

Memorandum

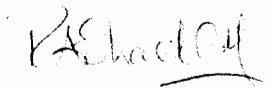
To/A	Don Munsch	From/Da	Bob Shadbolt
Department/Reparto:		Department/Reparto:	Customer Service
Company/Società:	Munsch & Company Aeromechanics	Tel.:	011 44 1935 705426
Date/Data:	Thursday, 22 February 2007	e-mail:	shadbolr@whl.co.uk
Ref.:			
Subject:	UK Apache Technical Publications		

Dear Don,

Please find enclosed the informaton relating to the Munsch Blade Pin Alignment Tool contained within the current issue of the United Kingdom Apache Technical Publications. I would advise that the information, although Unclassified, contains data which is proprietary to Agusta Westland and its sub-contractors and shall not be disclosed, reproduced in whole or in part except with the prior written permission of Agusta Westland.

I trust you will find the information useful.

for and on behalf of Agusta Westland



Bob Shadbolt
Customer Srvce Supplier Manager

Blade Pin Alignment Tool (BPAT) (Mod 8032) (SOO) - Special AGE and tools**References**

refer to AH-A-GE-49-00-00A-311A-C
refer to AH-A-GE-49-00-00A-311B-C

Description

Application: The BPAT (1, fig 1 Blade pin alignment-tool.) is used to align the main rotor blade and the main-rotor-head bushes during installation of the main-rotor-blade attachment pin.

Dimensions: 12.0 in. x 9.5 in. x 6.5 in.

Weight: 15.5 lb.

Fig 1 Blade pin alignment-tool

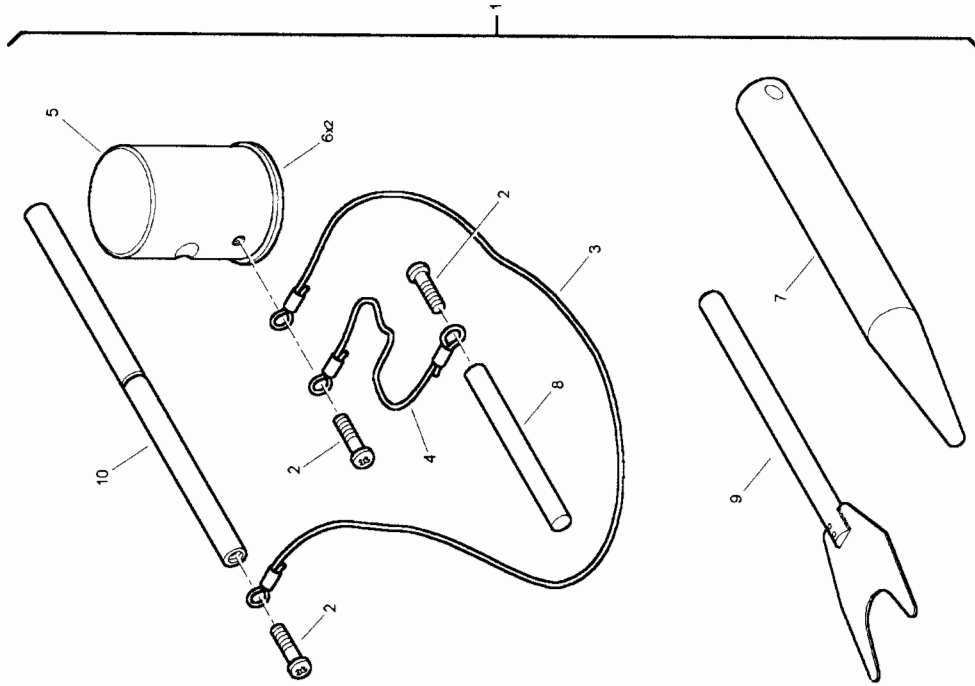
Visually examine the blade pin alignment-tool before each use, refer to AH-A-GE-49-00-00A-311A-C.
Visually examine the blade pin alignment-tool each 6 months, refer to AH-A-GE-49-00-00A-311B-C.
For a list of components on the blade pin alignment-tool, refer to table 1 Blade pin alignment-tool.

Table 1 Blade pin alignment-tool

End of data module

Item	Part number	Description									Unit per assembly
		1	2	3	4	5	6	7	8	9	
-0	G6205	Blade Pin Alignment-Tool (BPAT) STAGE 181									REF
1	MC64BPAT001	• Tool kit,aircraft maintenance									1
2	AH64006	• • Screw,machine									3
3	AH64004	• • Lanyard,BPAT									1
4	AH64005	• • Lanyard,BPAT									1
5	AH64001	• • Head,BPAT									1
6	AH64008	• • • Washer,BPAT									2
7	AH64010	• • Alignment shaft,BPAT									1
8	AH64003	• • Shaft pin,BPAT									1
9	AH64011	• • Spacer tool,BPAT									1
10	AH64002	• • Handle,BPAT									1
-11	1400 BLACK COLOR	• • Case,photographic equipment									1

Table 1 - Blade pin alignment-tool



AH46259W002AA

Fig 1 Blade pin alignment-tool

Number 1 main-rotor-blade (blade assembly, swept tip main rotor) (Mod 0109 and Mod 8032) - Remove and install

References

- refer to AH-A-00-20-01-00A-012A-A
- refer to AH-A-00-25-00-00A-120A-A
- refer to AH-A-05-60-00-00A-000A-A
- refer to AH-A-18-13-00-00A-520A-A
- refer to AH-A-18-13-00-00A-720A-A
- refer to AH-A-30-62-00-00A-340A-A
- refer to AH-A-30-62-01-00A-271A-A
- refer to AH-A-52-45-01-00A-925A-A
- refer to AH-A-53-24-14-00A-920A-A
- refer to AH-A-53-25-14-00A-920A-A
- refer to AH-A-56-32-01-00A-925A-A
- refer to AH-A-56-33-01-00A-925A-A
- refer to AH-A-62-12-00-00A-257A-A
- refer to AH-A-62-12-00-00A-520A-A
- refer to AH-A-62-12-00-00A-720A-A
- refer to AH-A-62-12-00-03A-271A-A
- refer to AH-A-62-12-01-00A-920B-A

Preliminary requirements

Required conditions

- Do the aircraft safety procedure refer to AH-A-00-25-00-00A-120A-A
- Install the four droop-stop wedge assemblies refer to AH-A-62-12-00-00A-720A-A

Required persons

- | | | |
|---|--|--------------|
| 4 | | 771B Ac Tech |
| 1 | | 771I Ac Tech |
| 1 | | 773B Av Tech |
| 1 | | 773I Av Tech |

Support equipment

Tool kit, aircraft maintenance	MC64BPAT001	1.00
Tester, spring resiliency, 0-100 lb	PP-100	1.00
Test set, earth resistance and bonding	1671M	1.00
Wrench, torque, 30-200 lb in., ¼ in. square drive	QJR117E	1.00
Tie down kit, aircraft mooring	7-262100004-611	1.00
Adaptor assembly, handling, rotor blades	7-262110028	1.00
Sling assembly, main rotor blade	7-362110216	1.00
Trailer, ground handling	100334	1.00
Rope, fibrous	BS2052-Table 1	2.00
Toolbox, apache line	JABS6401	1.00

Consumables, materials and expendables

Blade, rotary wing	7-311412000-103A	1.00
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Sealing compound (<u>C345</u>)	HMS16-1097 T2CB-1/2	As necessary
Wire, nonelectrical (<u>E639</u>)	MS20995C20	As necessary

Safety conditions

CAUTION

Before you use the sling assembly, make sure the rubber pads are correctly attached to the jaws of the sling. If they are not, they can fall off. The bare jaws of the sling assembly can then cause damage to the main rotor blade.

CAUTION

Do not lift the main rotor blade more than necessary. If you ignore this caution, damage to the main rotor blade will occur.

CAUTION

Be careful when you remove the blade sling from the rotor blade. The trailing edge of the rotor blade is easily damaged. If you ignore this caution, damage to the trailing edge will occur.

Procedure

Remove or/and Install

Make a selection from the list that follows:

- Remove
- Install
- Remove and Install

1 Remove

- 1.1 Is the blade (6, fig 1 Number 1 main-rotor-blade) a replacement blade. Make a selection from the list that follows:
- If yes, go to step 1.3
 - If no, go to step 1.2 .

Fig 1 Number 1 main-rotor-blade



- 1.2 Record the serial number (7) and position of the blade (6).
- 1.3 Extend and attach the tie-down pole (3, fig 2 Main-rotor blade tie-down) to the tie-down bracket (2).

Fig 2 Main-rotor blade tie-down



- 1.4 Turn the tie-down pole lock (4) to keep the tie-down pole (3) extended.
- 1.5 Put the blade tie-down (1) over the end of the blade (5) trailing edge.
- 1.6 Remove the tie-down pole (3) from the tie-down bracket (2).
- 1.7 Remove the sealing compound from the bolts (8, fig 1 Number 1 main-rotor-blade), washers (2) and nuts (3) that attach the bonding leads (1, 4) to the two angle brackets (5).

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- 1.8 Remove the two bolts (8) washers (2) and nuts (3) that attach the four bonding leads (1, 4) to the two angle brackets (5).
- 1.9 Disconnect the four bonding leads (1, 4) from the two angle brackets (5).
- 1.10 Remove and discard the lockwire (wire, nonelectrical) from the electrical connector P1078 (1, [fig 3 Main-rotor-blade electrical connector](#)).

Fig 3 Main-rotor-blade electrical connector



- 1.11 Disconnect the electrical connector P1078 (1) from the electrical connector J1 (2).
- 1.12 Put the crane hook (13, [fig 4 Main-rotor blade sling](#)) in the lifting ring (1).

Fig 4 Main-rotor blade sling



- 1.13 Turn the two knobs (4) clockwise to open the jaws (6) on the sling (5).
- 1.14 Use a maintenance platform to install the sling (5) on the leading edge of the blade (12). Make sure the Centre-of-Gravity (CG) indicator (8) is approximately in the middle of the jaws (6).
- 1.15 Turn the two knobs (4) counter-clockwise to close the jaws (6) around the blade (12) leading edge.
- 1.16 Put the two straps (7) around the blade (12) trailing edge and attach the two clips (10) to the bolts (11).

