MANDATORY SERVICE BULLETIN

MSB 42-087/1

MSB 42NG-016/1

Supersedes MSB 42-087 and MSB 42NG-016

I TECHNICAL DETAILS

I.1 Category

Mandatory.

I.2 Airplanes affected

Type:	DA 42, DA 42 M, DA 42 NG, DA 42 M-NG
Serial numbers:	42.004 through 42.036, 42.038 through 42.047, 42.049 through 42.053, 42.055 through 42.321, 42.324 through 42.347, 42.349, 42.351, 42.353 through 42.357, 42.359 through 42.386, 42.388, 42.389, 42.391, 42.394, 42.396, 42.399 through 42.401, 42.405 through 42.409, 42.412 through 42.416, 42.427 42.AC001 through 42.AC135, 42.AC138, 42.AC142 through 42.AC145, 42.AC148, 42.AC150, 42.AC151 42.M001 through 42.M012, 42.M015 through 42.M019, 42.M022 42.N001 through 42.N013, 42.N018, 42.N019, 42.N023 through 42.N028, 42.N034 42.MN001 through 42.MN009

I.3 Date of effectivity

20-Oct-2010

I.4 Time of Compliance

Inspection:	Within the next 100 flight hours from the date of effectivity but not later than 30-Apr-2011 and every scheduled 200 flight hours inspection thereafter, until repair is carried out.
Repair:	If disbonds are detected during inspection or at owner's discretion as terminating action for repetitive inspection.

I.5 Subject

Inspection of rudder control system and NLG steering bracket.

ATA-Code: 27-20 and 32-50

I.6 Reason

On two aircraft which have been used in a flight training environment, disbonds of the rudder steering bracket and insufficient clearance between the T-Yoke and the NLG steering rod was found. To prevent possible disbonds and subsequent possibility of insufficient clearance in the control system, all aircraft possibly affected must be inspected and if necessary corrective actions must be taken.

I.7 Concurrent Documents

None.

I.8 Approval

The technical information or instructions contained in this document relate to the Design Change Advisory No. RÄM 42-106 and MÄM 42-457/a, which has been approved under the authority of EASA Design Organization Approval ref. EASA.21J.052.

The technical content of this document has been approved under the authority of DOA ref. EASA.21J.052.

I.9 Accomplishments / Instructions

Comply with WI-MSB 42-087 / WI-MSB 42NG-016, latest effective issue.

Note: WI-MSB 42-087 / WI-MSB 42NG-016 is attached to this document.

I.10 Mass (Weight) and CG

The effect on mass and CG is negligible.

II PLANNING INFORMATION

II.1 Material and Availability

See WI-MSB 42-087 / WI-MSB 42NG-016, latest effective issue.

Materials including drawings are available from Diamond Aircraft Industries.

II.2 Special Tools

See WI-MSB 42-087 / WI-MSB 42NG-016, latest effective issue.

II.3 Labor Effort

Approx. 0.5 hours for inspection.
Approx. 6 hours for repair.
Approx. 3 hours for adjustment.

II.4 Credit

None for inspection only.

For repair:
- 6 hours of labor for repair and additional 3 hours if adjustment is required.
- Material according to WI-MSB 42-087 / WI-MSB 42NG-016, latest effective issue.

II.5 Reference Documents

Diamond Aircraft 42 Series Airplane Maintenance Manual, Doc. No. 7.02.01, latest effective issue.

Diamond Aircraft 42 NG Airplane Maintenance Manual, Doc. No. 7.02.15, latest effective issue.

III REMARKS

1. All measures must be carried out by a certified aircraft service station or a certified aircraft maintenance mechanic.
2. All works, in particular those that are not especially described in this Service Bulletin, must be carried out in accordance with the referenced Maintenance Manual.
3. Accomplishment of the measures must be confirmed in the log book.
4. If material and/or labor hours are subject to be credited through Diamond Aircraft Industries, the Service Bulletin must be carried out by an authorized Diamond Service Center and the Warranty Application incl. Work Report must be sent not later than 30 days after the expiry of time of compliance.
5. In case of doubt contact Diamond Aircraft Industries GmbH.

