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NONDESTRUCTIVE TEST MANUAL

PART 9 - THERMOGRAPHY

OUTBOARD FLAP TRAILING EDGE WEDGE AND INBOARD FLAP COVE PANELS

1. Purpose

- A. Use this procedure to examine the trailing edge wedge of the outboard flaps and the cove panels of the inboard flaps for water. The trailing edge wedge and the cove panel are honeycomb parts.
- B. This procedure uses a "portable vacuum chamber" to do the liquid crystal thermography inspection of these parts. It is an approved alternative to the X-ray and electronic thermography procedures.
- C. The vacuum bag or couplant attachment procedures specified in par. 5 of Part 9, 51-00-02, are satisfactory alternatives to the portable vacuum chamber procedure identified in this procedure.
- D. Service Bulletin reference: 767-57-0061, 767-57-0062

2. Equipment

- A. Refer to the general procedure for liquid crystal inspections, Part 9, 51-00-02 for equipment data.
- B. Prepare the inspection result templates that are used during the inspection.
 - (1) Cut repair bag material (or equivalent transparent material) to dimensions of 12 x 14 inches (305 x 356 mm). These repair bag sheets will be used as templates to make a record of the water locations identified during the inspection.
- C. Hot air guns are recommended as the heat source for this inspection. The hot air gun helps the inspection result template to fully touch the inspection surface for good heat transfer during the inspection. Refer to your local safety instructions for the safe use of heat guns around airplanes.
- D. Reference Standard
 - (1) Refer to Part 9, 51-00-02, par. 2.D., for data about reference standard NDT1046.

3. Preparation for Inspection

- A. Refer to Figure 1 and Figure 2 for the inspection areas.
- B. Clean the inspection areas. Remove loose paint, dirt, grease and moisture from the inspection surface.
- C. Refer to Part 9, 51-00-02, Part 9, 51-00-02, par. 3.C., to make a selection of the correct liquid crystal sheet.
- D. Attach the liquid crystal sheet to the polyurethane window on the vacuum frame. Make sure that the shiny side of the liquid crystal sheet touches the polyurethane window.
- E. Attach a compressed air hose to the venturi on the vacuum frame. The venturi changes the compressed air into a vacuum. Control the vacuum with the switch on the vacuum frame.

4. Instrument Calibration

- A. Refer to Part 9, 51-00-02, par. 4., for calibration instructions.

5. Inspection Procedure

- A. Apply compressed air to the venturi on the vacuum frame to attach the vacuum frame to the lower surface and outboard edge of the trailing edge wedge (of the outboard flap). See the "first position" Figure 3.
- B. Make a mark on the flap above the frame to identify the edge of the liquid crystal sheet. Use an approved marker.

NOTE: This mark identifies the edge of the liquid crystal sheet to help make sure that the subsequent vacuum frame inspection locations will overlap this position by a minimum of 1 inch (25 mm).

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- C. Use the "Portable Vacuum Chamber" inspection procedure specified in par. 5.A.(2) of Part 9, 51-00-02, to examine the part. During the inspection, do the steps that follow to make a record of the water locations:
- (1) Make marks on the surface of the inspection part at the corners of the vacuum frame. See Figure 4, Detail A. Use an approved marker.
 - (2) Remove the vacuum frame.
 - (3) Write an identification number on the surface of the part that is inside the corner marks made in Paragraph 5.C.(1). See Figure 4, Detail B.
- NOTE: Use a different identification number for each vacuum frame position that gives a water indication.
- (4) Make two alignment marks on the surface of the inspection part at opposite corners inside the corner marks made in Paragraph 5.C.(1). See Figure 4, Detail B. These alignment marks will be used with the inspection result template.
 - (5) Attach the vacuum frame to the inspection surface again. Make sure the vacuum frame is inside the corner marks that were made in Paragraph 5.C.(1).
 - (6) Put tape on the edges of the inspection result template and attach the inspection result template to the vacuum frame (Figure 4, Detail C).
 - (7) Put alignment marks on the inspection result template that are aligned with the alignment marks on the part. See Figure 4, Detail C.
 - (8) Write the identification number for the inspection area on a corner of the inspection result template. See Figure 4, Detail C.
 - (9) Remove the inspection result template.
- (10) Apply heat to the liquid crystal sheet and continue to do the inspection as specified in Part 9, 51-00-02, par. 5.A.(2). When the water indications occur again on the liquid crystal sheet, do the steps that follow:
- (a) Use tape and the alignment marks to attach the inspection result template to the vacuum frame again.
 - (b) Continue to heat the liquid crystal sheet. Adjust the distance between the heat gun and the part so you continue to see the water indication.
 - (c) Make a mark with a pencil to identify the water indications on the inspection result template.
 - (d) The inspection result template is the permanent record that will be used during the repair process to identify the location of the water.
- D. Move the vacuum frame to the adjacent inspection area. Make sure the liquid crystal sheet overlaps the last inspection area by a minimum of 1 inch (25 mm).
- E. Do Paragraph 5.B. thru Paragraph 5.D. until the trailing edge wedge has been fully examined.
- F. Do Paragraph 5.A. thru Paragraph 5.E. to examine the trailing edge wedge of the outboard flap on the other side of the airplane.
- G. Attach the vacuum frame to the cove panel of the inboard flap. Make sure the vacuum frame is on the upper surface and outboard end of the cove panel.

