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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2007-28255; Directorate Identifier 2007-NM-023-AD; Amendment 39-15589; AD 2008-13-26]

RIN 2120-AA64

Airworthiness Directives; Lockheed Model 1329 Series Airplanes

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: We are adopting a new airworthiness directive (AD) for certain Lockheed Model 1329 series airplanes. This AD requires determining the part number on the steering cylinder assembly for the nose landing gear (NLG), determining the total flight cycles accumulated on the NLG steering cylinder assembly, repetitively replacing the assembly, inspecting for missing tow turning limit markings, and performing corrective actions if necessary. This AD results from reports of numerous failures of the NLG steering cylinder. We are issuing this AD to prevent the loss of hydraulic pressure and steering control.

DATES: This AD is effective August 12, 2008.

The Director of the Federal Register approved the incorporation by reference of certain publications listed in this AD as of August 12, 2008.

ADDRESSES: For service information identified in this AD, contact Lockheed Martin Aeronautics Company, 86 South Cobb Drive, Marietta, Georgia 30063.

Examining the AD Docket

You may examine the AD docket on the Internet at <http://www.regulations.gov>; or in person at the Docket Management Facility between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this AD, the regulatory evaluation, any comments received, and other information. The address for the Docket Office (telephone 800-647-5527) is the Document Management Facility, U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue, SE., Washington, DC 20590.

FOR FURTHER INFORMATION CONTACT: Hector Hernandez, Aerospace Engineer, Systems and Equipment Branch, ACE-119A, FAA, Atlanta Aircraft Certification Office, One Crown Center, 1895 Phoenix Boulevard, Suite 450, Atlanta, Georgia 30349; telephone (770) 703-6069; fax (770) 703-6097.

SUPPLEMENTARY INFORMATION:

Discussion

We issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 to include an airworthiness directive (AD) that would apply to certain Lockheed Model 1329 series airplanes. That NPRM was published in the Federal Register on May 24, 2007 (72 FR 29088). That NPRM proposed to require determining the part number on the steering cylinder assembly for the nose landing gear (NLG), determining the total flight cycles accumulated on the NLG steering cylinder assembly, repetitively replacing the assembly, inspecting for missing tow turning limit markings, and performing corrective actions if necessary.

Comments

We gave the public the opportunity to participate in developing this AD. We considered the comments received.

Request To Withdraw NPRM: Inadequate To Correct Unsafe Condition

Faith Landmark Ministries requests that we withdraw the NPRM because it does not address the real problem with the NLG steering cylinder: Possible fatigue cracking due to machining errors during manufacture.

We disagree. Based on information from Lockheed Martin, due to lack of access to this area there is no reliable inspection that can be performed in the thread relief area where the failures are occurring. The only way to do the inspection is to disassemble the actuator steering cylinder—which would destroy the cylinder. Originally the NLG steering cylinder was a life-limited part, but unknown to Lockheed Martin the life limit was removed from the Lockheed JetStar/Handbook of Operating and Maintenance Instructions (HOMI). We have determined that it is necessary to issue the final rule to re-establish a relevant life limit and to address the identified unsafe condition.

Request To Remove Certain Cylinder Part Numbers as Affected

Faith Landmark Ministries and Carl A. Smith request that we revise the NPRM to remove P/N JL1955-7 steering cylinder as an affected part, because there is no record of a JL1955-7 steering cylinder failure due to stress corrosion cracking.

We disagree. We received reports of several more service failures of P/N JL1955-7 steering cylinders as a result of fatigue cracking in the thread relief area. Although no signs of corrosion were found in these particular failures, access to this area is difficult, and a reliable inspection cannot be performed in the thread relief area where the failures are occurring. Further, disassembling the actuator steering cylinder would destroy the cylinder. Crack growth cannot be shown and inspection intervals cannot be developed because the initial detectable crack length is longer than the critical crack length. As a result, we find it necessary to impose a fatigue-based life limit on the actuator steering cylinder. We have not changed the final rule regarding this issue.