EXECUTION REPORT TO SERVICE BULLETIN MSB 42-087/1 MSB 42NG-016/1

AIRPLANE DATA

Airplane Serial Number: _____

Airplane Registration: _____

Airplane Operator: _____

Hours of operation of airplane: _____

No. of landings: _____

Hours of operation-engine LH _____

RH _____

Typical operation of airplane: private, club, training, other _____

- o No repair necessary
- o Bonding repaired
- o Clearance adjusted

_____
Date, Name, Sign

Please fax the completed form to Fax No. +43-2622-26700-1369 or e-mail to airworthiness@diamond-air.at

WORK INSTRUCTION

WI-MSB 42-087

WI-MSB 42NG-016

Inspection of the rudder control system and NLG steering

I GENERAL INFORMATION

I.1 Subject

Inspection of the bonding of rudder steering bracket and clearance between the T-yoke and adjacent parts and corrective action if necessary.

I.2 Reference Documents

Diamond Aircraft DA 42 Series Airplane Maintenance Manual, Doc. No. 7.02.01, latest effective issue.

Diamond Aircraft DA 42 NG Airplane Maintenance Manual, Doc. No. 7.02.15, latest effective issue.

I.3 Remarks

a) The work must be carried out by a certified aircraft service station or a certified aircraft maintenance mechanic.

b) All works, particular those that are not especially described in this work instruction, must be carried out in accordance with the referenced maintenance manual.

c) The work must be performed in Workshop conditions acc. to Airplane Maintenance Manual Section 51-00.

d) It is recommended to print this Work Instruction in color.

e) In case of doubt, contact Diamond Aircraft Industries GmbH.

II DRAWINGS, SPECIAL TOOLS & MATERIALS

II.1 Drawings

D60-5710-05-00

D60-5710-05-00-SV (optional Tool)

II.2 Special Tools

For repair of cracks in bonding surface.

Ring saw 79mm (3.1in.),

2 pcs. Fixing tool D60-5710-05-00-SV (optional, also possible to make your own tool)

For adjustment between yoke bolt and steering rod.

Cable tension gauge (tensiometer)

II.3 Material for repair

Quantity	Part No.	Description
Repair of cracks in bonding surface		
2	D60-5710-06-00 or D60-5710-06-00X01	Lower shell panel Lower shell panel grey
2	D60-5710-05-01	Lower shell Insert
1	ISO 7380-M6x35-A2	screw
1	ISO 7380-M6x30-A2	screw
2	DIN 9021-6,4-A2,	washer
4	DIN-985-M6-A2.	nut
1	RSGU_1.18_15W1	rubber clamp
2	DIN 125-6,4-PA	washer
Adjustment clearance between yoke bolt and steering rod		
1	D60-5320-00-31	Oblong hole washer
2	MS 21256-1	turnbuckle pin

Materials including special tools are available from Diamond Aircraft Industries.

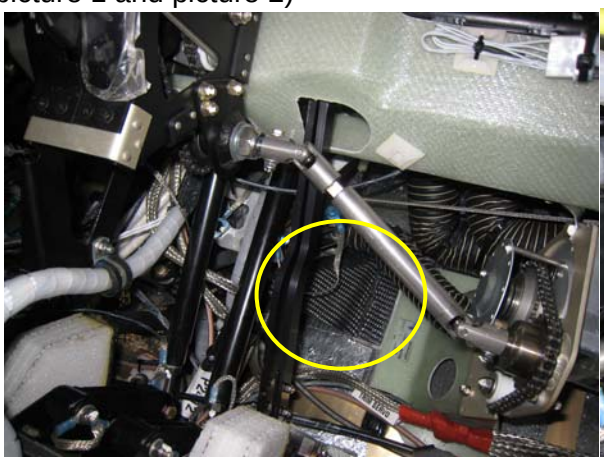
II.4 Consumables

Quantity	Part No.	Description
0,5 l (0.53 US qts)	N000 148 *	Fresh acetone
1	A00062 *	syringe
5	13205 *	Cup
3	F00010 *	Brush 1”
1	MS 9380_	Terostat MS 9380
200g (7.06 oz)	L20	Resin
60g (2.12 oz)	HAEH91	Hardener
50g or (0,5l volume) (1.76 oz or 0.53 US qts)	FB/035	Cotton Flocks

