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### **8.2ground operating instructions**

The company has adequate and sufficient ground support for the operations it carries out.

The Handling operators that it hires to carry out its operations are informed that they have at their disposal the sections of the "Operations Manual" that contain the procedures that they must comply with to provide their services (in Spanish and English), by accessing :

**[https://www.clipperjet.es/suppliers -safety/](https://www.clipperjet.es/suppliers-safety/)**

The sections of the MO are:

- Section 8.2 of the MOA.
- Section 9 of the MOA.
- Section 7 of the MOB of each fleet.

With the sending via email of the signed acceptance of the service , the handling company ensures that all personnel who attend the Company's aircraft have the necessary information and training to comply with our procedures.

On the other hand, through the Company's website, they can access the Security Policy and the procedure established for the notification of events.

Whenever there is any disagreement about the service received from the contracted Handling, the Commander sends a report to the ROV, so that it communicates it to the ROT (Responsible for its contracting) so that it can take the appropriate measures.



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### 8.2.1 Fuel management procedures

**TO.** The Management of each airport, the fuel suppliers, as well as the operators, have their responsibilities regarding the measures that must be adapted during the loading/unloading of fuel. At this point the CLIPPER NATIONAL AIR standards for this operation are collected.

The States or the Airport Authority may demand additional requirements, in which case, the Stopover Headquarters will establish the appropriate measures for compliance, informing the Commander, in what affects him.

When the aircraft is assigned and delivered for a service, the loading/unloading operations, even when carried out by personnel from outside the Company, will remain under the responsibility of the Commander.

You must:

- Check the type of refueling tank and type of fuel.
- Monitor refueling
- Signature and proof of refueling file.

The approved fuels to be used in each aircraft appear in its AFM, Section II – Operating Limitations – Fuel Limitations for the C-510 (Page 2-14) and C-S550 (Page 2-9), and Fuel Limits for the C -525C (Page 2-110-7).

The fuel normally used by the Company is JET A1.

**b.** Special loading and unloading.

The Company has established a special fuel loading/unloading that meets the conditions established in CAT.OP.MPA.200.

to. The Company guarantees that a risk analysis of the operation has been carried out,


Their procedures have been developed (Refer to 8.2.1.b of this section), and

A training program has been established for our personnel involved in the operation (MOD 2.1.22).

b. The special loading or unloading of fuel/energy used by the Company includes:

- The loading/unloading of fuel/energy during the embarkation, disembarkation or stay on board of passengers.

c. The procedures to carry out this special loading/unloading of fuel, or its modifications, must be previously approved by the Agency.

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### 8.2.1.a SAFETY MEASURES DURING THE SUPPLY AND UNLOADING OF FUEL

- 1) A portable fire extinguishing equipment must be available, at least, for the initial intervention in case of ignition of the fuel. The fire extinguishers that tank vehicles are normally equipped with are considered sufficient to meet this requirement.
- 2) All loading/unloading operations will be carried out outside, never inside the hangars.
- 3) Extreme precautions will be taken when there is a storm during loading/unloading operations, and will be interrupted when lightning strikes near the airport.
- 4) Loading/unloading will be avoided when any part of the landing gear is abnormally overheated; charging/discharging will be interrupted or postponed until abnormal excess heat has been dissipated.
- 5) Special care must be taken to avoid possible spills, and the engines will not start until the spilled fuel has not been made to disappear.
- 6) The electrical and/or electronic systems, except the radar, can be operated as long as they are necessary during pre-flight operations.
- 7) No fuel will be loaded/unloaded or said operation will be interrupted when there is an aircraft with engines running in the immediate vicinity of the area.
- 8) Batteries shall not be installed, connected, or removed on the aircraft. Neither should the generators for charging batteries be put into operation or disconnected.
- 9) Electric power generators will not be connected.
- 10) Do not use power tools, drills or similar equipment that can produce sparks; Neither will electronic or electric flashes be used to take photographs in the vicinity of the refueling equipment, and in particular, the filler holes or air vents of the aircraft.
- 11) The use of lighters or matches is strictly prohibited for the personnel participating in the loading/unloading operations.
- 12) The presence of open flames or devices capable of producing them is strictly prohibited in places located less than fifteen meters from where any refueling operation is taking place. The category of such flames and devices capable of producing them include, among others:
  - i) Cigarettes and lighted pipes.
  - ii) Flame heaters.
  - iii) Torches.
  - iv) Torches.
- 13) Aircraft refueling operations are prohibited while its engines are running.



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14) Prevention of electrostatic discharge. During fuel loading/unloading operations, with possible electrical potential differences, there is a risk of discharge spark production. Electrostatic charges that can accumulate on the surface of the aircraft or tanker vehicle or both, and create hazardous conditions. To avoid this, the cisterns, the metal parts of the pipes **and** the plane must be connected to each other, as well as the tanks and the plane with the ground.

15) Among the safety measures during refueling, guidelines and precautions to be taken with respect to:

- Approach of the fuel supply vehicle and its positioning:
  - C-S550, C-525 and C510 is positioned by the nose
- Establishment of the refueling safety area:
  - It is delimited by the cones
- Earth cable connection sequence:
  - It is carried out by the tanker operator.
  - Whenever the hose is in contact with the aircraft, the ground deviation must be on.
- Existence of fire extinguishers.
- The Commander is responsible for supervising the fuel supply, paying special attention to verifying the specific amount to refuel.
- Ground cable disconnection sequence.
- Exit of the refueling vehicle

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**8.2.1.b REFUELING AND UNLOADING FUEL WHEN PASSENGERS ARE BOARDING, ON BOARD OR DISEMBARKING.**


The Company contemplates the case of refueling or unloading fuel with the passenger installed on board, due to the interest in reducing the duration of transit time on land or for passenger comfort.

The procedure contemplates the following conditions:

- to. The entire procedure must be carried out with the engines stopped.
- b. Ground service activities and work inside the aircraft, such as catering or cleaning, can be carried out as long as they do not create a hazard and allow emergency evacuation through the aisle and emergency exits.
- c. The aircraft ladder will remain deployed and unobstructed.

States, with few exceptions, allow passengers to remain on board the aircraft while fuel is being loaded/unloaded and may establish additional specific rules to those listed below, which must be complied with.

- (1) At least one of the two pilots will remain inside the aircraft and in the event of a fire, apply the procedures to put it out and initiate and direct the evacuation if necessary.
- (2) Two-way communication must be established and remain available between the ground personnel performing refueling and the pilot on board the aircraft;
- (3) passengers, staff, and crew must be warned that the refueling/unloading will take place;
- (4) "fasten seat belt" signs must be turned off;
- (5) "No Smoking" signs must be lit, along with interior lighting to allow identification of the emergency exit.
- (6) passengers must be told to unfasten seat belts and refrain from smoking;
- (7) if fuel vapor is detected inside the aircraft or if any other hazard arises, refueling/unloading must be stopped immediately;
- (8) The ground area around and below emergency exits must be clear of obstacles,
- (9) The flight commander and the personnel carrying out the loading/unloading will plan the measures to carry out a quick and safe evacuation if necessary.
- (10) Passengers with reduced capacity during loading/unloading. As long as there are no legal impediments and sufficient personnel are available to ensure their evacuation, the commander in agreement with handling may authorize their stay on board, even when the rest of the passengers are disembarked.

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(11) In case of carrying out a flight with a patient on a stretcher, the CM1 will ask the doctors to prepare the patient for a possible evacuation.

**8.2.1.c PRECAUTIONS TO BE TAKEN INTO ACCOUNT TO AVOID THE MIXING OF FUELS.**

The crew must:

- Coordinate with the supplier the specific type of fuel required.
- Verify the type of fuel supplied on the delivery note.
- Verify the proof of refueling before signing.
- The responsibility for these precautionary measures lies with the pilot who is supervising the refueling and records it by signing the delivery note.



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### 8.2.2 Aircraft, passenger and cargo safety operational procedures

The Company will hire the corresponding handling agent at each airport who will be in charge of identifying hold baggage and will ensure that it has passed security control before being loaded onto the plane.

Passengers or part thereof may not be admitted on board, or remain on transit scales, if there is not at least one technical crew member on board who must:

- Have an electrical supply on the plane
- Have the means to initiate an evacuation
- Know your responsibilities on board as specified in your Operations Manual
- Know at all times the position of service and cargo vehicles at or near the exits

The following operational procedures will be followed 1. Approach and positioning of equipment

- When approaching and leaving the aircraft, they will circulate at the speed of a person walking (8 km/h).
- In low visibility conditions, the driver of the vehicle or equipment will be guided by another person who guides him until his approach to the aircraft using standard visual signals.
- Unattended vehicles and ramp equipment located near the aircraft shall be with their engines off, in neutral and with the parking brake engaged.

#### 2. Placement of chocks.

They will be placed by a member of the crew or handling before disembarking the passengers and whenever the aircraft has completely stopped its engines.


In the ladders, two chocks will be placed on the nose wheel, one in front and one behind, and depending on the inclination of the parking lot, another on a wheel of the main landing gear, to prevent the aircraft from moving.

They will always be placed so that they touch the wheels, first on the front axle and then on the main one, three in total.

On base or in adverse weather conditions, two chocks will be placed on each wheel, one in front and one behind, to increase the immobility of the aircraft. Six in all.

The chocks can only be removed with the authorization of the Commander.

**FAILURE TO FOLLOW THIS PROCEDURE MAY CAUSE THE AIRCRAFT TO ROLL UNCONTROLLEDLY CREATING RISKS TO THE ASSISTANCE PERSONNEL AND THIRD PARTIES**

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### 3. Placement of cones.

Once the motors have stopped and the chocks have been placed, the dimensioning cones will be placed. These cones serve the purpose of delimiting the circulation areas around the parked aircraft and will be removed once the aircraft is ready to start up.

A cone will be placed towards the nose, to the right of the exit gate, and another one near the left wingtip, to facilitate entry and exit of the passage.

### 4.FOD

The handling personnel, under the supervision of the Commander, will ensure that the runway surface is clean of objects that could cause damage to the aircraft or its engines before departure.

Before arrival, Tower Control assigns parking and the Handling staff must notify you if the runway is not in a clean condition to receive the aircraft.

### 5. Accident prevention.

- The vehicles necessary for operations will not approach the aircraft until authorization has been received from the person in charge of handling.
- The doors will not be opened or closed until authorization is received from the Commander
- The handling contracted by the Company will have a coordinator who will be responsible for the operation of ground assistance. The Company has previously sent a copy of the procedures to be used in the ground handling operation of its aircraft.



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**8.2.2.a. SPECIAL PASSENGERS INCLUDING CHILDREN/BABIES, SICK PASSENGERS AND PERSONS WITH REDUCED MOBILITY**

**a.1. Minors**

For transport purposes, a person who has not reached TWELVE years of age on the date of the flight and who is more than seven days old is considered a minor.

**INFANT (BABY):** Minor than on the date of the flight has not met the **TWO** year old. Travels **without occupying a seat** accompanied by a person over 18 years of age.

**CHILD:** Minor who, having reached the age of two, has not turned TWELVE on the date of the flight. He travels occupying a seat.

**a.1.1. Aircraft oxygen masks and flotation devices on board**

- 1) The C-550 has two additional masks, the C-510 with one and the C-525C with three, they are used to supply oxygen to the baby (infant), which the adult carries and are installed on the roof of the cabin.
- 2) Life jackets on board. Whenever you have to fly over water, the provision of vests on board must contain the necessary number of vests suitable for the children who are going to fly.

**a.1.2. Seat occupation by minors**

**a.1.2.1. Babies (infant)**

Babies do not occupy a place. The adult in charge of the baby during the flight, whenever the use of a seat belt is mandatory, after tying it up, will hold the baby with his arms on his knees.

The baby is not allowed to be fastened by the same belt as the person accompanying him.

In the C-550 two babies can be transported and in the C-510 only one and in the C-525C three.


**a.1.2.2 Seat occupation by two children (SOD)**

The occupation of a seat by more than one person is not allowed, unless one of them is an adult and the other a baby.

In order to comply with the regulations that regulate the distribution of oxygen in the case of cabin decompression, the grouping of an adult and a baby is authorized only in a row of seats in which an additional mask is available.