NOTE

The locking spherical bearing on the sling lets the blade adjust in any direction $\pm 15^\circ$.

-
- 1.17 Hold the bottom torque handle (3) and move the top clamp handle (2) counter-clockwise to release the bearing (9).
- 1.18 Lift the crane hook (13) to apply tension on the cable.
- 1.19 Hold the bottom torque handle (3) and move the top clamp handle (2) clockwise to lock the bearing (9).
- 1.20 Attach the two fibrous ropes (2, [fig 5 Main-rotor-blade fibrous ropes](#)) to the root end of the blade (1).

Fig 5 Main-rotor-blade fibrous ropes



- 1.21 Push down and release the two spring clips (5, [fig 6 Main-rotor blade pins](#)) from the nuts (3) at the bottom of the pins (4).

Fig 6 Main-rotor blade pins



- 1.22 Pull the two spring clips (5) up to the full open position.

NOTE

Use the crane to lift or lower the blade to remove the two blade pins more easily.

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- 1.23 Remove the two blade pins (4) from the blade (2) root and lead lag link (1).

NOTE

Use the two fibrous ropes and blade tie-down to control the position of the blade.

- 1.24 Remove the blade (2) from the lead lag link (1).
- 1.25 Put the blade (3, [fig 7 Main-rotor blade adaptor and trailer](#)) on the blade adaptor (1) and trailer (2).

Fig 7 Main-rotor blade adaptor and trailer



- 1.26 Lower the crane hook (13, [fig 4 Main-rotor blade sling](#)) to release the tension on the cable.
- 1.27 Remove the crane hook (13) from the lifting ring (1).
- 1.28 Hold the bottom torque handle (3) and move the top clamp handle (2) counter-clockwise to release the bearing (9).
- 1.29 Remove the two clips (10) with straps (7) from the bolts (11).
- 1.30 Turn the two knobs (4) clockwise to open the jaws (6) on the sling (5).
- 1.31 Remove the sling (5) from the blade (12).
- 1.32 Remove the two fibrous ropes (2, [fig 5 Main-rotor-blade fibrous ropes](#)) from the blade (1).
- 1.33 Remove the tie-down (1, [fig 2 Main-rotor blade tie-down](#)) from the blade (5).
- 1.34 Is the blade (3, [fig 8 Main-rotor-blade counter-balance weights](#)) a replacement blade. Make a selection from the list that follows:
- If yes, go to [step 1.35](#)
 - If no, go to [step 1.37](#).

Fig 8 Main-rotor-blade counter-balance weights



- 1.35 Remove the two nuts (5) and washers (4) that attach the counter-balance weights (1) to the blade (3).
- 1.36 Remove the counter-balance weights (1) from the blade (3).
- 1.37 Clean and examine the general area.

2 Install

- 2.1 Is the blade (3, [fig 8 Main-rotor-blade counter-balance weights](#)) a replacement blade. Make a selection from the list that follows:
- If yes, go to [step 2.2](#)
 - If no, go to [step 2.8](#).
- 2.2 The replacement blade has the part number 7-311412000-103. Make a selection from the list that follows:
- If yes, refer to [AH-A-62-12-01-00A-920B-A](#)
 - If no, go to [step 2.3](#).
- 2.3 Is the blade (3) a replacement blade. Make a selection from the list that follows:
- If yes, go to [step 2.4](#)
 - If no, go to [step 2.8](#).
- 2.4 Paint the markings on the blade (3) as necessary. refer to [AH-A-62-12-00-00A-257A-A](#)
- 2.5 Put the necessary counter-balance weights (1, [fig 8 Main-rotor-blade counter-balance weights](#)) on the two studs (2).
- 2.6 Loosely install the two washers (4) and nuts (5) that attach the counter-balance weights (1) to the blade (3). Add washers as necessary so that the nuts do not become threadbound.
- 2.7 Torque tighten the two nuts (5) to 100 lbf in.
-

NOTE

The blade must be installed in the same position from where it was removed.

- 2.8 Identify the serial number (7, [fig 1 Number 1 main-rotor-blade](#)) and position of the blade (6).
 - 2.9 Put the blade tie-down (1, [fig 2 Main-rotor blade tie-down](#)) over the end of the blade (5) trailing edge.
 - 2.10 Put the crane hook (13, [fig 4 Main-rotor blade sling](#)) in the lifting ring (1).
 - 2.11 Turn the two knobs (4) clockwise to open the jaws (6) on the sling (5).
 - 2.12 Install the sling (5) on the blade (12). Make sure the CG mark (8) is approximately in the middle of the jaws (6).
 - 2.13 Turn the two knobs (4) counter-clockwise to close the jaws (6) around the blade (12) leading edge.
 - 2.14 Put the two straps (7) around the blade (12) trailing edge and attach the two clips (10) on the bolts (11).
-

NOTE

The locking spherical bearing on the sling lets the blade adjust in any direction $\pm 15^\circ$.

- 2.15 Hold the bottom torque handle (3) and move the top clamp handle (2) counter-clockwise to release the bearing (9).
 - 2.16 Lift the crane hook (13) to apply tension on the cable.
 - 2.17 Hold the bottom torque handle (3) and move the top clamp handle (2) clockwise to lock the bearing (9).
-

NOTE

Use the two fibrous ropes and blade tie-down to control the position of the blade.

- 2.18 Attach the two fibrous ropes (2, [fig 5 Main-rotor-blade fibrous ropes](#)) to the root end of the blade (1).
- 2.19 Remove the blade (3, [fig 7 Main-rotor blade adaptor and trailer](#)) from the blade adaptor (1) and trailer (2).
- 2.20 Assemble the Blade Pin Alignment-Tool (BPAT) (3, [fig 9 Blade pin alignment-tool](#)) as follows:
 - 1 Install the alignment-shaft (3, [fig 10 BPAT installation](#)) into the head (4).
 - 2 Align the hole in the head with the hole in the alignment-shaft.
 - 3 Install the pin (5) through the hole in the head and the hole in the alignment-shaft.
 - 4 Install the handle (1) through the hole in the head.

Fig 9 Blade pin alignment-tool



Fig 10 BPAT installation



- 2.21 Align the two holes in the lead lag link (1, [fig 9 Blade pin alignment-tool](#)) with the holes in the blade root (2).
 - 2.22 Install the BPAT (3) through the holes in the lead lag link (1) and blade root (2).
 - 2.23 Push down on the handle (1, [fig 10 BPAT installation](#)) until the bottom of the head (4) touches the lead lag link (2).
 - 2.24 Make sure the alignment-shaft (3) is fully through the lead lag link and blade root (2, [fig 9 Blade pin alignment-tool](#)).
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CAUTION

Do not let the blade-pin alignment-tool shaft fall when you remove the head. If you ignore this caution, damage to

the aircraft can occur.

- 2.25** Hold the bottom of the alignment-shaft (3, [fig 10 BPAT installation](#).) and remove the pin (5) that attaches the head (4) to the alignment-shaft.
- 2.26** Continue to hold the bottom of the alignment-shaft (3) and remove the head (4).
-

NOTE

The blade pin will push the alignment-shaft out of the lead lag link and blade root.

- 2.27** Continue to hold the bottom of the alignment-shaft (2, [fig 11 Blade pin installation](#).) and install the blade pin (1) into the top of the alignment-shaft.

Fig 11 Blade pin installation



- 2.28** Push down on the blade pin (1).
- 2.29** Remove the alignment-shaft (2).
- 2.30** Carefully lift the blade pin (3, [fig 12 Spacing tool](#).) and install the spacing tool (1) between the lead lag link (2) and the bottom of the blade pin washer (4).

Fig 12 Spacing tool



- 2.31** Push down on the blade pin (3) until the bottom of the blade pin washer (4), spacing tool (1) and lead lag link (2) touch.
- 2.32** Push down on the spring clip (5) until the spring clip is approximately 90° to the blade pin (3).
- 2.33** Remove the spacing tool (1).
-

NOTE

Each of the two blade pins must be measured and if necessary adjusted.

- 2.34** Measure the distance between the lead lag link (3, [fig 13 Main-rotor-blade pin spring-tester](#).) and bottom of the blade pin washer (2). Move the blade pin (4) up or down until the distance is between 0.002 in. and 0.060 in.

Fig 13 Main-rotor-blade pin spring-tester



NOTE



When measuring or adjusting the spring clip tension, you must hold the blade so there is a minimum load on the two blade pins.

- 2.35** Align the spring tester (1) with the spring clip (7) and bottom rivet (6).
- 2.36** Push the spring tester (1) against the rivet (6) until the spring clip (7) latches over the nut (5).
- 2.37** Is the force used to close the spring clip (7) between 50 lb and 60 lb. Make a selection from the list that follows:
- If yes, [go to step 2.40](#)
 - if no, [go to step 2.38](#).
- 2.38** Unfasten the spring clip (7) on the blade pin (4).
-

-
- 2.39** Tighten or loosen the nut (5) on the blade pin (4), go to step 2.34 .
- 2.40** Connect the electrical connector P1078 (1, [fig 3 Main-rotor-blade electrical connector](#)) to the electrical connector J1 (2).
- 2.41** Lock the electrical connector P1078 (1) to the electrical connector J1 (2) with lockwire.
- 2.42** Loosely install the two bolts (8, [fig 1 Number 1 main-rotor-blade](#)), washers (2), four bonding leads (1, 4) and two nuts (3) that attach to the two angle brackets (5).
- 2.43** Torque tighten the two nuts (3) to between 60 lbf in. and 85 lbf in.
- 2.44** Do a check of the electrical bond between the bonding lead (4) and angle bracket (5). Make sure the resistance is not more than 1Ω.
-

WARNING

You must know the safety precautions and first aid instructions related to sealing compound before you use it. Sealing compound is a hazardous substance. refer to AH-A-00-20-01-00A-012A-A

