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Customer Support Specification CSS-501
3M™ 8542HS Polyurethane Tape Installation

July 31, 2020

Revision B
Revision B Date: September 4, 2020

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REVISIONS

	DATE	DESCRIPTION	APPROVED
N/C	07/31/20	Initial Release	DR
A	08/06/20	Revised 2. INTRODUCTION and paragraph 3.3 to allow installation of polyurethane tape over any abrasion strip cracks.	DR
B	09/04/20	Installation of polyurethane tape now optional for abrasion strip joint, required to protection of cosmetic cracks. Added notes on rain vs abrasive environments. Added edge sealant repair procedure	DR

TABLE OF CONTENTS

1. EQUIPMENT AND MATERIALS

1.1 CSS-501-PTK1 Polyurethane Tape Kit (obtain kit from Van Horn Aviation or source individual components locally):

1.1.1 3M™ 8542HS polyurethane tape (inboard and outboard strips)

1.1.2 3M™ 86A pre-saturated adhesion promoter wipe

1.1.3 3M™ DP190 epoxy adhesive OR 3M™ 2110 Repair Paste OR 3M™ 2220 Repair Paste

1.1.4 Nozzles for adhesive application (style of nozzle applicable to edge sealant provided)

1.1.5 220 grit sandpaper

1.2 3M™ Scotch-Brite™ surface conditioning disc (maroon or blue)

1.3 220 – 320 grit sandpaper

1.4 Single edge razor blade

1.5 Soft polyethylene squeegee

1.6 Masking tape (vinyl)

1.7 Masking tape (general purpose green, yellow, off-white)

1.8 Cleaning solvent (acetone, MEK, MPK, denatured alcohol)

1.9 Lint free cloth

1.10 Permanent marker

2. INTRODUCTION

NOTE: This specification is applicable to the 20631000-101, 20633000-101 and 20635000-501 VHA main rotor blade assemblies. The installation of polyurethane tape is considered a minor repair by Van Horn Aviation L.L.C. and shall be recorded as such in the historical record of the blade assembly.

At time of production, some 20633000-101 and 20635000-501 Van Horn Aviation (VHA) main rotor blades are covered with a sprayed-on elastomeric compound or covered with a layer of 3M™ 8542HS polyurethane tape at the abrasion strip joints. 20631000-101 VHA main rotor blades did not utilize this protective covering over the abrasion strip joints. The purpose of the abrasion strip coverings is to protect the abrasion strip joints from environmental conditions.

Van Horn Aviation has found that this protective covering is not required at the abrasion strip joint. However, if cracks are found in the abrasion strips, application of polyurethane tape is required to prevent water intrusion.

All non-voided cracks in abrasion strips shall be protected by applying a layer of polyurethane tape, sealed with edge sealant adhesive

If voids are found adjacent to cracks in abrasion strips, contact Van Horn Aviation for further instructions.

If an existing application of this protective covering is damaged, the operator may remove the covering per Section 3.1 or 3.2 and operate the blades without protection at the abrasion strip joints. Operation in heavy rain environments may speed up the degradation the elastomer or polyurethane.

However, the protective coverings do perform well against abrasive elements, and at the operator's discretion, may be repaired, replaced, or installed at the abrasion strip joints.

The instructions in this specification may be accomplished in the field.

3. PROCEDURE

To ensure good adhesion of the tape to the blade surfaces, all existing coverings (elastomeric or polyurethane tape) must be removed from the abrasion strip and painted surfaces before installing new polyurethane tape.

3.1 Removal of elastomeric coating:

3.1.1 On the bare abrasion strip surface only, use a single edge razor blade to cut off/skim off the elastomeric coating.

3.1.2 On the painted surfaces, use a rotary tool with a maroon or blue Scotch-Brite™ pad and abrade the elastomeric coating until it is removed. Do not abrade through the clearcoat or paint layers.

3.1.3 Lightly scuff the abrasion strip by hand with a Scotch-Brite™ pad to remove any remnants of the elastomeric compound and to remove any other surface contaminants.

3.1.4 Clean the removal areas with acetone, MEK, MPK or denatured alcohol and a clean, lint free cloth.

3.2 Removal of polyurethane covering:

3.2.1 Slowly peel the existing tape up by hand using any free edge where the sealant is missing, or where the edge is exposed. Avoid damaging the paint.

3.2.2 If no free edge is available, lightly score through the leading edge of the tape along the leading edge of the abrasion strip using a single edge razor blade. Take care to not score into the abrasion strip.

3.2.3 Peel the cut edges of the polyurethane tape apart, and slowly peel the tape off the blade to avoid damaging the paint.

