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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. 99–NM–361–AD; Amendment 39–11502; AD 2000–01–05]

RIN 2120–AA64

Airworthiness Directives; Boeing Model 747 Series Airplanes

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final rule; request for comments.

SUMMARY: This amendment supersedes an existing airworthiness directive (AD) applicable to certain Boeing Model 747 series airplanes. That AD currently requires repetitive inspections and tests of the thrust reverser control and indication system on each engine, and corrective actions, if necessary; installation of a terminating modification; and repetitive operational checks of that installation, and repair, if necessary. This amendment is prompted by the results of a safety review, which revealed that in-flight deployment of a thrust reverser could result in significant reduction in airplane controllability. The actions specified in this AD are intended to ensure the integrity of the fail-safe features of the thrust reverser system by preventing possible failure modes, which could result in inadvertent deployment of a thrust reverser during flight, and consequent reduced controllability of the airplane. This action identifies certain repetitive operational checks that were inadvertently omitted from the existing AD, and revises certain procedures for accomplishment of the operational checks and certain follow-on corrective actions.

DATES: Effective January 24, 2000.

The incorporation by reference of certain publications as listed in the

regulations was approved previously by the Director of the Federal Register as of September 15, 1999 (64 FR 47365, August 31, 1999).

Comments for inclusion in the Rules Docket must be received on or before March 7, 2000.

ADDRESSES: Submit comments in triplicate to the Federal Aviation Administration (FAA), Transport Airplane Directorate, ANM–114, Attention: Rules Docket No. 99–NM–361–AD, 1601 Lind Avenue, SW., Renton, Washington 98055–4056.

The service information referenced in this AD may be obtained from Boeing Commercial Airplane Group, P.O. Box 3707, Seattle, Washington 98124–2207. This information may be examined 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.

FOR FURTHER INFORMATION CONTACT: Ed Hormel, Aerospace Engineer, Propulsion Branch, ANM–140S, FAA, Transport Airplane Directorate, Seattle Aircraft Certification Office, 1601 Lind Avenue, SW., Renton, Washington 98055–4056; telephone (206) 227–2681; fax (206) 227–1181.

SUPPLEMENTARY INFORMATION: On August 19, 1999, the FAA issued AD 99–18–03, amendment 39–11269 (64 FR 47365, August 31, 1999), applicable to certain Boeing Model 747 series airplanes. That AD requires repetitive inspections and tests of the thrust reverser control and indication system on each engine, and corrective actions, if necessary; installation of a terminating modification; and repetitive operational checks of that installation, and repair, if necessary. That AD was prompted by the results of a safety review, which revealed that in-flight deployment of a thrust reverser could result in significant reduction in airplane controllability. The actions required by that AD are intended to ensure the integrity of the fail-safe features of the thrust reverser system by preventing possible failure modes, which could result in inadvertent deployment of a thrust reverser during flight, and consequent reduced controllability of the airplane.

Actions Since Issuance of Previous Rule

Since the issuance of AD 99–18–03, the FAA finds that it inadvertently

omitted reference to the accomplishment of repetitive operational checks; however, the Summary and Explanation of Requirements of the Rule sections both specified accomplishment of the repetitive operational checks. The FAA's intent in paragraph (d) of that AD was to require operators to perform repetitive operational checks at intervals not to exceed 3,000 flight hours following accomplishment of the initial operational check. Paragraph (d) of this AD has been revised accordingly.

The FAA also has determined that the procedures in the Airplane Maintenance Manual (AMM) are inadequately defined to allow for accomplishment of the operational checks; therefore, the procedures are included in an appendix to this AD. Accordingly, this action revises paragraphs (d) and (e) of that AD to remove all references to the AMM for accomplishment of the operational checks, and replace those references with references to Appendix 1 (including Figure 1) of this AD, which describes the Gearbox Lock and Air Motor Brake Test procedures required for accomplishment of the operational checks.

In addition, all references to the procedures specified in the Master Minimum Equipment List and the Dispatch Deviation Guide in paragraphs (b) and (e) of the existing AD have been removed because the FAA is unable to determine that an airplane is safe for operation if the thrust reverser functional tests are not successfully passed, or if the tests are unable to be performed. These procedures are retracted by the FAA because failure of the functional test might indicate that a fault or faults are present, which could lead to an uncommanded deployment of a thrust reverser during flight.

