

APPLICATION OF DECALCOMANIAS

PURPOSE

1 The purpose of this Engineering Order is to outline the procedure for the application of decalcomanias to aircraft exterior and interior surfaces.

TYPES OF DECALCOMANIAS

2 There are three types of decalcomanias for use on aircraft surfaces. These types are as follows:

- (a) Water applied decalcomania to Specification 63-GP-2a Type I.
- (b) Varnish applied decalcomania to Specification 63-GP-2a Type II.
- (c) Pressure sensitive decalcomania MAT9-1 Type III and IV.

POLICY

3 MAT9-1 Type III and IV decalcomanias only may be applied to aircraft external surfaces. The use of types I and II decalcomanias to aircraft external surfaces creates a hazard to flight safety.

4 Units purchasing squadron crests for use on exterior of aircraft in accordance with EO 05-1-2U shall ensure they are to Specification MAT9-1 Type III and IV.

APPLICATION OF WATER DECALCOMANIAS

5 The following items are required for the application of water applied decalcomanias to Spec. 63-GP-2a.

- (a) One gallon container.
- (b) Dry cloths or sponge.
- (c) Detergent (Item 6).
- (d) Plastic squeegee (Item 8).

6 Apply decalcomanias as follows:

- (a) Mark out the surface area on which the decalcomania is to be applied.
- (b) If this surface area contains breaks and protrusions such as hinges, door opening, flanges etc., cut the decalcomania prior to application and apply in smaller sections.
- (c) Thoroughly mix two or three level teaspoons of detergent (Item 6) in one gallon of cold water. Stronger solutions should be avoided as they will cause deterioration of the decalcomania.
- (d) Start the removal of a small section of the paper backing. Then hold the emblem face down on a clean surface and remove the backing, a small area at a time.

