of the local flight standards district office/certificate holding district office.

(2) *Contacting the Manufacturer:* For any requirement in this AD to obtain instructions from a manufacturer, the instructions must be accomplished using a method approved by the Manager, International Section, Transport Standards Branch, FAA; or EASA; or Dassault Aviation's EASA Design Organization Approval (DOA). If approved by the DOA, the approval must include the DOA-authorized signature.

(j) Related Information

For more information about this AD, contact Tom Rodriguez, Aerospace Engineer, International Section, Transport Standards Branch, FAA, 2200 South 216th St., Des Moines, WA 98198; telephone and fax 206–231–3226.

(k) Material Incorporated by Reference

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

(2) You must use this service information as applicable to do the actions required by this AD, unless this AD specifies otherwise.

(i) European Union Aviation Safety Agency (EASA) AD 2019–0273, dated November 4, 2019.

(ii) [Reserved]

(3) For information about EASA AD 2019–0273, contact the EASA, Konrad-Adenauer-Ufer 3, 50668 Cologne, Germany; telephone +49 221 89990 6017; email *ADs@easa.europa.eu;* Internet *www.easa.europa.eu.* You may find this EASA AD on the EASA website at *https://ad.easa.europa.eu.*

(4) You may view this material at the FAA, Transport Standards Branch, 2200 South 216th St., Des Moines, WA. For information on the availability of this material at the FAA, call 206–231–3195. This material may be found in the AD docket on the internet at *https://www.regulations.gov* by searching for and locating Docket No. FAA–2019–0973.

(5) You may view this material that is incorporated by reference at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, email *fedreg.legal@nara.gov,* or go to: *https://www.archives.gov/federal-register/cfr/ibr-locations.html.*

Issued in Des Moines, Washington, on November 21, 2019.

Dorr Anderson,

Acting Director, System Oversight Division, Aircraft Certification Service.

[FR Doc. 2019–26704 Filed 12–11–19; 8:45 am]

BILLING CODE 4910–13–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA–2017–1024; Product Identifier 2017–NM–065–AD; Amendment 39–19746; AD 2019–19–10]

RIN 2120–AA64

Airworthiness Directives; The Boeing Company Airplanes

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: The FAA is adopting a new airworthiness directive (AD) for all The Boeing Company Model 737–300, –400, –500, –600, –700, –700C, –800, –900, and –900ER series airplanes; Model 757 series airplanes; Model 767 series airplanes; Model 777 series airplanes; and Model 787–8 and 787–9 airplanes. This AD was prompted by reports of fuel crossfeed valves failing to open when activated during flight. This AD requires, for certain airplanes, revising the existing airplane flight manual (AFM); and for certain other airplanes, revising the existing minimum equipment list (MEL) to do an operational check of the fuel crossfeed valve prior to each extended operations (ETOPS) flight if one fuel crossfeed valve (or the fuel balancing system on Model 787 airplanes) is inoperative. The FAA is issuing this AD to address the unsafe condition on these products.

DATES: This AD is effective January 16, 2020.

ADDRESSES:

Examining the AD Docket

You may examine the AD docket on the internet at *https://www.regulations.gov* by searching for and locating Docket No. FAA–2017–1024; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this final rule, the regulatory evaluation, any comments received, and other information. The address for Docket Operations is 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: Jon Regimbal, Aerospace Engineer, Propulsion Section, FAA, Seattle ACO Branch, 2200 South 216th St., Des Moines, WA 98198; phone and fax: 206–231–3557; email: *Jon.Regimbal@faa.gov.*

SUPPLEMENTARY INFORMATION:

Discussion

The FAA issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 by adding an AD that would apply to all The Boeing Company Model 737–300, –400, –500, –600, –700, –700C, –800, –900, and –900ER series airplanes; Model 757 series airplanes; Model 767 series airplanes; Model 777 series airplanes; and Model 787–8 and 787–9 airplanes. The NPRM published in the **Federal Register** on December 5, 2017 (82 FR 57383). The NPRM was prompted by reports of fuel crossfeed valves failing to open when activated during flight. The NPRM proposed to require, for certain airplanes, revising the existing AFM; and for certain other airplanes, revising the existing MEL to do an operational check of the fuel crossfeed valve prior to each ETOPS flight if one fuel crossfeed valve (or the fuel balancing system on Model 787 airplanes) is inoperative.

The FAA is issuing this AD to prevent an airplane from being dispatched on an ETOPS flight with a single fuel crossfeed valve (due to design or due to MEL dispatch of a dual crossfeed valve equipped airplane with one crossfeed valve inoperative) that cannot be opened or a fuel balancing system that cannot properly operate when activated. This condition could cause the fuel in the main tank associated with a failed engine to be unavailable to the remaining operative engine, potentially resulting in a forced off-airport landing due to exhaustion of the remaining usable fuel and consequent loss of all engine thrust.

Comments

The FAA gave the public the opportunity to participate in developing this final rule. The following presents the comments received on the NPRM and the FAA's response to each comment.

Request To Withdraw the NPRM

United Airlines (UAL) and Delta Air Lines (DAL) asked that the NPRM be withdrawn until corrective action is proposed with an adequate level of safety.

UAL stated that the FAA processes leading to issuing the NPRM did not include certain expected elements (*e.g.,* risk analysis, adequate cost analysis [which the FAA addresses in the ''Request to Increase Cost Estimate'' comment], and consideration for airplanes equipped with aircraft health monitoring (AHM) [which the FAA addresses in the ''Request to Exclude Airplanes with AHM'' comment]). UAL added that it is not aware of an FAA risk

analysis of a simultaneous engine failure and a crossfeed valve failure during an ETOPS flight in a critical fuel location.

UAL conducted a risk analysis and provided the following comments and questions:

- The NPRM specified that the FAA had received reports of fuel crossfeed valves failing to open when activated during flight, but provided no data.
- The NPRM provided no statistical analysis of industry engine failure rates, or of crossfeed valve failure rates. What is the probability that an engine will fail and a crossfeed valve will fail on the same ETOPS flight in a fuel-critical location?
- ETOPS-qualified aircraft engine failure rates are extremely low. UAL engine failure rates vary from 0.005 to 0.000, well below the 0.030 required for ETOPS certification.
- Crossfeed valve failure rates are extremely low (roughly 1 per 100,000 departures), and Boeing had indicated that it did not regard the failure of crossfeed valves as a potential reliability issue.

DAL stated that a Boeing risk analysis showed that an engine shutdown with the inability to transfer fuel is improbable (the FAA infers that the commenter meant ''extremely improbable'' as used in FAA risk analysis policy) and that Boeing does not consider this to be a safety issue. DAL added that cycling the fuel crossfeed valve prior to further flight, or at any time, does not ensure that the valve will work as intended at a later point in flight. DAL concluded that the proposed AD does not provide corrective action that will improve the safety of the airplane.

The FAA does not agree to withdraw the NPRM. The FAA determined that the unsafe condition of fuel crossfeed valves failing to open or fuel balancing systems failing to operate when activated during flight must be addressed. For transport airplanes, this determination is based on several criteria, and the failure to meet one or more of the criteria could lead the FAA to determine that corrective action is warranted.

For each identified potential safety issue on a transport airplane, the FAA examines the risk on the worst reasonably anticipated flights (flights actually predicted to occur) to ensure that each flight provides an acceptable level of safety [identified as ''individual flight risk'' in FAA risk analysis policy]. That acceptable level of safety consists of three basic expectations:

- That each flight begins in a fail-safe state (including consideration of latent failure conditions and allowed dispatch states under the MEL), meaning that a foreseeable single failure on any anticipated flight should not have a significant likelihood of causing a catastrophic event.
- That each flight does not have a numerical risk of a catastrophic event due to the issue being examined that is excessively (an order of magnitude or more) greater than the risk of a catastrophic event on an average transport airplane.
- That safety features that were prescriptively required due to lessons learned from past incidents and accidents are not excessively reduced in their effectiveness or availability.

