

ALERT SERVICE BULLETIN

Checking and replacing hinge pins on ailerons and elevator on the BW 600 aircraft

ASB BW 600XX 01

MANDATORY

1 Planning information

1.1 Effectivity

This service bulletin is applicable to a limited number of Blackwing BW 600 aircrafts with serial numbers listed below.

- 003*, 004*, 005, 006, 007, 008, 009, 010, 011

*On aircraft 003 and 004 only the elevator hinges are affected.

1.2 Concurrent requirement

N/A

1.3 Reason

The cadmium plated steel pins for the elevator and aileron hinges has insufficient locking.

1.4 Description (Subject)

This alert service bulletin describes how to inspect the hinge pins before every flight and how to replace the pins at the next 50-hour service.

1.5 Compliance

Mandatory.

A loss of pin can result in a non-controllable aircraft.

1.6 Approval

Approved by DULV Germany

1.7 Manpower and time consumption

With the correct tools for inspection, the inspection can be completed within 5 minutes.

Replacing the part requires removing the aluminum hinges and disassembling the hinge. Estimated work time is between 6 and 8 man-hours.

1.8 Weight and balance

Not affected.

1.9 Electrical load

Not affected.

1.10 Software modifications

Not affected.

1.11 References

Appendix A

1.12 Other publications affected

None affected.

1.13 Interchangeability

New parts are interchangeable.

2 Material information

2.1 Material – price and availability

Replacement pins are provided by BLACKWING.

Price: Free of charge.

Blackwing Sweden AB commits to provide the replacement material free of charge in less than 2 weeks (transport not included).

New assemblies can be provided on request.

2.2 Company support information

Not affected.

2.3 Material necessary

- 8 steel pins (168mm long)
- 3M double-sided strong tape (12mm)
- 2*1.3m + 1*2.6m speed tape (25mm wide Mylar)
- 2*1.3m + 1*2.6m colored wrapping foil (30mm wide)
- 2*M6 locking nuts with MW4-20 surface treatment
- 2.5 mm drill bit
- Hinge lubrication oil (not provided, engine oil can be used)
- Degreaser agent (not provided)
- Tape residue remover (not provided)

2.4 Material necessary for each spare

None.

2.5 Rework of parts

The original pin is secured by deformed edges of the aluminum hinge.

- Push the hinge pin to one side and drill out the deformation on the other side of the aluminum hinge using a 2.5mm drill bit.
- Carefully push/hammer the pin out of the hinge using a mandrel tool (or similar).
- Drill out the deformation on the other side using the 2.5mm drill bit.
- Insert new *lubricated* pin
- Bend the non-bent end using a plier or similar*

*The end of the steel-pin, that is not bent, needs to be bent by the owner or an aircraft mechanic after it is inserted in the hinge. The hinge shall not be mounted on the plane during this bending to ease the operation. A few millimeters of play back and forward for the pin are recommended to avoid friction.

2.6 Tooling – price and availability

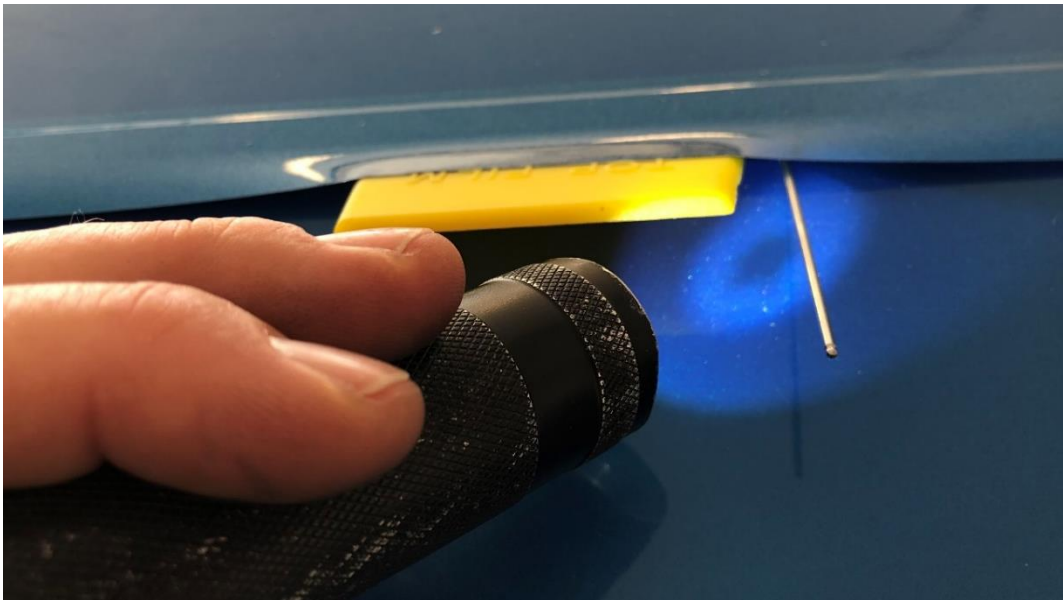
For replacement of a faulty part only normal hand tools are needed

