 2 checks the channel 2 power supply. In each test position, all analog scale elements illuminate and all the digital displays indicate "8." The FUEL CONTROL panel digits indicate "8880" on each tank and "88800" on the total fuel reading. The AUX PWR light, when illuminated, indicates a failure of either power supply; it does not illuminate when either TEST 1 or TEST 2 is selected.

TEST Switch . . . . . RELEASE TO OFF

**NOTE:** During prolonged testing, the Signal Data Converter for the engine instruments/fuel panels can be damaged. CAE SFI recommends 2-3 seconds maximum in either 1 or 2 test position, followed by a 1-2 second pause before testing the opposite position. In the CAE SFI Challenger simulator both tests happen quickly and it is recommended that one crewmember watch for the engine gage indications while the other monitors the test of the fuel gages.

## Expanded Normal Procedures

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**Standby Attitude Indicator . . . . . SET**

Un-cage and set the horizon as required.

**AFCS Advisory Panel/FGC . . . . . CHECKED/SET**

Check the AFCS Advisory Display Panel to verify that actual SAT, TAT, and TAS numbers are displayed (no dashed lines) and there are no warning messages. The indicator light to the left of the FGC CPL button should be illuminated at power-up (defaults to the captain's (left) side). Verify CPL set to desired side. After engine start this system is refreshed with the "transfer and return".

**Engine Speed Control . . . . . ON**

Check the both engine speed control switches are in the ON (up) position.

**Flight Surface and Trim Indicator . . . . . CHECKED**

Surface position indicating needles ("bird beaks") should be in a neutral (3 o'clock position for spoiler, aileron, and elevators; and 6 o'clock position for the rudder). The trim indicators will be checked next. The actual flight controls will be checked later on.

# CAE SimuFlite

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## Trims (3) . . . . . ■ TESTED/SET

Previously for the TOC check, a pitch trim channel was selected. Assuming Channel 2 was selected at that time, the amber CHAN 1 INOP Switchlight will be illuminated. To complete the stabilizer trim check both pilot and co-pilots' control switches must be used to check both channels as follows.

### Channel 2 – TEST

#### Split Pitch Trim . . . . . EACH HALF PUSH

Separately push each half of the Pitch Trim switch on the yoke in each direction and verify the pitch trim indicating pointer does not move.

**NOTE:** The Split Pitch Trim test is not addressed in the AFM.

#### Pitch Trim switch (both halves) . . . . . PUSH.

Push both halves of the pilot's Pitch Trim switch and observe trim pointer movement coincident with the trim commanded and that needle movement stops when switches are released.

#### Disconnect Button . . . . . PRESS

Press the control wheel Pitch Trim Disconnect button. Both amber CHAN 2 INOP and CHAN 1 INOP Switchlights illuminate. The illumination of the CHAN 1 and 2 INOP lights cause the 8 channel FLT CONT light and flashing M/C (4 seconds later) to come on. After disconnecting, verify trim pointer does not move when trim switches are pushed.

### Channel 1 – TEST

Push the pitch trim channel selector (CHAN 1 INOP/CHAN 2 INOP Switchlight) followed by the OVSPD / CHANGE CHAN Switchlight. This (2 switch push) action activates Channel 1 and Channel 2 pitch trim (Channel 2 is armed ready to activate if 1 fails) and extinguishes both CHAN1 and 2 INOP lights.

■ First Flight of Day

## Expanded Normal Procedures

---

Re-check same control wheel stab trim switches again as above this time for Channel 1.

REPEAT the above procedures USING THE OPPOSITE control wheel pitch trim and disconnect switches during the test for EACH channel.

AFTER BOTH CONTROL WHEEL PITCH TRIM CONTROLS HAVE BEEN CHECKED:

Re-engage CHAN 1 . . . . . SET TRIM FOR TAKEOFF

Press CHAN 1/CHAN 2 Switchlight followed by the CHANGE CHAN Switch and verify that the CHAN 1 INOP and CHAN 2 INOP lights extinguish. Set stabilizer trim for takeoff.

CG Range % MAC	Set Trim
16 to 23%	Top Range
23 to 28%	Mid Range
28 to 35%	Bottom Range

Aileron Trim . . CHECK FOR FREE MOVEMENT/NEUTRAL

Individually check that each half of the aileron trim switch by itself causes no trim needle movement. Using both halves of the aileron trim switches, trim left and right. (Notice that the control wheel moves slightly coincident with the trim commanded.)

**CAUTION:** Do not split both aileron switches in opposite directions at the same time.

Rudder Trim . . CHECK FOR FREE MOVEMENT/NEUTRAL

Turn the Rudder Trim knob left and right. (Notice slight rudder pedal movement coincident with the trim commanded).

All Trims . . . . . SET FOR TAKEOFF

**NOTE:** AFM procedure is to trim fully in each direction.

**NOTE:** While it appears that the “flow” has been broken by the trim checks you now pick-up where you left off at the “bird beaks” and continue the “flow” across the center panel.

# **CAE SimuFlite**

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**SN 5027 and subsequent; prior AC with SB 601-225  
(Powered Crossfeed):**

**Fuel Panel . . . . . TESTED**

**NOTE:** This fuel panel test is often referred to as the “smiley face” check.

**LEFT to RIGHT Switchlight . . . . . PRESS ON**

Green LEFT TO RIGHT switchlight illuminates and the valve opens allowing fuel to gravity flow from left MAIN tank into the AUX tank.

**LEFT electric fuel PUMP Switchlight . . . . . PRESS ON**

Both green (left and right electric fuel PUMP) ON lights illuminate and amber pump INOP and LOW PRESS lights extinguish.

**Fuel X-FLOW . . . . . PRESS OPEN**

OPEN light illuminates.

**RIGHT electric fuel PUMP Switchlight . . . . . PRESS ON**

No change to lights.

**RIGHT TO LEFT Switchlight . . . . . PRESS ON**

The green LEFT TO RIGHT switchlight will extinguish. Both “powered crossfeed” valves close when both switches are selected at the same time.

**NOTE:** Aircraft without “Powered Crossfeed” systems DO NOT have LEFT TO RIGHT or RIGHT TO LEFT Switchlights or associated valves. Fuel panel tests therein involve only the two electric pump switchlights and the X-FLOW as indicated in the Fuel Panel test procedure.



## Expanded Normal Procedures

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Start over again on left side of panel to complete test as follows:

LEFT TO RIGHT Switchlight . . . . . PRESS OFF

LEFT TO RIGHT Switchlight remains extinguished and the RIGHT TO LEFT switchlight illuminates as the valve opens allowing fuel to gravity flow from the right MAIN tank into the AUX tank.

LEFT electric fuel PUMP Switchlight . . . . . PRESS OFF

No change to lights.

Fuel X-FLOW . . . . . PRESS OFF

OPEN light extinguishes.

**NOTE:** The Fuel Control X-Flow check is required before each flight in excess of 1 hour.

**CAUTION:** Do not leave the X-Flow valve open while the aircraft is on the ground.

RIGHT electric fuel PUMP Switchlight . . . . . PRESS OFF

Both pump ON lights extinguish. Both electric pump INOP lights illuminate and cause the 8 Channel FUEL and M/C annunciations. Additionally the left and right ENG fuel LOW PRESS lights may illuminate and cause the M/C annunciations also.

RIGHT TO LEFT Switchlight . . . . . PRESS OFF

RIGHT TO LEFT Switchlight extinguishes.

Fuel Temperature . . . . . CHECK/IN GREEN ARC

# CAE SimuFlite

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**If Tail Tank contains fuel:**

FUEL CONTROL, TAIL TANK ARMED Switch  
(S/Ns 5135 and subsequent) or  
T/TANK FUEL TRANS ARMED Switch  
(S/Ns 5001 to 5134) . . . . . ARMED

Check NOT ARMED light extinguished.

Fuel Temperature . . . . . CHECK/IN GREEN ARC

ALL aircraft with fuel in Tail Tank:

Tail Tank Secondary Transfer . . . . . TEST

Located above CB panel B:

T/TANK TEST Switch . . . . . HOLD TO AFTER FUEL

After 15 seconds:

SEC TRANS Light . . . . . VERIFY ILLUMINATED

Fuel Quantity Tail Tank . . . . . MONITOR FOR 10 LB  
DECREASE

T/TANK TEST Switch . . . . . RELEASE

**NOTE:** Additional procedures and limitations for operations with Tail Tanks are found in the AFM, Supplement 12.

**Fuel quantity . . . . . CHECKED**

## Expanded Normal Procedures

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### **Jet Pipe/Pylon Overheat . . . . . TESTED**

OVHT Switchlights . . . . . PRESS AND HOLD

Red OVHT flashes if the system is operating normally.

OVHT Switchlights . . . . . RELEASE

OVHT WARN FAIL Switchlights . . . . PRESS AND HOLD  
IN TURN

Press one at a time. The amber OVHT WARN FAIL light illuminates as does the 8 Channel ENGINE light. If held for more than 4 seconds, the M/C lights flash. Release the OVHT WARN FAIL Switchlight and all warning lights should extinguish indicating a good test. Repeat test for other switchlight.

OVHT WARN FAIL Switchlights . . . . . RELEASE

### **Ice Detector . . . . . TESTED**

ICE DETECTOR FAIL/

PRESS TO TEST Switchlights . . . . . PRESS AND HOLD

Both red ICE lights flash; FAIL lights remain extinguished.

ICE DETECTOR FAIL/

PRESS TO TEST Switchlights . . . . . RELEASE

Both red ICE lights extinguish and FAIL lights remain extinguished.

### **■ Landing Gear Panel . . . . . TESTED**

Verify WOW lights extinguished.

TEST Switch . . . . . PRESS and HOLD

The green LEFT, NOSE, and RIGHT lights remain illuminated and while pressing the TEST switch verify: BOTH red lights in the GEAR HANDLE; the amber MUTE HORN light button; the red NOSE DOOR OPEN light illuminate; and {Not seen in the CAE simulator, the NO SMOKING & FASTEN SEAT BELTS signs illuminate.} Verify the DN LCK REL landing gear lever lock is in position over the landing gear lever (indicates weight on wheels).

### **■ First Flight of Day**

## **CAE SimuFlite**

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### ■ **MLG Bay Overheat Detector . . . . . TESTED**

MLG BAY OVHT DETECT Switchlight . . PRESS/RELEASE

While pressing the MLG BAY OVERHEAT DETECT switchlights, verify the RED OVHT light illuminates, then extinguishes after releasing the switchlight.

MLG BAY OVHT

WARN FAIL switchlight . . . . . PRESS AND HOLD

Verify the amber OVHT WARN FAIL light, and the 10 Channel MLG BAY OVHT FAIL light illuminate. Holding the switchlight to TEST for more than 4 seconds will cause the M/C to flash. Verify upon releasing the switchlight that the associated MLG and M/C system lights extinguish.

### **Electrical Power Panel . . . . . CHECKED**

All buses and TRUs should be powered. Verify green Essential AC Power ALTN (transfer) and amber FAIL lights are extinguished. The only lights remaining illuminated on the electrical panels will be the two engine-driven GEN OFF lights. Verify that the BATTERY and CHARGER lights on the overhead panel are extinguished. Check external power if necessary.

### **ESS AC PWR XFER . . . . . CHECKED**

ESS AC POWER PRESS TO

TRANSFER Switchlight . . . . . PRESS TO SELECT

Verify the green ALTN light illuminates and the FAIL light remains extinguished. The switching can normally be heard (in the aircraft). All buses remain powered.

ESS AC POWER PRESS TO

TRANSFER Switchlight . . . . . PRESS TO DE-SELECT

Verify the green ALTN Switchlight and the FAIL light (remains) extinguished. The switching can normally be heard (in the aircraft). All buses remain powered.

### ■ First Flight of Day

## Expanded Normal Procedures

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**Pitch and Roll Disconnect Handles . . . . . STOWED**

**Ground Spoilers . . . . . TESTED/OFF**

Thrust Levers . . . . . SHUTOFF

GROUND SPOILERS Switch . . . . . ON

With thrust levers in the shutoff position, verify that the SPLRS INOP, LH GND SPLR, and RH GND SPLR lights are extinguished.

GROUND SPOILERS Switch . . . . . TEST AND HOLD

While holding the switch in the TEST position for at least six seconds, verify that after a two second delay, the LH GND SPLR and RH GND SPLR lights (on the glareshield) illuminate for four seconds, then extinguish. As they extinguish the amber SPLR INOP light (just aft of the GROUND SPOILER / TEST Switch) and, the 8 channel FLT CONT light illuminates. If TEST is prolonged the M/C flashes.

GROUND SPOILERS Switch . . . . . OFF

The SPLR INOP, FLT CONT and flashing M/C lights extinguish.

**NOTE:** This Ground Spoiler check should be performed with the hydraulic systems unpressurized.

■ **Audio Panels . . . . . TESTED/SET**

■ First Flight of Day

# **CAE SimuFlite**

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## **Avionics . . . . . ON/CHECKED**

### **GPWS Test . . . . . PRESS HOLD RELEASE**

Press and hold either red PULL UP/PRESS TO TEST Switchlights located on each pilot's Instrument Panel. The "short test" is initiated by pressing the test switch for only 1-2 seconds. Pressing to test more than 3-4 seconds continues the "long test". Lights associated with either short or long test are: Red PULL UP — PRESS TO TEST switchlights, BELOW G/S PRESS TO CANCEL switchlights, and GPW FAIL.

### **Wind Shear Test . . . . . PRESS HOLD RELEASE**

Test switchlight located below the GPWS test switchlight. Press and hold until the audio voice says "wind shear, wind shear."

### **TCAS System . . . . . TESTED/SET**

Check MFD for AUTO (upper right quadrant). Press (momentarily) either Transponder or TCAS Control Unit Test pushbutton. TCAS will self-test and present four targets on the MFD, red and green indications on both EADIs vertical flight indicator and a voice call out indicating TCAS checks OK.

### **VHF COM Radios Self Test.....AS DESIRED**

When the TEST button is depressed, The CTL display intensity cycles from bright to dim to indicate the self-test is in progress (approximately 5 seconds). If an out-of-limit condition is detected, "FLAG" is displayed in the active window and a two-digit fault code is displayed in the preset window. A no fault condition is indicated by four dashes in the active window and "00" displayed in the preset window. The alpha/numeric digits displayed are flashing.

