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## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

#### **14 CFR Part 39**

**[Docket No. FAA-2014-0194; Directorate Identifier 2014-NM-022-AD; Amendment 39-18266; AD 2015-19-03]**

**RIN 2120-AA64**

#### **Airworthiness Directives; The Boeing Company Airplanes**

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Final rule.

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**SUMMARY:** We are adopting a new airworthiness directive (AD) for all The Boeing Company Model 737-600, -700, -700C, -800, -900, and -900ER series airplanes. This AD was prompted by reports of latently failed fuel shutoff valves discovered during fuel filter replacement. This AD requires revising the maintenance or inspection program to include new airworthiness limitations. We are issuing this AD to detect and correct latent failures of the fuel shutoff valve to the engine, which could result in the inability to shut off fuel to the engine and, in case of certain engine fires, an uncontrollable fire that could lead to wing failure.

**DATES:** This AD is effective October 21, 2015.

#### **Examining the AD Docket**

You may examine the AD docket on the Internet at <http://www.regulations.gov> by searching for and locating Docket No. FAA-2014-0194; or in person at the Docket Management Facility between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this AD, the regulatory evaluation, any comments received, and other information. The address for the Docket Office (phone: 800-647-5527) is Docket Management Facility, U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE., Washington, DC 20590.

**FOR FURTHER INFORMATION CONTACT:** Rebel Nichols, Aerospace Engineer, Propulsion Branch, ANM-140S, FAA, Seattle Aircraft Certification Office, 1601 Lind Avenue SW., Renton, WA 98057-3356; phone: 425-917-6509; fax: 425-917-6590; email: [rebel.nichols@faa.gov](mailto:rebel.nichols@faa.gov).

## **SUPPLEMENTARY INFORMATION:**

### **Discussion**

We 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 737-600, -700, -700C, -800, -900, and -900ER series airplanes. The NPRM published in the Federal Register on April 14, 2014 (79 FR 20834). The NPRM was prompted by reports of latently failed fuel shutoff valves discovered during fuel filter replacement. The NPRM proposed to require revising the maintenance or inspection program to include new airworthiness limitations. We are issuing this AD to detect and correct latent failures of the fuel shutoff valve to the engine, which could result in the inability to shut off fuel to the engine and, in case of certain engine fires, an uncontrollable fire that could lead to wing failure.

### **Record of Ex Parte Communication**

In preparation of AD actions such as NPRMs and immediately adopted rules, it is the practice of the FAA to obtain technical information and information on operational and economic impacts from design approval holders and aircraft operators. We discussed certain comments addressed in this final rule in a teleconference with Airlines for America (A4A) and other members of the aviation industry. All of the comments discussed during this teleconference are addressed in this final rule in response to comments submitted by other commenters. A discussion of this contact can be found in the rulemaking docket at <http://www.regulations.gov> by searching for and locating Docket No. FAA-2014-0194.

### **Clarification of Certain Terminology**

Throughout the preamble of this final rule, commenters may have used the terms "fuel shutoff valve" and "fuel spar valve" interchangeably. Both terms refer to the same part. In our responses to comments, we have used the term "fuel shutoff valve." The term "fuel spar valve" is more commonly used in airplane maintenance documentation and, therefore, we have used that term in figure 1 to paragraph (g) of this AD.

### **Comments**

We gave the public the opportunity to participate in developing this AD. The following presents the comments received on the NPRM (79 FR 20834, April 14, 2014) and the FAA's response to each comment.

### **Request To Withdraw the NPRM (79 FR 20834, April 14, 2014)**

American Airlines (AA) requested that no further regulatory action be taken. AA stated that it has experienced only a small number of fuel shutoff valve actuator failures. AA stated that the combination of failures necessary to produce the catastrophic event described in the NPRM (79 FR 20834, April 14, 2014) includes fuel shutoff valve actuator failure, an erroneous position indication, and a fire in the engine compartment. AA also stated that risk analysis shows the probability of this combination occurring is in the improbable range of "10E-11 to 10E-16."