- 2.45** Apply sealing compound around the head of the two bolts (8), washers (2), nuts (3) and bonding leads (1, 4).
- 2.46** Lower the crane hook (13, [fig 4 Main-rotor blade sling](#)) to release the tension on the cable.
- 2.47** Remove the crane hook (13) from the lifting ring (1).
- 2.48** Hold the bottom torque handle (3) and move the top clamp handle (2) counter-clockwise to release the bearing (9).
- 2.49** Remove the two clips (10) with straps (7) from the two bolts (11).
- 2.50** Turn the two knobs (4) clockwise to open the jaws (6) on the sling (5).
- 2.51** Remove the sling (5) from the blade (12).
- 2.52** Remove the two fibrous ropes (2, [fig 5 Main-rotor-blade fibrous ropes](#)) from the blade (1).
- 2.53** Attach the tie-down pole (3, [fig 2 Main-rotor blade tie-down](#)) to the tie-down bracket (2).
- 2.54** Remove the tie-down (1) from the blade (5).
- 2.55** Open access door 5R86. refer to AH-A-52-45-01-00A-925A-A
- 2.56** Open the RTR DE-ICE CONT circuit-breaker (2, [fig 14 RTR DE-ICE CONT circuit-breaker](#)) on the Electrical Load Centre number 2 (ELC 2) (1).
Fig 14 RTR DE-ICE CONT circuit-breaker 
- 2.57** Remove access panel R200. refer to AH-A-53-25-14-00A-920A-A
- 2.58** Disconnect the electrical connector P1034 (3, [fig 15 Main-rotor de-ice controller](#)) from the main-rotor de-ice controller (1) electrical connector J2 (2).
Fig 15 Main-rotor de-ice controller 
- 2.59** Install blanking caps on the electrical connectors and stow electrical connector P1034 (3) safely.
- 2.60** Make sure the work area is clean and there are no loose objects.
- 2.61** Remove all the tools and equipment from the work area.

Requirements after job completion

- 1** Remove the four droop-stop wedge assemblies refer to AH-A-62-12-00-00A-520A-A
 - 2** Remove the access panel L200 refer to AH-A-53-24-14-00A-920A-A
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-
- 3 Phase the main rotor blades refer to AH-A-62-12-00-03A-271A-A
 - 4 Install the access panel R200 refer to AH-A-53-25-14-00A-920A-A
 - 5 Install the access panel L200 refer to AH-A-53-24-14-00A-920A-A
 - 6 Open the pilot door refer to AH-A-56-33-01-00A-925A-A
 - 7 Open the CPG door refer to AH-A-56-32-01-00A-925A-A
 - 8 Install the rotor-analysis diagnostics-system for the main rotor refer to AH-A-18-13-00-00A-720A-A
 - 9 Close the CPG door refer to AH-A-56-32-01-00A-925A-A
 - 10 Close the pilot door refer to AH-A-56-33-01-00A-925A-A
 - 11 Do the flight test schedule refer to AH-A-05-60-00-00A-000A-A
 - 12 Remove the rotor-analysis diagnostics-system for the main rotor refer to AH-A-18-13-00-00A-520A-A