Suggestion of Possible Batch Problem

Mr. Smith and Faith Landmark Ministries suggest the possibility of a batch problem with the P/N JL1955-7 steering cylinder. Faith Landmark Ministries states that four cylinders failed within two years on Lockheed Martin airplanes that had very close serial numbers (S/N 5211, 5213, 5215, and 5218) and another cylinder failed on an airplane having S/N 5210. Mr. Smith also notes that the airplanes on which the parts experienced fatigue failures are bunched together (S/Ns 5210, 5213, 5215, and 5218).

The commenters made no specific request. We have reviewed the data and have found no evidence of any batch problem with the steering cylinders having P/N JL1955-7. We have not changed the final rule regarding this issue.

Request To Withdraw NPRM: Documentation Errors

Faith Landmark Ministries requests that we withdraw the NPRM because of major errors in the supportive documentation and data supplied by Lockheed Martin.

We disagree. The identified unsafe condition is a serious safety issue that must be corrected. Lockheed Service Bulletins 329-300, Revision C, and 329II-32-8, Revision B, both dated September 5, 2006, were cited as the appropriate sources of service information for the NPRM's proposed requirements. The actions specified in these service bulletins adequately address the identified unsafe condition; however, these service bulletins did contain discrepancies, which Lockheed Martin has corrected in Lockheed Service Bulletin 329-300, Revision D, and 329II-32-8, Revision C, both dated October 4, 2007. Relevant changes to the service bulletins are outlined below. We have determined that it is necessary to issue this final rule in order to address the identified unsafe condition. We have revised paragraph (f) of this final rule to require the revised service bulletins, and provided credit for accomplishment of the earlier revisions.

Requests To Address Service Bulletin Discrepancies

Faith Landmark Ministries requests correction of certain discrepancies, as outlined below, in the service information cited in the NPRM. Lockheed Martin also stated that several operators have indicated a need for additional instructions on rebuilding the NLG steering cylinder assembly.

Since we issued the NPRM, Lockheed issued Lockheed Service Bulletin 329-300, Revision D, and 329II-32-8, Revision C, both dated October 4, 2007. These revisions address many of the problems noted by the commenters, but do not add work beyond the actions specified in the previous revision levels. The service bulletins also extend the life limits for certain NLG steering cylinder assemblies (as set forth in the Life Limits table below).

Revised Jetstar NLG Steering Cylinder Assembly Life Limits

Component	Part number	Life limit (in flight cycles)
7049-T73 die forging	JL1955-5	2,175
7050-T7451 plate	JL1955-9	1,113
4340 steel bar	JL1955-801	3,211

We have revised paragraph (f) of this AD to require the revised service bulletins and added new paragraph (j) of this AD to provide credit for work already done in accordance with the previous revisions.

Paragraph 2.B.(1) of the service bulletins indicates disassembling, cleaning, and inspecting the NLG steering actuator assembly per "HOMI 32.4.4.1" (of the Lockheed JetStar/Handbook of

Operating and Maintenance Instructions), but the correct reference is "HOMI Figure 32-26A." Faith Landmark Ministries states that for nose steering system rigging instructions, paragraph 2.B.(5) of the service bulletins refers to "HOMI Figure 32-22," but the correct reference is "HOMI Figure 32-25" and that paragraph 2.B.(4) should refer to "HOMI Figure 32-26A." The service bulletins have been revised to correct these discrepancies. Although the revised service bulletins do not specify the HOMI, they incorporate the necessary figure and instructions.

Paragraph 2.B.(2) of the service bulletins specifies to identify the replacement NLG steering cylinder assembly with a serial number in the location and method specified by engineering drawing JL-1955, Revision AE or later. Faith Landmark Ministries states that one or more JetStar operators will probably use the same serial number so that, after repair, overhaul, or replacement, multiple units could have the same identifier. Further, the commenter states that the NLG steering cylinders are not serialized, so they cannot be traced. The commenter notes that many operators, trying to comply with an earlier version of the service bulletin, installed exchanged overhauled units, which are not serialized. As a result, the cylinders are mixed within the fleet, and it is possible that some of the mis-machined cylinders are still in service.

