

Section - III

SYSTEMS DESCRIPTION

Sub-section 11

ICE PROTECTION

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SYSTEM OPERATION (continued)

De-icing fluid is drawn from the tank through a suction filter to the pump, and then via a pressure filter and check valve to the head compensating valve. The head compensating valve ensures equal fluid pressure at the wings and horizontal stabilizers proportioning units. Fluid is fed from the head compensating valve to the three proportioning units, one located in each wing, the other between the horizontal stabilizers.

A check valve is incorporated in each proportioning unit outlet to prevent back-flow when the system is inoperative. Each proportioning unit splits the main flow down to the requirements of the individual distributor panels. This arrangement makes sure the fluid supply is maintained to the remaining outlets should a pipe become disconnected.

At each distributor panel, fluid is fed through a metering tube into a cavity. From the cavity the fluid passes through a micro-porous plastic sheet and through a titanium outer skin of greater porosity to escape into the atmosphere. Airflow then causes the fluid to spread rearward over the wings and horizontal stabilizer surfaces.

ROTARY-CUTTER ICE DETECTOR (Figure 1)

Formation of ice is detected automatically after takeoff and manual selection of the detector is available for operation on the ground. Power supplies to the ice detector are fed through the weight-on-wheels switch relay system and controlled by an ICE DET AUTO-OVRD switch. With the switch selected to AUTO, the detector operates when the airplane becomes airborne. Selecting the switch to OVRD by-passes the weight switch relay so that the detector runs on the ground and in flight.

NOTE: The ICE DET switch should be selected to OVRD before taxiing in icing conditions.

The ice detector unit consists of an AC powered motor driving a serrated rotor which rotates in close proximity to a fixed knife-edge cutter. When ice forms on the rotor, the gap between the rotor and adjacent cutter is filled. The skimming action of the cutter against the ice causes a rise in motor torque which rotates the motor slightly within its mounting. Rotation of the motor actuates a microswitch which connects a DC power supply, via a time delay relay, to illuminate an ICE DETECTED annunciator located on the overhead roof panel. The ice warning is also indicated on the MWS by the illumination of the ICE PROT repeater annunciator.

Pushing an ICE DET TEST button illuminates both annunciators.

The time delay relay maintains the ice warning signal during intermittent rises in motor torque. When ice ceases to form, a spring returns the motor to the normal position, the microswitch opens and after a delay (60 seconds) the warning is cancelled.

WING SPOTLIGHTS (Figure 1)

Two ice detection spotlights, one on each wing fairing, are controlled by an ICE/LOGO switch located on the EXTERIOR LIGHTS section of the flight compartment overhead roof panel forward extension.

When the ICE/LOGO switch is selected to ICE, the spotlights illuminate the left and right wing leading edges for night visual inspection.

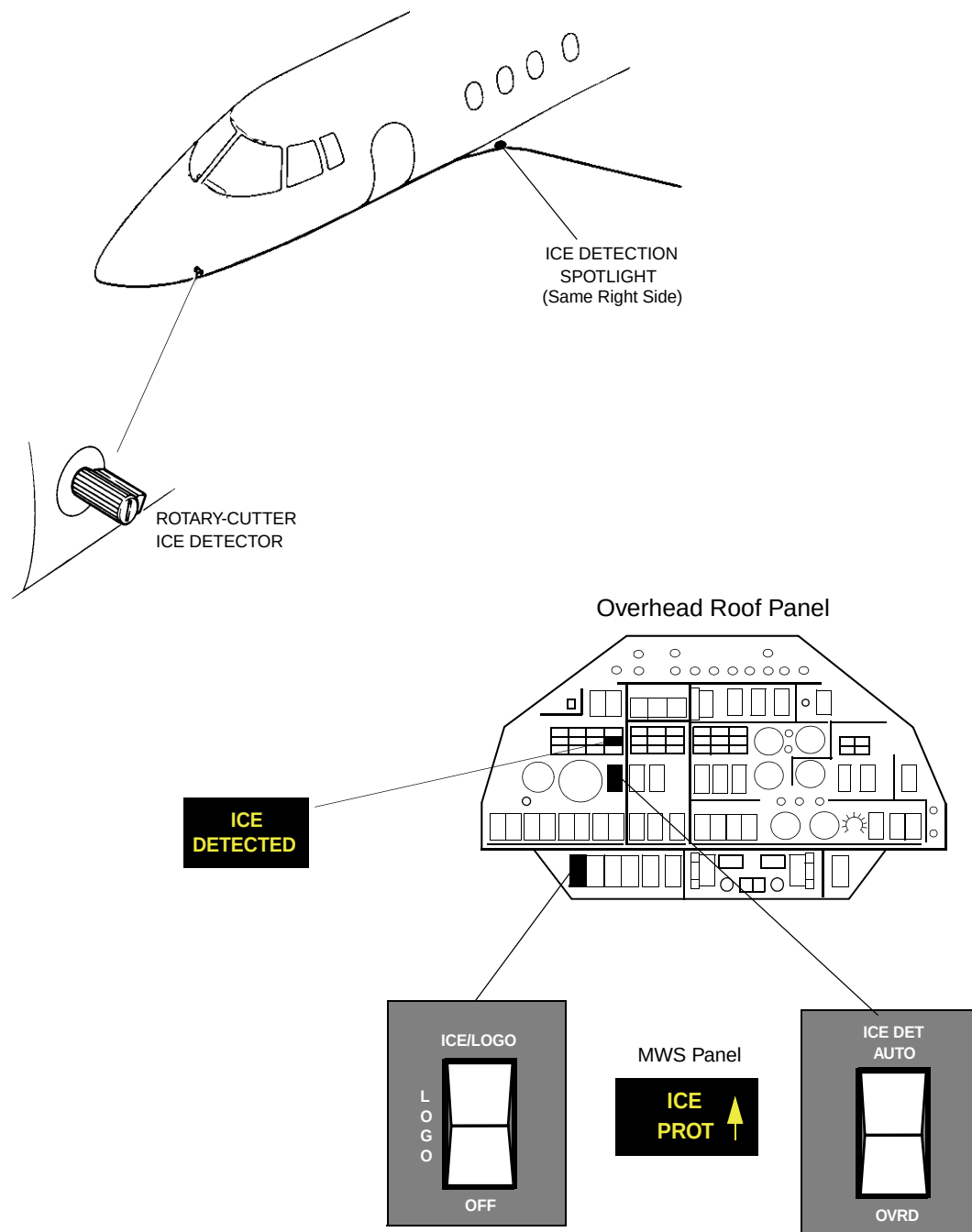


Figure 1
Ice Detection Components