



## GROUND DEICE/ANTI-ICE OPERATIONS

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

Ground icing may occur whenever there is high humidity with temperatures of +10°C or colder. Type I deice, and Type II or Type IV anti-ice fluids may be used sequentially to ensure compliance with FAA regulations (clean wing concept) requiring critical component airframe deicing and anti-icing.

### NOTE

It is recommended that flight crews refamiliarize themselves seasonally with the following publications for expanded deice and anti-ice procedures:

- Cessna Maintenance Manual Chapter 12.
- FAA Advisory Circular AC 120-58 (large aircraft), dated September 30, 1992 or later.
- FAA Advisory Circular AC 135-17 (small aircraft), dated December 14, 1994 or later.
- Cessna Citation Service Letter 560XL-30-01, dated November 02, 1999 or latest revision.

### DEICING/ANTI-ICING PROCEDURES (TYPE I, TYPE II, AND TYPE IV FLUIDS)

**ONE STEP DEICING** - Type I fluid is used to remove ice, slush and snow from the airplane prior to departure, and to provide minimal anti-icing protection as provided in the Type I holdover timetable (refer to applicable service letter).

**TWO STEP DEICE/ANTI-ICE** - May be used to ensure the airplane remains clean after deicing. Type II or Type IV fluid is used to provide longer term anti-icing protection as provided in the Type II or Type IV holdover timetable (refer to applicable service letter).

### CAUTION

**TYPE I, TYPE II, AND TYPE IV FLUIDS ARE NOT COMPATIBLE AND MAY NOT BE MIXED. ADDITIONALLY, MOST MANUFACTURERS PROHIBIT MIXING OF BRANDS WITHIN A TYPE.**

Line personnel should be supervised by the PIC or SIC to ensure proper application of deice or anti-ice, fluids. Refer to Figures 7-9 and 7-10.

### NOTE

The first area to be deiced/anti-iced should be easily visible from the cabin/cockpit and should be used to provide a conservative estimate for unseen areas of the airplane before initiating takeoff roll.

Holdover timetables are only estimates and vary depending on many factors to include temperature, precipitation type, wind and airplane skin temperature. Holdover times are based on mixture ratio. Times start when the last application begins.

## SECTION VII - ADVISORY INFORMATION

### DEICING/ANTI-ICING PROCEDURES (TYPE I, TYPE II, AND TYPE IV FLUIDS) (Continued)

Guidelines for holdover times anticipated by SAE Type I, Type II, or Type IV, and ISO Type I, Type II, or TYPE IV fluid mixtures are a function of weather conditions and outside air temperature (OAT).

#### CAUTION

- AIRPLANE OPERATORS ARE SOLELY RESPONSIBLE FOR ENSURING HOLDOVER TIMETABLES CONTAIN CURRENT DATA.
- TABLES ARE FOR USE IN DEPARTURE PLANNING ONLY AND THEY SHOULD BE USED IN CONJUNCTION WITH PRETAKEOFF CONTAMINATION CHECK PROCEDURES.

#### NOTE

- Tables do not apply to other than SAE or ISO Type I, Type II or Type IV FPD fluids.
- The responsibility for the application of this data remains with the user.
- The freezing point of Type I, Type II, and Type IV fluid mixture must be at least 10°C (18°F) below the current OAT.

#### SPRAYING TECHNIQUE - TYPE I FLUID

Type I fluid should be sprayed on the airplane (with engines off) in a manner which minimizes heat loss to the air. If possible, fluid should be sprayed in a solid cone pattern of large coarse droplets at a temperature of 160° to 180°F. The fluid should be sprayed as close as possible to the airplane surfaces, but not closer than 10 feet if a high pressure nozzle is used. Refer to Figures 7-9 and 7-10 for essential areas to be deiced and anti-iced.

#### SPRAYING TECHNIQUE - TYPE II FLUID

Application techniques for Type II fluid are the same as for Type I, except that since the airplane is already clean, the application should last only long enough to properly coat the airplane surfaces. Refer to Figure 7-9 and 7-10 for essential areas to be deiced/anti-iced.

Type II, fluid should be applied cold to a "clean" airplane. It is, however, sometimes heated and sprayed as a deicing fluid. For this case, it should be considered a Type I fluid, as the heat may change the characteristics of the thickening agents in the fluid. Type II fluid, therefore, applied in this manner, will not be as effective as if it were applied cold.

## DEICING/ANTI-ICING PROCEDURES (TYPE I, TYPE II, AND TYPE IV FLUIDS) (Continued)

### SPRAYING TECHNIQUE - TYPE IV FLUID

Application techniques for Type IV fluid are the same as for Type I, except that since the airplane is already clean, the application should last only long enough to properly coat the airplane surfaces. Refer to Figure 7-9 and 7-10 for essential areas to be deiced/anti-iced.

Type IV, fluid should be applied cold to a "clean" airplane. It is, however, sometimes heated and sprayed as a deicing fluid. For this case, it should be considered a Type I fluid, as the heat may change the characteristics of the thickening agents in the fluid. Type IV fluid, therefore, applied in this manner, will not be as effective as if it were applied cold.

#### **NOTE**

- Holdover time starts when last application has begun.
- Some Type IV fluids could form a thick or high-strength gell during "dry-out" and when rehydrated form a slippery film.
- Some Type IV fluids exhibit poor aerodynamic elimination (flow-off) qualities at colder temperatures.
- Heated areas of aircraft (i.e.; heated leading edge) should be avoided due to the fact that fluid may "dry-out" into hard globular nodules.
- Type IV fluid should not be used undiluted below -24°C (-11 °F).

