



Service Bulletin

REMOVE AND REPLACE INBOARD/OUTBOARD TRIM TAB ASSEMBLIES

SUMMARY: The trim tab assemblies installed on the 20633000-101 Van Horn Aviation main rotor blades consist of two identical trim tabs that are bonded together at the tab-to-tab bond area and bonded to the trailing edge of the main rotor blade structure at the tab-to-blade bond area. The trim tabs incorporate a joggle to allow the trim tab to fit over the trailing edge of the blade. Early trim tabs were made of stainless steel sheet that were formed with a shallow joggle line. The shallow joggle inadvertently allowed the trim tabs to be installed too far onto the blade assembly, thereby creating a preload in the bondline of the tab-to-blade bond areas. The preload created the potential for premature microcracking of the adhesive bondline during trim tab adjustments. Once initiated, environmental contaminants and/or flight loads may propagate the cracks into debonds and gradually cause delaminations of the trim tab assembly.

PURPOSE: The purpose of this bulletin is to provide instructions for operators to remove any existing trim tab assemblies from any 20633000-101 Main Rotor Blade Assembly, and to replace them with new pre-bonded 20633130-101/103/105 trim tab assemblies. Operators may elect to replace the existing trim tabs at any time, even without evidence of bondline cracking or trim tab debond/separation.

PART NUMBERS AND SERIAL NUMBERS AFFECTED: All 20633000-101 blade assemblies (FAA STC No: SR 02684LA, Transport Canada STC SH18-69, Brazil ANAC Supplemental Type Certificate STC 2018S11-11) serial numbers A001 thru INDEF.

HELICOPTER MODELS AFFECTED: Bell Helicopters, Inc. Models 206L, 206L-1, 206L-3, 206L-4.

TIME OF COMPLIANCE: Upon notification of the service bulletin, visually inspect the trim tab assemblies within the next 10 flight hours. Perform subsequent visual inspections of the trim tab assemblies at each 100-hour inspection interval in accordance with ICA manual VMM-MR-206L-501. If bondline cracking or debonding/separation of the trim tabs is found, comply with this service bulletin within the next 30 flight hours. For all elective trim tab replacements, the trim tab replacement may be scheduled for any regular maintenance interval where the blades can be removed from the aircraft and when replacement parts are available.

MANPOWER: Compliance with this bulletin on a single main rotor blade assembly will require approximately 10 man-hours. The man-hour estimate is based on the skill level of an experienced mechanic. Eight (8) man-hours are required to accomplish the removal, replacement and paint touch up of the trim tab assembly. Two (2) man-hours are required for track and balance.

WARRANTY POLICY: Upon request, Van Horn Aviation will provide a parts kit containing a preassembled trim tab assembly and clamping caul plates. For blades with in-service trim tab debonds, the replacement parts will be provided at no cost. For operators electing to change their trim tab assemblies absent in-service debonds, the replacement parts will be made available for purchase, with the operator being responsible for cost of shipping.

WEIGHT AND BALANCE: Perform a new static balance after completing the service bulletin. Check blade sweep when blade is reinstalled onto the hub.



Van Horn Aviation, LLC
1510 W Drake Drive
Tempe, Arizona 85283

NOTICE No.: 33000-3R2

DATE: 16 July 2020

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INSPECTIONS AND REWORK:

MATERIAL	
Nomenclature	Source
Adhesive, Epoxy, Magnolia Magnobond 6398	Commercial
Adhesive, Epoxy, EA934NA	Commercial
Adhesive, Epoxy, EA9392	Commercial
Tape, Polyester, Flash Breaker (green or blue)	Commercial
Tape, Masking, (green or yellow)	Commercial
Tape, Foil, Multi-Purpose	Commercial
Sandpaper, 150 – 320 grit	Commercial
Solvent, Cleaning, MEK or MPK or Acetone	Commercial
Primer, Epoxy, High Build, Sandable	Commercial
Paint, Polyurethane (single stage, 2K)	Commercial
Paint, Clearcoat, Polyurethane (gloss, matte, Toughguard NHP)	Commercial
Cloth, Lint Free	Commercial
Solvent, Cleaning, MEK or MPK or Acetone	Commercial
Rubber, Cured Silicon, Heat Resistant	Commercial
Gloves, Powder Free, Nitrile	Commercial