## Expanded Normal Procedures

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The Marker Beacon and DME functions are automatically tested during VOR or ILS self-tests which are explained next. The OM, MM and IM annunciations are presented in turn in the upper right hand corner of the respective EADI and a 30Hz tone is audible in the audio system. During the VOR or ILS self-tests the DME is annunciated as "DME 100 AOK" in the upper left hand corner of the respective EHSI.

VOR Receiver Check . . . . . CURRENT  
Log entry within past 30 days for the VOR check.

VOR Self-Test . . . . . AS DESIRED

Select a VOR frequency (does not have to be received) and set the CDI to 0° with the CRS Knob. When the test button is depressed and held, the CTL display intensity cycles from bright to dim and there are no bearing pointers on the HSI. After 2 seconds, the circle pointer appears and indicates 0° magnetic heading; the lateral deviation bar centers and the "TO" indicator is displayed. The test is complete in 15 seconds; after 2 additional seconds the system returns to normal. Now release TEST button.

In addition to the flag and deviations, a self-test diagnostic routine is initiated during self-test. If a fault is detected, "FLAG" is displayed and coded as explained above for the VHF COM.

ILS Self-test . . . . . AS DESIRED

Select an ILS frequency (does not have to be received) and set the course pointer to aircraft Heading. If an ILS frequency is not being received, a red boxed LOC annunciator appears on the ADI and a red boxed GS annunciator appears on the HSI. Three seconds after the test button is pressed, the red boxed LOC and GS annunciators disappear. The lateral deviation bar deflects right approximately 2/3 full scale and the glideslope pointer deflects down approximately 2/3 full scale. The test is over in 15 seconds and the red LOC and GS annunciators reappear. COMP MON (Comparator Monitor) clears.

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ADF Self-Test . . . . . AS DESIRED

Set the ADF control mode selector to ADF and tune an NDB or an AM broadcast station. The ADF pointer on the HSI points to the station. Pressing the TEST pushbutton initiates a Self-test that causes the pointer to rotate 90° and the tone generator activates. Releasing the TEST button returns the pointer to the original position and the tone stops. In addition to the flag and deviations, a self-test diagnostic routine is initiated during self-test. If a fault is detected, a “FLAG” is displayed and coded as explained above for the VHF COM.

Radio Altimeter Self-Test . . . . . AS DESIRED

The Radio Altimeter is tested on the ground in conjunction with the EFIS test described below by pressing the TEST button on the EFIS Display Controller (left and right side panels). However in flight, pressing the TEST pushbutton on the EFIS Controller only checks the radio altimeter. When the TEST button is pressed, the ADI RA display shows a test altitude that scales from 0 to 100 ±10 feet, a red boxed RA appears left of the radio altitude and the rising runway is approximately the size compared to a radio altitude of 0 feet (maximum size).

**CVR/FDR . . . . . TESTED**

CVR TEST Button . . . . . PRESS

CVR Audio Meter . . . . . IN RANGE ARC

Watch for four bumps to ensure all 4 channels checked

Headsets . . . . . LISTEN FOR TONE



## Expanded Normal Procedures

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### Reversion Panels . . . . . TESTED

Both pilots EFIS and MFD reversion capabilities are tested using six switchlights on the instrument panel and the MFD Mode Select knob on the Center Pedestal. Check both pilots SG, IRS, IAS REV's and MFD reversion IN TURN for appropriate flags on all four EFIS displays.

**NOTE:** The FD REV does NOT revert unless the Flight Guidance Computer (FGC) fails.

#### SG REV Switchlights . . . . . SELECT/CHECK DISPLAYS/ DESELECT

IN TURN Press and release the switch (it is NOT necessary to hold the reversion switches during the test).

#### SG REV Switchlight (left side) . . . . . SELECT

Verify displays amber SG2 in an amber box on the pilot's EADI and EHSI and green SG2 in an amber box on the copilot's EADI and EHSI display.

#### SG REV Switchlight (captain) . . . . . DESELECT

Returns SG1 to the pilot's EADI and EHSI and all SG flags (both sides) extinguish.

#### SG REV Switchlight (right side) . . . . . SELECT

Verify displays amber SG1 in an amber box on the copilot's EADI and EHSI and green SG1 in an amber box on the pilot's EADI and EHSI.

#### SG REV Switchlight (right side) . . . . . DESELECT

Returns SG2 to the copilot's EADI and EHSI and all SG flags (both sides) extinguish.

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IRS REV Switchlight . . . . SELECT/CHECK DISPLAYS/  
DESELECT

**NOTE: Dual IRS Installations:** When IRS reversion is selected, the source side displays a green IRS within an amber box. The cross-side (the side selecting IRS reversion) displays an amber XIRS in an amber box.

**Triple IRS Installations:** Pilot and copilot reversion is only between IRS 1 and 3 OR IRS 2 and 3, respectively. When IRS 3 REV is selected on either side, a white XIRS in a white box appears on that side. When IRS 3 is selected on both sides at the same time, an amber XIRS appears in an amber box on both sides.

IAS REV Switchlights . . . . SELECT/CHECK DISPLAYS/  
DESELECT

When IAS REV is selected, the opposite side EADI displays a green IAS in an amber box. The on-side EADI (side where IAS REV was selected) displays an amber XIAS in an amber box.

Deselecting the IAS REV switchlight returns each IAS to its associated DADC and the flags extinguish.

MFD Mode Select knob . . . . TURN/CHECK DISPLAYS/  
SET to MFD

MFD Mode Select knob . . . . TURN (counterclockwise)  
to HSI

Verify MFD displays the captains EHSI information.

## Expanded Normal Procedures

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MFD Mode Select knob . . . . TURN (counterclockwise)  
to SG

Verify MFD is blank and a white MG flag on captain's  
EADI.

MFD Mode Select Knob . . . . . TURN (clockwise)  
to Right side HSI

Verify MFD displays the copilot's EHSI information.

MFD Mode Select knob . . . . . TURN (clockwise)  
to Right side SG

Verify MFD is blank and a white MG flag on copilot's  
EADI.

MFD Mode Select Knob . . . . . TURN to MFD

Verify all SG and MG annunciators extinguished and all  
screens have normal presentations.

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## IRUs . . . . . ■ TESTED/NAV

After at least 20 seconds after power-up of the previously noted equipment:

**NOTE:** The IRU test presents indications on each IRU MSU, Lasertrak Inertial System Display Unit (ISDU), and pilot/copilot EFIS instruments. The EFIS instrument indications for the number 3 IRU test can only be viewed by activating either or both pilots IRS REVersionary switches.

**NOTE:** This test of the IRUs can be considered similar to the old fashioned GYRO tests but includes a few more features to monitor.

## IRUs MSU TEST Buttons . . . . . PRESS IN TURN

**NOTE:** The Operating Manual Volume 2, Section 16, page 8 indicates the IRS Test Pushbutton is “used for maintenance purposes” and is therefore not frequently tested by pilots during preflight.

During the 24 second test that follows the MSU annunciator lights (ALIGN, FAULT, NAV RDY, NO AIR, ON BATT, and BATT FAIL) illuminate during the first 8 seconds while both pilots’ EADI/EHSIs have IRS Comparison Monitor flags (4 flashing) which in turn cause both COMP MON lights on the instrument panels, the NAV 10 channel, and the M/C to illuminate. On-side EADI shows bank and EHSI compass swings to 030 and the course indicator is not in view with the CDI. WIND SHEAR FAIL lights are illuminated.

## ■ First Flight of Day

## Expanded Normal Procedures

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During the next 8 seconds, only the on-side EADI/EHSIs show red IRS Failure flags (2, not flashing). The EHSI heading swings to North up and only the compass-heading dial is on screen. The COMP MON and NAV lights extinguish (the “failed” IRU not being “compared”).

Initiation of the test also trips the associated IRU NO AIR 1/2/3 magnetic trip annunciator behind the pilot/copilot seat thereby illuminating the COOL AIR FAIL light on the instrument panel.

During the test, additional values may be observed on the Lasertrak ISDU. As the test concludes, the once-illuminated Ground Proximity – GPW FAIL – light extinguishes.

**NOTE:** Through the Lasertrak system the IRUs can provide backup navigation capabilities in the event the FMSs fail.

COOL AIR FAIL Switchlights and Panels (4) . . . . . RESET

**S/N 5067, 5087 and subsequent,** If FLIGHT requires FMS:  
LASERTRAK Selector Switch . . . . . SET to NORM  
MAP Button, Pilot’s or Copilot’s Display Controller . . .PRESS  
FMS Button (Pilot’s or Copilot’s) . . . PRESS (as appropriate)  
Select FMS 1 flight plan on respective EHSI.

LASERTRAK Selector Switch . . . SET TO OVRD FMS 1  
Check L TRK display replaces FMS 1 display on the appropriate EHSI.

FMS Button (Pilot’s or Copilot’s) . . . PRESS (as appropriate)  
Select FMS 2 flight plan on respective EHSI.

LASERTRAK Selector Switch . . . SET TO OVRD FMS 2  
Check L TRK display replaces FMS 2 display on the appropriate EHSI.

LASERTRAK Selector Switch . . . . . SET to NORM  
Check FMS 1 and FMS 2 display is normal for pilot’s and/or copilot’s EHSI.

LASERTRAK TST Pushbutton on NDU . . . . . PRESS

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## **EFIS . . . . . TESTED IN TURN**

During this test, both EHSI and EADI as well as the opposite side EADI need to be observed for 'flags' and indications described below. Depending on the pilot adjusted intensity of each indicators' lighting, the 'flags' may appear as amber (high intensity) or red (lower intensity).

Additionally during the test, the opposite side COMP MON light (instrument panel) is illuminated for a few seconds and the EADI RA is flagged.

## **EFIS TEST Button . . . . . PRESS AND HOLD IN TURN**

Press and hold the TEST button on the pilot's or copilot's EFIS Display Controller (in-turn) to initiate the EFIS system test, observing both onside and offside EFIS indications.

## **EHSI . . . . . CHECK DISPLAY**

Observe the on-side EHSI first while holding the TEST pushbutton/knob in order to observe the amber Course and Glide Slope Deviation dots and the boxed IRS at the 11 o'clock position during the first 4 seconds of the test. The deviation dots disappear and the IRS flag is at 12 o'clock. During the entire test, an amber TEST message box appears on the on-side EADI.

## **EADI . . . . . CHECK DISPLAY**

During the first four seconds, the EADI test pattern appears with all comparison monitors illuminated. During the next four seconds, the comparison monitors disappear along with the rest of the normal EADI display. Warning flags appear with their corresponding logic. After the test, the symbol generator resets to the power-up configuration.

Repeat TEST for copilot EFIS.

## Expanded Normal Procedures

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**Yaw Damper/Mach Trim . . . . . ENGAGED**

**Flight Director/Modes . . . . . SELECT/SET**

GA and HDG . . . . . SELECT

Press the G/A (Go Around) switch on left thrust lever followed by the FD HDG mode selector switch (on the glareshield). Confirm proper mode annunciations on either EADI or Advisory Display

**ATIS/Clearance . . . . . COPIED**

**Flight Data/V speeds/N<sub>1</sub> . . . . . COMPUTED**

**FMS . . . . . PROGRAMMED**

**NOTE:** For FMS programming, see the checklist sized look-alike Challenger/Hawker FMS Taskbook or the Honeywell FMZ Series Flight Management System Pilot's Manual.

**Altimeters/Flight Instruments . . . . SET/CROSS CHECKED**

Correct altitude, current altimeter cross check (set 4 places, each pilots' altimeter, standby altimeter and cabin controller) ASI, EADI, EHSI, VSI etc.

**FLIGHT COMPARTMENT Checklist . . . . . COMPLETED**

# **CAE SimuFlite**

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## **Normal Start**

### **Passenger Briefing . . . . . COMPLETED**

FAR 91.519 requires that the pilot-in-command or a crewmember brief the passengers on smoking, use of safety belts, location and operation of the main entrance 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 floatation equipment.

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

### **Pins, Chocks, and Keys . . . . . REMOVED/STOWED**

### **Main Entrance Door . . . . . CLOSED AND LOCKED**

Verify that the four roll-over catch witness marks are aligned and that the inner door handle is in the stowed position. Verify green PASS DR READY light on door annunciator panel is illuminated and other amber door annunciators are extinguished. If installed, verify all service door annunciators extinguished. (In the CAE SFI simulator the door annunciator panel is below engine oil pressure gauges).

### **Main Entry Door (A/C 5041 and 5146) {N/A CAE SFI simulator}:**

DOOR FAULT Light . . . . . CHECK EXTINGUISHED

Passenger Door . . . . . CLOSE

Visually check four roll-over catch witness marks correctly aligned and inner handle correctly positioned.



## Expanded Normal Procedures

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Door Inner T-Handle . . . . . STOW

Check EXTERNAL HANDLE LOCKED indicator moves correctly into alignment.

DOOR FAULT Switch . . . . . PRESS

PASS DR LOCKED light adjacent to passenger door illuminated.

Cockpit Warning Lights . . . . . CHECK

PASS DR LOCKED light illuminated, PASS DR UNLKD and BAG DR UNSAFE lights extinguished.

**Seat/Rudder Pedals . . . . . ADJUSTED**

Ensure that seat is properly adjusted using the alignment balls below the standby compass for a standard seating position.

**Seat Belts/Shoulder Harnesses . . . . . SECURED**

**Hydraulic 3A Pump Switch . . . . . ON/CHECKED**

3A Pump Switch . . . . . ON

3A Pump Light . . . . . EXTINGUISHED

The 3A ELECT PUMP light is illuminated whenever the 3A switch is in the OFF position regardless of flap position.

**NOTE:** The AFM Normal Procedures CONSOLIDATED CHECKLIST selects the hydraulic 3B pump ON during the preflight Before Starting Engines checklist without subsequently switching it off. Therefore, at engine start, the 3B pump is providing INBOARD brake pressure for the Parking Brake. However, operationally, most pilots will use the 3A pump instead; and still a few others will additionally select the 2B pump ON as well (to provide pressure for the OUTBOARD brakes and “unload” the engine-driven hydraulic pump during the start).

# **CAE SimuFlite**

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## **Parking Brake . . . . . SET/CHECKED**

Red PARKING BRAKE Light . . . . . ILLUMINATED

If it is necessary to set the parking brake, FULLY DEPRESS and HOLD the toe brakes while pulling the parking brake handle out and turning it 90 degrees. However, the parking brake does NOT require “resetting”.

