

RECOMMENDED SERVICE BULLETIN

RSB 42-139

RSB 42NG-081

I TECHNICAL DETAILS

I.1 Category

Recommended.

I.2 Airplanes affected

Type: DA 42, DA 42 M, DA 42 NG, DA 42 M-NG

Serial numbers:

42.004 through 42.391,	42.N100 through 42.N250,
42.394 through 42.396,	42.N300 through 42.N381,
42.399 through 42.402,	42.N391,
42.405 through 42.416,	42.MN001 through 42.MN034,
42.427,	42.MN037 through 42.MN042,
42.AC001 through 42.AC135,	42.MN050 through 42.MN055,
42.AC137 through 42.AC145,	42.MN057, 42.MN058,
42.AC148, 42.AC150,	42.MN100 through 42.MN103,
42.AC151, 42.AC152,	42.NC001 through 42.NC004,
42.M001 through 42.M026,	42.NC006 through 42.NC008,
42.N001 through 42.N067,	42.NW001 through 42.NW064

I.3 Date of effectivity

21-Oct-2019

I.4 Time of Compliance

At owner's discretion.

I.5 Subject

Replacement of rudder T-yoke axle with improved design.

ATA-Code: 53-20

I.6 Reason

On two airplanes a loose T-yoke axle (LN 9037-M6x90) nut was reported. A loose T-yoke axle nut allows vertical movement of the T-yoke axle, possibly causing reduced rudder control.

An additional retaining pin on the improved T-yoke axle D60-5320-00-32 limits the travel of the self-locking nut and prevents reduced rudder control, in case the nut gets loose. This Service Bulletin describes replacement of the existing T-yoke axle with the improved design, which is also the terminating action for the repetitive inspection of MSB 42-137 / MSB 42NG-079.

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 42-1124, 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-RSB 42-139 / WI-RSB 42NG-081, latest effective issue.

I.10 Mass (Weight) and CG

Mass and Center of Gravity are not affected.

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

See WI-RSB 42-139 / WI-RSB 42NG-081, latest effective issue.

II.2 Special Tools

None.

II.3 Labour Effort

Approx. 3 hours when done along with 200h or annual inspection, approx. 6 hours otherwise.

II.4 Credit

Labour effort and parts for all aircraft within warranty period, when performed during 200 hours or 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, 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
RSB 42-139
RSB 42NG-081**

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 _____	

Date, Name, Sign

Please e-mail the completed form to executionreports@diamondaircraft.com

WORK INSTRUCTION

WI-RSB 42-139

WI-RSB 42NG-081

I GENERAL INFORMATION

I.1 Subject

Replacement of rudder T-yoke axle with an improved design.

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

Cable tension gauge (tensiometer)

II.3 Material for repair

Quantity	Part Number (P/N)	Description
1	D60-5320-00-32	T-yoke axle
1	AN416-1	retaining pin
1	DIN-985-M6-A2	nut
2	MS 21256-1	turnbuckle pin
2	DIN 125-6.2-A2	washer
1	DIN 9021-M6-A2	washer
1	DIN 988-6-12-0,5-A2	shim
as required	D60-5320-00-31_01	oblong hole washer