Failure to meet any of these three criteria can lead to a determination that an unsafe condition exists and AD action is necessary, because the level of safety on the affected flights does not meet the FAA's thresholds for an acceptable level of safety on individual flights.

For each identified potential safety issue, the FAA also assesses the total cumulative risk of an event occurring at any time in the remaining life of the fleet of affected airplanes (identified as ''total fleet risk'' in FAA risk analysis policy). The FAA may determine that corrective action is needed to limit total fleet risk even when the assessed individual flight risk does not violate any of the three individual flight risk criteria discussed above. Total fleet risk is typically assessed by multiplying the average probabilities of each of the failures or other factors that contribute to the occurrence of an event, the total number of airplanes affected, the average utilization of those airplanes, and the average remaining life for those airplanes. The FAA also considers the number of occupants of an aircraft in assessing fleet risk, and applies total fleet risk guideline thresholds expressed in terms of both aircraft accidents and number of fatalities.

Either excessive individual flight risk or excessive total fleet risk, or both, can lead the FAA to determine that an unsafe condition exists that requires corrective action. The FAA does not use or accept calculations of acceptable total fleet risk, or acceptable average per-flight-hour risk, as a justification for taking no action on issues where an excessive individual flight risk is determined to exist on flights that are anticipated to occur.

For this AD, the FAA identified that flights of airplanes with a single operative crossfeed valve (due to design or due to MEL dispatch of a dual crossfeed valve equipped airplane with one crossfeed valve inoperative) are expected to occur with a pre-existing undetected failure of that single crossfeed valve (or of the fuel balancing system on Boeing Model 787 airplanes). On such a flight, if an engine shutdown occurs during the fuel-critical ETOPS portion of the flight, it can lead to fuel exhaustion and a forced off-airport landing. That fuel-critical portion of the flight can be of significant duration. For example, according to Boeing, the fuel-critical exposure window (during which an engine failure without crossfeed capability would lead to fuel exhaustion prior to reaching a suitable airport under the current 14 CFR part 121 fuel reserve requirements) ranges from approximately 1.8 to 2.3 hours in length for flights between the West Coast of the U.S. and Hawaii. For ETOPS missions using greater-than-180-minute ETOPS capability, the exposure can be significantly greater.

While the average probability per flight hour of a failure of the crossfeed valve and an engine failure in cruise on the same flight has been shown by Boeing to be extremely improbable (on the order of one event per billion flight hours), the actual risk is not evenly spread among flights at the average level. Instead, most of that risk is currently concentrated in the flights of airplanes operating with a single crossfeed valve due to design configuration or MEL dispatch relief, and on which that single crossfeed valve is inoperative due to a latent failure. On such flights, the estimated average probability of an engine failure during the cruise phase of flight is in the range of one event per 100,000 to 1 million flight hours (based on current industry in-flight engine shutdown data), depending on the engine/airplane combination. In addition, engine shutdowns can be caused by many different single failures of engine or airplane components, which means those flights that begin with an already inoperative crossfeed valve are not fail-safe for an engine failure as required by the airworthiness regulations and expected by the public.

Based on the crossfeed valve actuator failure rates supplied by the Boeing and the current AFM requirements to check the operation of the crossfeed valves in the last hour of cruise on ETOPS flights, the FAA estimates that well over 100 flights with inoperative crossfeed valves will occur in the remaining life of the affected fleet. Such flights do not provide the level of safety that is intended for ETOPS operations. Checking the operation of the crossfeed valve immediately prior to each ETOPS flight will ensure that each flight begins with a crossfeed valve that was recently

verified to operate, and will minimize the likelihood of a crossfeed valve failing if engine crossfeed is required. The FAA considers a check of the crossfeed valve operation prior to each ETOPS flight to be a significant improvement in safety for the flights on which the risk is actually concentrated, thereby minimizing the chance that an engine failure on one of those flights will lead to a catastrophic fuel exhaustion event. For the reasons specified previously, the FAA is issuing this final rule to address the identified unsafe condition.

Request To Revise Airplanes Affected by Certain Requirements

American Airlines generally supported the NPRM, but asked that the airplanes affected by paragraphs (h) and (j) of the proposed AD be corrected. American Airlines stated that paragraphs (h) and (j) of the proposed AD specify airplanes having line numbers 1 through 616 inclusive and 618; however, the effectivity specified in Boeing Service Bulletin 757–28–0029 for the corresponding actions is line numbers 1 through 518 inclusive. American Airlines added that airplanes having line numbers above 518 had the actions specified in the referenced service information incorporated in production.

The FAA agrees with the commenter's request for the reason provided. Paragraphs (h) and (j) of this AD have been changed accordingly.

Effect of Winglets on Accomplishment of the Proposed Actions

Aviation Partners Boeing (APB) stated that the installation of winglets per Supplemental Type Certificate (STC) ST01219SE, ST00830SE, ST01518SE, or ST01920SE does not affect the accomplishment of the manufacturer's service instructions.

The FAA agrees that STC ST01219SE, ST00830SE, ST01518SE, and ST01920SE do not affect the accomplishment of the manufacturer's service instructions. Therefore, the installation of STC ST01219SE, ST00830SE, ST01518SE, or ST01920SE does not affect the ability to accomplish the actions required by this AD. The AD has not been changed in this regard.

Request To Increase Cost Estimate

UAL stated that the FAA did not include adequate cost analysis and stated the FAA should consider the negative effects of daily activation of the crossfeed valve on mean time between failure (MTBF) rates, or the associated cost of increased valve replacement rates.

The FAA infers that UAL is asking that the cost estimate in the ''Costs of Compliance'' section of this final rule be increased to account for a decreased MTBF for the crossfeed valve or actuator. The FAA does not agree to increase the estimated costs. The FAA normally addresses only the direct cost of a required action, and the agency has not received any data from the manufacturer or operators indicating that actuating the crossfeed valve prior to each ETOPS flight will significantly increase the crossfeed valve failure and replacement rate.

Relative to the effects of daily activation of the crossfeed valve, a significant decrease in MTBF will likely not result from the actions in this AD, for the following reasons:

- The various fuel system valves and valve actuators are all of similar designs, and some of those valves are cycled once or more per flight. They are designed to operate for many thousands of cycles without failure.
- For airplanes equipped with a single crossfeed valve, the existing AFM requires operators to perform an operational check of the crossfeed valve in the last hour of cruise of every ETOPS flight. This AD requires the same check to be performed prior to each ETOPS flight, and provides relief from the existing requirement for a valve operational check in the last hour of cruise.
- For airplanes with dual crossfeed valves or a fuel balancing system (for Boeing Model 787 airplanes), this AD requires a crossfeed valve operational check only when the airplane is operated under the MEL with a crossfeed valve or fuel balance system inoperative.

Therefore, this AD will not require a significantly increased total number of valve operational checks to be performed; the AD just changes when the check is performed. In light of these factors, this AD has not been changed in this regard.

Request To Exclude Airplanes With AHM

UAL asked to revise the applicability of the proposed AD to exclude airplanes that have an AHM system capable of reporting an impending crossfeed valve failure before an actual service failure occurs. UAL did not provide a reason for its request, but the FAA infers that the commenter considered that a system that can detect an impending crossfeed valve failure before an actual crossfeed valve failure occurs, leading to a precautionary crossfeed valve or actuator replacement, would provide an acceptable way to address the unsafe condition.

The FAA does not agree with the commenter's request. The FAA is not aware of any of the affected airplanes having the capability to detect and annunciate an impending crossfeed valve failure. UAL did not identify a specific airplane or installed system feature that has that capability. Operators may apply for an alternative method of compliance (AMOC) in accordance with paragraph (o) of this AD, provided they can show that such a system is available for installation on an airplane and adequately addresses the unsafe condition. The AD has not been changed in this regard.