Inboard Brake Pressure  
(3A or 3B pump) . . . . . 3000 PSI (Normal)

Operationally, awaiting engine start, the 3A/3B pump may be selected off. However, during prolonged waiting because hydraulic pressure bleeds off, crews must monitor inboard brake pressure and occasionally switch on a number 3 system hydraulic pump.

Brake Pressures . . . . . IN GREEN ARC

## **Thrust Levers . . . . . SHUTOFF**

Verify the levers are in SHUTOFF position by attempting to raise the levers without releasing the red latching levers below the thrust levers.

## **SCAV/MAIN EJCTRS Lights . . . . . ON**

Verify they are already illuminated.

## **Fuel Pumps (both switchlights) . . . . . ON**

Press to select both electric pumps ON. Both Green ON lights illuminate (even when only one switch is pressed), INOP lights extinguish, as do the FUEL LOW PRESS lights.

**NOTE: S/N 5135 and subsequent**, the FUEL LOW PRESSURE lights will be on until the fuel pumps are selected on.

## Expanded Normal Procedures

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### **ACUs (without SB 601-0450) . . . . . OFF**

White OFF legend illuminated on each ACU switchlight and cockpit/cabin airflow terminates. CAE SFI Challenger simulator does not have S/B 601-0450 (Mod to Inhibit ACUs During Engine Start).

**NOTE:** Even though an aircraft incorporates S/B 601-0450 (Mod to Inhibit ACUs During Engine Start), Bombardier recommends the ACUs be selected OFF for engine starts unless S/B 601-0533 (Mod to Replace ACU DELAY RELAYS) has been incorporated.

### **Cockpit Heat (S/Ns 5001 to 5134 and 3001 to 3066) . OFF**

It will already be off unless cockpit heat had been selected on for additional heating.

**NOTE:** Although the CAE SFI Challenger simulator is S/N 5135 (the first 3R), it is equipped with 2 cockpit heat switches. One on the Overhead Panel and the other (like 3R configuration) located on the pilot's console.

### **Bleed Air Pressure . . . . . 45 PSI MINIMUM**

### **Ignition . . . . . A OR B**

Pressing either split legend IGN A/ON or IGN B/ON switchlight illuminates the green upper portion IGN A or IGN B, arming the selected igniter.

### **ROTATING BEACON . . . . . ON**

*Go to CROSS BLEED AIR START (2B-54), if required.*

# CAE SimuFlite

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## Engines . . . . . START

Press and hold the engine START switchlight for a few seconds and verify:

The green START light and the selected IGN A or B white ON light illuminates, the APU EGT is increasing, the left and right 10th stage BLEED CLOSED lights extinguish (“black”). The 10th stage isolator valve (ISOL) remains open as the green OPEN light indicates. The lights should remain as described above until the starter cuts out automatically or is deselected with the STOP switchlight. (The above simply stated: “green, white, green, APU EGT, black, green, black”.)

■ **CAUTION:** If ITT reaches 800°C and is rising rapidly during an attempted start, move the thrust lever to SHUTOFF and continue operating the starter. Deselect fuel pumps and ignition IAW Aborted Engine Start Checklist.

### At 20% N<sub>2</sub> and below 120°C ITT:

#### Thrust Lever . . . . . IDLE

When engine speed reaches 20% N<sub>2</sub> RPM and ITT is below 120°C, move thrust lever to IDLE position.

If ITT is above 120°C, dry motor engine until ITT is below 120°C, then move thrust lever to IDLE.

■ **CAUTION:** If N<sub>2</sub> ceases to accelerate after lightoff, abort the start IAW Aborted Engine Start checklist found in QRH PSP 601A-15S.

■ **CAUTION:** If N<sub>2</sub> is 57% or less and OAT is above -20°C (-4°F), do not increase thrust above idle.

## Expanded Normal Procedures

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**AFM Normal Procedures information:** Light-off, as indicated by a rise in ITT, is normally achieved within 10 seconds from thrust lever operation. Normally within 20-40 seconds automatic starter disengagement occurs between 54-57% N<sub>2</sub>. At temperatures below 15°C, start sequence may exceed 60 seconds. At ambient temperatures above 15°C, if light-off time exceeds 25 seconds, abort the start.

**GE CF34 Operating Instructions information:** Moving the thrust lever to IDLE monitor engine instruments. Positive Oil Pressure within 30 seconds of start initiation. Engine must not be operated if the FAN (N1) is not rotating. Ensure starter and ignition are OFF prior to 57% N<sub>2</sub>.

**Engine Instruments . . . . . MONITOR**

N<sub>2</sub> . . . . Above 57% and STABILIZED 62.9 to 64.0% N<sub>2</sub>  
Notify maintenance if N<sub>2</sub> variation between engines exceeds 2%.

ITT . . . . . WITHIN NORMAL RANGE

Oil Pressure . . RISING ABOVE 25 PSI – RED LIGHTS OUT  
Both pilots monitor engine instruments. At 55% N<sub>2</sub> the pilot monitoring the start should look for starter cutout: START light extinguished, white IGN A or B ON light extinguished, green IGN A or B armed light still illuminated, ISOL valve as selected (normally OPEN), and the 10th stage BLEED CLOSED lights illuminated.

**NOTE:** Higher than normal oil pressure may exist when starting cold soaked engines. See Limitations.

Engine (2nd engine) . . . . . START  
Follow same procedures and indications as above.

**SCAV/MAIN EJCTRS Lights . . . . . EXTINGUISHED**

**START Checklist . . . . . COMPLETED**

# **CAE SimuFlite**

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## **Cross Bleed Air Start**

**APU Bleed Air . . . . . OFF**

APU BLEED AIR Switchlight . . . . . PRESS OFF

OPEN Light (Green) . . . . . EXTINGUISHES

**Operating Engine 10th Stage Bleed . . . . . ON**

BLEED CLOSED light extinguished.

**Operating Engine Thrust Lever . . . ADVANCE TO 45 PSI**

On the operating engine, advance the thrust lever to obtain 45 PSI minimum bleed air pressure.

**Starting Engine START Switchlight . . . . . START**

**At 20% N<sub>2</sub> and Below 120°C ITT:**

**Starting Engine Thrust Lever . . . . . IDLE**

When engine speed reaches 20% N<sub>2</sub> RPM and ITT is below 120°C, move thrust lever to IDLE position.

If ITT is above 120°C, dry motor engine until ITT is below 120°C, then move thrust lever to IDLE.

**AFM Normal Procedures information:** Light-off, as indicated by a rise in ITT, is normally achieved within 10 seconds from thrust lever operation. Normally within 20-40 seconds automatic starter disengagement occurs between 54-57% N<sub>2</sub>. At temperatures below 15°C, start sequence may exceed 60 seconds. At ambient temperatures above 15 ° C, if light-off time exceeds 25 seconds, abort the start.

**GE CF34 Operating Instructions information:** Moving the thrust lever to IDLE monitor engine instruments. Positive Oil Pressure within 30 seconds of start initiation. Engine must not be operated if the FAN (N1) is not rotating. Ensure starter and ignition are OFF prior to 57% N<sub>2</sub>.

## Expanded Normal Procedures

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**When starting engine is stable at idle:**

**Operating Engine Thrust Lever . . . . . REDUCE TO IDLE**

After bleed air pressure is no longer required for engine start, reduce power on the opposite engine to the IDLE position.

**Engine Instruments . . . . . MONITOR**

**N<sub>2</sub> . . . . . Above 57% and STABILIZED 62.9 to 64.0% N<sub>2</sub>**  
Notify maintenance if N<sub>2</sub> variation between engines exceeds 2%.

**ITT . . . . . WITHIN NORMAL RANGE**

**Oil Pressure . . . . . RISING ABOVE 25 PSI – RED LIGHTS OUT**

Both pilots monitor engine instruments. At 55% N<sub>2</sub> the pilot monitoring the start should look for starter cutout: START light extinguished, white IGN A or B ON light extinguished, green IGN A or B armed light still illuminated, ISOL valve as selected (normally OPEN), and the 10th stage BLEED CLOSED lights illuminated.

**SCAV/MAIN EJCTRS Light . . . . . EXTINGUISHED**

**START Checklist . . . . . COMPLETED**

# **CAE SimuFlite**

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## **Aborted Engine Start**

Typically, the engine lights off within 10 seconds after advancing its thrust lever from the SHUTOFF to IDLE position. At ambient temperatures below 15°C (59°F), lightoff time may exceed 60 seconds.

Abort engine start if ITT reaches 800°C and is rising rapidly, lightoff time exceeds 25 seconds, or N2 RPM stops accelerating after light-off. Abort the start by accomplishing the following:

**Thrust Lever . . . . . SHUTOFF**

**Both Fuel Pumps . . . . . OFF**

**Ignition . . . . . OFF**

Press IGN A and/or B Switchlight and verify the associated green IGN A or B legend and white ON lights extinguish. Continue with the ATS engaged to decrease temperature and purge fuel from engine (maximum 90 seconds from start initiation).

**When required:**

**STOP Switchlight . . . . . PRESSED**

The STOP switchlight illuminates after 60 seconds from start initiation. Pressing the amber STOP switchlight will extinguish both the START and the STOP switchlights and terminate the start.



## After Starting Engines

Ignition . . . . . **DISARMED**

Verify IGN A/IGN B switchlights extinguished.

**CAUTION:** Neither CONT IGN nor IN FLIGHT START ignition should be selected during ground operations except during takeoff and landing rollout.

Isolation Valve . . . . . **OPEN**

ACUs (with or without SB 601-0450) . . . . . **ON**

**SNs 5001-5134, also 3001-3066 without S/B 601- 0419 (i.e. unmodified 1A and 3As) Not applicable to 3Rs:**

Cockpit Heat . . . . . **STBY/CHECK/OFF**

CKPT HEAT Switch . . . . . **STBY**

Footwarmer/Demist Pull Knobs . . . . . **PULL**

Verify increased airflow directed to windshields and down toward feet.

While knobs are still pulled out:

CKPT HEAT Switch . . . . . **OFF**

Listen for Footwarmer/Demist airflow to cease.

Footwarmer/Demist System . . . . . **SET AS DESIRED**

**NOTE: In 3A and 1A aircraft without S/B 601-0419 (Footwarmer/Windshield Vent and Ducts – New Electrical Heater and Ducts), this would be the appropriate time (after engine start) to check the Emergency Pressurization system by a quick pressing (ON then OFF) the EMERG PRESS Switchlight. Listen for the momentary increased airflow.**

**NOTE: The CAE SFI Challenger simulator does not direct airflow as described in this cockpit heat procedure (airflow is assumed).**

# **CAE SimuFlite**

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## **14<sup>th</sup> Stage Bleed Air . . . . . ON**

Prior to selecting 14<sup>th</sup> Bleed Air on, verify that both left and right 14<sup>th</sup> Stage BLEED CLOSED legends are illuminated.

BLEED AIR 14th Stage  
Left and Right Switchlights . . . . . PRESS ON  
BLEED CLOSED legends extinguish.

## **Hydraulic Systems . . . . . CHECKED**

Verify systems number 1 and 2 engine-driven pumps are providing 3,000 PSI and both system quantities are in the GREEN ARC. Amber ENG PUMP lights are extinguished.

## **Generators . . . . . TEST/ON/CHECKED**

Test each engine-driven generator for:

AC Voltage . . . . . 115 ±9V  
AC Frequency . . . . . 400 ±25 Hz

Select generators ON in turn and verify:

GEN OFF Lights . . . . . EXTINGUISHED  
AUTO OFF (AC bus tie) Switchlights . . . . . EXTINGUISHED

## **APU GEN Switch . . . . . OFF**

APU generator OFF after engine-driven generators on-line. APU GEN OFF light and ELECT 8-channel annunciator illuminate, followed in four seconds with the MASTER CAUTION lights flashing.

**NOTE:** The APU generator GEN OFF light will remain illuminated as long as the APU PWR FUEL ON/OFF SWLT remains pressed in and not cycled off (SOV CLOSED legend extinguished) even if the APU has been shut down.

## **DC BUS TIE CLOSED Switchlights . . . . . EXTINGUISHED**

## Expanded Normal Procedures

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**DC Volts/Amps . . . . . CHECK**

With TRU LOAD/BUS VOLTS selector, check voltage and bus load on the Essential bus and DC buses 1 and 2.

**ADG Unit . . . . . TESTED**

ADG TEST Switch . . . . . UNIT

**NOTE:** Upon initiation of the UNIT test if there is a 4-5 second delay before the ADG Test Lamp light illuminates, an abnormal WOW condition is sensed and the ADG could auto deploy even while on the ground. See WOW O/P Failure checklist prior to de-powering the AC buses or shutting down engines to prevent inadvertent auto-deployment of the ADG.

**Within one second:**

Green ADG Test Lamp . . . . . ILLUMINATES

**After two seconds of illumination:**

Green ADG Test Lamp . . . . . EXTINGUISHES

**Servo Monitor . . . . . CHECKED/LIGHTS OUT**

■ **Cowl Anti-Icing . . . . . CHECKED/SET**

L/R Cowl Anti-Ice Switchlights . . . . . ON (one at a time)

The split legend amber FAIL and white ON switchlight illuminate. The amber FAIL light should extinguish in a few seconds. Note the associated engine ITT rise. While the FAIL light is illuminated, the 10-channel ANTI-ICE light will also be illuminated. Repeat for the other cowl.

L/R Cowl Anti-Ice Switchlights . . . . . AS REQUIRED

**NOTE:** If anti-ice is not required at this time, some aircrews will accomplish the previous anti-ice systems check during taxi in conjunction with the operational check of the thrust reversers, cowl and wing anti-ice systems control.

■ **First Flight of Day**

# CAE SimuFlite

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## Wing Anti-icing . . . . . **CHECKED**

Wing Anti-Ice Switch . . . . . NORMAL

When the switch is placed in NORMAL, the amber L FAIL R FAIL lights illuminate momentarily. As the wing is warmed, the white L HEAT and R HEAT (sufficient heat) lights will illuminate when the leading edge temperature is sufficient for effective anti-icing.

Wing Anti-Ice ISOL Valve . . . . . OPEN THEN CLOSE

Verify the white ISOL OPEN switchlight illuminates.