REPLACEMENT PARTS			
Nomenclature	Part No.	Qty	Source
Assembly, Trim Tab	20633130-101	A/R	Van Horn Aviation
Assembly, Trim Tab	20633130-103	A/R	Van Horn Aviation
Assembly, Trim Tab	20633130-105	A/R	Van Horn Aviation

Tools and Equipment	
Nomenclature	Source
Caul Plate, Aluminum, Rubber Backing (P/N 206CS33130-103)	Van Horn Aviation
Heat Gun	Commercial
Metallic ruler	Commercial
Razor blade, Stainless steel	Commercial
Pliers	Commercial
Clamp, C-Clamp, Vise-grip, or Cantilever (preferred)	Commercial
Permanent marker	Commercial



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NOTE: The main rotor blades must be removed from the aircraft to accomplish the service bulletin instructions and must be removed from the main rotor hub to allow access to both the upper and lower surfaces of the blades. A filtered air supply line is recommended for use with all air tools and paint spray guns. Do not oil any air tools prior to work; the oil in the exhaust air will contaminate the bond areas on the blade.

NOTE: If any aspect of this service bulletin is unclear, or if difficulties arise while implementing any of the instructions, contact VHA for additional support before proceeding any further with the work.

A. REMOVE EXISTING TRIM TABS

Use this procedure to remove any existing trim tabs (any style) from any location on the main rotor blade assembly.

- (1) Reference Figure 1 for profiles of the various trim tab installations. Use a razor blade and trace the profile of the trim tab, cutting through the paint layer, upper and lower surface of the blade. Scoring the paint in this way will allow the trim tab to pull cleanly through the paint layer when it is removed. Only cut into the paint layer. Do not cut into the underlying composite layers.

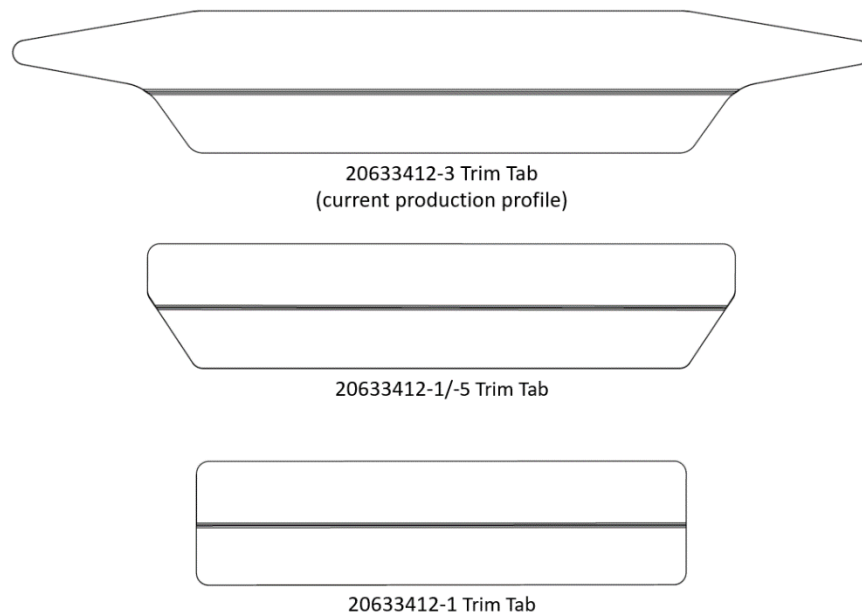


Figure 1 – Trim Tab Profiles

- (2) Use 1 to 2 layers of heat resistant rubber, or 5 to 6 layers of foil tape or masking tape, to mask around the outside of the trim tab profile and onto the blade surface. The masking will protect the blade against direct heat exposure from operation A.(3). Leave all surfaces of the trim tab exposed.