- 2.5mm Allen wrench
- Drilling machine (2.5mm drill bit)
- Plier
- 10 mm socket wrench
- 3/32 inch Allen wrench (to hold the hi-loc bolt securing the aileron and elevator)

3 Accomplishment instructions

3.1 Inspection of part

For daily inspection, any combination of flashlight and plastic spatula, (or your credit card) is needed.



3.1.1 The following procedure is only necessary at first inspection:

Bend rudder down and use a 1.5mm Allen wrench to push the end of the pin in each direction to make sure the deformation of the hinge is sufficient to stop the hinge pin from coming out in both directions.



3.1.2 Inspection before every flight:

Make sure pin is not visible outside of any end of the eight hinges.

3.2 Replacement of part

For replacement of the hinge pin the hinge needs to be dismantled from the aircraft.

3.2.1 Removal of the aluminum hinge

3.2.1.1 Aileron

1. Remove speed tape
2. Remove Hi-loc bolt attaching the push rod using a 10mm wrench and a 3/32 Allen wrench.
3. Remove M4 counter sunk screws using a 2.5mm Allen wrench (aileron dismount)
4. Mark with a red pen or similar around the hinges on the aileron
5. Remove Hinges from aileron

3.2.1.2 Elevator

1. Remove speed tape
2. Remove Hi-loc bolt attaching the push rod using a 10mm wrench and a 3/32 Allen wrench (on some aircraft M6*20mm socket button head bolt)
**CAUTION! The pushrod is spring-loaded and elevator up action is needed on the stick.*
3. Remove M4 screws using a 2.5mm Allen wrench (elevator dismount)
4. Mark with a red pen or similar around the hinges on the elevator
5. Remove Hinges from elevator

3.2.2 Hinge disassembly

The original pin is secured by deformed edges of the aluminum hinge.

1. Push the hinge pin to one side and drill out the deformation on the other side using a 2.5mm drill bit. About 5mm depth, *see figure 1*.
2. Carefully push/hammer the pin out of the hinge using a mandrel tool (or similar)
3. Drill out the other side of the hinge



Figure 1. Removed hinge with faulty locking of hinge pin. Area marked that needs to be drilled out (about 5mm)

3.2.3 Hinge assembly

4. Insert new lubricated pin
5. Bend the non-bent end using a plier or similar according **HT_ASM_ULS_004_02** below (Appendix A)

*The end of the steel-pin, that is not bent, needs to be bent by the owner or an aircraft mechanic after it is lubricated and inserted in the hinge. The hinge shall not be mounted on the plane to ease the operation. A few millimeters of play back and forward are recommended to avoid friction.



Figure 2. New hinge with correct locking of hinge pin according to HT_ASM_ULS_004_01_02 below (Appendix A)

3.2.4 Reattaching hinge

1. Mount hinges on the aileron and the elevator using your red line as a reference according to drawing **HT_ASM_ULS_002_03_01**, **HT_ASM_ULS_005_01_02** and **WI_ASM_ULS_002_01_02** below (Appendix A)
2. Make sure hinge is flush with upper control surface
3. Mount the control surface on the aircraft with the counter sunk M4 bolts (3.5 Nm) according to drawing **HT_ASM_ULS_004_01_02** below (the hinges have floating anchor nuts and therefore the control surface can be moved 1-2mm in each direction)
4. Connect the controls using the hi-loc bolts, the 3/32 Allen wrench and the 10mm wrench. (On some aircraft the hi-loc can be replaced by a M6*20 Socket button head bolt) according to drawing **WI_ASM_ULS_002_01_02** and **HT_ASM_ULS_008_01_02** below.
5. Check torque on M6 nut. 10 Nm on elevator and 5Nm on aileron. Mark with safety lacquer.
Warning! Do not re-use old nut!

