

MANDATORY SERVICE BULLETIN

MSB 42-143/1

MSB 42NG-086/1

supersedes MSB 42-143 / MSB 42NG-086

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 42.427,
42.AC001 through 42.AC152,
42.M001 through 42.M026,
42.N001 through 42.N067,
42.N100 through 42.N265,
42.N300 through 42.N423,
42.N427 through 42.N450,
42.MN001 through 42.MN034,
42.MN037 through 42.MN042,
42.MN050 through 42.MN055,
42.MN057, 42.MN058,
42.MN100 through 42.MN112,
42.NC001 through 42.NC004,
42.NC006 through 42.NC008,
42.NW001 through 42.NW090,
42.NW093 through 42.NW095,
42.MNW001 through 42.MNW004

I.3 Date of effectivity

23-Dec-2021

I.4 Time of Compliance

Within the next 200 flight hours from the date of effectivity, but not later than 31-Dec-2022.

I.5 Subject

Inspection of hole position and condition in the rudder steering bracket.

ATA-Code: 57-10

I.6 Reason

Reports of worn holes in the rudder steering bracket were received, that were caused by incorrectly tightened self-locking nuts.

This condition, if not corrected, may lead to loss of the primary directional control system.

This Service Bulletin provides instructions to identify the condition of the hole and to measure the distance between the hole and the edge of the rudder steering bracket.

After completion of this Service Bulletin the repetitive inspection of the torque of the T-yoke bolt is replaced by visual inspection of torque seal marks.

I.7 Concurrent Documents

None.

I.8 Approval

The technical information or instructions contained in this document relate to the Design Change Advisory No. MÄM 42-1213/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 42-143 / WI-MSB 42NG-086, latest effective issue.

I.10 Mass (Weight) and CG

No change.

II PLANNING INFORMATION**II.1 Material and Availability**

See WI-MSB 42-143 / WI-MSB 42NG-086, latest effective issue.

II.2 Special Tools

None.

II.3 Labour Effort

Approx. 1.5 hours when done along with scheduled 200 hour or annual inspection, approx. 4.5 hours otherwise.

II.4 Credit

For all airplanes within warranty period, if performed in conjunction with an annual inspection.

II.5 Reference Documents

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

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

III REMARKS

1. All work must be done by a certified aircraft service station or a certified aircraft maintenance mechanic.
2. All work, in particular that which is not especially described in this Service Bulletin, must be done in accordance with the referenced Maintenance Manual.
3. Completion of all work must be recorded 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 done by an authorized Diamond Service Center within the time of compliance and the Warranty Application incl. Work Report must be sent not later than 30 days after completion of work.
5. In case of doubt contact Diamond Aircraft Industries GmbH.

**EXECUTION REPORT TO
SERVICE BULLETIN
MSB 42-143/1
MSB 42NG-086/1****AIRPLANE INFORMATION**

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 _____

Oblong hole washer found to be installed yes / no

Distance **d** between edge of hole and edge of rudder steering bracket. _____

Replacement of rudder steering bracket yes / no

Worn hole found yes – dimensions / no

Repair of rudder steering bracket necessary (bushing) yes / no

Accomplishment with RSB 42-139 / RSB 42NG-081 yes – date / no

Salesforce case number, if known _____

Date, Name, SignPlease send the completed form to executionreports@diamondaircraft.com

WORK INSTRUCTION

WI-MSB 42-143

WI-MSB 42NG-086

I GENERAL INFORMATION

I.1 Subject

Inspection of hole position and condition in the rudder steering bracket.

I.2 Reference Documents

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

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

I.3 Remarks

- a) All work must be done by a certified aircraft service station or a certified aircraft maintenance mechanic.
- b) All work, in particular if not described in this work instruction, must be done in accordance with the referenced maintenance manual.
- c) For conversion factors between SI units and US/Imperial units refer to AMM Chapter 02.
- d) In case of doubt, contact Diamond Aircraft Industries GmbH.

II DRAWINGS, SPECIAL TOOLS & MATERIALS

II.1 Drawings

None.

