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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. 2002-NM-128-AD; Amendment 39-13269; AD 2003-16-16]

RIN 2120-AA64

Airworthiness Directives; Boeing Model 747-400 Series Airplanes Equipped With General Electric Model CF6-80C2 Series Engines

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final rule.

SUMMARY: This amendment supersedes an existing airworthiness directive (AD), applicable to certain Boeing Model 747-400 series airplanes, that currently requires repetitive tests of the cone brake of the central drive unit (CDU) of the thrust reversers, and corrective actions if necessary. This amendment requires installation of a thrust reverser actuation system (TRAS) lock and various related modifications and installations. Following installation of the TRAS lock, this action also requires repetitive functional tests of the TRAS lock, and corrective action if necessary. These actions are intended to prevent an inadvertent deployment of a thrust reverser during flight, which could result in loss of control of the airplane.

DATES: Effective October 1, 2003.

The incorporation by reference of certain publications, as listed in the regulations, is approved by the Director of the Federal Register as of October 1, 2003.

The incorporation by reference of certain other publications, as listed in the regulations, was approved previously by the Director of the Federal Register as of September 6, 2000 (65 FR 47252, August 2, 2000).

The incorporation by reference of certain other publications, as listed in the regulations, was approved previously by the Director of the Federal Register as of March 13, 2000 (65 FR 5742, February 7, 2000).

The incorporation by reference of certain other publications, as listed in the regulations, was approved previously by the Director of the Federal Register as of August 25, 1999 (64 FR 39003, July 21, 1999).

ADDRESSES: The service information referenced in this AD may be obtained from Boeing Commercial Airplane Group, P.O. Box 3707, Seattle, Washington 98124-2207; and Distribution, Lockheed Martin Technical Services, 1330 Kemper Meadow Drive, suite 110-C, Cincinnati, Ohio 45240. This information may be examined at the Federal Aviation Administration (FAA), Transport Airplane Directorate, Rules Docket, 1601 Lind Avenue, SW., Renton, Washington; or at the Office of the Federal Register, 800 North Capitol Street, NW., suite 700, Washington, DC.

FOR FURTHER INFORMATION CONTACT: Sulmo Mariano, Aerospace Engineer, Propulsion Branch, ANM-140S, FAA, Seattle Aircraft Certification Office, 1601 Lind Avenue, SW., Renton, Washington 98055-4056; telephone (425) 917-6501; fax (425) 917-6590.

SUPPLEMENTARY INFORMATION: A proposal to amend part 39 of the Federal Aviation Regulations (14 CFR part 39) by superseding AD 2000-09-03, amendment 39-11711 (65 FR 25829, May 4, 2000), which is applicable to certain Boeing Model 747-400 series airplanes, was published in the Federal Register on January 30, 2003 (68 FR 4731). The action proposed to continue to require repetitive tests of the cone brake of the central drive unit of the thrust reversers, and corrective actions if necessary. The action proposed to add new requirements for installation of a thrust reverser actuation system (TRAS) lock and various related modifications and installations. The action also proposed to require, following installation of the TRAS lock, repetitive functional tests of the TRAS lock, and corrective action if necessary.

Comments

Interested persons have been afforded an opportunity to participate in the making of this amendment. Due consideration has been given to the comments received from a single commenter.

Request To Add Additional Sources of Service Information

The commenter notes that there are later revisions available for certain service bulletins referenced in the proposed AD. The commenter points out the following:

- Lockheed Martin is now Middle River Aircraft Systems (MRAS).
-] Lockheed Martin Service Bulletin 78-1007, Revision 1, dated March 18, 1997, has been superseded by MRAS Service Bulletin 78-1007, Revision 2, dated March 10, 1998.
- Lockheed Martin Service Bulletin 78-1020, Revision 2, dated March 20, 1997, has been superseded by MRAS Service Bulletin 78-1020, Revision 3, dated March 16, 1998; and MRAS CF6-80C2B Service Bulletin 78-1020, Revision 4, dated October 10, 2002.

The commenter notes that no additional work is necessary per the new revisions of the service bulletins.

