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AIRWORTHINESS DIRECTIVE

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Inspection and/or modifications described below are mandatory. No person may operate a product to which this Airworthiness Directive applies except in accordance with the requirements of this Airworthiness Directive.

Translation of 'Consigne de Navigabilité' ref. : 1998-473-083(B) R5 In case of any difficulty, reference should be made to the French original issue.

AIRBUS INDUSTRIE

A330 aircraft

A330-300 - Landing gear -Steering limits and main landing gear inspections (ATA 32)

APPLICABILITY:

Airbus A330 aircraft models -301, -321, -322, -323, -341, -342, -343, all serial numbers.

REASONS:

This Airworthiness Directive (AD) was prompted by an incident that occurred in August 1998 when the right hand main landing gear (MLG) of an A340 aircraft fractured at Landing.

Investigation revealed a fatigue crack initiation located in the upper part of the MLG main fitting cylindrical barrel. This fatigue crack results from high steering and/or high towing angles when turning the aircraft.

It was determined that all A330 and A340 MLG of any standard to date could be affected.

This condition, if not corrected could ultimately lead to a possible MLG failure on ground.

Several mandatory actions have been launched through AD 98-405-078(B) for A330 aircraft. This AD has been introduced because the operational procedures mandated previously revealed to be complicated and in the meantime, new modifications have become available.

AD 98-405-078(B) has been replaced by this AD.

The Revision 1 of this AD:

introduces an alternate means of compliance as described in the paragraph A).1),

- restricts the applicability to A330 aircraft series -300. For A330-200 series aircraft refer to the new AD 1999-160-096(B),

- corrects a discrepancy between English and French version at paragraph A4 of the French version.

The Revision 2 of this AD takes into account:

- certification of A330-343,

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- availability of modification 46830 under AIRBUS INDUSTRIE Service Bulletin (SB) A330-31-3033 for automatic recording of all nose wheel steering (NWS) angle exceedance.

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Reason for Revision 3:

AIRBUS INDUSTRIE has designed Modification 47487 which introduces a scallop machining to the aft end of the MLG fitting in order to remove the areas where high stress concentrations have been found and to allow the NWS angles up to 72°

In addition, the investigation results allow the NWS angle to be increased up to 72° for aircraft fitted with Modification 43029 (growth main fitting).

MLG modified in accordance with mod 47487 or 43029 are temporary life limited while awaiting completion of investigation and testing.

Reason for Revision 4:

The life limits have been removed from this AD and will be given either in AD 2001-379(B) or in the Chapter 5 of the AMM.

In addition, as a result of an in-service evaluation, it is now acceptable to remove the ACMS software (Mod 47787) which automatically recorded NWS exceedances with the exception of aircraft which have NOT received modification 43029 nor modification 47487.

Reason for Revision 5:

This revision clarifies the first note associated to configuration 1 (paragraph ACTIONS).

COMPLIANCE:

To prevent the possible failure of a MLG resulting from fatigue crack propagation, within 20 days after the effective date of the original issue of this AD or within the compliance time defined below, accomplish the following instead of the actions mandated by AD 98-405-078(B):

<u>Configuration 1</u>: A330 Aircraft fitted with "Basic" Main Strut and Dressings P/Ns 201254001-xxx to 201254032-xxx: A330 aircraft which have NOT received on production modification 43029 (Growth main fitting) nor modification 47487 (Growth scallop main fitting).

Note: Main fittings and torque links (upper and lower) of "Basic" Main Strut and Dressings (P/Ns 201254001-xxx to 201254032-xxx) which have been fitted on the aircraft listed above shall not be removed and fitted to any A340 aircraft.

A) Maintenance:

- 1. BSCU std 8C or tiller modification:
 - a) Not later than March 31, 2002, unless already accomplished, modify the aircraft steering system in accordance with SB A330-32-3092 (Mod 46863) BSCU std 8C which limits the nose wheel steering angle to a maximum of 65° during powered turns.

Accomplishment of this paragraph A)1)a) cancels the requirements of the following paragraph A)1)b) of this AD.

Note 1

The BSCU std 8C is aimed at limiting the powered nose wheel steering (NWS) angle at no more than 65° without override capability by the crew.

Note 2: Modification 46804/SB A330-32-3091 can be removed in accordance with SB A330-32-3093 for aircraft fitted with BSCU std 8C.

- b) Pending accomplishment of the above paragraph A)1)a), unless accomplished previously, modify the aircraft steering system in accordance with SB A330-32-3091 (Mod 46804).
- <u>Note</u>: This modification (Mod 46804) is aimed at limiting the Nose Wheel Steering (NWS) angle through the NWS Handle to no more than 65°, using a stop, breakable in case of exceptional need.