We disagree with commenter's request. We have determined that an unsafe condition exists that warrants an interim action until the manufacturer finishes developing a modification that will address the identified unsafe condition. We have determined that, without the required interim action, a significant number of flights with a fuel shutoff valve actuator that is failed in the open valve position will occur during the affected fleet life. If certain engine fire conditions were to occur, or if extreme engine damage were to occur, or if an engine separation event were to occur during flight, the crew

procedures for such an event would not stop the fuel flow to the engine strut and nacelle. The continued flow of fuel could cause an uncontrolled fire or lead to a fuel exhaustion event.

The FAA regulations require all transport airplanes to be fail safe with respect to engine fire events, and the risk due to severe engine damage events to be minimized. Therefore, we require, for each flight, sufficiently operative fire safety systems so that fires can be detected and contained, and that fuel to the engine strut and nacelle can be shut off in the event of an engine fire or severe damage.

The FAA airworthiness standards require remotely controlled powerplant valves to provide indications that the valves are in the commanded position. These indications allow the prompt detection and correction of valve failures. We do not allow dispatch with a known inoperative fuel shutoff valve. Therefore, we are proceeding with this final rule—not because of the higher-than-typical failure rate of the particular valve actuator involved, but instead because the fuel shutoff valve actuator can fail in a manner that also defeats the required valve position indication feature. That failure can lead to a large number of flights occurring on an airplane with a fuel shutoff valve actuator failed in the open position without the operator being aware of the failure. An airworthiness limitation containing required inspections is intended to limit the number of flights following latent failure of the fuel shutoff valve. We have not changed this AD in this regard.

### **Request for Inspection Relief**

AirDo, AA, All Nippon Airlines (ANA), Delta Airlines (DAL), Southwest Airlines (SWA), Transavia, and United Airlines (UAL) requested clarification of the daily check requirement. The commenters stated that the check applies to airplanes that are in operational revenue status. The commenters stated that the proposed AD (79 FR 20834, April 14, 2014) does not account for airplanes in routine maintenance or for an out-of-service condition.

We infer the commenters are requesting inspection relief for airplanes that are not in service. We agree with the commenters' request. It would be unnecessarily burdensome to require the inspections on airplanes that are not being used. We agree with limiting inspections to days when the airplane is in revenue service. In the Interval column of figure 1 to paragraph (g) of this AD, we have added a note to clarify that the operational check is not required on days when the airplane is not used in revenue service, but that the check must be done before further flight once the airplane is returned to revenue service.

### **Request To Limit the Applicability**

UAL requested that we revise the proposed AD (79 FR 20834, April 14, 2014) to limit the applicability specified in figure 1 to paragraph (g) of the proposed AD to airplanes with the valve actuators that have the identified unsafe condition. UAL stated the applicability applies to valve actuators having part number (P/N) MA30A1001. UAL stated that the problem does not apply to other existing actuator designs, and will not apply to future designs.

We agree with the commenter's request. It would be unnecessarily burdensome to require the inspections on airplanes that do not have any of the susceptible valves installed. We have added a note to the Applicability column in figure 1 to paragraph (g) of this AD to clarify that the limitations apply to Model 737-600, -700, -700C, -800, -900, and -900ER airplanes having actuator P/N MA20A2027 (Boeing P/N S343T003-56) or P/N MA30A1001 (Boeing P/N S343T003-66) installed at the engine fuel spar valve positions.

### **Request To Follow the Master Minimum Equipment List (MMEL) in Lieu of the Daily Check**

AA and Qantas Airways stated that if the master minimum equipment list (MMEL) is being used, then the daily check should be not required.

AA stated that the Boeing Model 737 MMEL item 28-22, "Fuel/Spar Valve Closed Lights," allows for the lights to be inoperative, provided the associated valve is verified to operate normally and the crossfeed VALVE OPEN light operates normally. AA stated that this item allows the lights to be inoperative for up to 10 days, and it requested that a provision be added to state that if this MMEL is being used, the daily check is not required.

Qantas Airways stated that if an airplane is dispatched under the MMEL for inoperative SPAR VALVE CLOSED light(s), then it is not possible to accomplish the proposed checks.

We partially agree with the commenters' request. We disagree with providing MMEL relief for an inoperative fuel shutoff valve indication because such relief could potentially allow the fuel shutoff valve to be inoperative for up to 10 days of revenue operation. However, we do agree to provide flexibility regarding verification that the fuel shutoff valve is operational. We have added item D. to figure 1 to paragraph (g) of this AD to specify a fourth option to perform daily inspections to verify that the fuel shutoff valve is closing.

