Temporary Maintenance Instruction
TMI 139-538

Trim tab (main rotor blade) – Replacement

All AW139 Helicopters

The technical content of this document is approved under the authority of DOA nr. EASA.21J.005.

The present TMI will be evaluated for its introduction in the standard set of Technical Publication.
If no further notice is received, the present document expires on: January 26th, 2022.

2021-01-26

Introduction

This TMI provides the instructions to perform the removal of the inboard/outboard trim tab and the subsequent installation of a new trim tab with composite repair patch.

All the information reported in the subsequent pages will be introduced within next issue of pertinent technical publication, Data Module:

ANNEX	DATA MODULE CODE	DATA MODULE TITLE
Annex 1	39-A-62-11-01-08A-520A-C	Trim tab (main rotor blade) - Remove procedure
Annex 2	39-A-62-11-01-08C-720A-C	Trim tab (main rotor blade) - Install procedure

Trim tab (main rotor blade) – Replacement

Table of contents
Refer to attached annexes

List of tables
Refer to attached annexes

List of figures
Refer to attached annexes

References

Refer to attached annexes

Preliminary Requirements

Required conditions
Refer to attached annexes

Support equipment
Refer to attached annexes

Supplies
Refer to attached annexes

Spares
Refer to attached annexes

Safety condition
Refer to attached annexes

Procedure

Refer to attached annexes

Requirement after job completion

Refer to attached annexes

ANNEX 1

Trim tab (main rotor blade)

Remove procedure

Table of contents

List of tables

References

Table 1 References

Data module/Technical publication	Title
39-A-62-11-01-00A-31AA-B	Main rotor blade - Detailed inspection
39-A-62-11-01-00A-520A-A	Main rotor blade - Remove procedure
39-A-62-11-01-00A-66AN-B	Main rotor blade - Skin panels and fairings - Repair procedure
39-A-62-11-01-08A-520A-B	Trim tab (main rotor blade) - Remove procedure
39-A-62-11-01-08A-720A-B	Trim tab (main rotor blade) - Install procedure
39-A-62-11-01-08B-720A-B	Trim tab (main rotor blade) - Install procedure
39-A-62-11-01-08C-720A-C	Trim tab (main rotor blade) - Install procedure
39-A-GF-06-00-00A-066A-A	Hammer (alum) M/R and T/R blades tapping insp. (GF-06-00) - Support equipment and tools data
39-A-ZZ-00-00-00A-066A-A	Local supply support equipment and tools - Support equipment and tools data

Preliminary requirements

Required Conditions

Table 2 Required conditions

Action/Condition	Data module/Technical publication
The main rotor blade must be removed	39-A-62-11-01-00A-520A-A

Support Equipment

Table 3 Support Equipment

Name	Identification No.	Quantity
Aluminium hammer	GF-06-00	1
Grinding wheel	Local supply	1

Supplies

Table 4 Supplies

Name	Identification No.	Quantity
Lint-free cloth	C011	AR

Spares

Table 5 Spares

Name	Identification No.	Quantity
No spares are required		

Safety conditions

None

Procedure

1 Remove the inboard trim tab and/or the outboard trim tab. Refer to the applicable steps of 39-A-62-11-01-08A-520A-B.

2 Examine the blade skin, refer to the conditions that follow:

2.1 Blade skin without a composite repair patch:

2.1.1 Examine the unpainted blade skin for damage and/or debondings. Refer to 39-A-62-11-01-00A-31AA-B.

2.1.2 Examine the stiffener surface (layer of glass fiber) for damage and/or debondings. If you find damage and/or debondings repair the stiffener, refer to 39-A-62-11-01-00A-66AN-B.

2.2 Blade skin with a composite repair patch:

Note

Debondings of the patch are not permitted. If you find debondings, remove the patch and apply a new trim tab with repair patch.

2.2.1 Inspect the unpainted blade skin and the patch for damage or for debondings with the Aluminium hammer (GF-06-00) . If you find damage and/or debondings, do as follows:

CAUTION

During removal and sanding make sure not to damage the surfaces below. Use gradually finer abrasive paper near the blade surface.