We infer that the commenter is requesting that we revise the final rule to include references to the later revisions of the service bulletins. We concur and have revised paragraphs (d)(2)(i) and (d)(2)(iii) of this AD to reference the service bulletin revisions cited by the commenter as additional acceptable sources of service information.

Request To Accept Additional Software Versions

The same commenter notes that Boeing Service Bulletin 747-31-2242, dated April 18, 1996, which is cited in paragraph (d)(2)(iv) of the proposed AD, specifies installation of integrated display system (IDS) software version 995-0017-012. The commenter similarly notes that Boeing Service Bulletin 747-45-2016 (Revision 1, dated May 2, 1996), which is cited in paragraph (d)(2)(v) of the

proposed AD, specifies installation of central maintenance computer (CMC) software version 685-2270-009. The commenter points out that, since the issuance of those service bulletins, the manufacturer has released several additional software versions. The commenter requests that we include the additional software versions as acceptable parts for the purposes of the proposed AD.

We concur and have added references to acceptable versions of the IDS and CMC software into paragraphs (d)(2)(iv) and (d)(2)(v) of this AD, respectively. We note, however, that the manufacturer has delayed release of one of the CMC software versions to which the commenter refers, 685-2270-012. Because we are unable to determine whether that version would be acceptable for compliance with this AD, this final rule does not refer to that version.

Conclusion

After careful review of the available data, including the comments noted above, the FAA has determined that air safety and the public interest require the adoption of the rule with the changes previously described. The FAA has determined that these changes will neither increase the economic burden on any operator nor increase the scope of the AD.

Changes to 14 CFR Part 39/Effect on the AD

On July 10, 2002, the FAA issued a new version of 14 CFR part 39 (67 FR 47997, July 22, 2002), which governs the FAA's airworthiness directives system. The regulation now includes material that relates to altered products, special flight permits, and alternative methods of compliance. Because we have now included this material in part 39, we no longer need to include it in each individual AD. However, for clarity and consistency in this final rule, we have retained the language of the NPRM regarding that material.

Change to Labor Rate Estimate

Since we issued the proposed AD, we have reviewed the figures we have used over the past several years to calculate AD costs to operators. To account for various inflationary costs in the airline industry, we find it necessary to increase the labor rate used in these calculations from \$60 per work hour to \$65 per work hour. The cost impact information, below, reflects this increase in the specified hourly labor rate.

Cost Impact

There are approximately 145 airplanes of the affected design in the worldwide fleet. The FAA estimates that 8 airplanes of U.S. registry will be affected by this AD.

The functional test that is currently required by AD 2000-09-03 takes approximately 12 work hours per airplane to accomplish, at an average labor rate of \$65 per work hour. Based on these figures, the cost impact of the currently required actions on U.S. operators is estimated to be \$6,240, or \$780 per airplane, per test cycle.

The installations in Boeing Service Bulletin 747-78-2151, Revision 2, will take approximately 410 work hours per airplane to accomplish, at an average labor rate of \$65 per work hour. Required parts will be provided at no charge. Based on these figures, the cost impact of this requirement on U.S. operators is estimated to be \$213,200, or \$26,650 per airplane.

The installation specified in Lockheed Martin Service Bulletin 78-1007, Revision 1, or MRAS Service Bulletin 78-1007, Revision 2, will take approximately 60 work hours per airplane to accomplish, at an average labor rate of \$65 per work hour. Required parts will be provided at no charge. Based on these figures, the cost impact of this requirement on U.S. operators is estimated to be \$31,200, or \$3,900 per airplane.

The installation specified in Boeing Service Bulletin 747-78-2132, Revision 2, will take approximately 223 work hours per airplane to accomplish, at an average labor rate of \$65 per work hour. Required parts will cost between \$32,219 and \$36,562 per airplane. Based on these figures, the cost impact of this requirement is estimated to be between \$46,714 and \$51,057 per airplane. The manufacturer may cover the cost of replacement parts associated with this service bulletin, subject to warranty conditions. As a result, the costs attributable to this required action may be less than stated above.