End of data module

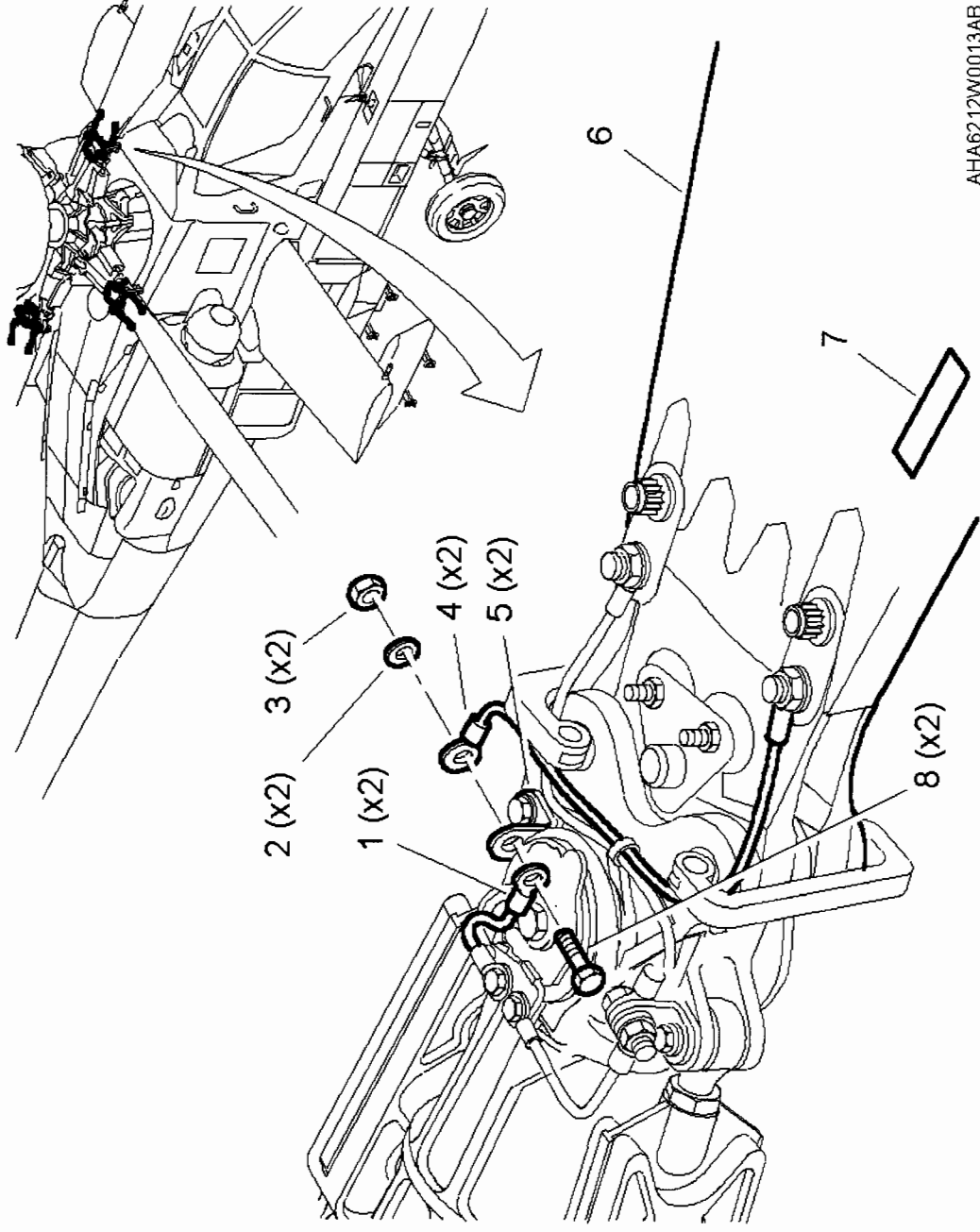


Fig 1 Number 1 main-rotor-blade

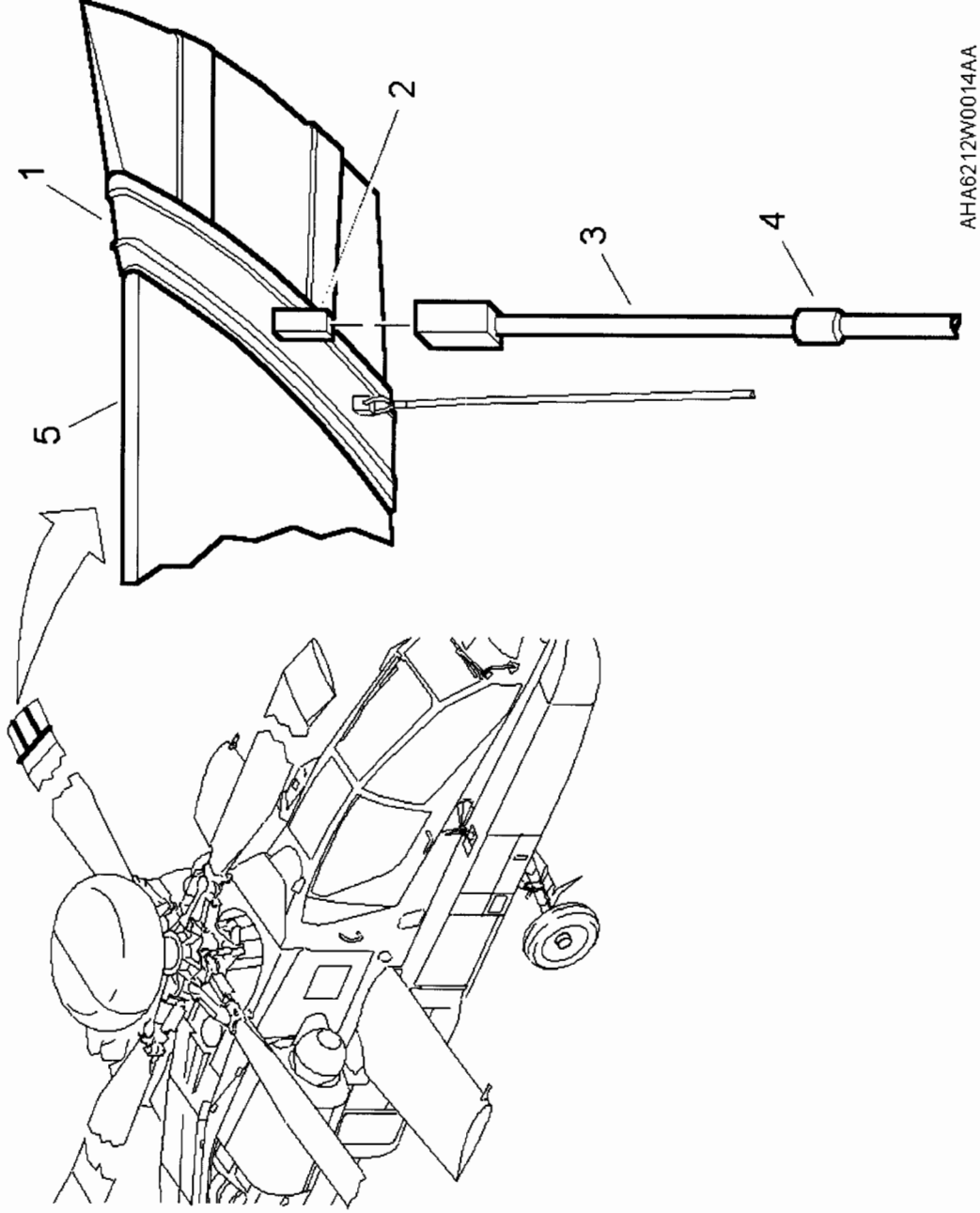
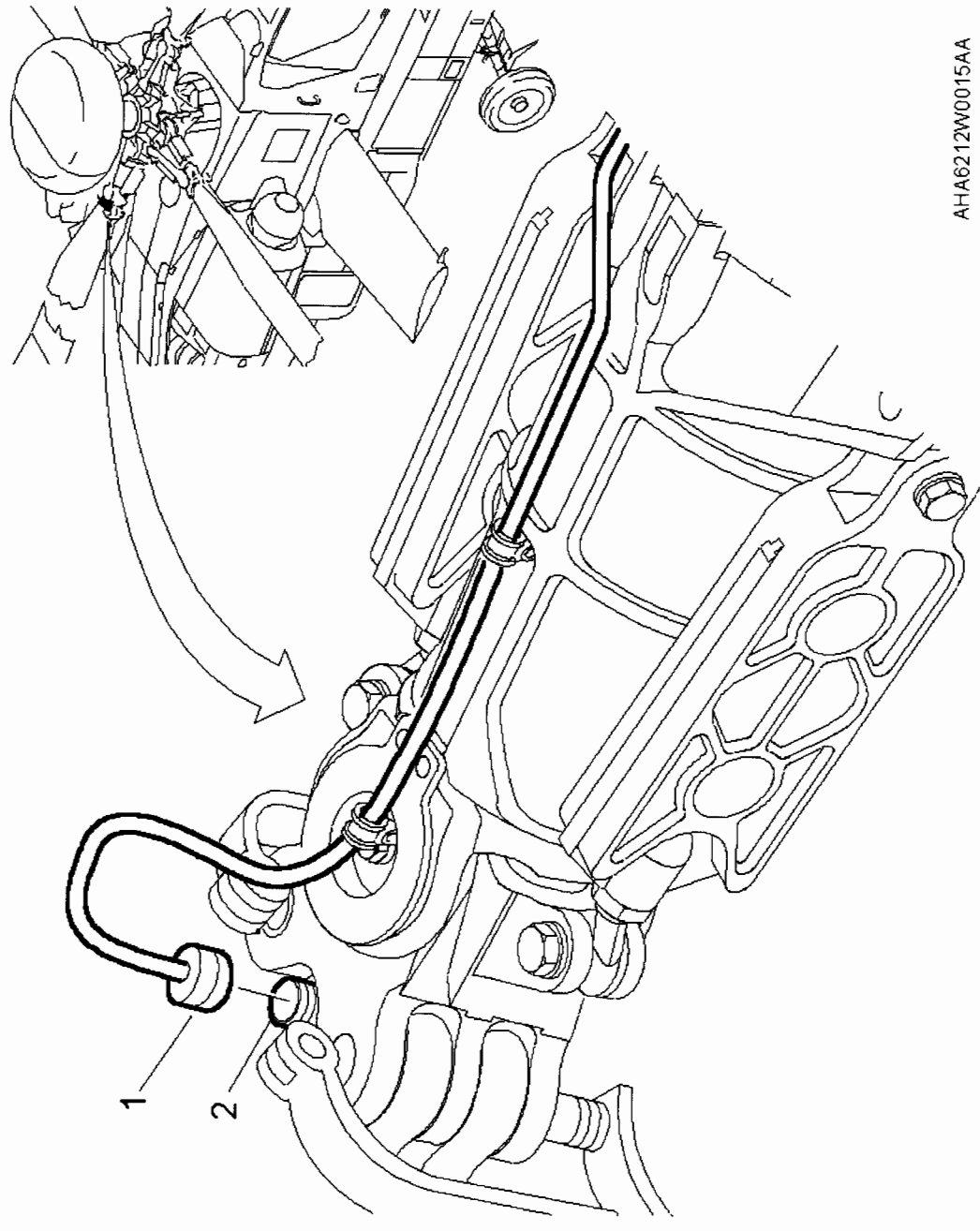


Fig 2 Main-rotor blade tie-down



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Fig 3 Main-rotor-blade electrical connector

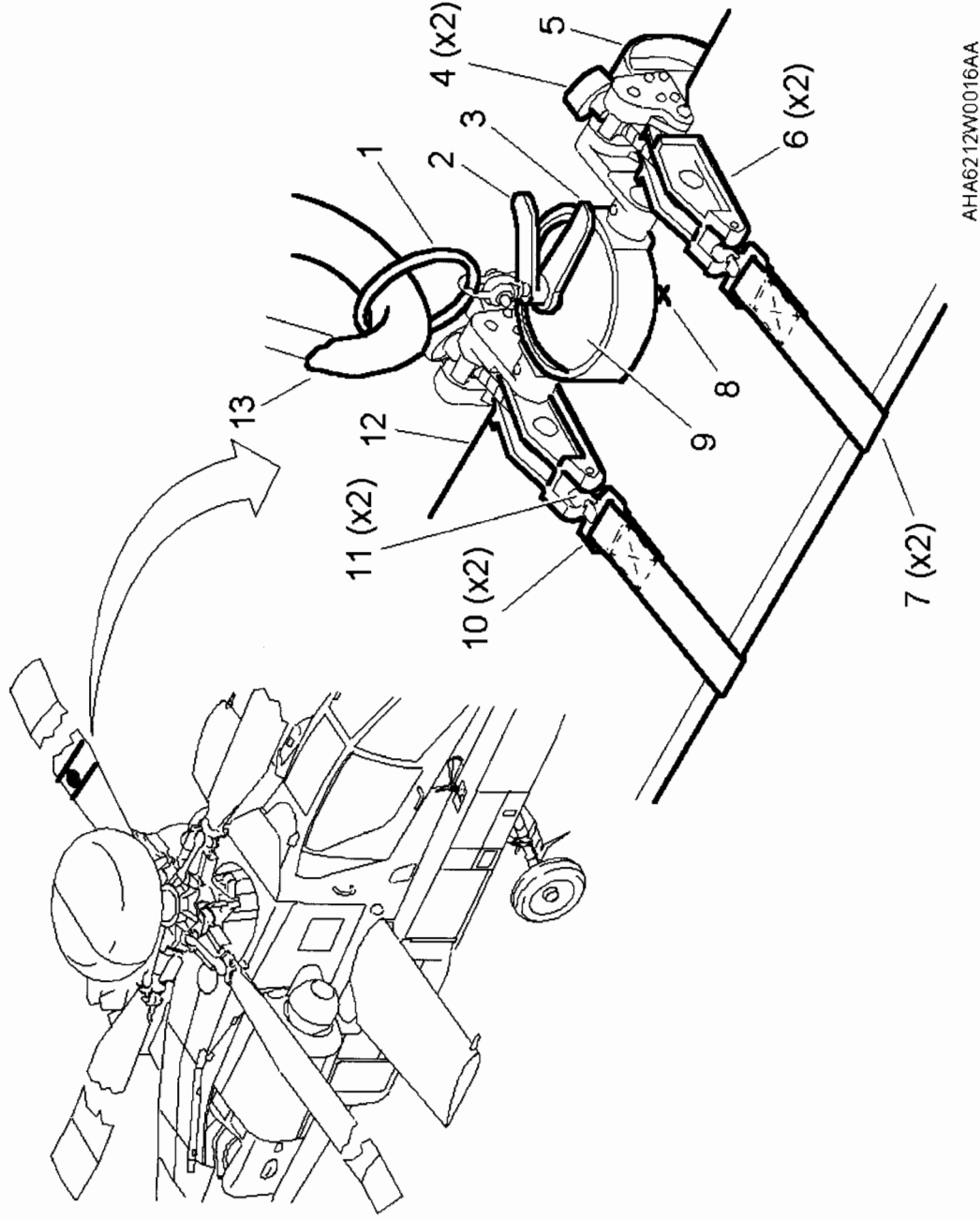
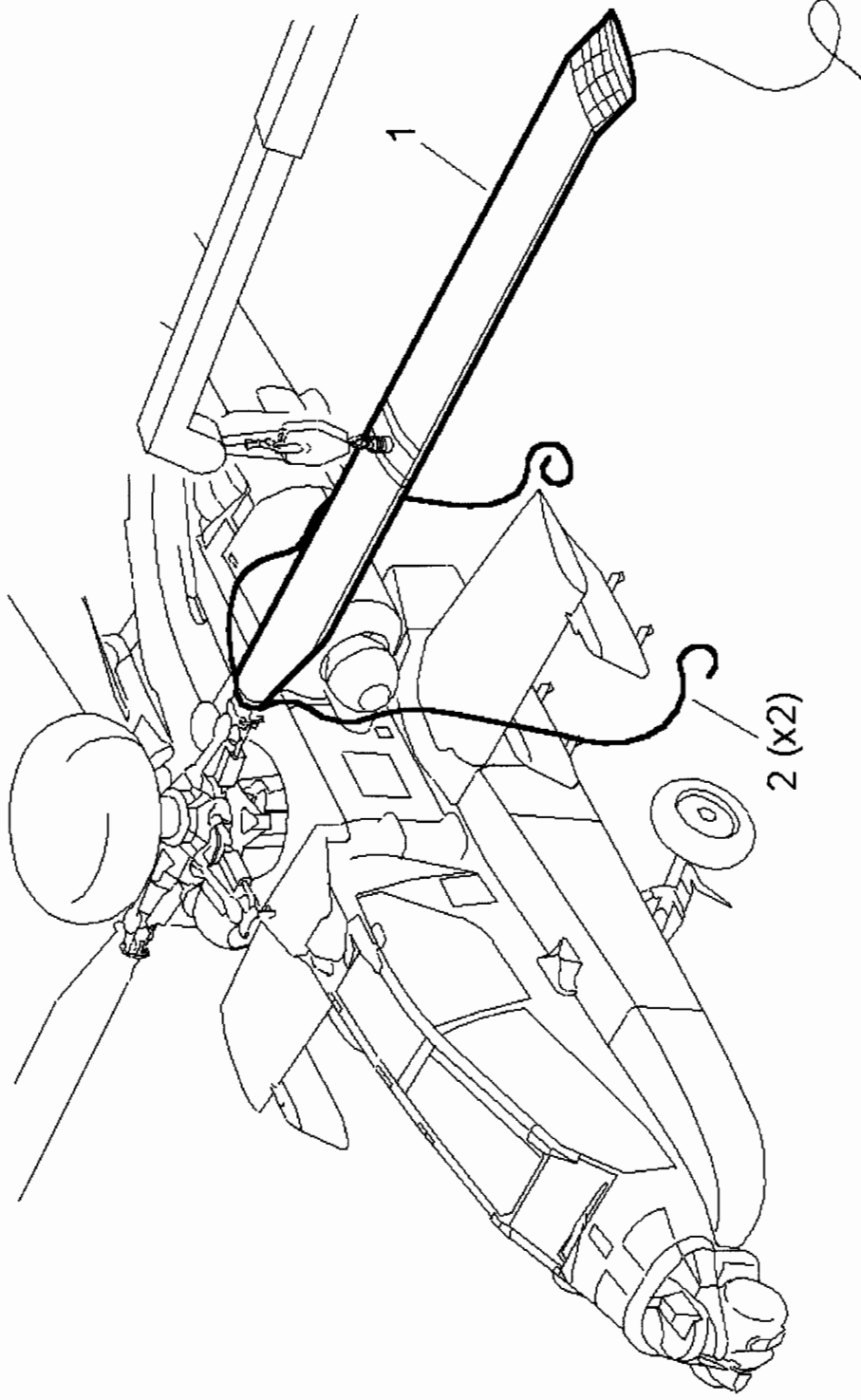
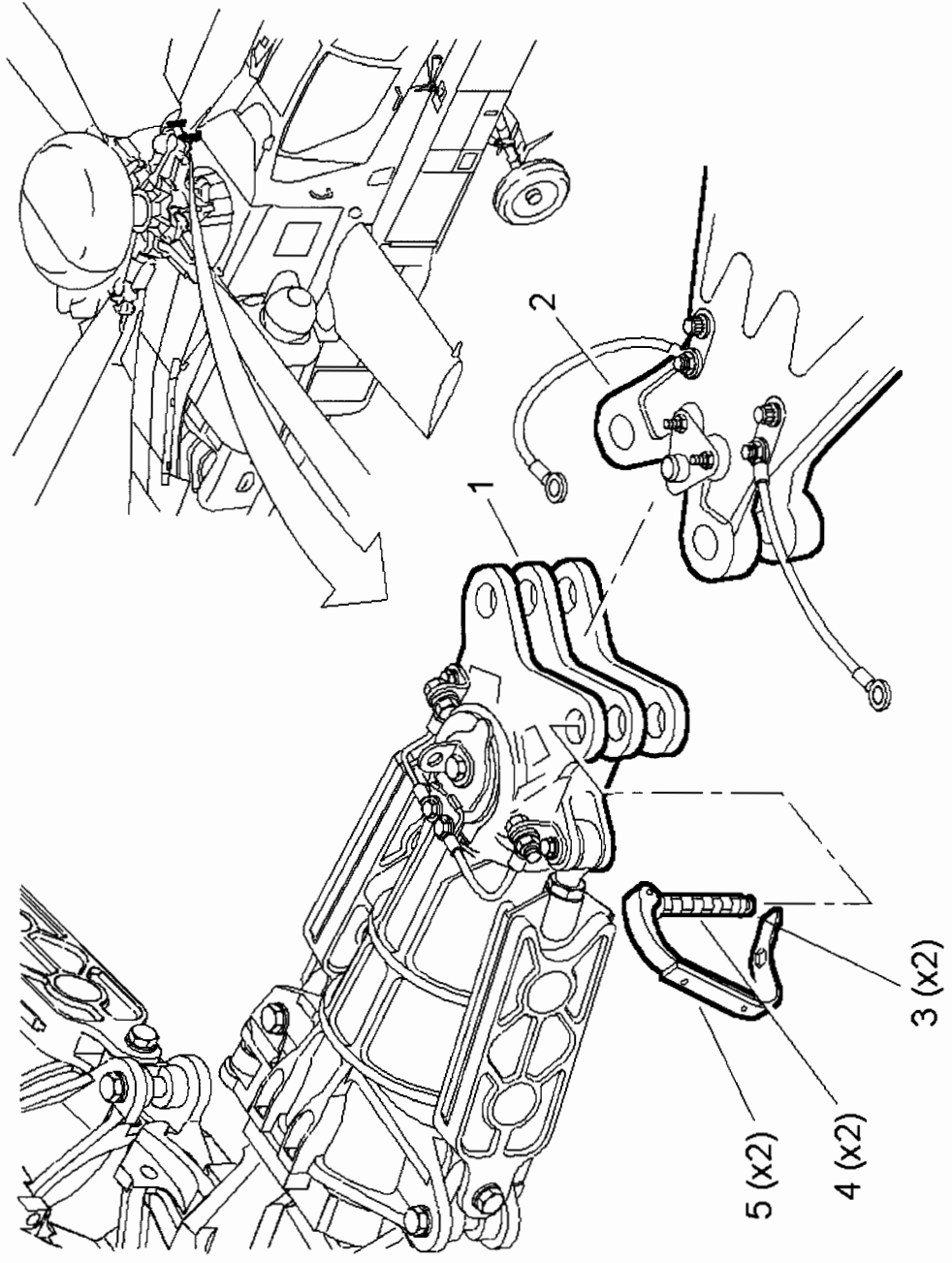