Explanation of Requirements of Rule

Since an unsafe condition has been identified that is likely to exist or develop on other airplanes of this same type design, this AD supersedes AD 99–18–03 to continue to require repetitive inspections and tests of the thrust reverser control and indication system on each engine, and corrective actions, if necessary; installation of a terminating modification; and repetitive operational checks of that installation, and repair, if necessary. The actions are required to be accomplished in

accordance with the service bulletins described previously, except as discussed below.

Repetitive operational checks to detect discrepancies of the gearbox locks and the air motor brake are required to be accomplished in accordance with the procedure included in Appendix 1 (including Figure 1) of this AD. Correction of any discrepancy detected is required to be accomplished in accordance with the procedures described in the Boeing 747 Airplane Maintenance Manual.

Cost Impact

None of the Model 747 series airplanes affected by this action are on the U.S. Register. All airplanes included in the applicability of this rule currently are operated by non-U.S. operators under foreign registry; therefore, they are not directly affected by this AD action. However, the FAA considers that this rule is necessary to ensure that the unsafe condition is addressed in the event that any of these subject airplanes are imported and placed on the U.S. Register in the future.

Should an affected airplane be imported and placed on the U.S. Register in the future:

It would require approximately 24 work hours (6 work hours per engine) to accomplish the required inspections and tests, at an average labor rate of \$60 per work hour. Based on these figures, the cost impact of the inspections and tests required by this AD would be approximately \$1,440 per airplane, per inspection/test cycle.

It would require approximately 392 work hours to accomplish the required installation of provisional wiring, at an average labor rate of \$60 per work hour. Required parts would cost approximately \$22,298 per airplane. Based on these figures, the cost impact of this modification required by this AD would be approximately \$45,818 per airplane.

It would require approximately 306 work hours to accomplish the required installation of the locking gearbox, at an average labor rate of \$60 per work hour. Required parts would be provided by the manufacturer at no cost to the operators. Based on these figures, the cost impact of the installation required by this AD would be approximately \$18,360 per airplane.

It would require approximately 2 work hours to accomplish the required operational check, at an average labor rate of \$60 per work hour. Based on these figures, the cost impact of the operational check required by this AD would be approximately \$120 per airplane, per check.

Determination of Rule's Effective Date

Since this AD action does not affect any airplane that is currently on the U.S. register, it has no adverse economic impact and imposes no additional burden on any person. Therefore, prior notice and public procedures hereon are unnecessary and the amendment may be made effective in less than 30 days after publication in the **Federal Register**.

Comments Invited

Although this action is in the form of a final rule and was not preceded by notice and opportunity for public comment, comments are invited on this rule. Interested persons are invited to comment on this rule by submitting such written data, views, or arguments as they may desire. Communications shall identify the Rules Docket number and be submitted in triplicate to the address specified under the caption **ADDRESSES**. All communications received on or before the closing date for comments will be considered, and this rule may be amended in light of the comments received. Factual information that supports the commenter's ideas and suggestions is extremely helpful in evaluating the effectiveness of the AD action and determining whether additional rulemaking action would be needed.

Comments are specifically invited on the overall regulatory, economic, environmental, and energy aspects of the rule that might suggest a need to modify the rule. All comments submitted will be available, both before and after the closing date for comments, in the Rules Docket for examination by interested persons. A report that summarizes each FAA-public contact concerned with the substance of this AD will be filed in the Rules Docket.

Commenters wishing the FAA to acknowledge receipt of their comments submitted in response to this rule must submit a self-addressed, stamped postcard on which the following statement is made: "Comments to Docket Number 99-NM-361-AD." The postcard will be date stamped and returned to the commenter.

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 39-11269 (64 FR 47365, August 31, 1999), and by adding a new airworthiness directive (AD), amendment 39-11502, to read as follows:

2000-01-05 Boeing: Amendment 39-11502.

Docket 99-NM-361-AD. Supersedes AD 99-18-03, Amendment 39-11269.

Applicability: Model 747-100B, -200, -300, and SP series airplanes, equipped with Rolls Royce RB211-524B2, C2, and D4 engines; certificated in any category, as listed in the following service bulletins:

- Boeing Alert Service Bulletin 747-78A2148, dated June 1, 1995;
- Boeing Service Bulletin 747-78A2148, Revision 1, dated July 20, 1995;
- Boeing Service Bulletin 747-78-2136, dated May 11, 1995; and
- Boeing Service Bulletin 747-78-2156, dated October 31, 1996.