The installation specified in Lockheed Martin Service Bulletin 78-1020, Revision 2, or MRAS Service Bulletin 78-1020, Revision 3 or 4, will take approximately 16 work hours per airplane to accomplish, at an average labor rate of \$65 per work hour. Required parts will be provided at no charge. Based on these figures, the cost impact of this requirement on U.S. operators is estimated to be \$8,320, or \$1,040 per airplane.

The installation specified in Boeing Service Bulletin 747-31-2242 will take approximately 2 work hours per airplane to accomplish, at an average labor rate of \$65 per work hour. The cost of required parts will be negligible. Based on these figures, the cost impact of this requirement is estimated to be \$1,040, or \$130 per airplane. The manufacturer may cover the cost of replacement parts and labor costs associated with accomplishment of this service bulletin, subject to warranty conditions. As a result, the costs attributable to this required action may be less than stated.

The installation specified in Boeing Service Bulletin 747-45-2016, Revision 1, will take approximately 3 work hours per airplane to accomplish, at an average labor rate of \$65 per work hour. The cost of required parts will be negligible. Based on these figures, the cost impact of this requirement is estimated to be \$1,560, or \$195 per airplane. The manufacturer may cover the labor costs associated with accomplishment of this service bulletin, subject to warranty conditions. As a result, the costs attributable to this required action may be less than stated above.

The functional test that will be required following installation of the TRAS lock would take approximately 12 work hours per airplane to accomplish, at an average labor rate of \$65 per work hour. Based on these figures, the cost impact of this requirement is estimated to be \$6,240, or \$780 per airplane, per test cycle.

The cost impact figures discussed above are based on assumptions that no operator has yet accomplished any of the requirements of this AD action, and that no operator would accomplish those actions in the future if this AD were not adopted. The cost impact figures discussed in AD rulemaking actions represent only the time necessary to perform the specific actions actually required by the AD. These figures typically do not include incidental costs, such as the time required to gain access and close up, planning time, or time necessitated by other administrative actions.

Regulatory Impact

The regulations adopted herein 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. Therefore, it is determined that this final rule does not have federalism implications under Executive Order 13132.

For the reasons discussed above, I certify that this action (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. A final evaluation has been prepared for this action and it is contained in the Rules Docket. A copy of it may be obtained from the Rules Docket at the location provided under the caption ADDRESSES.

List of Subjects in 14 CFR Part 39

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

Adoption of the Amendment

Accordingly, pursuant to the authority delegated to me by the Administrator, the Federal Aviation Administration amends part 39 of the Federal Aviation Regulations (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. Section 39.13 is amended by removing amendment 39-11711 (65 FR 25829, May 4, 2000), and by adding a new airworthiness directive (AD), amendment 39-13269, to read as follows:

AIRWORTHINESS DIRECTIVE



Aircraft Certification Service
Washington, DC

U.S. Department
of Transportation
**Federal Aviation
Administration**

We post ADs on the internet at "www.faa.gov"

The following Airworthiness Directive issued by the Federal Aviation Administration in accordance with the provisions of Title 14 of the Code of Federal Regulations (14 CFR) part 39, applies to an aircraft model of which our records indicate you may be the registered owner. Airworthiness Directives affect aviation safety and are regulations which require immediate attention. You are cautioned that no person may operate an aircraft to which an Airworthiness Directive applies, except in accordance with the requirements of the Airworthiness Directive (reference 14 CFR part 39, subpart 39.3).

2003-16-16 Boeing: Amendment 39-13269. Docket 2002-NM-128-AD. Supersedes AD 2000-09-03, Amendment 39-11711.

Applicability: Model 747-400 series airplanes equipped with General Electric (GE) Model CF6-80C2 series engines, certificated in any category.

Note 1: This AD applies to each airplane identified in the preceding applicability provision, regardless of whether it has been modified, altered, or repaired in the area subject to the requirements of this AD. For airplanes that have been modified, altered, or repaired so that the performance of the requirements of this AD is affected, the owner/operator must request approval for an alternative method of compliance in accordance with paragraph (h)(1) of this AD. The request should include an assessment of the effect of the modification, alteration, or repair on the unsafe condition addressed by this AD; and, if the unsafe condition has not been eliminated, the request should include specific proposed actions to address it.