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2. ACMS software:

Unless accomplished previously, introduce a software program which automatically records all NWS angle exceedance above 67° into the Aircraft Condition Monitoring System (ACMS).

This software program is provided by AIRBUS INDUSTRIE under reference 940.2386/98 or modification 46830 (SB A330-31-3033).

An Operator customized version may also be used, providing the NWS angle exceedances are immediately reported to the flight crew (log book entry) for maintenance purposes.

<u>Note</u>: This Modification is aimed at alerting Maintenance personnel, through an automatic print out ACMS maintenance message when a 67° NWS angle is exceeded.

3. Nose landing gear (NLG) doors markings:

Unless accomplished previously, install Markings of the 60° Steering angle limitation on NLG Doors in accordance with AIRBUS INDUSTRIE Note 957.4055/98, or Service Bulletin A330-32-3089, or modification 46769.

<u>Note</u>: If markings are installed on the NLG fittings in addition to the NLG doors markings, they must be installed in accordance with SB A330-32-3100 (Modification 47318).

4. MLG Inspections for aircraft which are not fitted with BSCU standard 8C (i.e. which are only fitted with the tiller mod) :

On aircraft having its MLG with more than 800 landings accumulated since new, within the next 120 landings since last inspection or the 800 landings threshold, and thereafter at intervals not to exceed 120 landings from the last inspection, perform MLG inspection, in accordance with the procedure specified in SB A330-32A3088 Rev 1.

If a fault is found using the ultrasonic method, contact AIRBUS INDUSTRIE before any further flight.

5. Life limits : Refer to AD 2001-379(B),

B) Operations:

1. Towing and Pushback:

Aircraft Towing and Rushback Steering angle is limited to a maximum of 60° using the procedure described in AIRBUS INDUSTRIE FOT 999.0099/98 Rev 2 of November 23, 1998.

- 2. Powered Taxi:
 - a) Do not exceed a 65° steering limit during taxi and powered turns
 - b) Do not use differential braking during taxi or turning at speeds less than 20kts.
 - c) Do not use asymmetric thrust to tighten turns.

Asymmetric thrust is only authorized during turns at high NWS angles to initiate the turn and keep the aircraft moving during the turn.

C) Steering limits exceedance:

If the 65° stop on the hand wheel (Mod 46804 or SB A330-32-3091) is exceeded, or 67° recorded on the ACMS, or 60° during Towing or Pushback, accomplish the following within the next 4 flight cycles/landings:

1. Inspect the MLG in accordance with the procedure specified in Inspection SB A330-32A3088 Rev 1.

If a fault is found using the ultrasonic method, contact AIRBUS INDUSTRIE before any further flight.

2. In addition for the aircraft on which mod 46804 or SB A330-32-3091 has been embodied,

If a 65° limit is exceeded on the handwheel steering, or a 67° steering is recorded on the ACMS:

- a) Reinstall a positive stop in accordance with SB A330-32-3091.
- b) Re-rig the tiller in accordance with SB A330-32-3091.

or

Install BSCU std 8C in accordance with SB A330-32-3092 (mod 46863).

<u>Note</u>: Modification 46804 / SB A330-32-3091 can be removed in accordance with SB A330-32-3093 for aircraft fitted with BSCU std 8C.

<u>Configuration 2</u>: A330 Aircraft fitted with "Growth" Main Strut and Dressings P/Ns 201489001-xxx to 201489004-xxx pre-Mod 47487/SB A330-32-3111: A330 aircraft which have received on production modification 43029 (Growth main fitting) and which have not received modification 47487 (Growth Scallop main fitting).

A) Maintenance:

- 1. BSCU std 8C/8D or tiller modification:
 - a) Not later than March 31, 2002, unless already accomplished, modify the aircraft steering system in accordance with SB A330-32-3115 (Mod 47500) BSCU std 8D which limits the nose wheel steering angle to a maximum of 72° or,
 SB A330-32-3092 (Mod 46863) BSCU std 8C which limits the nose wheel steering angle to a

maximum of 65°.

Accomplishment of this paragraph A)1)a) cancels the requirements of the following paragraph A) 1) b) of this AD.

<u>Note 1</u>: When BSCU std 8D or 8C is installed, the NWS angle is limited for self-powered turns. The flight crew cannot override the angle limitation value which depends on the installed BSCU standard:

| Installed BSCU standard | NWS angle limitation for self-powered turns | Remark |
|----------------------------|---|--|
| 8D | 72° | 65° if tiller modification also installed (Mod 46804/SB A330-32-3091) |
| 8C | 65° | / |

- Note 2: Tiller Modification 46804/SB A330-32-3091 can be removed in accordance with SB A330-32-3093 for aircraft fitted with BSCU std 8C or 8D.
- b) Pending accomplishment of the above paragraph A) 1) a), unless accomplished previously, modify the aircraft steering system in accordance with SB A330-32-3091 (Mod 46804).