3.2.5 Check clearance

Check clearance on both side of aileron and elevator to make sure no jamming can occur. Also check that the control pushrods are centered and have clearance to the surrounding structure. Minimum clearance is 2mm.

3.2.6 Reattaching speed tape.

The speed tape reduce drag and increase aileron and elevator effectiveness. For help contact your local gliding club.

1. Clean area where speed tape shall attach with a degreasing agent
2. Install 12 mm double sided tape
3. Install 25mm curved mylar
4. Secure with provided 30mm wide wrapping foil (also covering the white mylar)
5. Use a heat gun carefully to increase the adhesion of the provided colored foil

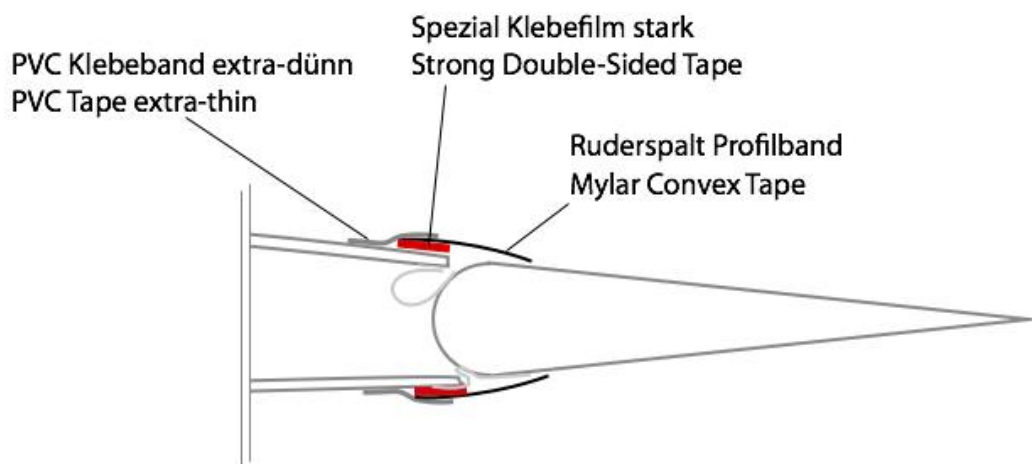


Figure 3. Typical installation of speed tape. PVC Tape in figure is replaced by colored wrapping foil provided by BLACKWING.

3.2.7 Control flight

Perform a control flight.