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- (3) Use a digitally controlled heat gun set to 300°F – 350°F and heat the surface of the trim tab assembly to soften the adhesive bond. Move the heat gun continuously to prevent hotspots in the underlying composite structure. If available, use a small diameter nozzle attachment to focus the heat. Keep the heat concentrated only on the trim tab assembly.
- (4) While the trim tab assembly is hot, insert a razor blade into the bondline of the tab-to-tab bond area and separate the two halves. Once the whole tab-to-tab area is separated use pliers to grip a corner of one of the trim tab halves. Slowly pull the trim tab up and away from the blade, while continuously applying heat to the outer surface of the trim tab. Use the minimum amount of pulling force necessary to allow the trim tab to peel away from the blade without pulling up any surfacing film, copper mesh or carbon fiber. Do not apply heat directly to the exposed area of the main rotor blade assembly.
- (5) As required, repeat operations A.(3) and A.(4) to remove the opposite portion of the trim tab.
- (6) Remove all masking material from blade.
- (7) **INSPECTION:** Visually inspect the exposed tab-to-blade bond area for any damage. Document any damage resulting from the trim tab removal. Report any damage or defects to VHA prior to removing adhesive. If not damage or defects found, proceed with operation A.(8).
- (8) **NOTE:** Film adhesive color is red/pink with an embedded synthetic mesh.

Use a combination of 120 – 220 grit sandpaper, 150 – 220 grit 3M™ Roloc™ (or equivalent) discs and 3M Scotch-Brite™ (or equivalent) light grinding and blending discs (maroon or blue) with appropriate equipment set to low speed to remove all old adhesive from the tab-to-blade bond area on both upper and lower surfaces (1.0 inch diameter or smaller discs are recommended). Begin removing the adhesive with a rougher grit sandpaper or maroon blending discs until the adhesive layer has been thinned out, but without exposing the underlying composite material. Switch to finer grit sandpaper or blue blending discs to remove the remaining adhesive. It is acceptable for a thin film of adhesive or small areas of thinned adhesive (approximately 0.50 inch²) to remain on the surface. Stay within the boundaries of the original trim tab installation. Do not damage the surrounding paint or underlying surfacing film, copper mesh or carbon fiber layer. As required, lightly hand sand with 220 grit sandpaper to remove any other surface contaminants from the exposed trim tab area.
- (9) Wipe the exposed surfaces clean with MPK, MEK or acetone and a non-lint cloth. Wipe until the non-lint cloth wipes clean, i.e. no sanding residue visible on cloth.
- (10) **INSPECTION:** Use a 10x – 30x inspection glass and visually inspect the exposed areas of the blade for damage. No nicks, dents or cuts permitted in the extreme trailing edge. If trailing edge damage is found, or if there is damage through to the second skin ply, then report those findings to VHA for further guidance and disposition. Minor surface damage that meets the following criteria may be dispositioned for acceptance as is:



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- a) The combined total area of surface damage in the exposed areas may not exceed 1.0 in² on each side of the blade
 - b) Minor surface damage may consist of medium depth scratches (less than 0.04 inches), missing/damaged surfacing film, missing/damaged copper mesh, and frayed/split/scuffed fibers in the topmost carbon fiber skin ply.
- (11) **INSPECTION:** Verify that the old adhesive has been sufficiently thinned or removed from the tab-to-blade bond area on both sides of the blade. A translucent layer of adhesive may remain on the surface, provided that the remaining adhesive does not significantly add to the thickness of the final adhesive bondline. There should be no synthetic mesh visible in any adhesive that remains. Repeat operations A.(8) – A.(10) if necessary.

B. ENLARGE TAB-TO-BLADE BOND AREA (for installation of new 20633130-103 assembly only)

NOTE: Do not perform the procedure in section B if you do not need to enlarge the tab-to-blade bond area. Perform section B only if replacing 20633412-1/-5 trim tabs with the larger -3 configuration (20633130-103 Trim Tab Assembly) .

- (1) Complete all applicable procedures in Section A. REMOVE EXISTING TRIM TABS.
- (2) Reference Figure 2 for trim tab locations.



Figure 2 – Trim Tab Locations

- (3) Temporarily locate and center a new 20633130-103 Trim Tab Assembly to the tab-to-blade bond areas indicated in Figure 2 (at STA 79.5 and STA 189.0). Trace the outline of the trim tab assembly onto the blade surface with a permanent marker. Remove the trim tab assembly. Reference Figure 3.
- (4) Mask along the outside edge of the traced trim tab profile with masking tape, polyurethane tape or metal foil tape. The tape will protect the existing paint from sanding damage and serve as a visual guide when enlarging the bond area.