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H. Examine the cove panel for water as specified in Paragraph 5.B. thru Paragraph 5.D.

NOTE: Water indications that occur as you examine the upper surface of a part are usually not as good as the water indications that occur when you examine the lower surface. This is because the water in the honeycomb usually does not touch the upper surface of the part.

NOTE: Internal fiberglass washers in the cove panel will cause a cold indication that can be equivalent to a water indication. These areas are identified by their circular shape (approximately 3 inches in diameter) and the fasteners that are centered on the indication.

I. Do Paragraph 5.B. thru Paragraph 5.D. to examine the cove panel of the inboard flap that is on the other side of the airplane.

6. Inspection Results

A. Refer to Part 9, 51-00-02, for instructions on how to make an analysis of the inspection results.

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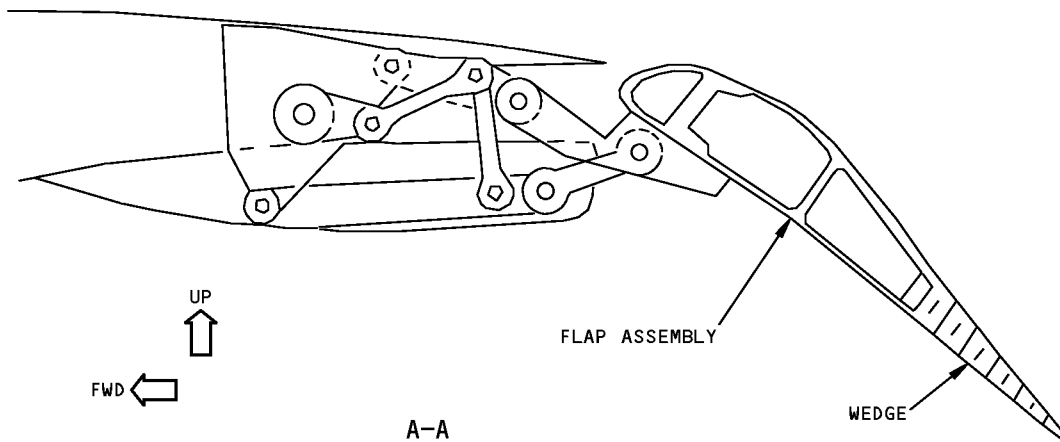
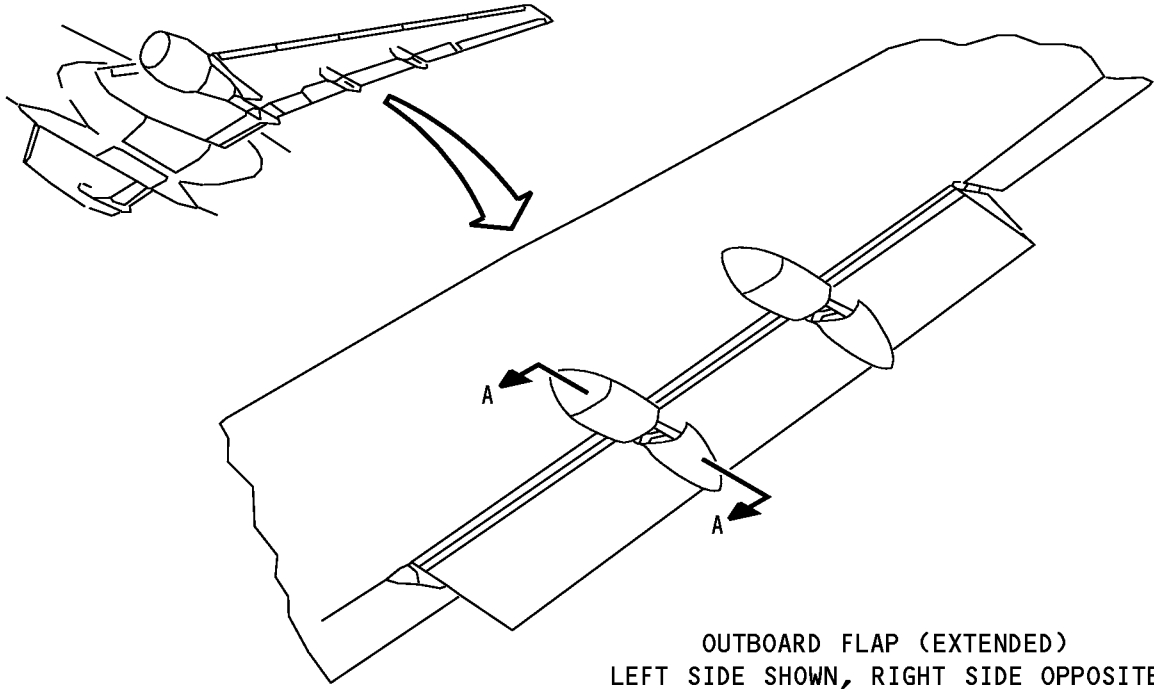
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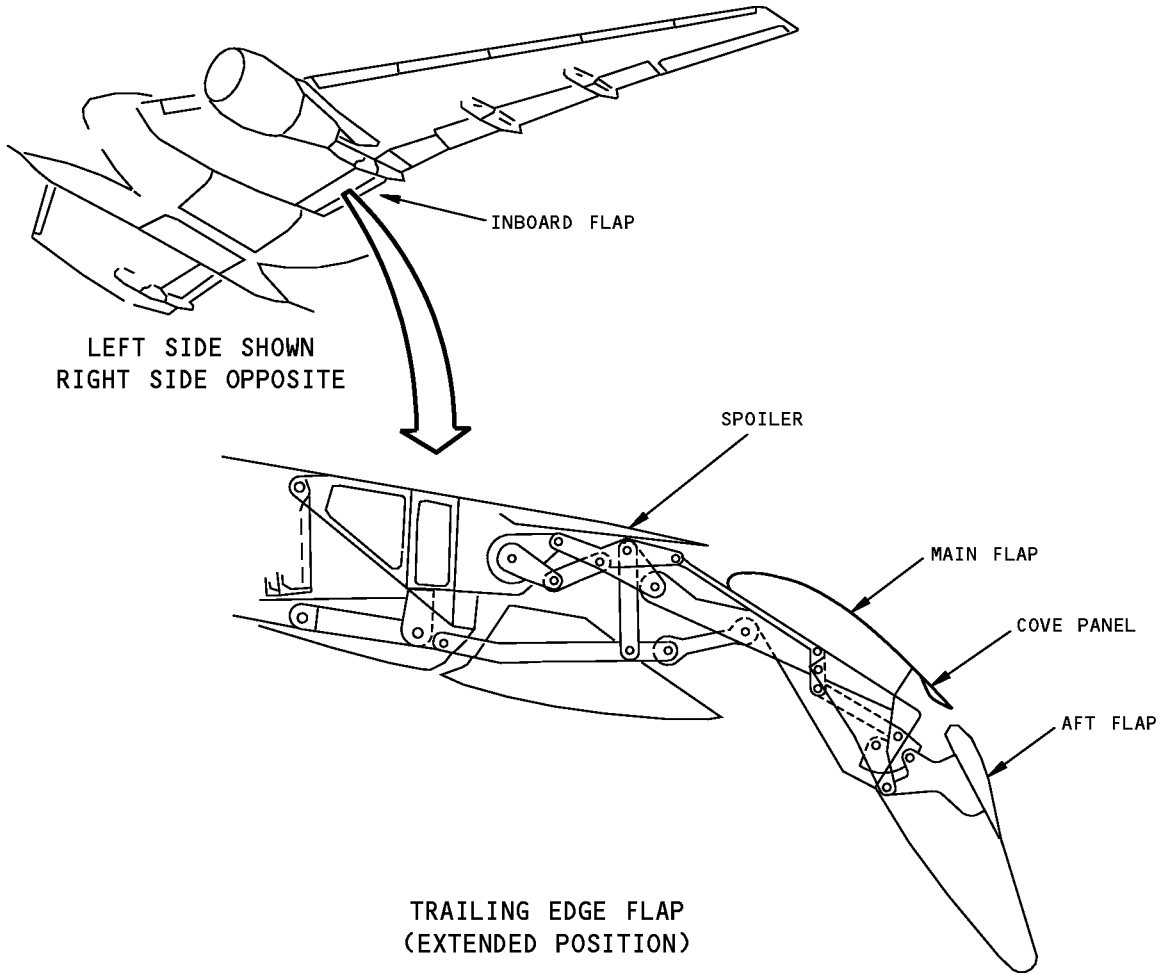