Compliance: Required as indicated, unless accomplished previously.

To prevent an inadvertent deployment of a thrust reverser during flight, which could result in loss of control of the airplane, accomplish the following:

Requirements of AD 2000-09-03

Repetitive Functional Tests

(a) Within 1,000 hours time-in-service after the most recent test of the center drive unit (CDU) cone brake as specified in paragraph (b)(1) of AD 94-15-05, amendment 39-8976; or within 650 hours time-in-service after May 19, 2000 (the effective date of AD 2000-09-03, amendment 39-11711); whichever occurs later: Perform a functional test to detect discrepancies of the CDU cone brake on each thrust reverser as specified in paragraph (a)(1) or (a)(2) of this AD, as applicable.

(1) For Model 747-400 series airplanes equipped with thrust reversers that have not been modified in accordance with Boeing Service Bulletin 747-78-2151 or a production equivalent: Perform the test in accordance with Boeing Service Bulletin 747-78A2166, Revision 1, dated October 9, 1997; or paragraph 3.C. of Boeing Alert Service Bulletin 747-78A2166, Revision 2, dated March 15, 2001; or the applicable section of paragraph III.A. of the Accomplishment Instructions of Boeing Service Bulletin 747-78A2113, Revision 2, dated June 8, 1995; or Revision 3, dated September 11, 1997. Repeat the test thereafter at intervals not to exceed 650 hours time-in-service.

(2) For Model 747-400 series airplanes equipped with thrust reversers that have been modified in accordance with Boeing Service Bulletin 747-78-2151 or a production equivalent: Perform the test in accordance with Appendix 1 (including Figure 1) of this AD, or paragraph 3.C. of Boeing Alert Service Bulletin 747-78A2166, Revision 2, dated March 15, 2001. After the effective date of this AD, only Boeing Alert Service Bulletin 747-78A2166, Revision 2, may be used. Repeat the test thereafter at intervals not to exceed 1,000 hours time-in-service.

Note 2: Accomplishment of the CDU cone brake test during production in accordance with Production Revision Record (PRR) 80452-102 prior to May 19, 2000, is considered acceptable for compliance with the initial test required by paragraph (a) of this AD.

Note 3: Model 747-400 series airplanes, line numbers 1061 and subsequent, equipped with GE CF6-80C2 engines, had a third locking system installed during production in accordance with PRR 80452-102, and were not modified in accordance with Boeing Service Bulletin 747-78-2151 (which is a retrofit action for airplanes having line numbers 700 through 1060 inclusive).

Terminating Action

(b) Accomplishment of the functional test of the CDU cone brake, as specified in paragraph (a) of this AD, constitutes terminating action for the repetitive tests of the CDU cone brake required by paragraph (b)(1) of AD 94-15-05.

Corrective Action

(c) If any functional test required by paragraph (a) of this AD cannot be successfully performed as specified in the referenced service bulletin, or if any discrepancy is detected during any functional test required by paragraph (a) of this AD, accomplish either paragraph (c)(1) or (c)(2) of this AD.

(1) Prior to further flight, repair in accordance with Boeing Service Bulletin 747-78A2166, Revision 1, dated October 9, 1997; Boeing Alert Service Bulletin 747-78A2166, Revision 2, dated March 15, 2001; Boeing Service Bulletin 747-78A2113, Revision 2, dated June 8, 1995; or Revision 3, dated September 11, 1997. After the effective date of this AD, only Boeing Alert Service Bulletin 747-78A2166, Revision 2; or Boeing Service Bulletin 747-78A2113, Revision 2 or Revision 3; may be used.

(2) The airplane may be operated in accordance with the provisions and limitations specified in the operator's FAA-approved Minimum Equipment List, provided that no more than one thrust reverser on the airplane is inoperative.

New Requirements of This AD

Installation of Thrust Reverser Actuator System Lock and Associated Actions

(d) For airplanes listed in Boeing Service Bulletin 747-78-2151, Revision 2, dated January 13, 2000: Within 36 months after the effective date of this AD, do paragraphs (d)(1) and (d)(2) of this AD.