We agree that the identification of the NLG steering cylinder assembly must be clear. The revised service bulletins specify completing the identification plate to indicate compliance with the service bulletin, and to indicate new P/N JL1501-7 or JL1501-9 for the NLG steering actuator assembly. It is our understanding that the JL1955-13 cylinder assembly (which uses the JL1955-15 cylinder) will have a serial number consisting of a vendor cage code and sequential numerical lot number beginning at -001. For example, the serial number should be 8 characters XXXXX001, where XXXXX is the vendor cage code unique to the manufacturer (vendor) and -001 identifies the lot number. The proposed serial number will tie the cylinder assembly to a specific manufacturer and lot number for traceability. As we discussed previously, we have revised this final rule to refer to the revised service bulletins.

Requests for Revised Engineering Drawing

Mr. Smith and Faith Landmark Ministries refer to two reports by the National Transportation Safety Board (NTSB): (1) The report associated with the NPRM (regarding a 1998 incident involving a Lockheed Model 1329 airplane on which the nose landing gear wheel locked sideways on landing and caused the airplane to run off the runway) and (2) NTSB Materials Laboratory Factual Report 99-107, dated April 13, 1999. The commenters note that the Lockheed engineering drawing for the cylinder does not clearly define the machining details of this region of the cylinder, but shows a large radius without dimensions. The commenters suggest that this indicates a design problem that needs to be corrected. The commenters state that the fatigue origins were all located in a very straight circular path in the tread relief area around the inner surface of the cylinder.

We infer that the commenters are requesting that we wait to issue the final rule until a revised drawing is available. We agree that the NTSB reports could indicate a design problem. Lockheed Martin examined engineering drawing JL-1955, Revision AD, dated March 10, 1978, and determined that view A on sheet 1 did not contain sufficient clarity to consistently produce the cylinder in a condition that Lockheed Martin had intended. Lockheed Martin examined the engineering drawing and found that the radius was defined but needed clarification. Lockheed Martin has prepared an engineering order against drawing JL-1955 and determined that sufficient detail now exists to consistently produce the cylinder with the intended thread relief groove. However, the revised service bulletins removed any reference to drawing JL-1955, Revision AD or AE. We have not changed the final rule regarding this issue.

Request To Clarify Criteria for Maintenance Personnel

Faith Landmark Ministries asserts that reassembling the NLG steering cylinder should be done by qualified shop persons or overhaul specialists at an appropriately rated repair station.

We infer that the commenter is requesting that we revise the NPRM to clarify the qualifications of personnel allowed to reassemble the NLG steering cylinder. As long as the actions are to be accomplished by persons prescribed in section 43.3 ("Persons authorized to perform maintenance, preventive maintenance, rebuilding, and alterations.") of the Federal Aviation Regulations (14 CFR 43.3), the persons authorized to perform the work required in an AD are not prescribed by the AD. We have not changed the final rule regarding this issue.

Request To Remove Spares Prohibition

Faith Landmark Ministries states that Lockheed Martin issued a JetStar Assessment, dated June 8, 2007, which reviews the history of the P/N JL1955-7 cylinder failures due to fatigue at the thread relief. This is the current configuration of most JetStars. The commenter is aware of six P/N JL1955-7 cylinders that were built as spares. The commenter states that there is no need to remove all the existing P/N JL1955-7 NLG cylinders from service. Lockheed Martin has developed a way to examine these cylinders; Lockheed Martin inspected the six cylinders that were in stock.

