



SERVICE DIRECTIVE BULLETIN

SERVICE DIRECTIVE BULLETIN NO. T-042

Revision 2

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DATE: November 7, 2017

1. SUBJECT: Cyclic and Collective Control Tubes and Stop Ring Assembly Inspections

2. MODEL: TH-28, 480, 480B

3. EFFECTIVITY: S/N 5226 and prior, excluding S/N 5220-5223

4. BACKGROUND:

Enstrom has received reports of corrosion on the surface of cyclic and collective control tubes (push-pull rods) and cyclic stop ring assemblies. The corrosion is limited to the area of the tube or stop ring in contact with the protective rubber boot. During the investigation, it was determined that a residue on the interior surface of the boot (a result of the manufacturing process) and a reaction with ambient moisture caused the corrosion on the aluminum surface of the tube. Enstrom has incorporated a cleaning process to ensure the boots are free of residue on assembly.

This Service Directive Bulletin (SDB) requires a one-time inspection of the cyclic and collective control tube assemblies, cleaning or replacing the boots, as required, and cleaning or replacing any corroded assemblies.

5. COMPLIANCE:

Inspect the surface condition of the lateral and longitudinal cyclic control tube assemblies, the collective control tube assembly, and cyclic stop ring assemblies in accordance with paragraph 6 at the next 100-hour/annual inspection.

Revision 1 added the collective control tube assembly to the inspection requirements (para. 5 and para. 6.10) and clarified replacement parts (para. 7.1).

Revision 2 revises the effectivity to include fielded helicopters since the previous issue of this service bulletin. The inspection requirements for serial numbers 5226 and prior are exempt if the original issue and Revision 1 of this SDB were complied with.

6. INSPECTION:

NOTE: Perform all maintenance in accordance with the TH-28/480 Series Maintenance Manual.

NOTE: Refer to Figures 9-1, 9-2, and 9-5 of the TH-28/480 Series Illustrated Parts Catalog and paragraph 7 of this SDB for parts and locations.

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- 6.1 Cyclic Control Tube Assembly Inspection
- 6.2 Extend the lateral and longitudinal trim assemblies (cyclic fully forward and fully left).
- 6.3 Disconnect electrical power.
- 6.4 Open the pilot and copilot side engine access panels. Locate the lateral (see *Figure 1* example) and longitudinal cyclic control tube assemblies where they pass through the cabin backwall. It may be helpful to remove the battery to access the longitudinal cyclic control tube assembly.

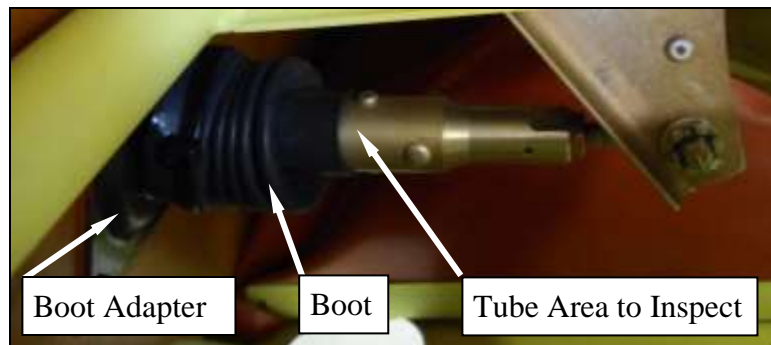


Figure 1. Lateral cyclic control tube assembly (looking inboard)

- 6.5 Using a bright light, inspect the cyclic control tube surface for corrosion (see *Figure 2* example). Cut the tie wrap securing the boot to the boot adapter to permit the boot to move freely for inspecting the control tube adjacent to the cabin wall.

NOTE: For some installations, the boot may be bonded to the adapter. Use care when breaking the seal to avoid damaging the boot.

NOTE: Inspect both lateral and longitudinal cyclic control tubes.

NOTE: Paragraph 12-7 of the Maintenance Manual may be referenced for additional inspection criteria.



Figure 2. Example of corrosion on a control tube

- 6.5.1 If the condition of the control tube assemblies is satisfactory, no additional inspection is required. Re-install the boot ends over the tubes, tie wrap the boot end onto the boot adapter, and replace the battery, if required.
- 6.5.2 If corrosion is detected and damage is less than 0.010" (0.25 mm deep), perform the following:
- 6.5.2.1 Remove the applicable cyclic control tube assembly in accordance with paragraph 12-6 of the maintenance manual.
 - 6.5.2.2 Remove the boot. If the boot is damaged, replace with a new boot. Prior to re-installing the boot, wash with soapy water, rinse thoroughly, and dry completely.
 - 6.5.2.3 Repair damage to the control tube in accordance with paragraph 12-7.B of the maintenance manual. Clean and apply corrosion protection to the control tube surface.