Note: This modification is aimed at limiting the Nose Wheel Steering (NWS) angle through the NWS Handle to no more than 65°, using a stop, breakable in case of exceptional need.

2. ACMS software:

ACMS recording of NWS angle exceedances are no longer required on this aircraft configuration.

3. NLG doors markings:

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|------|---|---|---|---|--|------------------------------|
| | Unless accomplished previously, install Markings of the Steering angle limitation on NLG Doors accordance with AIRBUS INDUSTRIE: | | | | | |
| | SB A330-32-3089 or AIRBUS INDUSTRIE Note 957.4055/98 or modification 4676 installs markings for maximum towing/pushback turning angles (+/-60°), or | | | | ation 46769 | which |
| | SB A330-32-3120/modification 47701 which installs markings for maximum towing/p turning angles (+/-65°) | | | | | hback |
| | <u>Note</u> | If markings are installed on the NLC must be installed in accordance with SB A330-32-3121 (Modification 4773 Consistent angles (60° or 65°) mus door markings. | 6 fittings in SB A330-3 94) for 65°. t be used | addition to the NLG do 32-3100 (Modification 473 for the Nose Landing ge | ors markings 318) for 60° c ar main fittin | s, they or with ng and |
| 4. | MLG only f | Inspections for aircraft which are not fi itted with the tiller mod): | tted with th | ne BSCU standard 8C or | 8D (i.e. whi | ch are |
| | On a 120 la excea proce | ircraft having its MLG with more than andings since last inspection or the 800 ed 120 landings from the last inspecti edure specified in SB A330-32A3088 Re | 800 landin) landings on, perforr ev 1. | gs accumulated since ne threshold, and thereafter n MLG inspection, in ac | w, within the at intervals cordance wi | e next not to th the |
| | lf a fa | ult is found using the ultrasonic method, o | contact AIR | BUS INDUSTRIE before a | any further flig | ght. |
| | <u>Note</u> | : For aircraft fitted with BSCU std 8C o | or 8D no in | spection is required. | | |
| 5 | . Tem | porary Life limits : the life limits will be p | ublished in | the AMM Chapter 5. | | |
| B) O | peratio | ons: | | | | |
| | Towir | ng and Pushback: | | | | |
| | Aircra the N the pi | aft Towing and Pushback Steering ang ILG doors markings installed in accord rocedure described in AIRBUS INDUST | e is limited ance with t RIE FOT S | d to a maximum of 60 or he above paragraph A)3 999.0099/98 Rev 2 of Nov | 65° depend) of this AD, vember 23, 1 | ing on using 998. |
| 2. | Powe | ered Taxi: | | | | |
| | 2.1. \$ | Steering angle limit - For aircraft which are fitted with BSC steering limit during taxi and powered - For aircraft which are fitted with BSCL and powered turns. | U std 8C turns. std 8D: D | or tiller modification: Do o not exceed a 72° steer | not exceed ing limit durir | a 65° ng taxi |
| | 2.2. I I | For aircraft which are not fitted with BS0 mod): | CU std 8C | or 8D (i.e. which are only | fitted with th | e tiller |
| 6 | - | Do not use differential braking during t | axi or turni | ng at speeds less than 20 | 0kts. | |
| | | Do not use asymmetric thrust to tighte | n turns. | | | |
| | 2.3. I - | For aircraft which are fitted with either B - No braked pivot turn is allowed (ie diff gear). - Asymmetric thrust may be used to ma | SCU std 8 erential bra intain the t | C or 8D: aking cannot be used to t urn only, but NOT to tight | fully stop one en it. | e main |
| C) 5 | Steerin | a limits exceedance: | | | | |

For aircraft which are not fitted with BSCU std 8C or 8D and which are fitted with tiller modification 46804 or SB A330-32-3091:

