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Direction générale de l'aviation civile France GSAC publication	This Airworthiness Directive is published by the DGAC on behalf of EASA, Airworthiness Authority of the State of Design for the affected product, part or appliance.		<i>Translation of « Consigne de Navigabilité » of same number. In case of difficulty, reference should be made to the French issue.</i>	
	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: F-2004-112 cancelled by its Revision 1		
Person in charge of airworthiness: AIRBUS SAS		Type(s): A330, A340-200/300 aircraft		
Type certificate(s) No. A.004, 183 TCDS No A.004, 183				
ATA chapter: 27	Subject: Flight controls - Elevator servocontrols - Replacement of solenoid valve O-ring seals and application of temporary revisions of AFMs and MMEL			

1. EFFECTIVITY:

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

2. REASONS:

2.1. This Airworthiness Directive (AD) deals with the two following points:

- elevator blocked in down position due to two independent failures one of which is hidden,
- incorrect PN for solenoid valve O-ring seals in IPC 27-34-51-1.

2.1.1. Case of an elevator blocked in down position due to two independent failures one of which is hidden:

Each elevator is controlled by two servocontrols.

In normal operation:

- one servocontrol in active mode controlled by PRIM 1 (Green servocontrol),
- one servocontrol in damping mode (Yellow or Blue servocontrol) monitored by PRIM 2.

Change from active mode to damped mode is obtained by means of a mode selector which is controlled by two identical solenoid valves housed on the servocontrol. The sealing of each solenoid valve is ensured by four O-ring seals.

During pre-flight control checks, the flight crew of an A330-200 observed that one of the elevators was blocked in down position, the ECAM screen displaying "F/CTL PRIM 1 PITCH FAULT".



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This situation was due to two independent failures, one of which was hidden, which occurred on one of the elevators.

Investigations revealed that the origin of the blocking of the elevator in down position was due to the inability of the Yellow servocontrol to switch to active mode.

This inability:

- was caused by an internal hydraulic leak due to the deterioration of an O-ring seal on a solenoid valve,
- was not detected by the PRIM 2 computer and not announced to the flight crew.

2.1.2. Incorrect PN for solenoid valve O-ring seals in IPC:

An incorrect O-ring seal PN in IPC 27-34-51-1 could have led to the installation of O-ring seals incompatible with the hydraulic fluid causing them to deteriorate within several flight hours.

In both cases, this situation if not detected could lead to the loss of an elevator on takeoff and, in the extreme case, reduce the controllability of the aircraft which is potentially critical.

2.2. The aim of this AD is to:


- Require the replacement of all servocontrol O-ring seals in damping position installed on A330-200 aircraft only and of the spare parts.
- Render mandatory the application of the temporary revisions of the A330/A340 flight manual concerning the "Undetected Elevator Control Loss in case of Dual Failure" procedure.
- Render mandatory the application of the temporary revisions of the A330/A340 MMEL concerning the additional conditions which must be applied to maintain the "GO IF" dispatch capability in case where PRIM 1 is not operational.
- Reuse the requirements of AD F-2004-112 for the replacement of O-ring seals not compatible with the hydraulic fluid.
- Ensure that O-ring seals with correct PNs are installed on the complete A330 and A340 fleet and all spare servo controls.

3. MANDATORY ACTIONS AND COMPLIANCE TIMES:

3.1. For elevator servocontrols installed in damping position on A330-200 aircraft only:

- Before the accumulation of 3,000 flights (FC) by the servocontrol since new or 3,000 FC since the installation of the solenoid valve on the servocontrol
or
within 700 flight hours (FH) from the effective date of this AD, whichever occurs later:

Unless already accomplished, replace the O-ring seals installed on the two solenoid valves of each servocontrol by new O-ring seals in accordance with AOT A330-27A3129 Revision 01.

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3.2. For spare elevator servocontrols which were installed on A330-200 aircraft the O-ring seals of which were not replaced as detailed in paragraph 3.1 of this AD:

Before installation on aircraft, replace the O-ring seals installed on the two spare servocontrol solenoid valves by new O-ring seals in accordance with AOT A330-27A3129 Revision 01.

3.3. For A330-200, A330-300, A340-200, A340-300 aircraft:

3.3.1. From the effective date of this AD, the following operational procedure is rendered mandatory, on the ground before takeoff:

Undetected Elevator Control Loss in case of Dual Failure

"On ground, before takeoff until takeoff power thrust setting, apply the following procedure.