### PRETAKEOFF CONTAMINATION CHECK - GROUND ICING CONDITIONS

When ground icing conditions are present, a pretakeoff contamination check should be conducted by the PIC/SIC within 5 minutes prior to takeoff, preferably just prior to taxiing onto the active runway. Critical areas of the airplane such as empennage, wing, windshield and control surfaces should be checked to ensure they are free of ice, slush and snow or that the deice/anti-ice fluids are still protecting the airplane. Refer to Figure 7-9 and 7-10 for essential areas to be deiced/anti-iced.

# SHADED AREAS INDICATE ESSENTIAL AREAS TO BE DEICED

## NOTE

AVOID DIRECT SPRAYING OF DEICING FLUID ON/IN THE FOLLOWING AREAS:

ENGINE INLETS  
ENGINE EXHAUST  
RAM AIR INLETS

BRAKES  
WINDSHIELD  
CABIN WINDOWS

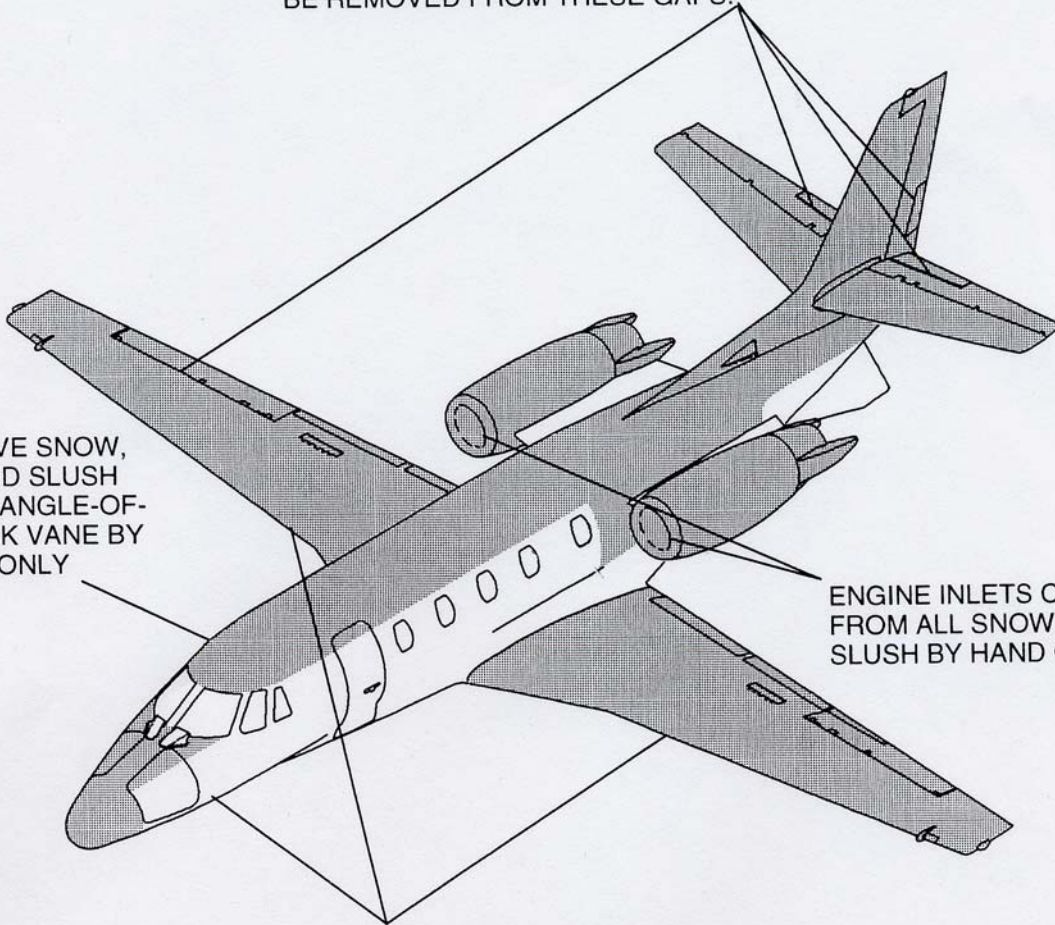
PITOT HEADS  
STATIC PORTS  
AOA VANES

PAY SPECIAL ATTENTION TO THE GAPS BETWEEN THE FLIGHT CONTROLS. ALL SNOW, ICE AND SLUSH MUST BE REMOVED FROM THESE GAPS.

REMOVE SNOW, ICE AND SLUSH FROM ANGLE-OF-ATTACK VANE BY HAND ONLY

ENGINE INLETS CLEARED FROM ALL SNOW, ICE AND SLUSH BY HAND ONLY

LANDING GEAR DOORS AND WHEEL WELLS MUST BE FREE OF SNOW, ICE AND SLUSH



# SHADED AREAS INDICATE ESSENTIAL AREAS TO BE ANTI-ICED

## NOTE

AVOID DIRECT SPRAYING OF ANTI-ICING FLUID ON/IN THE FOLLOWING AREAS:

ENGINE INLETS  
ENGINE EXHAUST  
RAM AIR INLETS

BRAKES  
WINDSHIELD  
CABIN WINDOWS

PITOT HEADS  
STATIC PORTS  
AOA VANES