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GSAC **AIRWORTHINESS DIRECTIVE** ref.: Page n° 1998-473-083(B) R5 6 1. If the 65° stop on the hand wheel is exceeded, accomplish the following within the next 4 flight cycles/landings: Inspect the MLG in accordance with the procedure specified in AIRBUS INDUSTRIE Inspection SB A330-32A3088 Rev 1. If a fault is found using the ultrasonic method, contact AIRBUS INDUSTRIE before any further flight. 2. In addition, if a 65° limit is exceeded on the handwheel steering: a) Reinstall a positive stop in accordance with SB A330-32-3091. b) Re-rig the tiller in accordance with SB A330-32-3091. or Install BSCU std 8C in accordance with SB A330-32-3092 (mod 46863) or BSCU std 8D in accordance with SB A330-32-3115 (mod 47500). Note: Modification 46804/SB A330-32-3091 can be removed in accordance with SB A330-32-3093 for aircraft fitted with BSCU std 8C or 8D. Configuration 3: A330 Aircraft fitted with "Scalloped Growth" Main Strut and Dressings P/Ns 201489001-xxx to 201489004-xxx post-Mod 47487/SB A330-32-3111: A330 aircraft which have received on production modification 47487 or SB A330-32-3111. A) Maintenance: 1. BSCU standard 8C/8D Unless accomplished previously, modify the aircraft steering system in accordance with SB A330-32-3115 (Mod 47500) - BSCU std 8D which limits the nose wheel steering angle to a maximum of 72° or, SB A330-32-3092 (Mod 46863) - BSCU std 8C which limits the nose wheel steering angle to a maximum of 65°. Note 1: The NWS angle is limited for self-powered turns. The flight crew cannot override the angle limitation value which depends on the installed BSCU standard: Installed BSCU standard NWS angle limitation for self-powered turns 72° 8D 8C 65° If tiller modification 46804/SB A330-32-3091 is installed then it must be removed in Note 2: accordance with SB A330-32-3093. ACMS software: ACMS recording of NWS angle exceedances are no longer required on this aircraft configuration. 3. NLG door markings:

Unless accomplished previously, install Markings of the Steering angle limitation on NLG Doors in accordance with AIRBUS INDUSTRIE:

- SB A330-32-3089 or Airbus Industrie Note 957.4055/98/modification 46769 which installs markings for maximum towing/pushback turning angles (+/-60°), or
- SB A330-32-3120/modification 47701 which installs markings for maximum towing/pushback turning angles (+/-65°).

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| <u>Note</u> : | If markings are installed on the N must be installed in accordance wi SB A330-32-3121 (Modification 47 | ILG fittings i th SB A330- 734) for 65°. | n addition to the NLG do 32-3100 (Modification 473 | or markings 18) for 60° c | , they or with |
| | Consistent angles (60° or 65°) mu door markings. | ust be used | for the Nose Landing gea | ar main fittin | g and |
| 4. Inspe | ction requirements: None. | | | | |
| 5. Temp | orary Life limits: the life limits will be | published in | the AMM Chapter 5. | | |
| B) Operation | ons: | | | | |
| 1. Towir | ng and Pushback: | | | | |
| Aircra the N the pi | ft Towing and Pushback Steering ar LG doors markings installed in accor rocedure described in AIRBUS INDU | ngle is limited dance with t STRIE FOT 9 | d to a maximum of 60 or he above paragraph A) 3 999.0099/98 Rev 2 of Nov | 65° dependi) of this AD, ember 23, 1 | ng on using 998. |
| 2. Powe | red Taxi: | | | | |
| 2.1. [| Do not exceed a 65° (BSCU std 8C powered turns | ;) or 72° (B | SCU std 8D), steering lim | nit during tax | ki and |
| 2.2. 1 | No braked pivot turn is allowed (ie di gear). | fferential bra | king cannot be used to fu | Illy stop one | main |
| 2.3. / | Asymmetric thrust may be used to ma | aintain the tur | n only, but NOT to tighten | ı it. | |
| REF.: AIRBUS INDUSTRIE Service Bulletin A330-32A3088 Revision 1 AIRBUS INDUSTRIE Service Bulletin A330-32-3089 AIRBUS INDUSTRIE Service Bulletin A330-32-3091 AIRBUS INDUSTRIE Service Bulletin A330-32-3092 AIRBUS INDUSTRIE Service Bulletin A330-32-3093 AIRBUS INDUSTRIE Service Bulletin A330-32-3100 AIRBUS INDUSTRIE Service Bulletin A330-32-3110 AIRBUS INDUSTRIE Service Bulletin A330-32-3111 AIRBUS INDUSTRIE Service Bulletin A330-32-3115 AIRBUS INDUSTRIE Service Bulletin A330-32-3120 AIRBUS INDUSTRIE Service Bulletin A330-32-3121 AIRBUS INDUSTRIE Service Bulletin A330-32-3121 AIRBUS INDUSTRIE Service Bulletin A330-31-3033 AIRBUS INDUSTRIE Service Bulletin A330-31-3033 AIRBUS INDUSTRIE Service Bulletin A330-31-3038 Any further approved revision of these SB or FOT is acceptable. | | | | | |
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