Request To Allow Alternative AFM Approval

Southwest Airlines (SWA) contended that use of the term ''identical'' in paragraph (g)(2) of the proposed AD would be unnecessarily restrictive and could prevent operators from using previously accepted formatting standards and layout. SWA therefore asked that paragraph (g)(2) of the proposed AD be revised to add the following statement: ''Alternative statements that meet the intent of the following requirements may be used if approved by an appropriate FAA POI.'' SWA added that a similar principal operations inspector (POI) allowance was provided in AD 2011–18–03, Amendment 39–16785 (76 FR 53317, August 26, 2011).

The FAA does not agree with the commenter's request. The intent of this AD is for the text of the general AFM revision limitations and procedures to be identical to that required by the AD; however, formatting and layout can be changed without an approved AMOC as long as those changes do not change the text of the statements. Operators may apply for an AMOC in accordance with paragraph (o) of this AD for any changes to the text required by the AD. The AD has not been changed in this regard.

Request To Include Certain Provisions Required by Original Type Design

Boeing asked that paragraph (n) of the proposed AD be changed to eliminate certain existing requirements for airplanes on which a last-hour-of-ETOPS-flight crossfeed valve operational check is in the AFM as part of the type certificate approval. Boeing stated that after publication of AD 88–21–03 R1, Amendment 39–6077 (53 FR 46605, November 18, 1988) (''AD 88–21–03 R1''), new airplane models with a single crossfeed valve that were not affected by the requirements in AD 88–21–03 R1 had a similar requirement in

the AFM as part of the airplane type certificate.

The FAA does not agree with the commenter's request. The FAA approval of the AFM change proposed by the commenter would be considered an approval of a voluntary change to a type certificate. Such changes are required to be approved under the process defined in 14 CFR part 21 and are not accomplished through an AD. Once the operational check prior to each ETOPS flight is incorporated into the existing AFM or MEL as required by this AD, the check required in the last hour of cruise by the existing AFM could be eliminated through a type certificate design change approval. If Boeing or an operator wants to obtain approval of a revised AFM without the limitation requiring the last-hour-of-ETOPS-flight crossfeed valve operational check, the request can be submitted for FAA approval using the normal process for obtaining approval of a revised AFM. Therefore, the AD has not been changed in this regard.

Request To Revise Headings for Certain Figures

Boeing asked that the FAA expand the headings for the AFM text in figure 3 to paragraph (h)(1) of the proposed AD and figure 5 to paragraph (i)(1) of the proposed AD by adding ''The following is applicable prior to incorporation of Boeing Service Bulletin 757–28–0029 or production equivalent,'' and ''The following is applicable prior to incorporation of Boeing Service Bulletin 757–28–0034 or production equivalent,'' respectively. Boeing stated that the referenced service information and production equivalent are closing actions for the applicable AD.

The FAA partially agrees with the commenter's request. The FAA agrees to change these headings, because an operator could have a mixed fleet of single- and dual-valve airplane configurations operating under a single AFM version, which should have limitation language that is applicable only to airplanes with a single crossfeed valve. However, the FAA does not agree with making the specific change by referencing only service bulletins or production equivalent configurations, because while limitations with similar language have been approved in the past, the flight crew does not have readily available information on the service bulletins or production changes that are installed. However, the crew can readily identify whether the airplane has one or two crossfeed valves simply by looking at the overhead fuel control panel, where either one or two crossfeed valve switches are installed. Therefore, the referenced headings in this AD have been changed to refer to the crossfeed valve configuration rather than the service bulletin number.

Request To Eliminate the Operational Requirement in the MMEL

Boeing asked that the proposed operational requirement for airplanes with dual crossfeed valves operating on the master minimum equipment list (MMEL) be eliminated. Boeing stated that after publication of AD 88–21–03, which required operational checks of the crossfeed valves in the last hour of each ETOPS flight for airplanes equipped with a single crossfeed valve, the FAA approved the installation of a second crossfeed valve as an AMOC for that AD, without requiring any crossfeed valve checks if the airplane is operated with a crossfeed valve inoperative under the MEL. Boeing added that it is not necessary to now mandate an operational check for an airplane operating with a crossfeed valve inoperative under the MEL.

Boeing stated that the fundamental criterion for MMEL relief is that an acceptable level of safety must be maintained considering the next critical single failure event in flight. Boeing also stated that operation with a crossfeed valve or transfer system inoperative under the current MMEL requires verification that the remaining crossfeed valve is operative, and that in-flight failure of the remaining crossfeed valve during a subsequent flight would not itself create an unsafe condition. Boeing added that issuing an AD to require operational checks for operation under the MMEL is therefore redundant.

Boeing cited the preamble language required by the FAA in MMEL Policy Letter 34, Revision 4, dated August 15, 1997:

> Experience has shown that with the various levels of redundancy designed into aircraft, operation of every system or installed component may not be necessary when the remaining operative equipment can provide an acceptable level of safety.

Boeing stated that the addition of a redundant crossfeed valve provides a fault-tolerant configuration, which experience has shown provides an acceptable level of safety. Boeing concluded that unless credit is given for the redundant crossfeed valve without a requirement for an operational check, the redundant valve provides no added safety benefit and therefore could be eliminated.

The FAA does not agree with the commenter's request. When the FAA determines that an existing MMEL relief provision does not provide an acceptable level of safety, the FAA may either eliminate or modify that relief through AD action. In this case, the FAA determined that an operational check of the crossfeed valve, prior to each ETOPS flight that takes place with a single crossfeed valve, is necessary to prevent dispatch of an ETOPS flight with no ability to access all of the remaining fuel in the event of an engine failure. The FAA has further determined that flights without the ability to access all of the remaining fuel would not provide an acceptable level of safety, because a single engine failure during the critical portion of the cruise phase could result in a forced offairport landing due to inadequate usable fuel available to the operative engine. This check is necessary when an airplane equipped with a dual crossfeed valve is dispatched under the MMEL with one crossfeed valve inoperative or with the fuel balancing system inoperative, for the same reason that the crossfeed valve operational check is required prior to each ETOPS flight on an airplane with a single crossfeed valve.

The citation from MMEL Policy Letter 34 is from the standardized language required by that policy letter to be included in the preamble of an MMEL. It is simply an introductory statement indicating that redundant systems may allow for dispatch with certain equipment inoperative in some cases. It is not intended to restrict the conditions or limitations that the FAA may place on a particular MMEL relief provision. The failure of a crossfeed valve in a manner that will prevent it from actuating is typically detected only through subsequent attempted actuation of the crossfeed valve for fuel balancing, or for crossfeed in the event of an engine failure. Therefore, the failure of the crossfeed valve is likely to remain undiscovered from the time of the failure until the next attempt at actuation. This latency period may occur during several flights in some operational situations, such as movement of an individual airplane to an ETOPS route when that airplane has previously been operated on non-ETOPS routes. That operational situation and the associated latency period increases the likelihood that the crossfeed valve on that airplane will fail when the next attempt is made to actuate the crossfeed valve. An operational check of the crossfeed valve immediately prior to each ETOPS flight (the flights where the ability to open the crossfeed valve may be critical) is a practical measure to minimize the likelihood that the crossfeed valve will fail to open if needed, and to ensure that

the flight is started with an operative crossfeed valve.

The addition of a second crossfeed valve provides redundancy that the FAA determined in the past was an acceptable substitute for a preflight operational check, and that also could allow for dispatch with one crossfeed valve inoperative. However, since that time the FAA has determined that when an airplane is operated with a crossfeed valve (or a fuel balancing system) under the MEL, it should be operated with the same crossfeed valve operational check requirement as an airplane with a single crossfeed valve configuration, for the same reason that the preflight operational check is required for an airplane with a single crossfeed valve configuration. Therefore, the AD has not been changed in this regard.