**Flap Wedge
Figure 1**

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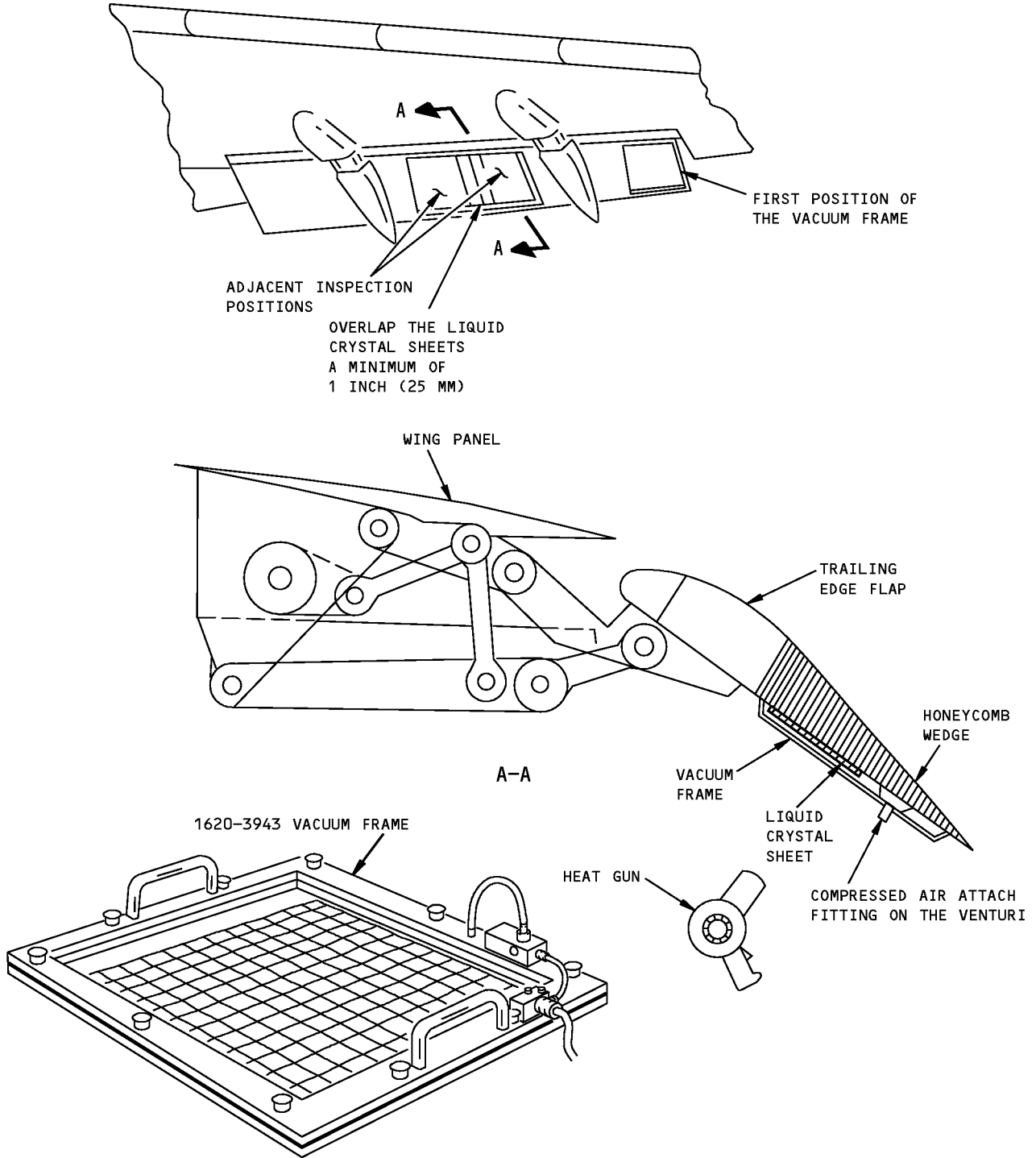