**a.1.3. unaccompanied minors**

The Company does not accept this type of transport

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**a.2. People with Reduced Mobility or Passengers with Reduced Capacity** It's all fleeting:

- That, due to their special physical or mental conditions, they need more individual attention than the normal one provided to another passenger, during the trip, during a possible emergency evacuation and/or on land. These special psychophysical conditions are noticed due to requests or statements made by passengers and/or their families or by a medical authority or because they have been observed and notified by the personnel of the Airline Companies or associated persons of the Industry (Agents, etc. .)

**Note:** Among the passengers cited above are those who have serious difficulties in receiving or understanding emergency instructions.

- That he could suffer a worsening in his state of health, due to the realization of an air trip.

Passengers with reduced capacity, due to their mobility, can be classified as:

- Ambulatory: Able to get on, off or move inside the plane without help or with little help from any other person, such as the deaf, blind or mentally handicapped.
- Non-ambulatory: Not able to get on, off or move inside the plane without help.

**a.2.1. valid companion**

This is the name given to the person over 18 years of age, in full use of their faculties, who goes with the passenger with reduced capacity, in order to provide them with the help they may require during the trip.

They will be informed of the security procedures, the position of the emergency exits and the path to be followed in case of evacuation, information that will be provided to them on board.


The companions of ambulatory passengers, even blind, may be under 18 years of age.

A guide dog is considered a valid companion for a blind or deaf person traveling alone.

**a.2.2. Companies specialized in assistance and transport of sick and injured (EATEH)**

They are the ones that carry out the transport in CLIPPER NATIONAL AIR planes with their own professional staff with their medical support teams on board. CLIPPER NATIONAL AIR will establish cooperation agreements with these companies.

- The personnel of these companies will have an accreditation of their identity and faculties to transport the sick/injured on CLIPPER planes.

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- NATIONAL AIR, which must show the crew, this accreditation being sufficient for the transport of said passengers. (INCAD will not be required).
- The Company's competent services will have taken the necessary measures to provide the aircraft with the devices and mechanisms that may be necessary for this type of transport, without any loss of passenger and aircraft safety.

As an annex to the CLIPPER NATIONAL AIR contract with these companies, a catalog of each and every one of the auxiliary medical equipment that the company plans to use in its normal activity is included. It will expressly state the authorization of CLIPPER NATIONAL AIR to said equipment before its use or transport in the cabin or hold. This procedure must be passed by the new equipment that may be necessary in the future. The devices will have a label that will include your name, its period of validity and authorization from CLIPPER NATIONAL AIR.

#### **a.2.3. Authorization for transport**

When medical authorization is required to travel, it can only be granted by doctors authorized by the Company if the limitations on the maximum number of passengers, other security regulations and the required formalities are fulfilled.

Authorization from the Medical Service is the only valid means of admitting on board a passenger who requires medical authorization to travel.

The ROT will include the name of the passenger, the flight number, date and route as well as the complementary means (stretcher, oxygen, etc.) and type of companion if necessary.

Previously, the passenger or a representative will have completed the documents and requirements demanded by the Medical Service, which in view of these issues or not the authorization.

#### **a.2.4. Medical Oxygen (Therapeutic)**

The transport of medical oxygen requires the authorization of the Medical Service. Only oxygen cylinders supplied by CLIPPER NATIONAL AIR will be accepted. The passenger's own bottles will not be allowed on board for use in the cabin.

The stretchers have their own certified oxygen service and will be the only ones allowed on board the Company's aircraft.

#### **a.2.5. Acceptance**

These rules and instructions will apply to carriage on CLIPPER NATIONAL AIR flights exclusively. If an itinerary also includes journeys on other airlines, the conditions of acceptance may differ, especially with regard to provision of equipment and/or extra charges. The requirements for acceptance to the flight will vary according to the status of the passenger. (See point A.2.7).



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**a.2.6. passenger classes**

Passengers with reduced capacity are divided, for the purposes of aeronautical communications, into different classes. These classes are indicated in the messages of the airlines by means of the AIRIMP code with keys such as:

MEDA: Medical Case, those that require authorization. STCR:

Passenger: Passenger on a stretcher.

WCHR: Wheelchair – R, for ramp. The passenger can ascend/descend by stairs and getting to/from your seat to the passenger cabin, but you need a wheelchair for long distances to/from the plane; that is, to move by ramp, telescopic walkways or planters.

WCHS: Wheelchair –S, by steps. The passenger cannot ascend or descend steps, but can move to/from your seat in the passenger cabin; requires a wheelchair to get to/from the plane or planters and must be taken up or down steps.

WCHC: Wheelchair –C, up to cabin seat. The passenger cannot move around itself; requires a wheelchair to get to/from the plane/planter and must be taken up and down steps to/from his or her seat in the passenger cabin.

BLND: Blind passenger. It can be accompanied by a guide dog.

DEAF: Deaf passenger. It can be accompanied by a guide dog.



Cat.	Description (1)	Code airimp	Authori- zation medical	Lim. max by type avo	Lim. No. Without Accomp.	Accompany - nante required do	Assign Asien. Wait- cials	Lim. Clusters
A-6	Deaf, dumb or deaf-mute passengers.	DEAF	NO	NO	NO	BUT (4)	NO	NO
A-7	blind passengers	BLND	NO	YEAH	YEAH	BUT (4)	NO	NO
A-8	Mentally handicapped, who have difficulties understanding and following instructions during a possible evacuation of emergency.	-	NO	NO	NO	BUT (4)	NO	NO

- (1) Special circumstances may determine your classification in a category other than the one that initially corresponded to you. In case of doubt, the authorized Physicians will be consulted, who will decide in which category the passenger must be included and what requirements must be met.
- (2) The trip will not be recommended according to IATA regulations, of healthy or premature newborns, less than seven days.

#### a.2.7.2. Medical Cases: Passengers who require special attention, both on land and on board

Cat.	Description (1)	incad (2)	Authori- zation medical (2)	Lim. max By type Avo.	Lim. Num. Without Accomp.	Accom- pañante Required (3)	Assign Asien. Wait- cials	Lim. groups
B-1	Passengers requiring oxygen supply	YEAH	YEAH	YEAH	-	YEAH	NO	YEAH
B-2	Passengers who cannot travel seated and need to do so on a stretcher.	YEAH	YEAH	YEAH	-	YEAH	YEAH	YEAH
B-3	premature children. The incubator will be necessarily of type autonomous.	YEAH	YEAH	YEAH	-	YEAH	NO	YEAH
B-4	disabled passengers psychics incapable of understand the instructions and follow them.	YEAH	YEAH	YEAH	-	YEAH	BUT	YEAH
B-5	Passengers not included in other groups, with NON-contagious diseases, acute or chronic, medical or surgical, which due to its characteristics in the time of the flight can be admitted on board in the opinion of the authorized doctors, because it is not foreseeable that the transport could be a cause of aggravation or death.	YEAH	YEAH	YEAH	-	YEAH	BUT	YEAH

- (1) In case of doubt, the authorized physicians will be consulted, who will decide in which category the passenger must be included and what requirements must be met.
- (2) The type of companion will be the one prescribed by the authorized physicians.



**a.2.7.3. Cases that cannot be accepted on the flight**

They are those people who, due to their physical or mental state, can cause discomfort to the rest of the passengers, or are in such a serious state that they can cause a complication or death.

In general they will not be accepted on the flight. In case of doubt, it will be the authorized doctors who will decide whether or not to accept the flight and the requirements demanded. The following cases are distinguished.

CAT	DESCRIPTION
C-1	Persons whose bad odors, severe disfigurement, or other unpleasant characteristics are so infrequent that they may cause restlessness or disturbance to other passengers.
C-2	People with contagious diseases.
C-3	People whose behavior may be dangerous to other passengers.  <b>Note:</b> If deemed necessary, the intervention of the Authorities will be required, in order to endorse the action of CLIPPER NATIONAL AIR before any subsequent claim.
C-4	People in such a serious state that the trip could cause a complication or death.
C-5	Any passenger with reduced capacity in categories A and B who does not meet the requirements set forth therein and can be detected by the staff in charge of boarding, public relations or billing at the airport itself, or by the crew upon boarding.
C-6	People under the obvious influence of alcohol, drugs or narcotics.

**Note:**In the event that the aforementioned persons insist on traveling and/or there is any doubt regarding their acceptability, the authorized physicians must decide on the acceptance and the requirements applicable to them.

aircraft type	total maximum number
all fleets	2



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**a.2.8.2. Maximum number of individual passengers**

**Traveling WITHOUT a companion**

Passengers in categories A-3/A-4/A-6/A-7 and A-8 may travel unaccompanied in numbers that do not exceed those indicated in the following table:

aircraft type	Maximum number
all fleets	1

**Companions required**

When the number of category A passengers indicated in the previous point is exceeded, the existence of companions will be necessary according to the following:

- (a) For passengers in categories A-3/A-4/A-8, a companion will be necessary for each passenger.

The Company, or if necessary the Commander, may require, for reasons of the passenger's weight or other circumstances, that there be two accompanying persons, in order to allow an easier evacuation.


- (b) For passengers in categories A-6 and A-7 (deaf or blind), one person for every two passengers.

The guide dog is considered a valid companion of a blind or deaf person.

For all categories B, a companion will always be necessary for each passenger.

**Passengers on a stretcher**

The number of stretcher passengers on board is limited to TWO for the CESSNA 550 and ONE for the CESSNA 510.

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### **a.2.9. Criteria for assigning seats to passengers in seats**

In the seats with access to the emergency door, a passenger must be seated who can help in the possible evacuation and they must never be seated:

- (a) Passengers with a physical or mental disability that prevents them from moving quickly.
- (b) Passengers with vision or hearing problems that prevent them from quickly assimilating written or verbal instructions.
- (c) Passengers who, due to their age or illness, cannot move quickly.
- (d) Passengers who, due to their obesity, have difficulty moving or going through the door.
- (e) Children, regardless of whether they are accompanied.
- (f) Passengers deported, not admitted at destination or in custody.
- (g) Passengers with animals.

### **a.2.10. Seat assignment for stretcher passengers**

The seats to be occupied by the stretcher and those affected by it will be blocked.

The seats blocked and not occupied by the stretcher will be assigned to the companions of the passenger on the stretcher.

### **a.2.11. passenger handling**


In all cases in which passengers have to be transported on a stretcher/wheelchair, as well as in cases in which passengers with reduced capacity cannot board/disembark without assistance, the necessary help will be provided by the hired handling staff. . Boarding will not be considered completed until the passenger is accommodated by said personnel in the seat previously assigned, they will collaborate in locating the seat and in the best installation on board the passenger.

In cases where the seat allocation is obviously not correct, the Commander may alter it.

In the case of passengers with reduced capacity who can board/disembark without help, the crew will accommodate them on board in the previously assigned seats.

#### **a.2.11.1. Actions to take at airports**

Handling will take care of everything related to the transport of passengers with reduced capacity, from the moment they have been accepted until they leave the destination airport.

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## origin scale

### Ground Operations:

It will verify that all the requirements, limitations (maximum number accepted) and formalities have been processed and fulfilled.

It will verify that the passenger can travel in accordance with the previously agreed conditions.

It will verify that the passengers/passenger groups with reduced capacity are accompanied by the notified person or persons and carry the specified equipment/medications. Otherwise, it will not authorize the transport.

If any requirement is not met, the possibility of meeting it at the time or until the departure of the flight will be analyzed. When the time frame or circumstances do not make it possible, the passenger cannot be accepted on the flight.

It will assign/block the necessary seats. It will inform the Commander (Load Sheet or other form). The appropriate information will be passed to the Cabin. The passenger/passengers with reduced capacity will be boarded in advance of the remaining passengers. It will send the appropriate message to the affected scale or scales.

Whenever possible, in the case of a passenger traveling with their own folding wheelchair, they may remain in it, already duly labeled, until they reach the plane and there it will be stowed in the hold.

Guide dogs specially trained as guides for the blind or deaf, will be accepted for transportation when they accompany their owners at no additional charge.

Physicians belonging to a company specializing in the transport of patients, if they travel alone to meet said patient, or on the return flight once their mission is over, may transport bulky and delicate medical equipment in the cabin, with the exception of the oxygen.

### transit scale

Handling will have the appropriate personnel and equipment ready to carry out the landing if necessary.


If the passenger needs or wishes to remain on board during a transit stopover, given the difficulty of moving on their own, the Commander may authorize it, as long as they allow it:

- The safety regulations given by the Company.
- The provisions of the local authorities on this matter.
- The rules on fuel loading with passengers on board.
- Other circumstances.