3.3 Installation of polyurethane tape:

Use the following procedure to install pre-cut polyurethane tape from the CSS-501-PTK1 kit over the inboard and outboard abrasion strip joints. When required, this procedure may be adapted to install smaller strips of polyurethane tape anywhere else on any of the abrasion strips. Notify Van Horn Aviation of any cracks before covering with polyurethane tape and edge sealant.

3.3.1 Clean the tape installation areas on the abrasion strip joints and painted surfaces with acetone, MEK, MPK or denatured alcohol. Surfaces must be free from all contaminants so that the polyurethane tape will adhere properly.

3.3.2 The pre-cut tape has two straight edges and two curved edges. Do not remove the backing material from the polyurethane tape yet.

3.3.3 Dry fit the tape to the blade. The centerline of the tape must be aligned to the leading edge of the abrasion strip. Overlap the tape onto the main abrasion strip by 2.0 inches. The remaining length of tape will overlap onto the inboard or tip

abrasion strip. The straight edges of the tape must overlap the trailing edges of the abrasion strips on the upper surface of the blade.

3.3.4 Hold the polyurethane tape onto the upper surface of the blade with masking tape, then stretch the polyurethane tape around to the lower surface. The polyurethane tape should lay tight against the blade, with no wrinkles, and must lay tight over the abrasion strip joint. Repeat this dry fit procedure until comfortable with how the tape conforms to the blade. When the tape is permanently installed, it becomes difficult to reposition the tape. Hold the polyurethane tape in its final location and outline the polyurethane tape with a contrasting permanent marker. Reference Figure 1.

3.3.5 Remove the polyurethane tape and any masking tape from the blade.

3.3.6 Use masking tape and mask back 1/16 – 1/8 inches from the marker line.

3.3.7 Scuff the painted surface within the masked area using a maroon Scotch-Brite™ pad or 220 - 320 grit sandpaper. Do not scuff completely through the clearcoat or paint layer.

3.3.8 Remove all masking tape and wipe the scuffed area thoroughly with acetone, MEK, MPK or denatured alcohol and a clean cloth to remove all sanding residue. The surface must be completely dry before continuing.

3.3.9 Temporarily locate the polyurethane tape to the blade and mark the outline of the tape with dots using a permanent marker. Remove the polyurethane tape from the blade.

3.3.10 Apply 3M™ Adhesion Promoter 86A to the scuffed paint and metal on the upper and lower surfaces of the blade. The preferred application method is to use pre-moistened 3M™ 86A Adhesion Promotor wipes. Alternatively, a clean, lint free cloth may be moistened with 3M™ 86A Adhesion Promotor from the pint can version supplied by 3M™. Apply only enough to wet the surface. Wipe in one continuous motion, do not re-wipe (the wipe will stick to the paint).

NOTE: It is important that entire prepared area receive the adhesion promoter. Make sure the edge of the abrasion strip lap joint is wiped with adhesion promoter so that the polyurethane tape does not detach later. After the adhesion promoter has been wiped onto all the prepared surfaces, wait 5-10 minutes.

NOTE: Return the wipe to the pouch immediately after using so that it does not dry out. The wipe may be resealed in its pouch and reused on all the other abrasion strip joint locations. Use only a small portion of the wipe for each application. The single wipe has enough solution to wipe 2 - 4 polyurethane tape locations.

3.3.11 Make sure to have clean, dry hands for the next step. Do not use gloves - gloves will stick to the polyurethane tape and damage the adhesive layer.

3.3.12 Peel the backing material from the polyurethane tape. Starting on the upper surface of the blade, attach the straight edge corner of the tape to the wiped paint surface, leaving a 1/16 – 1/8 inch space of prepared surface for edge