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 (f) 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 inadvertent deployment of a thrust reverser during flight and consequent reduced controllability of the airplane, accomplish the following:

Restatement of Requirements of AD 99-18-03

Repetitive Inspections and Tests

(a) Within 90 days after September 15, 1999 (the effective date of AD 99-18-03, amendment 39-11269): Perform the applicable inspections and tests of the thrust reverser control and indication system on each engine, in accordance with Part III.A. through III.G. of the Accomplishment Instructions of Boeing Alert Service Bulletin 747-78A2148, dated June 1, 1995, or Boeing Service Bulletin 747-78A2148, Revision 1, dated July 20, 1995. Repeat the applicable inspections and tests thereafter at intervals not to exceed 18 months, until accomplishment of paragraph (c) of this AD.

Corrective Actions

(b) If any inspection or test required by paragraph (a) of this AD cannot be successfully performed as specified in the service bulletin, or if any discrepancy is detected during any inspection or test, prior to further flight, repair in accordance with Boeing Alert Service Bulletin 747-78A2148, dated June 1, 1995, or Boeing Service Bulletin 747-78A2148, Revision 1, dated July 20, 1995. Additionally, prior to further flight, any failed inspection or test required by paragraph (a) of this AD must be repeated and successfully accomplished.

Modification

(c) Within 36 months after September 15, 1999: Install an additional locking system on the thrust reversers in accordance with the Accomplishment Instructions of Boeing Service Bulletin 747-78-2156, dated October 31, 1996. Prior to or concurrent with accomplishment of Boeing Service Bulletin 747-78-2156, dated October 31, 1996: Accomplish Boeing Service Bulletin 747-78-2136, dated May 11, 1995; and Rolls-Royce Service Bulletins RB.211-71-B545, Revision 2, dated August 8, 1997, RB.211-71-B551, Revision 1, dated March 20, 1998, and RB.211-78-B552, dated June 21, 1996.

Accomplishment of these actions constitutes terminating action for the repetitive inspections and tests required by paragraph (a) of this AD.

Operational Checks

(d) Within 3,000 flight hours after accomplishing the modification required by paragraph (c) of this AD, or within 1,000 flight hours after September 15, 1999, whichever occurs later: Perform operational checks of the number 2 and number 3 gearbox locks and of the air motor brake, in accordance with the procedures described in Appendix 1 (including Figure 1) of this AD. Repeat the operational checks thereafter at intervals not to exceed 3,000 flight hours.

Corrective Actions

(e) If any operational check required by paragraph (d) of this AD cannot be successfully performed as specified in the procedures described in Appendix 1 (including Figure 1) of this AD, or, if any discrepancy is detected during any operational check, prior to further flight, repair in accordance with the procedures specified in the Boeing 747 Airplane Maintenance Manual. Additionally, prior to further flight, any failed operational check required by paragraph (d) of this AD must be repeated and successfully accomplished. Continue to repeat the operational checks thereafter at intervals not to exceed 3,000 flight hours.

Alternative Methods of Compliance

(f) 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, Transport Airplane Directorate. 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.

Note 2: 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

(g) 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

(h) Except as provided by paragraphs (d) and (e) of this AD, the actions shall be done in accordance with the applicable service bulletins:

- Boeing Service Bulletin 747-78-2136, dated May 11, 1995;
- Boeing Alert Service Bulletin 747-78A2148, dated June 1, 1995;
- Boeing Service Bulletin 747-78A2148, Revision 1, dated July 20, 1995;
- Boeing Service Bulletin 747-78-2156, dated October 31, 1996;
- Rolls-Royce Service Bulletin RB.211-78-B552, dated June 21, 1996;
- Rolls-Royce Service Bulletin RB.211-71-B545, Revision 2, dated August 8, 1997; or
- Rolls-Royce Service Bulletin RB.211-71-B551, Revision 1, dated March 20, 1998.

This incorporation by reference was approved previously by the Director of the Federal Register as of September 15, 1999 (64 FR 47365, August 31, 1999). Copies may be obtained from Boeing Commercial Airplane Group, P.O. Box 3707, Seattle, Washington 98124-2207. 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.

(i) This amendment becomes effective on January 24, 2000.