Request To Correct Errors in Figure 10

Boeing, UAL, All Nippon Airways (ANA), and Captain David Stewart (Captain Stewart) asked that the language specified in figure 10 to paragraph (m) of the proposed AD be corrected to reflect that the allowed MMEL dispatch relief in that figure is for the fuel balance system instead of the crossfeed valve. UAL listed four specific MMEL provisions (specified in paragraphs (m)(1) through (4) of this AD) that are for various inoperative components or systems that cause the fuel balance system to be inoperative. Boeing and ANA stated that the figure should be revised to reflect that if the crossfeed valve fails to open, the FUEL CROSSFEED advisory message will not be displayed until 15 seconds after crossfeed is selected ON. Captain Stewart stated that the language in figure 10 to paragraph (m) of the proposed AD is erroneous and should have stated ''Before the next ETOPS departure after the Fuel Balance Switch is determined to be inoperative . . . .''

The FAA agrees with the commenters' requests for the reasons provided. Figure 10 to paragraph (m) of this AD has been revised to correct the errors noted by the commenters.

Request To Revise the MMEL Operational Check Requirements

United Airlines MEL Engineering asked that the MMEL operational check requirements in figure 4 to paragraph (h)(2) of the proposed AD, figure 6 to paragraph (i)(2) of the proposed AD, figure 7 to paragraph (j) of the proposed AD, and figure 8 to paragraph (k) of the proposed AD be revised to allow the use of either the ''VALVE'' light that is integral to the crossfeed valve switch, or the associated engine indication and crew alerting system (EICAS) message for the preflight operational check. UAL stated that if the ''VALVE'' light is inoperative, it would be unable to perform the check. UAL noted that MMEL relief is provided for the crossfeed valve lights.

The FAA does not agree with the commenter's request to perform the check using the ''FWD/AFT FUEL CROSSFEED'' EICAS message because there are certain crossfeed valve actuator failure modes that can cause the crossfeed valve to remain closed without the ''FWD/AFT FUEL CROSSFEED'' EICAS message being displayed. Short of directly observing the valve actuator, monitoring the VALVE light to verify that the crossfeed valve actually transitioned from closed to open is the only way to verify from the flight deck that the crossfeed valve transitioned to the open position. While MMEL relief is provided for the VALVE light, that relief is subject to the provision that the crossfeed valve is verified to operate correctly.

The FAA does agree to allow an alternative procedure that is effective if the ''VALVE'' light is inoperative, because it is possible to perform an operational check of the crossfeed valve by directly observing the movement of the actuator if the ''VALVE'' light is inoperative. The FAA has revised the referenced figures in this AD accordingly.

Request To Revise Crossfeed Valve Operational Check

The Air Line Pilots Association, International (ALPA), Allied Pilots Association (APA), and Captain Stewart asked for revisions to the operational checks specified in the proposed AD. Captain Stewart asked that certain crossfeed valve actions in the proposed AD be changed to require one of the following: (1) Performing the crossfeed valve operational check in flight, prior to entering the ETOPS segment of the flight, and diverting the airplane to a suitable airport if the check fails, or (2) opening the crossfeed valve prior to entry into the ETOPS segment, leaving the crossfeed valve open throughout the ETOPS segment, and diverting the airplane to a suitable airport if the valve fails to open. Captain Stewart pointed out that operation with the crossfeed valve open for the duration of the ETOPS portion of the flight was proven effective at a major airline.

ALPA, while supporting the inclusion of an operational check prior to dispatch of ETOPS flights, stated that since the action in the proposed AD is not directed at a specific crossfeed valve failure mode, and is instead intended to identify and minimize the exposure to any crossfeed valve failure mode, it is important to check the crossfeed valve in its normal operating environment during flight. ALPA therefore requested that the proposed AD be revised to include an AFM requirement for airplanes with only one crossfeed valve, and a MEL requirement for airplanes with two crossfeed valves, for an operational check of the crossfeed valve during cruise, prior to the entering ETOPS airspace.

APA had no objection to the steps for checking the crossfeed valve operation, using the procedure recommended by the original equipment manufacturer (OEM). APA recommended checking the crossfeed valve immediately prior to the ETOPS segment of the flight where its operation has the potential to be critical.

The FAA does not agree with the commenters' requests. Although the agency agrees that operationally checking the crossfeed valve immediately prior to entering the critical ETOPS portion of each ETOPS flight would provide a greater reduction in the risk that a crossfeed valve will fail to open in the fuel-critical phase of flight should an engine failure occur, it would also significantly increase the costs associated with each discovered failure of a crossfeed valve. The cost of an air turn-back or diversion is significantly higher than the cost of a delay for maintenance, and is likely to be greater than the cost of a flight cancellation. The FAA considered the additional costs that would be incurred by operators from an air turn-back or diversion each time a crossfeed valve fails its check, and also considered the additional reduction in exposure to latent crossfeed valve failures that develop between the time of a preflight check and the time of an ETOPS entry check. As a result of these considerations, the FAA determined that the incremental reduction in exposure to the development of a latent crossfeed valve failure due to checking the crossfeed valve in-flight prior to entry into the critical ETOPS portion of the flight, when the low probability of an engine failure is also considered, did not justify imposing those significant additional operational costs and service disruptions on affected operators.

Before the NPRM was published, the FAA discussed with Boeing the value of conducting the crossfeed valve operational check during flight under cold soak conditions (which are part of the normal operating environment), versus performing the check on the ground. As a result of some of the comments on the NPRM, the agency discussed this issue again with Boeing, and placed a record of that discussion

in the public rulemaking docket. Boeing stated that the valve actuator failure modes identified by other commenters that result in actuator failures only in cold soak conditions have been corrected in newer designs. Boeing further stated that the previous valve actuator configurations that had those issues are no longer in service. Boeing added that it had no reason to believe that a check of the current in-service crossfeed valves under cold, in-flight conditions would detect failures that would not be detected on the ground.

In addition, the FAA does not agree with the request to require operation with the crossfeed valve open throughout the ETOPS segment of flight. While operation in that configuration would prevent the need to open the crossfeed valve in the event of an engine failure, there are other failure scenarios (such as a large fuel leak or contamination of one main tank) where operating with the crossfeed valve open compromises the intended isolation and independence of the fuel system for each engine. Also, differences in fuel pump performance could cause the need for repeated switching off and on of fuel pumps to maintain balanced main tanks. The FAA considers this undesirable because a flight crew error could put one or both engines on suction feed, potentially causing engine flameout. It would also add start/stop cycles on the fuel pumps, which could cause additional pump failures. Such a procedure is not recommended or approved by either Boeing or the FAA. Finally, that procedure violates the required fuel usage procedures in the limitations section of the FAA-approved AFMs for all of the affected airplane models, which require the airplane to be operated with the crossfeed valve closed except when it is specifically required to be open for crossfeeding to maintain balanced main tanks or for a low fuel condition. Therefore, that procedure would also violate 14 CFR 91.9, which requires operators to operate aircraft in accordance with their applicable AFM limitations, unless a revised AFM was approved. In light of all these factors, the AD has not been changed in this regard.

Request To Change MMEL-Related Requirements

Captain Stewart recommended that the proposed AD be revised to require an MMEL revision with clearly written provisions that identify the appropriate verification to confirm that no latent faults exist. Captain Stewart added that there is no benefit in mandating specific (M) & (O) procedures in the proposed AD, because it would cause an unnecessary administrative burden. Captain Stewart concluded that MELs published without the adequate (M) & (O) procedures indicates a failure of the MEL review/approval process at the flight standards district office (FSDO) or certificate management office (CMO) level.

The FAA infers that the commenter is requesting that the MEL entries for operation with an inoperative crossfeed valve or fuel balancing system (for Model 787 airplanes) state the requirement for and objectives of the MEL maintenance and operational requirements, rather than mandating specific maintenance or operational procedures. The FAA does not agree with the commenter's request. In this case, there are various ways that the operational or maintenance check can be done, some of which would not detect all of the possible crossfeed valve failure modes. Therefore, the FAA has determined that the agency should maintain control over the operational and maintenance check procedures used. Operators may, however, apply for an AMOC in accordance with paragraph (o) of this AD, provided they can show that their proposed alternative operational or maintenance procedures adequately address the unsafe condition. The AD has not been changed in this regard.