Fig 4 Main-rotor blade sling



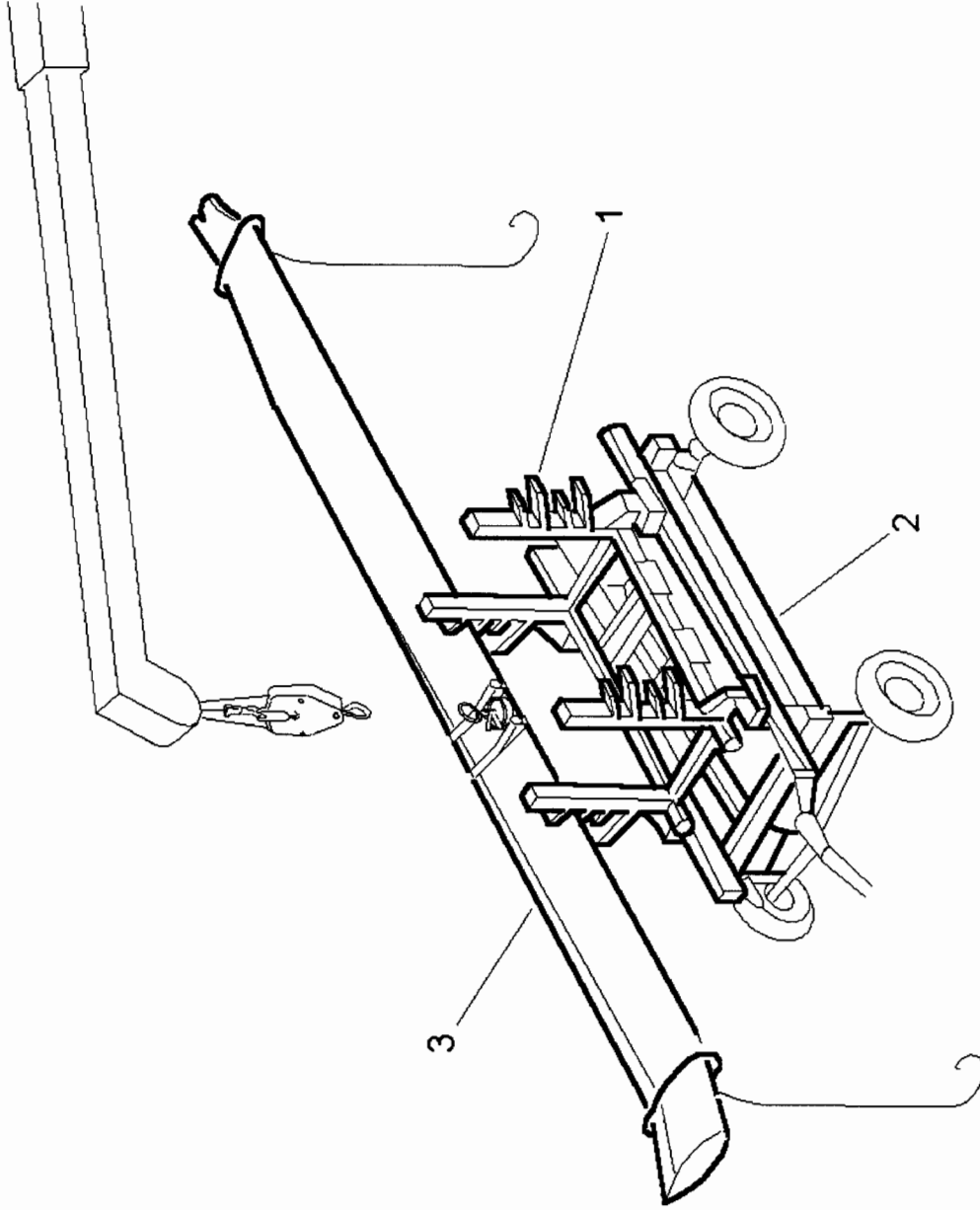
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Fig 5 Main-rotor-blade fibrous ropes



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Fig 6 Main-rotor blade pins



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Fig 7 Main-rotor blade adaptor and trailer