2.2.2 Remove the patch with a portable Grinding wheel (ZZ-00-00) . Stop immediately when you see the red adhesive layer.

2.2.3 Remove the remaining abrasive residues with a dry and clean Lint-free cloth (C011) .

2.2.4 Remove the old red adhesive. Refer to the applicable steps of 39-A-62-11-01-08A-520A-B.

3 Install the inboard trim tab and/or outboard trim tab as follows:

- If you removed a steel inboard/outboard trim tab, install a new item of the same material. Refer to 39-A-62-11-01-08A-720A-B.
- If you removed an aluminum inboard/outboard trim tab, install a new item of the same material. Refer to 39-A-62-11-01-08B-720A-B.
- If you removed a composite repair patch or it is necessary to apply a composite repair patch to repair damage on the blade trailing edge, install a new trim tab with repair patch. Refer to 39-A-62-11-01-08C-720A-C.

Requirements after job completion

1 Remove all the tools and the other items from the work area. Make sure that the work area is clean.

THIS PAGE INTENTIONALLY LEFT BLANK

ANNEX 2

Trim tab (main rotor blade)

Install procedure

Table of contents

List of tables

List of figures

References

Table 1 References

Data module/Technical publication	Title
39-A-62-11-01-00A-257A-B	Main rotor blade - Paint and apply marking
39-A-62-11-01-00A-37DA-C	Main rotor blade - Static balance
39-A-62-11-01-00A-520A-A	Main rotor blade - Remove procedure
39-A-62-11-01-00A-66AD-B	Main rotor blade - Trim tab conductor mesh - Repair procedure
39-A-GF-06-00-00A-066A-A	Hammer (alum) M/R and T/R blades tapping insp. (GF-06-00) - Support equipment and tools data
39-A-ZZ-00-00-00A-066A-A	Local supply support equipment and tools - Support equipment and tools data

Preliminary requirements

Required Conditions

Table 2 Required conditions

Action/Condition	Data module/Technical publication
The main rotor blade must be removed	39-A-62-11-01-00A-520A-A

Support Equipment

Table 3 Support Equipment

Name	Identification No.	Quantity
Aluminium hammer	GF-06-00	1
Vacuum bag	Local supply	AR
Vacuum device	Local supply	AR
Strip (resistance heating)	Local supply	AR
Temperature sensor (thermocouples type)	Local supply	AR
Multimeter	Local supply	AR

Supplies

Table 4 Supplies

Name	Identification No.	Quantity
Solvent	C005	AR
Lint-free cloth	C011	AR
Abrasive paper	C016	AR
Cheesecloth	C028	AR
Isopropyl alcohol	C039	AR
Aliphatic naphtha	C059	AR
Adhesive	C189	AR
Adhesive	C191	AR
Teflon tape	C223	AR
Sealant	C355	AR

Spares

Table 5 Spares

Name	Identification No.	Quantity
Inboard trim tab (with repair patch)	3G6210Z00751	1
Outboard trim tab (with repair patch)	3G6210Z00851	1

Safety conditions

WARNING

The materials that follow are dangerous. Before you do this procedure, make sure that you know all the safety precautions and first aid instructions for these materials:

- **Solvent (C005)**
- **Isopropyl alcohol (C039)**
- **Aliphatic naphtha (C059)**
- **Adhesive (C189)**
- **Adhesive (C191)**
- **Sealant (C355) .**

Note

The subsequent procedure is applicable only if you install the inboard/outboard trim tab with a composite repair patch.

Procedure

1 Put the main rotor blade (1, Fig 1) on an applicable work table.

2 Get a new Inboard trim tab (with repair patch) (3G6210Z00751) and / or Outboard trim tab (with repair patch) (3G6210Z00851) (2).

3 Remove the nylon peel ply from the bonding surfaces of the composite repair patch.

4 Identify the damaged area on the blade skin trailing edge.

Note

During the procedure take extreme care not to damage the red adhesive layer on the external surfaces of the trim tab.

5 Put the new trim tab with repair patch (2) in its correct position on the blade skin trailing edge, perfectly centered on the STA (see Fig 1).

6 Make sure that the damaged area is fully covered by the composite repair patch. The minimum distance between the perimeter of the damage and the edge of the composite repair patch must be at least 25 mm (1 in). If the damage is not covered correctly, contact the Design Authority for further information.