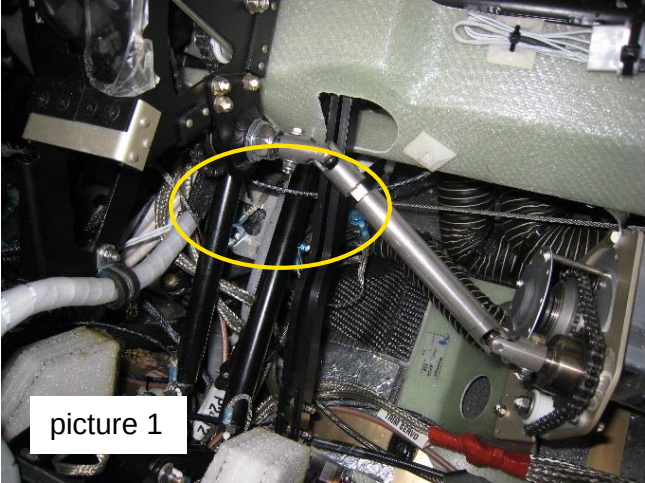
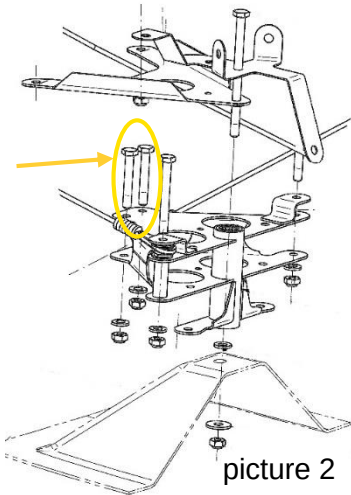
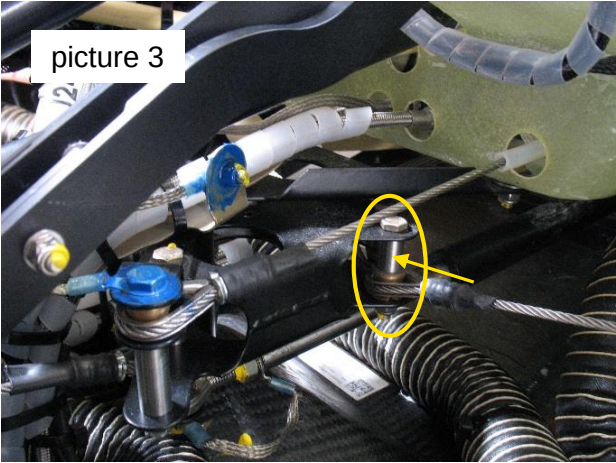
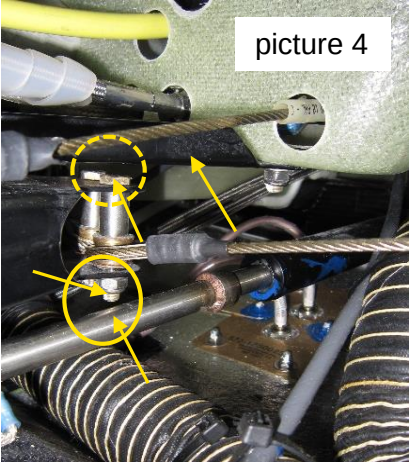
II.4 Consumables

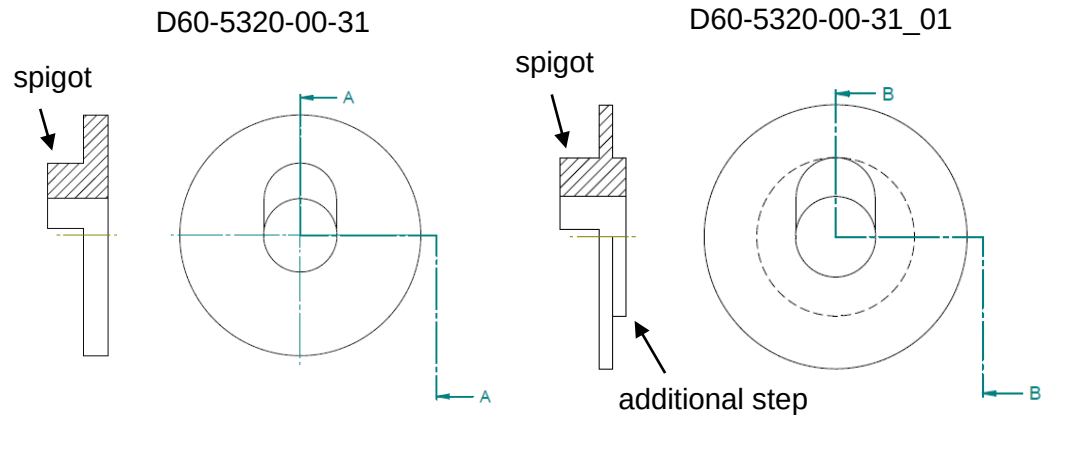
Quantity	Part Number (P/N)	Description
1	3M Scotch-Weld DP 410	cartridge adhesive

Material is available from Diamond Aircraft Industries.