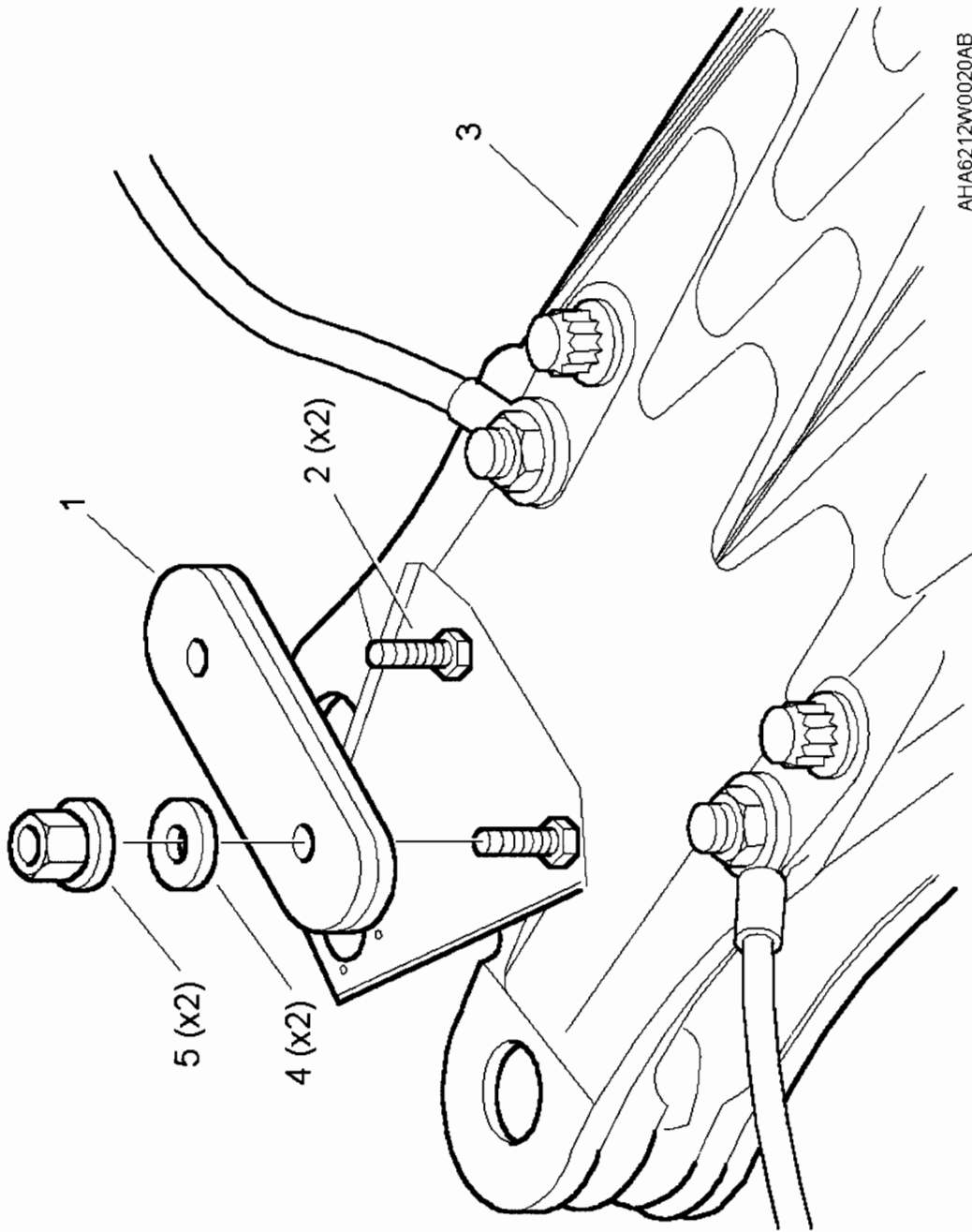


Fig 8 Main-rotor-blade counter-balance weights

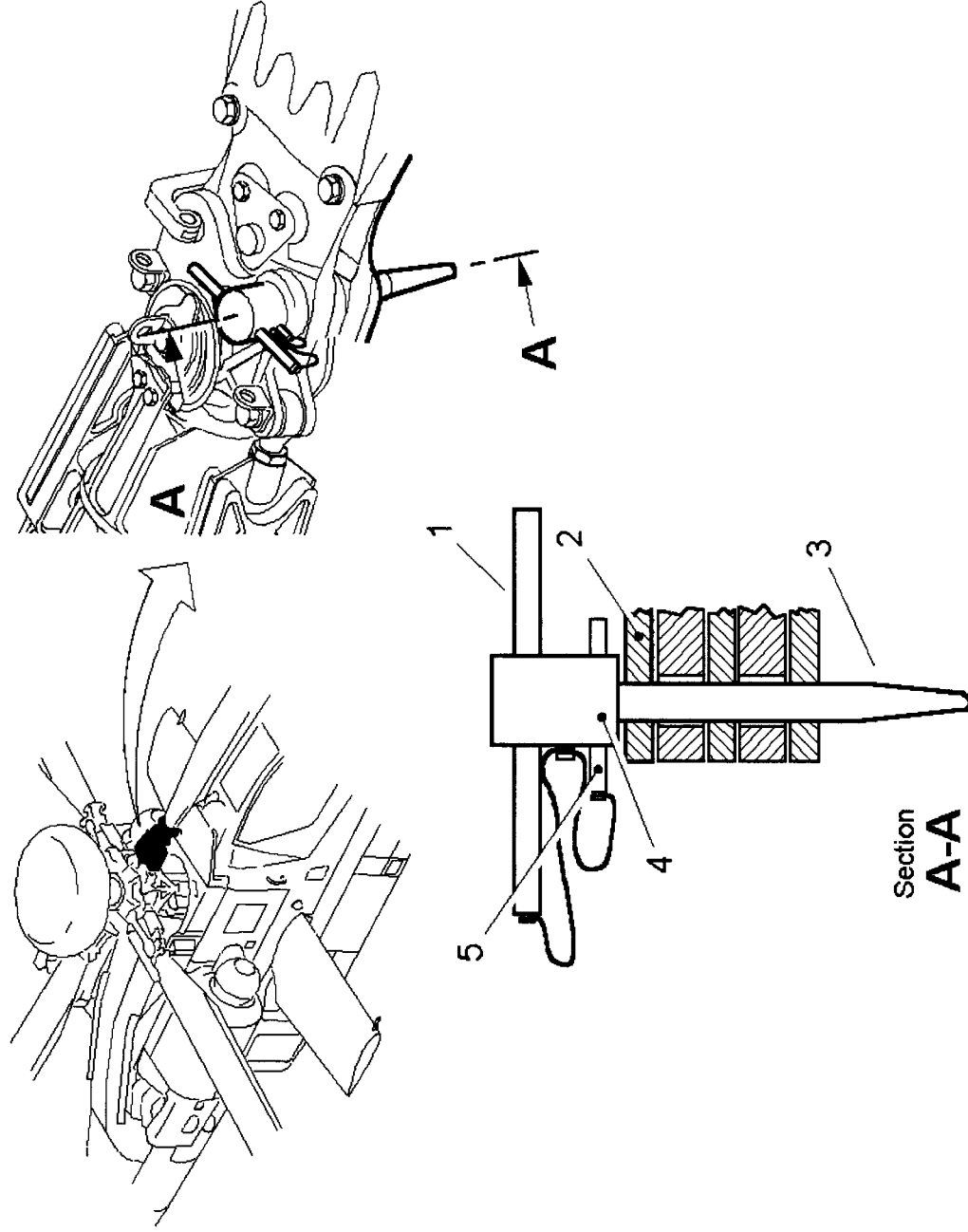
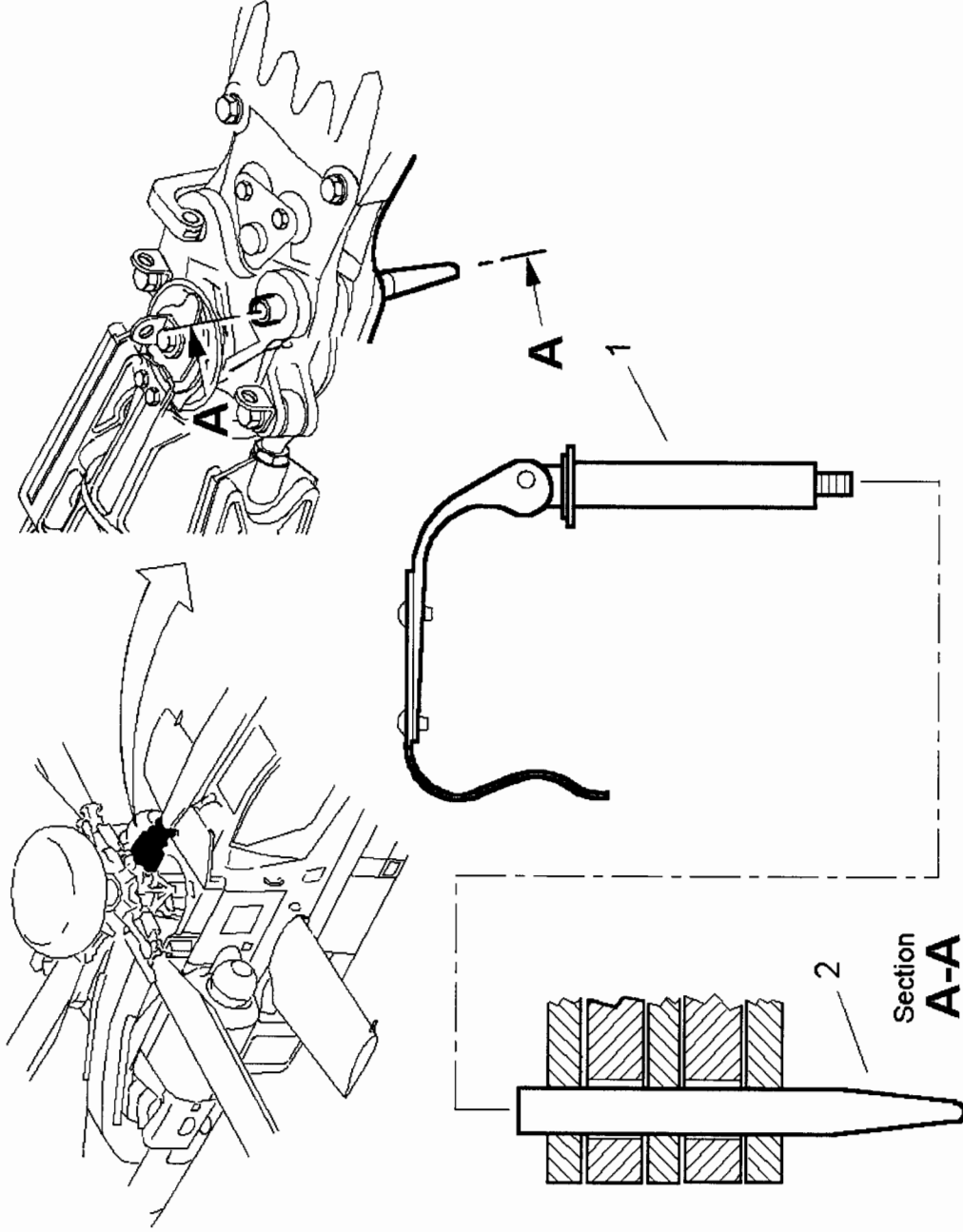
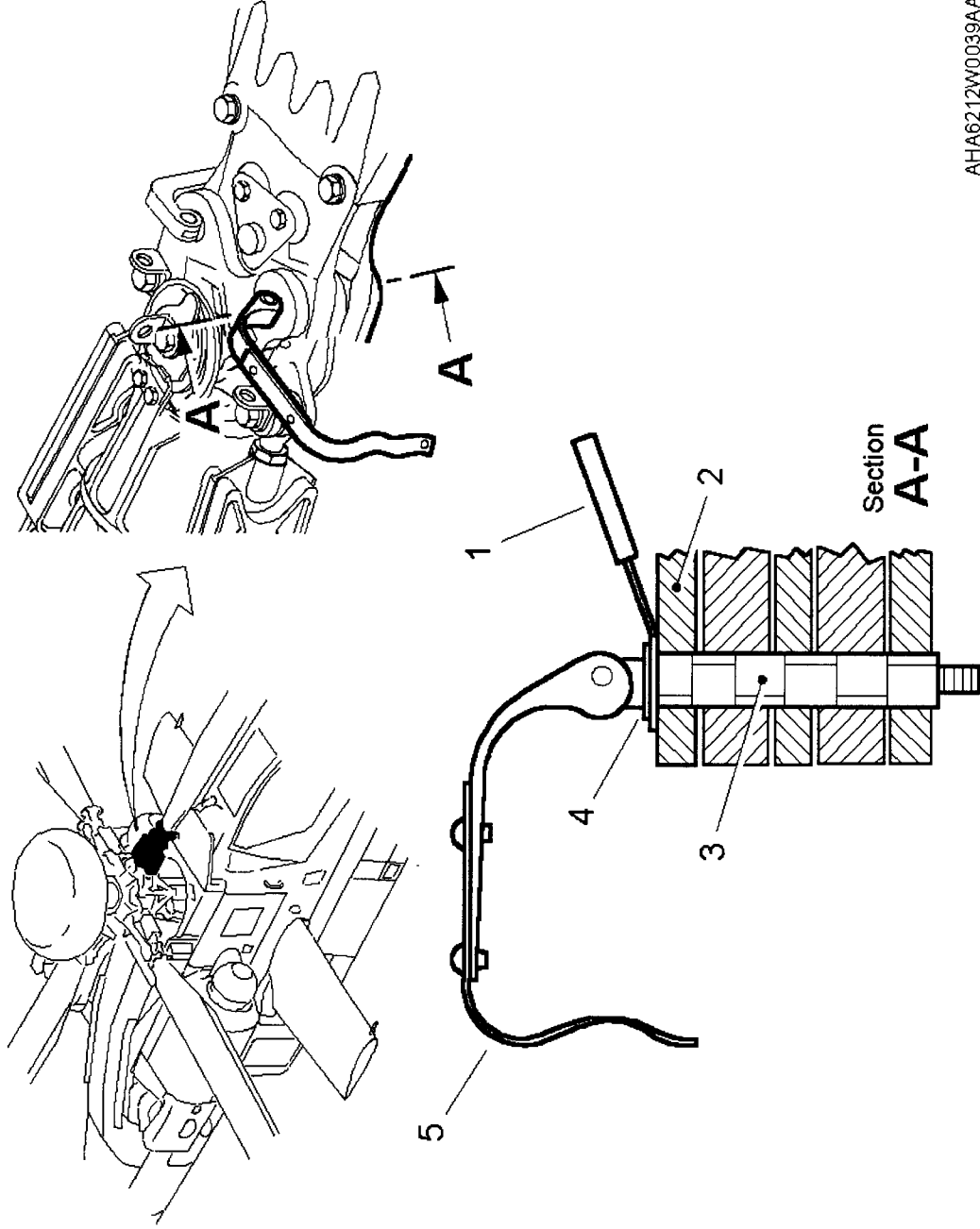