NOTE: Apply ACF-50 anti-corrosion compound, or equivalent, to the surface of the new control tube on re-installation.

- 6.5.2.4 Re-install the control tube assembly in accordance with paragraph 12-8 of the maintenance manual.

NOTE: Re-install the cleaned boot on re-installation.

- 6.5.2.5 Safety wire the re-installed hardware.

- 6.5.3 If corrosion is detected and damage exceeds 0.010" (0.25 mm deep), perform the following:
- 6.5.3.1 Remove the applicable cyclic control tube assembly in accordance with paragraph 12-6 of the maintenance manual for replacement.
 - 6.5.3.2 Remove the boot. If the boot is damaged, replace with a new boot. Prior to re-installing the boot, wash with soapy water, rinse thoroughly, and dry completely.
 - 6.5.3.3 Re-install a new control tube assembly in accordance with paragraph 12-8 of the maintenance manual.

NOTE: Apply ACF-50 anti-corrosion compound, or equivalent, to the surface of the new control tube on re-installation.

NOTE: Re-install the cleaned boot on re-installation.

- 6.5.3.5 Safety wire the re-installed hardware.

- 6.6 Re-install the battery, if required.

6.7 Cyclic Stick Stop Ring Assembly Inspection

- 6.8 For the pilot and copilot cyclic sticks, remove the four screws that attach the cyclic cover and boot to the stop ring assembly (*Figure 3*).



Figure 3. Cyclic boot and cover installation (copilot side shown)

- 6.9 Move the cyclic cover and boot up to expose the stop ring assembly. Inspect the surface of the stop ring assembly for corrosion (see *Figure 4* example).

NOTE: Inspect both pilot and copilot cyclic stop ring assemblies.



Figure 4. Example of corrosion on the cyclic stop ring assembly

- 6.9.1 If the condition of the stop ring assembly is satisfactory, no additional inspection is required. Re-install the cyclic boots and covers.
- 6.9.2 If corrosion is detected and damage is less than 0.010" (0.25 mm deep), perform the following:

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6.9.2.1 Remove the corrosion from the stop ring assembly using Scotch-Brite, or equivalent. Apply ACF-50 anti-corrosion compound, or equivalent, to the cleaned surface.

NOTE: Apply ACF-50 anti-corrosion compound, or equivalent, to the surface of the cleaned stop ring on re-installation.

6.9.2.2 Remove the boot.

- a) Pilot side: Disconnect the electrical plug and carefully slide the boot through the cover, then over the electrical plug, cyclic stick, and grip.
- b) Copilot side: Remove the safety pin. Remove the cyclic stick in accordance with paragraph 12-48 steps A and B; remove the boot.

6.9.2.3 If the boot is damaged, replace with a new boot. Prior to re-installing the boot, wash with soapy water, rinse thoroughly, and dry completely.

6.9.2.4 Re-install the boots.

NOTE: Re-install the cleaned boot on re-installation.

- a) Pilot side: Slide the boot over the grip, cyclic stick, and electrical plug. Install the boot and cyclic cover. Connect the electrical plug.
- b) Copilot side: Install the boot and cyclic cover. Install the cyclic stick in accordance with paragraph 12-51 steps A and B; install the safety pin.

6.9.3 If corrosion is detected and damage exceeds 0.010" (0.25 mm deep), perform the following:

6.9.3.1 Remove the stop ring assembly and boot.

- a) Pilot side: Remove the cyclic stick in accordance with paragraph 12-48 steps C through F; remove the cyclic cover and boot. Remove the screws that attach the stop ring assembly to the cabin floor.
- b) Copilot side: Remove the safety pin. Remove the cyclic stick in accordance with paragraph 12-48 steps A and B; remove the cyclic cover and boot. Remove the screws that attach the stop ring to the cabin floor.

6.9.3.2 Re-install a new stop ring. Apply ACF-50 anti-corrosion compound, or equivalent, to the surface.

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NOTE: Apply ACF-50 anti-corrosion compound, or equivalent, to the surface of the stop ring on re-installation.

NOTE: Install the stop ring with the thinner cross-section of the insert in the forward position.