III INSTRUCTIONS

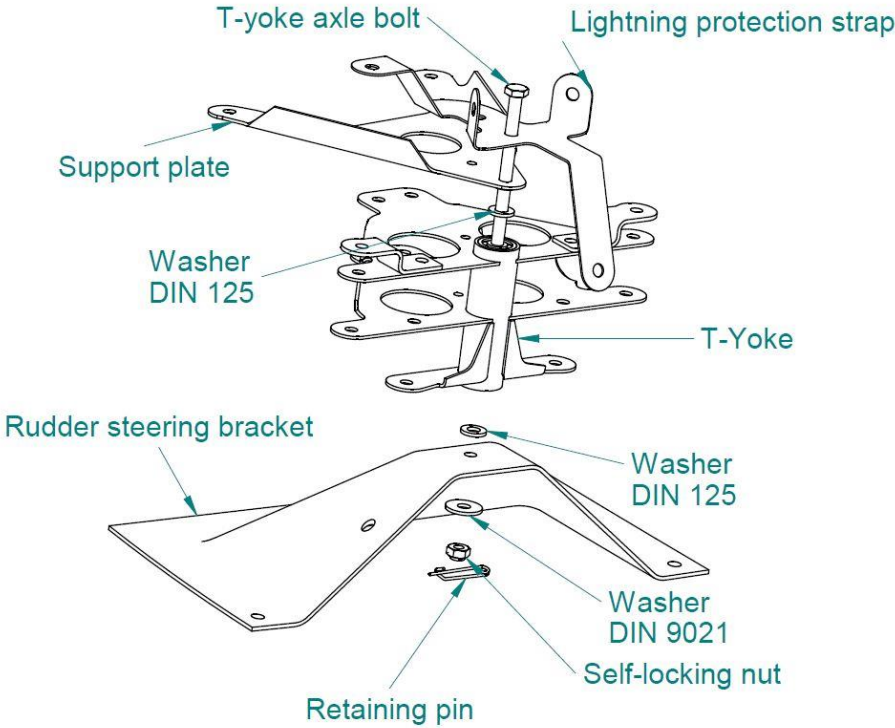
III.1 Replacement of rudder T-yoke axle

1.	Remove the pilot and copilot seat in accordance with AMM, Section 25-10.
2.	Remove the middle tunnel front cover in accordance with AMM, Section 25-10.
3.	Remove the two heating hoses from Y-connector in acc. with AMM, Section 25-10.
4.	Disconnect the short elevator push rod from the main spar lever.
5.	Remove the passenger seat in accordance with AMM, Section 25-10.
6.	Check the clearances while moving the rudder in both directions • between end of T-yoke bolts for copilot's right rudder cable & pilot's left rudder cable and nose landing gear (NLG) steering rod (continuous circle in picture 4) • and between head of T-yoke bolts for copilot's right rudder cable & pilot's left rudder cable and support plate (dashed circle in picture 4). Record the measured clearances. Each clearance must be greater than 2 mm (0.08 in). Pictures 1 – 4 show the affected area.  picture 1  picture 2  picture 3  picture 4