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Upper Surface



Lower Surface

Figure 3 – New -103 Trim Tab Assembly Profile Traced onto Blade

- (5) Use light grinding and blending discs (maroon or blue) with appropriate equipment set to low speed to remove all the paint within the trim tab outline. Sand down only to the surfacing film layer (gray color). Do not damage the underlying copper mesh or carbon fiber structure.
- (6) Remove all masking material. Wipe the exposed surfaces clean with MPK, MEK or acetone and a non-lint cloth. Wipe until the cloth is smudge free, i.e. no sanding residue visible on cloth.
- (7) **INSPECTION:** Use a 10x – 30x inspection glass and visually inspect the exposed areas to verify that all paint has been removed and to inspect the exposed surface for damage. Temporarily locate a trim tab assembly to the prepared area to verify that the trim tab assembly will not overlap any paint. No nicks, dents or cuts are permitted in the extreme trailing edge. If trailing edge damage is found, or if there is damage through to the second skin ply, then report those findings to VHA for further guidance and disposition. Minor surface damage that meets the following criteria may be dispositioned for acceptance as is:
 - a) Reference inspection results from operation A.(10). The combined total area of surface damage in the exposed areas may not exceed 1.0 in² on each side of the blade.
 - b) Minor surface damage may consist of medium depth scratches (less than 0.04 inches), missing/damaged surfacing film, missing/damaged copper mesh, and frayed/split/scuffed fibers in the topmost carbon fiber skin ply.



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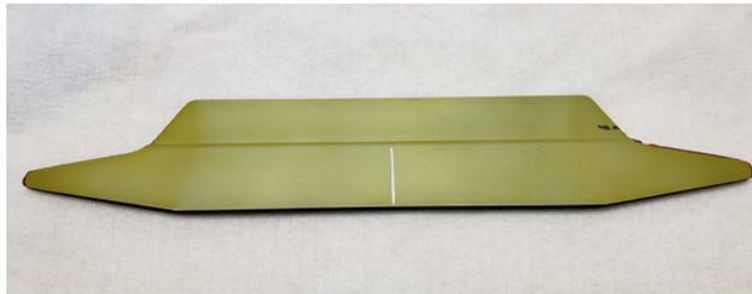
C. INSTALLATION OF TRIM TAB ASSEMBLY (20633130-101/-103/-105)

Install a new 20633130-101/-103/-105 trim tab assembly to the prepared tab-to-blade bond areas on the rotor blade assembly. Use the same procedure when installing a trim tab assembly to either the STA 79.5 location or STA 189.0 location. The 20633130-101/-103/-105 trim tab assemblies are compatible in any configuration with all existing trim tab assemblies.

- (1) Wipe the tab-to-blade bond area clean with MPK, MEK or acetone and a non-lint cloth. Wipe until the non-lint cloth remains smudge free. Allow the solvent to flash off completely.

CAUTION: The pre-bonded trim tab assemblies are sealed in plastic packaging to prevent contamination of the bonding surfaces. Wear protective nitrile gloves when handling the trim tab assembly to keep skin oils away from the bonding surfaces.

- (2) Remove the trim tab assembly from its packaging and proceed immediately with the remaining steps.
- (3) Measure the length of the trim tab assembly and mark the center with a line (see Figure 4). On the blade assembly, mark the center of the tab-to-blade bond area, using the dimensions indicated in Figure 2. Dry fit the trim tab assembly (20633130-103 shown) to the blade. Align the center mark on the trim tab assembly with the mark on the blade.



Centerline on Trim Tab Assembly



Centerline on Blade Surface

Figure 4 – Centerline on Trim tab Assembly and Blade Surface



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- (4) Re-trace the outline of the trim tab assembly onto both sides of the blade. The outline will serve as a guide for later adhesive application. Leave the trim tab assembly on the blade for the inspection step.
- (5) **INSPECTION:** Verify the trim tab assembly is located correctly per Figure 2. Remove the trim tab assembly and confirm that all areas within the outline are free from old adhesive, paint and any other contaminants. Verify that the prepared surface of the tab-to-blade bond area is clean and ready for adhesive application.
- (6) Prepare the cured adhesive layer on the trim tab assembly for bonding by doing a light scuff sanding to the surface with 220 – 320 grit sandpaper. Do not sand through any of the cured adhesive. Wipe scuffed surfaces clean with MPK, MEK or acetone and a non-lint cloth until all sanding residue is removed.
- (7) **INSPECTION:** Verify that the pre-cured adhesive surface has been scuff-sanded and is clean and free of debris.
- (8) Attach one rubber-backed metal caul (206CS33130-103) to each side of the trim tab assembly with flash breaker tape. Make sure that the rubber side of the caul is in contact with the surface of the trim tab assembly. Ensure that all edges of the trim tab are visible and not covered by the caul plates (Figure 5). Verify there is no tape inside the trim tab assembly.