Consumables may be procured locally or from Diamond Aircraft Industries
* or equivalent

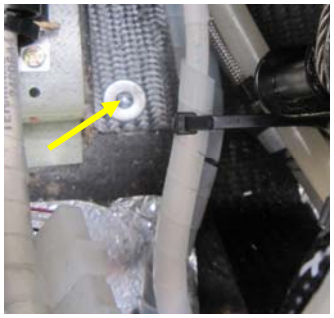
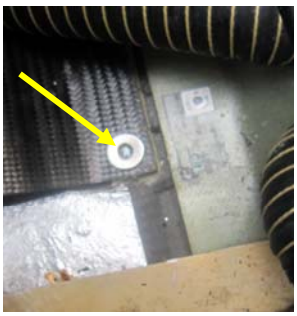
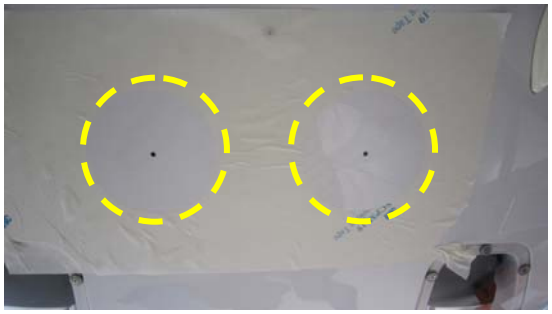
III INSTRUCTIONS

III.1 Inspection

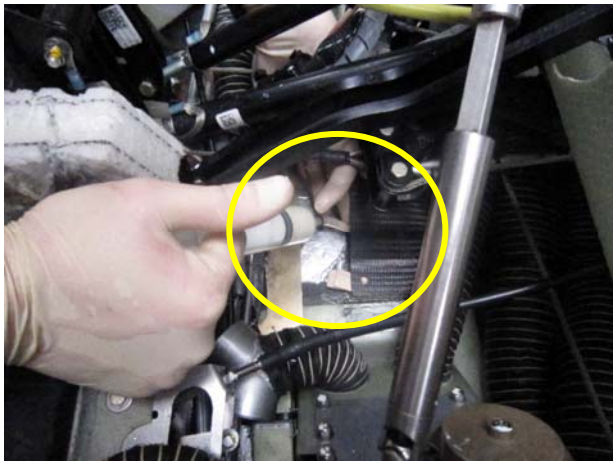
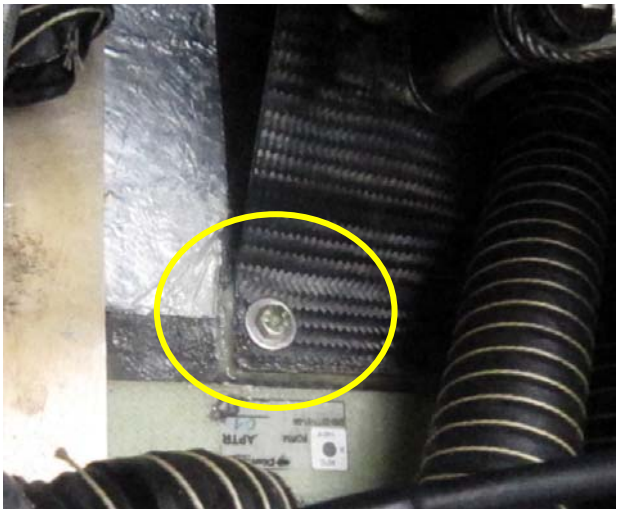
1.	Remove the pilot’s seat acc. to AMM Section 25-10.
2.	Inspect the rear edges LH and RH of rudder steering bracket bond line while pushing the right rudder pedal. Look especially for cracks in the bonding paste. (see picture 1)
3.	If cracks are found in bond line, repair in accordance with Instruction III.2.
4.	Check the clearance (min. 2 mm (0.08 in)) between T-yoke bolt for copilot right rudder cable and NLG steering rod and the clearance between bolt head and support plate. (see picture 1 and picture 2)  Picture 1  Picture 2