**Cove Panel
Figure 2**

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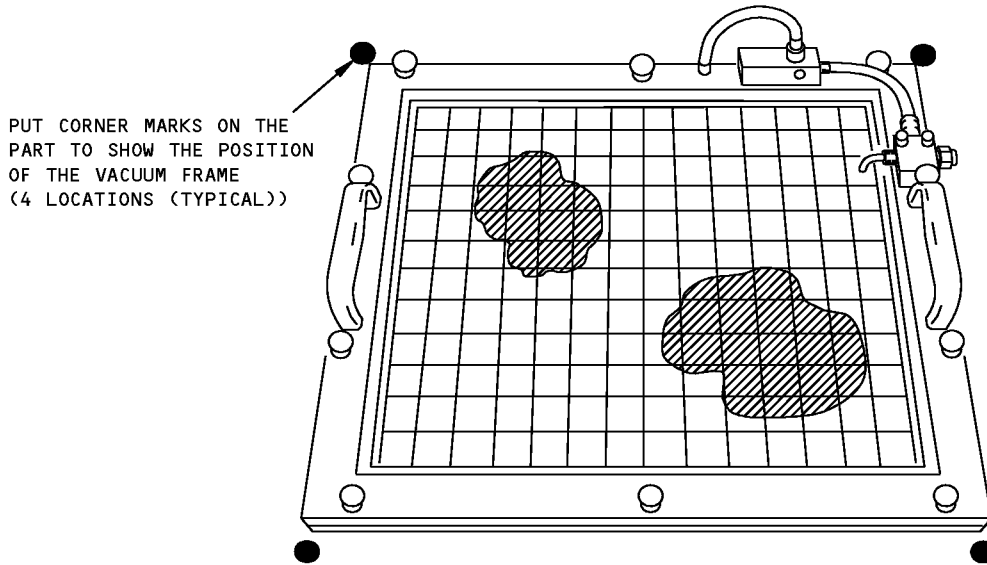
VACUUM FRAME MANUFACTURER: TORR TECHNOLOGIES INC.,
14350-022nd ST. N.W., AUBURN, WA., 98001-3330,
TELEPHONE: (253) 735-9115, FAX: (253) 735-0437

**Example of How to Position the Vacuum Frame
Figure 3**

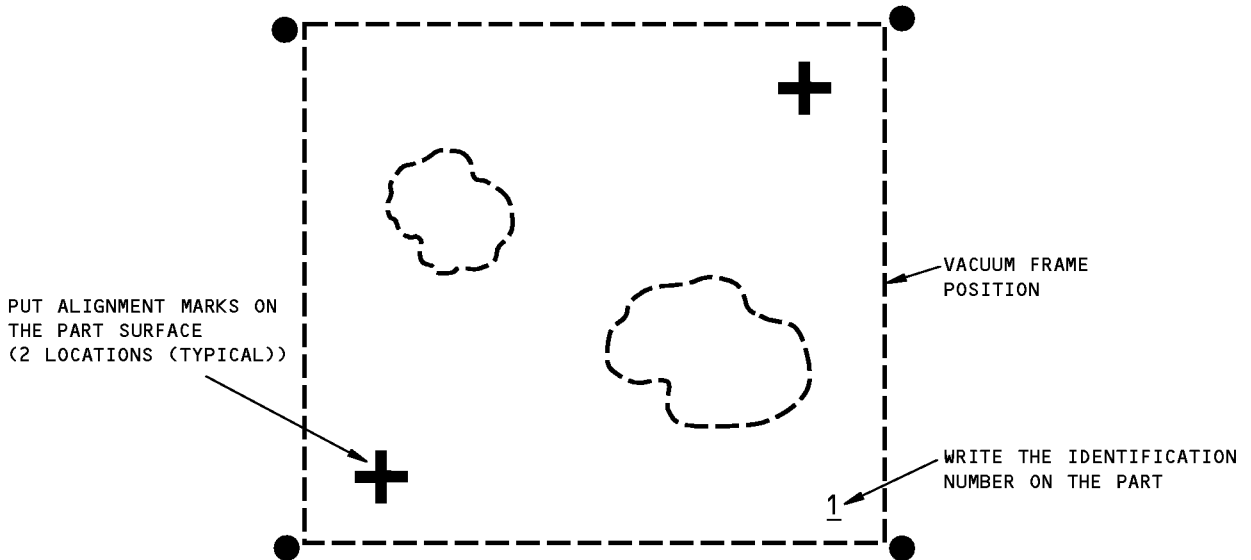
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DETAIL A