### a.2.11.2. Deviation in the flight itinerary

#### Transit or destination layover

If during the flight the aircraft suffers any deviation from the planned itinerary, the intermediate stopover or destination, where the aircraft should have landed, will IMMEDIATELY send the appropriate message to the alternative airport.

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In case of diversion or interruption of the service, the Company will provide the necessary assistance for this type of passenger, but will not be obliged to assume maintenance and lodging expenses that derive from their disabled condition and that exceed those of the remaining passengers.

**Crew**

In the case of a flight diverted to an alternative airport in which CLIPPER NATIONAL AIR has signed an assistance agreement for said airport, the Commander May, according to the content of the aforementioned agreement, go to the Assistant Company and request from it as many aids as possible. type of health or assistance is required, such as physicians, ambulance services, hospitalization, etc.


Regarding unforeseen and unpaid charges, therefore, at source, that may occur, the standards established by our Company will be taken into account.

**a.2.11.3. Destination airport**

The destination scale will be notified, by means of a message, of the arrival of the passenger with reduced capacity and will have planned the necessary services in advance.

These passengers will be disembarked last.

The unloading operations will be carried out by the personnel in charge for that purpose, using the same means and equipment already described for the loading operations. Once the passenger has disembarked, they will be accompanied to the arrival hall or customs, helping them to collect their luggage and in the subsequent search for a means of transport.

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**a.2.12. Special or specifically chartered flights for the transport of injured or victims of catastrophic events**

In these cases there are no limitations, and the specific instructions received in these circumstances must be followed.

**a.2.13. Rules of action on board- Normal Operation**

Passengers with reduced capacity will be specially cared for by the crew as soon as it is compatible with their flight tasks.

**location on board**

It is important that the canes (rigid or telescopic) and crutches used by passengers with reduced capacity, are stowed in a suitable place. It has been shown that the use of these elements during emergency evacuation has hindered the exit of users, instead of speeding it up. On the other hand, there is the possibility that the accidental fall of these elements in a corridor could completely obstruct or block it.

**Instructions before takeoff**

In general, passengers with reduced capacity do not present problems in this regard. The instructions and demonstrations are also valid for these passengers; Those who, due to their characteristics, require it, will be instructed individually, taking into account their particular circumstances.

The crew will be in charge of giving the companions of groups of passengers with reduced capacity, the following instructions:

It will indicate the location of the nearest emergency exit. He will point out the location of the rafts and life jackets. He will give each companion a brochure of "Safety Instructions".

He will ask the companions to study them and ask for any additional information they need.


The forms will be collected and kept in their place, in order to avoid their loss.

**a.2.14 Emergency operation**

**Evacuation**

- (a) Individual passengers with reduced capacity.

In the event of an emergency, the evacuation of passengers with reduced capacity will be carried out in the safest and most expeditious manner possible, without this implying a delay or slower evacuation of the remaining passengers.

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**a.2.15. Passengers affected by incidents/accidents on land**

If, once the flight is accepted, any passenger suffers illness, accident, injury, injury or aggravation of their illness, for the initiation of transportation or its continuation, the following action will be taken.

**a.2.15.1. The passenger seems fit for the flight and wants to start the flight**


Handling will consult with the airport Medical Service and they will submit the case to the Commander for consideration.

**a.2.15.2. The passenger does not appear fit to travel**

Handling will consult with the airport Medical Service and they will submit the case to the Commander for consideration.

**a.2.15.3. Injuries or accidents produced on board**

In the event that a passenger who had accepted transportation on a passenger/sick/ disabled basis worsens while on board the aircraft in flight, the Captain may decide to land at the nearest suitable airport based on the severity of the event.

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### **a.3 TRANSPORT OF PASSENGERS NOT ADMITTED AT DESTINATION, DEPORTED AND PERSONS IN CUSTODY**

These passengers are mainly included in the following groups:

- not admitted
- deported
- Convicted, Prisoners and Subject to Extradition The rules to follow with these travelers are detailed below, taking into account that they are **always subject to those of the country that orders the departure of the passenger.**

#### **a.3.1 Passenger Not Admitted (inadmissible Passenger, INAD)**

In accordance with IATA Resolution 701, they are passengers of a nationality other than that of the arrival airport, who are not admitted by the competent Authority. The usual reasons for non-admission are:

- Defects in ticket documentation
- Decision of the Immigration Authorities that consider the passenger unacceptable.

If any of the Company's passengers is not accepted at the destination, they will return to the departure airport on the same plane.

This non-admission will be communicated to the Commander.


#### **a.3.2 Deportees (Deportees, DEPO)**

According to IATA Resolution 701, it is a person who has been legally admitted to a country by its authorities or who has entered the country illegally, and who is subsequently formally ordered by said authorities to leave the country.

#### **a.3.3 Limitations on transport**

Given the characteristics of the aircraft used by the Company, unless ordered by the competent Authority, passengers who have been deported, convicted, imprisoned and/or subject to extradition will not be admitted on board due to the potential danger they pose.



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### 8.2.2.b SIZE AND WEIGHT ALLOWED FOR HAND BAGGAGE


- **Classification and definition.**

The dimensions of the package will not exceed 50x40x20 cm in such a way that no package whose dimensions length + width + height exceed 110 cm and a weight of 6 kilograms.

In no case will the location of the luggage in the cabin hinder access to the emergency exits or the crew members' vision of the passengers.

- Limitation by number of pieces, weight and size of these. Passengers can transport a package with the measurements described above, a handbag and warm clothes
- Hand luggage that exceeds the accepted measurements: the handling staff will initially be responsible for checking the measurements of the hand luggage. Subsequently, the crew will check again that there is no package on board that exceeds the measurements described above.
- Packages that exceed these measurements or weights will be shipped in the warehouse.
- As planes do not have pressurized cargo holds, pets (dogs and cats) must be transported in the passenger cabin in the company of their owners. They must be over 3 months old, have a veterinary passport, identification system and if they weigh more than 8 Kg they must be moved inside a cage.

Some type of small pet that meets the above requirements and is harmless may be acceptable.

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### 8.2.2.c LOADING AND FIXING ITEMS ON THE AIRCRAFT

The cargo compartments of the Company's aircraft are not accessible to the crew during the flight, they are not pressurized and they do not have any warning system to the cabin (except the C-525, which has a smoke detector with warning to the cabin).


#### c.1. Passenger cabin.

To ensure that hand luggage and packages are correctly placed, the following measures must be taken into account:

- Each element transported in the cabin must be placed only in a place that is capable of retaining it;
- Luggage will not be placed under the seats.
- No items should be placed in toilets or next to bulkheads.
- Baggage and packages shall not be placed where they may impede access to the emergency team; and
- Before takeoff and landing, the Copilot will make sure that the baggage is placed where it does not prevent an evacuation or could cause injury (due to a fall or other movement).

#### c.2. Cellars.

- Care should be taken with the doors during loading and unloading operations.
- Precautions must be taken when handling bulky or heavy merchandise inside the warehouse to avoid damaging the floor.
- When liquids are spilled in the warehouses, it will be reported immediately to avoid damage to the floor or electrical wiring.
- Any package labeled as dangerous goods will be immediately removed.
- Proceed with caution when a package in poor condition is detected. These packages will not be transported, as they are a possible source of damage.
- The runway surface shall be free of objects that may cause damage to the aircraft or its engines.
- Before the departure of the aircraft, a visual inspection will be carried out to ensure that all service and hold doors, as well as all panels, are closed, brocaded and free of FOD.

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**8.2.2.d. GROUND CREW POSITION**

The mobile teams that normally approach the aircraft are:

- passenger van
- Butler Van
- Handling Van
- GPUs
- waste bin and
- Push Back

The responsibility for its handling falls on the handling that attends the plane

Ground mobile equipment, operated only by Company personnel or appropriately trained handling agents, will not approach the aircraft until all engines have stopped (anti-collision lights off) and chocks are on, or there is authorization from the Commander. The speed of these teams will always be reduced. In the event that an engine should remain operating, the mobile team will approach the aircraft from the side that has the engine stopped. In any case, the flight crew and the ground staff will previously agree on the action to follow.

A distance must always be left between the ground equipment and the aircraft to avoid possible damage caused by displacement of any surface of the aircraft, during the loading/unloading/refueling process, etc.

The ground crew should not invade the areas dedicated to aircraft taxiing and passenger boarding/disembarkation.



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### 8.2.2.e OPERATION OF THE AIRCRAFT DOORS

The opening and closing of the passenger cabin door will be carried out after the authorization of the Commander.

Both the passenger door and the hold door cannot be opened until the engines are stopped and the chocks are on, and these same conditions must be met, with the hold door, before starting the engines.

The passenger door may remain open, with the right engine running, to allow conditioning of the cabin. It will close, once the passage is on board, before starting the left engine.

They are operated by the crew from the inside. In an emergency they can be opened from the outside.

The doors of all Company aircraft are operated in the same way: **To open:** Turn the lever clockwise and push out

**To close:** Close the door and turn the lever counterclockwise.


Tanker vehicles shall be positioned so that:

- i) Do not obstruct the access to the aircraft for rescue and/or firefighting vehicles.
- ii) Keep your exit clear in case you need to get away quickly in an emergency. Loading/unloading will be interrupted when any vehicle obstructs the rapid evacuation routes of the tanker vehicles.
- iii) Do not obstruct the evacuation of the aircraft in case of fire on board.
- iv) The engines of said vehicles are not below the planes of the plane.

The vehicles used for the different operations other than the loading/unloading of fuel, will comply with the provisions of the previous point. They will be located so that they do not impede the operation of firefighting vehicles, nor the exit of the tanks.

The gas exhausts of all the vehicles that have to operate in the loading/unloading area must be carefully maintained to eliminate causes that could produce sparks or flames that could ignite the fuel or its vapors.

The ground and/or on-board auxiliary power units (APU) will be connected and started before the start of the supply and will not be stopped or disconnected until the loading/unloading has been completed.

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### **8.2.2.f SAFETY ON THE RAMP, INCLUDING FIRE PREVENTION, AND JET AND SUCTION ZONES**

All the personnel who carry out their work on the ramp must wear a reflective vest and take extreme care with the mobile equipment that moves along it.

When the ground crew goes to or leaves the plane, it must not be driven at a speed greater than the speed of a person's walk.

Before moving ground equipment, an inspection will be carried out around the plane and it will be verified that it is free of FOD.

When locating equipment, special care will be taken to ensure adequate clearance from vehicles, aircraft, or other equipment.

When vision in critical areas is limited, one person will guide the operation.

Standard hand signals will be used to guide the ground crew.

The guide will be positioned in such a way that he can accurately judge the available space, is visible and is able to communicate signals at all times to the operator of the vehicle. This will stop immediately if you lose visual contact with the guide.

The powered team must check brakes before entering a restricted area and again before reaching the side of the aircraft.

Vehicles with rubber protection bumpers will not compress them against the aircraft fuselage, to prevent damage to the aircraft.

All equipment, except that necessary for the start, will be behind the restriction line before starting the pushback of the aircraft.

In an open departure area, the team will be positioned in such a way that there is sufficient space for the movement of the aircraft.

#### **f.1. FIRE PREVENTION IN COMBUSTION RISK AREAS AND IN REFUELING AREAS.**

Fire prevention is more important than fire fighting. The following considerations will be taken into account to prevent and protect yourself from fire:

- The accumulation of garbage will not be allowed, unless it is in containers appropriate.
- Any suspicion or knowledge of the existence of the fire will be reported immediately.
- Any failure in electrical wiring will be reported immediately.
- Smoking is not permitted on the ramps or in any vehicle located on the ramps.
  
- The location of fire-fighting equipment, fire alarms, emergency switches, etc. They must be known by the staff.
- Access to fire fighting equipment, fire alarms, emergency switches, etc. it will not be clogged.
- If a fire is observed in a parked aircraft, the people inside will be notified immediately and they will be evacuated.



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- While the fire is under control, if there is any question as to the safety of personnel, any fire extinguisher from a ground crew or available fire extinguishers on the aircraft may be used.
- If possible, the aircraft doors should be closed.
- If the fire breaks out in any aircraft support ground equipment, it will be fought using the fire extinguishers on the ramp or those of the ground equipment itself. As soon as possible, the ground crew will be removed from the vicinity of the aircraft.
- No ground equipment will operate in the vicinity of a fuel spill.
- The personnel must know the kinds of equipment available for fire fighting, and will be trained in its use.