(1) Install and activate a thrust reverser actuator system (TRAS) lock on each thrust reverser per the Accomplishment Instructions of Boeing Service Bulletin 747-78-2151, Revision 1, dated August 21, 1997; as revised by Notice of Status Change (NSC) 747-78-2151 NSC 04, dated November 26, 1997; and NSC 747-78-2151 NSC 05, dated December 18, 1997; or Boeing Service Bulletin 747-78-2151, Revision 2, dated January 13, 2000. The procedures for completing the installation and activating the TRAS lock include replacing a certain microswitch pack with a new one; adding new

wires; routing certain new wire bundles; changing certain wiring, circuit breakers, and components; installing thrust-reverser relay panels; and performing a functional test to ensure that the thrust reverser actuation system operates properly.

(2) Prior to or concurrently with the installation required by paragraph (d)(1) of this AD, do the requirements of paragraphs (d)(2)(i), (d)(2)(ii), (d)(2)(iii), (d)(2)(iv), and (d)(2)(v) of this AD.

(i) Install a bracket and fastening hardware for the third locking system on each thrust reverser, per Lockheed Martin Service Bulletin 78-1007, Revision 1, dated March 18, 1997; or Middle River Aircraft Systems Service Bulletin 78-1007, Revision 2, dated March 10, 1998.

(ii) Install wiring provisions in various areas of the airplane, per the Accomplishment Instructions of Boeing Service Bulletin 747-78-2132, Revision 2, dated December 11, 1997.

(iii) Install a TRAS lock (also called an electromechanical lock or brake) and a flexible drive cable on each thrust reverser, per Lockheed Martin Service Bulletin 78-1020, Revision 2, dated March 20, 1997; or Middle River Aircraft Systems Service Bulletin 78-1020, Revision 3, dated March 16, 1998; or Middle River Aircraft Systems CF6-80C2B Service Bulletin 78-1020, Revision 4, dated October 10, 2002.

(iv) Install new integrated display system (IDS) software in six integrated display units and three electronic flight information/engine indication and crew alerting system (EICAS) interface units, per the Accomplishment Instructions of Boeing Service Bulletin 747-31-2242, dated April 18, 1996. Where the service bulletin specifies installation of IDS software version 995-0017-012, installation of IDS software version 995-0017-013, 995-0017-014, 995-0017-015, 995-0017-016, 995-0017-018, 3174-COL-EG5-01, 3177-COL-EG5-02, or 3176-COL-EG5-03 is also acceptable for compliance with this paragraph.

(v) Replace two central maintenance computers (CMC), part number 622-8592-103, with new, improved CMCs, part number 622-8592-105, and install new software for the CMCs, per the Accomplishment Instructions of Boeing Service Bulletin 747-45-2016, Revision 1, dated May 2, 1996. Where the service bulletin specifies installation of CMC software version 685-2270-009, installation of CMC software version 685-2270-010, or 685-2270-011 is also acceptable for compliance with this paragraph.

Repetitive Tests

(e) For airplanes on which a TRAS lock is installed on the thrust reversers: Within 1,000 flight hours after the installation of the TRAS lock, or within 90 flight hours after the effective date of this AD, whichever is later, do a functional test of the TRAS lock (also called an electromechanical lock or brake) per the Accomplishment Instructions of Boeing Alert Service Bulletin 747-78A2166, Revision 2, dated March 15, 2001. Then, repeat this test at least every 1,000 flight hours. If the functional test cannot be successfully performed, before further flight, repair per the Accomplishment Instructions of the service bulletin, and repeat the test until it is successful.

Dispatch Limitations

(f) If, prior to accomplishment of Boeing Service Bulletin 747-78-2151 on any airplane, it becomes necessary to install a thrust reverser with the TRAS lock installed, dispatch of the airplane is allowed per the provisions and limitations specified in the 747-400 Master Minimum Equipment List (MMEL), provided that the thrust reverser assembly that has the TRAS lock installed is deactivated per the 747-400 Dispatch Deviations Guide, Boeing Document D6U10151, dated June 28, 2002. Installation of a thrust reverser without a TRAS lock installed and reactivation of the thrust reverser must be accomplished within the time constraints specified in the MMEL.