3.3 Contact information

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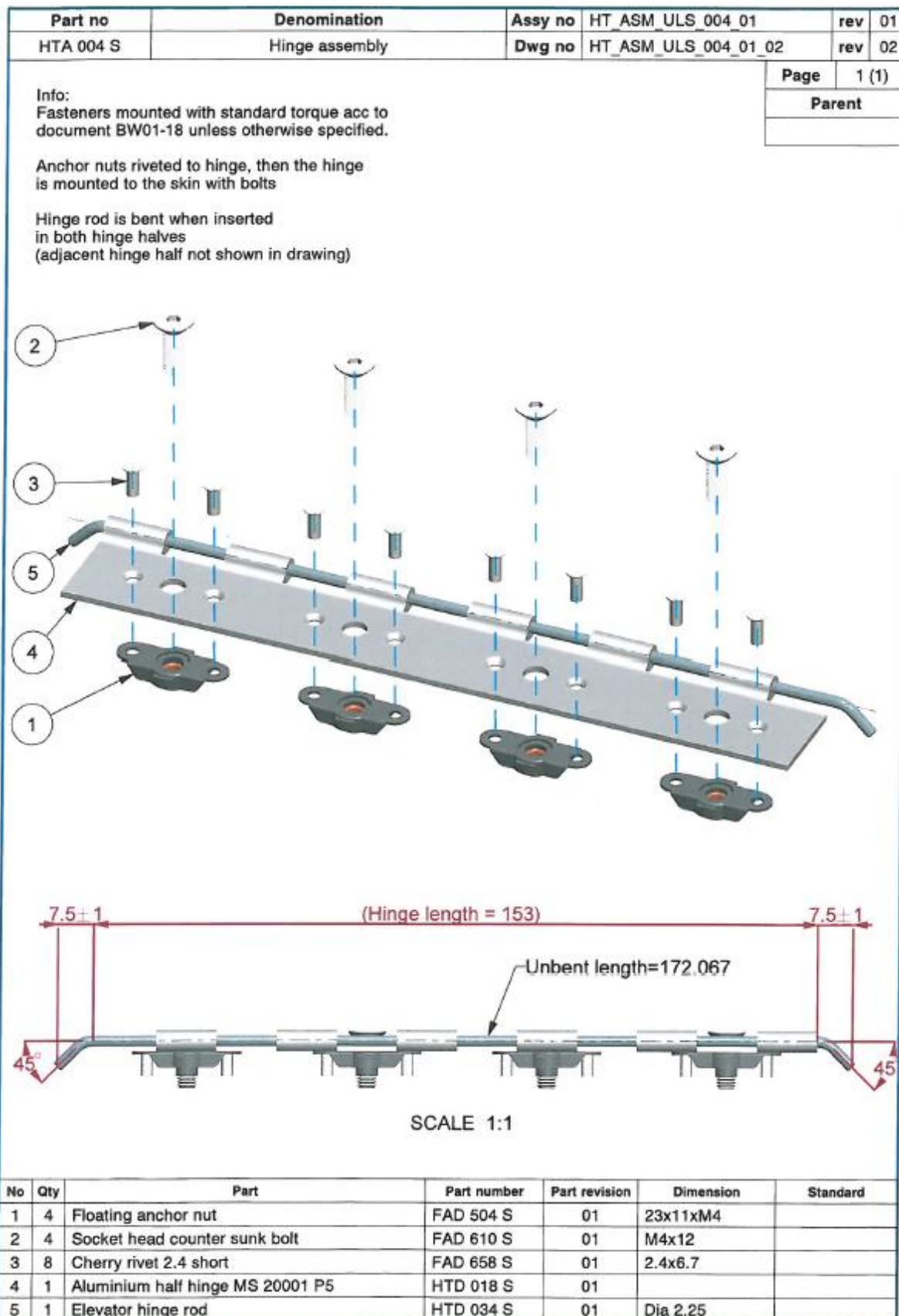
4 Appendix A, Information, and drawings

Standard torques for steel bolts 8.8

M3	1.2 Nm
M4	2.9 Nm
M5	6.0 Nm
M6	10.0 Nm
M8	25.0 Nm
M10	49.0 Nm

The aileron pushrod is attached to the aileron in a carbon fiber lug.

Tightening torque, for the 6mm attachment bolt, is reduced to 5 Nm for the aileron lug.

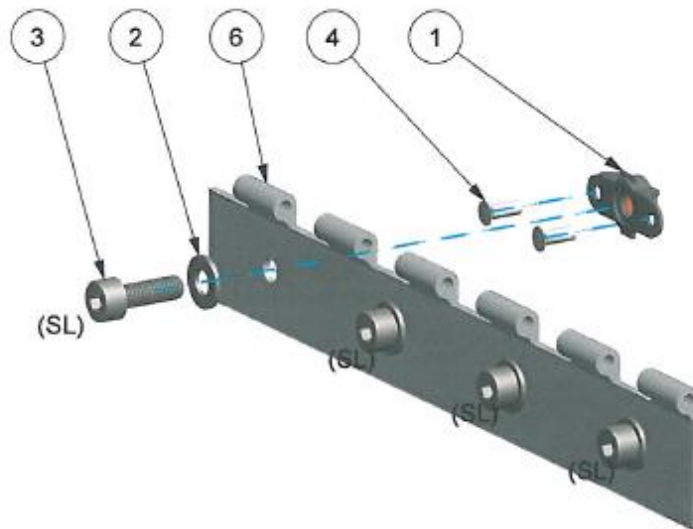


Part no	Denomination	Assy no	HT_ASM_ULS_005_01	rev	01
HTA 005 S	Aluminium half hinge assembly	Dwg no	HT_ASM_ULS_005_01_02	rev	02

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Info:
Fasteners mounted with standard torque acc to document BW01-18 unless otherwise specified.

