

CONTENTS

INTRODUCTION	10.2
GENERAL	
WING AND EMPENNAGE DE-ICING	10.2
WINDSHIELD AND PROPELLER ANTI-ICING	10.2
CARBURETOR ANTI-ICING	10.2
WINDSHIELD DEFROSTING	10.2
PITOT/ STATIC ANTI-ICING	10.2
OPERATION	
WING AND EMPENNAGE DE-ICING	10.3
WINDSHIELD DEFROSTING	10.3
PITOT/ STATIC ANTI-ICING	10.3
LIMITATIONS	
CARBURETOR HEAT	10.3
PITOT/ STATIC ANTI-ICING	10.3
DIAGRAM	
WING AND EMPENNAGE DE ICING SYSTEM	10.4

INTRODUCTION

This chapter provides a general overview of the DC-3 Ice and Rain Protection System as well as normal operations and limitations.

GENERAL

WING AND EMPENNAGE DE-ICING

The wing and empennage de-icing system is installed on the aircraft for the purpose of removing ice after it has been formed. Rubber de-ice boots are installed on the leading edges of the inboard and outboard wing sections, the horizontal stabilizer sections, and the vertical stabilizer.

Each wing leading edge is separated into two de-icing sections: The inner and outer section. In each section the de-ice boots have three parallel tubes: The upper, center, and lower tubes. The de-ice boot for the tail section consists of a single tube.

Air pressure is supplied from the pressure port of each respective engine driven vacuum pump to a pneumatic distribution valve. This air pressure is routed from the vacuum pump through an oil separator, a check valve, an air filter, and finally to the distributor valve. This distributor valve provides air pressure to the de-ice boots in eight-second intervals to each of five sets of de-ice boots. The total time for the complete de-ice cycle for the entire airplane is 40 seconds.

Once activated by the pilot, the order of de-icing pressure distribution is controlled by the automatic operation of the distributor valve and occurs in the following order:

<u>Cycle</u>	<u>Tube(s)</u>	<u>Section</u>
1	Center	Outer Wings (L&R)
2	Center	Inner Wings (L&R)
3	Upper & Lower	Outer Wings (L&R)
4	Upper & Lower	Inner Wings (L&R)
5	(Only One)	Three Tail Sections

WINDSHIELD AND PROPELLER ANTI-ICING

The DC-3 aircraft utilizes isopropyl alcohol to prevent the formation of ice on each pilot's windshield, as well as on each propeller. The system consists of an alcohol storage tank, a system shutoff valve, an electric pump, a cockpit control switch, and a variable output control.

The storage tank and system shutoff valve are located in the companionway. The storage tank holds approximately 10 gallons of alcohol and is vented overboard.

The alcohol system electric pump is in the cockpit on the floor behind the Captain's seat and is protected by a circuit breaker in the J-box in the companionway. The cockpit control switch is on the Captain's overhead panel and the variable output control is behind the Captain's seat.

CARBURETOR ANTI-ICING

The primary method of avoiding carburetor icing is by application of carburetor heat. The carburetor heat control levers are located on the right side of the control pedestal.

The carburetor heat system mixes engine heat with ram air to keep the carburetor air temperature above freezing. Carburetor heat should be used as an anti-icing system to prevent icing rather than a de-icing system to remove ice. Carburetor heat should be applied prior to operating in visible moisture when the OAT is 5°C. (40°F.) or below. When applied correctly and prior to operating in icing conditions, partial carburetor heat will be sufficient to prevent ice formation in the carburetor throat and induction system. If ice is permitted to form, full carburetor heat may be needed in order to clear the ice.

CAUTION

Place the mixtures in AUTO RICH before using carburetor heat. When carburetor heat is no longer required, allow several minutes for the automatic mixture control to stabilize before resetting the mixtures to AUTO LEAN.

WINDSHIELD DEFROSTING

The cockpit windshields can be defrosted by opening the windshield defrost valve behind the First Officer's seat. When opened, this valve directs heated air from the cabin heater system to the windshields. Each windshield duct is equipped with a shutoff valve.

PITOT/ STATIC ANTI-ICING

The pitot heads are equipped with electrical heating elements that are controlled by two switches on the right overhead switch panel. Ammeters that indicate current flow are mounted above each switch.

Pitot heat should be used when operating in visible moisture regardless of ambient outside air temperature.

OPERATION**WING AND EMPENNAGE DE-ICING**

Do not activate the wing and empennage de-icing system unless an accumulation of more than 1/4 inch of ice has formed on any cockpit representative surface. Activation of the de-icing system too early may cause subsequent selections of the de-ice equipment to be ineffective.