II.2 Special Tools

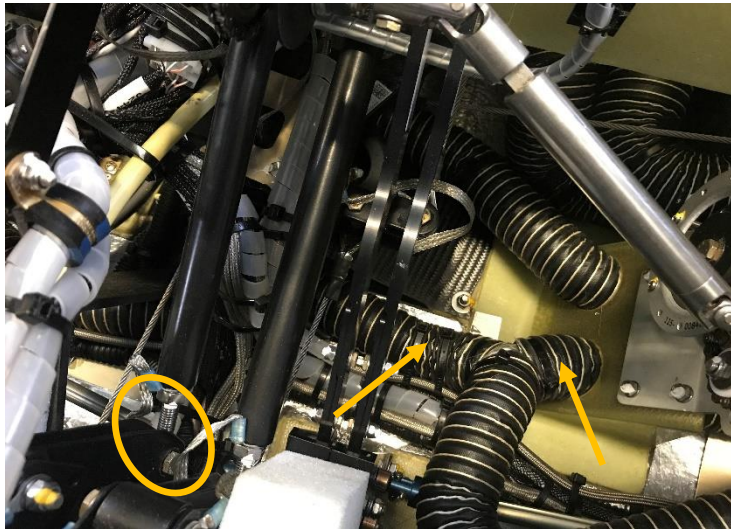
None.

II.3 Material

Quantity	Part Number	Description
3	DIN-985-M6-A2	Self-Locking Nut
2	MS 21256-1	turnbuckle clip
as required	D60-5320-00-32	T-yoke bolt

Material is available from Diamond Aircraft Industries.

III INSTRUCTIONS

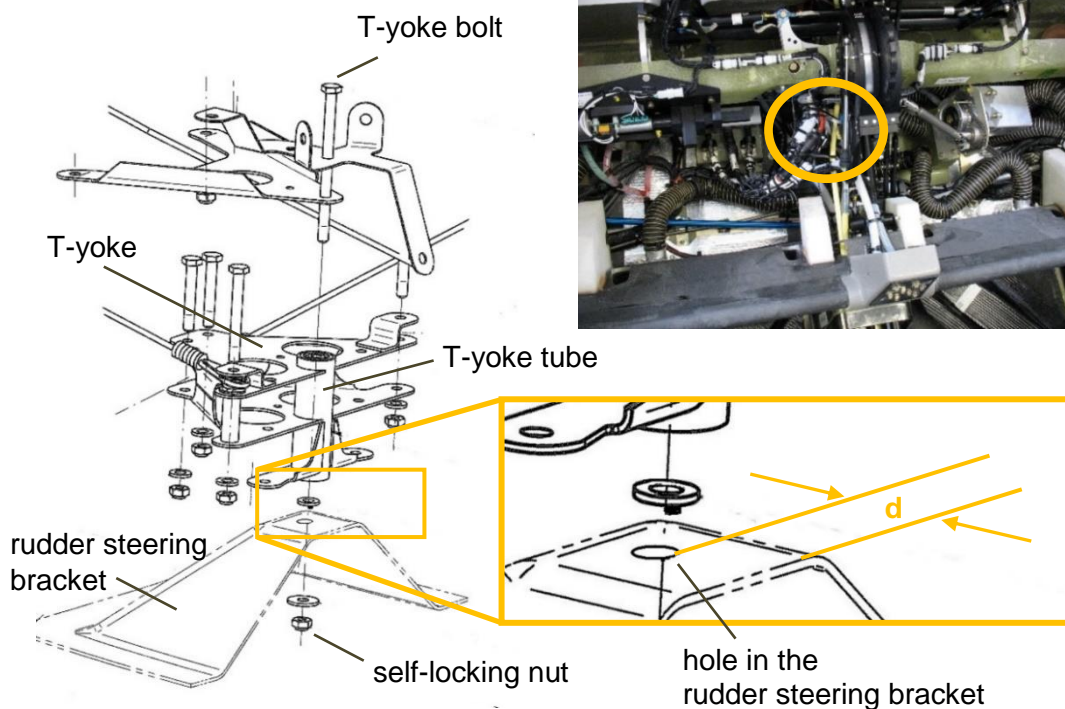
1.	Insert AMM-TR-MÄM-42-1213 into the AMM or use an AMM revision, in which AMM-TR-MÄM-42-1213 has been incorporated.
2.	Remove the pilot and co-pilot seat in accordance with AMM Section 25-10.
3.	Remove the middle tunnel front cover in accordance with AMM Section 25-10.
4.	<p>Remove components for better access to the rudder steering bracket:</p> <ul style="list-style-type: none"> Remove the two heating hoses, that are indicated in the picture by the arrows, from the aluminum Y-connector, pull out the heating hose, that is routed along the rudder steering bracket, disconnect the short aileron push rod from the main spar lever as indicated by the circle. 
5.	Disconnect the NLG steering rod at the NLG steering cardan in the wheel well.

