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SERVICE DIRECTIVE BULLETIN

SERVICE DIRECTIVE BULLETIN NO. 0116
Revision 3

DATE: April 11, 2023

1. SUBJECT: Cyclic and Collective Control Tube Assembly Inspections

2. MODEL: F-28F, F-28F-R, 280FX and any additional models that have been modified by adding rubber boots

3. EFFECTIVITY: F-28F Series: Serial Numbers 747 through 832*
280FX Series: Serial Numbers 2013 through 2147*
*All Models: Any earlier Serial Number modified with the Control Tube Cover Installation

4. REFERENCE: Enstrom F-28A/F-28C Series Maintenance Manual, Latest Revision
Enstrom 280/280C Series Maintenance Manual, Latest Revision
Enstrom F-28F/280FX Series Maintenance Manual, Latest Revision

5. BACKGROUND:

Enstrom has received reports of corrosion on the surface of cyclic and collective control tube (push-pull rods) assemblies. The corrosion is limited to the area of the tube in contact with the 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.

Revision 1 updates the number of piston models affected by the contents of this SDB and revises the effectivity to include fielded helicopters since the previous issue of this SDB. The inspection requirements for serial numbers 832 (F-28F) and 2147 (280FX) and prior are exempt if the original issue of this SDB was complied with.

Revision 2 corrects a typographical error in the numbering sequence of paragraph 7.

Revision 3 updates part number descriptions and quantities per assembly in paragraph 9.1.

6. COMPLIANCE:

Inspect the surface condition of the lateral and longitudinal cyclic control tube assemblies and the collective control tube assembly in accordance with paragraph 7 at the next 100-hour/annual inspection.

NOTE: Perform all maintenance in accordance with the applicable Maintenance Manual.

NOTE: Refer to Figures 8-5 and 8-16A of the F-28/280 Series Illustrated Parts Catalog and paragraph 9 of this SDB for parts and locations.

7. INSPECTION – Cyclic Control Tube and Collective Control Tube Assembly Inspection:

7.1. Remove the seat deck and back fiberglass structure.

7.2. Extend the lateral and longitudinal trim assemblies (cyclic fully forward and fully left).

7.3. Position collective in full up position.

7.4. Disconnect electrical power.

7.5. Remove the left and right side upper engine cowling.

NOTE: Removal of the fuel cell structures will facilitate inspection of the cyclic control tube assemblies but is not necessary.

7.6. (Optional) Remove the left and right fuel cell structures.

7.7. Locate the cyclic (lateral and longitudinal) and collective control tube assemblies (Figure 1). Remove the tie wrap and inspect the surface near and under the boot for corrosion (Figure 2). Use a flashlight or bright light source as necessary for the inspection.

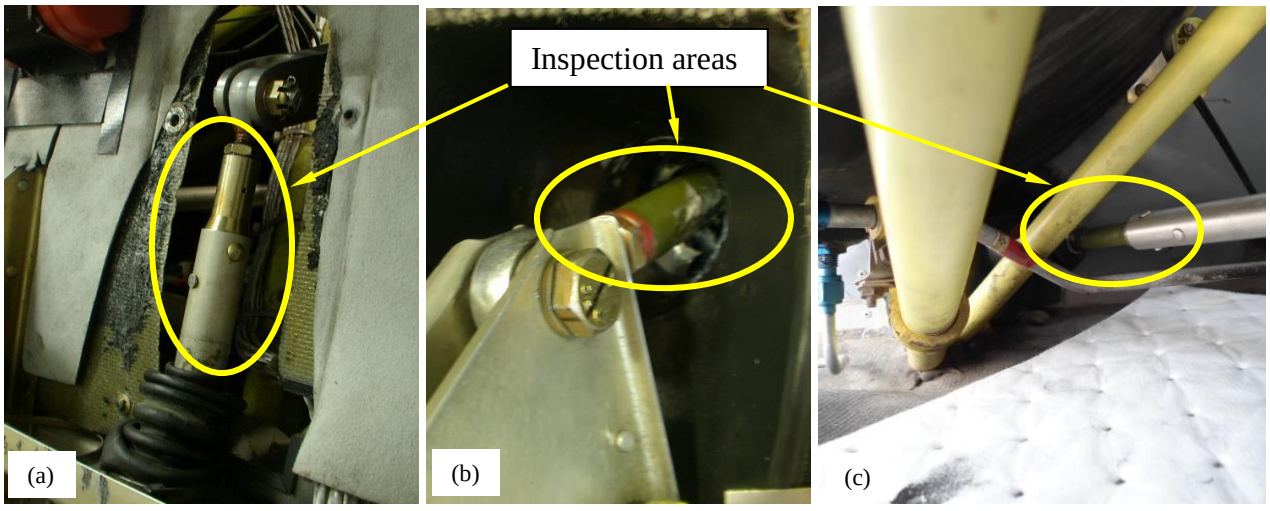


Figure 1. Inspection areas; (a) collective control tube assembly and cyclic control tube assembly ((b) as viewed from the cabin through the backwall and (c) as viewed through the upper left side engine cowling).