6.9.3.3 If the boot is damaged, replace with a new boot. Prior to re-installing the boot, wash with soapy water, rinse thoroughly, and dry completely.

6.9.3.4 Re-install the boots.

NOTE: Re-install the cleaned boot on re-installation.

a) Pilot side: Install the boot and cyclic cover. Install the cyclic stick in accordance with paragraph 12-51 steps C through H.

b) Copilot side: Install the boot and cyclic cover. Install the cyclic stick in accordance with paragraph 12-51 steps A and B; install the safety pin.

6.10 Collective Control Tube Assembly Inspection

6.11 Disconnect electrical power.

6.12 Remove the copilot seat, fold up the rear seats, and slide the pilot's seat to the forward position.

6.13 Remove the collective torque tube cover(s).

6.14 Inspect the collective control tube surface for corrosion (see *Figure 2* example). Cut the tie wrap securing the boot to the boot adapter to permit the boot to move freely for inspecting the control tube adjacent to the cabin wall.

NOTE: Paragraph 12-7 of the Maintenance Manual may be referenced for additional inspection criteria.

6.14.1 If the condition of the control tube assembly is satisfactory, no additional inspection is required. Re-install the boot end onto the boot adapter, tie wrap the boot end.

6.14.2 If corrosion is detected and damage is less than 0.010" (0.25 mm deep), perform the following:

6.14.2.1 Remove the collective control tube assembly in accordance with paragraph 12-6 of the maintenance manual.

6.14.2.2 Remove the boot. If the boot is damaged, replace with a new boot. Prior to re-installing the boot, wash with soapy water, rinse thoroughly, and dry completely.

6.14.2.3 Repair damage to the control tube in accordance with paragraph 12-7.B of the maintenance manual. Clean and apply corrosion protection to the control tube surface.

NOTE: Apply ACF-50 anti-corrosion compound, or equivalent, to the surface of the new control tube on re-installation.

6.14.2.4 Re-install the control tube assembly in accordance with paragraph 12-8 of the maintenance manual.

NOTE: Re-install the cleaned boot on re-installation.

6.14.2.5 Safety wire the re-installed hardware.

6.14.3 If corrosion is detected and damage exceeds 0.010" (0.25 mm deep), perform the following:

6.14.3.1 Remove the control tube assembly in accordance with paragraph 12-6 of the maintenance manual for replacement.

6.14.3.2 Remove the boot. If the boot is damaged, replace with a new boot. Prior to re-installing the boot, wash with soapy water, rinse thoroughly, and dry completely.

6.14.3.3 Re-install a new control tube assembly in accordance with paragraph 12-8 of the maintenance manual.

NOTE: Apply ACF-50 anti-corrosion compound, or equivalent, to the surface of the new control tube on re-installation.

NOTE: Re-install the cleaned boot on re-installation.

6.14.3.5 Safety wire the re-installed hardware, if required.

6.15 Re-install the collective torque tube cover(s).

6.16 Re-install the seats.

7. PARTS:

7.1 Replacement parts: see *Figure 5*

7.2 Consumable Materials: MS20995C25 Safety Wire; ACF-50 Anti-Corrosion Compound, or equivalent; Scotch-Brite (3M), or equivalent

7.3 Equipment: bright light source

8. SPECIAL TOOLS: None
9. MAN-HOURS: Inspection – 15 minutes
10. WARRANTY: Per Enstrom Warranty Policy
11. WEIGHT CHANGE: None
12. LOG BOOK ENTRY: Record repair actions in detail as required for maintenance actions.
13. REPETITIVE ACTION: None