6. Find out, if distance **d** (the distance between the edge of the hole of the rudder steering bracket and rear edge of the rudder steering bracket) is at least 11 mm.

Refer to section IV for measuring methods.

d < 11 mm → proceed with step 7

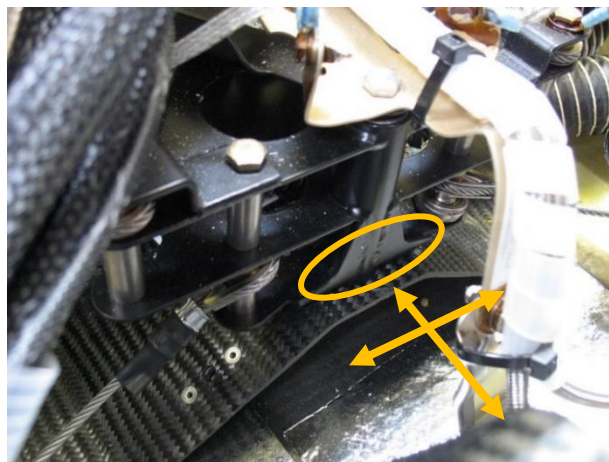
d ≥ 11 mm → proceed with step 8



7.	<p>If distance d is less than 11mm:</p> <ul style="list-style-type: none"> • disconnect the NLG steering rod from the T-yoke, • disconnect all rudder control cables from the T-yoke, • remove the T-yoke bolt, • remove the T-yoke, • make sure that all washers are removed from the airplane, • confirm that the oblong hole washer is or is not installed, • confirm orientation of the oblong hole washer, if installed, • confirm dimension of distance d by measuring the distance between the edge of the hole and the edge of the bracket on rudder steering bracket, • send all information to support-austria@diamondaircraft.com, containing: <ul style="list-style-type: none"> - detailed photographs of the hole together with a measuring tape, positioned beside the hole, - the filled-in damage report, which can be downloaded from DAI technical publications home page • request repair instructions for the rudder steering bracket, • proceed with step 14 after repair.
8.	Remove the passenger seat in accordance with AMM, Section 25-10.
9.	Release rudder cable turnbuckles.
10.	<p>Remove self-locking nut of T-yoke bolt:</p> <ul style="list-style-type: none"> • Remove the Fokker Needle, if installed, • block the self-locking nut with a ring-wrench, • turn the T-yoke bolt until the self-locking nut falls off, • remove washer and self-locking nut from the airplane, • discard the self-locking nut. <p>Note: Make sure the washer between rudder steering bracket and T-yoke does not get lost, if oblong hole washer D60-5320-00-31 or no oblong hole washer is installed.</p>

11. Examine the hole in the rudder steering bracket for wear and play. Look especially for possible lateral movement of the lower part of the T-yoke:

- Apply simultaneous rudder pedal force to the RH pilot rudder pedal and LH co-pilot rudder pedal.
- Apply rudder pedal force and move the rudder from full LH deflection to full RH deflection.
- Apply hand force to the T-yoke and tilt it back / forth and sideward.
- Use an inspection mirror to examine the hole in the bottom side of the rudder steering bracket.



If a worn hole has been found, proceed with step 12.

If the hole is not damaged, proceed with step 13.