Appendix 1—

Gearbox Lock and Air Motor Brake Test

A. General

To do the test of the gearbox locks and air motor brake, you must do the steps that follow:

- (a) Do the deactivation procedure of the thrust reverser system.
- (b) Do the test of the air motor brake.
- (c) Do the test of the gearbox locks.
- (d) Do the activation procedure of the thrust reverser system.

B. Equipment

- (1) CP30784—INA Access Platform, Rolls-Royce
- (2) CP30769—Protection Pads, Rolls-Royce
- (3) CP30785—Access Stools, Rolls-Royce
- (4) UT1293/1—Load Tool, Rolls-Royce (2 required)

C. Procedure (Fig. 1)

Warning: Do the Deactivation Procedure of the Thrust Reverser System, Which Must Include the Installation of Lock Bars (or Blockers), to Prevent the Accidental operation of the Thrust Reverser. The Accidental Operation of the Thrust Reverser Could Cause Injury to Persons and Damage to Equipment.

(1) Do the deactivation procedure of the thrust reverser in the forward thrust position for ground maintenance.

(2) Use a 0.25-inch (6.4-mm) square drive to turn the manual lock release screw to release the No. 2 and No. 3 gearbox locks.

Note: It is not always easy to turn the manual lock release screws. This is because of a preload in the systems. To release the preload, lightly turn the manual cycle and lockout shafts in the stow direction.

(a) Make sure the lock indicators are extended at gearboxes No. 2 and No. 3.

(3) Do a test of the air motor brake:

(a) If You Use the Load Tools;

Try to move the translating cowl in the extend direction as follows:

(1) Remove the lock bars that you installed in the deactivation procedure.

(2) Install the load tools through the cutouts and into the No. 2 and No. 3 gearboxes.

(3) Attach the torque wrenches to the load tools.

(4) Try to move the translating cowl in the extend direction.

(b) If You Do Not Use the Load Tools;

Try to move the translating cowl in the extend direction as follows:

(1) Remove the lock bars that you installed in the deactivation procedure.

(2) Put the 0.25-inch (6.4-mm) square drive extensions into the manual cycle and lockout shaft at the No. 2 and No. 3 gearboxes.

(a) Attach the standard drive tools.

(3) Try to move the translating cowl in the extend direction.

(c) If the translating cowl moves, replace the air motor and shutoff valve.

(4) Do a test of the gear box locks:

Note: The steps that follow are for the No. 3 gearbox. Then, do these steps again for the No. 2 gearbox.

(a) Install the lock bars in the manual cycle and lockout shafts at the No. 2 and No. 3 gearboxes.

(b) Install the INA access platform in the exhaust mixer duct.

(c) Install the protection pads and the access stools.

(d) Release the air motor brake:

(1) Open the air motor access and pressure relief panel.

(2) Pull the air motor brake release handle forward and turn it counterclockwise to lock the handle in its position.

(e) Turn the manual lock release screw clockwise to engage the No. 3 gearbox lock.

(1) Make sure that the lock indicator is retracted (under the surface) at gearbox No. 3.

(f) Make sure No. 2 gearbox lock is released.

(1) Make sure the lock indicator is extended at gearbox No. 2.

(g) If You Use the Load Tools;

Do a check of the lock dogs as follows:

(1) Remove the lock bars from the No. 2 and No. 3 gearboxes.

(2) Install the load tool through the cutout and into the No. 3 gearbox.

(3) Attach the torque wrench to the load tool.

Caution: Do Not Apply a Torque Load of More Than 30 Pound-Inches (3.4 Newton-Meters) to the Manual Cycle and Lock Out Shaft. A Larger Torque Load Can Cause Damage to the Mechanism.

(4) Apply a torque counterclockwise through the manual wind position of the No. 3 gearbox.

(a) If the translating cowl does not move, the lock bar touched one of the two lock dogs.

(b) If the translating cowl moved, lock the thrust reverser until the No. 3 gearbox is replaced.

(5) Turn the manual lock release screw counterclockwise to release the gearbox lock.

(a) Make sure that the indication rod comes out of the No. 3 gearbox.

(6) Turn the manual cycle and lockout shaft counterclockwise $\frac{1}{4}$ turn.

(7) Turn the manual lock release screw clockwise to engage the No. 3 gearbox lock.

(a) Make sure that the indication rod is fully retracted (under the surface).

Caution: Do Not Apply a Torque Load of More Than 30 Pound-Inches (3.4 Newton-Meters) to the Manual Cycle and Lockout Shaft. A Greater Torque Load Can Cause Damage to the Mechanism.