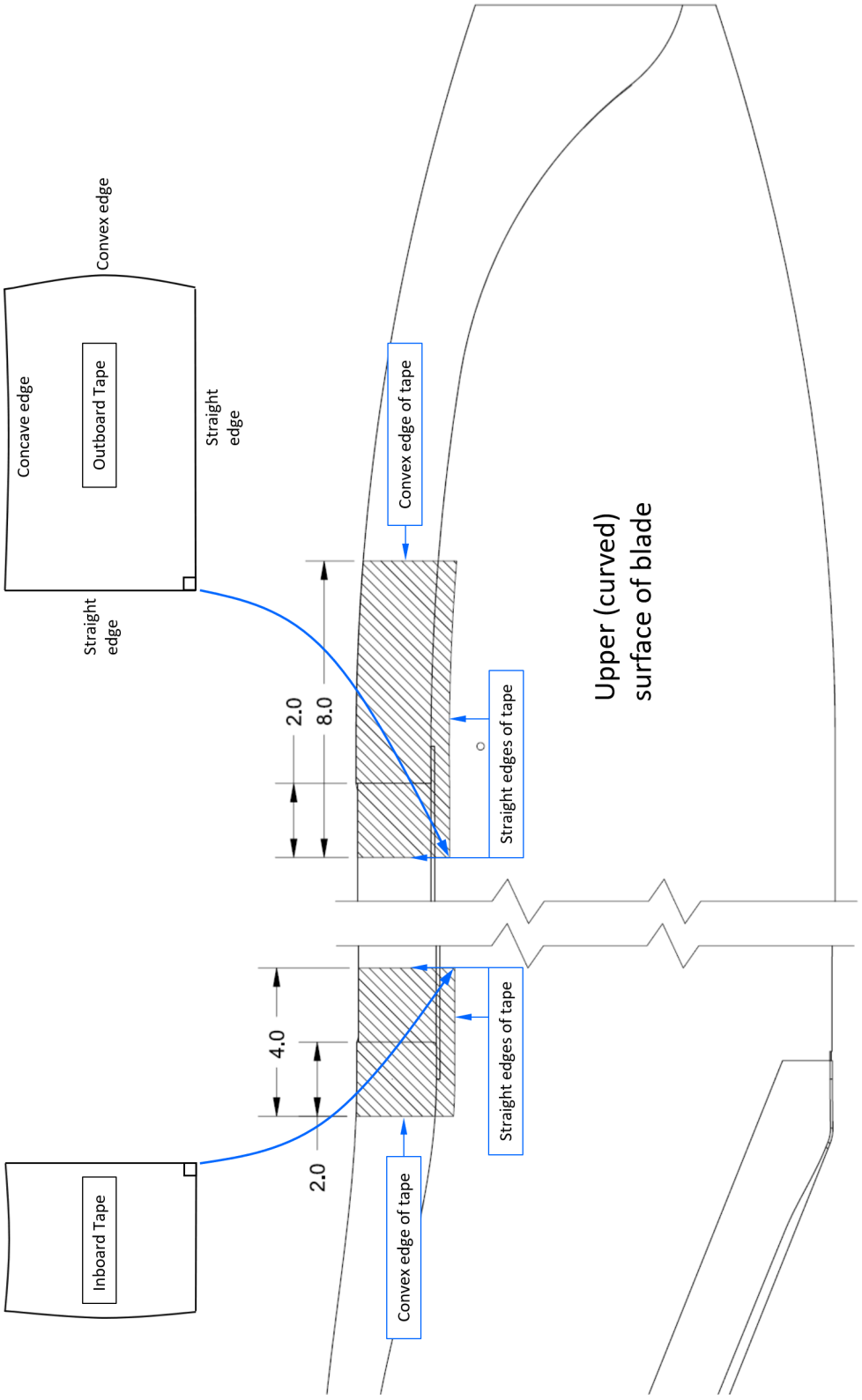

Figure 1 ~ Alignment and Location of Polyurethane Tape

sealant. Pull the tape slightly and stretch it around the blade, making sure there are no air bubbles, wrinkles or creases as the tape stretches against the abrasion strip joint. Smooth the tape by hand or with a soft polyethylene squeegee. Firmly press down all edges of the tape. Do not attempt to reposition the tape. Make sure that the tape is applied only to the previously prepared surfaces.

3.3.13 Mask around the polyurethane tape for edge sealant: mask back 1/16 – 1/8 inches around the entire perimeter of the polyurethane tape. Mask the inside of the polyurethane tape, set back by 1/16 – 1/8 inches from the edges. Reference Figure 2.

3.3.14 When all the edges are masked, apply a bead of 3M™ DP190, 3M™ 2110 Repair Paste or 3M™ 2220 Repair Paste. If operation of the aircraft occurs in rain environments, it is recommended to use DP190 to seal the edges. Smooth the sealant immediately with a tongue depressor, soft polyethylene squeegee or gloved finger.

3.3.15 Allow adhesive to cure for a short period of time (10 – 30 minutes depending on ambient temperature) before removing the masking tape. Adhesive should not sag when the masking tape is removed, but still be able to flow slightly to self-level and to provide a smooth transition to the blade and tape surfaces. Reference Figure 3 and Figure 4.