Fig 10 BPAT installation



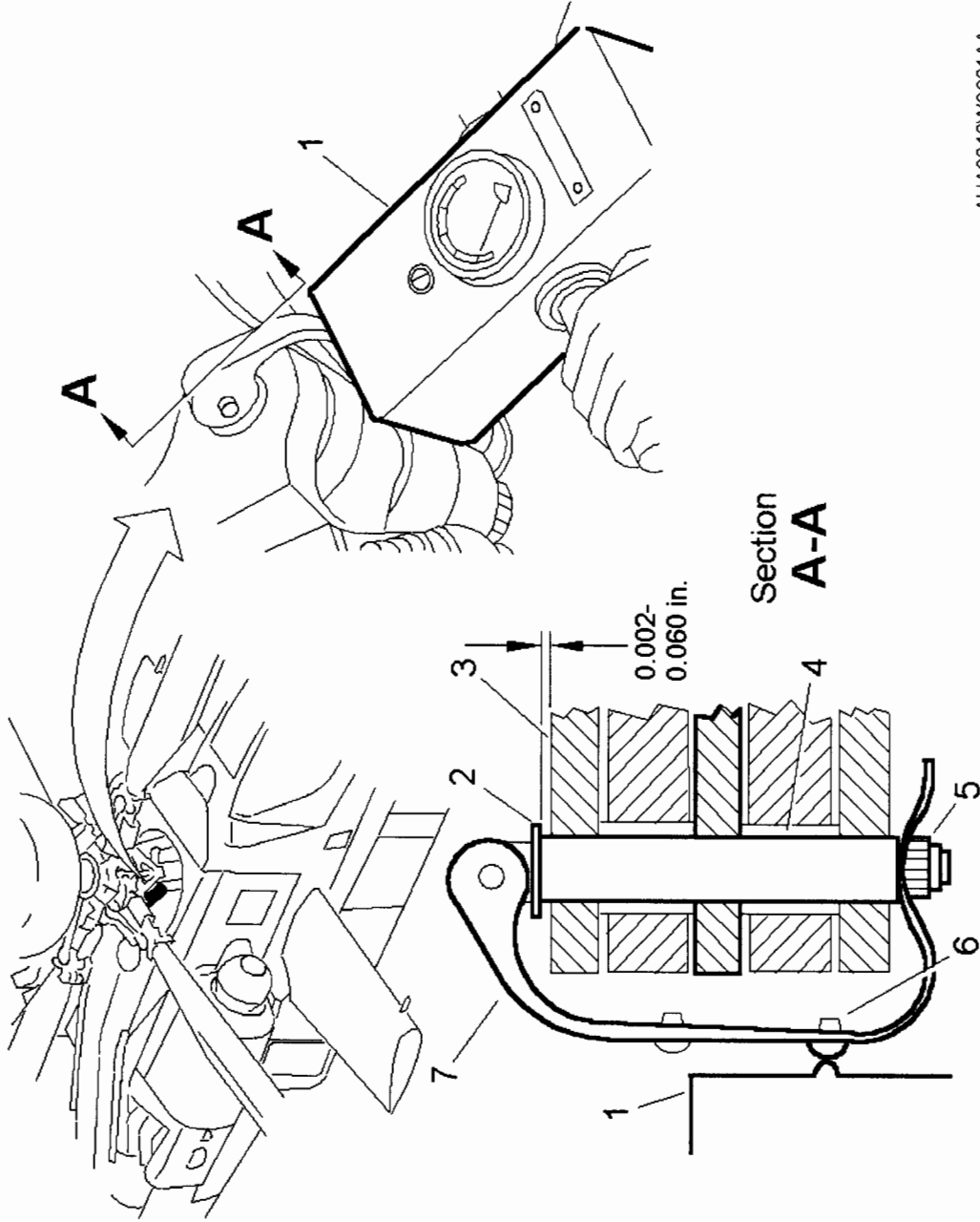
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Fig. 11 Blade pin installation