(8) Apply a torque counterclockwise through the manual wind position of the No. 3 gearbox.

(a) If the manual cycle and lockout shaft can not be turned more than approximately $\frac{1}{4}$ turn, the second lock dog is serviceable.

(b) If the manual cycle and lockout shaft can be turned more than approximately $\frac{1}{4}$ turn, the second lock dog is unserviceable. Lock the thrust reverser until the No. 3 gearbox is replaced.

Note: The two lock dogs are found $\frac{1}{2}$ turn apart when you use the manual cycle and lockout shaft. If necessary, do the check again to make sure that the lock dogs are serviceable.

(9) Do the procedure given above for the No. 2 gearbox lock.

(h) If You Do Not Use the Load Tools;

Do a check of the lock dogs as follows:

(1) Remove the lock bars from the No. 2 and No. 3 gearboxes.

(2) Put the 0.25-inch (6.4-mm) square drive extensions into the manual cycle and lockout shaft at the No. 2 and No. 3 gearboxes.

(a) Attach the standard drive tools.

Caution: Do Not Apply a Torque Load of More Than 30 Pound-Inches (3.4 Newton-Meters) to the Manual Cycle and Lockout Shaft. A Larger Torque Load Can Cause Damage to the Mechanism.

(3) Apply a torque counterclockwise through the manual wind position of the No. 3 gearbox.

(a) If the translating cowl does not move, the lock bar touched one of the two lock dogs.

(b) If the translating cowl moved, lock the thrust reverser until the No. 3 gearbox is replaced.

(4) Turn the manual lock release screw counterclockwise to release the gearbox lock.

(a) Make sure that the indication rod comes out of the No. 3 gearbox.

(5) Turn the manual cycle and lockout shaft counterclockwise $\frac{1}{4}$ turn.

(6) Turn the manual lock release screw clockwise to engage the No. 3 gearbox lock.

(a) Make sure that the indication rod is fully retracted (under the surface).

Caution: Do Not Apply a Torque Load of More Than 30 Pound-Inches (3.4 Newton-Meters) to the Manual Cycle and Lockout Shaft. A Greater Torque Load Can Cause Damage to the Mechanism.

(7) Apply a torque counterclockwise through the manual wind position of the No. 3 gearbox.

(a) If the manual cycle and lockout shaft can not be turned more than approximately $\frac{1}{4}$ turn, the second lock dog is serviceable.

(b) If the manual cycle and lockout shaft can be turned more than approximately $\frac{1}{4}$ turn, the second lock dog is unserviceable.

Lock the thrust reverser until the No. 3 gearbox is replaced.

Note: The two lock dogs are found $\frac{1}{2}$ turn apart when you use the manual cycle and lockout shaft. If necessary, do the check again to make sure that the lock dogs are serviceable.

(8) Do the procedure given above for the No. 2 gearbox lock.

(5) Install the lock bars in the manual cycle and lockout shafts at the No. 2 and No. 3 gearboxes.

(6) Apply the air motor manual brake:

(a) Turn the air motor brake release handle clockwise and then release.

(b) Close the air motor access and pressure relief panel.

(7) Make sure the No. 2 and No. 3 gearbox locks are released.

(a) Make sure the lock indicator rods are extended at the No. 2 and No. 3 gearboxes.

(8) If You Use the Load Tools;

Try to move the translating cowl in the extend direction as follows:

(a) Remove the lock bars from the No. 2 and No. 3 gearboxes.

(b) Install the load tools through the cutouts and into the No. 2 and No. 3 gearboxes.

(c) Attach the torque wrenches to the load tools.

(d) Try to move the translating cowl in the extend direction.

(9) If You Do Not Use the Load Tools;

Try to move the translating cowl in the extend direction as follows:

(a) Remove the lock bars from the No. 2 and No. 3 gearboxes.

(b) Put the 0.25-inch (6.4-mm) square drive extensions into the manual cycle and lockout shaft at the No. 2 and No. 3 gearboxes.

(1) Attach the standard drive tools.

(c) Try to move the translating cowl in the extend direction.

(10) If the translating cowl moves, do the full test again.

(a) If the translating sleeve moves again, lock the thrust reverser until you can replace the two locking gearboxes and the air motor and shutoff valve.