Request To Exempt Certain Airplanes

FedEx asked that the proposed AD be revised to exclude airplanes that are not used for ETOPS operations from the proposed requirement to revise the existing AFM and MEL. Specifically, FedEx requested that paragraphs (h), (i), (j), and (k) of the proposed AD be revised to add ''Airplanes that are not used for ETOPS operations are exempt from the requirements of this paragraph.'' FedEx stated that the proposed AD does not allow for exemption of affected fleets that are not certified or utilized for ETOPS operations. FedEx reported that its fleets include the types of airplanes affected by the proposed AD, but that only its Model 777F airplanes are certified for ETOPS operations.

The FAA does not agree with the commenter's request. The addition of the language proposed by the commenter is not sufficient to ensure that the existing AFM and MEL will be updated as required by this AD if there is an operational change in the future. However, operators may apply for an AMOC in accordance with paragraph (o) of this AD, provided they submit a proposal that (1) describes how the operator will ensure that future introduction of ETOPS operations includes the required AFM and MEL changes and (2) is supported by its FAA POI. The AD has not been changed in this regard.

Request To Clarify Instructions for Operational Check

FedEx and Japan Airlines (JAL) asked that the language in figure 8 to paragraph (k) of the proposed AD be revised to include instructions for a fuel crossfeed valve operational check including ''steps on the ground prior to engine start.'' The commenters requested that ''prior to engine start'' be changed to ''prior to each flight.'' FedEx stated that this language should be clarified given that the intent of the proposed AD is to prevent fuel in the main tank associated with the failed engine from being unavailable to the remaining operative engine, potentially resulting in a forced off-airport landing. JAL stated that the time for performing the operational check in the proposed AD is more restrictive than that in the MMEL. JAL added that since both are the same action, that compliance time should be the same.

The FAA acknowledges the commenters' concerns regarding potential misunderstanding of when to perform the operational check, and agree that clarification is necessary. The FAA infers that FedEx found that figure 8 to paragraph (k) of this AD was not sufficiently clear that the operational check is intended to be performed prior to each flight. The FAA presumes that FedEx's concern is that an operator might perform the operational check only once prior to the first engine start after placing the other inoperative crossfeed valve on MEL relief, but not prior to subsequent flights on the MEL. The intent of the procedure is that an operational check of the crossfeed valve be performed, by maintenance personnel or flightcrew, immediately prior to each ETOPS flight, as was stated in the ''Proposed AD Requirements'' section of the NPRM.

The FAA disagrees with using the specific language proposed by FedEx because its language would not alleviate the confusion about the intent of the requirement, and might be interpreted as allowing the check to be performed at any time prior to flight, as opposed to immediately prior to each flight. Although the comment from FedEx requested a change to figure 8 to paragraph (k) of this AD, which provides the required MEL revision for the Model 767, the FAA is satisfied that the MEL language in figure 7 to paragraph (j) of this AD, figure 8 to paragraph (k) of this AD, figure 9 to paragraph (l) of this AD, and figure 10

to paragraph (m) of this AD is clear with respect to the intended timing of performing the crossfeed valve operational check.

The general intent of operational procedures in the existing MEL is that they are associated with each flight conducted with the inoperative equipment. However, the comments provided caused the agency to reconsider whether the corresponding language in the AFM revisions required for airplanes equipped with single crossfeed valves are sufficiently clear regarding the intended timing for the check. In light of this, figure 1 to paragraph (g)(1) of this AD, figure 3 to paragraph (h)(1) of this AD, and figure 5 to paragraph (i)(1) of this AD of this AD have been revised to clarify the AFM limitations on airplanes equipped with a single crossfeed valve. However, the language in other figures, including figure 8 to paragraph (k) of this AD, have not been changed.

Request To Change Time for Performing Operational Check

DAL asked that the time for performing the operational check be changed to the last hour of the cruise flight, instead of prior to each ETOPS flight. DAL stated that solder joint cracks at the connectors and electronic assembly could cause intermittent or hard fault failure of the motor-operated crossfeed valves (MOVs) that is difficult to detect during the ground test prior to each ETOPS flight. DAL added that a cold soak test at the end of the cruise flight will better detect intermittent MOV failures than a test performed on the ground.

The FAA does not agree with the commenter's request. At the FAA's request, Boeing examined the commenter's statements, and Boeing provided comments. A record of the phone conversation in which Boeing provided its comments was placed in the public rulemaking docket for this AD. Boeing stated that the valve actuator failure modes described by DAL that tended to occur in cold conditions were successfully addressed by design improvements, and that the valve actuator configurations that were susceptible to failures that could only be detected in cold conditions have been replaced on operational aircraft and are no longer in service. Boeing added that its more recent failure data shows that the timing of failures is random, and that the ability to detect a failed crossfeed valve is no longer significantly impacted by environmental conditions during the operational check.

As previously discussed, the FAA has determined that the greatest practical reduction in risk during operation with a single operational crossfeed valve would be achieved by requiring the operational check as close as possible to the beginning of the fuel-critical ETOPS portion of the flight. However, as noted, the impact of requiring the operational check in flight, just prior to entry into the ETOPS portion of the flight, would cause a significant number of air turn-backs and diversions at significant cost, so the FAA, with agreement from Boeing, proposed the check requirement for immediately prior to each ETOPS flight. Therefore, this AD has not been changed in this regard.

Request To Reduce Compliance Time

ALPA asked that the compliance time be reduced from 120 to 90 days. ALPA stated that the proposed AD would not require extensive, one-time maintenance actions on affected airplanes, but only revision of existing AFM and MEL actions, thus the commenter recommended a shorter compliance time.

The FAA does not agree with the commenter's request. In conjunction with Boeing, the FAA has determined that the compliance time for each airplane model will accommodate the time necessary to accomplish the actions required by this AD and maintain an adequate level of safety. In addition, the suggested compliance time change would alter the requirements of this AD, so additional rulemaking would be required, ultimately delaying issuance of the AD. The FAA finds that delaying this action further is inappropriate in light of the identified unsafe condition. However, if additional data are presented that would justify a shorter compliance time, the FAA may consider further rulemaking on this issue. The AD has not been changed in this regard.

Request To Add Airplanes to Applicability

American Airlines asked that Model 737–7, –8, and –9 (MAX) airplanes be added to the applicability of the proposed AD. American Airlines stated that the design on these airplanes is similar to that of the Model 737 Classic and Next Gen airplanes.

The FAA does not agree with the request. Although the commenter is correct about the similar design, this unsafe condition was identified at the time of certification of the 737 MAX airplanes as a planned airworthiness directive against the existing Model 737 airplanes. Therefore, Boeing included the requirement for the operational check of the crossfeed valve required by this AD in the FAA-approved AFM for the 737 MAX airplanes. The AD has not been changed in this regard.

Engineering Oversight

Captain Stewart and APA stated that it is an engineering oversight that new production ETOPS airplanes are being certificated with only one fuel crossfeed valve installed.

The FAA acknowledges the commenter's concern about the risk associated with two-engine ETOPS airplanes that depend on a single active component to allow the remaining engine to access all of the remaining fuel on board after an engine failure. However, the allowance for such designs was not an engineering oversight, but a result of how the initial 120-minute ETOPS type-design standards were developed with existing airplanes in mind, of the later 180-minute ETOPS type-design standards being developed based on the 120-minute standards, and of conscious decision making by Boeing and the FAA associated with AD 88–21–03 R1 (which applies to certain Airbus Model A300 and A310–200 series airplanes, and Boeing Model 737–200, 737–300, 757–200, 767–200, and 767–300 series airplanes) and certification of the Model 737–700 airplane. Discussion of the potential need for improvements to airworthiness standards is outside the scope of the actions required by this AD. Therefore, the AD has not been changed in this regard.

Report of Incident

Commenter Amirul Ismail provided what appears to be a pilot report of an instance where an operational check of the crossfeed valve on a Model 737–800 airplane resulted in the VALVE light failing to extinguish. The incident appears to be an indication-related fault rather than a valve actuator failure. No change to the final rule has been made.