7.8. If the condition of the control tube assembly is satisfactory, no additional inspection is required. Re-install the boot over the tube assembly and tie wrap.

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

7.9.1. Remove the damaged control tube assembly by removing attachment hardware.

7.9.2. 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.

7.9.3. Blend out damage less than 0.010" (0.25 mm deep). Clean and apply corrosion protection to the control tube surface (i.e. Alodine or epoxy primer).

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

7.9.4. Install the control tube assembly. Install the connecting hardware, torque, and install new cotter pin.

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

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

7.10.1. Remove the damaged control tube assembly by removing attachment hardware.

7.10.2. 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.

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

7.10.3. Install a new control tube assembly as follows:

NOTE: Install control tube assembly with the HMVV-XM (right hand) rod-ends orientated to the right, top, and aft and HMLVV-XM (left hand) rod-ends orientated to the left, bottom, and forward.

NOTE: Ensure the control tube assemblies are set to the lengths as when removed from the aircraft. Measure the length from centerline to centerline of rod end attachment points.

7.10.3.1. Measure the control tube assembly length (center to center distance between the rod ends.)

7.10.3.2. Remove the rod ends from the damaged control tube assembly. Install the rod ends in the new control tube assembly.

7.10.3.3. Set the rod ends to the length measured in step 7.10.3.1.

7.10.3.4. Install the control tube assembly. Install the connecting hardware, torque, and install new cotter pin.

7.10.4. Apply corrosion protection to the control tube surface (i.e. Alodine or epoxy primer).

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

7.10.5. Install boot to indicated length in Figure 3.

7.10.5.1. Position collective in full up position when cable tie is added at this dimension.

7.11. If removed, install fuel cells.

7.12. Install left and right side upper engine cowling.

7.13. Lower collective.

7.14. Install seat deck and back fiberglass structure.

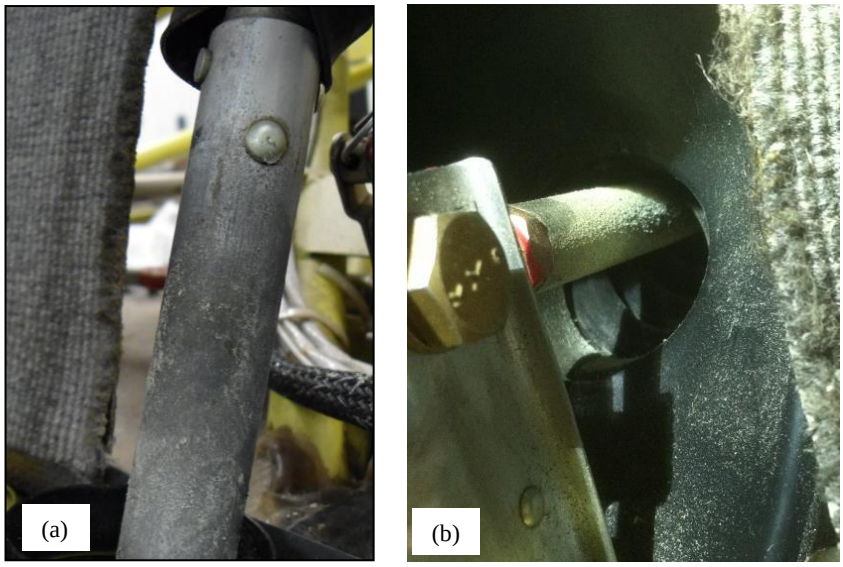


Figure 2. Examples of corrosion; (a) collective control tube assembly, and (b) cylic control tube assembly.

8. POST MAINTENANCE CHECK – Flight Control System:

8.1. If a cyclic control tube assembly was replaced, verify cyclic control travel.

8.1.1. Rotate cyclic stick 360° around stop ring to check for evidence of binding.

CAUTION: Upon completion of any adjustments to the control system, check if the autorotative rpm is in a safe range during first ground run-up: at flat pitch, 18.5-19.5 inches manifold pressure at 3050 rpm. (NOTE: A high manifold pressure indicates a low autorotation rpm. A low manifold pressure indicates a

high autorotation rpm. Proceed to 8.1.2, if autorotative rpm adjustment is required.)

