Docket No. SA-531

Exhibit No. 2-KK

NATIONAL TRANSPORTATION SAFETY BOARD

Washington, D.C.

Operations Group Chairman
Q400 AFM – 4.7.2 Ice Protection Procedures

(4 Pages)

3. AIRFRAME MANUAL SELECT selector – Rotate through wing and tail positions and observe WING, TAIL and engine air intake advisory lights illuminate as selected.

PROPELLER

1. PROP selector – TEST. Check PROPS advisory lights illuminate individually and go out in sequence through one cycle, and the normal operating (green arc) on the OIL temperature indication on ED changes to 65 to 107 °C.

NOTE

In the event that the PROP selector is released early from the TEST position, wait 30 seconds before repeating test.

2. PROP selector – OFF. Check the normal operating (green arc) on the OIL temperature indication on ED changes to 0 to 107 °C.

ENGINE INTAKE DOORS

1. ENGINE INTAKE door switches – Press. Check CLOSED advisory lights go out and after 35 to 40 seconds OPEN/HTR advisory lights illuminate.
2. ENGINE INTAKE door switches – Press. Check CLOSED advisory lights illuminate.

NOTE

The HTR advisory light may not illuminate if SAT is greater than 15 °C.

WINDSHIELD HEAT

1. WINDSHIELD HEAT selector – NORM. Check WSHLD CTRL caution light out.

NOTE

It will require a period of 5 minutes in NORM to confirm correct windshield heat operation.

STALL PROTECTION SYSTEM

1. REF SPEEDS switch – INCR. Check [INCR REF SPEED] appears on ED.
2. REF SPEEDS switch – OFF. Check [INCR REF SPEED] disappears on ED.

4.7.2 ICE PROTECTION PROCEDURES

4.7.2.1 TAKE-OFF IN OR INTO ICING CONDITIONS

PRE TAKE-OFF CHECKS

1. ENGINE INTAKE door switches – Press. Check OPN/HTR advisory lights illuminate.
2. WINDSHIELD HEAT:
   a. WINDSHIELD HEAT selector – NORM.
3. DEICE PRESS indicator – Check 18 ±3 psi on each dial.
4. PROP selector – ON. Observe PROPS advisory lights illuminate individually and go out in sequence, and the normal operating (green arc) on the OIL temperature indication on ED changes to 65 to 107 °C.

AFTER TAKE-OFF

At 400 ft AGL; commencement of third segment:

1. Airspeed – Increase to Final Take-off Climb Speed (Figure 5–2–7) + 20 kt.
2. FLAPS lever – 0° at flap retraction initiation speed (Figure 5–6–11) flap 5° and 10° or (Figure 5–6–12) flap 15°.
3. REF SPEEDS switch – INCR. Check [INCR REF SPEED] appears on ED.

CAUTION

If airspeed is not increased before REF SPEEDS switch is selected to INCR, stall warning may occur.

4. For performance penalty, see Table 5–13–1.

At 400 ft AGL; continued second segment:

1. Airspeed – Increase to V_2 (Figure 5–2–2) flap 5° + 20 kt.
   – Increase to V_2 (Figure 5–2–4) flap 10° + 20 kt.
   – Increase to V_2 (Figure 5–2–6) flap 15° + 20 kt.
2. REF SPEEDS switch – INCR. Check [INCR REF SPEED] appears on ED.

CAUTION

If airspeed is not increased before REF SPEEDS switch is selected to INCR, stall warning may occur.

3. For performance penalty, see Table 5–13–1.
4. On initial detection of ice: AIRFRAME MODE SELECT selector – FAST.

At commencement of third segment:

5. Airspeed – Increase to Final Take-off Climb Speed (Figure 5–2–7) + 20 kt.
6. FLAPS lever – 0° at flap retraction initiation speed (Figure 5–6–11) flap 5° and 10° + 20 kt or (Figure 5–6–12) flap 15° + 20 kt.
7. See paragraph 4.7.2.3.

4.7.2.2 IN-FLIGHT – BEFORE ENTERING ICING CONDITIONS OR WHEN ICE IS DETECTED OR WHEN FLASHING "ICE DETECTED" ADVISORY APPEARS ON ED

1. ENGINE INTAKE door switches – Press. Check OPN/HTR advisory lights illuminate.
2. PROP selector – ON. Observe PROPS advisory lights illuminate individually and go out in sequence, and the normal operating (green arc) on the OIL temperature indication on ED changes to 65 to 107 °C.