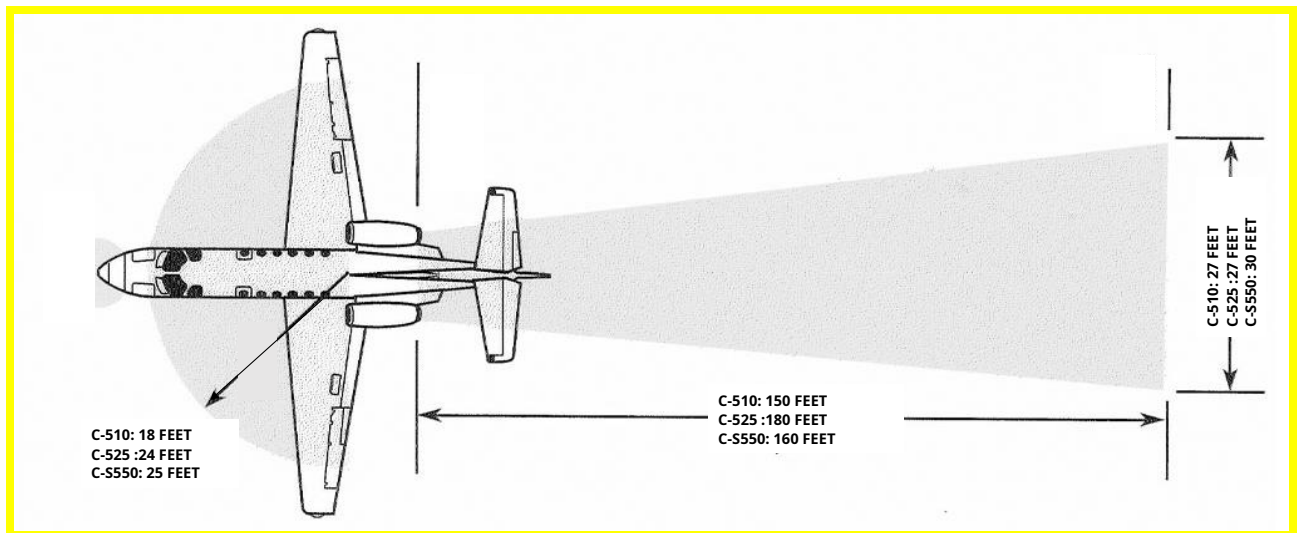
**f.2. PRECAUTIONS IN THE JET AND SUCTION AREAS**


On the ramp with the engines running, precautions will be taken by ground personnel in the area of influence of the reactors. The following safety distances will be maintained:

C-510: OM Figure 1-4 (Page 1-4) C-525C: OM

Figure 1-5 (Page 1-6) C-S550: AMM Figure

501 (Page 71-01-02)



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**8.2.2.g. PROCEDURES FOR START-UP, LEAVING THE RAMP AND ARRIVAL, INCLUDING BACKUP AND TOWING OPERATIONS**

The auxiliary power unit or ground group will be used as a ground power source before commissioning.

If said units are out of service, the aircraft engines will be started with battery as established in Section 3 of the AFM and in the QRH (Starting with battery).

**g.1. Start up.**

Starting the engines can be dangerous for ground personnel and objects close to the aircraft.

The commander will take into consideration the departure time, the slot and other related factors, to start the commissioning.

Before launch, the Commander will ensure that the aircraft's clamps are on board and that the launch area is clear.

**g.2. Ramp exit procedure.**

Before starting filming, it will be necessary to have the corresponding authorization from the Control Tower and, in addition, the ground personnel must give the zone free and clear.

The Commander will notify Handling that it is ready to start up, with a brake signal set and Beacon On.

Handling personnel remove the brakes and once the plane has started, the GPU team. Check the clear zone and give the signal that the aircraft is ready to taxi.

When taxiing begins, the captain must judge the situation around the aircraft, especially near other aircraft and objects, using an appropriate taxiing speed and a power that does not cause excessive noise; particularly when starting filming from the parking lot.


The commander is responsible for ensuring that the aircraft does not come into contact with any object while performing engine-powered maneuvers.

The "aircraft free" signal must be given by the ground staff before taxiing begins.

The taxi lights will be activated once the "aircraft clear" signal is obtained, before releasing the brakes and starting taxiing.

It is very important that all flight crew members pay attention to taxiing, especially when conditions are adverse, for example: low visibility, unknown airport, etc. The reading of the checklists will not start, or will continue while there are conditions that require special attention.

When there is doubt about the position at the airport, the aircraft will be stopped immediately and ATC or runway control will be informed.

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Signs on the surface must be strictly followed. Stop lights must not be passed.

The taxi lines vary from one place to another and do not always ensure that they are free of obstacles. They will be used with caution as a guide for positioning the aircraft.

The commander, when guided by signs posted on the ramps, is responsible for the maneuvering of the aircraft.

**Back-out procedures by external means and towing** When it is necessary

to do Push Back, proceed as follows:

- 1) The personnel serving the tow, with the aircraft braked or with the main gear wheel chocks on to prevent the aircraft from rolling back, insert the equipment ramp under the nose wheel and secure it with a retainer.
- 2) Notify the Commander "shigs off and remove brakes"
- 3) Moves the aircraft to the departure point, stops it and advises it to put on the brakes before removing the nose wheel ramp and taking the trailer away.

**Authority for the taxiing of the plane**

CLIPPER NATIONAL AIR aircraft will taxi through the movement zone of an aerodrome always managed by members of the flight crew, unless the person at the controls:

- 1) has been duly authorized by CLIPPER NATIONAL AIR or an agent designated by it and is competent to:
  - i) taxi the plane
  - ii) use the radiotelephone and
- 2) has been instructed in the general layout of the aerodrome, taxiways, signs, markings, lights, air traffic control instructions, phraseology and procedures, and can follow the rules of practice for the safe movement of airplanes over the airfield; aerodrome.

**g.3. Arrival procedures.**


With the aircraft braked, the engines and the beacon turned off, the Commander makes a chock signal. The Handling staff places them and makes the signal for the Commander to release the brakes and order the doors to open.

The number of wedges and their placement appear in point 8.2.2 of this section.

**g.4. parked plane**

When an aircraft is parked, the main gear wheels will have chocks in place.



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#### 8.2.2.h. AIRCRAFT MINOR MAINTENANCE

The Commander must request the Handling that attends him, the services he needs, such as:

- Defrost / Antifreeze
- Maintenance Care
- Fuel
- Catering
- Oxygen
- Cleaning etc.

These services will be supervised by a member of the crew and invoiced by the handling, within the framework contract that it has with the Company and that contemplates this possibility.

#### 8.2.2.i DOCUMENTS AND FORMS FOR THE HANDLING OF THE AIRCRAFT

##### Generalities

The reports, forms, and in general, all the documentation, will be written with a pen (with very clear handwriting, preferably in capital letters) and, when required, will be signed.

Unless otherwise specified, the date will be the day to which the start time belongs, and the GMT time


Each stage of a series of flights is considered as an individual flight.

The following documents and forms are required for conducting ground operations:

- **load sheet.** It is provided by CLEARWAY flight dispatch, its data must match those of the PVO and it must be approved by the Pilot in command.
- The cargo and passenger information is included in the "GenDec" that is sent to the handling and included in the operation and to the flight dispatcher who uses their data to prepare the cargo sheet that is sent to the crew, along with all the documentation of the flight.

The number of passengers, their mass and/or the weight of the cargo indicated in the «GenDec», must coincide with the data indicated in the load sheet.

- **Information to the crew.** In the "Pilots info" there is all the data of the service that they are going to carry out, jumps and scheduled times, passengers, special loads if any, hotels, fuel, etc.
- **fuel sheet,** is carried out by the person responsible for the supply. The Commander with his signature on the delivery note records his verification. The Commander will keep the receipt that he will include in the flight envelope.

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- **Medical assistance report.** It is signed by the doctor responsible for patient care on medicalized flights.
- **security lists** Once the passengers and cargo have been disembarked, the corresponding personnel will complete the lists described in the security procedures.

#### **8.2.2.j. SPECIAL CARGO AND CLASSIFICATION OF CARGO COMPARTMENTS.**

The information on the transfer of special cargo is received by the Commander through the "Flight Info" and the data from the "GenDec" that he receives with the flight documentation.

##### **special loads**

##### **PERISHABLE merchandise**

All merchandise that must be transported without delay is perishable because, otherwise, it loses its usefulness, and therefore its value, because it has to be delivered within a certain period, or because it could deteriorate due to changes in temperature and humidity and of the passage of time

Examples of perishable goods are:

- Groceries such as: meat, fish, fruits and vegetables, flowers,...

##### **human remains**

The Company will agree to transport human remains (HUM) provided that the following restrictions are met:

1. With the exception of cremated human remains, they must be contained in an inner lead or zinc coffin hermetically sealed inside a wooden coffin.  
The wooden coffin must be protected by an outer canvas packaging so that its contents are not obvious.
2. The cremated remains must be contained in funeral urns protected against breakage with the appropriate packaging.
3. They must be handled with respect and kept covered during loading/unloading.
4. They will not be transported in the same warehouse as any perishable merchandise.
5. The commander will be informed through his flight "info" and Gen Dec, of the presence of human remains, their weight and their exact location in the aircraft.



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Human remains will not be accepted unless proper documentation is attached to the coffin or coffin.

**Compatibility between perishable goods and human remains**

The following table shows the various perishable goods or human remains that can be loaded together in the hold, and those that cannot.

Type	MEAT	SEAFOOD	FRUIT & VEGETABLES	FLOWERS	HUM
MEAT	✓	✓	✓	✓	✗
SEA FOOD	✓	✓	✓	✓	✗
FRUIT & VEGETABLES	✓	✓	✓	✗	✗
FLOWERS	✓	✓	✗	✓	✗
HUM	✗	✗	✗	✗	✓

**Non-perishable merchandise**

It is non-perishable, all merchandise that does not run the risk of losing its usefulness or value in case of being transported late.

**Aircraft spare parts, company material and mail(Non-dangerous goods)**

CO-MAIL = Company mail


CO-MAT = Company Material

Company mail and material means internal shipments of mail and material, such as documents, inventory, maintenance parts, cleaning supplies, or other items, that must be delivered to the company itself or to the company contracted to perform a particular service. (eg: cleaning company).

Both internal mail and Company material transported on company aircraft will be subject to security controls before being shipped.

The Company must ensure that any co-mail or co-mat shipment made on its behalf by a contracted company is examined before it is loaded on the aircraft.

All requests for the transportation of aircraft spare parts must come from the Company's maintenance department. The carriage of CO-Mail and spare parts is permitted on aircraft, subject to space and weight restrictions.

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The Gen Dec will be completed, which includes the relevant information and will be sent to the Handling contracted at the departure airport.

You must provide a description of the part, its dimensions and weight, as well as a non-dangerous goods declaration.

Maintenance will ensure that the parts have been brought to the aircraft, that they have been properly protected and that a “part” tag has been attached.

**Post mail**

The Company accepts and transports commercial mail or packages

**Wheelchair**

Given the size of the cellar and the door, only folding wheelchairs can be transported.

**Live Animals (AVIS)**

Animals can go in the passenger cabin as long as they do not disturb the rest of the passenger

In any case, they must be insured and carry the corresponding documentation issued by the freight forwarder.

Animals (dogs and cats) must be transported in the company of their owners. They must be over 3 months old, have a veterinary passport and an identification system. Live animals will have to go in a cage and their maximum weight allowed is 8 kg. They will be considered wet merchandise and the floor of the cage will be covered with absorbent material. No more than 2 animals may be transported in the cabin.

**Refrigerators with organs for transplantation.**

These refrigerators must go in the passenger cabin as the cargo compartments are not pressurized. The surgical team will be transported in them. They are specially chartered flights



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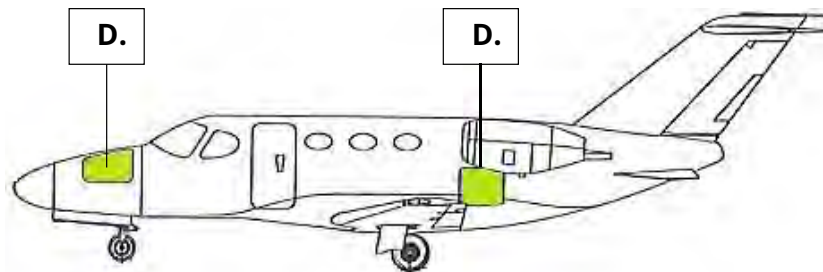
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**j.1. Classification of cargo compartments**

Cargo compartments are classified according to their accessibility during the flight, the possibility of being isolated in terms of ventilation and the type of fire extinguishing system that may originate inside..