8.1.2. Perform autorotative rpm adjustment, if required.

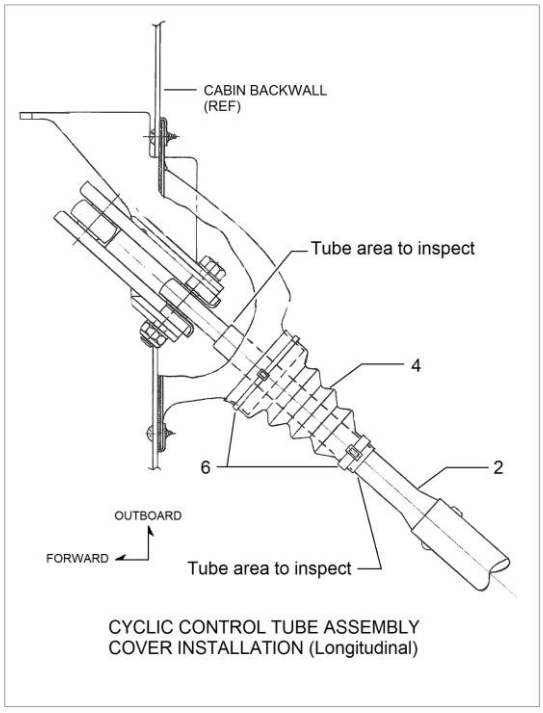
8.1.2.1. For F-28A/F-28C/280/280C, refer to page MM-11-21 of the applicable maintenance manual.

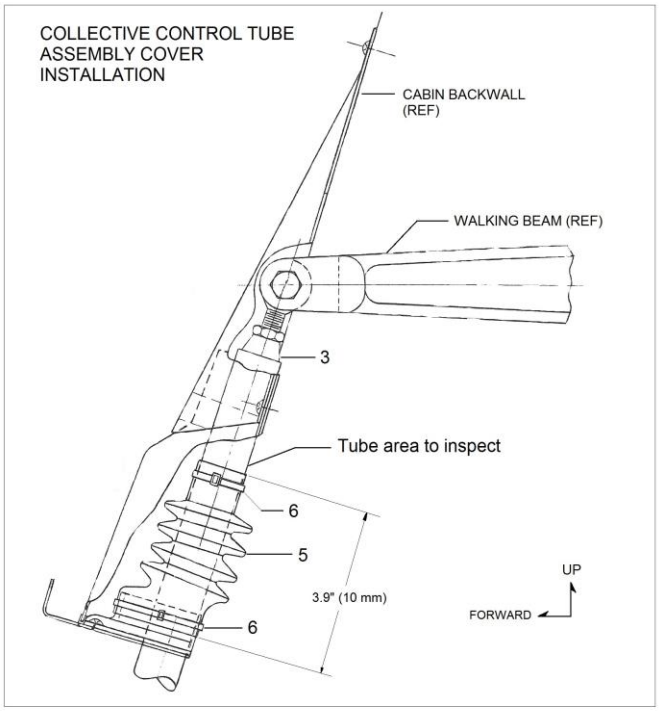
8.1.2.2. For F-28F/280F, refer to paragraph 12-8, B. of the F-28F/280F series maintenance manual.

8.2. If the collective control tube assembly was replaced, perform a check of the autorotative rpm in accordance with the applicable maintenance manual references listed in step 8.1.2.

9. PARTS:

9.1. Replacement parts: see Figure 3 below.





ITEM	PART NUMBER	DESCRIPTION	QTY PER ASSY	F28A	280	F28C	280C	F28F	280F	280FX
-1	28-16197-1	Push-Pull Rod Assembly (Lateral)	1	X	X	X	X	X	X	X
2	28-16198-1	Push-Pull Rod Assembly (Longitudinal)	1	X	X	X	X	X	X	X
3	28-16179-1	Push-Pull Rod Assembly (Collective)	1	X	X					
3A	28-16179-2	Push-Pull Rod Assembly (Collective)	1			X	X	X	X	X
4	LDF-6-228	. Boot	2	X	X	X	X	X	X	X
5	LDF-5-157	. Boot	1	X	X	X	X	X	X	X
6	SST25-MP	. Cable Tie	4	X	X	X	X	X	X	X

- ITEM NOT ILLUSTRATED

Figure 3: Cyclic and Collective Control Tube Cover Installation

9.2. Other materials:

ACF-50 Anti-corrosion compound, or equivalent
AN381-2-8 Cotter Pins
Chromate conversion coating (Alodine, or equivalent)
Epoxy primer (PRC-Desoto 593x300, or equivalent)
Scotch-Brite (3M), or equivalent

9.3. Equipment: bright light source

10. SPECIAL TOOLS: N/A

11. MAN-HOURS: 1 hour (Inspection)

12. WARRANTY: Per Enstrom Warranty Policy

13. WEIGHT CHANGE: None

14. LOG BOOK ENTRY:

Record repair actions in detail as required for maintenance actions.

15. REPETITIVE ACTION: None