We disagree with the commenter's assertion that Lockheed Martin has developed an adequate inspection for the P/N JL1955-7 NLG cylinders that would detect critical cracking. The JetStar assessment by Lockheed Martin addresses the service history of the failed cylinder along with material changes made on P/N JL1955-7, and explores the possibility of nondestructive inspections. Lockheed Martin concluded that combined ultrasonic and eddy current inspections would probably be ineffective. Lockheed Martin also considered a fluorescent penetrant inspection, provided a time interval could be calculated for continued safe flight and the cylinder could be disassembled for inspection.

Based on information provided to the FAA, no available nondestructive inspection would detect a critical crack in the thread relief area where the failures are occurring because access to this area is unavailable. As stated previously, the only way to inspect the area is to disassemble the steering cylinder—which would destroy the cylinder. However, according to the provisions of paragraph (1) of the final rule, we may approve requests for alternative method of compliances (AMOCs) if the request includes data that prove that the AMOC would provide an acceptable level of safety. We have not changed the final rule regarding this issue.

Request for Information on Addressing Unsafe Condition

Faith Landmark Ministries questions why Lockheed Martin did not take any action by way of an AD or similar to ensure that all the P/N JL1955-7 cylinders in the fleet were inspected for problems as soon as Lockheed Martin noticed the grouping of aircraft serial numbers experiencing steering cylinder failures or immediately after the incident that occurred in Houston in 1998, and the subsequent NTSB report.

Only the FAA may initiate and issue ADs. Lockheed Martin did report the in-service failures to the FAA, and communicated with the NTSB as required. Data were gathered to enable a full assessment. The commenter made no specific request to change the NPRM. No change to the final rule is necessary regarding this issue.

Request for Clarification of Unsafe Condition and Corrective Action

Faith Landmark Ministries further questions why, when Service Bulletins 329-300 and 329II-32-8 came out in 2000, they referred only to "corrosion problems" and included no requirement to inspect the steering cylinder for the mis-machined thread relief that caused the failure of the steering cylinder in the 1998 incident that resulted from the unsafe condition and prompted the AD.

The incident was investigated by the NTSB. Lockheed Martin was in contact with the NTSB and waiting for a final report and the actual part before they could properly make the assessment as shown in the service bulletins. The new revisions of the service bulletins issued in 2007 include an

inspection of all threads for burrs or evidence of cross threading. The commenter made no specific request to change the NPRM. We have not changed the final rule regarding this issue.

Request To Revise Cost Estimate

Lockheed Martin states that the estimated cost for the part should be \$14,876.57 per airplane, but the NPRM indicated no cost for parts.

We infer that the operator requests that we revise the cost estimate of the NPRM. We agree. The NPRM provided the estimated costs for the inspection only. This final rule includes the costs for the conditionally required cylinder replacement.

Request To Revise Description of Unsafe Condition

Lockheed Martin requests that we revise the Discussion section of the NPRM to add "fatigue cracking in the thread relief" as a possible cause of the NLG steering cylinder failures.

We agree with Lockheed Martin's rationale, but the Discussion section is not repeated in a final rule so we have not changed this final rule regarding this issue.

Request To Revise Lockheed Martin Address

Lockheed Martin requests that we revise the NPRM to update its address. We have changed the appropriate references in the final rule accordingly.

Request To Remove Life Limit

Lockheed Martin indicates it plans to revise Service Bulletins 329-300 and 329II-32-8 to remove the life limit on cylinder assembly P/N JL1955-9. Lockheed Martin believes that no P/N JL1955-9 cylinders have been built, as this material will not be the preferred material for replacement steering cylinders.

We disagree that the life limit on P/N JL1955-9 should be removed. We have received no evidence indicating that this part does not have corrosion or fatigue issues, in light of the incidents that have occurred. The revised service bulletins did not remove the life limit on any of the cylinder assemblies. No change to the final rule is necessary regarding this issue.