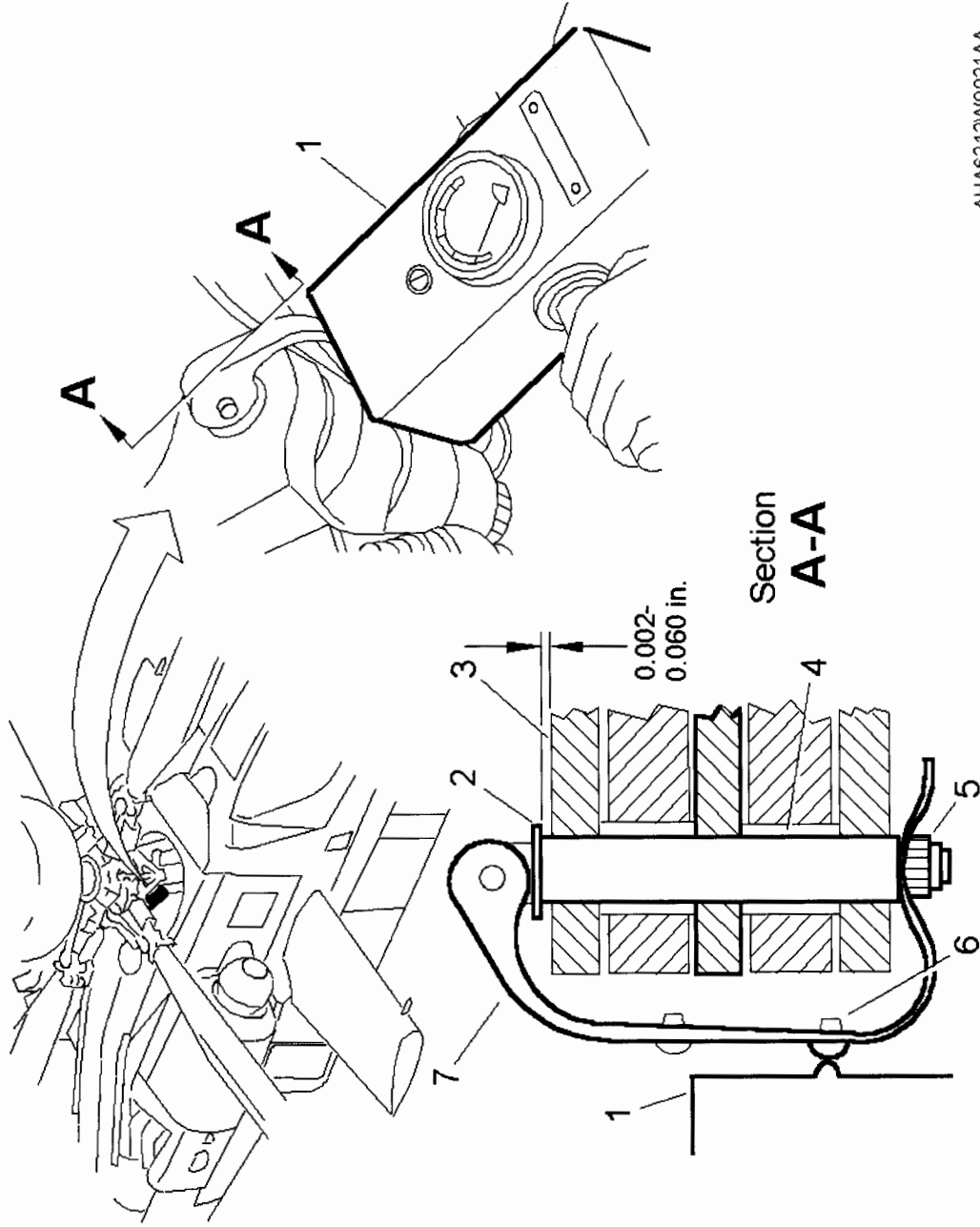
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Fig 12 Spacing tool



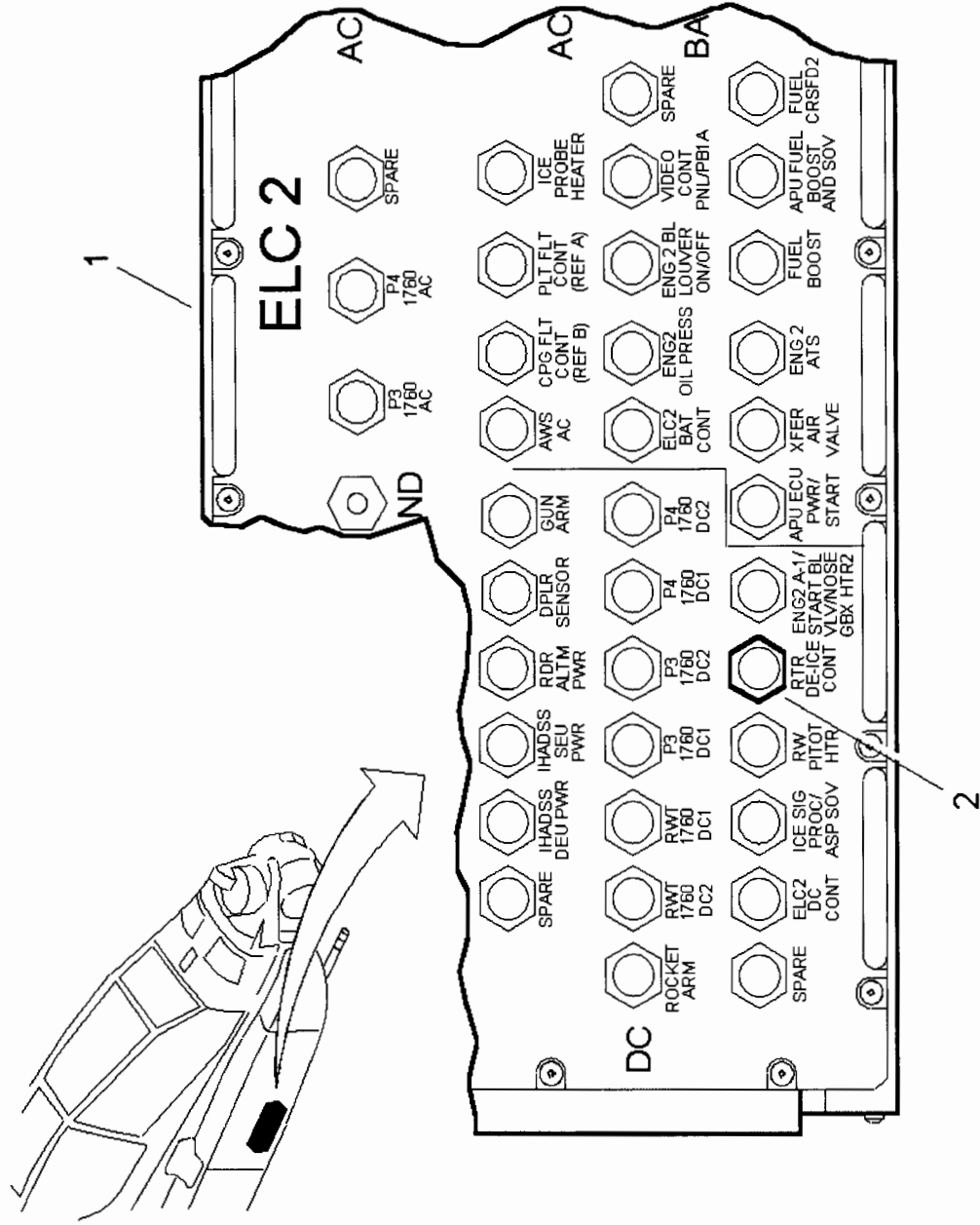
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Fig 13 Main-rotor-blade pin spring-tester



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Fig 13 Main-rotor-blade pin spring-tester



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Fig 14 RTR DE-ICE CONT circuit-breaker

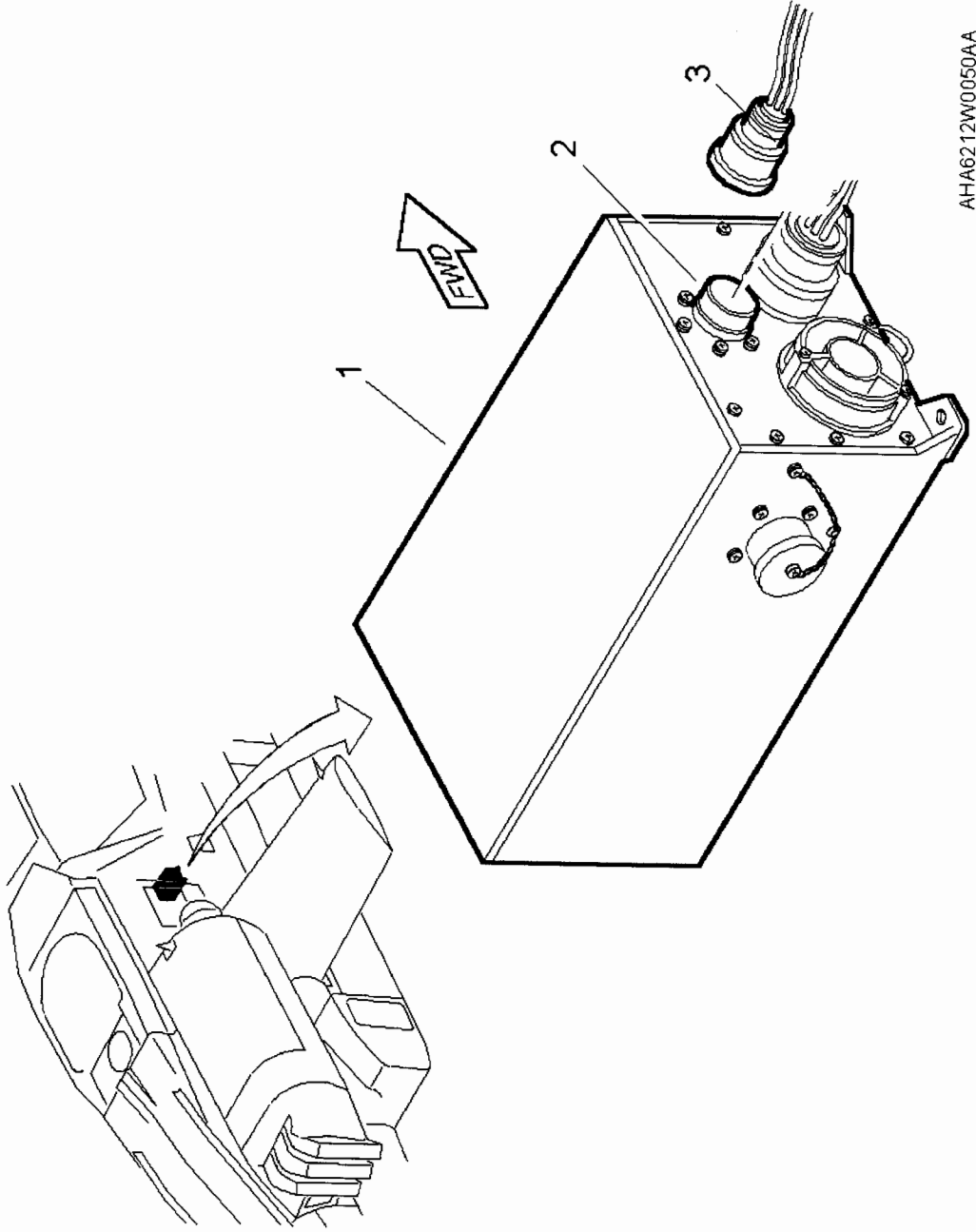


Fig 15 Main-rotor de-ice controller