**CESSNA 510**

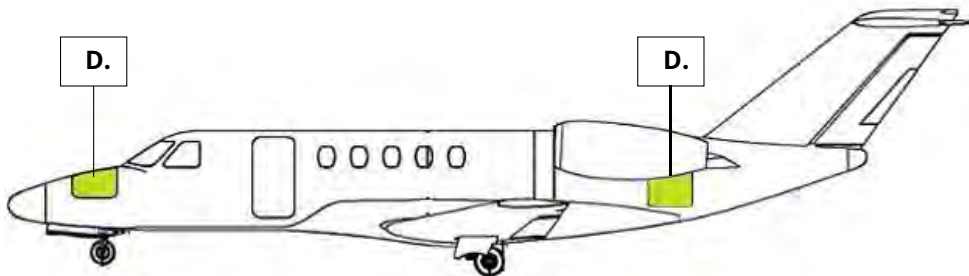
It has two Class "D" cargo or luggage compartments, they are not accessible from the cockpit, they are not pressurized or ventilated, nor do they have fire warnings.



The load data in weight, volume and soil resistance are listed in OM Chapter 1.

**CESSNA 525-C**

It has two Class "D" cargo or baggage compartments, they are not accessible from the cockpit, they are not pressurized or ventilated, and it has fire warnings.



The load data in weight, volume and resistance of the soil appear in Section VI of the AFM, pages 6-110-20 and are as follows:

NOSE: It has a capacity for 400 pounds, in an area of 15 cubic feet. TAIL CONE: has a capacity for 600 pounds, in an area of 50 cubic feet.



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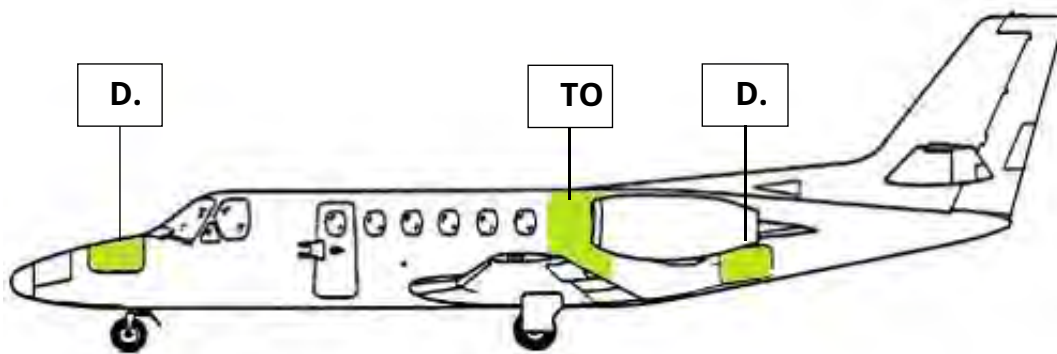
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**CESSNA S550**

It has three cargo or luggage compartments, two of Class "D", are not accessible from the cockpit, are not pressurized or ventilated, nor do they have fire warnings, and one is Class "A" in which the presence of fire it could be discovered by any member of the crew from his post and has easy accessibility to any part of it in flight.



As stated in the WB Manual 1-60-00 page 1, it has three load compartments with a resistance of 120 pounds per square foot.

The first NOSE has a capacity for 330 pounds in an area of 15.40 cubic feet

The second AFTER CABIN has a capacity of 600 pounds in an area of 36 cubic feet.


The third TAIL CONE has a 500 pound capacity in a 25 cubic foot area.

Due to the dimensions of the cargo hold, only folding chairs can be transported.

**8.2.2.k. MULTIPLE OCCUPANCY OF PLANE SEATS.**

Multiple occupancy of aircraft seats by both passengers and crew is prohibited.

Multiple occupancy of seats is only allowed when one of the occupants is an adult and the other is a baby.

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**8.2.3 Denied boarding procedures**

The company will not allow any person to enter under the influence of alcohol or drugs, in such a way that it may affect the safety of the aircraft or its occupants.

Before starting the flight, the Commander is empowered to prevent the boarding of passengers who are under the influence of alcohol, drugs, etc., and those who could be dangerous or annoying to the rest of the passenger. The Commander may seek advice from airport health personnel before making such a decision.

These points will not be applicable to patients undergoing medical attention and who have their release document and/or the corresponding medical company.



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### **8.2.4 Elimination and prevention of ice on land.**

The applicable procedures will be those established in the AFM and/or OM of each type of aircraft for Special Operations and Cold Weather Operations.

Considerations to take into account when evaluating aircraft icing:

- 1) It is necessary to have a clear idea of the adverse effects of the roughness on the external surface of the aircraft on its performances.
- 2) It is not advisable to request de-icing services without knowing the procedures and products used in them.
- 3) It is necessary to know the most critical areas of the aircraft in terms of icing, to be duly treated, in order to avoid possible deterioration in de-icing operations and to be duly examined in pre-flight inspections.
- 4) If deemed appropriate, there should be no hesitation in conducting additional pre-flight inspections.
- 5) There are several variables that affect the effectiveness of antifreeze liquids.
- 6) The effective time of antifreeze liquids cannot be determined with absolute accuracy, as there are many variables that influence such time.
- 7) The anti-icing treatment must be carried out as close as possible to the moment of takeoff.
- 8) The motors must not be started if there are fragments of ice on the surface that can be ingested.
- 9) Certain operations can produce recirculation of ice crystals, snow or a mixture of water and ice.
- 10) The operation of some equipment in the proximity of the aircraft can facilitate the accumulation of snow or ice in critical areas.
- 11) It is recommended to examine during the taxi the possible accumulation of ice in the profiles.
- 12) Immediately before starting takeoff, a final visual inspection must be made from the cockpit. Do not start takeoff if the cleanliness of the aircraft cannot be ensured.

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**Definitions:**

**Anti-ice:**the process of protecting aircraft from contamination due to existing or expected weather, usually by applying anti-icing fluids to uncontaminated surfaces of the aircraft.

**Conditions conducive to the formation of ice on the floor of aircraft:** freezing fog, freezing precipitation, frost, rain or high humidity (on cold-soaked wings), hail, ice pellets, snow or a mixture of rain and snow, etc.

**Pre-takeoff check:** The flight crew should continuously monitor the weather conditions after the de-icing / anti-icing treatment, to assess whether the maintenance time applied is still adequate. Within the HOT of the aircraft and prior to takeoff, the flight crew should check the aircraft wings or representative surfaces of the aircraft for frozen contaminants.

**Pollution:**Any type of frozen or semi-frozen moisture such as frost, snow, sleet, or ice.

**Contamination control:**a check of the aircraft for contamination. to determine the need to apply de-icing.

**Pollution control prior to takeoff:** a contamination control of the treated surfaces, carried out when the HOT has been exceeded or if there is any doubt regarding the continuation of the antifreeze treatment applied. It is normally done externally, just before the start of the takeoff roll.

**Thaw:**the process of removing frozen contamination from aircraft surfaces, typically by applying de-icing fluids.

**Defrost/Anti-frost:**Combination of de-icing and anti-icing procedures, carried out in one or two stages.

**Cold Soaked Surface Frost (CSSF):** Frost developed on cold-soaked aircraft surfaces by sublimation of moisture from the air. This effect can occur at ambient temperatures above 0 °C.

Cold soaked aircraft surfaces are more common on recently landed aircraft. The external surfaces of fuel tanks (for example, wing skins) are typical areas of CSSF formation (known in this case as Cold Soaked Fuel Frost (CSFF)), due to the very high thermal inertia of the fuel. cold that remains in the tanks after landing.



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**transparent ice:** a layer of ice, usually transparent and smooth, but with some air pockets. It forms on exposed objects, whose temperatures are at, below, or slightly above freezing, due to icing of drizzle, droplets, or supercooled raindrops. Transparent ice is very difficult to detect visually.

**Antifreeze liquid:** includes, but is not limited to, the following:

1. Normally Type II, III or IV fluid (neat or diluted), applied without heating (\*);
2. Mixture of Type I fluid and water heated to a minimum of 60°C in the nose.

(\*) When performing de-icing and anti-icing in a single process, Type II and Type IV fluids are typically applied diluted and heated.

3. Type II, III or IV liquid (neat or diluted). De-icing fluid is normally applied heated to ensure maximum efficiency and its freezing point should be at or below outside air temperature (OAT).

**Ground Ice Detection System (GIDS):** a system used during ground operations, to inform the personnel involved in the operation and/or the flight crew, about the presence of frost, ice, snow or sleet on the surfaces of the aircraft


**Liquid Water Equivalent System (LWE)**– An automated weather measurement system that determines the LWE precipitation rate in freezing or freezing precipitation conditions. The system provides the flight crew with continuously updated information on the protection capacity of fluids in different weather conditions.

**Lowest Operating Use Temperature (LOUT):** the lowest temperature at which a fluid has been tested and certified to be acceptable in accordance with the appropriate aerodynamic acceptance test, while maintaining a freezing point buffer of not less than:

1. 10°C for a Type I fluid; either
2. 7 °C for type II, III or IV fluids.

**Maximum effectiveness time (Hold Over Time):** the period of time during which an anti-icing fluid provides protection against frozen contamination to the treated surfaces of the aircraft. It depends, among other variables, on the type and intensity of the precipitation, OAT, wind, the particular fluid (or Fluid Type), the design of the aircraft, and the configuration of the aircraft during treatment.

**Post-treatment, de-icing or de-icing/anti-icing check:** an external check of the aircraft after treatment has been completed by qualified personnel and from suitably elevated vantage points (for example, from the de-icing/anti-icing equipment itself or other elevated equipment), to ensure that the aircraft is free of frost, ice, snow or mud.

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**ANTI-FROST CODES**

Upon completion of the anti-icing treatment, qualified personnel provide the anti-icing code to the flight crew as follows:

"the type of fluid / the name of the fluid (except for Type I) / concentration (except for Type I) / local time at the start of the antifreeze / date (optional) / the statement 'post de-icing / anti-icing check completed'" (if verification completed).

Example:

"TYPE II / MANUFACTURER, BRAND X / 75% / 1335 / 15FEB20 / POST-DEFROST / ANTI-FROST CHECK COMPLETED".

When a two-step defrost/anti-ice operation has been performed, the anti-freeze code must be determined by the second step fluid.



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**A) COMMERCIAL NAMES**

The most used in de-icing and anti-icing tasks, depending on the type of fluid are:

**Type I:**


- Hoechst: Safewing DG I and Safewing MP I.
- Kilfrost: DF.
- BASF: Aerex 102.

**Type II and III:**

- Hoechst: Safewing MP II.
- Kilfrost: ABC-3.
- UCAR: AAF ULTRA.

**Type IV:**

- Hoechst: Safewing MP IV.
- UCAR: AAF ULTRA PLUS.

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**B) CHARACTERISTICS**

**Type I Fluid.**

It has a high glycol content and a very low viscosity, since it does not contain thickeners, which means that its anti-icing capacity is very limited.

It is mainly used to remove ice, snow or slush from the surface of the aircraft before departure, by spraying it, alone or mixed with water, at a temperature between 70 and 80 degrees Celsius and at a distance of about three meters.

It does not alter the performance of the aircraft, and if the atmospheric conditions allow a Holdover that covers the time between the application of the fluid and the scheduled takeoff time, its use is the preferred option (See Annex II to the MOA).

**Fluid Type II, III and IV.**

They are normally used as anti-icing to ensure that the aircraft remains clean from de-icing until the scheduled take-off time.

The atmospheric conditions and the expected time between deicing and takeoff determine the type of fluid and its concentration (Refer to the Holdover tables in Annex II to the MOA).

They are cold sprayed onto the aircraft surface about three minutes after cleaning and are not compatible with each other, so they cannot be mixed.

Its high viscosity reduces the performance of the aircraft and requires its inspection and cleaning, normally every three applications.