7.	Remove the bolt from the NLG steering rod end on T-yoke.
8.	Release rudder cable turnbuckles.
9.	Remove T-yoke axle from the rudder steering bracket.
10.	Make sure that the self-locking nut and all washers are removed from the airframe.
11.	Verify, if an oblong hole washer was installed to the rudder steering bracket in accordance with MSB 42-087 / MSB 42NG-016. There are 3 different installation variants, which can be found in airplanes in field. Variant 1: No oblong hole washer is installed to the rudder steering bracket. Instead, a standard washer (13 mm outer diameter) is installed between T-yoke and rudder steering bracket. Variant 2: Oblong hole washer D60-5320-00-31 (outer diameter 20 mm) was bonded to the rudder steering bracket, in accordance with MSB 42-087 / MSB 42NG-016. Variant 3: Oblong hole washer D60-5320-00-31_01 (outer diameter 20 mm) was bonded to the rudder steering bracket, in accordance with MSB 42-087 / MSB 42NG-016. Note: The two different designs of oblong hole washers D60-5320-00-31 and D60-5320-00-31_01 can be identified in figure 1.  figure 1
12.	If an oblong hole washer is installed to the rudder steering bracket (variants 2 or 3), check if the oblong hole washer is well bonded to the rudder steering bracket.

13.	Install the T-yoke with new T-yoke axle D60-5320-00-32 - in accordance with Section III.2, if no oblong hole washer was installed to the rudder steering bracket (Variant 1), - in accordance with Section III.3, if oblong hole washer D60-5320-00-31 is installed and well bonded to the rudder steering bracket (Variant 2), - in accordance with Section III.4, if oblong hole washer D60-5320-00-31_01 (with additional step) is installed and well bonded to the rudder steering bracket (Variant 3), - in accordance with Section III.5, if oblong hole washer D60-5320-00-31 or D60-5320-00-31_01 is installed to the rudder steering bracket, but the bonding between oblong hole washer and rudder steering bracket had failed and oblong hole washer is found loose (Variant 2 or 3).
14.	Install the two heating hoses to the Y-connector in accordance with AMM, Section 25-10.
15.	Connect the short elevator push rod to the main spar lever.
16.	Check all control cables and push rods in working area for free movement and minimum clearance of 2 mm (0.8 in) in all positions.
17.	Do an inspection of all controls that have been adjusted. If required by the National Authority, do a duplicate inspection of the controls.
18.	Install the passenger seat in accordance with AMM, Section 25-10.
19.	Install the middle tunnel front cover in accordance with AMM, Section 25-10.
20.	Install the pilot and copilot seat in accordance with AMM, Section 25-10.
21.	Clean working area and check for foreign objects.
22.	Perform functional check of altered, repaired and new parts.
23.	Test all systems in working area for function.
24.	Make necessary entries into aircraft logs.

III.2 Installation of T-yoke without oblong hole washer installed to the rudder steering bracket

1.	Install the T-yoke with - the new T-yoke bolt D60-5320-00-32, - a DIN 125 washer between support plate and T-yoke, - a DIN 125 washer between the T-yoke and the rudder steering bracket, - a DIN 9021 washer between the self-locking nut and the rudder steering bracket, - a new self-locking nut and - a retaining pin AN416-1 perpendicular to the flight direction in accordance with figure 2. Note: The retaining pin can damage the heating hose if not installed perpendicular to the flight direction.  figure 2
2.	Tighten the T-yoke bolt with a tightening torque of 10 Nm.
3.	Adjust left and right rudder cable turnbuckles to give the correct tension to the control cables in accordance with AMM, Section 27-20.
4.	Check clearances in accordance with step 6 in Section III.1.
5.	If any of the clearances is not greater than 2 mm (0.08 in), reposition the T-yoke in accordance with Work Instruction of MSB 42-087 / MSB 42NG-016, Section III.3, latest effective issue.
6.	Continue with step 14 in Section III.1.

III.3 Installation of T-yoke with oblong hole washer D60-5320-00-31 well bonded to the rudder steering bracket

Install the T-yoke with

- the new T-yoke bolt D60-5320-00-32,
- a DIN 125 washer between support plate and T-yoke,
- a DIN 988 shim between the T-yoke and well bonded oblong hole washer,
- a DIN 9021 washer between the self-locking nut and the rudder steering bracket,
- a new self-locking nut and
- a retaining pin AN416-1 perpendicular to the flight direction

in accordance with figure 3.

Note: The retaining pin can damage the heating hose if not installed perpendicular to the flight direction.

1.