**NOTE:** If the ISOL valve is checked using the Wing A/I STANDBY position, the “high temperature” controller may have commanded the wing anti-ice valves to the closed position; therefore there is no air to drive the ISOL valve open.

Wing Anti-Ice Switch . . . . . STANDBY

Verify the L FAIL R FAIL lights illuminate momentarily then extinguish. It may be necessary to advance the thrust levers to not greater than 75% N<sub>2</sub> to extinguish the L FAIL and R FAIL lights. Check that the white L HEAT and R HEAT (sufficient heat) lights illuminate and DUCT FAIL, leading edge OVHT, and amber SENSOR FAIL lights are extinguished.

Wing Anti-Ice Switch . . . . . AS REQUIRED

## Rudder . . . . . **CHECKED**

Move rudder pedals full travel left, right, and back to center while verifying movement on the surface position indicator.



# **CAE SimuFlite**

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## **Door Lights . . . . . GREEN LIGHT**

Verify that the green PASS DR RDY light illuminated and all amber lights on the door panel are extinguished. If installed, verify all service door annunciators are extinguished.

## **APR . . . . . ■ STATIC CHECK/ARMED**

Select TEST with the APR switch and verify the following light combinations in sequence: Green READY and L ON; READY and R ON; TEST amber APR; green TEST.

## **APR Switch . . . . . ARM**

All associated lights extinguished (until the Dynamic Test during takeoff).

## **AFTER STARTING ENGINES Checklist . . . . . COMPLETED**

■ First Flight of Day

## Expanded Normal Procedures

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### Taxi

#### Anti-Skid . . . . . ARMED/TESTED

Before each flight, PARKING BRAKE released:

**NOTE:** Some aircrews initiate the test with the captain holding the brakes as the TEST push-button is pressed, feel the brakes release and let off the brakes to allow the aircraft to start rolling. Most aircrews coordinate and confirm that no brakes are being pressed at the time of the TEST.

ANTI-SKID Switch . . . . . ARM

TEST Switch (Push-button) . . . . . PRESS & HOLD

Press the anti-skid TEST switch two to four seconds to allow the system to complete its test. The anti-skid system test may fail if switch is not held long enough.

INBD/OUTBD TEST Lights . . . . . ILLUMINATE

INBD/OUTBD FAIL Lights . . . . . ILLUMINATE

ANTI-SKID illuminates on the 10 channel annunciator until TEST button is released.

TEST Push-button . . . . . RELEASE

INBD/OUTBD TEST Lights . . . . . EXTINGUISH

INBD/OUTBD FAIL Lights . . . . . EXTINGUISH

**NOTE:** If either INBD or OUTBD TEST light or FAIL lights fail to illuminate, OR if, after releasing the TEST push-button, either INBD or OUTBD FAIL light remains illuminated, the anti-skid system must be assumed to have failed.

#### Brakes . . . . . CHECK

Toe brakes press and brake pressures verify (not necessarily at the same time). This check is combined with the anti-skid check above. A few aircrews check both pilot's brakes. Not a bad idea to verify both pilot's seat and rudder pedals are properly adjusted.

## **CAE SimuFlite**

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### ■ **Thrust Reversers/Anti-Ice . . . . . CHECKED**

Thrust Reverser ARMED Switchlights . . . . . VERIFY ARMED

Verify both ARMED switchlights illuminate and at this time the REVERSER UNLOCKED and REVERSE THRUST lights are extinguished.

Cowl and Wing Anti-Ice . . . . . ON/NORMAL

Left Thrust Reverser . . . . . DEPLOY

Pull or “squeeze” the T/R lever toward the thrust lever knob and raise the Thrust Reverse lever to the “balk”. Idle deploy is sufficient. Verify the left REVERSER UNLOCKED, REVERSE THRUST, ANTI-ICE WING L FAIL, the left ANTI-ICE COWL FAIL, and the 10 channel M/C ANTI-ICE lights illuminate.

Left Thrust Reverser . . . . . STOW

REVERSE THRUST light extinguishes and REVERSER UNLOCKED light extinguishes within 5 seconds. After that same 5 second time frame, the ANTI-ICE WING L FAIL, left ANTI-ICE COWL FAIL, and M/C lights should extinguish as normal anti-ice valve operation resumes.

Right Thrust Reverser . . . . . DEPLOY

Verify the right REVERSER UNLOCKED, REVERSE THRUST, ANTI-ICE WING R FAIL, the right ANTI-ICE COWL FAIL, and the 10 channel M/C ANTI-ICE lights illuminate.

Right Thrust Reverser . . . . . STOW

REVERSE THRUST light extinguishes and REVERSER UNLOCKED light extinguishes within 5 seconds. After that same 5 second time frame, the ANTI-ICE WING R FAIL, right ANTI-ICE COWL FAIL, and M/C lights should extinguish as normal anti-ice valve operation resumes.

### ■ **First Flight of Day**



## Expanded Normal Procedures

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### **Cowl/Wing Anti-Icing . . . . . AS REQUIRED**

Comply with limitations for operations in icing conditions. (If type II or IV fluid is used on the aircraft, do not select Wing Anti-Ice until advancing power for takeoff.)

### **Pneumatics/APU . . . . . SET**

Performance Takeoff Option: APU operating and providing 10<sup>th</sup> stage bleed air; both 10<sup>th</sup> stage BLEED CLOSED lights illuminated and green ISOL (10<sup>th</sup> stage) valve and APU BLEED AIR, OPEN lights illuminated.

APU Shutdown Option: With APU shutdown, the engines (unless anti-ice is required for takeoff) provide 10<sup>th</sup> stage bleed air. For this option, all lights on the APU and BLEED AIR Control Panels will be extinguished except the APU PWR FUEL ON/OFF switchlight legend SOV CLOSED.

To shut down/secure the APU “loaded” at this time: Without hesitation between switchlight selections, press in turn the APU START/STOP, R 10<sup>th</sup>, Isolation valve, L 10<sup>th</sup>, and APU BLEED AIR valve. After the APU spools down to below 20% RPM, deselect the APU PWR FUEL ON/OFF Switchlight and verify the white SOV CLOSED light illuminates. While other “techniques” are used to secure/shutdown the APU, this is the most widely accepted procedure and can be used on the ground or in the air.

### **Trims . . . . . SET**

#### **PITCH TRIM . . . . . ENGAGED/SET**

Ensure that STAB TRIM indicator is set correctly within the green arc for takeoff range.

#### **Aileron and Rudder Trims . . . . . SET**

The Pilot Monitoring (accomplishing the checklist) will insure the trims are properly set and insist that the captain confirm the proper trim settings as well.

**NOTE:** Setting the STAB TRIM indicator needle slightly above the TO mark is a good practice.

# **CAE SimuFlite**

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## **Hydraulic B Pumps . . . . . ON**

Select the three pumps on in turn and verify each amber ELECT PUMP light illuminates momentarily then extinguishes as the pump comes up to operating pressure.

## **Flaps . . . . . 20°**

Set FLAPS control lever to 20 and both pilots confirm FLAPS DEG gauge indicates flaps are set at 20.

## **Flight Controls . . . . . CHECK FOR FREE MOVEMENT**

The rudder was checked prior to selecting N/W Steering ON. Check ailerons and elevators for correct movement by observing the SURFACE position indicators (“bird beaks”) as the control wheel is moved. Verify that the ailerons, elevator, and rudder are correctly positioned for takeoff at the completion of the check. When ailerons are fully deflected, they are visible through the cockpit side windows.

## **Spoilers . . . . . ■ CHECKED/RETRACTED**

GROUND SPOILERS Switch . . . . . ON

FLIGHT Spoilers . . . . . EXTEND

Extend flight spoilers and verify that the amber LH and RH FLT SPLR, LH and RH GND SPLR lights illuminate (glare shield) and green LEFT and RIGHT asymmetrical protection lights illuminate (adjacent to the flight spoiler handle) as flight spoiler handle extends past  $\frac{1}{2}$ . Check FLT SPLR SURFACE position indicators (“bird beaks”) when fully deployed.

FLIGHT Spoilers . . . . . RETRACT

Verify that all Flight Spoiler lights extinguish. The LH and RH GND SPLR lights will remain illuminated.

GROUND SPOILER Switch . . . . . OFF THEN ON

LH and RH GND SPLR lights extinguish.

■ First Flight of Day



# CAE SimuFlite

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## Before Takeoff

### Exterior Lights . . . . . **AS REQUIRED**

Taxi Lights Switch (1) . . . . . PULSE LT

Landing Lights Switches (3) . . . . . ON

BEACON/ANTI COLL Switch . . . . . AS REQUIRED

**NOTE:** Landing lights are only used during takeoff and landings and are not intended for other ground operations. Visual conditions may dictate different exterior light selections.

### Ignition . . . . . **AS REQUIRED**

Use ignition when runway surface is contaminated. When ignition is required, most 3A and 3R aircrews select left and right IN FLIGHT START Switchlights and verify both A and B ON (white) and both green IN FLIGHT START Switchlights are illuminated.

### Windshield/ADS Heaters . . . . . **ON**

WSHLD Heat Switches . . . . . LOW OR HIGH POSITION  
(as required)

Verify the WSHLD amber NO HT lights (4) extinguish.

**NOTE:** Extremely high OATs and sunshine on the windshield may cause the NO HT lights to remain illuminated. (In that case, leave the switches in LOW and wait until after takeoff to select OFF/RESET and back to LOW.)

Set A.D.S. HEAT CONT selector to any ALL ON position. Verify HTR FAIL light and PITOT HEAT lights (on both Pilot's Instrument Panels) are extinguished.

### Thrust Reversers . . . . . **VERIFY ARMED**

Center Pedestal REVERSE THRUST panel Left and Right white ARMED Switchlights illuminated UNSAFE TO ARM lights extinguished.

## Expanded Normal Procedures

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**Transponder . . . . . ON/ALT**

**Ground Spoilers . . . . . ON**

Before advancing thrust levers, place GROUND SPOILERS switch ON. Verify LH and RH GND SPLR lights out. If thrust levers are advanced and subsequently retarded to IDLE with the ground spoilers on, cycle the GROUND SPOILER switch to OFF and back to ON to extinguish the LH and RH GND SPLR lights.

**Annunciator Recall . . . . . CHECKED**

Press down to RECALL and release the TEST/RECALL switch on the 10 Channel Panel. Check for annunciators on the 8 and 10 Channel Panels and eliminate their cause. If the APU is operating and its generator is off line (as it should be), the only light will be ELECT. Confirm by testing that the ELECT annunciator is caused ONLY by the APU GEN OFF light legend. While holding the APU generator switch in the TEST position, confirm that the 8 Channel ELECT light is extinguished (the GEN OFF light on the metering panel also extinguishes but the aircrew must verify the 8 Channel ELECT extinguishes). This test should be accomplished prior to every takeoff.

**APR . . . . . DYNAMIC TEST/READY**

Thrust Levers . . . . . ADVANCE TO BETWEEN  
83 AND 85% N<sub>1</sub>

With brakes set or during takeoff roll, advance thrust levers to between 83 and 85% N<sub>1</sub> RPM. The dynamic test is completed automatically by the APR controller.

APR READY Light . . . . . ILLUMINATES

The READY light illuminates first (at approximately 79% N<sub>1</sub>) and should stay illuminated throughout the takeoff. The TEST light is quick to extinguish after illuminating for a very short time (2 seconds according to Ops. Manual) as power is advanced above 79% N<sub>1</sub> for takeoff.

APR TEST Light . . . . ILLUMINATES FOR 2 SECONDS

**Before Takeoff Checklist . . . . . COMPLETED**

# **CAE SimuFlite**

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## **After Takeoff/Climb**

**Landing Gear . . . . . RETRACTED**

Verify all landing gear position lights extinguished and NOSE DOOR OPEN light extinguished.

**NOTE:** The auxiliary tank fuel quantity indication is accurate in level flight. However, during rotation and at initial climb altitude, the auxiliary tank quantity indication can be up to 1,000 pounds below the actual tank quantity.

**Flaps . . . . . RETRACTED**

No earlier than 400 feet and  $V_2 + 20$ .

**APR . . . . . OFF**

Select APR off prior to first power reduction, but not before 400 ft AGL.

**Engine Thrust . . . . . SET**

It is recommended that  $N_1$  power settings be checked every 5,000 feet.

**Thrust Reversers . . . . . DISARMED**

It is prudent to disarm the reversers one at a time. ARMED switchlights extinguish.

**Landing Lights . . . . . OFF**

Recognition lights may be used for identification purposes.

**Hydraulic B Pumps . . . . . OFF**

1B, 2B, and 3B Pumps . . . . . OFF

ELECT and ENG PUMP Lights . . . . . EXTINGUISHED

## Expanded Normal Procedures

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### **ACU Transition . . . . . AS REQUIRED**

#### **If APU is providing 10<sup>th</sup> stage air for the ACUs during takeoff:**

Shutdown/secure the APU “loaded” at this time: Without hesitation between switchlight selections, press in turn the APU START/STOP, R 10th, Isolation valve, L 10th, and APU BLEED AIR valve. The ACU Transition just happened. The 10<sup>th</sup> stage bleed pressure indications will rise significantly due to the engine power settings during the climb.

After the APU spools down to below 20% RPM, deselect the APU PWR FUEL ON/OFF Switchlight and verify the white SOV CLOSED light illuminates. While other “techniques” are used to secure/shutdown the APU, this is the most widely accepted procedure and can be used on the ground or in the air.

If the APU is providing 10<sup>th</sup> stage bleed air, or an anti-ice required takeoff is made without the APU (therefore the 10<sup>th</sup> stage bleed valves closed), the ACU Switchlights stay the same (extinguished), and the R and L 10<sup>th</sup> stage bleeds are opened.

### **Ignition . . . . . AS REQUIRED**

Deselect the switchlights: IN FLIGHT START or CONT IGN and the IGN A & IGN B.

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

Operate COWL & WING anti-ice systems as required by limitations and weather conditions.

### **Cabin Pressurization . . . . . CHECKED**

Ensure cabin altitude moving in correct direction and at the proper rate.