NOTE

The effectiveness of the propeller deicing system can be improved and propeller vibration reduced by operation of the propellers at 1,020 rpm.

3. REF SPEEDS switch – INCR. Check [INCR REF SPEED] appears on ED.
4. WINDSHIELD HEAT:
   a. WINDSHIELD HEAT selector – NORM.

If ice forms on the forward edge of pilot's side window:

1. PLT SIDE WDO/HT switch – ON.
2. DEICE PRESS indicator – Check 18 ±3 psi on each dial.

NOTE

1. To ensure deice pressure is maintained at 15 psi or greater during descent, holding and approach, it may be necessary to increase N_L by advancing the POWER levers.
2. For performance penalty, see Table 5–13–2.

4.7.2.3 CLIMB, CRUISE AND DESCENT IN ICING CONDITIONS

On initial detection of ice:

1. Minimum airspeed:
   a. Climb – Final Take–off Climb Speed (Figure 5–2–7) + 20 kts.
   b. Descend – 1.23 V_{SR} (Figure 5–1–2) flap 0° + 25 kts.
2. AIRFRAME MODE SELECT selector – FAST or SLOW, depending on the rate of ice accumulation. Check WING and TAIL advisory lights illuminate sequentially in pairs.

NOTE

Monitor ice accumulation between boot cycles to confirm that the selected AIRFRAME MODE rate (FAST or SLOW) is appropriate. When using the wing inspection lights, the inboard boot area only, visible from the cockpit, is sufficiently illuminated for assessing ice accumulation.

CAUTION

An accumulation of ice on the airplane may change the stall characteristics, stall speed, or warning margin provided by the stall warning system.

3. Monitor WING and TAIL advisory lights for normal operation.

When clear of icing conditions and all ice is removed from the visible leading edges:

4. AIRFRAME MODE SELECT selector – OFF.

When the aircraft is aerodynamically clean:

NOTE

The aircraft can be considered aerodynamically clean when all ice is removed from the visible leading edges and wing tips.

5. REF SPEEDS switch – OFF. Check [INCR REF SPEED] disappears on ED.
6. Minimum airspeed 1.23 V_{SR} (Figure 5–1–2) flap 0° or Approach and V_{REF} (Figures 5–8–1 through 5–8–3) flap 5°, 10° and 15°.

4.7.2.4 HOLDING, APPROACH AND LANDING IN ICING CONDITIONS

NOTE

When holding in icing conditions flap must be at 0°.

On initial detection of ice:

1. Airspeed:
   - Minimum holding, 190 kt.
   - Approach Speed 1.23 V_{SR} (Figure 5–1–2) flap 0° + 25 kt.
   - Approach Speed (Figure 5–8–1) flap 5° + 20 kt.
   - Go-around Speed (Figure 5–8–1) flap 5° + 20 kt.
   - Approach Speed (Figure 5–8–2) flap 10° + 20 kt.
   - Go-around Speed (Figure 5–8–2) flap 10° + 20 kt.
   - Approach Speed (Figure 5–8–3) flap 15° + 20 kt.
   - Go-around Speed (Figure 5–8–3) flap 15° + 20 kt.
   - Landing V_{REF} (Figure 5–8–1) flap 10° + 20 kt.
   - Landing V_{REF} (Figure 5–8–2) flap 15° + 20 kt.
   - Landing V_{REF} (Figure 5–8–3) flap 35° + 15 kt.
2. AIRFRAME MODE SELECT selector – FAST. Check WING and TAIL advisory lights illuminate sequentially in pairs.
3. For performance penalty, see Table 5–13–2.
   For performance penalty for landing with abnormal flap (0° or 5°), see Table 5–11–1.

4.7.2.5 HOLDING, APPROACH AND LANDING AFTER FLIGHT IN ICING CONDITIONS

1. Minimum Airspeed – see Para. 4.7.2.4.
2. Continue to cycle boots on FAST until all ice is removed from visible leading edges.

When all ice is removed from visible leading edges:

3. AIRFRAME MODE SELECT selector – OFF.

NOTE

The aircraft can be considered aerodynamically clean when all ice is removed from the visible leading edges and wing tips.

When the aircraft is aerodynamically clean:

4. REF SPEEDS switch – OFF. Check [INCR REF SPEED] disappears on ED.
5. Minimum airspeed 1.23 V_{SR} (Figure 5–1–2) flap 0° or Approach and V_{REF} (Figures 5–8–1 through 5–8–3) flap 5°, 10° and 15°.