(g) If, after accomplishment of Boeing Service Bulletin 747-78-2151 on any airplane, it becomes necessary to install a thrust reverser assembly that does not have the TRAS lock installed, dispatch of the airplane is allowed per the provisions and limitations specified in the Boeing Model 747-400 MMEL, provided that the thrust reverser assembly that does not have the TRAS lock installed is deactivated per the 747-400 Dispatch Deviations Guide, Boeing Document D6U10151, dated June 28, 2002. Installation of a thrust reverser with the TRAS lock installed and reactivation of the thrust reverser must be accomplished within the time constraints specified in the MMEL.

Alternative Methods of Compliance

(h)(1) An alternative method of compliance or adjustment of the compliance time that provides an acceptable level of safety may be used if approved by the Manager, Seattle Aircraft Certification Office (ACO), FAA. Operators shall submit their requests through an appropriate FAA Principal Maintenance Inspector, who may add comments and then send it to the Manager, Seattle ACO.

(2) Alternative methods of compliance, approved previously in accordance with AD 2000-09-03, amendment 39-11711, are not considered to be approved as alternative methods of compliance with this AD.

Note 4: Information concerning the existence of approved alternative methods of compliance with this AD, if any, may be obtained from the Seattle ACO.

Special Flight Permits

(i) Special flight permits may be issued in accordance with sections 21.197 and 21.199 of the Federal Aviation Regulations (14 CFR 21.197 and 21.199) to operate the airplane to a location where the requirements of this AD can be accomplished.

Incorporation by Reference

(j) Unless otherwise provided by this AD, the actions shall be done in accordance with the service bulletins listed in Table 1 of this AD, as applicable:

TABLE 1.—APPLICABLE SERVICE BULLETINS

Service bulletin	Revision	Date
Boeing Service Bulletin 747-31-2242	original	April 18, 1996.
Boeing Service Bulletin 747-45-2016	1	May 2, 1996.
Boeing Service Bulletin 747-78-2132	2	December 11, 1997.
Boeing Service Bulletin 747-78-2151, as revised by	1	August 21, 1997.
Notice of Status Change 747-78-2151 NSC 04 and	NSC 04	November 26, 1997.
Notice of Status Change 747-78-2151 NSC 05	NSC 05	December 18, 1997.
Boeing Service Bulletin 747-78-2151	2	January 13, 2000.
Boeing Service Bulletin 747-78A2113	2	June 8, 1995.
Boeing Service Bulletin 747-78A2113	3	September 11, 1997.
Boeing Service Bulletin 747-78A2166	1	October 9, 1997.
Boeing Alert Service Bulletin 747-78A2166	2	March 15, 2001.
Lockheed Martin Service Bulletin 78-1007	1	March 18, 1997.
Middle River Aircraft Systems Service Bulletin 78-1007	2	March 10, 1998.
Lockheed Martin Service Bulletin 78-1020	2	March 20, 1997.
Middle River Aircraft Systems Service Bulletin 78-1020	3	March 16, 1998.
Middle River Aircraft Systems CF6-80C2B Service Bulletin 78-1020	4	October 10, 2002.

Middle River Aircraft Systems CF6-80C2B Service Bulletin 78-1020, Revision 4, dated October 10, 2002, contains the following list of effective pages:

Page No.	Revision level shown on page	Date shown on page
1, 7, 20	4	October 10, 2002.
2-6, 8-19, 21-37	3	March 16, 1998.

