	AIRWORTHINESS DIRECTIVE **No F-2003-460**	Distribution: **B**	Issue date: **December 24, 2003**	Page : **1/4**
Direction générale de l'aviation civile France **GSAC publication**	This Airworthiness Directive is published by the DGAC: [X] on behalf of EASA, the Primary Airworthiness Authority for the affected product. [ ] as the Registration Airworthiness Authority for the affected aircraft..		*Translation of « Consigne de Navigabilité » of same number.* *In case of difficulty, reference should be made to the French issue.*	
	No person may operate an aircraft to which an Airworthiness Directive applies, except in accordance with the requirements of that Airworthiness Directive, unless otherwise agreed with the Authority of the State of Registry.			

Corresponding foreign Airworthiness Directive(s): **Not applicable**	Airworthiness Directive(s) replaced: **2003-371, cancelled by its revision 1**
Person in charge of airworthiness: **AIRBUS**	Type(s): **A330 and A340-200/-300 aircraft**
Type certificate(s) No. **183, 184** TCDS No **183, 184**	
ATA chapter: **27**	Subject: **Flight controls - Elevator servo controls in damping position**

1. EFFECTIVITY:

AIRBUS A330-200, A330-300, A340-200 and A340-300 aircraft series, all certified models, all serial numbers.

2. REASONS:

Two cases of elevator dropped in full down position without ECAM warning have been reported on A330 aircraft. In both cases, the flight crew identified the anomaly while performing the pre-flight controls check.

In normal operation, each elevator surface is actuated by one servo control in active mode (green servo), while the other (yellow or blue servo) is in damping mode.

Whenever needed, the mode change from active to passive is achieved by a selector valve inside each servo control. The position of this selector valve is transmitted to the flight control computers by a mode selector valve position transducer.

Some operators have reported cases of cracks or rupture at the attachment lugs of the selector valve position transducer, all installed at damping position. It resulted in displacement of the transducer leading to internal leakage at the affected servo control.

Before the hydraulic circuit is lost, the displacement of the transducer can result in an un-commanded switching of the damped servo control from damping to active mode, undetected by the flight control computers and unannounced to the flight crew. The servo control thereby applies a permanent nose down order that prevents the normal active servo control moving the affected elevator upwards.

As there is no ECAM warning, this inoperative condition can only be identified by the absence of elevator surface movement on F/CTL ECAM page during the flight controls check.

Once the hydraulic circuit is lost, the failed servo is no longer hydraulically supplied and normal elevator control is recovered through the normal active servo control.

At take-off, the consequences of an inoperative elevator are potentially catastrophic, according handling qualities and performance analysis, in the worst-case configuration (max take-off weight and forward CG position) runway length (computed through AFM) may not be sufficient to take-off.

To detect this specific elevator failure mode and ensure reliable function of the elevator surfaces, the Airworthiness Directive (AD) 2003-371 requested:

- At operational procedure level:

  • To perform an additional elevator flight control check as close as practicable before take off to ensure detecting an elevator failure during taxi subsequent to the pressure peak after engine start.

  • To amend the current flight control check procedure provided in the FCOM Standard Operating Procedure (SOP) in order to reinforce the flight control check efficiency.

- At maintenance level:

  • To perform a dye penetrant inspection of the attachment lugs of the shut off valve selector valve position transducer for elevator servo control at damping positions.

  • To replace any cracked transducer before next flight.

The aim of this new AD is:

- to reduce the threshold of the inspection from 3000 flight cycles (FC) to 1000 FC,
- to delete flight hours (FH) limitations,
- to require a repetitive dye penetrant inspection at each 350 FC,
- to remove the additional elevator flight control check before take-off,
- to refer to AIRBUS Service Bulletin (SB) instead VSB Goodrich SC4800-27-13 Rev 2 for inspection of a spare transducer or transducer fitted on spare elevator servo control,
- to add a note to allow the operators to modify the task sharing between the PF and the PNF.

3. MANDATORY ACTIONS AND COMPLIANCE TIMES:

3.1. Operational procedures

From the effective date of this AD, amend the current flight control check procedures as follows for one or both damping servo controls above 1000 FC since new:

PRIOR OR DURING TAXI :
FLIGHT CONTROLS .....CHECK

"1. AT A CONVENIENT STAGE, PRIOR TO OR DURING TAXI, AND BEFORE ARMING THE AUTOBRAKE, THE PF SILENTLY APPLIES FULL LONGITUDINAL AND LATERAL SIDESTICK DEFLECTION.
ON THE F/CTL PAGE, THE PNF CHECKS FULL TRAVEL OF ALL ELEVATORS AND ALL AILERONS, AND THE CORRECT DEFLECTION AND RETRACTION OF ALL SPOILERS. THE PNF CALLS OUT "FULL UP", "FULL DOWN", "NEUTRAL", "FULL LEFT", "FULL RIGHT", "NEUTRAL", AS EACH FULL TRAVEL/NEUTRAL POSITION IS REACHED.