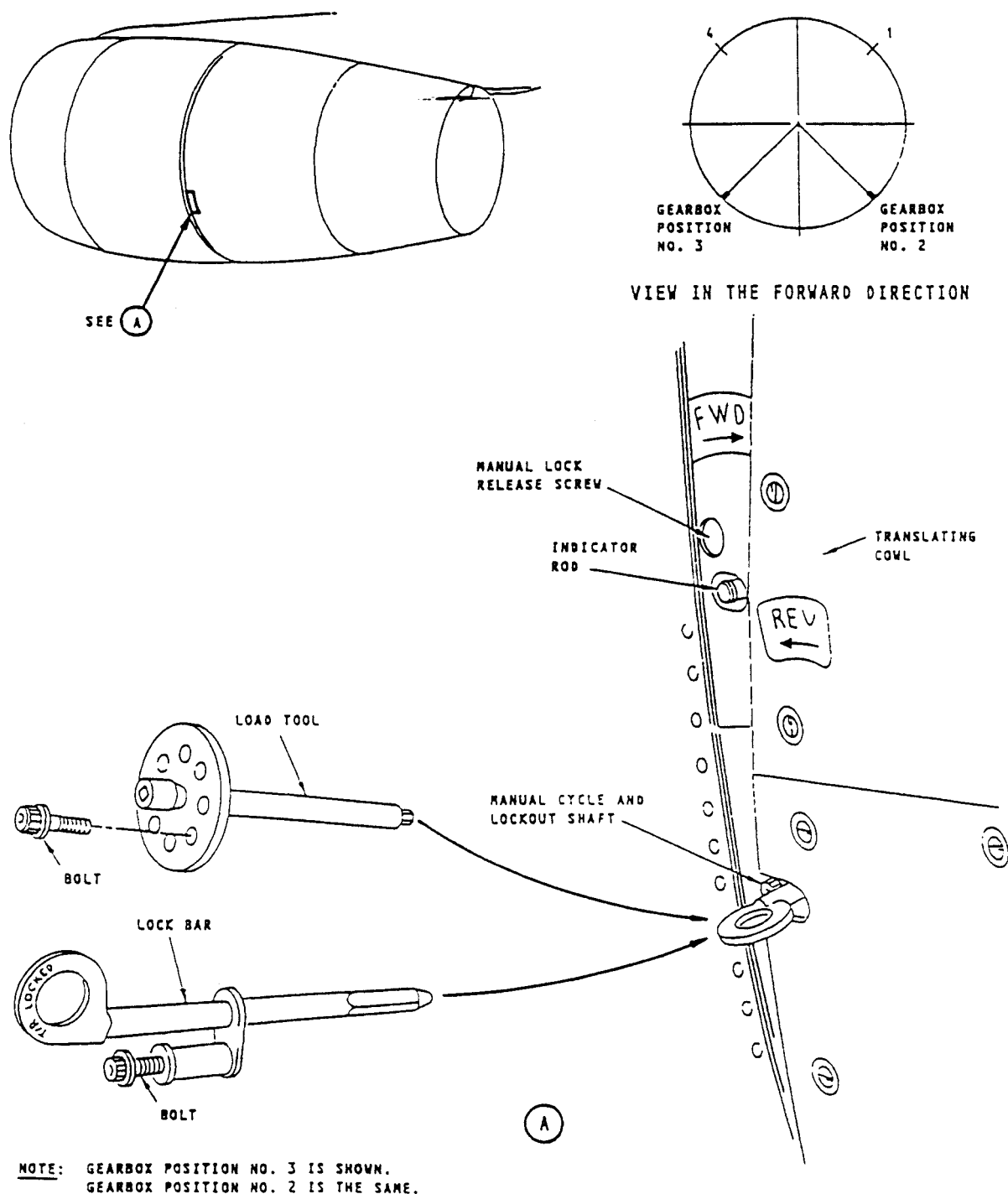
(11) Remove the access stools and protection pads.

(12) Remove the INA access platform from the exhaust mixer duct.

(13) Do the activation procedure of the thrust reverser system.

(14) Do the functional test of the thrust reverser system.

BILLING CODE 4910-13-U



Lock Bar/Load Tool Installation and Gearbox Manual Lock Release
Figure 1

Issued in Renton, Washington, on January 3, 2000.

Vi L. Lipski,

Acting Manager, Transport Airplane
Directorate, Aircraft Certification Service.

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