Conclusion

The FAA reviewed the relevant data, considered the comments received, and determined that air safety and the public interest require adopting this final rule with the changes described previously and minor editorial changes. The FAA has determined that these minor changes:

- Are consistent with the intent that was proposed in the NPRM for addressing the unsafe condition; and
- Do not add any additional burden upon the public than was already proposed in the NPRM.

The FAA also determined that these changes will not increase the economic burden on any operator or increase the scope of this final rule.

Costs of Compliance

The FAA estimates that this AD affects 3,252 airplanes of U.S. registry. The FAA estimates the following costs to comply with this AD:

ESTIMATED COSTS

Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
AFM Revision (2,127 airplanes)	1 work-hour × $85 per hour = $85	$0	$85	$180,795
MEL Revision (1,125 airplanes)	1 work-hour × $85 per hour = $85	0	85	95,625

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.

The FAA is 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.

This AD is issued in accordance with authority delegated by the Executive Director, Aircraft Certification Service, as authorized by FAA Order 8000.51C. In accordance with that order, issuance of ADs is normally a function of the Compliance and Airworthiness Division, but during this transition period, the Executive Director has delegated the authority to issue ADs applicable to transport category airplanes and associated appliances to the Director of the System Oversight Division.

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) Will not affect intrastate aviation in Alaska, 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.

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 airworthiness directive (AD):

2019–19–10 The Boeing Company: Amendment 39–19746; Docket No. FAA–2017–1024; Product Identifier 2017–NM–065–AD.

(a) Effective Date

This AD is effective January 16, 2020.

(b) Affected ADs

This AD affects AD 88–21–03 R1, Amendment 39–6077 (53 FR 46605, November 18, 1988) (''AD 88–21–03 R1'').

(c) Applicability

This AD applies to all The Boeing Company airplanes, certificated in any category, identified in paragraphs (c)(1) through (5) of this AD.

(1) Model 737–300, –400, –500, –600, –700, –700C, –800, –900, and –900ER series airplanes.

(2) Model 757–200, –200PF, –200CB, and –300 series airplanes.

(3) Model 767–200, –300, –300F, and –400ER series airplanes.

(4) Model 777–200, –200LR, –300, –300ER, and –777F series airplanes.

(5) Model 787–8 and 787–9 airplanes.

(d) Subject

Air Transport Association (ATA) of America Code 28; Fuel.

(e) Unsafe Condition

This AD was prompted by reports of fuel crossfeed valves failing to open when activated during flight. The FAA is issuing this AD to prevent an airplane from being dispatched on an extended operations (ETOPS) flight with a single fuel crossfeed valve (due to design or due to minimum equipment list (MEL) dispatch of a dual crossfeed valve equipped airplane with one crossfeed valve inoperative) that cannot be opened or a fuel balancing system that cannot properly operate when activated. This condition could cause the fuel in the main tank associated with a failed engine to be unavailable to the remaining operative engine, potentially resulting in a forced off airport landing due to exhaustion of the remaining usable fuel and consequent loss of all engine thrust.

(f) Compliance

Comply with this AD within the compliance times specified, unless already done.

(g) AFM Revisions for Model 737 Airplanes Equipped With a Single Fuel Crossfeed Valve

For airplanes identified in paragraph (c)(1) of this AD: Within 120 days after the effective date of this AD, do the actions specified in paragraphs (g)(1) and (2) of this AD.

(1) Revise the ''Extended Range Operations'' subsection of the ''Fuel System Limitations'' section of the Section 1 Certificate Limitations of the existing airplane flight manual (AFM) by incorporating the information specified in figure 1 to paragraph (g)(1) of this AD. This may be done by inserting a copy of this AD into the existing AFM. When a statement identical to that in figure 1 to paragraph (g)(1) of this AD has been included in the ''Extended Range Operations'' subsection of the ''Fuel System Limitations'' section of the Section 1 Certificate Limitations of the general revisions of the existing AFM, the general revisions may be inserted into the existing AFM, and the copy of this AD may be removed from the existing AFM.

Figure 1 to paragraph (g)(1) – *Model 737 AFM Section 1 Revision*

Fuel Crossfeed Valve Operational Check for Airplanes with a Single Crossfeed Valve (Required by AD 2019-19-10)

Prior to each extended operations (ETOPS) flight, an operational check of the fuel crossfeed valve must be performed. This check must be performed by the flight crew prior to each ETOPS flight as part of the pre-flight procedure for each specific extended range flight, or by the maintenance crew no earlier than one hour prior to the flight crew boarding the aircraft for the purpose of flight.

(2) Revise the ''Extended Range Operations'' section of the Section 3 Normal Procedures of the existing AFM by incorporating the information specified in figure 2 to paragraph (g)(2) of this AD. This may be done by inserting a copy of this AD into the existing AFM. When a statement identical to that in figure 2 to paragraph (g)(2) of this AD has been included in the ''Extended Range Operations'' section of Section 3 Normal Procedures of the existing AFM, the general revisions may be inserted into the existing AFM, and the copy of this AD may be removed from the existing AFM.

Figure 2 to paragraph (g)(2) – *Model 737 AFM Section 3 Revision*

Extended Range Operations (Required by AD 2019-19-10)

Fuel Crossfeed Valve Operational Check

Unless accomplished by maintenance personnel as part of preparing the airplane for the specific ETOPS flight, do the following steps on the ground prior to engine start.

Crossfeed selector……..Open
Verify that the VALVE OPEN light illuminates bright, then dim

Crossfeed selector……..Closed
Verify that the VALVE OPEN light illuminates bright, then extinguishes

(h) AFM Revisions for Model 757 Airplanes Equipped With a Single Fuel Crossfeed Valve

For airplanes identified in paragraph (c)(2) of this AD having line numbers 1 through 518 inclusive, on which the actions specified in Boeing Service Bulletin 757–28–0029 (second fuel crossfeed valve installation) have not been done: Within 120 days after the effective date of this AD, do the actions specified in paragraphs (h)(1) and (2) of this AD. For Model 757 airplanes identified in this paragraph, if the actions specified in Boeing Service Bulletin 757–28–0029 have been done, the actions specified in this paragraph are no longer required for that airplane and the actions specified in paragraph (j) of this AD must be done before further flight after the actions specified in Boeing Service Bulletin 757–28–0029 have been performed.

(1) Revise the ''Extended Range Operations'' section of the Section 1 Certificate Limitations of the existing AFM by incorporating the information specified in figure 3 to paragraph (h)(1). This may be done by inserting a copy of this AD into the existing AFM. When a statement identical to that in figure 3 to paragraph (h)(1) of this AD has been included in the ''Extended Range Operations'' section of the Section 1 Certificate Limitations of the general revisions of the existing AFM, the general revisions may be inserted into the existing AFM, and the copy of this AD may be removed from the existing AFM.

Figure 3 to paragraph (h)(1) – *Model 757 AFM Section 1 Revision*

Fuel Crossfeed Valve Operational Check for Airplanes with a Single Crossfeed Valve (Required by AD 2019-19-10)

Prior to each extended operations (ETOPS) flight, an operational check of the fuel crossfeed valve must be performed. This check must be performed by the flight crew prior to each ETOPS flight as part of the pre-flight procedure for each specific extended range flight, or by the maintenance crew no earlier than one hour prior to the flight crew boarding the airplane for the purpose of flight.

(2) Revise the ''Extended Range Operations'' section of Section 3 Normal Procedures of the existing AFM by incorporating the information specified in figure 4 to paragraph (h)(2) of this AD. This may be done by inserting a copy of this AD into the existing AFM. When a statement identical to that in figure 4 to paragraph (h)(2) of this AD has been included in the ''Extended Range Operations'' section of Section 3 Normal Procedures of the existing AFM, the general revisions may be inserted into the existing AFM, and the copy of this AD may be removed from the existing AFM.

Figure 4 to paragraph (h)(2) – *Model 757 AFM Section 3 Revision*

Fuel Crossfeed Valve Operational Check (Required by AD 2019-19-10)

Unless accomplished by maintenance personnel as part of preparing the airplane for the specific ETOPS flight, do the following steps on the ground prior to engine start.

