

## DESCRIPTION AND MAINTENANCE INSTRUCTIONS

REMOVAL OF SNOW, ICE AND FROST  
FROM AIRCRAFT SURFACES

(This EO replaces EO 05-1-2P dated 13 Nov 62)

## INTRODUCTION

- 1 Aircraft parked outside, during cold weather conditions are subject to being coated with snow, ice and hoar-frost on control surfaces and other areas. Aerodynamic efficiency of the aircraft is seriously affected if this accumulation of snow, ice and hoar-frost is not completely removed.
- 2 It is mandatory that all accumulations of snow, ice or hoar-frost, no matter how slight, on aircraft surfaces be completely removed before the aircraft is signed out as serviceable.

## PURPOSE

- 3 The purpose of this EO is to provide a source of preventive measures to be observed while aircraft are subjected to cold weather operations and the action, cautions and approved solutions necessary in the removal of ice snow and hoar-frost from aircraft surfaces.

## PREVENTION AIRCRAFT SURFACES

- 4 Covers in good condition are the best method of protection against snow, frost or ice accumulations. Approved aircraft covers for RCAF use are listed in CAP 10, Section 27D and are available on demand.
- 5 Caution should be exercised when using covers at temperatures exceeding 25°F (approximately -5°C) as rain or wet snow may freeze covers to surfaces. To prevent covers from freezing to surfaces, a film of anti-icing fluid should be applied first. A satisfactory procedure is to apply the anti-icing fluid to the surfaces after the last flight of the day and then apply covers. Frost and light snow which then form can easily be removed with minimum sticking of covers.
- 6 Covers are never installed over aircraft surfaces with frozen or freezeable moisture present. Wet covers are not to be used for covering aircraft surfaces but should be completely dry before applying. Care must also be exercised to ensure that covers are free from accumulations of oil, grease, hydraulic fluid etc., as these conditions create a fire hazard.
- 7 Covers when not in use should be completely dried and hung or stored in a dry place.
- 8 When approved covers are not available, an alternate method of protection is the use of a net made of 1-1/2" cotton webbing constructed with 3" square openings. The net should be draped over the wing and secured exercising the same precautions as specified for approved covers. When the net is removed, 90% of the snow is removed.

## CANOPIES

- 9 Canopies and perspex surfaces should be covered to prevent snow and ice accumulation. Covers should be of the fitted type normally supplied with each type of aircraft.