(1) The incorporation by reference of the service bulletins in Table 2 of this AD is approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Table 2 follows:

TABLE 2.—SERVICE BULLETINS INCORPORATED BY REFERENCE

Service bulletin	Revision	Date
Boeing Service Bulletin 747-31-2242	original	April 18, 1996.
Boeing Service Bulletin 747-45-2016	1	May 2, 1996.
Boeing Service Bulletin 747-78-2132	2	December 11, 1997.
Boeing Service Bulletin 747-78-2151, as revised by	1	August 21, 1997.
Notice of Status Change 747-78-2151 NSC 04 and	NSC 04	November 26, 1997.
Notice of Status Change 747-78-2151 NSC 05	NSC 05	December 18, 1997.
Boeing Service Bulletin 747-78-2151	2	January 13, 2000.
Boeing Alert Service Bulletin 747-78A2166	2	March 15, 2001.
Middle River Aircraft Systems CF6-80C2B Service Bulletin 78-1020	4	October 10, 2002.

(2) The incorporation by reference of the service bulletins in Table 3 of this AD was approved previously by the Director of the Federal Register as of September 6, 2000 (65 FR 47252, August 2, 2000). Table 3 follows:

TABLE 3.—SERVICE BULLETINS PREVIOUSLY INCORPORATED BY REFERENCE

Service bulletin	Revision	Date
Lockheed Martin Service Bulletin 78-1007	1	March 18, 1997.
Middle River Aircraft Systems Service Bulletin 78-1007	2	March 10, 1998.
Lockheed Martin Service Bulletin 78-1020	2	March 20, 1997.
Middle River Aircraft Systems Service Bulletin 78-1020	3	March 16, 1998.

(3) The incorporation by reference of Boeing Service Bulletin 747-78A2113, Revision 2, dated June 8, 1995; and Boeing Service Bulletin 747-78A2113, Revision 3, dated September 11, 1997; was approved previously by the Director of the Federal Register as of March 13, 2000 (65 FR 5742, February 7, 2000).

(4) The incorporation by reference of Boeing Service Bulletin 747-78A2166, Revision 1, dated October 9, 1997; was approved previously by the Director of the Federal Register as of August 25, 1999 (64 FR 39003, July 21, 1999).

(5) Copies may be obtained from Boeing Commercial Airplane Group, P.O. Box 3707, Seattle, Washington 98124-2207; and Distribution, Lockheed Martin Technical Services, 1330 Kemper Meadow Drive, suite 110-C, Cincinnati, Ohio 45240. Copies may be inspected at the FAA, Transport Airplane Directorate, 1601 Lind Avenue, SW., Renton, Washington; or at the Office of the Federal Register, 800 North Capitol Street, NW., suite 700, Washington, DC.

Effective Date

(k) This amendment becomes effective on October 1, 2003.

Appendix 1–Thrust Reverser CDU Cone Brake Test

1. This procedure contains steps to do a check of the holding torque of the CDU cone brake.
2. CDU cone brake check (Figure 1):

A. Prepare to do the check:

- (1) Open the fan cowl panels.
- (2) Pull up on the manual release handle to unlock the electro-mechanical brake.
- (3) Pull the manual brake release lever on the CDU to release the cone brake.

Note: This will release the pre-load tension that may occur during a stow cycle.

- (4) Return the manual brake release lever to the locked position to engage the cone brake.
- (5) Remove the two bolts that hold the lockout plate to the CDU and remove the lockout plate.
- (6) Install a $\frac{1}{4}$ -inch drive and a dial-type torque wrench into the CDU drive pad.

Caution: Do not use more than 100 pound-inches of torque when you do this check. Excessive torque will damage the CDU.

(7) Turn the torque wrench to try to manually extend the translating cowl until you get at least 15 pound-inches.

Note: The cone brake prevents movement in the extend direction only. If you try to measure the holding torque in the retract direction, you will get a false reading.