### **AFTER TAKEOFF/CLIMB Checklist . . . . . COMPLETED**

## **Transition Altitude**

**Recognition Lights . . . . . OFF**

**Altimeters . . . . . SET**

**No Smoking/Seat Belt Signs . . . . . AS REQUIRED**

**TRANSITION ALTITUDE Checklist . . . . . COMPLETED**

# **CAE SimuFlite**

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## **Cruise**

**Cruise Power . . . . . SET**

**Fuel Balance and Transfer . . . . . MONITORED**

**NOTE:** It is important to have the aircraft in coordinated flight to show accurate fuel indications. If using the X-FLOW valve to transfer fuel from one wing to the other, rudder trim may be used to assist in balancing fuel, but needs to be returned to “zero” (coordinated flight) after completion of fuel transfer. Otherwise, the FUEL CONTROL FEED switchlights LEFT TO RIGHT or RIGHT TO LEFT may be selected.

**Cabin Pressurization . . . . . CHECKED**

**No Smoking/Seat Belt Signs . . . . . AS REQUIRED**

**Cabin Temperature . . . . . MONITORED**

## **Severe Turbulence Penetration**

**Autopilot . . . . . DISCONNECT**

**Airspeed . . . . . REDUCE TO 280 KIAS OR 0.75 M<sub>I</sub>,  
WHICHEVER IS LOWER**

**Attitude . . . . . WINGS LEVEL/DESIRED PITCH ATTITUDE**

Do not use large control inputs to control aircraft.

**Stabilizer . . . . . SET AND MAINTAIN**

After setting pitch trim, use elevators. Do not use stabilizer trim to maintain attitude.

**Altitude . . . . . ADEQUATE MANEUVERING MARGIN**

Penetration altitude selected should provide adequate maneuvering margins.

**Power Setting . . . . . SET FOR TARGET AIRSPEED**



## Expanded Normal Procedures

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**Buffet Boundary . . . . . WITHIN LIMITS**

See AFM or Operating Handbook Normal Procedures for Buffet Boundary Chart. The Buffet Boundary Chart is also located in the Quick Reference Handbook (QRH).

**If flight into thunderstorms anticipated:**

**Ignition . . . . . CONTINUOUS**

**Engine Anti-Icing . . . . . ON**

### **Descent/In Range**

**Shoulder Harnesses . . . . . SECURED**

**Cabin Pressurization . . . . . SET**

**NOTE:** Verify landing field elevation set in controller.

**Fuel Balance . . . . . CHECKED**

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

**No Smoking/Seat Belt Signs . . . . . ON**

**ATIS . . . . . COPIED**

**Avionics/Flight Instruments/FMS . . . . . SET**

**Landing Data/V Speeds . . . . . COMPUTED**

**DESCENT/IN RANGE Checklist . . . . . COMPLETED**

### **Transition Level**

**Altimeters . . . . . SET**

**Recognition/Taxi Lights . . . . . ON**

**Fuel Crossflow . . . . . CLOSE**

**Approach Briefing . . . . . COMPLETED**

**TRANSITION LEVEL Checklist . . . . . COMPLETED**



## Expanded Normal Procedures

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At 95% RPM . . . . APU GEN OFF LIGHT ILLUMINATES  
At 95% RPM  
+ 4 Seconds . . . . . APU RDY LIGHT ILLUMINATES  
ELEC Light on 8-Channel Annunciator . . . ILLUMINATES  
Master Caution (M/C) Switchlight . . . . . FLASHES  
Four seconds after ELEC 8-Channel annunciator illuminates, the M/C switchlights illuminate.  
MASTER CAUTION PRESS TO RESET . . . . . PRESS  
When the APU is stabilized, transition the Bleeds as follows:  
PRESS IN TURN without hesitation:

**NOTE:** If time permits, allow APU to stabilize at 100% RPM for 2 minutes before applying bleed air load.

R 10<sup>th</sup> STAGE switchlight, ISOL OPEN switchlight, L 10<sup>th</sup> STAGE switchlight, and the APU Bleed Valve. Then verify that the right and left 10<sup>th</sup> BLEED CLOSED, Isolator OPEN and APU BLEED AIR OPEN switchlights illuminated.

**Hydraulic B Pumps . . . . . ALL ON**

No. 1B, 2B, and 3B ELECT PUMP Switches . . . . . ON  
Associated ELECT PUMP lights extinguished.

**Hydraulic System Quantities/Pressures . . . . CHECKED**

Hydraulic Systems Pressures . . . . . ALL 3000 PSI  
Hydraulic Systems Quantities . . . . . ALL IN GREEN ARC

**Nosewheel Steering . . . . . ARMED**

Verify the nose wheel steering is ARMED and that the “tiller” is centered and free of obstructions.

**Ground Spoilers . . . . . ON**

**Thrust Reversers . . . . . ARMED**

Verify that both ARMED switchlights are illuminated.

**APPROACH Checklist . . . . . COMPLETED**

# CAE SimuFlite

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## Before Landing

**NOTE:** When conducting a precision approach (ILS, PAR, or VNAV), perform an altitude crosscheck to include radar altitude at a known fix or waypoint as depicted on IAP.

- Flaps** . . . . . **AS REQUIRED**
- LANDING GEAR Handle** . . . . . **DOWN**
  - Green LEFT, NOSE, and RIGHT Lights . . . ILLUMINATE
  - NOSE DOOR OPEN Lights . . . . . ILLUMINATES THEN EXTINGUISHES
  - Red Gear Handle Lights . . . . . ILLUMINATES THEN EXTINGUISHES
  - WOW Lights . . . . . REMAIN EXTINGUISHED
- Brake Pressure** . . . . . **CHECKED**
  - Brake pressure in green arc.
- Anti-Skid** . . . . . **ARMED/TESTED**
  - Anti-Skid Switch . . . . . ARM
  - TEST Button . . . . . PRESS AND HOLD
    - Press the anti-skid TEST switch two to four seconds to allow the system to complete its test. The anti-skid system test may fail if switch is not held long enough.
    - INBD/OUTBD TEST and FAIL lights . . . . ILLUMINATE
    - ANTI SKID (10 Channel) . . . . . ILLUMINATES
    - TEST switch . . . . . RELEASE
    - INBD/OUTBD TEST and FAIL lights . . . . EXTINGUISH
    - ANTI SKID (10 Channel) . . . . . EXTINGUISH
- Flight Spoilers** . . . . . **STOWED**
  - Flight spoilers must be stowed prior to 300 feet AGL. This is a good time to verify Ground Spoilers switch is still ON.
- Ignition** . . . . . **AS REQUIRED**
- Landing Lights** . . . . . **AS REQUIRED**
- BEFORE LANDING Checklist** . . . . . **COMPLETED**

## Expanded Normal Procedures

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### After Landing

**Landing Lights . . . . . ALL OFF**

Landing lights are intended for takeoff and approach/landing only.

**Exterior Lights/Strobes . . . . . AS REQUIRED**

**Hydraulic B Pumps . . . . . OFF**

No. 1, 2, and 3B ELECT PUMP Switches . . . . . OFF

ELECT PUMP Lights . . . . . ILLUMINATE

Unless the flaps are zero. If flaps are still down, the 10-Channel HYD and M/C lights will illuminate. M/C press to RESET.

**Ignition . . . . . OFF**

**If not previously started:**

**APU . . . . . STARTED**

**NOTE:** Prior to starting the APU, the AFM procedures specify testing the APU FIREX Squib, FIRE WARN, and FAULT TEST.

Before starting the APU, verify the APU generator switch is OFF and APU Bleed Air Switchlight is de-selected (out) OPEN legend extinguished.

**NOTE:** Allow APU to stabilize at 100% RPM for 2 minutes before applying bleed air load.

APU PWR/FUEL ON/OFF Switchlight . . . . . PUSH

SOV CLOSED Light . . . . . EXTINGUISHES.

PUMP INOP Light . . . . . ILLUMINATES MOMENTARILY,  
THEN EXTINGUISHES

## **CAE SimuFlite**

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START/STOP Switchlight . . . . . START  
STARTER Light . . . . . ILLUMINATES  
SOV CLOSED Light . . . . . REMAINS EXTINGUISHED  
  
At 60% RPM . . . . . STARTER LIGHT EXTINGUISHES  
  
At 95% RPM . . . . . APU GEN OFF LIGHT ILLUMINATES  
  
At 95% RPM  
+ 4 Seconds . . . . . APU RDY LIGHT ILLUMINATES  
ELEC Light on 8-Channel Annunciator ILLUMINATES  
Master Caution (M/C) Switchlight FLASHES  
  
Four seconds after ELEC 8-channel annunciator illuminates, the M/C switchlight illuminates.

**Cowl/Wing Anti-Ice . . . . . OFF**

**NOTE:** Some weather or airport surface conditions may dictate the Cowl Anti-Ice to remain ON.

**Windshield and/ADS Heaters . . . . . OFF**

The 4 windshield NO HT lights and the HTR FAIL lights will illuminate and cause the 10 channel ANTI ICE light to illuminate until either M/C Switchlight is pressed to reset.

**Ground Spoilers . . . . . OFF**

**Flight Spoilers . . . . . STOWED**

**Flaps . . . . . RETRACTED**

Retracting the flaps to takeoff position will cause the APR and 8 channel ENGINE light to illuminate. M/C press to RESET.

**NOTE:** As the flap switch is moved to zero, a momentary pause at 30° and 20° detents could decrease the likelihood of a flap failure during retraction.



# **CAE SimuFlite**

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## **Shutdown**

**Taxi Lights . . . . . OFF**

**Parking Brake/Pressure . . . . . SET/CHECKED**

Brake pressure within green arc.

**Nosewheel Steering . . . . . OFF**

**Engine Generators . . . . . OFF**

Confirm that the APU generator External A/C power is already selected on and that thrust reversers are completely stowed (REVERSER UNLOCKED lights extinguished) before selecting engine generators OFF.

**Thrust Levers . . . . . SHUTOFF**

**Fuel Pumps . . . . . OFF**

ON lights extinguish. INOP legends illuminate. FUEL LOW PRESS lights may illuminate as well especially on **aircraft SNs 5135 and subsequent**. M/C press to RESET.

### **If ITT rises above 350°C during shutdown:**

**START Switchlight . . . . . ON**

Dry motor engine until temperature decreases. Observe engine starter limits.

**STOP Switchlight . . . . . PRESS**

ATS (starter) limited to 90 seconds. STOP light illuminates 60 seconds after START initiation.

**Anti-Collision Beacon . . . . . OFF**

**Cabin Signs . . . . . OFF**





# **CAE SimuFlite**

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## **Securing/APU Shutdown**

**Oxygen . . . . . AS REQUIRED**

**Emergency Lighting . . . . . OFF**

Additionally, No Smoking/Seat Belts, Galley and Cabin power as required.

**Standby Attitude Indicator . . . . . CAGED**

**Avionics/FMS/IRS . . . . . OFF**

**NOTE:** Avionics installations differ. In the CAE SFI Challenger simulator, press out the six Master Avionics Switchlights and “lift” and turn the 3 IRUs Mode Select knob to OFF.

**Radar . . . . . OFF**

**Thrust Reversers . . . . . DISARMED**

Verify that the ARMED, UNSAFE TO ARM, REVERSER UNLOCKED, and REVERSE THRUST lights extinguish.

**APU Generator . . . . . OFF**

When the ACU air conditioning and electrical power is no longer desired from the APU the following technique for shutting down the APU “fully loaded” is practiced by most operators. Within 1 or 2 seconds of selecting the APU generator switch OFF, press the APU START/STOP switchlight. All electro/pneumatic air valves will go to their un-powered position as soon as the APU generator is switched OFF. After the next step (APU Start/Stop), the bleed air associated switchlights are pressed to make them agree with valve positions (except the 14th stage valves “fail” to open).

**APU Start/Stop Switchlight . . . . . OFF**

APU RDY light extinguishes.

**ACUs . . . . . OFF**

OFF lights illuminate following the loss of the APU generator.

## Expanded Normal Procedures

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- Isolation Valve** . . . . . **CLOSED**  
OPEN light extinguished following loss of the APU generator.
- APU Bleed Valve** . . . . . **CLOSED**  
APU BLEED AIR OPEN light extinguishes following the loss of the APU generator.
- 10th Stage Bleeds** . . . . . **CLOSED**  
BLEED CLOSED lights illuminate following loss of the APU generator.
- APU Power/Fuel Shutoff Valve** . . . . . **OFF**

**NOTE:** In Section 5 of the Challenger Operating Manual, the “Normal shutdown of the APU” is described as follows:  
“Normal shutdown of the APU is accomplished by removing all loads from the unit then pressing out the START/STOP switchlight on the APU CONTROL panel. When the APU has completely stopped, pressing out the PWR-FUEL ON/OFF switchlight de-energizes the APU fuel pump and disconnects the electrical power supply circuit to the START/STOP switchlight.” However, the published checklist procedures make no note of this detail. Operators throughout the fleet shutdown the APU “loaded” and thereafter press out the PWR-FUEL ON/OFF Switchlight prior to the RPM completely stopping.

CAE SFI suggests to allow the APU RPM to spin down to 20% or below before selecting the PWR/FUEL ON/OFF Switchlight to OFF.

- SOV CLOSED Light . . . . . ILLUMINATES
- AUXILIARY BATTERY ON Light  
(if installed) . . . . . EXTINGUISHES
- Cockpit Heat** . . . . . **OFF**
- Battery Master Switch** . . . . . **OFF**
- Gear Pins/Chocks** . . . . . **INSTALLED**
- Parking Brake** . . . . . **RELEASED**
- SECURING/APU SHUTDOWN Checklist** . . . . **COMPLETED**

# **CAE SimuFlite**

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## **Quick Turnaround**

**NOTE:** Crews using the Quick Turnaround checklist must consider the operational situation and status of their aircraft. The Quick Turnaround checklist could be followed by Normal Start, After Starting Engines, Taxi or Before Takeoff checklists depending on the situation.

- Circuit Breakers . . . . . CHECKED**
- Lights . . . . . AS REQUIRED**
- No Smoking/Seat Belt Signs . . . . . ON**
- Cabin Pressurization . . . . . SET**
- Emergency Lighting . . . . . ARMED**
- Clocks . . . . . SET**
  - Flight Time zeroed.
- Flight Surfaces and Trim Indicators . . . . . CHECKED**
- Trims (3) . . . . . SET**
- Fuel Quantity . . . . . CHECKED**
- Avionics . . . . . SET**
- ATIS/Clearance . . . . . COPIED**
- Altimeters/Flight Instruments . . . . . SET**
- FMS/MFD . . . . . PROGRAMMED**
- Takeoff Data . . . . . COMPUTED AND BUGGED**
- QUICK TURNAROUND Checklist . . . . . COMPLETED**

## Expanded Normal Procedures

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### Alternate Start Procedure

After an engine shutdown or dry motoring to reduce ITT, the probability of a hung start increases.