If Type I Fluid is not available, it can be used to defrost following the same procedure.

When there is precipitation or icing conditions, or risk of them occurring in the takeoff phase, airplane surfaces must be treated with anti-ice in accordance with GM2.CAT.OP.MPA 250 (b)(3).

The de-icing and anti-icing procedure can be carried out in a single step or in two, depending on the weather conditions, the availability of equipment on the ground, the types of fluids available and the protection time required according to the Holdover tables.

The one-step procedure means that de-icing and anti-icing are performed at the same time, using a mixture of de-icing/anti-icing fluid with water heated to a minimum of 60°C.



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Mixture concentration (Fluid/Water) % vol	lower temperature limit for application (OAT)
50/50	-3°C
75/25	-14°C
100/0	-25°C

The two-step procedure separates the two functions, first the defrost is performed using hot water alone or mixed with fluid, as in the previous case, and then, finishing the defrost, a mixture of anti-freeze fluid with or without water is sprayed on the aircraft surfaces.

This second step must be carried out within a period not exceeding 3 minutes, before the liquid from the first step can freeze.

The fluid used for anti-icing will depend on the time required to protect the aircraft and the existing weather conditions (Holdover Tables).

All restrictions published by the fluid and aircraft manufacturer must be followed to avoid the formation of residues.



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**C. EFFECTS ON AIRCRAFT PERFORMANCE**

The Pilot in Command shall not commence takeoff unless the external surfaces are clean of any deposits that may adversely affect the performance and/or control of the aircraft.

**TAKEOFF PERFORMANCE – TYPE II, TYPE III, AND TYPE IV FLUIDS**

Established in Section VII of the AFM of each aircraft:

**MODEL C-S550**

*Takeoff performance is degraded when Type II, Type III, or Type IV anti-ice fluid i are the airplane.*

*The fluid that remains on the airplane during takeoff causes the elevator forces at rotation to be increased and the takeoff distance to be increased.*

*It is recommended takeoffs use the Flaps TO (7th) position and takeoff field length be increased as follows when Type II, Type III, or Type IV anti-ice fluid has been applied to the airplane.*

*Determine the normal Flaps TO (7°) takeoff field length and apply adjustments to speed and field length required by runway gradients or runway contamination. Multiply the resulting takeoff field length by the appropriate factor from the following table to determine the takeoff field length when Type II, Type III, or Type IV anti-ice fluid i are the airplane.*

<b>FLAPS TO TAKEOFF FIELD LENGTH</b>	<b>FACTOR</b>
<i>Dry Runway</i>	<b>1.15</b>
<i>Wet Runway</i>	<b>1.15</b>
<i>Contaminated Runway</i>	<b>1.15</b>

**CAUTION**

- *Anticipate heavier as normal elevator force at rotation. Even with the increased pull force, the airplane may rotate slower than normal. The elevator forces will return to normal shortly after liftoff.*

*The 1.15 correction factor is approximate. Actual conditions may require distances greater than those determined.*





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**MODEL C-510**

*Takeoff and climb performance is degraded when Types II, III, and IV fluids are on the airplane. The fluid that remains on the airplane after takeoff causes the elevator forces at rotation to be increased, takeoff distance to be increased, and climb performance to be decreased.*

*The following procedures are recommended when departing with anti-ice fluid on the airplane.*

1. Use Flaps UP.
2. Anticipate a heavier as normal elevator force at rotation.
3. Determine the normal Flaps Up takeoff field length, and apply any adjustments to speed and field length required by runway gradients or runway contamination from the basic FAA Approved Airplane Flight Manual. Multiply the takeoff field length by 1.25.
4. Decrease the First or Second Segment Takeoff Net Climb Gradient by the appropriate delta from the tables below.

*For weights greater than or equal to 7500 lbs:*

<b>Takeoff Net Climb Gradient Adjustment - Type II, III, or IV Fluid</b>					
Climb Segment	Wind				
	- 10 kt	0 kts	10 kts	20 kts	30 kt
First Segment	-1.8	-2.1	-2.1	- 23	-2.5
Second Segment	-1.8	-2.0	-2.1	-2.2	- 23


*For weights less than 7500 lbs:*

<b>Takeoff Net Climb Gradient Adjustment - Type II, III, or IV Fluid</b>					
Climb Segment	Wind				
	- 10 kt	0 kts	10 kts	20 kts	30 kt
First Segment	-2.2	-2.4	-2.6	- 2.7	-2.9
Second Segment	-2.0	- 23	-2.4	-2.6	- 2.7

5. Multiply the Single-Engine Takeoff Flight Path Distances by 1.3.

**NOTE**

*Flaps 15° takeoff with Types II, III, or IV fluid applied are prohibited per limitation in Section II.*

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**MODEL C-525 C.**

Precautions in accordance with the provisions of Section VII of the AFM (Page 7-210-1,2,3 and 4)

**Ground de-icing/anti-icing operations.**

Ice formation can occur whenever there is high humidity with temperatures of +10°C or below. Type I de-icing fluids and Type II, Type III, or Type IV anti-icing fluids can be used sequentially to ensure de-icing and anti-icing of critical airframe components.

Note: It is recommended that flight crews refamiliarize each season with the following publications for extended de-icing and anti-icing procedures:

- Cessna Maintenance Manual, Chapter 12.

**De-icing/anti-icing procedures (type I, type II, type III and type IV fluids).**

**ONE STEP DEFROSTING**(Refer to point B of this section):

Type I fluid is used to remove ice, sleet, and snow from the aircraft and to provide minimal anti-icing protection. (Refer to the Holdover tables in Annex II to the MOA).

**DEFROST/ANTI-FROST IN TWO STEPS**(Refer to point B of this section): It can be used to ensure that the aircraft remains clean after de-icing. Type II, Type III, or Type IV fluids are used to provide increased antifreeze protection.

**CAUTION**

Type I, Type II, Type III and Type IV fluids are not compatible and cannot be mixed. Also, most manufacturers forbid mixing brands within one type.


Line personnel must be supervised by the crew to ensure proper application of de-icing or anti-icing fluids.

See Annex II of MOA Point «B» C-525C.

Make sure the plane is always sprayed from the front. Spraying from the rear can force fluid into aerodynamic areas where it may not drain from the aircraft.

**NOTE**

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

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The holdover times in the MOA Annex II Holdover Tables are estimates only and vary based on many factors including temperature, precipitation type, precipitation rate, wind, and aircraft surface temperature. Times start when the last application starts.

Refer to GM3.CAT.OP.MPA.250(a)(3).

**CAUTION**

The Company is responsible for ensuring that the Holdover tables are up-to-date. The tables are for departure planning use only and should be used in conjunction with pre-takeoff contamination control procedures.

**NOTE**

The tables do not apply to fluids other than SAE or ISO Type I, Type II, Type III, or Type IV FPD.

The responsibility for its application rests with the Company.

The freezing point of the Type I fluid mixture should be at least 10°C (18°F) below the actual OAT. The freezing point of the mixture of Type II, Type III and Type IV fluids must be at least 7°C (13°F) below the actual OAT.

**SPRAY TECHNIQUE - TYPE I FLUID.**

Type I fluid should be sprayed on the aircraft in a manner that minimizes heat loss from the aircraft. If spraying is done with the engines running, the engines should be idling with all Engine Bleed off. If possible, the fluid should be sprayed in a solid cone pattern of large, coarse droplets at a temperature of 70°C to 80°C at the nozzle. The fluid should be sprayed as close as possible to the aircraft surfaces, minimum three meters if a high pressure nozzle is used. See Annex II of the MOA Punto. "B" for essential areas to be treated with de-icing/anti-icing.

**Pre-takeoff contamination check: icing conditions.**

When icing conditions exist, in addition to the tactile check required in Section II of the AFM, Takeoff and Landing Operational Limits, the crew must perform a visual contamination check within 5 minutes of takeoff, preferably just before takeoff. taxi to the active runway. Visible areas of the aircraft, such as the wing, should be checked to ensure that they are free of ice, sleet and snow, and that de-icing/anti-icing fluids continue to protect the aircraft.



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***Takeoff performance - Type II, Type III and Type IV fluids.***

Refer to GM2.CAT.OP.MPA.250 (c).

*Takeoff performance is degraded when Type II, Type III, and Type IV fluids are on the airplane. The fluid that remains on the airplane during takeoff causes the elevator forces at rotation to be increased and takeoff distance to be increased.*

*Takeoff is limited to flaps 0° configuration, per Section II, Takeoff and Landing Operational Limits when Type II, Type III, or Type IV anti-ice fluid has been applied to the airplane.*

*The following procedures are required when departing with anti-ice fluid on the airplane:*

- 1. Use Flaps 0°.*
- 2. Determine the normal Flaps 0° takeoff field length, and apply any adjustments to speed and field length required by runway gradients or runway contamination. Multiply the resulting takeoff field length by 1.15.*

**CAUTION**


*Anticipate a heavier than normal elevator force at rotation. Up to 75 lbs. pulling force may be required. Even with the increased pull force, the airplane may rotate slower than normal. The elevator forces will return to normal shortly after liftoff.*

**POST-FLIGHT INSPECTION - TYPE II, TYPE III AND TYPE IV FLUIDS.**

Cessna recommends that all operators using Type II, Type III, or Type IV antifreeze fluids perform periodic visual inspections for antifreeze fluid residue (Refer to GM2.CAT.OP.MPA 250(h)).

The visual inspection should include:

1. Along the trailing spar area of the wing with the flaps extended.
2. Around the perimeter of the spoiler surface.
3. The clearances around the riser and the riser trim tab.
4. The clearances around the rudder and rudder trim tab. Initially, these inspections should be performed after a maximum of three applications of Type II, Type III, or Type IV fluid. If the aircraft is washed or if Type I fluid is used for de-icing, the inspection frequency may be reduced. The operator should determine the frequency of inspections based on the results of residue inspections, the frequency of de-icing/anti-icing operations, as well as the frequency of aircraft washing.

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#### **D. EFFECTIVE TIME.**

It is the estimated time during which an anti-icing fluid will prevent the formation of frost or ice and the accumulation of snow on the protected surfaces of an aircraft, depending on the type of fluid used, its concentration, the outside ambient temperature and the conditions existing meteorological and precipitation

These times are established in the Holdover tables found in Annex II to the MOA and are renewed annually, reflecting the advances and improvements in the fluids used.


#### **E. PRECAUTIONS DURING USE.**

These fluids are toxic, avoid breathing them during application and contact with eyes or skin.

Do not spray directly towards pitot and static, windows, air conditioning intakes and cockpit windshield.

#### **F. AIRCRAFT DE-ICE / ANTI-ICE PROCEDURES.**

- 1) Carefully plan land-based thawing activities with reference to the above recommendation tables to ensure that appropriate materials and equipment are available based on forecast weather conditions and that responsibilities have been assigned and understood. This should include an assurance from the service provider that, in matters that the Pilot-in-Command cannot ascertain, the provider meets satisfactory quality standards in terms of procedures and facilities used.
- 2) Make sure that the de-icing service operators do not apply the data of table 8.2.B «Amount of Fluid for Anti-icing with Thickened Fluids» of the appendix B of AS6286.
- 3) Ensure that the fluid concentrations used will provide adequate holdover time.
- 4) Organize the de-icing and anti-icing processes so that the final treatments are carried out as close to the departure time as possible.
- 5) Arrange for the aircraft to position itself as close as possible to the departure point with passengers on board, prior to the final anti-icing operation to reduce the time between de-icing/anti-icing and takeoff.
- 6) Anti-icing fluids are applied in such a way that they can completely cover surfaces and form an even layer.

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**Note:** We will know that sufficient anti-icing fluid has been applied when it can be visually confirm that fluid is just beginning to ooze around the edges attack and exit from the surface.


- 7) Arrange for areas that can be seen from the cockpit to be thawed first, so that during the pre-takeoff inspection the crew can be sure that other areas of the aircraft are clean, as whatever thaws first will freeze through. usually also first.
  
- 8) Check that the motors have freedom of movement by turning them manually. If it is found that there is friction, blow hot air through the core of the motor until freedom of movement is obtained. **DO NOT ATTEMPT TO START THE ENGINE - CATASTROPHIC DAMAGE COULD RESULT.**

The areas where aircraft must be de-iced and anti-iced are found in Annex II to the MOA.