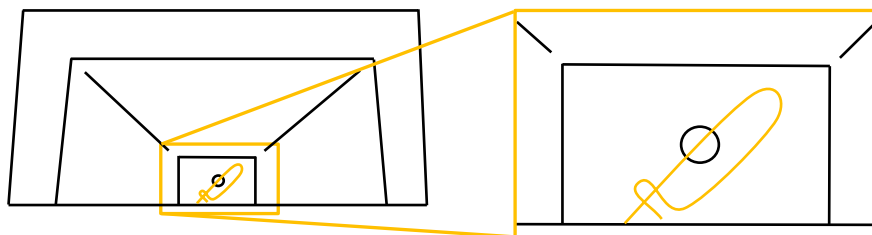
12. If a worn or enlarged hole, or play of the T-yoke bolt in the hole of the rudder steering bracket has been found,

- disconnect the NLG steering rod from the T-yoke,
- disconnect all rudder control cables from the T-yoke,
- remove the T-yoke bolt,
- remove the T-yoke,
- make sure that all washers are removed from the airplane,
- send all information to support-austria@diamondaircraft.com, containing:
 - dimensions of the worn / enlarged hole in the rudder steering bracket
 - detailed photographs of the worn / enlarged hole together with a measuring tape, positioned beside the hole,
 - filled-in [damage report](#), which can be downloaded from DAI technical publications home page
- request instructions for repair of the hole in the rudder steering bracket,
- proceed with step 14 after repair.

13. If not yet done, install T-yoke bolt D60-5320-00-32 with additional hole for a Fokker Needle, in accordance with MSB 42-146 / MSB 42NG-087.

14. Install a new self-locking nut to the T-yoke bolt.

- Block the self-locking nut with an open-end wrench.
- Turn the T-yoke bolt, until the self-locking nut is positioned above the hole for the additional Fokker Needle. Do not yet tighten the T-yoke bolt.
- Remove the open-end wrench.
- Turn the T-yoke bolt to a position, so that the Fokker Needle can be installed to the T-yoke bolt.
- Install Fokker Needle.
- Turn the T-yoke bolt by 180°.
- Close the Fokker Needle.
- Block the self-locking nut with an open-end wrench.
- Torque the T-yoke bolt with 6 Nm.
- Remove the open-end wrench.
- Turn the T-yoke bolt without blocking the self-locking nut to a position, so that the pointy end of the Fokker Needle is directly below the edge of the rudder steering bracket (refer to sketch).





- Block the self-locking nut with an open-end wrench.
- Torque the T-yoke bolt with 9 Nm.
- Make sure the pointy end of the Fokker Needle is hidden under the rudder steering bracket and does not damage the heating hose.

CAUTION: Tighten the T-yoke bolt to the correct torque only with released rudder cable turnbuckles.

CAUTION: It is essential to use a torque wrench, in order assure application of the correct torque and to avoid inadvertent loosening of the self-locking nut.

CAUTION: If the T-yoke bolt is already tightened to the correct torque, do not change the orientation of the Fokker Needle by turning the T-yoke bolt.

Note: The Fokker Needle can damage the heating hose if the pointy end is not hidden under the rudder steering bracket.

15.	Mark the head of the T-yoke bolt and the self-locking nut with at least two torque seal marks.
	 
16.	Adjust left and right rudder cable turnbuckles to give the correct tension to the control cables in accordance with AMM, Section 27-20.
17.	Install all heating hoses.
18.	Connect the short aileron push rod to the idler lever at the main spar.
19.	Connect the NLG steering rod to the NLG steering cardan in the wheel well.
20.	Install the passenger seat in accordance with AMM, Section 25-10.
21.	Install the middle tunnel front cover.
22.	Install the pilot and copilot seat in accordance with AMM Section 25-10.
23.	Clean working areas, check for foreign objects.
24.	Check all altered, replaced, repaired parts for proper function.
25.	Test all systems in working area for function.
26.	Make all necessary entries in the airplane logs.
27.	Fill in the execution report and send it to executionreports@diamondaircraft.com