Crossfeed selector……..ON
Verify that the VALVE light illuminates, then extinguishes

Crossfeed selector……..OFF
Verify that the VALVE light illuminates, then extinguishes

If the VALVE light is inoperative, it is acceptable to have ground personnel verify by direct observation the opening and closing of the crossfeed valve during this procedure.

(i) AFM Revisions for Model 767 Airplanes Equipped With a Single Fuel Crossfeed Valve

For airplanes identified in paragraph (c)(3) of this AD having line numbers 1 through 430 inclusive on which the actions specified in Boeing Service Bulletin 767–28–0034 (second fuel crossfeed valve installation) have not been done as of the effective date of this AD: Within 120 days after the effective date of this AD, do the actions specified in paragraphs (i)(1) and (2) of this AD. For airplanes on which the actions specified in Boeing Service Bulletin 767–28–0034 have been done, the actions specified in this paragraph are no longer required for that airplane and the actions specified in paragraph (k) of this AD must be done before further flight.

(1) Revise the ''Extended Range Operations'' section of the Section 1 Certificate Limitations of the existing AFM by incorporating the information specified in figure 5 to paragraph (i)(1) of this AD. This may be done by inserting a copy of this AD into the existing AFM. When a statement identical to that in figure 5 to paragraph (i)(1) of this AD has been included in the ''Extended Range Operations'' section of the Section 1 Certificate Limitations of the general revisions of the existing AFM, the general revisions may be inserted into the existing AFM, and the copy of this AD may be removed from the existing AFM.

Figure 5 to paragraph (i)(1) – *Model 767 AFM Section 1 Revision*

Fuel Crossfeed Valve Operational Check for Airplanes with a Single Crossfeed Valve (Required by AD 2019-19-10)

Prior to each extended operations (ETOPS) flight, an operational check of the fuel crossfeed valve must be performed. This check must be performed by the flight crew prior to each ETOPS flight as part of the pre-flight procedure for each specific extended range flight, or by the maintenance crew no earlier than one hour prior to the flight crew boarding the airplane for the purpose of flight.

(2) Revise the ''Extended Range Operations'' section of Section 3.1 Normal Procedures of the existing AFM by incorporating the information specified in figure 6 to paragraph (i)(2) of this AD. This may be done by inserting a copy of this AD into the existing AFM. When a statement identical to that in figure 6 to paragraph (i)(2) of this AD has been included in the ''Extended Range Operations'' section of Section 3.1 Normal Procedures of the existing AFM, the general revisions may be inserted into the existing AFM, and the copy of this AD may be removed from the existing AFM.

Figure 6 to paragraph (i)(2) – *Model 767 AFM Section 3.1 Revision*

Fuel Crossfeed Valve Operational Check (Required by AD 2019-19-10)

Unless accomplished by maintenance personnel as part of preparing the airplane for the specific ETOPS flight, do the following steps on the ground prior to engine start.

Crossfeed selector……..ON
Verify that the VALVE light illuminates, then extinguishes

Crossfeed selector……..OFF
Verify that the VALVE light illuminates, then extinguishes

If the VALVE light is inoperative, it is acceptable to have ground personnel verify by direct observation the opening and closing of the crossfeed valve during this procedure.

(j) MEL Revisions for Model 757 Airplanes Equipped With Dual Fuel Crossfeed Valves

For airplanes identified in paragraph (c)(2) of this AD having line numbers 519 and subsequent; and for airplanes identified in paragraph (c)(2) of this AD having line numbers 1 through 518 inclusive, on which a second fuel crossfeed valve has been installed, as specified in Boeing Service Bulletin 757–28–0029: Within 120 days after the effective date of this AD, revise the operator's existing FAA-approved MEL by incorporating the information specified in figure 7 to paragraph (j) of this AD as a required operations procedure when dispatching for ETOPS operation with an inoperative fuel crossfeed valve. Specific alternative MEL wording to accomplish the actions specified in figure 7 to paragraph (j) of this AD can be approved by the operator's principal operations inspector (POI).

Figure 7 to paragraph (j) – *Model 757 MEL Revision*

Fuel Crossfeed Valve Operational Check (Required by AD 2019-19-10)

Unless accomplished by maintenance personnel as part of preparing the airplane for the specific ETOPS flight, do the following steps on the ground prior to engine start.

Crossfeed selector……..ON
Verify that the VALVE light illuminates, then extinguishes

Crossfeed selector……..OFF
Verify that the VALVE light illuminates, then extinguishes

If the VALVE light is inoperative, it is acceptable to have ground personnel verify by direct observation the opening and closing of the crossfeed valve during this procedure.

(k) MEL Revisions for Model 767 Airplanes Equipped With Dual Fuel Crossfeed Valves

For airplanes identified in paragraph (c)(3) of this AD having line numbers 431 and subsequent; and for airplanes identified in paragraph (c)(3) of this AD having line numbers 1 through 430 inclusive on which a second fuel crossfeed valve has been installed, as specified in Boeing Service Bulletin 767–28–0034: Within 120 days after the effective date of this AD, revise the operator's existing FAA-approved MEL by incorporating the information specified in figure 8 to paragraph (k) of this AD as a required operations procedure when dispatching for ETOPS operation with an inoperative fuel crossfeed valve. Specific alternative MEL wording to accomplish the actions specified in figure 8 to paragraph (k) of this AD can be approved by the operator's POI.

Figure 8 to paragraph (k) – *Model 767 MEL Revision*

Fuel Crossfeed Valve Operational Check (Required by AD 2019-19-10)

Unless accomplished by maintenance personnel as part of preparing the airplane for the specific ETOPS flight, do the following steps on the ground prior to engine start.

Crossfeed selector……..ON
Verify that the VALVE light illuminates, then extinguishes

Crossfeed selector……..OFF
Verify that the VALVE light illuminates, then extinguishes

If the VALVE light is inoperative, it is acceptable to have ground personnel verify by direct observation the opening and closing of the crossfeed valve during this procedure.

(l) MEL Revisions for Model 777 Airplanes

For airplanes identified in paragraph (c)(4) of this AD: Within 120 days after the effective date of this AD, revise the operator's existing FAA-approved MEL by incorporating the information specified in figure 9 to paragraph (l) of this AD as a required operations procedure when dispatching for ETOPS operation with an inoperative fuel crossfeed valve. Specific alternative MEL wording to accomplish the actions specified in figure 9 to paragraph (l) of this AD can be approved by the operator's POI.

Figure 9 to paragraph (l) – *Model 777 MEL Revision*

Fuel Crossfeed Valve Operational Check (Required by AD 2019-19-10)

Before each departure, perform the following fuel crossfeed valve check:

1. Position operative crossfeed valve on and verify associated FUEL CROSSFEED AFT or FWD advisory message does not display.

2. Position operative crossfeed valve off and verify associated FUEL CROSSFEED AFT or FWD advisory message does not display.

(m) MEL Revisions for Model 787 Airplanes

For airplanes identified in paragraph (c)(5) of this AD: Within 120 days after the effective date of this AD, revise the operator's existing FAA-approved MEL by incorporating the information specified in figure 10 to paragraph (m) of this AD into the MEL requirements for each of the inoperative items specified in paragraphs (m)(1) through (4) of this AD. Specific alternative MEL wording to accomplish the actions specified in figure 10 to paragraph (m) of this AD can be approved by the operator's POI.

(1) 28–21–01–01 Pressure Refueling System, Main Tank Inboard Refuel Valve.

(2) 28–22–06 Fuel Balance Switch.

(3) 28–26–01 Defuel/Isolation Valves.

(4) 28–41–01–01 Main Tank Fuel Quantity Indication Systems.

Figure 10 to paragraph (m) – *Model 787 MEL Revision*

(Required by AD 2019-19-10)

Before the first ETOPS departure after the (insert the name of the applicable dispatch relief item identified in paragraphs (m)(1) through (m)(4) of AD 2019-19-10) is determined to be inoperative, perform the following maintenance (M) procedure prior to flight. If the item remains inoperative, this maintenance procedure is not required on subsequent ETOPS departures if the crossfeed valve operated normally on the operations (O) pre-flight check.