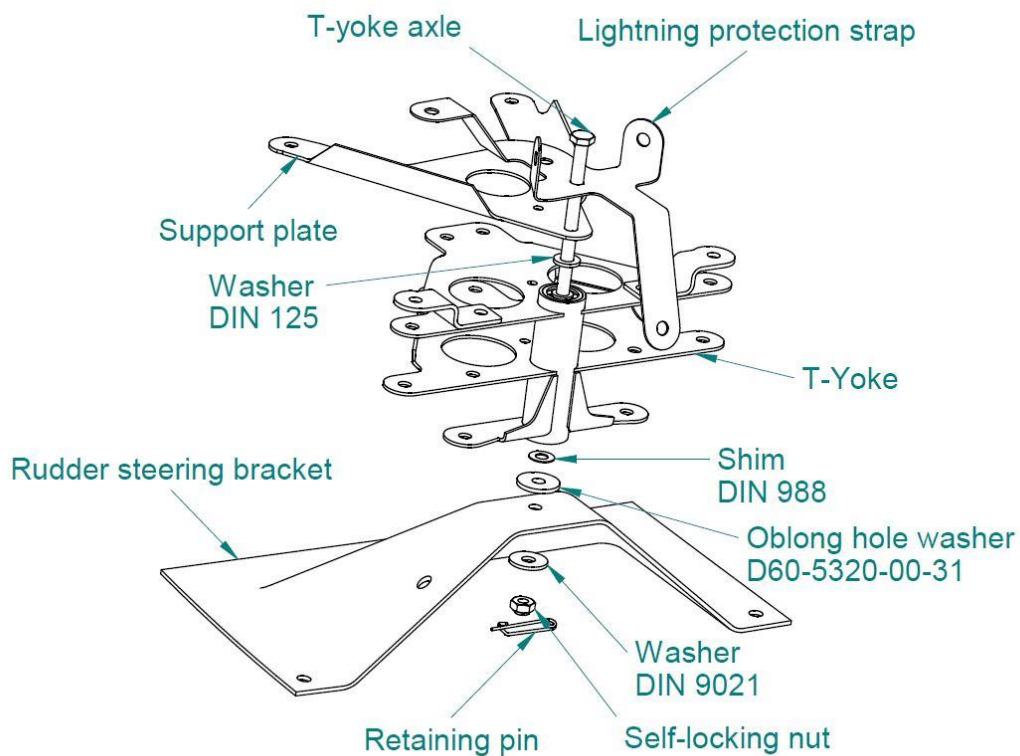
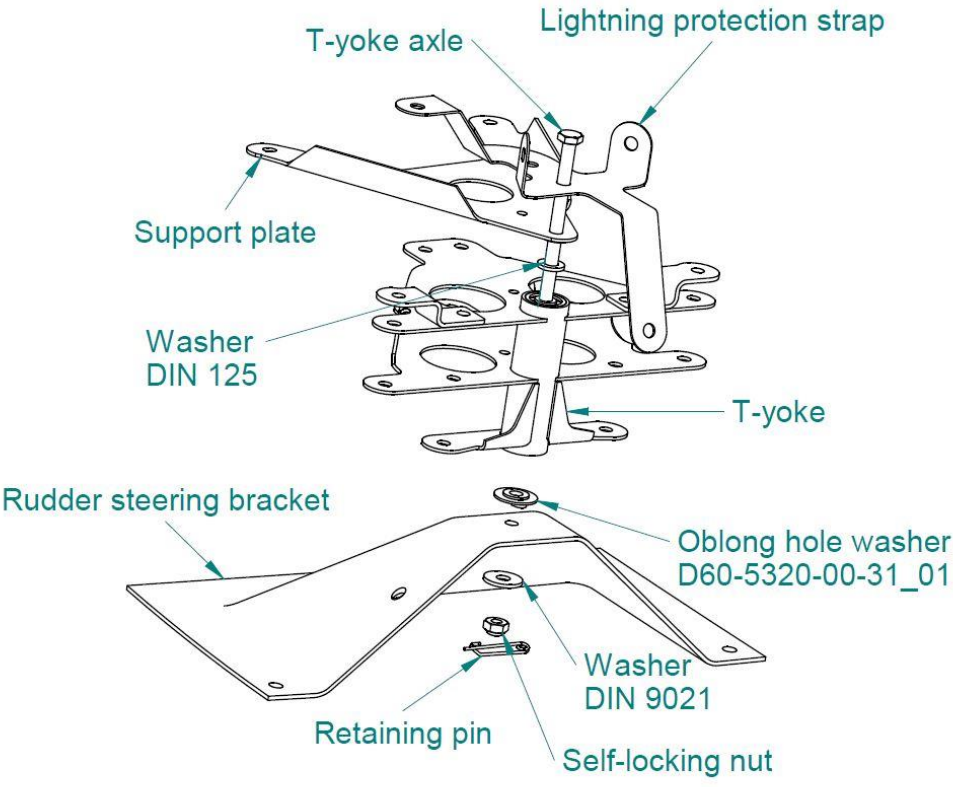