**NOTE:** This Alternate Start Procedure assumes AC electric power on line.

**Ignition** . . . . . **OFF**  
IGN A/IGN B Switchlights . . . . . PRESS OFF  
IGN A and IGN B Lights . . . . . EXTINGUISH

**If using an external air supply:**

**Bleed Air Pressure** . . . . . **45 PSI MINIMUM**

**If using the APU:**

**APU Bleed Air** . . . . . **ON**  
APU BLEED AIR Switchlight . . . . . PRESS ON  
OPEN Light . . . . . ILLUMINATES  
**Bleed Air Pressure** . . . . . **45 PSI MINIMUM**

**If performing a cross bleed air start:**

**APU Bleed Air** . . . . . **OFF**  
APU BLEED AIR Switchlight . . . . . PRESS OFF  
APU BLEED AIR OPEN Light . . . . . EXTINGUISHED  
**10<sup>th</sup> Stage Bleed Air (operating engine)** . . . . . **ON**  
BLEED CLOSED Light  
(operating engine) . . . . . EXTINGUISHED

**NOTE:** If able, set flaps to 20 degrees to silence TOCW.

## **CAE SimuFlite**

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**Thrust Lever (operating engine) . . . . . ADVANCE**

**Bleed Air Pressure . . . . . 45 PSI MINIMUM**

Advance operating engine's thrust lever to obtain 45 PSI minimum bleed air pressure.

**START Switchlight . . . . . PRESS**

START light and 10<sup>th</sup> Stage Isolation OPEN lights illuminate. BLEED CLOSED light (for engine to be started) extinguishes.

**N<sub>2</sub> RPM . . . . . 20%**

Wait for engine to accelerate to 20% N<sub>2</sub> or maximum motor-ing speed, whichever occurs first and ITT below 120°C.

**Ignition . . . . . ON**

IGN A or IGN B Switchlight . . . . . PRESS ON

IGN A or IGN B and ON Lights . . . . . ILLUMINATE

**Thrust Lever . . . . . ADVANCE TO IDLE**

**At 54 to 57% N<sub>2</sub>:**

Ignition ON Switchlight . . . . . EXTINGUISHED

START Switchlight . . . . . EXTINGUISHED

**After 5 seconds:**

10<sup>th</sup> Stage BLEED CLOSED Lights . . . . . ON

Bleed Air Isolation OPEN Switchlight . . . . . EXTINGUISHED

Whether or not the 10th Stage BLEED CLOSED or OPEN legends are extinguished or illuminated at this time is dependent upon switch positions previously selected by the pilot.

**SCAV/MAIN EJCTRS Lights . . . . . EXTINGUISHED**



## **CAE SimuFlite**

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Fire Warning Test Switch . . . . . **WARN TEST/HOLD**

The fire bell sounds, the red ENG FIRE PUSH (2), APU FIRE PUSH (1) switchlights and three green BOTTLE ARMED PUSH TO DISCH switchlights illuminate (“3 red, 3 green”); pressing the white TONE MUTED switchlight illuminates the white light and silences the bell. Releasing the Fire Warning Test switch extinguishes the fire push switchlights and also silences the fire bell.

Fire Warning Test Switch . . . . . **FAULT TEST/HOLD**

Three amber FIRE WARN FAIL lights illuminate causing the FIRE FAULT light to illuminate on the 8 channel annunciator. Prolonging the test for more than 4 seconds causes the left M/C light to Flash until the FAULT TEST switch is released.

SQUIB Switchlights (3) . . . . . **PRESS**

Verify firex bottles (2 engines) LOW PRESS & 1 APU LO PRESS amber lights are extinguished. Pressing BOTTLE 1, APU, & BOTTLE 2 firex SQUIB Test switchlights (in turn) tests the continuity of the electrical circuitry and should illuminate the split legend L SQUIB / R SQUIB switchlights for BOTTLE 1 and BOTTLE 2 and the SQUIB switchlight for the APU bottle.

**Jet Pipe/Pylon Overheat . . . . . TESTED**

OVHT Switchlights . . . . . **PRESS AND HOLD**

Red OVHT flashes if the system is operating normally.

OVHT Switchlights . . . . . **RELEASE**

OVHT WARN FAIL Switchlights . . . . **PRESS AND HOLD  
IN TURN**

Press one at a time. The amber OVHT WARN FAIL light illuminates as does the 8 Channel ENGINE light. If held for more than 4 seconds, the M/C lights flash. Release the OVHT WARN FAIL Switchlight and all warning lights should extinguish indicating a good test. Repeat test for other switchlight.

OVHT WARN FAIL Switchlights . . . . . **RELEASE**



## Expanded Normal Procedures

---

**SCAV/MAIN EJCTR Lights . . . . . ON**

Verify they are already illuminated.

**Right Fuel Pump Switchlight . . . . . ON**

Press the right standby fuel pump switchlight and verify the left standby fuel pump ON light illuminates and the left and right INOP and LOW PRESS lights extinguish. (Battery bus powers the left standby pump which will be used for starting the right engine).

**NOTE:** In some aircraft, the fuel LOW PRESS light may remain illuminated until Motive Flow is obtained.

**ACUs (without SB 601-0450) . . . . . OFF**

White OFF legend illuminated on each ACU switchlight and cockpit/cabin airflow terminates.

**NOTE:** Even though an aircraft incorporates S/B 601/0450 (Mod to Inhibit ACUs During Engine Start), Bombardier recommends the ACUs be selected OFF for engine starts unless S/B 601-0533 (Mod to Replace ACU DELAY RELAYS) has been incorporated.

**Cockpit Heat (S/Ns 5001 to 5134 and 3001 to 3066) . OFF**

It will already be off unless cockpit heat had been selected on for additional heating.

**External Air . . . . . 45 PSI MINIMUM**

Duct pressure gage not powered; no reading in the cockpit. Obtain reading from cart.

**Navigation/Beacon Lights . . . . . ON/AS REQUIRED**

**Ignition B . . . . . ARMED**

Ignition B is powered from the Battery bus and is equipped with its own static inverter. Green IGN B legend is illuminated.

# CAE SimuFlite

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## Right Engine Start Switch . . . . . START

Press and hold the engine start switchlight for a few seconds and verify: The green START light and the IGN B white ON light illuminates, the left and right 10th stage BLEED CLOSED lights extinguish (“black”). The 10th stage isolator valve (ISOL) green OPEN light indicates. The lights should remain as described above until the starter cuts out automatically or is deselected with the STOP switchlight.

### At 20% N<sub>2</sub> and below 120°C ITT:

## Right Thrust Lever . . . . . IDLE

**AFM Normal Procedures information:** Light-off, as indicated by a rise in ITT, is normally achieved within 10 seconds from thrust lever operation. Normally within 20-40 seconds automatic starter disengagement occurs between 54-57% N<sub>2</sub>. At temperatures below 15°C the start sequence may exceed 60 seconds. At ambient temperatures above 15°C, if light-off time exceeds 25 seconds, abort the start.

**GE CF34 Operating Instructions information:** Moving the thrust lever to IDLE monitor engine instruments. Positive Oil Pressure within 30 seconds of start initiation. Engine must not be operated if the FAN (N<sub>1</sub>) is not rotating.

### At 54 to 57% N<sub>2</sub>:

Ignition ON Switchlight . . . . . EXTINGUISHED

START Switchlight . . . . . EXTINGUISHED

**NOTE:** Both pilots monitor engine instruments. At 55% N<sub>2</sub> the pilot monitoring the start should look for starter “cutout”: START light extinguished, white IGN B ON light extinguished, green IGN B armed light still illuminated, ISOL valve as selected and the 10th stage BLEED CLOSED lights illuminated.

## Expanded Normal Procedures

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### After 5 seconds:

10<sup>th</sup> Stage BLEED CLOSED Lights . . . . . ON

Bleed Air Isolation OPEN Switchlight . . . . . EXTINGUISHED

Whether or not the 10th Stage BLEED CLOSED or OPEN legends are extinguished or illuminated at this time is dependent upon switch positions previously selected by the pilot.

Engine Instruments . . . . . MONITOR

N<sub>2</sub> Above 57% and STABILIZED 62.9 to 64.0% N<sub>2</sub>. Notify maintenance if N<sub>2</sub> variation between engines exceeds 2%.

ITT . . . . . WITHIN NORMAL RANGE

Oil Pressure . . . . . RISING ABOVE 25 PSI – RED LIGHTS OUT

**Right Generator . . . . . TESTED/ON**

AC Meter Selector . . . . . ROTATE TO RIGHT GEN

Generator Switch (right) . . . . . TEST/HOLD

Check voltage output and frequency unloaded (115 ±9V AC, 400 ±25 Hz). While holding the GEN switch in TEST, the GEN OFF light should be extinguished.

**Electrical Panels/Avionics . . . . . CHECKED**

The AC and DC POWER and METERING panels are checked to verify all lights (except the left engine driven generator GEN OFF light) are extinguished (all buses and TRUs should be powered). Verify the green ALTN and amber FAIL lights for the AC Essential power transfer are extinguished. Check the ELECT PWR panel on the overhead and verify battery CHARGER and BATTERY lights are extinguished, and the status of the ground power if required. Battery Bus voltage may temporarily exceed 28V during charging.

## **CAE SimuFlite**

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IRUs (3) . . . . . NAV  
Master Avionics Switches (6) . . . . . PRESS ON  
LASERTRAK . . . . . PRESS ON

**NOTE:** Powering-up the IRUs, AVIONICS, and Lasertrak at this time (after the AC generator is on-line) allows the FMSs and IRUs to warm up in preparation for initializing later in the checklist. Some installations may not have 3 IRUs and may have different switches/configurations for controlling the avionics.

### **Warning Lights . . . . . TESTED**

WARN LTS or WARNING LT TEST Switch . . . TEST/ON

HOLD any one of the three test switches (WARN LTS (facia panels) or WARNING LT TEST Switch (center pedestal) to the TEST or ON position and verify that the master caution related lights illuminate. Check annunciator lights on all panels for brightness and that all bulbs within a light/switchlight are illuminated. Occasionally bulbs do not illuminate properly and need to be touched or “flicked” to illuminate.

RECALL/TEST Switch  
(8-10 Channel Panel) . . . . . HOLD TO TEST

Hold in TEST position to verify all 8-10 panel annunciator legends (including the spares) and the left and right M/C (not flashing) switchlight bulbs illuminate; then release the switch.

M/C Switchlights . . . . . PRESS TO RESET

BRT/DIM Switch . . . . . AS REQUIRED

**NOTE:** Depending on aircraft completion design, warning/caution lights, except the Overhead Panel lights, may test when the Center Pedestal WARNING LT TEST switch is held to ON. The Overhead Panel annunciator lights, in this configuration, are tested using the WARN LTS test switch on either pilots’ facia panel.

## Expanded Normal Procedures

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- **Bleed Air Leak Detect Panel . . . . . TESTED/RESET**
  - SYSTEM TEST Switch  
(above the CBP-B) . . . . . PRESS AND HOLD
  - Bleed Air Magnetic Trip/Fault Indicators . . . . . TRIPPED
    - Verify white and black “flags” in the panel’s eight magnet-  
ic trip indicators and DUCT FAIL lights (6 red) ILLUMI-  
NATED.
  - SYSTEM TEST Switch . . . . . RELEASE
    - Verify the six warning lights extinguish.
  - IND RESET . . . . . PRESS
    - Verify the eight magnetic trip/fault indicators are black  
(reset) and warning lights extinguish.

**NOTE:** On the Center Instrument Panel the BLEED AIR LEAK DETECT test switchlight DUCT FAIL (flashing) and 5 DUCT FAIL lights on the Overhead Panel illuminate (Wing Anti-Ice, L & R 10th and L & R 14th). The 10th & 14th Stage DUCT FAIL(s) are switchlights that control their respective Bleed Valves.

**NOTE:** If any FUS or WING annunciator (4 on the Bleed Air Leak Detect Panel) fails to provide the indication specified, flight into known icing conditions is prohibited. The WING ANTI-ICE control switch must be set to OFF for flight. This note refers to the Magnetic Trip annunciators being black and white when tested and reverting to black when RESET switch is pressed.

- First Flight of Day

# CAE SimuFlite

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## **DUCT MON Switch Loops A and B . . . . ■ TESTED/BOTH**

Move the DUCT MON test switch to A and B in turn, allowing a couple of seconds in each position to test the systems. Verify that both 10th stage bleed air DUCT FAIL (red) lights remain extinguished. Return the DUCT MON switch to BOTH.

## **Right 10th Stage Bleed . . . . . ON**

R 10th BLEED CLOSED legend extinguished.

## **External Air . . . . . DISCONNECTED**

## **ISOL Valve . . . . . OPEN**

10th Stage green ISOL valve OPEN switchlight illuminated. Pressure from one engine at idle is less than what the APU provides but is usually adequate for some air conditioning.

## **■ ACUs (With or without SB 601-0450) Both . . . . . ON**

White OFF legends extinguished and notice the airflow.

**NOTE:** See text and note for ACUs in the NORMAL START section of this chapter (2B-51).

## **S/Ns 5001 to 5134, (also 3001-3066) and AC without SB 601-0419**

## **Cockpit Heat . . . . . NORMAL/CHECKED**

**NOTE:** The CAE SFI Challenger sim does not direct airflow as described in this procedure (airflow is assumed).

## **CKPT HEAT (Overhead Panel) . . . . . NORMAL**

## **Footwarmer/Demist Pull Knobs . . . . . PULL**

Verify increased airflow as directed to windshields and down toward feet.

While the knobs are still pulled out:

## **CKPT HEAT Switch . . . . . OFF**

Listen for footwarmer/demist airflow to cease.