### **Pre-flight inspection.**

The pre-flight inspection should be carried out after de-icing on the ground as close to departure time as possible. It must be meticulously checked that there is no ice or snow residue on the aircraft, paying particular attention to the following areas:

- Leading, trailing and surface edges of the planes.
- stabilizers
- control surfaces
- spoilers and airbrakes
- Crystals
- landing gear and doors
- Brakes
- Air inlets and drains
- Checking motors to spin freely and APU
- Pitots, antennas and static.
- Ventilation of fuel tanks
- Pressurization control valves
- Inlet and outlet of cooling air to the air conditioning packs.

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**G. COMMUNICATIONS WITH THE GROUND PERSONNEL CARRYING OUT THE TREATMENT.**

**Yo. Before treatment.**


The crew must confirm, with the personnel that will perform the de-icing/anti-icing, the types of fluid used to achieve the expected holdover times and their application in all the areas indicated in Section 7 of the AFM of each aircraft (Refer to Annex II to the MOA).

**ii. After treatment.**

Once the treatment is finished, the crew must receive confirmation from the personnel who carried it out and that the aircraft is free of contamination.

**iii. Finished process notice.**

Once the process is finished, the crew will receive notification from the ground personnel, of the withdrawal of the personnel who have carried it out and of the equipment used.

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**H. TECHNICAL LOG.**

The PIC must confirm that each time de-icing has been carried out, the de-icing/anti-icing form has been completed and there is an appropriate and signed entry in the technical log, and that, in particular, indications have been made. the start time, type of fluid and concentration used for the antifreeze protection operation. If there is a later delay in departure, or worsening weather conditions, you should use this information in conjunction with the information in the tables above to get a realistic idea of whether the entire process needs to be repeated.

The de-icing - anti-icing service provider must ensure that the information on the type of fluid and concentration of the mixture used, as well as the start time of the operation is not provided to the crew until it has been duly ensured by personnel. qualified person that the operation has been properly performed by post-application inspection.

It is not allowed to apply a second layer of anti-freeze fluid over the previous application when the protection time is running out, it is always mandatory to carry out a complete de-icing operation before applying anti-freeze protection in case of operation in two steps, or repeat the complete defrost-anti-freeze process in the case of one-step operation.





A) HOLDOVER TABLES

Winter 2022-2023

FAA Holdover Time Guidelines

TABLE 2: HOLDOVER TIMES FOR SAE TYPE I FLUID ON CRITICAL AIRCRAFT SURFACES COMPOSED PREDOMINANTLY OF ALUMINUM

Outside Air Temperature <sup>1,2</sup>	Freezing Fog, Freezing Mist <sup>3</sup> , or Ice Crystals <sup>4</sup>	Very Light Snow, Snow Grains or Snow Pellets <sup>5,6,7</sup>	Light Snow, Snow Grains or Snow Pellets <sup>5,6,7</sup>	Moderate Snow, Snow Grains or Snow Pellets <sup>5,7</sup>	Freezing Drizzle <sup>8</sup>	Light Freezing Rain	Rain on Cold-Soaked Wing <sup>9</sup>	Other <sup>10</sup>
-3 °C and above (27 °F and above)	0:11 - 0:17	0:18 - 0:22	0:11 - 0:18	0:06 - 0:11	0:09 - 0:13	0:02 - 0:05	0:02 - 0:05	CAUTION: No holdover time guidelines exist
below -3 to -6 °C (below 27 to 21 °F)	0:08 - 0:13	0:14 - 0:17	0:08 - 0:14	0:05 - 0:08	0:05 - 0:09	0:02 - 0:05		
below -6 to -10 °C (below 21 to 14 °F)	0:06 - 0:10	0:11 - 0:13	0:06 - 0:11	0:04 - 0:06	0:04 - 0:07	0:02 - 0:05		
below -10 °C (below 14 °F)	0:05 - 0:09	0:07 - 0:08	0:04 - 0:07	0:02 - 0:04				

NOTES

- Type I fluid / water mixture must be selected so that the freezing point of the mixture is at least 10 °C (18 °F) below outside air temperature.
- Ensure that the lowest operational use temperature (LOUT) is respected.
- Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
- Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
- To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 53) is required.
- Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
- Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
- Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.

CAUTIONS

- The cautions that apply to the holdover times in the table above can be found on page 10.



TABLE 4: GENERIC HOLDOVER TIMES FOR SAE TYPE II FLUIDS<sup>1</sup>

Outside Air Temperature <sup>2</sup>	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist <sup>3</sup> or Ice Crystals <sup>4</sup>	Snow, Snow Grains or Snow Pellets <sup>5,6,7</sup>	Freezing Drizzle <sup>8</sup>	Light Freezing Rain	Rain on Cold-Soaked Wing <sup>9</sup>	Other <sup>10</sup>
-3 °C and above (27 °F and above)	100/0	0:55 - 1:50	0:30 - 0:55	0:30 - 1:00	0:20 - 0:35	0:07 - 0:45	CAUTION: No holdover time guidelines exist
	75/25	0:40 - 1:10	0:15 - 0:30	0:25 - 0:40	0:15 - 0:25	0:04 - 0:25	
below -3 to -8 °C (below 27 to 18 °F)	50/50	0:15 - 0:30	0:07 - 0:15	0:09 - 0:15	0:06 - 0:09		
	100/0	0:30 - 0:45	0:20 - 0:40	0:20 - 0:45	0:15 - 0:20		
below -8 to -14 °C (below 18 to 7 °F)	75/25	0:25 - 0:55	0:10 - 0:25	0:15 - 0:30	0:08 - 0:15		
	100/0	0:30 - 0:45	0:15 - 0:30	0:20 - 0:45 <sup>11</sup>	0:15 - 0:20 <sup>11</sup>		
below -14 to -18 °C (below 7 to 0 °F)	75/25	0:25 - 0:55	0:08 - 0:20	0:15 - 0:30 <sup>11</sup>	0:08 - 0:15 <sup>11</sup>		
	100/0	0:15 - 0:20	0:02 - 0:07				
below -18 to -25 °C <sup>12</sup> (below 0 to -13 °F)	100/0	0:15 - 0:20	0:01 - 0:03				
	below -25 °C to LOUIT <sup>12</sup> (below -13 °F to LOUIT)	100/0	0:15 - 0:20	0:00 - 0:01			

**NOTES**

- To use the HOTs in this table, ensure that the fluid and dilution being used is listed in the Type II Fluids Tested for Anti-Icing Performance and Aerodynamic Acceptance table (Table 55). Any restrictions on the use of the fluid have to be identified and applied.
- Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type II fluid cannot be used.
- Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
- Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
- To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 53) is required.
- Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
- Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
- Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.
- No holdover time guidelines exist for this condition below -10 °C (14 °F).
- If the LOUIT is unknown, no holdover time guidelines exist below -25 °C (-13 °F).

**CAUTIONS**

- The cautions that apply to the holdover times in the table above can be found on page 13.



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**Winter 2022-2023**

**FAA Holdover Time Guidelines**

**TABLE 19: TYPE III HOLDOVER TIMES FOR ALLCLEAR AEROCLEAR MAX  
APPLIED UNHEATED ON MIDDLE SPEED AIRCRAFT<sup>1</sup>**

Outside Air Temperature <sup>2</sup>	Fluid Concentration Fluid/Water By % Volume	Freezing Fog, Freezing Mist <sup>3</sup> , or Ice Crystals <sup>4</sup>	Very Light Snow, Snow Grains or Snow Pellets <sup>5,6,7</sup>	Light Snow, Snow Grains or Snow Pellets <sup>5,6,7</sup>	Moderate Snow, Snow Grains or Snow Pellets <sup>5,7</sup>	Freezing Drizzle <sup>8</sup>	Light Freezing Rain	Rain on Cold-Soaked Wing <sup>9</sup>	Other <sup>10</sup>
-3 °C and above (27 °F and above)	100/0	0:45 - 1:55	1:20 - 1:45	0:40 - 1:20	0:18 - 0:40	0:25 - 0:50	0:14 - 0:25	0:05 - 0:40	CAUTION: No holdover time guidelines exist
	75/25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	50/50	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
below -3 to -10 °C (below 27 to 14 °F)	100/0	0:50 - 1:40	1:20 - 1:45	0:40 - 1:20	0:18 - 0:40	0:25 - 0:45	0:15 - 0:25	CAUTION: No holdover time guidelines exist	
	75/25	N/A	N/A	N/A	N/A	N/A	N/A		
below -10 to -20.5 °C (below 14 to -5 °F)	100/0	0:40 - 1:45	1:20 - 1:45	0:40 - 1:20	0:18 - 0:40				

**NOTES**

- 1 These holdover times are for aircraft conforming to the SAE AS5900 middle speed aerodynamic test criterion. Fluid must be applied unheated to use these holdover times. No holdover times exist for this fluid applied heated. If uncertain whether the aircraft conforms to the low, middle, or high speed aerodynamic test criterion, no holdover time guidelines exist below -16°C (3°F).
- 2 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type III fluid cannot be used.
- 3 Freezing mist is best confirmed by observation. It is never reported by METAR however it can occur when mist is present at 0 °C (32 °F) and below.
- 4 Use freezing fog holdover times in conditions of ice crystals mixed with freezing fog or mist.
- 5 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 53) is required.
- 6 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain or drizzle.
- 7 Use snow holdover times in conditions of very light, light, or moderate snow mixed with ice crystals.
- 8 Includes light, moderate and heavy freezing drizzle. Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 9 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
- 10 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail.

**CAUTIONS**

- The cautions that apply to the holdover times in the table above can be found on page 28.



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**B) DEFROST/ANTI-FROST ZONES**

**CESSNA 510**

**TEMPORARY FAA APPROVED AIRPLANE FLIGHT MANUAL CHANGE**

**AIRPLANE DEICING**

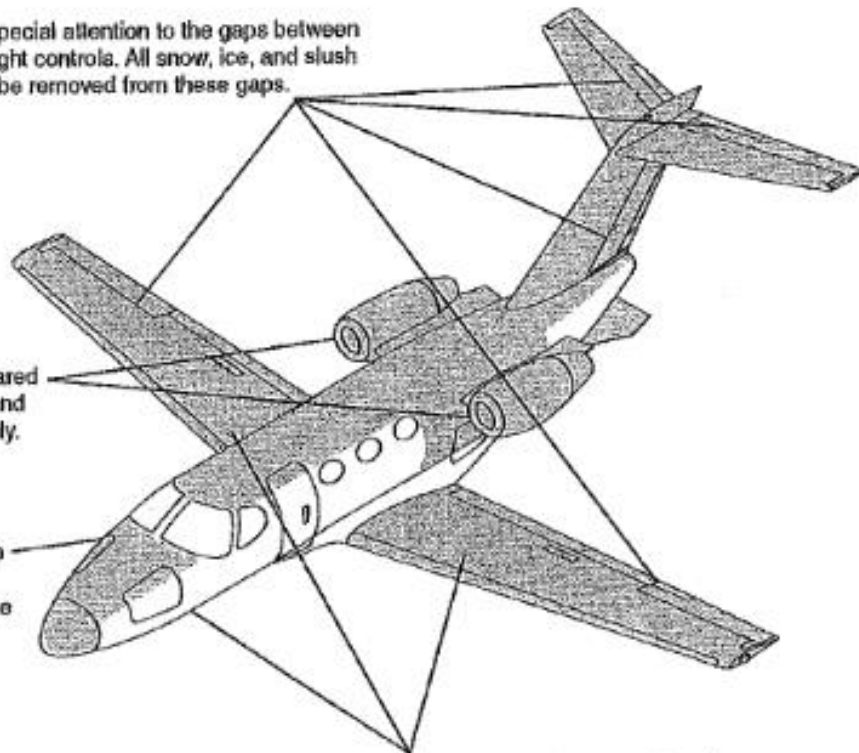
<b>MINIMUM DIRECT SPRAY AREAS</b>	
• BRAKES	• STALL WARNING VANE
• ENGINE INLETS	• STATIC PORTS
• ENGINE EXHAUST	• WINDSHIELD
• PITOT HEADS	• WINDOWS (CABIN)
• RAM AIR INLETS	

A/R2165

Pay special attention to the gaps between the flight controls. All snow, ice, and slush must be removed from these gaps.

Engine inlets cleared of all snow, ice, and slush by hand only.

Remove snow, ice and slush from Stall Warning Vane by hand only.



Landing gear doors and wheel wells must be free of snow, ice and slush.