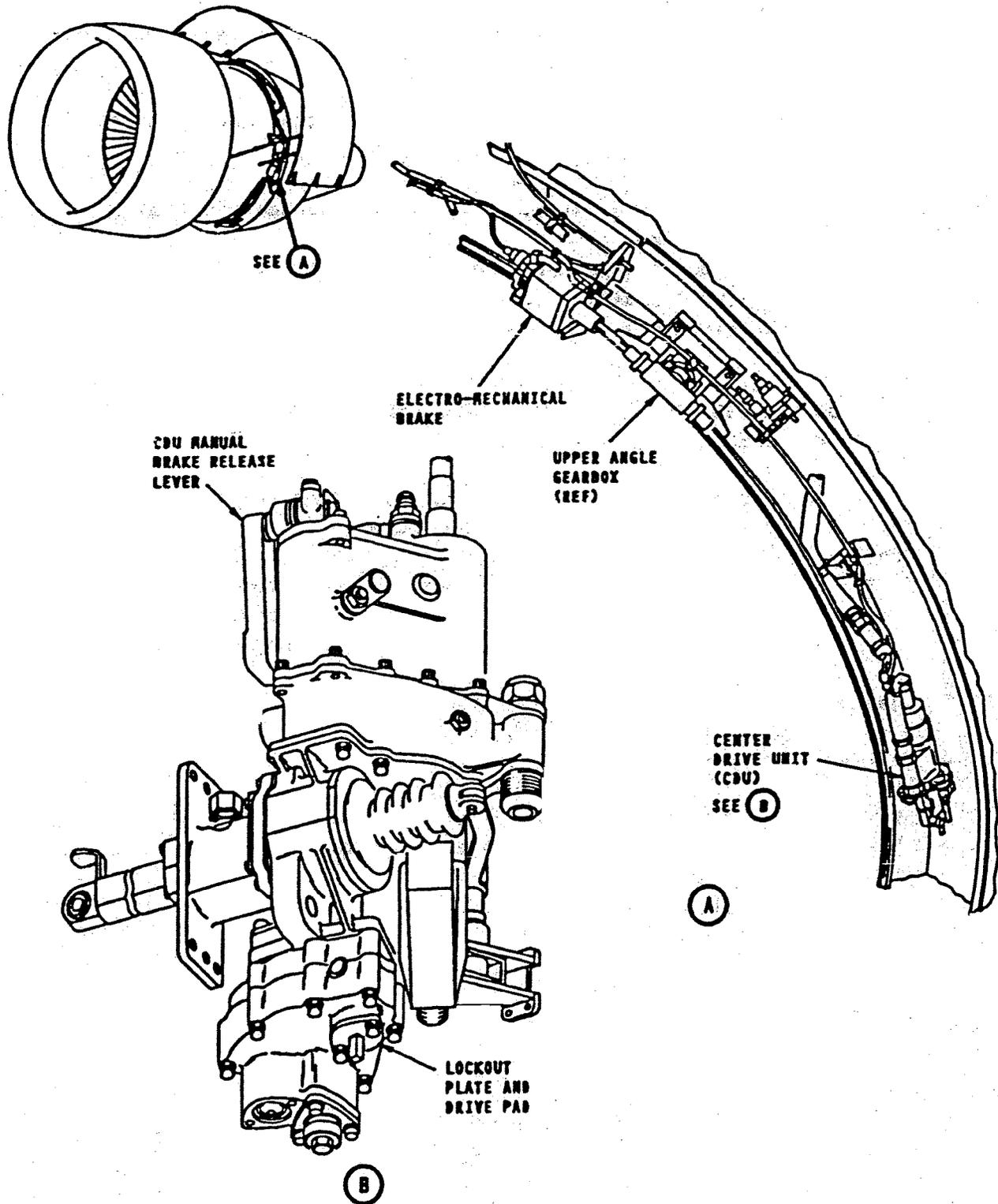
- (8) If the torque is less than 15 pound-inches, you must replace the CDU.
- (9) Reinstall the lockout plate.

B. Return the airplane to its usual condition:

- (1) Fully retract the thrust reverser (unless already accomplished).
- (2) Pull down on the manual release handle on the electro-mechanical brake until the handle fully engages the retaining clip (unless already accomplished).

Note: This will lock the electro-mechanical brake.

- (3) Close the fan cowl panels.



**Electro-Mechanical Brake and CDU Cone Brake Torque Check
Figure 1**

Issued in Renton, Washington, on August 13, 2003.
 Neil D. Schalekamp,
 Acting Manager, Transport Airplane Directorate, Aircraft Certification Service.
 [FR Doc. 03-21151 Filed 8-26-03; 8:45 am]
 BILLING CODE 4910-13-C