### PITOT HEATERS

10 Pitot tube covers should be used at all times to ensure no drifting snow or freezing rain enters the pitot tube.

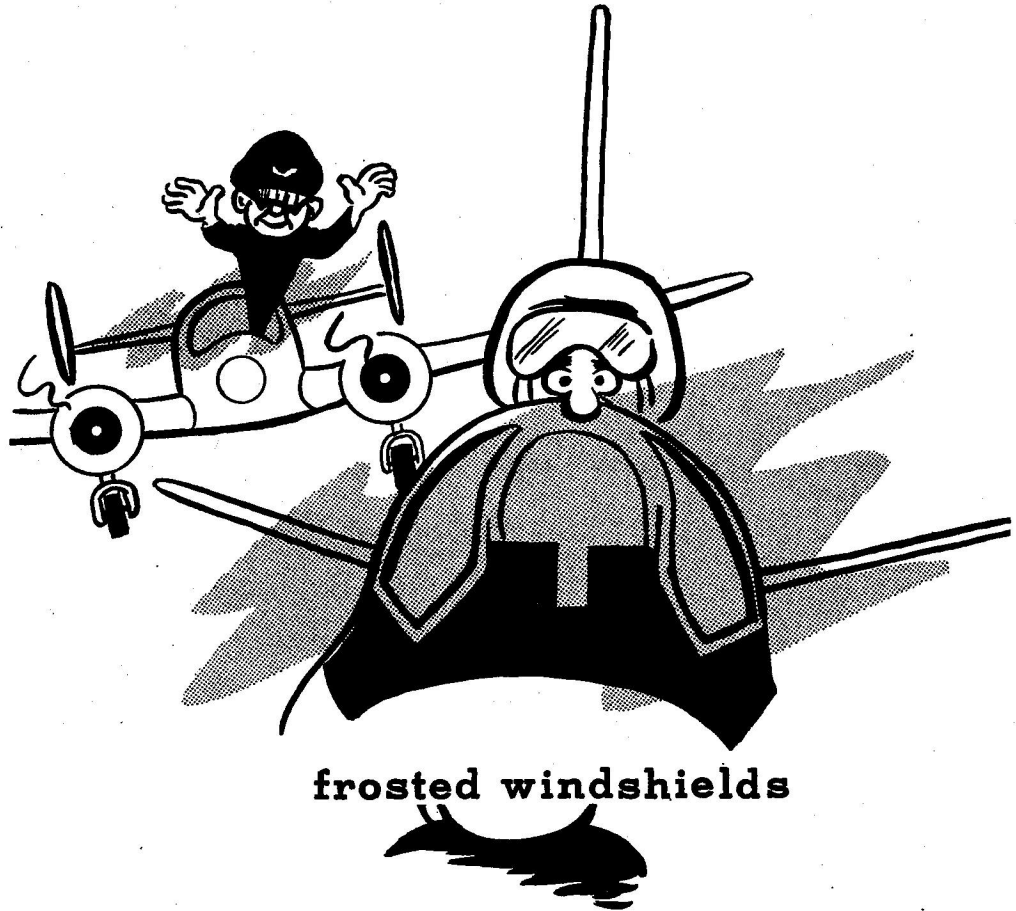
### REMOVAL

11 Removal of snow, ice and hoar-frost from aircraft metallic surfaces may be carried out by one of the following methods:

(a) Defrost the aircraft in a heated hangar ensuring that all surfaces are completely dry before removing from hangar.

(b) Sweep the aircraft surfaces with a hand broom.

(c) Spray the metallic aircraft surfaces with anti-icing and de-icing defrosting fluid specification MIL-A-8243A, Ref. 34A/6850-00-582-4685 (EO 45-1-4).



## **frosted windshields**

- (1) Use defrosting fluids sparingly and ensure the mixture does not enter the engine(s) compartment.
- (2) Excessive use of defrosting fluid could result in flushing action of lubricants. Ensure that all exposed control surface bearings, actuator and/or screw jack moving parts are adequately lubricated after each application of defrosting fluid.

## **CANOPIES**

12 . When it is necessary to defrost canopies or perspex surfaces the only recommended method is to apply heat using approved ground heating units. Ducts should not blow directly on perspex surfaces if the temperature of the surface will exceed 49°C (120°F) at any spot.

## **PROPELLERS**

13 . Alcohol anti-icing systems will not remove ice already formed on propellers. Therefore all ice deposits on propellers should be removed before starting engines. If icing temperature exist, anti-icing systems should be operated immediately after engine starting.

## JET BLAST

14 The use of jet blast from another aircraft as a means of defrosting will only be used in extreme emergency. If the jet blast method is used the distance between the tail pipe and the nose of the aircraft being defrosted will be at least 38'. Personnel will ensure before using the jet blast as a defrosting method, that all debris in the proximity of the aircraft is removed because of the possibility of damage to the aircraft.

## CRITICAL AREAS

15 Air inlets and vents should be thoroughly inspected for ice or snow accumulations. Static pressure source for flight instrument that are located flush with the skin of the fuselage are very susceptible to icing conditions. These are to be thoroughly inspected.

### CAUTION

The use of sharp pointed objects, such as screwdrivers, scrapers, ice picks or items of a similar nature for the removal of snow or hoar-frost from aircraft surfaces is strictly forbidden.

ISSUED ON AUTHORITY OF THE CHIEF OF THE AIR STAFF

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DE-ICING CHEMICALS

CHECK POINTS

- 1 Anti-Icing Fluid Ref. 34A/6850-00-582-4685 to Specification MIL-A-8243.
- 2 Ethylene glycol Ref. 34A/6850-21-572-4610 to Specification 3-GP-850.