**NOTE**

Shaded areas indicate essential areas to be deiced.



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**HOLDOVER TABLES AND ZONES  
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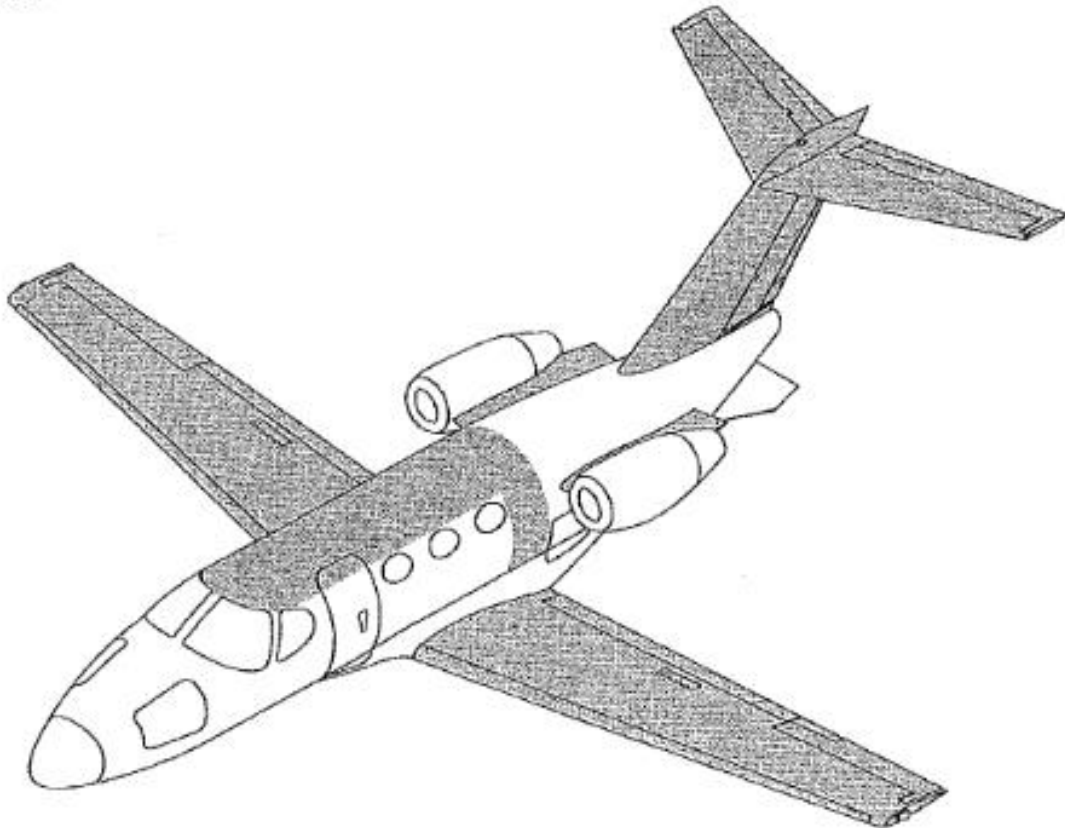
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**TEMPORARY FAA APPROVED AIRPLANE FLIGHT MANUAL CHANGE  
AIRPLANE ANTI-ICING**

**MINIMUM DIRECT SPRAY AREAS**

- BRAKES
- ENGINE INLETS
- ENGINE EXHAUST
- PITOT HEADS
- RAM AIR INLETS
- STALL WARNING VANE
- STATIC PORTS
- WINDSHIELD
- WINDOWS (CABIN)

A72168



**NOTE**

The shaded areas indicate areas where anti-ice fluid is applied. Upper fuselage is anti-iced to preclude ice formation that could be ingested into engine inlets.



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**CESSNA S-550**

## **AIRPLANE DEICING**

**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**

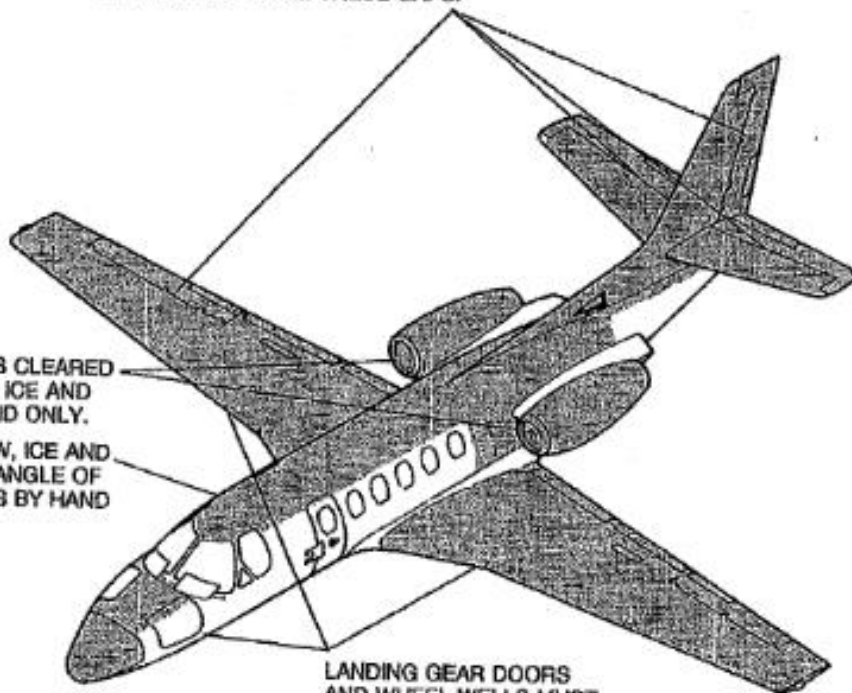
**BRAKES  
WINDSHIELD  
CABIN WINDOWS**

**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.**

**ENGINE INLETS CLEARED  
OF ALL SNOW, ICE AND  
SLUSH BY HAND ONLY.**

**REMOVE SNOW, ICE AND  
SLUSH FROM ANGLE OF  
ATTACK VANES BY HAND  
ONLY.**



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

65102014



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## **AIRPLANE ANTI-ICING**

**SHADED AREAS INDICATE ESSENTIAL AREAS TO BE ANTI-ICED**

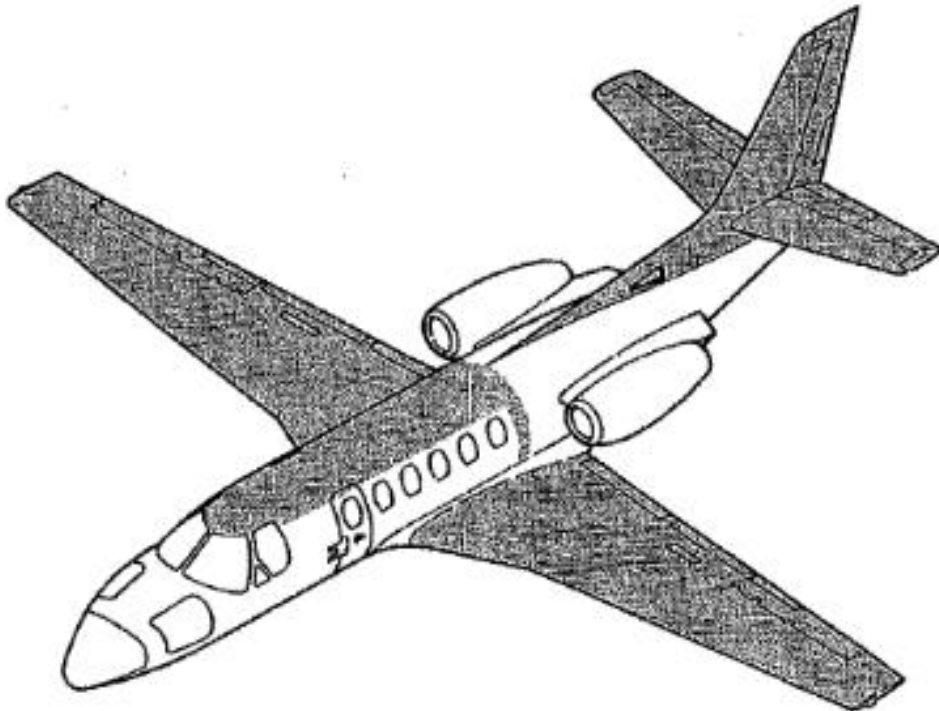
### **NOTE**

**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**







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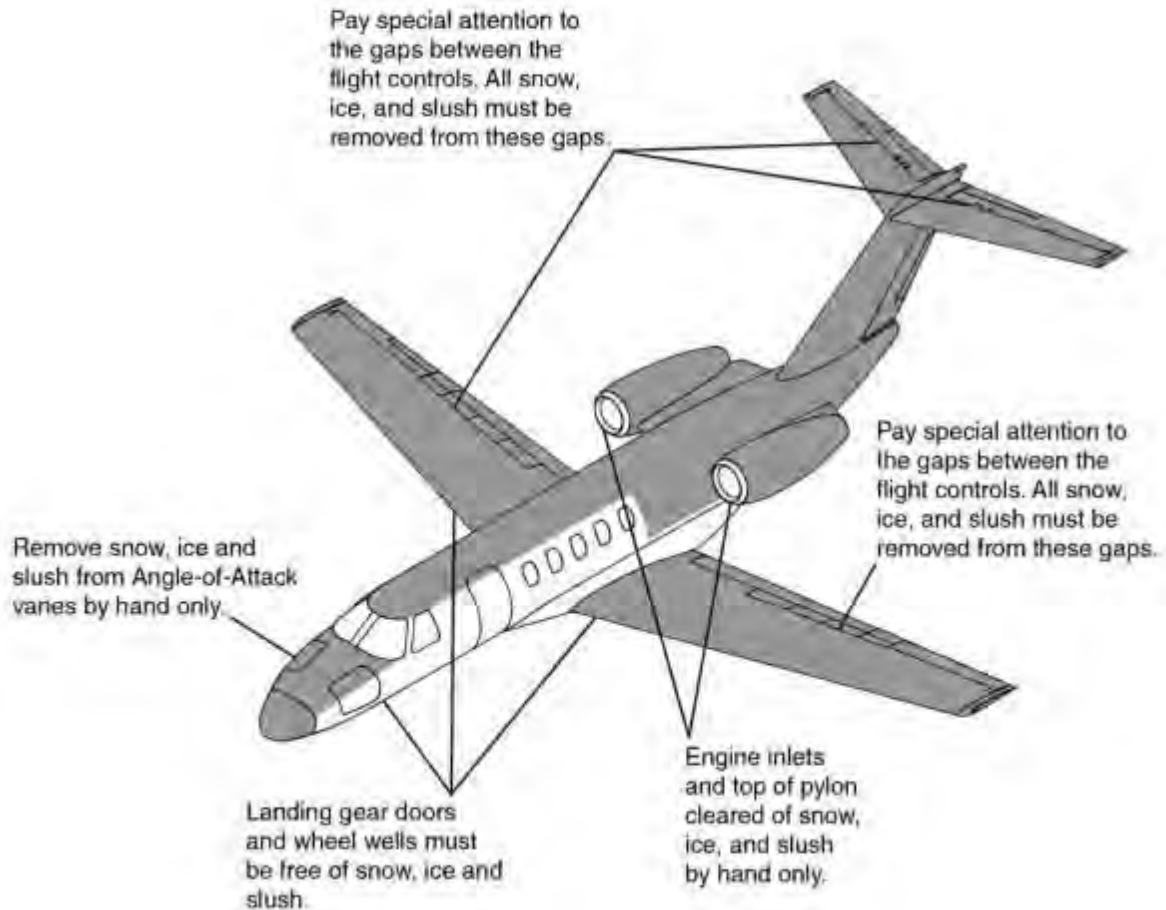
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**CESSNA 525C**

**AIRPLANE DEICING**

AI0064

Minimum Direct  
Spray Areas: Engine Inlets and Exhaust,  
Engine Pylons, Ram Air Inlets,  
Brakes, Pitot Heads  
Static Ports, Windshield,  
Cabin Windows, and AOA Vanes.





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## **AIRPLANE ANTI-ICING**

A8006E

Minimum Direct

Spray Areas: Engine Inlets and Exhaust,  
Engine Pylons, Ram Air Inlets,  
Brakes, Pitot Heads  
Static Ports, Windshield,  
Cabin Windows, and AOA Vanes.