- *In the case of a F/CTL PRIM 1 FAULT, or F/CTL PRIM 1 PITCH FAULT
Select the PRIM 1 switch to OFF then ON to perform a FCPC PRIM 1 reset*
 - *If successful
Perform the normal pre-flight Flight Control check*
 - *If unsuccessful
Return to the gate and require appropriate maintenance actions.*
- *In the case of a F/CTL ELEV SERVO FAULT or HYD G SYS LO PR
Return to the gate and require appropriate maintenance actions".*

Note1: The incorporation of the flight manual temporary revision 4.02.00/25 issue 02 (A330) or 4.02.00/40 issue 02 (A340) or a copy of this AD in the aircraft operations manual and their strict application by the flight crew allows the requirements of paragraph 3.3.1 of this AD to be met.

3.3.2. From the effective date of this AD:

Introduce into the aircraft Minimum Equipment List (MEL) the following temporary revisions relevant to the manufacturer's MMEL:

- SECTION 01: A330 MMEL TR No. 01-27/01K issue 01
 - SECTION 01: A330 MMEL TR No. 01-27/02K issue 01 (Enhanced A330 fitted with Rudder Fly-by-wire)
 - SECTION 01: A340 MMEL TR No. 01-27/01M issue 01
 - SECTION 01: A340 MMEL TR No. 01-27/02M issue 01 (Enhanced A340 fitted with Rudder Fly-by-wire)
- and comply with these directives.

Note2: These MMEL TRs will be introduced into the next general revision of the MMEL.

3.4. For all A330-200 aircraft which have received embodiment of AOT A330-27A3129 and which have not received embodiment of AOT A330-27A3129 Revision 01:

- Before the next flight, check the Part Numbers (PN) of the seals installed on the solenoid valve of the servocontrol of the elevator in damping position.
- If the seals installed have PN MS28775-XXX or a PN that cannot be identified, replace them before the next flight by the following seals:
 - IPC 27-34-51-1 item 130: NAS1611-011 or NAS1611-011A
 - IPC 27-34-51-1 item 140: NAS1611-012 or NAS1611-012A
 - IPC 27-34-51-1 item 150: NAS1611-013 or NAS1611-013A



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3.5. For A330-200, A330-300, A340-200, A340-300 aircraft equipped with elevator servocontrols SC 4800-2/-4/-7/-8 or SC4800-7/-8 changed to SC4800-7A/-9 by embodiment in service of Service Bulletin AIRBUS (SB) A340-27-4083 or A330-27-3076:

Within the 1,400 FH following the effective date of this AD, replace the O-ring seals installed on the two solenoid valves of each elevator servocontrol:

- in damping position (except for the A330-200 aircraft covered by paragraph 3.4 of this AD),
- in active position,

by new O-ring seals PN NAS1611-XXX or PN NAS1611-XXXA in accordance with the instructions of SB A330-27A3131 or A340-27A4130.

3.6. For the spare elevator servocontrols SC 4800-2/-4/-7/-8 or SC4800-7/-8 changed to SC4800-7A/-9 by embodiment in service of SB A340-27-4083 or A330-27-3076:

Before installation on aircraft, replace the O-ring seals installed on the two spare servocontrol solenoid valves by new O-ring seals PN NAS1611-XXX or PN NAS1611-XXXA in accordance with the instructions of SB A330-27A3131 or A340-27A4130.

4. REFERENCE PUBLICATIONS:

AOT A330-27A3129 dated June 24, 2004
AOT A330-27A3129 Revision 01 dated July 16, 2004
AIRBUS Service Bulletin A330-27A3131
AIRBUS Service Bulletin A340-27A4130
A330 AFM TR 4.02.00/25 issue 02 EASA approved on September 02, 2004
A340 AFM TR 4.02.00/40 issue 02 EASA approved on September 02, 2004
A330 MMEL TR N° 01-27/01K issue 01 JAA approved on September 06, 2004
A330 MMEL TR N° 01-27/02K issue 01 JAA approved on September 06, 2004
A340 MMEL TR N° 01-27/01M issue 01 JAA approved on September 06, 2004
A340 MMEL TR N° 01-27/02M issue 01 JAA approved on September 06, 2004
(Any further approved revision of these documents is acceptable).

5. EFFECTIVE DATE:

October 09, 2004.

6. REMARK:

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

AIRBUS SAS - EAL - Fax : 33 5 61 93 45 80.

7. APPROVAL:

This AD is approved under EASA reference No 2004-9778 dated September 21, 2004.