Safety lacquer applied on pos (SL)
acc to document BW01-34
on final assembly



No	Qty	Part	Part number	Part revision	Dimension	Standard
1	4	Floating anchor nut	FAD 504 S	01	23x11xM4	
2	4	Flat washer	FAD 547 S	01	4.3x9x0.8	ISO 7089
3	4	Socket head cap screw	FAD 570 S	01	M4x12	ISO 4762
4	8	Cherry rivet 2.4 short	FAD 658 S	01	2.4x6.7	
5	4	Safety lacquer	FAD 902 S	01		
6	1	Aluminium hinge	HTD 019 S	01	152	

Part no	Denomination	Assy no	WI_ASM_ULS_002_01	rev	01
WIA 002 S	Left aileron assembly	Dwg no	WI_ASM_ULS_002_01_02	rev	02
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Completed aileron balanced in MO WIA 005 01 JIG to specified value by trimming WID 061 S Aileron counterweight

No	Qty	Part	Part number	Part revision	Dimension	Standard
1	1	Nylon insert lock nut	FAD 601 S	01	M6	ISO 7040
2	1	Fender washer	FAD 619 S	01	6.4x18x1.6	ISO 7093
3	1	Hi-lok pin	FAD 834 S	01	M6x23	
4	2	Aluminium half hinge assembly	HTA 005 S	01		
5	1	Left aileron bottom skin	WID 005 S	01		
6	1	Left aileron top skin	WID 006 S	01		
7	1	Left aileron inner rib	WID 024 S	01		
8	1	Left aileron outer rib	WID 032 S	01		
9	1	Pushrod fairing aileron	WID 036 S	02		
10	1	Aileron counterweight	WID 061 S	01		

Part no	Denomination	Assy no	HT_ASM_ULS_002_03	rev	03	
HTA 002 S	Elevator assembly	Dwg no	HT_ASM_ULS_002_03_01	rev	01	
Info:				Page	1 (2)	
Fasteners mounted with standard torque acc to document BW01-18 unless otherwise specified.				Parent		
Safety lacquer applied on all lock nuts acc to document BW01-34 on final assembly						
HTD 027 S/M glued with Araldite 4859 (ref note in view)						
No	Qty	Part	Part number	Part revision	Dimension	Standard
1	1	Elevator trim tab pushrod assembly	CSA 039 S	03	C-C LENGTH 116	
2	1	Trim servo assembly	CSA 057 S	02		
3	2	Araldite 4859	FAD 901 S	01		
4	5	Safety lacquer	FAD 902 S	01		
5	4	Aluminium half hinge assembly	HTA 005 S	01		
6	1	Trim tab assembly	HTA 007 S	01		
7	1	Elevator control arm assembly	HTA 008 S	01		
8	1	Elevator bottom skin	HTD 005 S	03		
9	1	Elevator top skin	HTD 006 S	03		
10	2	Elevator lid left/right	HTD 013 S	02		
11	1	Elevator right rib	HTD 014 M	02		
12	1	Elevator left rib	HTD 014 S	02		
13	1	Elevator trim reinforcement	HTD 023 S	01		
14	1	Elevator counterweight right	HTD 027 M	02		
15	1	Elevator counterweight left	HTD 027 S	02		

Part no	Denomination	Assy no	HT_ASM_ULS_008_01	rev	01
HTA 008 S	Elevator control arm assembly	Dwg no	HT_ASM_ULS_008_01_02	rev	02
<p>Info: Fasteners mounted with standard torque acc to document BW01-18 unless otherwise specified.</p> <p>Safety lacquer applied on all lock nuts acc to document BW01-34 on final assembly</p>				Page	1 (1)
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No	Qty	Part	Part number	Part revision	Dimension	Standard
1	1	Elevator pushrod back assembly	CSA 021 S	02	C-C 3020	
2	4	Socket head bolt	FAD 578 S	01	M5x16	ISO 4762
3	4	Nylon insert lock nut	FAD 600 S	01	M5	ISO 7040
4	1	Nylon insert lock nut	FAD 601 S	01	M6	ISO 7040
5	1	Socket button head bolt	FAD 616 S	01	M6x20	ISO 7380
6	5	Safety lacquer	FAD 902 S	01		
7	1	Elevator control arm	HTA 003 S	02		