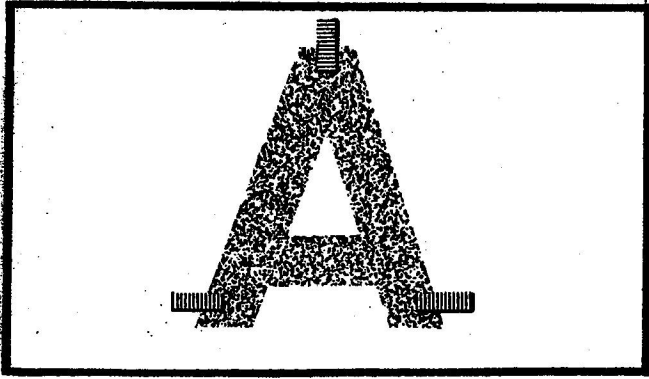


Figure 1

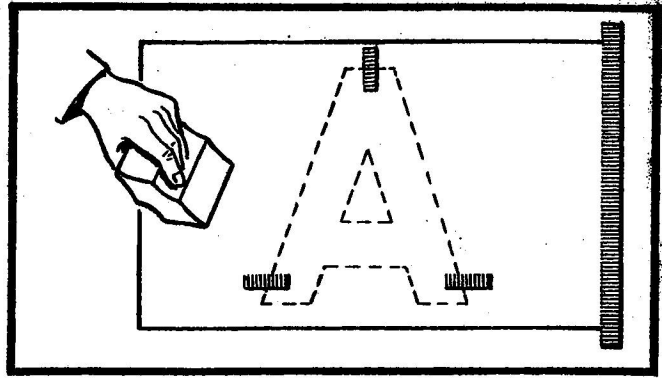


Figure 2

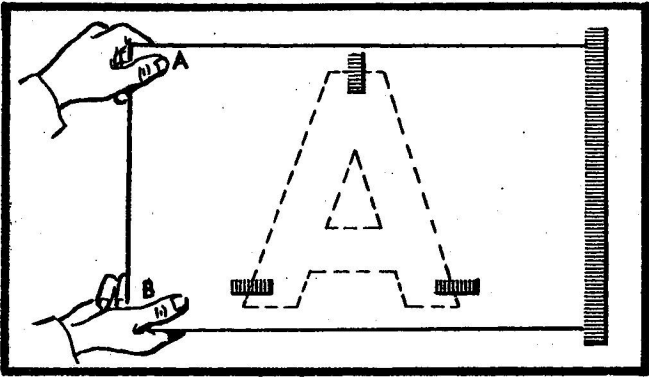


Figure 3

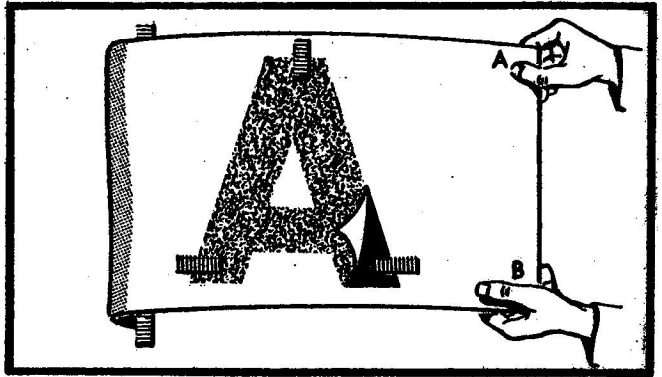


Figure 4

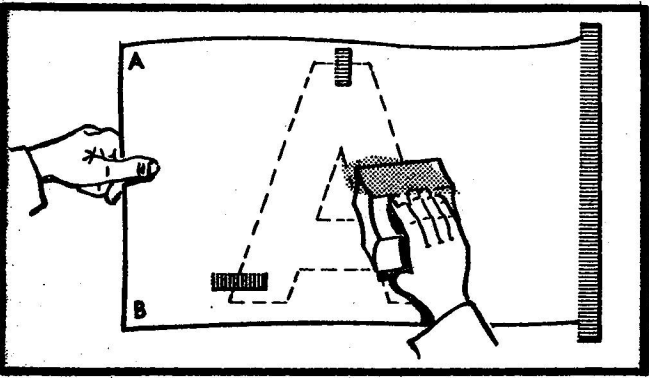


Figure 5

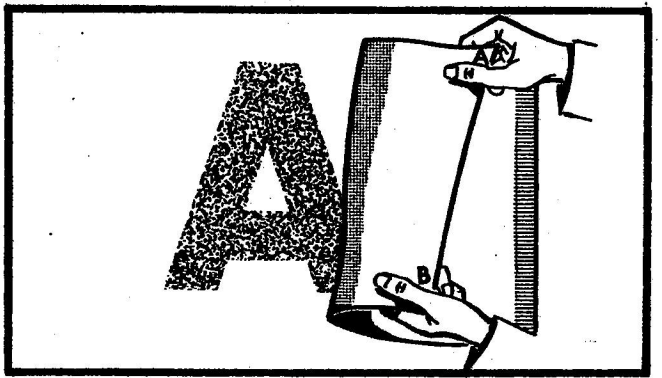


Figure 6

- (e) Flood adhesive side with the wetting solution prepared in paragraph 6(c). This will prevent the adhesive side from sticking to itself should a wrinkle occur.
- (f) Then, flood the aircraft surface on which the decalcomania will be applied with the wetting solution of paragraph 6(c) above.
- (g) Position the emblem. Squeegee from top of emblem to bottom using light overlapping strokes to smooth out the emblem.

NOTE

When applying emblems using the water method it is desirable to wrap several thicknesses of soft cloth over squeegee to avoid hairline scratches.

- (h) Dry entire area with cloth and resqueegee with firm overlapping strokes. Dry with cloth.
- (j) Work out any blisters with squeegee. If blisters are persistent puncture with pin and then squeegee.
- (k) Allow emblem to dry then resqueegee to assure complete adhesion.
- (m) Allow emblem to dry thoroughly for 24 hours. Then coat entire emblem with clear lacquer (Item 5) overlapping the adjacent surface to a quarter of an inch.

APPLICATION OF VARNISH DECALCOMANIA

7 The procedure for the application of Type II varnish applied decalcomanias to Spec. 63-GP-2a is the same as Type I above subject to the following exceptions.

- (a) Transfer varnish (Item 9) is required.
- (b) Following the removal of the backing as described in paragraph 6(d) apply one very even thin coat of transfer varnish (Item 9) on the adhesive side of the decalcomania.
- (c) Allow the transfer varnish to become tacky prior to proceeding as outlined in paragraph 6(e) and following.
- (d) After application of decalcomania remove surplus cement around edges, with a naphtha saturated rag. Wipe dry with soft cloth.

APPLICATION OF PRESSURE SENSITIVE DECALCOMANIAS

8 The following items are required for the application of Type III and IV pressure sensitive decalcomanias to Spec. MAT9-1 (Item 1).

- (a) Plastic squeegee (Item 8).
- (b) Masking tape (Item 10).
- (c) Application tape (Item 4).
- (d) Clean cloth.

9 Apply pressure sensitive decalcomanias as follows:

- (a) Mark out the surface area on which the decalcomania is to be applied.