figure 3

2. Tighten the T-yoke bolt with a tightening torque of 10 Nm.
3. Adjust left and right rudder cable turnbuckles to give the correct tension to the control cables in accordance with AMM, Section 27-20.
4. Check clearances in accordance with step 6 in Section III.1.
5. Continue with step 14 in Section III.1.

III.4 Installation of T-yoke with oblong hole washer D60-5320-00-31_01 (additional step) well bonded to the rudder steering bracket

1.	Install the T-yoke with - the new T-yoke bolt D60-5320-00-32, - a DIN 125 washer between support plate and T-yoke, - a DIN 9021 washer between the self-locking nut and the rudder steering bracket, - a new self-locking nut and - a retaining pin AN416-1 perpendicular to the flight direction in accordance with figure 4. Note: The retaining pin can damage the heating hose if not installed perpendicular to the flight direction.  figure 4
2.	Tighten the T-yoke bolt with a tightening torque of 10 Nm.
3.	Adjust left and right rudder cable turnbuckles to give the correct tension to the control cables in accordance with AMM, Section 27-20.
4.	Check clearances in accordance with step 6 in Section III.1.
5.	Continue with step 14 in Section III.1.

III.5 Installation of T-yoke and failed bonding between oblong hole washers D60-5320-00-31 or D60-5320-00-31_01 and rudder steering bracket

1.	Remove old thickened resin / bonding material from the rudder steering bracket.
2.	Make sure, that the oblong hole washer is installed with correct orientation. In case of doubt, do a test installation of the T-yoke and test-fit the new oblong hole washer D60-5320-00-31_01 without bonding it to the rudder steering bracket. Check all clearances in accordance with step 6 in Section III.1. Note: If the clearance between end of T-yoke bolts for copilot's right rudder cable & pilot's left rudder cable and NLG steering rod is not greater than 2 mm (0.08 in), install the oblong hole washer with the spigot opposite to flight direction. If the clearance between head of T-yoke bolts for copilot's right rudder cable & pilot's left rudder cable and support plate is not greater than 2 mm (0.08 in), install the oblong hole washer with the spigot in flight direction. Note: The spigot must face downwards.
3.	Prepare oblong hole washer and rudder steering bracket for bonding in accordance with AMM, Chapter 51.
4.	Clean bonding area of oblong hole washer and rudder steering bracket with clean acetone.
5.	Bond oblong hole washer D60-5320-00-31_01 to the rudder steering bracket in accordance with adhesive manufacturer instructions: • Apply 3M Scotch-Weld DP 410 adhesive to the mating surfaces. • Move oblong hole washer into correct position. • Make sure the oblong hole washer is correctly aligned (orientation of spigot, plane surface perpendicular to direction of T-yoke bolt axle) • Fix oblong hole washer until further processing is possible (refer to adhesive manufacturer data sheet) • Remove excessive adhesive.
6.	Install T-yoke in accordance with Section III.4
7.	Continue with step 14 in Section III.1.