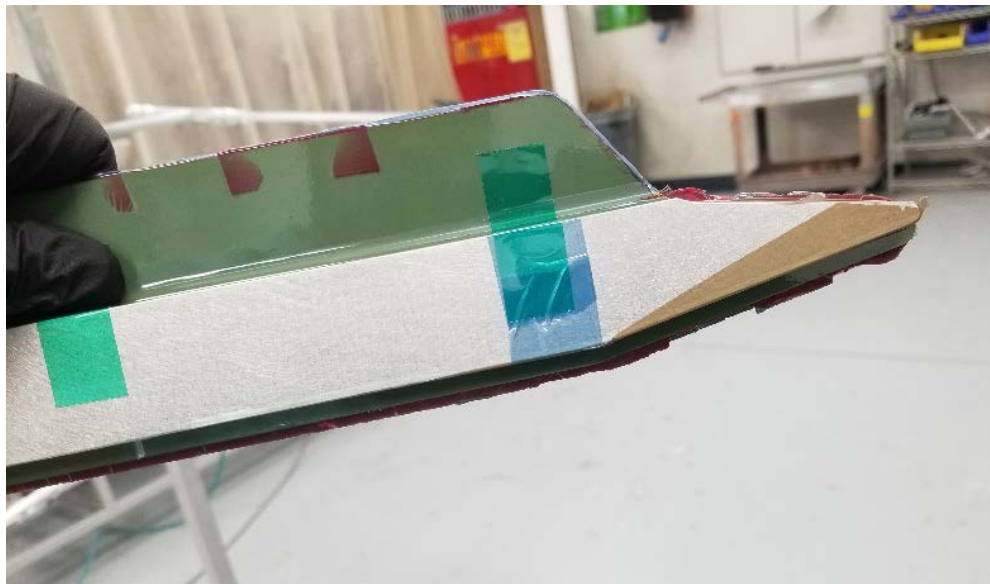


Figure 5 – Metal/Rubber Caul taped to Trim tab Assembly

- (9) Mix 65 to 75 grams of epoxy adhesive per manufacturer's instructions. Refer to the material list on page 2 for a selection of suitable adhesives. Apply a thin layer of adhesive to the blade assembly such that the entire outlined area of the tab-to-blade bond area is coated (Figure 6). Apply a similar thin layer of adhesive to the inner surfaces of the trim tab assembly (Figure 7). Verify 100% coverage of the adhesive on all bonding surfaces.



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Figure 6 – Adhesive Applied to Tab-to-Blade Bond Area



Figure 7 – Adhesive Applied to Inner Surfaces of Trim Tab Assembly



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- (10) Hold the trim tab assembly parallel to the trailing edge of the blade and visually align the centerline mark on the trim tab assembly with the centerline mark on the blade. When the marks are aligned, slide the trim tab assembly onto the blade (Figure 8). If possible, do not make any more adjustments to the installation. Press the trim tab assembly firmly against the trailing edge of the blade. The adhesive will provide some resistance as it squeezes out around the edges of the trim tab assembly (Figure 9). Continue to apply pressure until the squeeze-out ceases and the trim tab assembly seats firmly against the trailing edge of the blade.