## **Footwarmer/Demist knobs . . . . . PUSH IN**

## **Footwarmer/Demist System . . . . . SET AS DESIRED**

## **■ First Flight of Day**

## Expanded Normal Procedures

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**S/Ns 5142, 5160, and subsequent and 5135 to 5141 and 5143 to 5159 with SB 601-0419 (see Note)**

**NOTE:** Cockpit Heat: **S/Ns 5142, 5160 and subsequent, AND aircraft with SB 601-0419** (Footwarmer/windshield Vent System – New Electrical Heater and Ducts). Both the Cockpit Heat switch and a single Pull/Push diverter knob are located forward of the TEMPERATURE CONTROL Panel (copilot's console). With a single knob configuration, PUSH in for footwarmer only, PULL mid way out for both and PULL all the way out for windshield/demist only.

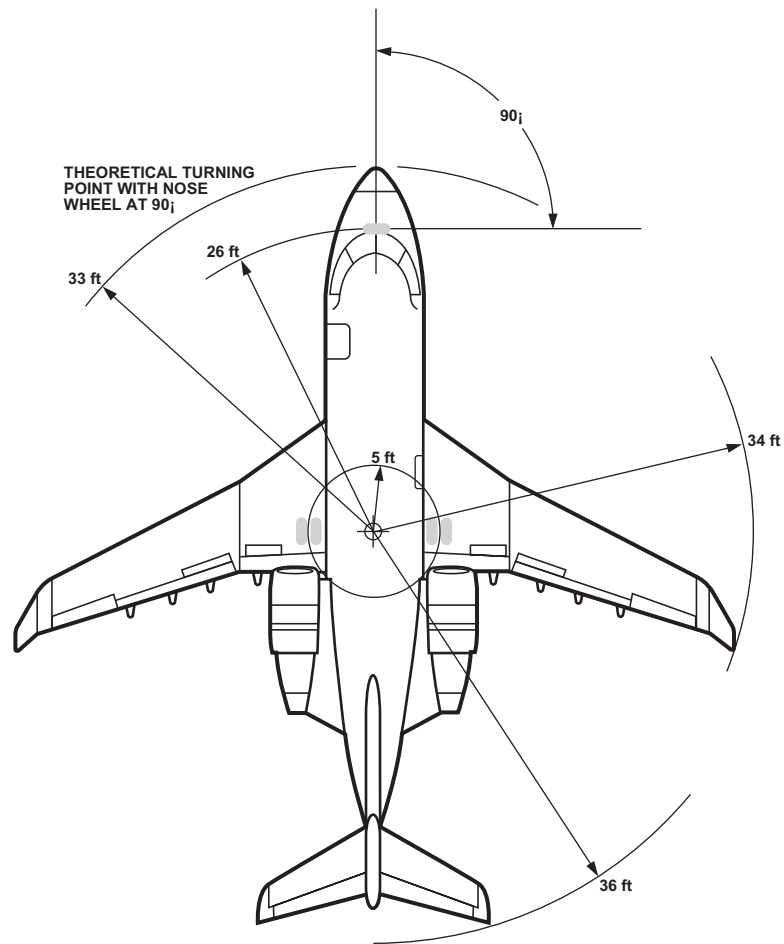
**Cockpit Heat . . . . . ON/CHECKED**  
COCKPIT HEAT . . . . . ON  
Switch is located on the TEMPERATURE CONTROL panel (co-pilot's console). When selected ON the fan and electric heater are activated. Check for airflow.  
AIR Knob . . . . . PULL/PUSH  
Verify appropriate airflow to windshield and footwarmer areas.  
■ IN — Footwarmer only  
■ MID — Footwarmer and windshield vents  
■ Fully OUT — Windshield vent only  
COCKPIT HEAT Switch . . . . . OFF  
Verify airflow ceases.

**NOTE:** Cockpit Heat in the CAE SFI Challenger simulator, nearly emulates both configurations by having two Cockpit Heat Switches instead of one, and by having separate knobs for the Windshield and Footwarmer control rather than one knob as in the later 3Rs.

AIR KNOB/Demist System . . . . . SET AS DESIRED  
**Cockpit Temperature Selectors . . . . . NORMAL/SET**  
**14th Stage Bleed/Cowl Anti-Ice . . . . . AS REQUIRED**  
**EXTERNAL AIR START Checklist . . . . . COMPLETED**

***Return to FLIGHT COMPARTMENT (2B-5).***

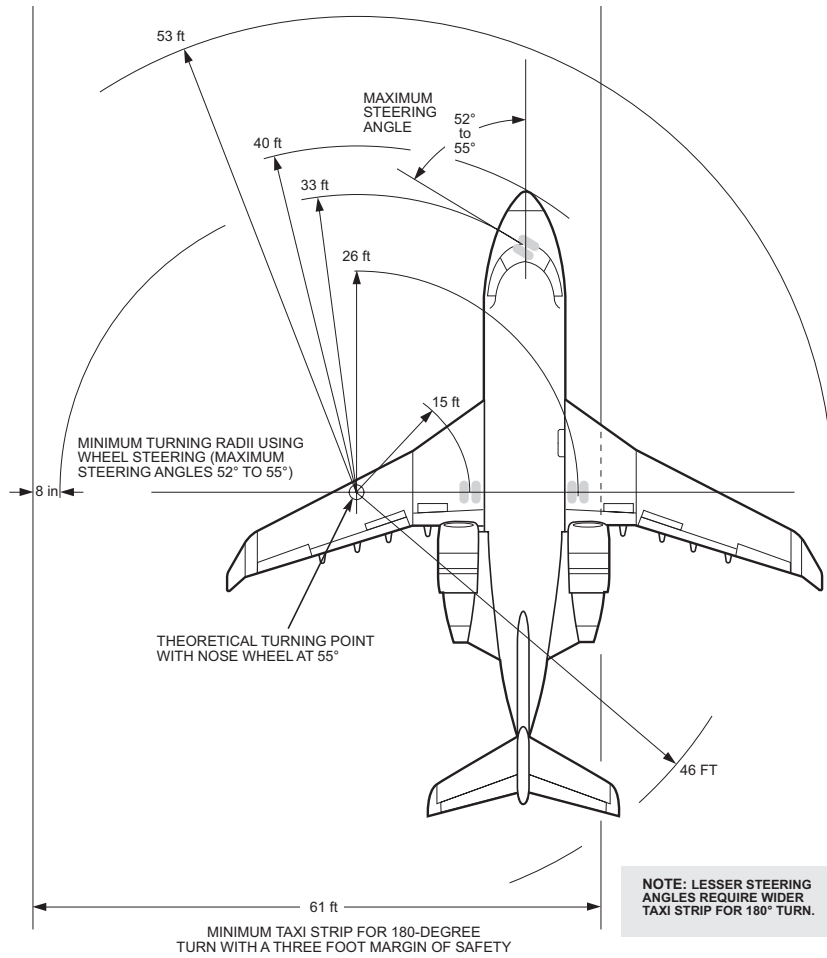
## Towing Radii



2B-1



## Taxiing Radii



2B-2





# CAE SimuFlite

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## Nose Wheels . . . . . CENTERED

After towing, ensure nose wheels are centered.

**CAUTION:** Nose wheels must be brought to an angle less than 55° from center before arming nosewheel steering. If aircraft was parked with the nose wheel not centered, it returns to center when power is applied. Nosewheel steering must be disarmed during castoring operations to shut off hydraulic pressure supply. This may cause inadvertent aircraft movement.

**CAUTION:** Turning the nose wheels beyond 90° from center with a tow bar attached could damage nose gear mechanism.

## Parking Brake . . . . . APPLIED

**CAUTION:** Use care when pushing the aircraft nose gear. Rearward movement must be controlled and stopped by the tug. Aircraft wheel brakes are capable of lifting the nose gear off the ground.

## Chocks . . . . . IN PLACE

## Tow Bar . . . . . DISCONNECTED FROM TUG

## Tow Bar . . . . . DISCONNECTED FROM NOSE GEAR

## BATTERY MASTER Switch . . . . . OFF

## Aircraft . . . . . PROPERLY GROUNDED

**NOTE:** Refer to Ground Handling and Servicing Information (PSP 601-13) for parking and mooring instructions.





## Cold Weather Operations

Deicing procedures are located at the end of this chapter. Also refer to the AFM; the Challenger Operating Manual, Vol. 1 Supplementary Procedures Section 1; Maintenance Manual, Chapter 12 – Servicing, and applicable FAA Advisory Circulars for deicing procedures and fluids.

**NOTE:** The AFM/Operating Manual has more information about cold weather operations that is beyond the intended scope of this publication, and should be referred to by the Challenger aircrew in advance of deicing/anti-icing procedures. Bombardier publishes additional COLD WEATHER OPERATIONS periodicals that have valuable information for the winter season.

### Preflight

**All Protective Covers . . . . . REMOVED**

**Aircraft Surface . . . . FREE OF FROST, ICE, AND SNOW**

The wing, tail surfaces, primary control surfaces, and flaps must be completely free of frost, ice, and snow.

Light rime ice or hoar frost on the upper surface of the fuselage is acceptable provided vents and ports are unobstructed.

**APU Inlet . . . . . CLEAR OF IMPACTED ICE AND SNOW**

**Engine Inlets . . . . . CLEAR OF ICE AND SNOW**

**CAUTION:** Before engine start, ensure that the N<sub>1</sub> fan rotates freely. In cold weather, water may freeze in the lower intake area and jam the fan blades. Use warm air to melt the ice and free the fan blades. Do not use de-icing/anti-icing fluid to clear the fan blades.

## **CAE SimuFlite**

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- Fuel Tank Vents . . . . . CLEAR OF ICE AND SNOW**
- Pitot/Static Probes and Static Ports . . . . CLEAR OF ICE AND SNOW**
- AOA Vanes . . . . CHECK FOR FREEDOM OF MOVEMENT**
- Landing Gear Doors/Brakes . . . . . CLEAR**
- Air Inlets and Exhausts . . . . CLEAR OF ICE AND SNOW**
- Battery . . . . . INSTALLED/FULLY CHARGED**

As a precaution in extreme weather conditions, remove the battery to a warm area. Reinstall the battery before flight.

### **After Entering Aircraft**

- APU . . . . . STARTED**
- Cockpit and Cabin Temperature . . . . . AS REQUIRED**

Ensure normal operation of the passenger and baggage doors if the aircraft has been cold-soaked at temperatures below -20°C (-4°F):

- CABIN TEMP Selector . . . . . HOT**

Heat cabin to 10°C (50°F) or higher.

- Doors . . . . . OPERATE**

After heating the cabin, operate the passenger and baggage doors to ensure normal operation.

### **Before Starting Engines**

If a pushback is required and the ramp is covered with ice or snow, the tug may be unable to overcome aircraft idle thrust. Under these conditions, delay engine start until pushback is complete.

When operating on ramps covered with snow or ice, the parking brake may be insufficient to prevent aircraft movement with idle thrust.





## After Starting Engines

### COWL Anti-Ice Switches . . . . . ON IN ICING CONDITIONS

Icing conditions for operations while on the ground exist with OAT 10°C or below:

- when visible moisture in any form is present (such as fog with visibility of one mile or less, rain, snow, sleet and ice crystals), or
- when operating on ramps, taxiways or runways where surface snow, ice, standing water or slush is present

**NOTE:** Use reported OAT to determine anti-ice requirements on the ground. The TAT/SAT readings are not reliable when the airplane is static or moving at low speed on the ground.

### Engine Instruments . . . . . MONITOR

All engine instruments should have normal indications shortly after the engine reaches idle speed. Do not operate the engines above idle speed until all engine instruments read normal. Do not abruptly advance the thrust levers.

If a sudden unexplainable rise in engine ITT occurs, immediately shut down the engine.

During prolonged ground operations in moderate to severe icing conditions, perform periodic engine run-ups every 10 minutes to as high a thrust setting as practical for 10 to 15 seconds to prevent fan blade icing.

Do not advance thrust levers to takeoff power until normal engine operation has been achieved and engine indications are stable.

## Expanded Normal Procedures

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### **Generators . . . . . ON**

As the generator oil warms to its normal operating temperature, generator output may vary for five minutes after engine start.

### **Thrust Reversers . . . . . OPERATE**

At temperatures below -20°C (-4°F), condensation and freezing moisture in the thrust reverser components may degrade system operation. The risk of this occurrence is highest when an aircraft is moved from a relatively warm hangar to freezing conditions for preflight preparations.

Clear the thrust reversers by operating them through three complete (deploy/stow) cycles.

## **Taxi**

### **Nosewheel Steering . . . . . CHECK OPERATION**

During taxi, check the operation of the nosewheel steering system in both directions. Avoid large steering inputs.

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

Exercise the flight controls through their full range of travel. If a flight control binds or operates abnormally, investigate before flight.

### **Flaps . . . . . RETRACTED**

To avoid contaminating the flaps with slush thrown by the wheels, taxi with flaps retracted. Before takeoff extend flaps to the required setting.

### **Ignition . . . . . OFF**

Ignition system should be off to prevent continuous ignition operation from masking engine problems. Before takeoff, turn ignition system ON.

### **Taxi Speed . . . . . 10 KTS MAXIMUM (recommended)**

Operating from Wet, Snow Covered or Slush Covered Surfaces may require BRAKE SNUBBING (see AFM/Operating Manual, Normal Procedures section "Landing Gear Wheels and Brakes").

# **CAE SimuFlite**

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## **Aircraft/Obstacles . . . . . MAINTAIN SEPARATION**

When taxiing on slush, snow, or ice, increase the separation between other aircraft, equipment, and obstacles.

## **Reverse Thrust . . . . . ONLY WHEN NECESSARY**

Minimize use of reverse thrust. Use only to prevent aircraft from leaving taxiway or if nosewheel skidding occurs and aircraft cannot be controlled any other way.

## **Before Takeoff**

### **BEFORE TAKEOFF Checklist . . . . . COMPLETE**

Verify flap and trim positions are set before beginning aircraft takeoff roll.

**NOTE:** Data extracted from the “blue pages” for takeoff and landing on contaminated runways are also located on the last three pages of the Flight Planning (performance) section of the Quick Reference Handbook (QRH-checklist).

## **Wing Anti-icing . . . . . OFF UNTIL TAKEOFF**

If there is anti-icing fluid on the wings, delay selecting the wing anti-ice system on until thrust is increased for takeoff. 10th stage bleed valves must be closed for take-off and landing when Cowl and/or Wing Anti-Ice is ON.