MAINTENANCE (M)
Verify crossfeed valve operates normally.

1. Gain access to the crossfeed valve in the main gear wheel well.

2. Set Fuel Control Panel (P5) CROSSFEED switch to ON and visually confirm the valve drive moves from the closed (C) position to the open (O) position.

3. Set Fuel Control Panel (P5) CROSSFEED switch to OFF and visually confirm the valve drive moves from the open (O) position to closed (C) position.

Before each ETOPS flight conducted with this item inoperative, perform the following operational check as part of the pre-flight check of the airplane. This check may be performed by either the flight crew or ground crew.

OPERATIONS (O)
1. Prior to each flight, verify crossfeed valve operates normally.

A. Set Fuel Control Panel (P5) CROSSFEED switch to ON and after 15 seconds confirm FUEL CROSSFEED advisory message does not display.

B. Set Fuel Control Panel (P5) CROSSFEED switch to OFF and after 15 seconds confirm FUEL CROSSFEED advisory message does not display.

2. For fuel balancing, do the FUEL BALANCE SYS Non-Normal Checklist.

(n) AD 88–21–03 R1 AFM Limitation Removal

After the applicable AFM limitations specified in paragraphs (g)(1), (h)(1), and (i)(1) of this AD are incorporated into an airplane's existing AFM, operators may remove the AFM limitation required by AD 88–21–03 R1, for that airplane.

(o) Alternative Methods of Compliance (AMOCs)

(1) The Manager, Seattle ACO Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the certification office, send it to the attention of the person identified in paragraph (p) of this AD. Information may be emailed to: *9-ANM-Seattle-ACO-AMOC-Requests@faa.gov.*

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

(3) An AMOC that provides an acceptable level of safety may be used for any repair, modification, or alteration required by this AD if it is approved by The Boeing Company Organization Designation Authorization (ODA) that has been authorized by the Manager, Seattle ACO Branch, FAA, to make those findings. To be approved, the repair method, modification deviation, or alteration deviation must meet the certification basis of the airplane, and the approval must specifically refer to this AD.

(p) Related Information

For more information about this AD, contact Jon Regimbal, Aerospace Engineer, Propulsion Section, FAA, Seattle ACO Branch, 2200 South 216th St., Des Moines, WA 98198; phone and fax: 206–231–3557; email: *Jon.Regimbal@faa.gov.*

(q) Material Incorporated by Reference

None.

Issued in Des Moines, Washington, on October 3, 2019.

Michael Kaszycki,

Acting Director, System Oversight Division, Aircraft Certification Service.

[FR Doc. 2019–26736 Filed 12–11–19; 8:45 am]

BILLING CODE 4910–13–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA–2019–0494; Product Identifier 2019–NM–051–AD; Amendment 39–19801; AD 2019–23–07]

RIN 2120–AA64

Airworthiness Directives; The Boeing Company Airplanes

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: The FAA is adopting a new airworthiness directive (AD) for certain The Boeing Company Model 787–8, 787–9, and 787–10 airplanes. This AD was prompted by reports that the nose landing gear (NLG) retracted on the ground, with weight on the airplane's wheels, due to the incorrect installation of an NLG downlock pin in the apex pin inner bore of the NLG lock link assembly. This AD requires installing an insert to prevent installation of the pin in the incorrect location. The FAA is issuing this AD to address the unsafe condition on these products.

DATES: This AD is effective January 16, 2020.

The Director of the Federal Register approved the incorporation by reference of a certain publication listed in this AD as of January 16, 2020.

ADDRESSES: For service information identified in this final rule, contact Boeing Commercial Airplanes, Attention: Contractual & Data Services (C&DS), 2600 Westminster Blvd., MC 110–SK57, Seal Beach, CA 90740–5600; telephone 562–797–1717; internet *https://www.myboeingfleet.com.* You may view this service information at the FAA, Transport Standards Branch, 2200 South 216th St., Des Moines, WA. For information on the availability of this material at the FAA, call 206–231–3195. It is also available on the internet at *https://www.regulations.gov* by searching for and locating Docket No. FAA–2019–0494.

Examining the AD Docket

You may examine the AD docket on the internet at *https://www.regulations.gov* by searching for and locating Docket No. FAA–2019–0494; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this final rule, the regulatory evaluation, any comments received, and other information. The address for Docket Operations is 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: Allen Rauschendorfer, Aerospace Engineer, Airframe Section, FAA, Seattle ACO Branch, 2200 South 216th St., Des Moines, WA 98198; phone and fax: 206–231–3528; email: *allen.rauschendorfer@faa.gov.*

SUPPLEMENTARY INFORMATION:

Discussion

The FAA issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 by adding an AD that would apply to certain The Boeing Company Model 787–8, 787–9, and 787–10 airplanes. The NPRM published in the **Federal Register** on July 23, 2019 (84 FR 35352). The NPRM was prompted by reports that the NLG retracted on the ground, with weight on the airplane's wheels, due to the incorrect installation of an NLG downlock pin in the apex pin inner bore of the NLG lock link assembly. The NPRM proposed to require installing an insert to prevent installation of the pin in the incorrect location.

The FAA is issuing this AD to address the NLG downlock pin being incorrectly installed in the apex pin inner bore of the NLG lock link assembly, which could result in the NLG retracting on the ground, possibly causing serious injuries to personnel and passengers and substantial damage to the airplane.

Comments

The FAA gave the public the opportunity to participate in developing this final rule. The following presents the comments received on the NPRM and the FAA's response to each comment.

Request To Revise Applicability of the Proposed AD

American Airlines (AAL) requested that the FAA revise the applicability of the AD to specify the affected part numbers of the NLG lock link assembly rather than the affected airplanes because the affected parts may be swapped between airplanes. AAL noted that paragraph A.2. of Boeing Requirements Bulletin B787–81205–SB320040–00 RB, Issue 001, dated March 12, 2019, specifies to identify, modify, and part mark the spares. AAL suggested that once the apex bin inner bore insert is installed in the NLG lock link assembly in production, the NLG lock link assembly part number should also change. AAL requested that, should the FAA not revise the applicability of the proposed AD to affected part numbers, the applicability of the proposed AD be revised to include all Model 787 airplanes rather than only the airplanes specified in Boeing Requirements Bulletin B787–81205–SB320040–00 RB, Issue 001, dated March 12, 2019. AAL asserted that the unsafe condition applies to all airplanes.

The FAA disagrees with the request to revise the applicability of this AD. This AD does not require operators to identify, modify, or part mark their spares. Paragraph (g) of this AD specifies to accomplish the actions in accordance with the Accomplishment Instructions of Boeing Requirements Bulletin B787–81205–SB320040–00 RB, Issue 001, dated March 12, 2019, and does not specify to accomplish actions in accordance with paragraph A.2. of Boeing Requirements Bulletin B787–81205–SB320040–00 RB, Issue 001, dated March 12, 2019. Therefore, the FAA has determined that it is appropriate for this AD to apply to Boeing Model 787–8, 787–9, 787–10 airplanes, line numbers 6 through 848 inclusive, as specified in Boeing Requirements Bulletin B787–81205–SB320040–00 RB, Issue 001, dated March 12, 2019. Only these airplanes need to have the apex bin inner bore insert installed in order to address the identified unsafe condition.

Regarding AAL's request to revise the applicability to all Model 787 airplanes, Boeing will incorporate the apex pin inner bore insert as part of the airplane type design at line number 849 and subsequent. At that time, the NLG lock link assembly will change part numbers, and the airplane type design will be changed as a result. If an operator installs an NLG lock link assembly of a different part number than what is defined as airplane type design, then the airplane would be out of compliance. Consequently, all airplanes will be required to have the apex pin inner bore insert installed in the NLG lock link assembly. No changes have been made to the applicability of this AD.