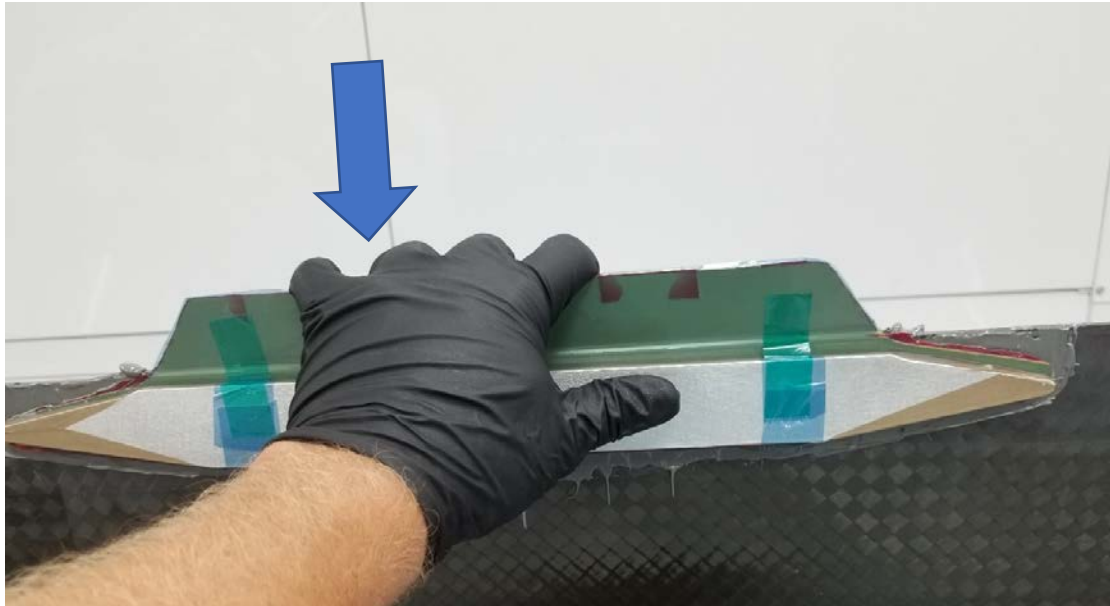


Figure 8 – Slide Trim Tab Assembly onto Blade

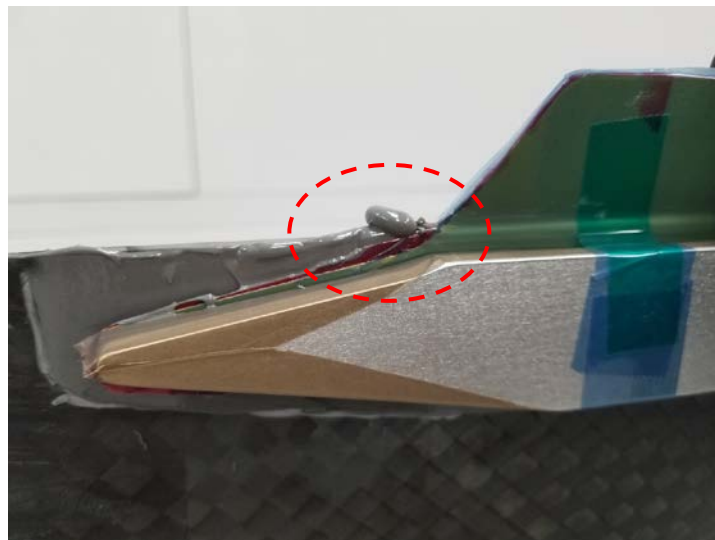


Figure 9 – Adhesive Squeeze Out from Joggle Joint



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- (11) Keep the trim tab assembly seated firmly to the trailing edge of the blade. Use flash breaker tape to hold the assembly in place. Extend the tape from the trailing edge of the trim tab to the blade surface. (Figure 10).

NOTE: The trim tab assembly will slide out of position when clamping force is applied. It is important to hold the trim tab assembly in place with tape so that clamping force can be applied evenly across the metal caul plate. It is considered best practice to wrap the tape completely around the blade assembly to keep the trim tab assembly firmly seated to the trailing edge, and to prevent the assembly from moving during the room-temperature cure.



Figure 10 – Tape the trim Tab Assembly in Place to Prevent Movement

- (12) Clamp the caul plates using a minimum of three (3) C-clamps, vise grip clamps, or cantilever clamps (Figure 11). Install the first clamp at the center of the caul plates. This will permit even distribution of the adhesive as pressure is applied. Apply the second and third clamp 1.0 – 2.0 inches from the ends of the caul plates (Figure 12). Only apply clamp pressure to the caul plates and not to any part of the trim tab assembly. Ensure good adhesive squeeze out along all edges (Figure 11 and Figure 12). If adhesive is not seen on all edges, do the following: use additional clamps to apply more force, incrementally increase clamp pressure, adjust clamp locations, or remove the tab and apply additional adhesive. With all changes, always work from the center of the trim tab assembly to the outboard ends of the trim tab assembly, driving adhesive toward the extreme tips of the trim tabs.