7 Remove the trim tab with repair patch (2) and, if possible, trim spanwise the composite repair patch to reduce its dimensions for a maximum of 25 mm (1 in) per side (see Fig 1). Make sure that the trimmed composite repair patch correctly covers the damage as given in Step 6.

8 Put the new trim tab with repair patch (2) in its correct position on the blade skin trailing edge, perfectly centered on the STA (see Fig 1),

9 Mark the position on the blade skin trailing edge and remove the new trim tab with repair patch (2) from the main rotor blade (1).

CAUTION

It is very important to trim the trailing edge gradually to agree with the shape of the patch accurately.

10 Gradually trim the blade skin trailing edge as necessary to make a cavity for the installation of the new trim tab with composite repair patch (see Fig 2). Make sure that there is no step between the patch and the blade skin (see Detail A).

11 Prepare the bonding surfaces of the composite repair patch and of the blade skin as follows:

Note

You must bond the new trim tab with repair patch to the main rotor blade within 72 hours from cleaning by abrasion.

11.1 Wipe clean with a soft Lint-free cloth (C011) moist with Isopropyl alcohol (C039) or Aliphatic naphtha (C059) or Solvent (C005) , or similar cleaner, and let it dry for at least 30 minutes.

CAUTION

During sanding be careful not to damage the carbon fibers of the blade skin and the layer of glass fiber of the stiffener.

11.2 Lightly sand the bonding surfaces with Abrasive paper (C016) , grit 80 - 100, as preparation for bonding. Be careful not to damage the fibers.

11.3 Remove sanding residuals with a dry Lint-free cloth (C011) .

11.4 Wipe clean with a soft Lint-free cloth (C011) moist with Isopropyl alcohol (C039) or Aliphatic naphtha (C059) or Solvent (C005) , or similar cleaner.

11.5 Let the part dry for at least 30 minutes at ambient temperature.

CAUTION

Always wear clean dry gloves when you handle the trim tab with repair patch (2, Fig 1) and the main rotor blade (1) to prevent contamination of the bonding surfaces.

12 Cut one layer of Adhesive (C189) (weight .06) with the necessary dimensions and shape to cover, upper side and lower side, the full bonding area of the trim tab with the composite repair patch (2).

13 Cut one layer of Adhesive (C191) (weight .03) with the necessary dimensions and shape to cover the upper side of the bonding area of the trim tab with the composite repair patch (2).

14 Apply the layer of Adhesive (C189) (weight .06) on the bonding surface of the new trim tab with repair patch (2) as shown in Fig 3 .

15 Apply the layer of Adhesive (C191) (weight .03) on the upper side of the blade bonding surface as shown in Fig 3 .

Note

Correctly position the trim tab with repair patch on the blade skin trailing edge, perfectly centered on the STA (see Fig 1) and without step between the patch and the blade skin trailing edge (see Detail A of Fig 2).

16 Put the new trim tab with repair patch (2, Fig 1) on the adhesive layer applied on the blade skin.

17 Protect from adhesive squeeze-out the boundary of the new trim tab with repair patch and the boundary of its bonding surface on the blade skin with Teflon tape (C223) , upper side and lower side.

18 Cure the adhesive as follows:

18.1 Apply the Temperature sensor (thermocouples type) (ZZ-00-00) on the blade skin to control the bonding temperature. Secure with Teflon tape (C223) .

18.2 Apply an applicable Strip (resistance heating) (ZZ-00-00) to supply heat to the bonding area at the necessary temperature.

18.3 Prepare and apply a Vacuum bag (ZZ-00-00) to the bonding area. Then connect an applicable Vacuum device (ZZ-00-00) to the vacuum bag.

Note

Make sure that the pressure over the entire bonding area is constant during the cure cycle.

Note

The cure time starts when the repair area gets the necessary temperature for curing.

18.4 Cure the adhesive at a temperature of 104 thru 110 °C (219 thru 230 °F) for at least 120 minutes at a pressure of 0,6 - 0,8 kg/cm^2 (9.95 thru 21.3 lbf/in^2).

18.5 Remove the vacuum bag, the strips and the temperature sensors from the bonding area.

19 Remove the Teflon tape.

20 Blend possible adhesive squeeze out all around the tabs with Abrasive paper (C016) , grit 240 - 320, leaving a bead of adhesive.