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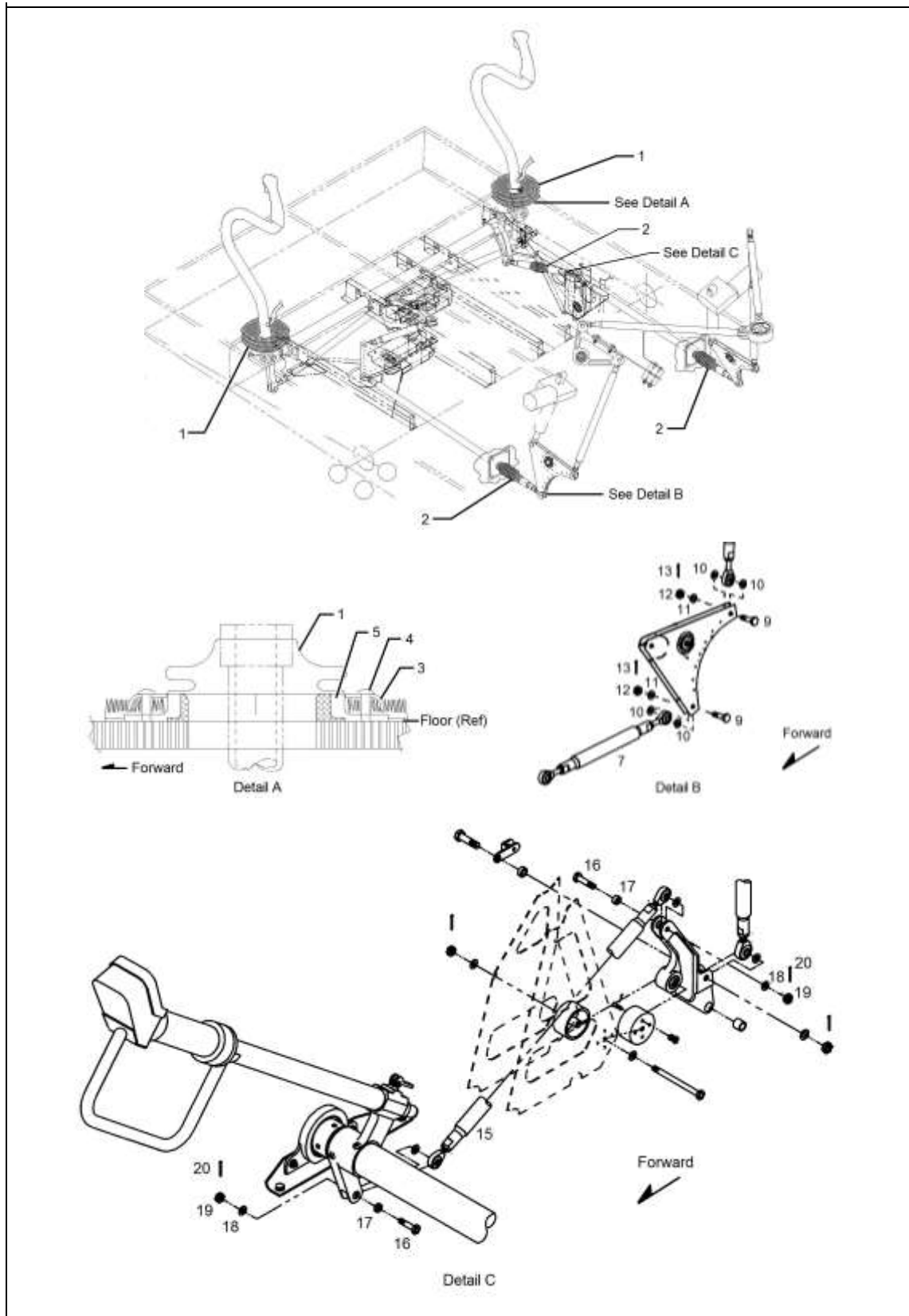


Figure 5. Control tube installations and cyclic boot cover installation

ITEM NUMBER	PART NUMBER	DESCRIPTION	QTY
1	ZFD-1094-0-7-32	. Boot	2
2	LDF-5-157	. Boot	3
-	PLT2S-CO	. Cable Tie	2
3	4167521-19	. Boot Cover	2
4	AN526-832R8	. . Screw	4
5	4167511-5	. Stop Ring Assembly	2
-6	MS24694S51	. . Screw	4
7	4166050-103	. Control Tube Assembly (lateral)	1
-7A*	4166050-903	. Control Tube (lateral)	1
-8	4166050-7	. Control Tube Assembly (longitudinal)	1
-8A*	4166050-907	. Control Tube (longitudinal)	1
9	NAS1104-9D	. . Bolt	2
10	AN960D416L	. . Washer	4
11	AN960D416	. . Washer	4
12	MS17826-4	. . Nut	2
13	MS24665-153	. . Cotter Pin	2
-14	MS20995C25	. . Safety Wire	A/R
15	4166050-201	. Control Tube Assembly (collective)	1
-15A*	4166050-901	. Control Tube (collective)	1
16	NAS6204-12D	. Bolt	2
17	NAS73-4E004	. Bushing	2
18	AN960-416L	. Washer	2
19	MS17826-4	. Nut	2
20	MS24655-153	. Cotter Pin	2

- ITEM NOT ILLUSTRATED

* Bearing rod ends are not included.