Do not delay the use of wing and empennage de-icing after at least 1/4 inch of ice has accumulated as excessive ice build-up may prevent the de-icing boots from functioning properly.

WINDSHIELD DEFROSTING

For windshield defrosting, accomplish the following:

Cabin heater switch ON
Defrost tube shutoff valve OPEN

PITOT/ STATIC ANTI-ICING

Pitot heater switches ON
Normal amperage for each heater 2-5 amps

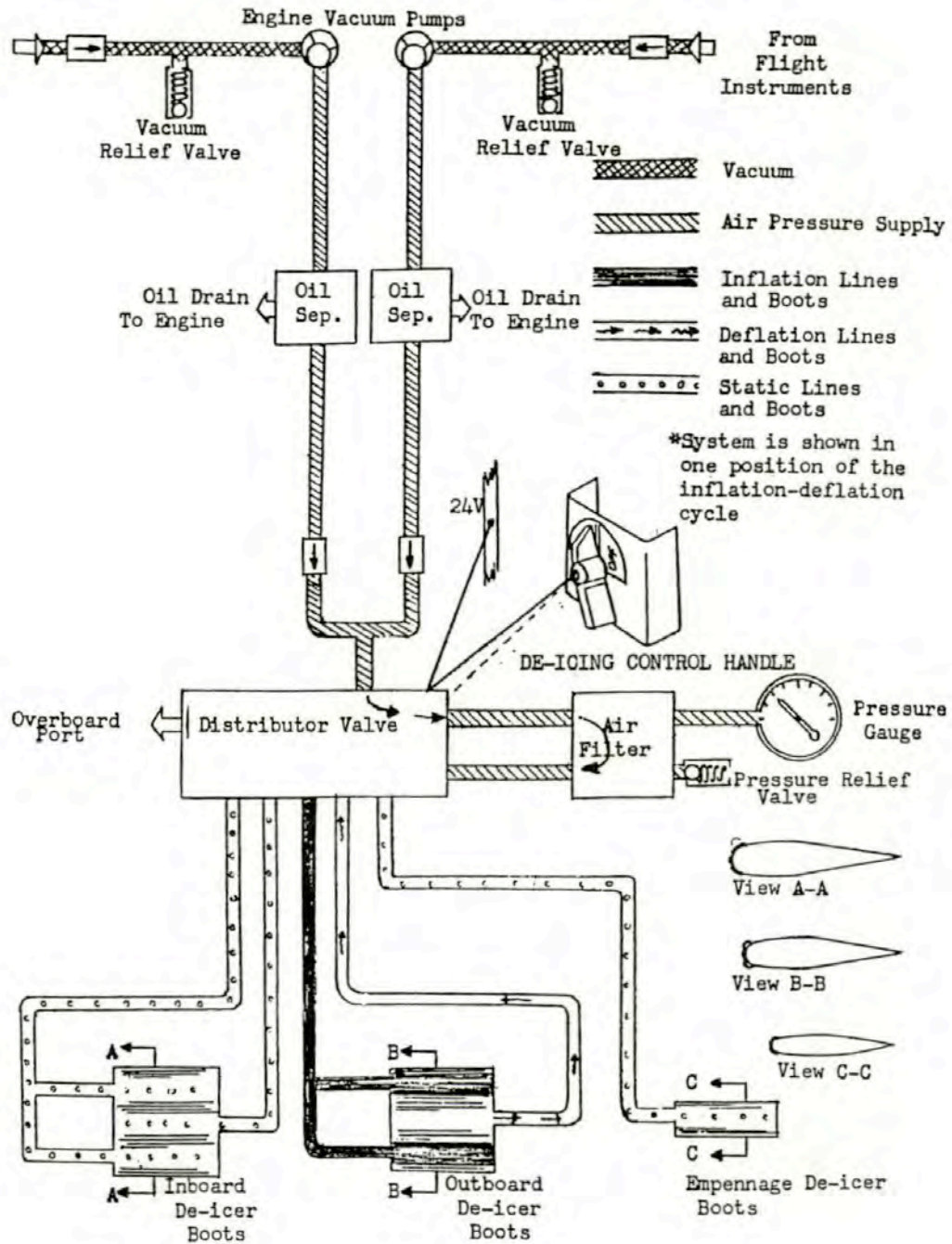
***NOTE:** If operating in freezing temperatures or cold rain, the pitot heaters will indicate a slightly higher than normal amperage.*

LIMITATIONS**CARBURETOR HEAT**

AUTO RICH must be selected during carburetor heat operation.

PITOT/ STATIC ANTI-ICING

Do not operate the pitot/ static heater continuously on the ground unless required to prevent ice formation.



Wing and Empennage De-icing System

———— End of Chapter ————