21 Check for the correct positioning of the with repair patch (2) on the main rotor blade (1). Make sure that it is perfectly centered on the STA (see Fig 1) and without step between the patch and the blade skin trailing edge (Detail A of Fig 2).

22 Do a tap inspection for correct bonding with the Aluminium hammer (GF-06-00) between the composite repair patch and the blade skin. No unbondings are permitted after repair.

23 Do a visual inspection of the assembly to make sure that the metallic mesh is installed in the correct position.

24 Do the electrical continuity check of the bonding meshes with the Multimeter (ZZ-00-00) . The maximum permitted resistance is 50 Ohm.

25 If the results of the continuity check are more than the permitted limit or if you find possible unbondings in the installed bonding mesh proceed as per DM 39-A-62-11-01-00A-66AD-B.

26 Apply a bead of Sealant (C355) as shown in Fig 1 .

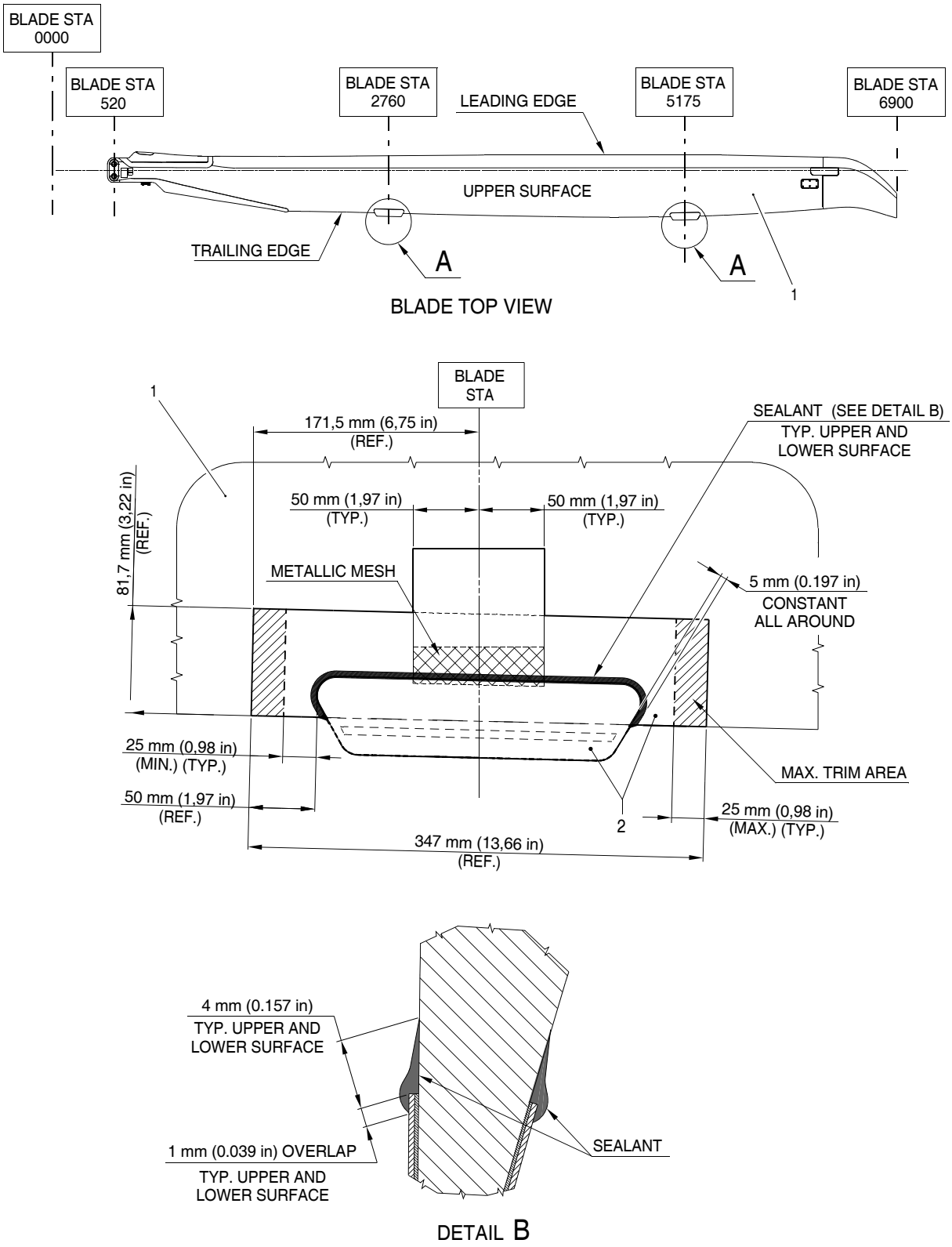
Requirements after job completion

1 Remove all the tools and the other items from the work area. Make sure that the work area is clean.