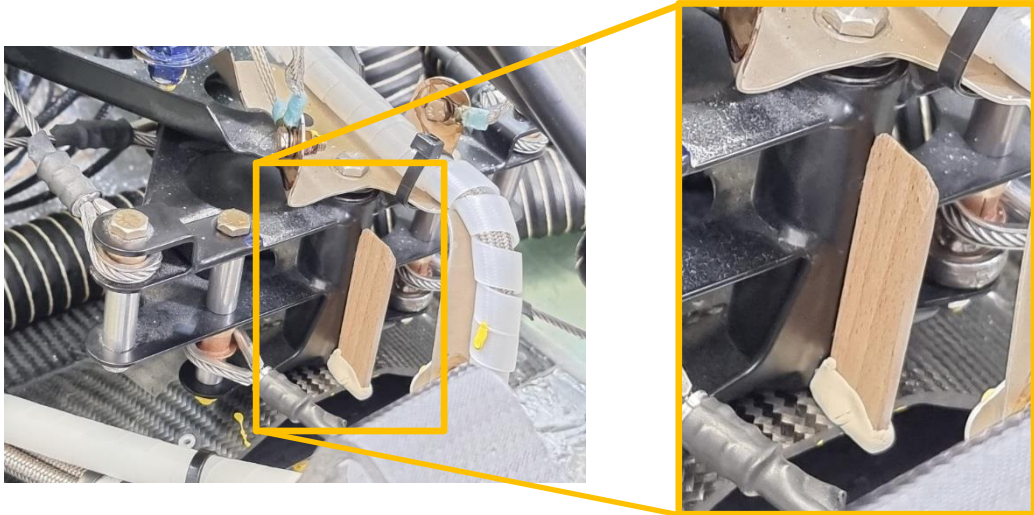
IV Measurement of distance d

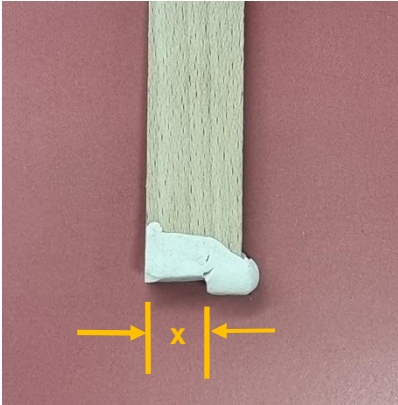
This section provides methods to find out, if distance **d** is at least 11 mm.

IV.1 Direct measurement

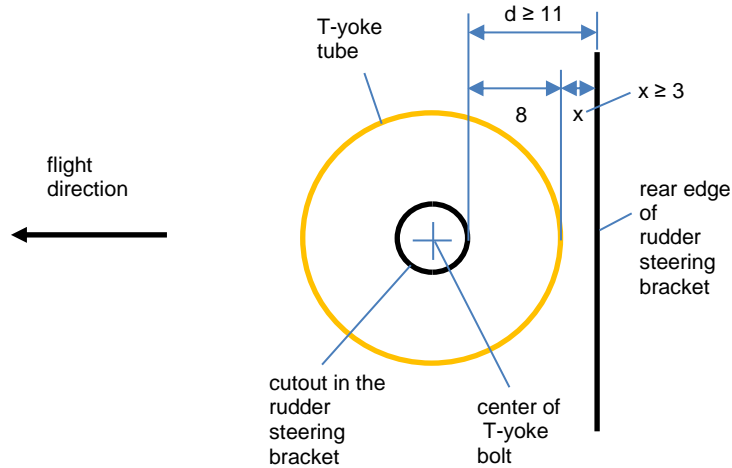
1.	<p>Determine distance d by direct measurement with the T-yoke removed.</p> <p>Note: When measuring distance d directly, consider the orientation of the oblong hole washer, if installed. Refer to IV.2, step 6.</p> <p>Distance d = _____</p> <p>Return to section III.</p>
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IV.2 Indirect measurement