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- (13) **INSPECTION:** Verify that adhesive squeeze-out is visible around all edges of the trim tab assembly. Confirm that the trim tab joggle is seated against the trailing edge of the blade. Verify that the clamps will not slip or move during the cure.
- (14) Clean up all excess adhesive from the edges of the trim tab assembly and blade surfaces using MPK, MEK or acetone and a non-lint cloth or cotton-tipped swabs.
- (15) Allow adhesive to cure at room temperature for a minimum of 24 hours or longer per manufacturer's instructions prior to removing clamps and handling of the trim tab assembly.
- (16) After the adhesive has cured, remove the clamps, caul plates, and tape. The blade and tabs are safe to handle; however, it will take several more days for the adhesive to completely cure and reach full strength. It is recommended that flight operations and trim tab adjustments not be made until the adhesive has cured to full strength per the cure schedule on the adhesive manufacturer's technical data sheet.

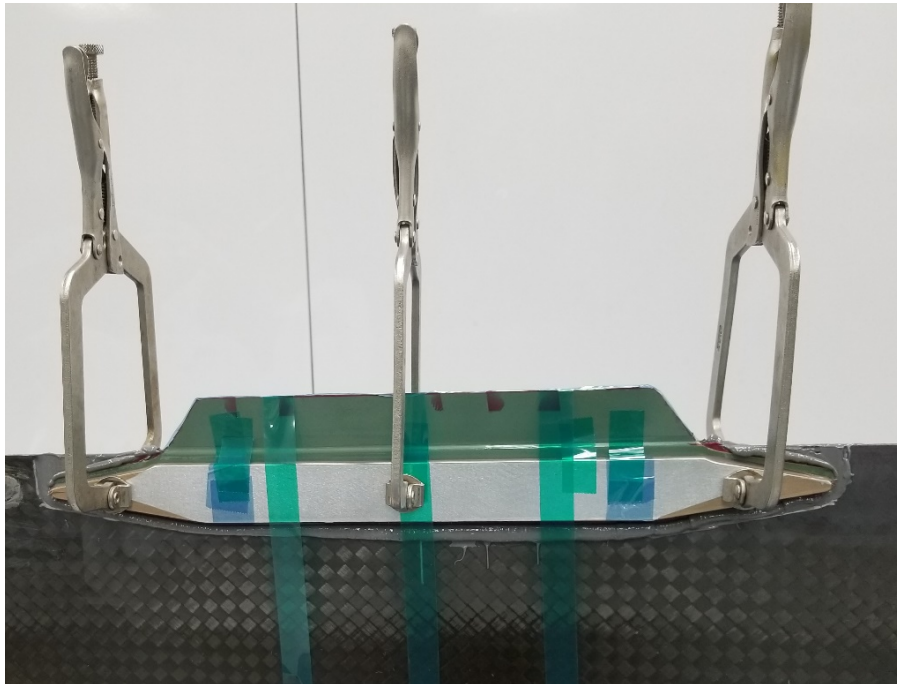


Figure 11 – Installation of Clamps Prior to Cure



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Figure 12 – Adhesive Squeeze Out at End of Trim Tab Assembly