Request To Clarify Cost Estimate

Four Star Int'l, Inc., states that replacement cylinders should be made available to operators at no cost. The commenter reports that an NLG steering actuator failed apparently due to stress, with no corrosion observed. Because Lockheed Martin has since identified the source of the problem, and because this operator has already paid to replace the part once, the commenter contends that future parts costs should be Lockheed Martin's responsibility.

The operator made no specific request to change the NPRM. Operators are responsible for maintaining their airplanes to the type design. The FAA cannot direct payment for replacement parts by any party. Operators should discuss any issues regarding these costs with the airplane manufacturer. We have made no change to the final rule regarding this issue.

Additional Change to NPRM

Paragraph (g) of the NPRM specified to replace any cylinder assembly having P/N JL1955-1 or JL1955-3 with a new assembly, and paragraph (j) of the NPRM (paragraph (k) of this final rule) would have prohibited the installation of any cylinder assembly having P/N JL1955-1 or JL1955-3.

(P/N JL1955-3 is a cylinder, rather than an assembly.) Since the P/N JL1955-1 cylinder assembly uses the P/N JL1955-3 cylinder, we have deleted the references to P/N JL1955-3 in the final rule.

Conclusion

We reviewed the relevant data, considered the comments received, and determined that air safety and the public interest require adopting the AD with the changes described previously. We also determined that these changes will not increase the economic burden on any operator or increase the scope of the AD.

Costs of Compliance

There are about 48 airplanes of the affected design in the worldwide fleet. The following table provides the estimated costs for U.S. operators to comply with this AD.

Estimated Costs						
Action	Work hours	Average labor rate per hour	Parts	Cost per airplane	Number of U.S.-registered airplanes	Fleet cost
Inspect for P/N	3	\$80	\$0	\$240	34	\$8,160
Replace assembly	2	\$80	\$14,877	\$15,037, per replacement	Up to 34	Up to \$511,258, per replacement

Authority for This Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. Subtitle VII: "Aviation Programs" describes in more detail the scope of the Agency's authority.

We are issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: "General requirements." Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

This AD will not have federalism implications under Executive Order 13132. This AD will not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify that this AD:

- (1) Is not a "significant regulatory action" under Executive Order 12866,
- (2) Is not a "significant rule" under DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979), and
- (3) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

You can find our regulatory evaluation and the estimated costs of compliance in the AD Docket.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

Adoption of the Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA amends 14 CFR part 39 as follows:

PART 39—AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. The FAA amends § 39.13 by adding the following new AD:



2008-13-26 Lockheed: Amendment 39-15589. Docket No. FAA-2007-28255; Directorate Identifier 2007-NM-023-AD.

Effective Date

(a) This airworthiness directive (AD) is effective August 12, 2008.

Affected ADs

(b) None.

Applicability

(c) This AD applies to the following airplanes, certificated in any category.

(1) Lockheed Model 1329-23A, 1329-23D, and 1329-23E series airplanes; serial numbers 5001 through 5162 inclusive.

(2) Lockheed Model 1329-25 series airplanes, serial numbers 5201 through 5240 inclusive.

Unsafe Condition

(d) This AD results from reports of numerous failures of the nose landing gear (NLG) steering cylinder. We are issuing this AD to prevent the loss of hydraulic pressure and steering control.

Compliance

(e) You are responsible for having the actions required by this AD performed within the compliance times specified, unless the actions have already been done.

Service Information

(f) The term "service bulletin," as used in this AD, means the Accomplishment Instructions of the applicable service bulletin identified in Table 1 of this AD.

Table 1 – Service Bulletins

Lockheed Service Bulletin	Revision	Date	Affected airplanes
329-300	D	October 4, 2007	1329-23A, 1329-23D, 1329-23E
329II-32-8	C	October 4, 2007	1329-25

Inspection for Cylinder Assembly Part Number

(g) Within 30 days after the effective date of this AD, inspect to determine the part number (P/N) on the steering cylinder assembly for the nose landing gear (NLG). A review of airplane maintenance records is acceptable in lieu of this inspection if the part number can be conclusively determined from

that review. Replace any cylinder assembly having P/N JL1955-1 with a new assembly before further flight in accordance with the applicable service bulletin.