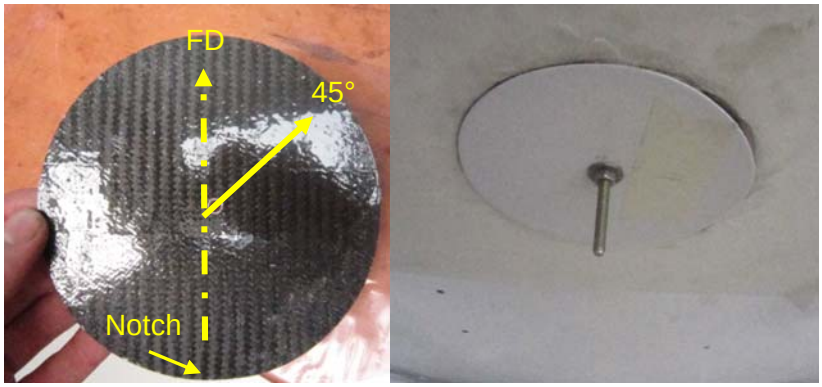
5.	If clearances between T-yoke bolt for copilot right rudder cable and steering rod or support plate are too small, adjust in accordance with Instruction III.3.
6.	Install the pilot's seat access panel (AMM Section 25-10).
7.	Clean working area and check for foreign objects.
8.	Perform functional check of altered, repaired and new parts.
9.	Test all systems in working area for function.
10.	Make necessary entries into aircraft logs.

III.2 Repair cracks in bond line

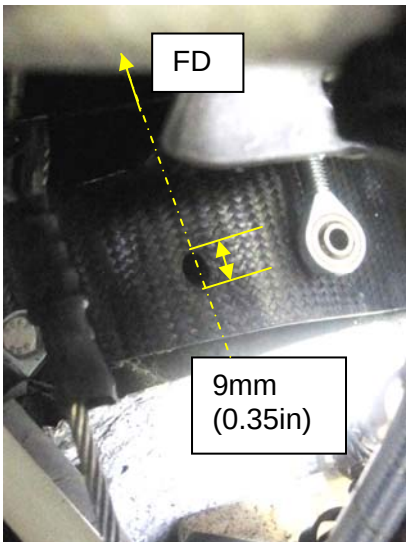
11.	Remove pilot seat and co pilot seat and disconnect the two heating hoses from Y-Connector (AMM Section 25-10).
12.	Mark the two positions on rudder steering bracket acc. to picture 3 and 4 and drill two 6 mm (0.24 in) holes into rudder steering bracket and centre wing skin. Centre of hole is 12 mm (0.5 in.) from the edges.  Picture 3  Picture 4
13.	Protect surrounding surface with masking tape. Note: Use the Lower shell panel (P/N: D60-5710-06-00) as template.  Picture 5

14.	Cut out two 79 mm (3.1 in) holes in the outer layers of centre wing with a hole saw centred on 6 mm (0.24 in) holes. Drill only half–way through the foam. Carefully cut foam up to the inner layer and remove all foam core in 79 mm (3.1 in) holes. **CAUTION: Do not damage the inner layer.**
15.	Prepare inner and outer laminate of centre wing for bonding in acc. with AMM Chapter 51. Diameter of bonding surface: 147 mm (5.8 in)  Picture 6
16.	Prepare all bonding surfaces of the Lower shell inserts (P/N: D60-5710-05-01): peel off 1 layer on each side. Remove peel ply from lower shell panel and prepare for bonding in acc. with AMM Chapter 51. Make a temporary installation of the inserts in the Lower shell holes to try fit.
17.	Prepare bonding crack between rudder steering bracket and centre wing for re-bonding (widen crack with a saw blade) in acc. with AMM Chapter 51.
18.	Apply a thin coat of release agent on M6 bolts of the fixing tools.
19.	Apply a thin coat of resin (L20/H91) into the bonding crack between center wing skin and rudder steering bracket. **CAUTION:** L20/H91 mixture: 100 parts resin and 27 parts hardener (by weight). Supplier: Hexion Specialty Chemicals Stuttgart GmbH. Follow the instructions given in the material data sheet and obey the material safety data sheet. **CAUTION: Pay attention to pot time of resin. Do not prepare more than 50g of resin.**