### **Request To Clarify Recording Requirements**

Air Do, Ryanair, SWA, Transavia, UAL, and Darryl Voss requested that the FAA provide a more complete explanation of the requirements with regard to recording compliance.

Air Do stated that if the flightcrew performed the operational check, a maintenance record is usually not created. The commenter questioned whether this is acceptable, or whether the flightcrew should record it in the flight log.

Ryanair requested that the FAA explicitly state in the AD that the proposed actions may be performed by maintenance and/or flight operations checklists, and that the AD will not require the retention of maintenance or flight operations records to show compliance. Ryanair stated that due to the high frequency of the actions in the NPRM (79 FR 20834, April 14, 2014) and the large number of affected airplanes in its fleet (approximately 300), the creation, retention, and reforecasting of individual records for this activity is not practical.

Because of the high frequency of checks resulting from the proposed AD (79 FR 20834, April 14, 2014), compounded with the creation, distribution, and retention of the documentation of the checks, SWA requested that the FAA specifically state in the AD that when the daily check is performed successfully by flightcrews, no documentation is required. SWA also requested that the FAA specifically state in the AD that documentation (i.e., logbook entry or other type of defect report) is required only when a failure is detected by the flightcrew, or when the check is performed by maintenance personnel.

Transavia requested that, if the daily check remains, we revise the proposed AD (79 FR 20834, April 14, 2014) to state that the inclusion of the daily check requirement into a checklist is sufficient to show AD compliance and prevent unwanted paperwork, and that the daily check can be performed by either maintenance personnel or the flightcrew.

UAL asked whether the flightcrews will be required to record compliance of the operational checks and document each inspection. Darryl Voss requested that we revise the proposed AD (79 FR 20834, April 14, 2014) to remove the option to allow flightcrews to perform operational checks for maintenance. Mr. Voss stated that showing compliance with ADs is almost exclusively a maintenance function and should remain a maintenance function to provide compliance continuity.

We agree that clarification is necessary. This AD requires including the information in figure 1 of paragraph (g) of this AD in the maintenance or inspection program. However, this AD does not require accomplishing the actions specified in figure 1 of paragraph (g) of this AD. The actions specified in the figure in this AD are done, and remain enforceable, as part of the airworthiness limitations of the instructions for continued airworthiness (ICA). Section 14 CFR 43.11(a) of the Federal Aviation Regulations (14 CFR 43.11(a)) requires maintenance record entries for maintenance actions such as the required checks. If an operator elects to have a flightcrew member do the check in accordance with the applicable airworthiness limitation, that same action would be considered an operational task (not maintenance), and therefore 14 CFR 43.11(a) would not apply. In that case,

operators should follow their normal processes for operational activities, including necessary Principal Operations Inspector (POI) involvement. We have not changed this AD in this regard.

### **Request To Clarify Inspection Procedures for Operational Checks**

Boeing requested to add a flightcrew inspection procedure during engine start and engine shutdown. Boeing stated that this will provide common flight procedures and eliminate each operator creating its own test.

DAL requested that the preamble of the NPRM (79 FR 20834, April 14, 2014) be revised to match the rest of the requirements in the NPRM. DAL stated that if POI approval is required for flightcrews to accomplish operational checks, then the preamble should identify that flightcrews can only accomplish operational checks approved by the inspector. DAL stated that the preamble should not associate the operational check without engine start to only maintenance crews, and the operational checks while starting the engine or shutting down the engine to only flightcrews.

UAL requested that standardized procedures be established by the FAA aircraft certification office for the POI to approve on behalf of all affected operators.

We disagree with the commenter's request to add to this AD a method describing how maintenance actions and operations actions should be coordinated. The operational requirements are specified in figure 1 to paragraph (g) of this AD; how these requirements are captured in the operations processes to ensure that the maintenance action has been completed is likely different for each operator. As the commenter stated, flightcrews can only accomplish operational checks approved by the inspector. No change has been made to the final rule in this regard.