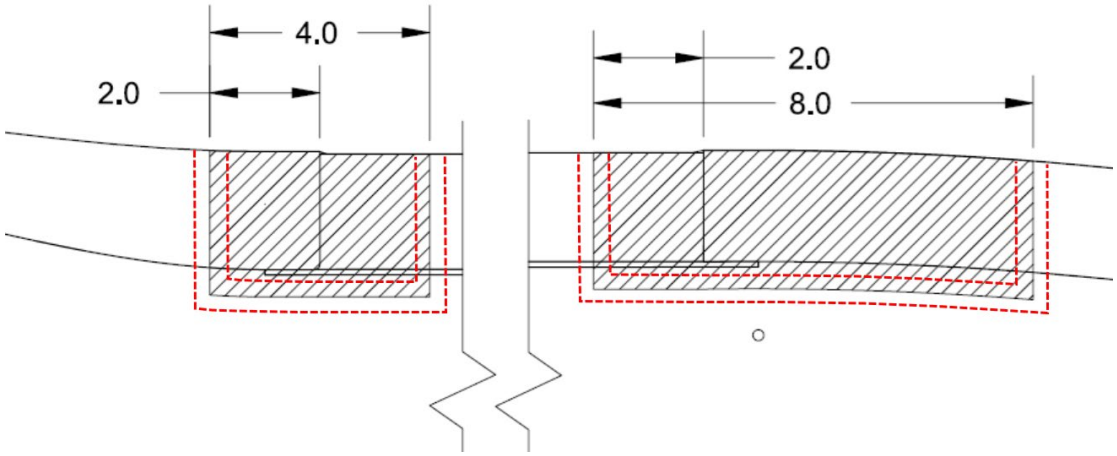

Figure 2 ~ Masking Lines for Edge Sealant

3.3.16 Allow adhesive to cure to full strength per adhesive manufacturer's instructions.

3.3.17 Clean up any excess adhesive before it cures using acetone, MEK, MPK or denatured alcohol and a lint free cloth.

Figure 3 ~ Completed Polyurethane Tape Installation – Tip Abrasion Strip Joint

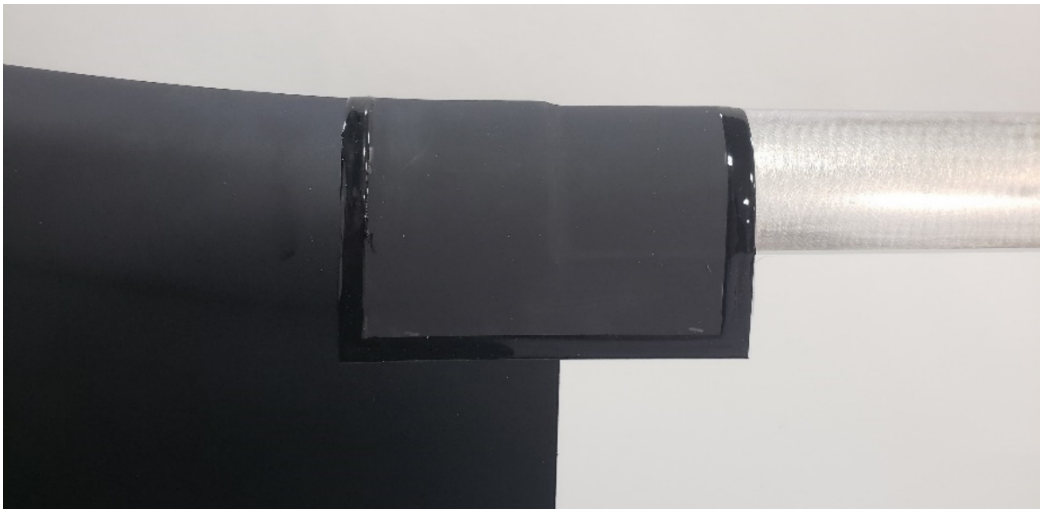

Figure 4 ~ Completed Polyurethane Tape Installation – Inboard Abrasion Strip Joint

3.4 Repair of polyurethane tape or edge sealant:

3.4.1 Damaged edge sealant (3M DP190 Adhesive or 3M 2110 or 2220 Repair Paste) may be repaired with the following process:

3.4.1.1 Sand away the damaged adhesive or repair paste using a maroon Scotch-Brite™ pad or 220 - 320 grit sandpaper. Do not scuff completely through the clearcoat or paint layer.

3.4.1.2 Wipe the scuffed area thoroughly with acetone, MEK, MPK or denatured alcohol and a clean cloth to remove all sanding residue. The surface must be completely dry before continuing.

3.4.1.3 Repeat steps 3.3.13 – 3.3.17 for the local repair area

3.4.2 Damaged polyurethane tape may be repaired in accordance with 3M™ Scotch-Weld Repair Paste 2110 B/A Repair Bulletin:

https://multimedia.3m.com/mws/media/1034143O/3m-scotch-weld-repair-paste-2110-b-a-repair-bulletin.pdf