20.	Fill thickened resin (L20/H91 thickened with cotton flocks) with a syringe into the bonding crack between rudder steering bracket and centre wing skin.  Picture 7  Picture 8
21.	Apply a thin coat of resin (L20/H91) on bonding surfaces of the centre wing. Apply a thin coat of resin on lower shell inserts and bonding surface of lower shell panels.
22.	Bond lower shell inserts in place with thickened resin (L20/H91 thickened with cotton flocks). Apply thickened resin on both bonding surfaces acc. to picture. Fill gap along circumference with thickened resin.  Picture 9  Picture 10

23.	Install M6 bolts (coated with mold release agent) of bonding tools in Ø6mm holes.
24.	Bond lower shell panels in place with thickened resin (L20/H91 thickened with cotton flocks) and fix them with washers DIN 125-6,4 and nuts DIN 934-M6 of bonding tools acc. to drawing D60-5710-05-00-SV. **CAUTION: Observe fiber orientation 45°.**  Picture 11
25.	Install cup of bonding tool acc. to drawing D60-5710-05-00-SV.
26.	Remove thickened resin around cover plates. Remove masking tape and clean surrounding surface.
27.	Pre-cure repair in acc. to AMM Chapter 51.
28.	Post-cure repair 8 hrs 60°C (140°F).
29.	Remove bonding tools and install the following M6 bolts from outside acc. to drawing D60-5710-05-00. RH: Bolt ISO 7380-M6x30-A2 with washer DIN 125-6,4-PA, structure, washer DIN 9021-6,4-A2 and nut DIN-985-M6-A2. LH: Bolt ISO 7380-M6x35-A2 with washer DIN 125-6,4-PA, structure, washer DIN 9021-6,4-A2, rubber clamp RSGU_1.18_15W1 (to fix the starter cable), washer DIN 125-6,4-PA, and nut DIN-985-M6-A2.
30.	Seal the edges of cover plates with Terostat MS 9380 (or equivalent).
31.	Connect the two heating hoses to Y-connector.
32.	Do an inspection of all the controls that you have been adjusted. If required by the Airworthiness Authority do a duplicate inspection of the controls.
33.	Install pilot seat and co pilot seat acc. to AMM Section 25-10.
34.	Clean working area and check for foreign objects.
35.	Perform functional check of altered, repaired and new parts.
36.	Test all systems in working area for function.
37.	Make necessary entries into aircraft logs.

III.3 Adjust clearance between yoke bolt and steering rod

38.	Remove pilot seat and co pilot seat and disconnect the two heating hoses from Y- Connector acc. to AMM Section 25-10.
39.	Remove bolt from steering rod end on T-yoke.
40.	Remove T-yoke axle bolt and washer between T-yoke and rudder steering bracket.
41.	Remove passenger seat acc. to AMM Section 25-10.
42.	Release rudder cable turnbuckles.
43.	Move the T-yoke forward.
44.	Repositioning of rudder T-yoke: If the clearance between bolt and steering rod is too small, elongate old hole by 3 mm (0.12 in) in flight direction (forward) in the rudder steering bracket acc. to picture. If the clearance between bolt head and support plate is too small, elongate old hole by 3 mm (0.12 in) opposite to flight direction (rearward) in the rudder steering bracket acc. to picture 11.  Picture 12
45.	Trial fit the oblong hole washer. Check the bolt installation in rudder steering bracket.
46.	Install the oblong washer: Prepare washer and rudder steering bracket for bonding acc. to AMM Chapter 51. Carefully clean washer using a fresh degreasing agent. Bond the washer with thickened resin on rudder steering bracket acc. to AMM Chapter 51. Holes positioned in flight direction or opposite to flight direction refer to item 44.