### **Request To Provide an Alternative to the Maintenance or Inspection Program Revision in Operational Documents**

DAL requested that the proposed AD (79 FR 20834, April 14, 2014) be revised to provide an option for revising the Boeing Model 737 "Airplane Normal Checklist" to specify accomplishment of one of the required operational checks (operational check during engine start, operational check during engine shutdown, or operational check without engine operations) as a "FIRST FLIGHT OF THE DAY" requirement as an alternative to the maintenance or inspection program revision specified in paragraph (g) of the proposed rule. DAL stated that this option would ensure that operational aircraft are inspected daily, provide clear responsibility to the flightcrew to accomplish the operational checks, and remove concern for accomplishing the actions during times when the airplane is not in service. DAL stated that incorporating this change to the "Airplane Normal Checklist" will simplify compliance procedures while satisfying the requirements of the proposed rule.

JAL requested that the FAA coordinate with Boeing to revise the flightcrew operations manual (FCOM) to provide the check of the fuel spar valve as a normal procedure. JAL stated that if an operational check by the flightcrew is allowed, the FCOM should be revised to provide the normal procedure to perform the fuel spar valve check during engine start or shutdown.

Qantas Airways suggested that a revision to the Boeing Model 737 Airplane Flight Manual (AFM), Section 1 "Certificate Limitations," or Section 3 "Normal Procedures," might be a more appropriate location to allow the flightcrew to monitor valve operations during engine start and/or engine shutdown.

We find that clarification is necessary. Changing these documents presupposes that every operator will have flightcrews perform this task. It is not our intention to require flightcrews to perform this task. Individual operators can modify their normal operating procedures to add this requirement.

## **Request To Clarify the Operational Check During Engine Start**

Qantas stated that it does not believe that paragraph B. of the Description column of figure 1 to paragraph (g) of the proposed AD (79 FR 20834, April 14, 2014), which specifies to do an operational check during engine start, achieves the desired failure detection. Qantas stated that if the test fails (i.e., bright light fails to illuminate), the valve has failed to open; this is different than a valve that has failed to close. Qantas stated that the test should identify the failed actuator in the failure mode, which results in an unsafe condition.

We infer that Qantas is requesting we clarify the operational check during engine start. We find that clarification is necessary. The check procedure is designed to make sure the fuel shutoff valve actuator moves to the open position from the closed position. However, if the fuel shutoff valve actuator had previously failed open, the actuator would not move the valve and this check would fail. If this check fails, the fuel shutoff valve actuator is either failed in the closed position or has failed previously in the open position. Either way, the failed fuel shutoff valve actuator must be replaced. We have not changed this AD in this regard.

## **Request To Add Requirement To Provide Electrical Power Before the Maintenance Check**

UAL requested we add a requirement to provide electrical power before accomplishment of the maintenance check specified by the proposed AD (79 FR 20834, April 14, 2014).

We agree with the commenter's request because electrical power is required. In item C.1. of figure 1 to paragraph (g) of this AD, we have added an instruction to supply electrical power to the airplane using standard practices when performing the operational check.

## **Request To Reference the Fault Isolation Manual**

Boeing requested that figure 1 to paragraph (g) of the proposed AD (79 FR 20834, April 14, 2014) be revised in order to reference the Fault Isolation Manual (FIM), instead of the Boeing Model 737 Aircraft Maintenance Manual (AMM), should the operational check fail. Boeing stated that the faults are isolated to failed components using the FIM. The AMM provides instructions for removing and replacing identified failed components. Boeing stated that the light could fail to illuminate for reasons other than actuator failure.

We disagree with the commenter's request to reference the FIM instead of the AMM. If an operational check fails, the failed component must be replaced. As Boeing stated, the AMM provides instructions for replacing failed components. The FIM also refers to the AMM for replacement of the fuel shutoff valve actuator after doing some preliminary testing. Operators may consult the FIM for guidance in troubleshooting other reasons the light could fail to illuminate. We have not changed this AD in this regard.

## **Request To Extend the Repetitive Interval for the Operational Checks**

ANA requested that the repetitive interval be revised from daily to 15,000 flight hours or 6,000 flight hours, or a weekly interval. ANA stated that Boeing has included these repetitive intervals in certain maintenance documents. ANA commented that it has 38 airplanes in operation and it has never experienced a latent failure of the MOV actuator. ANA also stated that the possibility of the unsafe condition happening is very low. ANA stated that a daily interval is a burden to operators.