## **Aircraft Surfaces . . . . . CLEAN**

Visually examine the wing leading edges and upper surfaces for signs of contamination. If the anti-icing holdover time has been exceeded, visually inspect the wings and, if necessary, return to the ramp and have the aircraft deiced.

## **Ignition . . . . . ON**

CAE SimuFlight recommends both IN FLIGHT START switchlights be selected ON.

## Expanded Normal Procedures

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### Takeoff

#### Canadair recommends NOT taking off:

- on runways covered with more than  $\frac{1}{4}$  inch (6.3 mm) of standing water or slush or more than 1 inch (25.4 mm) of snow
- with reduced takeoff power settings
- with only one thrust reverser operational
- with a tailwind
- if the crosswind component exceeds 15 kts, and there is wet or dry ice, slush, or standing water on the runway
- if there is any wing leading edge roughness.

**CAUTION:** Do not rely on visual icing cues or ice detector before turning on cowl and wing anti-icing systems. If temperature is 10°C TAT or below and moisture is visible, turn anti-icing systems on. Delaying use of anti-icing systems until ice is visible may result in ice ingestion and engine damage and or flameout.

Small accumulations of ice on the wing leading edge can change the stall characteristics, the stall speed and the stall margin provided by the SPS.

**CAUTION:** If temperature is at or below freezing and visible moisture is present, clear ice could build up on the wing's upper surface.

## **CAE SimuFlite**

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### **Canadair also recommends:**

- knowing performance penalties incurred on contaminated runways
- using AFM Unapproved Supplement 2 (blue pages) for determining takeoff distances and  $V_1$  speed
- using normal takeoff procedures
- monitoring engine instruments to ensure sufficient thrust is available
- that power be applied symmetrically to avoid aircraft yawing during the takeoff run
- avoiding rapid or large nosewheel/rudder steering inputs during takeoff run
- using rudder and ailerons to control aircraft direction between 60 and 100 kts groundspeed
- applying light but firm forward pressure on the control column to improve directional control from the nosewheel
- rotating the aircraft at 3 degrees-per-second
- using ailerons, rudder, and elevators as required to maintain directional control if the aircraft tends to pitch-up or roll-off once airborne.
- avoid over-controlling and apply smooth and continuous flight control inputs.

## **Expanded Normal Procedures**

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**If a rejected takeoff (RTO) is made:**

**Spoilers . . . . . EXTENDED**

**Reverse Thrust . . . . . MAXIMUM REVERSE THRUST**

**Brakes . . . . . MAXIMUM BRAKING EFFORT**

Keep the nosewheel centered and maintain directional control with the rudder and small inputs from the nosewheel steering.

**If a skid develops:**

**Reverse Thrust . . . . . REDUCE TO IDLE OR FORWARD THRUST**

**Differential Braking . . . . . USE TO RETURN TO CENTERLINE**

**Nosewheel Steering . . . . . REGAIN DIRECTIONAL CONTROL**

Problematic directional control on slick runways could be caused by excessive cycling of the anti-skid system necessitating the reduction of brake pressure.

### **Information Applicable to Super-Cooled Large Water Droplet (SLD) Icing Conditions**

SLD conditions are distinct from other common icing forms such as clear, rime, or frost because of the propensity for the ambient liquid water to be contained in droplets of relatively large mass and inertia thus causing a larger proportion of water to impact the leading edge. Additionally, the droplets impact the wing surface further aft than smaller droplets common to the clear and rime ice varieties. This results in formation of ice ridges on wing surfaces.

Research indicates that SLD icing conditions may be prevalent in pristine atmospheres typical of coastal maritime environments, however, there are no defined means for prior indication of SLD icing conditions or for differentiating SLD from other forms of icing. The presence of SLD can only be determined by observation of the resulting ice accumulation on unprotected surfaces.

The indication of SLD on the Challenger is observation of ice accumulation on the flight compartment (cockpit) side windows. Any ice accumulation on the side windows is the indicator that SLD icing conditions are present.

Operation in SLD icing is prohibited. Once SLD conditions are recognized, pilots must ensure that both cowl and wing anti-ice protection is ON and immediately LEAVE SLD conditions. After leaving SLD icing conditions, pilots should look for signs of ice formation aft of the heated leading edge area of the wings. If ice is observed aft of the leading edge, consult the QRH or AFM Emergency Procedures for ANTI-ICE, WING DUCT FAILURE.



## Expanded Normal Procedures

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### Descent and Approach

**NORMAL DESCENT Checklist . . . . . ACCOMPLISHED**

**Engine and Wing Anti-Icing Systems . . . . . ON**

Anticipate use of engine and wing anti-icing systems when descending through visible moisture and icing conditions.

**Aircraft Performance . . . . . ANTICIPATE REDUCED PERFORMANCE**

When flying through icing conditions, expect degraded aircraft performance. Observe all operating limitations.

**Icing Conditions . . . . . AVOID**

Avoid holding in icing conditions. Coordinate actions with air traffic control.

**NOTE:** If holding in icing conditions is necessary, flaps must be up, highest practical airspeed must be used, and no prolonged use of the autopilot should be considered.

**Runway Conditions . . . . . EVALUATE**

Ensure that cleared runway width is adequate.

**PIREPs . . . . . OBTAINED**

Note any PIREPs concerning braking conditions.

**Approach . . . . . SLOWEST SPEED POSSIBLE**

Aim for a stabilized approach at the lowest speed using highest flap setting possible considering conditions. Aim for landing point on the touchdown zone. 10th stage bleed valves must be closed for take-off and landing when Cowl and/or Wing Anti-Ice is ON.

# CAE SimuFlite

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## Landing

### Landing Distance Factors . . . . . **COMPUTED**

Use AFM Unapproved Supplement 2 (“blue pages”), OPERATION ON CONTAMINATED RUNWAYS, to obtain required landing distance factors.

**NOTE:** Data extracted from the “blue pages” for takeoff and landing on contaminated runways are also located on the last three pages of the Flight Planning (performance) section of the Quick Reference Handbook (QRH-checklist).

### Touchdown . . . . . **POSITIVE TOUCHDOWN**

Make a positive touchdown on the main wheels to loosen frozen brakes and ensure optimum wheel side forces.

### Nose Wheel . . . . . **LOWER TO GROUND IMMEDIATELY**

Immediately lower the nose wheel to the runway and hold light forward column force to maintain directional control.

### Spoilers . . . . . **DEPLOYED**

### Thrust Reversers . . . . . **DEPLOYED MAXIMUM REVERSE THRUST**

Deploy the thrust reversers as soon as possible and use maximum reverse thrust. Minimize reverse thrust at low speed; however max reverse thrust may be used to a complete stop in an emergency.

### Brakes . . . . . **APPLIED**

Use normal braking pressure to reduce the possibility of a skid. Do not pump the brakes. Allow the anti-skid to modulate braking pressure while providing maximum braking effort. Problematic directional control on slick runways could be caused by excessive cycling of the anti-skid system necessitating the reduction of brake pressure.

During landing roll and subsequent taxi use the brakes to prevent progressive build up of ice on the wheels and brakes.



# **CAE SimuFlite**

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## **After Landing**

### **Taxi . . . . . USE NORMAL PROCEDURES**

Use normal taxi procedures when operating in extreme weather conditions.

### **Flaps . . . . . DO NOT RETRACT**

After landing on slush or snow covered runways, do not retract the flaps completely. Slush and snow thrown by the main wheels into the flaps may refreeze. Retracting the flaps may damage the structure and operating mechanisms. After stopping, have ground personnel examine the flap area for significant amounts of frozen slush and snow.

### **Cowl Anti-Icing . . . . . ON IN ICING CONDITIONS**

### **Engines . . . . . RUN UP**

During prolonged ground operations, periodically run the engines up to 70% N<sub>1</sub> to reduce the possibility of ice build-up.

### **Reverse Thrust . . . . . USE IF REQUIRED**

Anticipate parking the aircraft on ramps covered with snow and ice. If necessary to stop the aircraft, use reverse thrust.

## **Securing**

### **Wheel Chocks . . . . . IN PLACE**

### **Parking Brake . . . . . RELEASED**

After installing the chocks, release the parking brake to prevent brake freezing.

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

Install all aircraft protective covers.

## Expanded Normal Procedures

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**Water System . . . . . DRAINED**

Drain the water system to prevent freezing and damage to system components and supply lines.

**Lavatory and Waste System . . . . . DRAINED**

Drain the lavatory and waste system of all liquids.

**Galley . . . . . ALL LIQUIDS REMOVED**

**Battery . . . . . REMOVED**

In cold ambient temperatures, the battery should be removed to a warmer place. Reinstall the battery before the preflight inspection.

**Doors . . . . . ALL CLOSED**

**NOTE:** Following take-off or landing on water, snow or slush covered runway, tires should be inspected for flat spotting prior to the next flight.

## Mooring

**Aircraft . . . . . PARKED**

**Tiedown Adapters . . . . . INSTALLED**

Remove plastic plugs from the wing and fuselage. Install adapter plates with jacking pads. Remove plastic plugs from rear fuselage; install hoist rings.

**Tie-Down Cables . . . . . INSTALLED**

At each adapter plate and hoist ring, install two cables and secure them to the ground tie-downs.

**Covers . . . . . INSTALLED**

Install engine nacelle, windshield, and wheel covers.

### **Deicing Supplemental Information**

This section provides supplementary information on aircraft deicing, anti-icing/deicing fluids, deicing procedures, and aircraft operating procedures. Consult the Challenger Operating Manual (PSP 601A-6) Vol. 1 Supplementary Procedures Section 1, Maintenance Manual Chapter 12 – Servicing, and FAA Advisory Circulars for deicing procedures, 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).

**NOTE:** The Freezing Point of Type I fluid mixture used must be at least 10°C (18°F) below OAT when it is the only fluid used for deicing/anti-icing. Therefore, if conditions dictate continued anti-icing, it is imperative that Type II, III or Type IV fluids be used.

## Expanded Normal Procedures

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### Deicing Fluids

Two types of anti-icing/deicing fluids are in commercial use: SAE/ISO Types I and II/IV.

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

Type II/III/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. During takeoff, airflow reduces the viscosity and allows the fluid layer to flow off the aircraft surfaces.

Type III fluids are not approved for use on the Challenger.

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

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

- 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.

## **CAE SimuFlite**

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### **Deicing Procedures**

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

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

Deice the aircraft from top to bottom. Avoid flushing snow, ice, or frost onto treated areas. Apply from leading edges to trailing edge and from outer panels to inner panels. Deice in the following sequence:

- horizontal stabilizer
- vertical stabilizer
- top of fuselage
- sides of fuselage
- wings

**CAUTION:** Deicing and use of holdover times remains the responsibility of the pilot-in-command.

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

**HOLDOVER TIMES ARE FROM THE BEGINNING OF THE DEICING STEP.**



## Expanded Normal Procedures

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Deicing fluid SHOULD NOT be applied to:

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

**CAUTION:** Type II/III/IV 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.

During deicing observe the following.

- Avoid excessive use of deicing fluid to prevent flushing of slush into areas forward of control surfaces.
- When applying fluid, avoid pressures 300 PSI or greater.
- Exercise extreme caution when moving deicing equipment around aircraft. Maintain adequate separation between equipment and aircraft.
- A fine mist of deicing fluid applied two or three times provides better anti-icing protection than a single heavy application.
- Apply deicing fluid to lower surfaces if anticipating taxi and takeoff through snow.
- Follow all deicing fluid manufacturer's recommendations and procedures.

## CAE SimuFlite

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- Do not use diluted deicing fluid for anti-icing. Melting snow will further dilute the solution and refreezing can occur.
- After deicing the aircraft nose, wipe all remaining traces of fluid from area in front of windshield.

**NOTE:** Whenever frost or ice occurs on the lower surface of the wing indicating a cold soaked wing, the 50/50 dilutions of Type II or Type IV should not be used for the anti-icing step.

**NOTE:** If airplane skin temperature is colder than OAT, use a stronger mix of deicing fluid.

Deicing fluid sprayed into an operating engine can introduce smoke or vapors into the cabin and cockpit and pose a serious fire hazard.

**CAUTION:** If engines are running when spraying of deicing fluids is in progress, turn cabin and crew conditioning switches to OFF.

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.

**CAUTION:** Do not use deicing fluid for engines. After deicing engine, start engine(s) immediately to prevent any reicing condition. Select cowl anti-ice ON after engine start.

**CAUTION:** Deicing/anti-icing fluids have not been tested for ice pellet precipitation. When ice pellet precipitation occurs after the application of deicing/anti-icing fluid, the deicing/anti-icing fluid dilutes, which results in rapid wing contamination.



## **CAE SimuFlite**

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### **Taxi**

During taxi on ice or snow covered surfaces, observe the following.

- Maintain a greater than normal distance between aircraft.
- Do not use reverse thrust. If reverse thrust used, reinspect the aircraft for snow, ice, and frost accumulations.
- Taxi with the flaps up. Do not perform Taxi/Before Takeoff checklist until flaps are extended.
- Periodically conduct engine run-ups to as high a thrust setting as practical.
- Turn ENGINE and WING ANTI-ICE switches ON immediately after engine start.
- Conduct final pre-takeoff inspection five minutes before takeoff.

### **Pre-takeoff Inspection**

Within five minutes of takeoff, conduct an exterior aircraft inspection from within the aircraft to:

- note any loss of anti-icing fluid effectiveness
- examine visible aircraft surfaces for ice and snow accumulation

If uncertain of current aircraft condition, conduct an exterior “hands on” inspection of the wing leading edge, wing forward upper surface and wing rear upper surface.

## Expanded Normal Procedures

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### Takeoff

During takeoff observe the following.

- Do not use reduced thrust.
- Accomplish an engine run-up to highest practical thrust and observe stable engine operation before brake release.
- After setting takeoff throttle, verify that LP RPM and other engine indications are normal.

### Approach and Landing

During the descent approach observe the following.

- Anticipate use of engine and wing anti-icing.
- After the ground and flight spoilers are deployed and the nosewheel contacts the runway, use maximum reverse thrust as soon as possible.
- With the anti-skid system operational, apply normal braking smoothly and symmetrically to maintain direction control.
- Do not use asymmetric thrust on icy or slippery runways.
- Be prepared for possible downwind drift on icy or slippery runways with crosswind when using reverse thrust.
- Do not attempt to turn off runway at too high speeds.
- see additional text on pages 2B-113 and following.

# **CAE SimuFlite**

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