THE PF SILENTLY CHECKS THAT THE PNF CALLS ARE IN ACCORDANCE WITH THE SIDESTICK ORDER.

NOTE: IN ORDER TO REACH FULL TRAVEL, FULL SIDESTICK MUST BE HELD FOR A SUFFICIENT PERIOD OF TIME.

2. THE PF PRESSES THE PEDAL DISC PUSHBUTTON ON THE NOSEWHEEL TILLER, AND SILENTLY APPLIES FULL LEFT RUDDER, FULL RIGHT RUDDER, AND NEUTRAL. THE PNF CALLS OUT "FULL LEFT", "FULL RIGHT", "NEUTRAL", AS EACH FULL TRAVEL/NEUTRAL POSITION IS REACHED.

3. THE PNF APPLIES FULL LONGITUDINAL AND LATERAL SIDESTICK DEFLECTION, AND SILENTLY CHECKS FULL TRAVEL AND CORRECT SENSE OF ALL ELEVATORS AND ALL AILERONS, AND CORRECT DEFLECTION AND RETRACTION OF ALL SPOILERS, ON THE ECAM F/CTL PAGE.»

Note 1: The task sharing between the PF and the PNF for the above flight control checks can be amended by each operator depending on its operational policy and local airworthiness requirements.

Note 2: The above listed procedure is included in the associated FCOM documentation and can be used to amend the flight control check procedure:
- A340 FCOM VOL.3 REV. 26 / Standard Operating Procedures 3.03.10 p3
- A330 FCOM VOL.3 REV. 19 / Standard Operating Procedures 3.03.10 p3

3.2. Inspection of each elevator servo control damping position 3CS1 and 3CS2

3.2.1. Perform a dye penetrant inspection of the mode selector valve position transducer attachment lugs as per SB A340-27A4119 Rev 02 or A330-27A3115 Rev 02:

3.2.1.1. For each elevator servo control not yet dye penetrant inspected per AOT A340-27A4119 Rev 01 or A330-27A3115 Rev 01 referenced in previous AD 2003-371, prior to the accumulation of 1000 FC since new or within 350 FC following the effective date of this AD, whichever occurs later.

3.2.1.2. For each elevator servo control already dye penetrant inspected as per AOT A340-27A4119 Rev 01 or A330-27A3115 Rev 01 referenced in previous AD 2003-371, prior to the accumulation of 700 FC since the last dye penetrant inspection or prior to the accumulation of 1350 FC since new, whichever occurs later.

Note 3: Paragraph 3.2.1.1 applies also to elevator servo controls only visually inspected per AOT A340-27A4119 Rev 01 or A330-27A3115 Rev 01 referenced in previous AD 2003-371.

3.2.2. Repeat the dye penetrant inspection of the mode selector valve position transducer attachment lugs as per SB AIRBUS A340 27A4119 Rev 02 or A330 27A3115 Rev 02 at intervals not exceeding 350 FC.

3.2.3. In case of any crack finding, replace the transducer by a spare one or replace the elevator servo control before next flight, as per SB A340-27A4119 Rev 02 or A330-27A3115 Rev 02. Report any finding to AIRBUS.

Note 4: Action 3.1. of this AD is no more mandatory once both damping servo controls are repetitively inspected as per paragraph 3.2.1. However, it is recommended to follow flight control check as procedure given in § 3.1., which has been introduced in FCOM documentation.

3.3. Inspection of spare transducer or elevator servo control

Any spare transducer or transducer fitted on spare elevator servo control must be inspected as per SB A340 27A4119 Rev 02 or A330 27A3115 Rev 02 prior to installation on aircraft.

4. REFERENCE PUBLICATIONS:

- AIRBUS AOT A340-27A4119 Rev 01 issued on September 25, 2003
- AIRBUS AOT A330-27A3115 Rev 01 issued on September 25, 2003
- AIRBUS SB A340-27A4119 Rev 02
- AIRBUS SB A330-27A3115 Rev 02
- AIRBUS OIT/FOT SE 999.0149/03 issued on December 19, 2003

(Any further approved revision of these documents is acceptable).

5. EFFECTIVE DATE:

January 03, 2004.

6. REMARK:

For questions concerning the technical contents of this AD's requirements, contact:

AIRBUS – Gérard MEUREY – Fax : 33 5 61 93 45 8[illegible]

7. APPROVAL:

This AD is approved under EASA reference No. 1885 dated December 16, 2003.