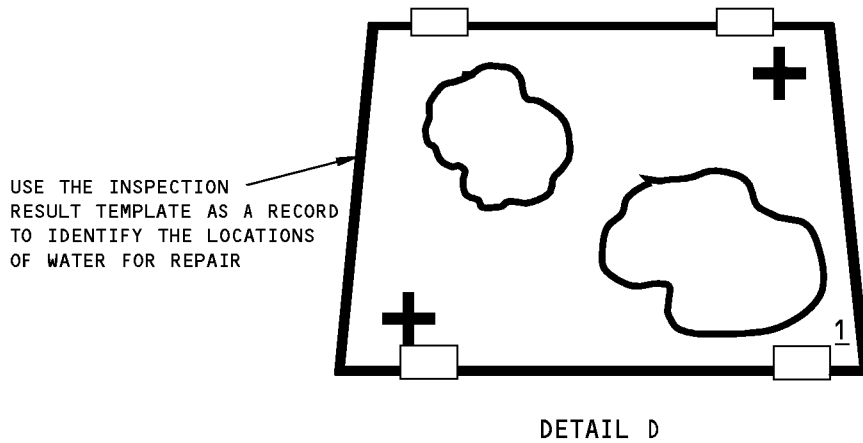
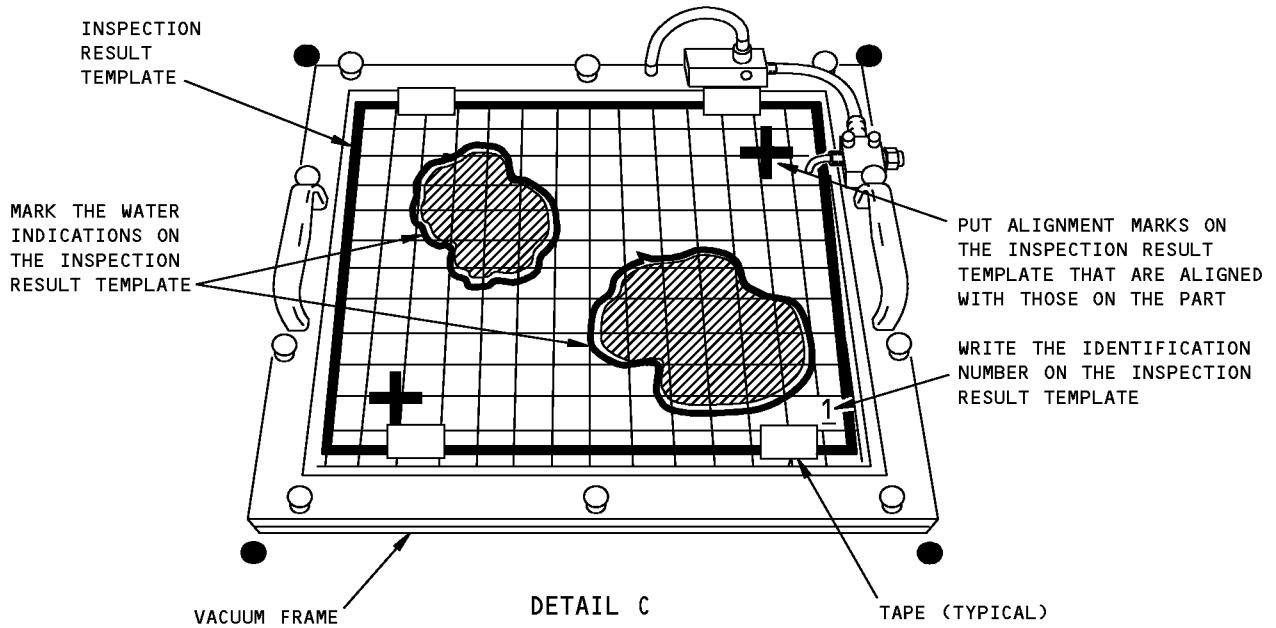
DETAIL B

**Procedure to Record the Water Indications
Figure 4 (Sheet 1 of 2)**

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Procedure to Record the Water Indications
Figure 4 (Sheet 2 of 2)

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