- 1 Top and bottom of all flight surfaces.
- 2 Air intake and vents.
- 3 Control hinge gaps.
- 4 Hinge points.
- 5 All movable parts.
- 6 Antennas and radar enclosures.
- 7 Windshields and adjoining areas.
- 8 Ensure bearings etc., adequately lubricated after use of de-icing fluid.

DEPOSIT	DRY SNOW	WET SNOW	FROZEN SNOW	ICE	FROST
WEATHER	<ol style="list-style-type: none"> <li>1 Overcast skies.</li> <li>2 Temperature below 30°F</li> </ol>	<ol style="list-style-type: none"> <li>1 Overcast skies.</li> <li>2 Temperature 30 - 35°F</li> </ol>	<ol style="list-style-type: none"> <li>1 Temperature drop after wet snow fall.</li> </ol>	<ol style="list-style-type: none"> <li>1 Uniformly overcast skies.</li> <li>2 Temperature 25 - 32°F</li> </ol>	<ol style="list-style-type: none"> <li>1 Temperature near freezing.</li> <li>2 Clear skies-night.</li> <li>3 High relative humidity</li> <li>4 Little or no wind.</li> </ol>
PREVENTION	<ol style="list-style-type: none"> <li>1 Protective covers.</li> <li>2 Frequent removal of snow prevents packing.</li> </ol>	<ol style="list-style-type: none"> <li>1 Waterproof protective covers.</li> <li>2 Frequent removal more important.</li> </ol>	<ol style="list-style-type: none"> <li>1 Do not allow wet or dry snow to remain on surface, thaw and refreeze.</li> <li>2 Do not remove the aircraft from hangar during snowfall.</li> </ol>	<ol style="list-style-type: none"> <li>1 Frequent application of anti-icing fluid may prevent freezing.</li> <li>2 Remove water or slush that may freeze.</li> </ol>	<ol style="list-style-type: none"> <li>1 Protective covers.</li> <li>2 Application of anti-icing fluid (temporary protection only).</li> </ol>
REMOVAL	<ol style="list-style-type: none"> <li>1 Sweeping</li> <li>2 Cloth strip</li> <li>3 Ground run.</li> </ol>	<ol style="list-style-type: none"> <li>1 Sweeping</li> <li>2 Mopping</li> <li>3 Cloth strip.</li> </ol>	<ol style="list-style-type: none"> <li>1 Sweep to remove loose deposits.</li> <li>2 Apply chemicals by mop or spray.</li> <li>3 Use heat under cover as alternative method.</li> </ol>	<ol style="list-style-type: none"> <li>1 Allow ice to melt off in hangar.</li> <li>2 Apply chemicals generously.</li> <li>3 Use heat under cover.</li> </ol>	<ol style="list-style-type: none"> <li>1 Chemicals mop or spray.</li> <li>2 Cloth strip.</li> <li>3 Place aircraft in bright sun.</li> </ol>
CAUTIONS	<ol style="list-style-type: none"> <li>1 Chemicals are wasteful in removing dry snow</li> </ol>	<ol style="list-style-type: none"> <li>1 Check all openings, moving parts, etc., where snow may collect and freeze.</li> </ol>	<ol style="list-style-type: none"> <li>1 Check surfaces for frozen snow after wet or dry snow has been removed.</li> </ol>	<ol style="list-style-type: none"> <li>1 Check all openings and movable parts.</li> </ol>	<ol style="list-style-type: none"> <li>1 Do not underestimate effect of frost. Remove from top and bottom of all flight surfaces and antennas.</li> </ol>

DEPOSIT	DRY SNOW	WET SNOW	FROZEN SNOW	ICE	FROST
CAUTIONS (Cont'd)	2 Check all air intakes and openings for blown snow.	2 Dry surface after removal of snow.  3 Check for frozen slush on underside of surfaces.	2 Do not heat surfaces over 160°F.  3 Check lubrication of bearings, etc., on control surfaces as per para. 11(2).	2 Check for run-off water that has frozen between or on underside of surfaces.  3 Check lubrication of bearings, etc., on control surfaces as per para. 11(2).	2 Check lubrication of bearings, etc., on control surfaces as per para. 11(2).