1.	<p>Use a wooden strip (cross-section e.g. 15 mm x 3 mm) and a piece of modeling clay to determine distance d.</p> <ul style="list-style-type: none">• Put a small piece of modeling clay to the end of a wooden strip.• Hold the wooden strip to the metal tube of the rudder bell crank.• Move the wooden strip down, so that the modeling clay is pressed onto the rudder steering bracket. <p>Note: Make sure there is no modeling clay between the wooden strip and the metal tube of the rudder bell crank.</p> <p>Note: For illustration, this step is shown on an airplane with removed components in the area of the rudder steering bracket.</p> <div data-bbox="323 1462 1362 1975"></div>
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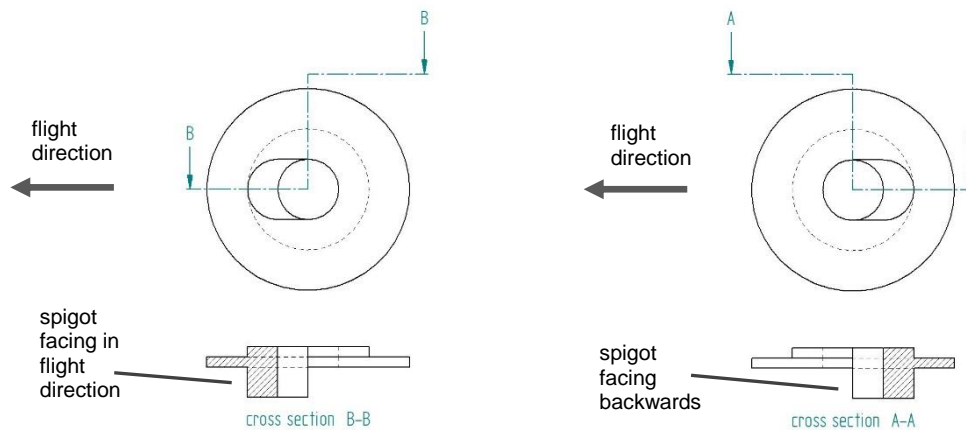
2.	<p>Measure distance x.</p> 
3.	<p>If distance x is less than 3 mm (.12 in), distance d is less than 11 mm. Return to section III.</p> <p>If distance x is greater than or equal to 6 mm (.24 in), distance d is at least 11 mm. Return to section III.</p> <p>If distance x is between 3 mm (.12 in) and 6 mm (.24 in), proceed with the following steps.</p>
<p>Note: As an alternative method an appropriate material (stick) with a defined thickness of 3 mm and 6 mm can be used, to check if distance x is less than 3 mm or if distance x is greater than or equal to 6 mm.</p>	
4.	<p>Check, if an oblong hole washer has been installed to the rudder steering bracket in accordance with MSB 42-087 / MSB 42NG-016:</p> <ul style="list-style-type: none"> • Obtain information from the maintenance logs, • Slightly lift off the T-yoke and use an inspection mirror to check, if an oblong hole washer is installed to the rudder steering bracket. <p>CAUTION: Make sure, the washer between the T-yoke and the rudder steering bracket does not get lost.</p>

5. If no oblong hole washer installed, distance **d** is at least 11 mm. Return to section III.

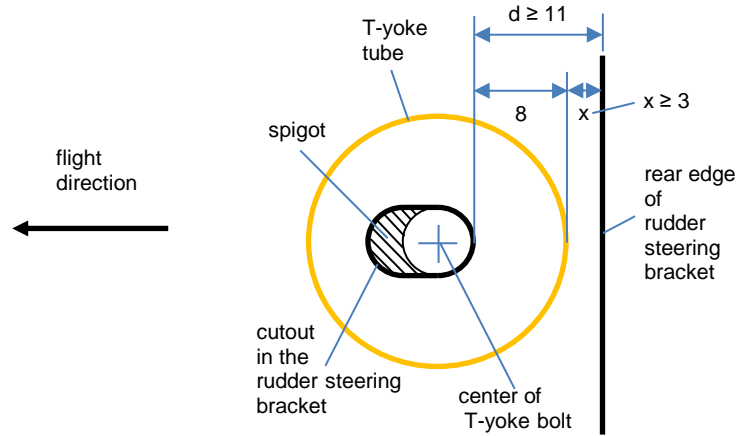


6. If an oblong hole washer is installed to the rudder steering bracket, determine the orientation of the oblong hole washer.

- Use an inspection mirror and inspect the bottom side of the rudder steering bracket.



7. If an oblong hole washer is installed to the rudder steering bracket with the spigot facing in flight direction, distance **d** is at least 11 mm. Return to section III.



8. If an oblong hole washer is installed to the rudder steering bracket with the spigot facing backwards, distance **d** is less than 11 mm. Return to section III.