- (b) Clean painted surfaces by wiping with clean cloths and toluene (Item 2). Then wipe the surface dry with clean dry cloths. For unpainted aluminum surface, degrease by wiping with clean cloths and thinner (Item 3). Then wipe dry with a clean dry cloth. Etch the area to which the decalcomania is to be applied with phosphoric acid treatment as specified in EO 05 1-2AH. Rinse thoroughly by wiping with clean cloths moistened with water and wipe dry. Blow water out of all seams and joints with compressed air.
- (c) Separate the paper liner of the decalcomania at one corner only. To start, part the film from the liner using the thumb, or a piece of masking tape then bend the corner. This will make it easier to remove later.
- (d) Tape the decalcomania into position with small strips of masking tape, see Figure 1.
- (e) Cut a piece of application tape (Item 4) 4 inches larger in both dimensions than the decalcomania. Place it over the decalcomania and wipe down with the plastic squeegee. Put a strip of masking tape on one edge to serve as a hinge, see Figure 2.
- (f) Lift corners marked A and B in Figure 3. Keeping the application tape (Item 4) taut, pull firmly to the right. The decalcomania and tape will come up together. Continue pulling until the entire decalcomania is separated from the surface.

NOTE

Do not remove the tape hinge.

- (g) Fold the application tape (Item 4) over the hinge so that the paper liner on the decalcomania is exposed. Take care not to pull off the hinge. Now remove the paper liner, see Figure 4.
- (h) Swing decalcomania back into position, see Figure 5, but do not let it touch the surface until the plastic squeegee presses it down. Wipe over the entire application tape surface. Heavy pressure on the film is required for good contact with the application surface. Using heavy pressure and a wiping motion, draw plastic squeegee across film at an angle of 60° to the surface. Start wiping at the centre of one edge. Wipe toward the top edge and back down over the same area beyond the bottom edge. Always wipe at least half an inch beyond the edges to obtain good edge adhesion. Proceed across film with parallel, overlapping vertical strokes, exerting maximum pressure at all times.

NOTE

Be sure all edges are adhered.

- (j) Lift corners marked A and B in Figure 6, and carefully pull the application tape (Item 4) from the decalcomania.
- (k) Immediately re-wipe the decalcomania with plastic squeegee to assure good edge adhesion.
- (m) Any blisters caused by trapped air should be punctured with a pin or blade, and the air worked out with the finger or plastic squeegee. This should be done immediately after completing the application.
- (n) At this point, all openings covered by the decalcomania shall be cut out. All edges and areas surrounding rivets should then be pressed down using the plastic squeegee or a small roller.

NOTE

MAT9-1 Type III and IV decalcomanias are so strong and flexible that they may be pulled up immediately if an error in application is made. Should the film be stretched or distorted, allow it to regain its original shape and size before re-applying it.

(p) Finally, after applying the decalcomania, all edges shall be sealed with clear lacquer (Item 5). The width of the seal shall be one quarter inch and shall be divided equally between the surface of the decalcomania and the adjacent surface.

REMOVAL OF DECALCOMANIAS

10 Remove the Type I and II decalcomania to Spec. 63-GP-2a by scraping it with a putty knife, sharp pocket knife or razor blade.

11 Remove the Type III and IV decalcomania by rubbing with a cloth saturated with methyl-ethyl-keytone (Item 7). Where decalcomanias have to be removed from painted surfaces, ensure that the methyl-ethyl-keytone does not spread beyond the area of the decalcomania. After the decalcomania has been removed, examine the painted surface carefully to determine whether the solvent has removed any of the paint. If the paint film has deteriorated in any way, it must be stripped and the affected area repainted.

INSPECTION

12 Reject and replace decalcomania which, after application, exhibit any of the following defects:

- (a) Tears or wrinkles.
- (b) Air blisters which cannot be smoothed out.
- (c) Poor adhesion or inadequate edge contact.
- (d) Discolouration.

Item Number	Material	RCAF Ref.	Specification	Manufacturer
1	Decalcomania	Class 7690	MAT9-1 Type III	Sampson Matthews Ltd 1165 Leslie Street Don Mills Toronto
2	Thinner Toluene	33A/467	TT-T-548A	
3	Thinner Etch Primer Ethanol	34A/6810-21-802-3438	MIL-C-15328A	
4	Tape, Application Scotch Brand No. 343	33G/8135-21-800-9530		Sampson Matthews Ltd 1165 Leslie Street Don Mills Toronto
5	Lacquer Clear	33A/8010-21-805-6744	1-GP-159 (Type I)	
6	Detergent General Purpose	33CM/7930-21-803-6785	2-GP-103	

Item Number	Material	RCAF Ref.	Specification	Manufacturer
7	Methyl-Ethyl-Ketone	33C/520	15-GP-52	
8	Plastic Squeegee	29/7920-21-800-5144		
9	Varnish Transfer	33A/498		Canada Decalcomania Co. Ltd.
10	Masking Tape 1"	33G/103	53-GP-79	

ISSUED ON AUTHORITY OF THE CHIEF OF THE AIR STAFF

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