47.	Install T-yoke on hat profile acc. to figure. 1
48.	Install bolt for steering rod end on T-yoke. Adjust rod end if necessary for directional stability during taxiing.
49.	Install turnbuckles and adjust rudder cables acc. to AMM Chapter 27-20.
50.	Connect the two heating hoses to Y-connector.
51.	Check all control cables and bush rods in working area for free movement and minimum clearance of 2mm in all positions.
52.	Do an inspection of all the controls that you have been adjusted. If necessary for your Airworthiness Authority do a duplicate inspection of the controls.
53.	Install passenger seat acc. to AMM Section 25-10.
54.	Install the pilot and copilot seat acc. to AMM Section 25-10.
55.	Clean working area and check for foreign objects.
56.	Perform functional check of altered, repaired and new parts.
57.	Test all systems in working area for function.
58.	Make necessary entries into aircraft logs.

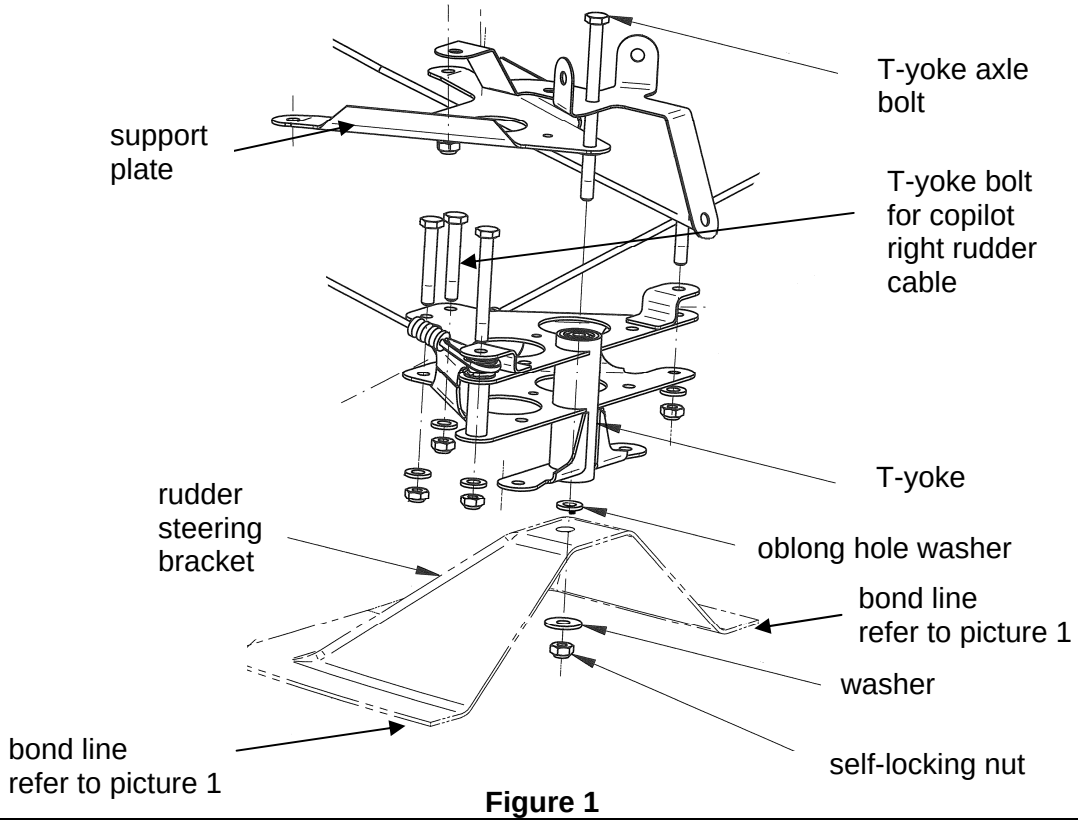


Figure 1