2 Record the repair on the log card of the blade.

3 Restore the blade surface finish. Refer to 39-A-62-11-01-00A-257A-B

4 Do the static balance of the main rotor blade. Refer to 39-A-62-11-01-00A-37DA-C



ICN-39-A-621101-G-00001-31151-A-001-01

Fig 1 Trim tab (with repair patch) - Install procedure

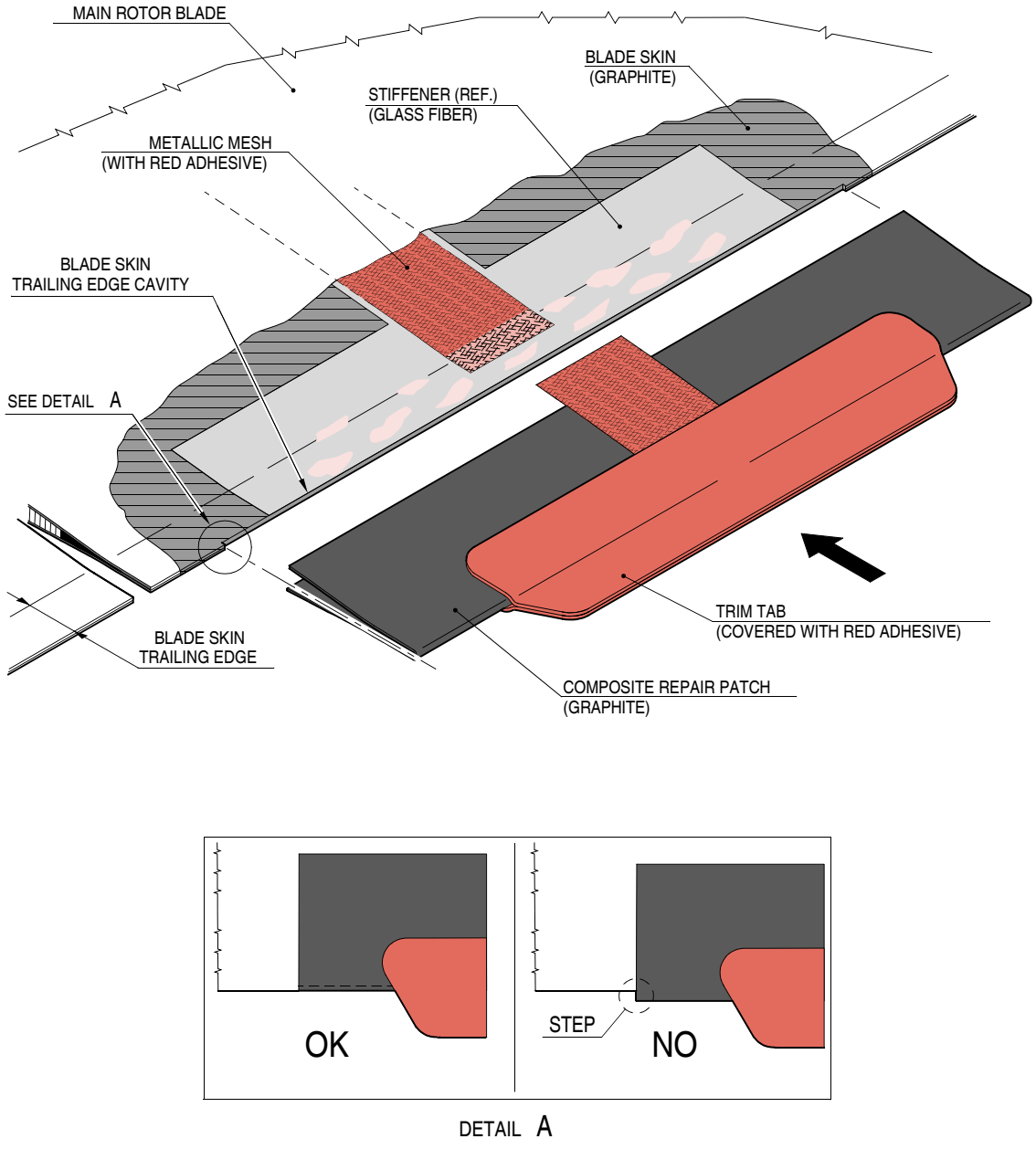
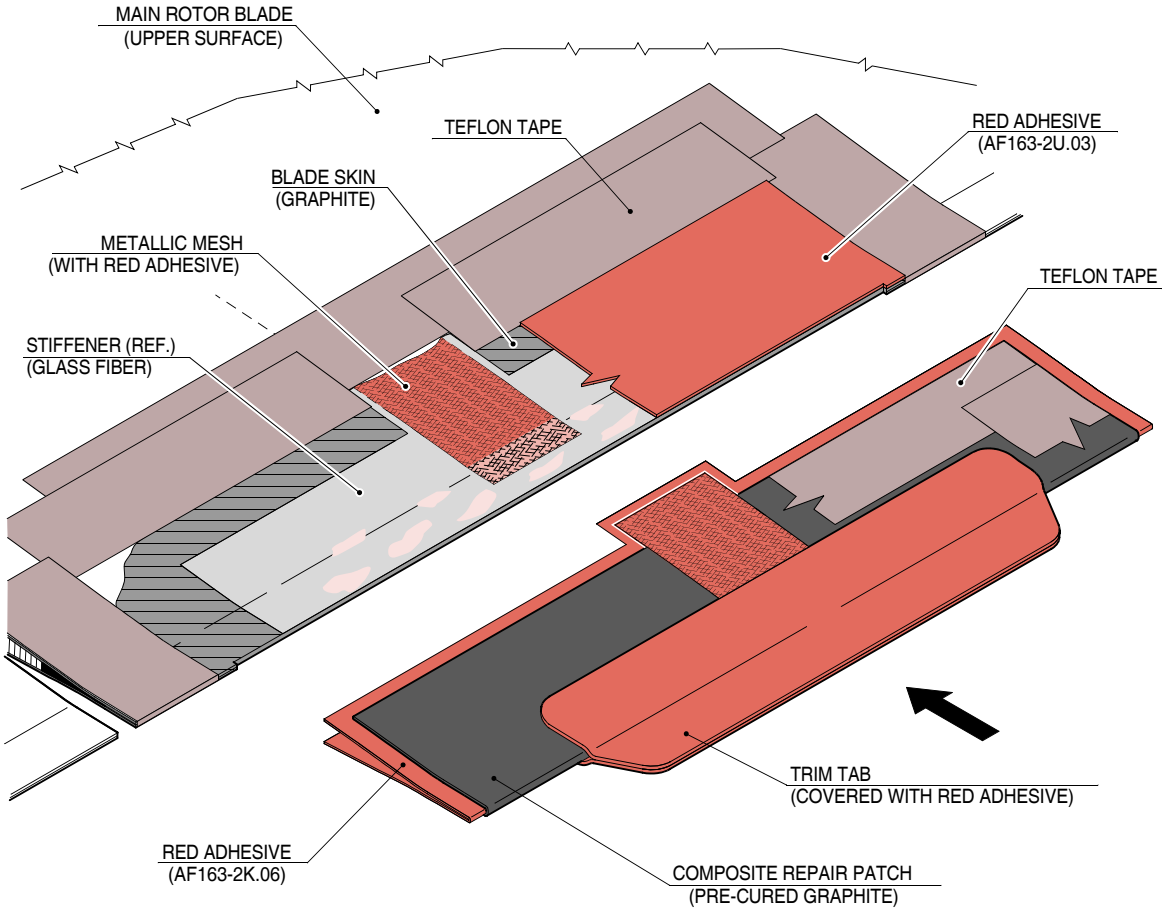


Fig 2 Trim tab (with repair patch) - Dry test



ICN-39-A-621101-G-00001-31152-A-001-01

Fig 3 Trim tab (with repair patch) - Adhesive application

THIS PAGE INTENTIONALLY LEFT BLANK