Figure 13 – Adhesive Squeeze Out at End of Trim Tab Assembly



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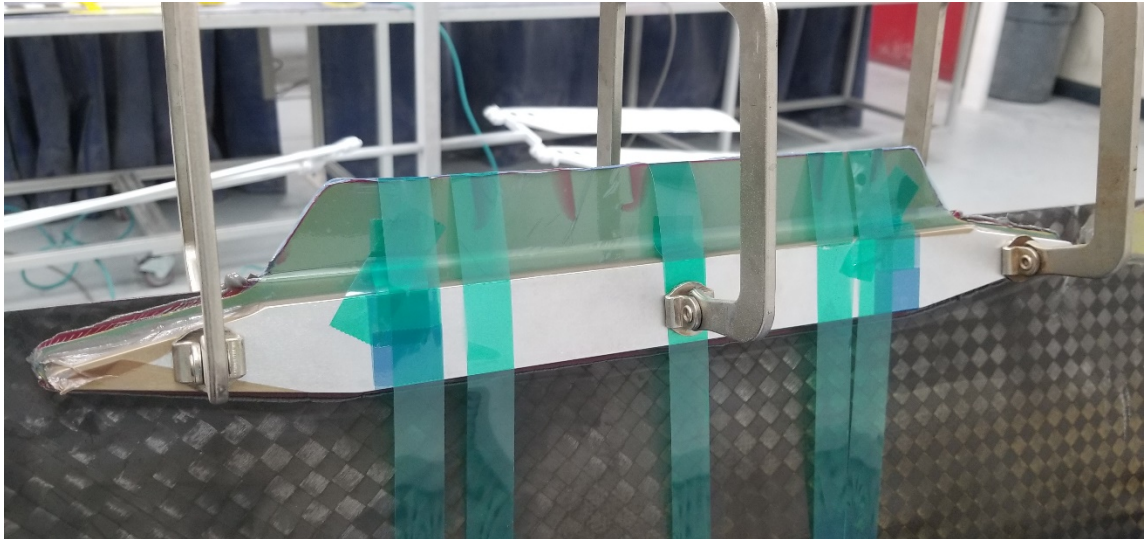


Figure 14 – Complete Trim Tab Assembly Installation Ready for Cure

D. PAINT RESTORATION

- (1) Use 220 – 320 grit sandpaper and appropriate sanding equipment to sand and fair smooth any cured adhesive to match the surrounding contour. As required, use 2-part polyester finishing putty to fair the edges of the trim tab to the blade surface. Minimize damage to the existing paint.
- (2) As required, spot refinish the trim tab installation area per ICA manual VMM-MR-206L-501, paragraph 5.11.7. Spot Refinishing. First apply a compatible epoxy primer paint to all bare surfaces before applying a polyurethane basecoat layer followed by a clearcoat layer on top.

Any high build, chromate free epoxy primer and any compatible polyurethane paint system is acceptable. For the primer system, VHA recommends Corlar® 13580S™ Non-Chromate Epoxy Primer. For the polyurethane base-clear paint system, VHA recommends Axalta Imron® Elite Productive Basecoat 8400E, and Imron® Elite 8430S™ Clearcoat or Toughguard NHP.

E. TRIM TAB 0° ADJUSTMENT

- (1) When the installation is complete, set the trim tab deflection angle to chord 0°. Verify 0° with indicator tool 206C31412-13.



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F. RECORDING AND COMPLIANCE

- (1) It is the responsibility of the user of these instructions to comply with all local and national airworthiness regulations prior to returning the VHA 20633000-101 Main Rotor Blade Assembly to service.
- (2) Record compliance to this service bulletin in the HISTORY OF INSPECTION, OVERHAUL, REPAIR AND APPLICATION OF TECHNICAL BULLETIN, SERVICE BULLETIN, AIRWORTHINESS DIRECTIVES, ETC. section of the rotor blade Historical Service Record.
- (3) Complete the Bulletin Completed Record and FAX the form to VHA at +1 (480) 483-4204 or email to info@vanhornaviation.com.

G. POINTS OF CONTACT

For further information and replacement parts, contact Van Horn Aviation at +1 (480) 483-4202, FAX +1 (480) 483-4204 or email info@vanhornaviation.com.



Van Horn Aviation, LLC
1510 W Drake Drive
Tempe, Arizona 85283

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Bulletin Completed Record

REPLACEMENT OF TRIM TAB ASSEMBLY ON VHA 206L MR BLADE

FAX or email this record to +1 (480) 483-4204 or info@vanhornaviation.com

Owner/Operator:

Address:

**Blade Serial
Number:**

Blade Total Time:

**Inboard Trim Tab
Assembly Replaced?**

☐ Yes ☐ No

**Outboard Trim Tab
Assembly Replaced?**

☐ Yes ☐ No

**Assembly Installed:
(-101/-103/-105)**

Phone:

Date Complete:

Email:

This bulletin completed by:

(Print Name)

(Signature)

(Title)