Life Limits

(h) Within 30 days after the effective date of this AD: Review the airplane records to determine the total flight cycles accumulated on the NLG steering cylinder assembly, in accordance with the applicable service bulletin. Before any steering cylinder assembly component reaches its life limit, as specified in Table 1 of the Accomplishment Instructions of the applicable service bulletin, or within 30 days after the effective date of this AD, whichever occurs later: Replace the cylinder assembly with a new assembly in accordance with the applicable service bulletin. If the steering cylinder assembly's age cannot be positively determined from the records review, replace it within 30 days after the effective date of this AD, in accordance with the applicable service bulletin. Thereafter, replace the cylinder assembly at intervals not to exceed the life limits as specified in the applicable service bulletin.

Inspection for Tow Turning Limit Markings

(i) Within 30 days after the effective date of this AD: Perform a general visual inspection above the NLG doors to detect missing tow turning limit markings, in accordance with the applicable service bulletin. If any markings are absent, restore/apply markings before further flight in accordance with the applicable service bulletin.

Note 1: For the purposes of this AD, a general visual inspection is: "A visual examination of an interior or exterior area, installation, or assembly to detect obvious damage, failure, or irregularity. This level of inspection is made from within touching distance unless otherwise specified. A mirror may be necessary to ensure visual access to all surfaces in the inspection area. This level of inspection is made under normally available lighting conditions such as daylight, hangar lighting, flashlight, or droplight and may require removal or opening of access panels or doors. Stands, ladders, or platforms may be required to gain proximity to the area being checked."

Credit for Actions Done per Previous Version of Service Bulletins

(j) Accomplishment of the actions specified in Lockheed Service Bulletin 329-300, Revision C, dated September 5, 2006, or 329II-32-8, Revision B, dated September 5, 2006, as applicable, before the effective date of this AD, is acceptable for compliance with the corresponding requirements of this AD.

Parts Installation

(k) As of the effective date of this AD, do not install on any airplane a NLG steering cylinder assembly that has P/N JL1955-1.

Alternative Methods of Compliance (AMOCs)

(l)(1) The Manager, Atlanta Aircraft Certification Office (ACO), FAA, ATTN: Hector Hernandez, Aerospace Engineer, Systems and Equipment Branch, ACE-119A, FAA, Atlanta Aircraft Certification Office, One Crown Center, 1895 Phoenix Boulevard, Suite 450, Atlanta, Georgia 30349; telephone (770) 703-6069; fax (770) 703-6097; has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19.

(2) To request a different method of compliance or a different compliance time for this AD, follow the procedures in 14 CFR 39.19. Before using any approved AMOC on any airplane to which the AMOC applies, notify your appropriate principal inspector (PI) in the FAA Flight Standards District Office (FSDO), or lacking a PI, your local FSDO.

Material Incorporated by Reference

(m) You must use Lockheed Service Bulletin 329-300, Revision D, dated October 4, 2007; or Lockheed Service Bulletin 329II-32-8, Revision C, dated October 4, 2007; as applicable, to do the actions required by this AD, unless the AD specifies otherwise.

(1) The Director of the Federal Register approved the incorporation by reference of this service information under 5 U.S.C. 552(a) and 1 CFR part 51.

(2) For service information identified in this AD, contact Lockheed Martin Aeronautics Company, 86 South Cobb Drive, Marietta, Georgia 30063.

(3) You may review copies of the service information incorporated by reference at the FAA, Transport Airplane Directorate, 1601 Lind Avenue, SW., Renton, Washington; or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.

Issued in Renton, Washington, on June 13, 2008.

Ali Bahrami,

Manager, Transport Airplane Directorate, Aircraft Certification Service.

[FR Doc. E8-14470 Filed 7-7-08; 8:45 am]