DAL requested that the operational checks be required at intervals not to exceed 90 days or 1,400 flight cycles or 1,800 flight hours; DAL stated that this is similar to what is proposed by the original equipment manufacturer. DAL stated that Airworthiness Limitation Task 28-AWL-MOV, "Engine Fuel Shut-Off Valve (Fuel Spar Valve) Position Indication Operational Check," which was introduced by the proposed AD (79 FR 20834, April 14, 2014), would require daily operational checks of the engine fuel shutoff valve. DAL stated that it finds this will be an onerous operational

requirement as it does not have maintenance personnel in all locations where the affected airplanes are operated. DAL stated that for this reason, it will be necessary for its flightcrews to accomplish the operational checks in order to comply with the daily requirement specified by the proposed AD.

DAL also stated that the proposed AD (79 FR 20834, April 14, 2014) does not provide significant information as to how the daily check requirement was determined or why it differs so significantly from the compliance recommendation established by Boeing. DAL stated that lacking specific details of the methodology used by the FAA and the assumptions made to arrive at a daily check interval hinders the operator's ability to provide comments on the appropriateness of this interval. DAL stated that Boeing has indicated that its numeric safety analysis supports a compliance period of 3,000 flight hours for the operational checks. DAL also stated that based on current DAL utilization, accomplishment of daily checks equates to accomplishing the check approximately 300 times more frequently than the interval supported by the Boeing safety analysis.

JAL requested that the FAA extend the inspection interval to a heavy maintenance opportunity. For Model 737-800 airplanes, JAL stated to set the heavy maintenance opportunity (such as "C-Check" and "K-Check") at approximately 2-year intervals to efficiently accomplish the maintenance program.

Qantas Airways requested an interval that can be effectively scheduled in aircraft maintenance control programs, such as a 7-day interval.

Jim Way requested a monthly interval for the operational checks. Mr. Way stated that a daily check is too restrictive.

Bradley Most requested that the daily inspection interval be revised to every 2 calendar days to accommodate "international operations, out of station, overnight, etc." Mr. Most stated that the interval of daily lacks a clear definition.

We disagree with the requests to extend the inspection interval. An increase in the inspection interval from daily to every other day, to weekly, or to 90 days, would result in 2, 7, or 90 times as many flights at risk in the event of an engine fire. The daily inspection has been deemed practical because, in practice, it will mean the flightcrew will need to watch a light as they start or shut down the engine using normal procedures. An increased interval to 6,000 flight hours would have no real effect on the unsafe condition since the fuel filter replacement currently detects the problem every 6,000 flight hours. In addition, an increased interval of 15,000 flight hours, or 24 months, would similarly not improve safety. We have not changed this AD in this regard.

### **Request To Revise the Proposed Compliance Time for Revising the Maintenance or Inspection Program**

Mr. Most requested that the compliance time to revise the maintenance or inspection program be changed to 120 days after the effective date of this AD. Mr. Most stated that FAA offices are typically requesting 60 days to review an airplane maintenance or inspection program revision that is submitted for approval and, in many cases, are taking longer. Mr. Most stated that the current inspection interval would not allow operators enough time to revise the airplane maintenance or inspection program, submit it to FAA for approval, and implement the revised airplane maintenance or inspection program within 30 days of the effective date.

Jim Way requested that operators be given 90 days after the effective date of the proposed AD (79 FR 20834, April 14, 2014) to incorporate the actions specified in figure 1 to paragraph (g) of the proposed AD into the maintenance program. Mr. Way stated that single aircraft operators use a vendor to provide support for the inspection program revisions. Mr. Way stated that a 30-day compliance time after the effective date of the proposed AD is not enough time to properly make and submit the changes to the FAA's principal maintenance inspector for approval and implementation.

We do not agree to revise the compliance time for revising the maintenance or inspection program beyond 30 days. The 30-day compliance time specified in paragraph (g) of this AD is consistent with other regulatory actions for other affected models in similar ADs. However, under the provisions of paragraph (i)(1) of this AD, we might consider requests for adjustments to the

compliance time if data are submitted to substantiate that such an adjustment would provide an acceptable level of safety.

### **Request To Change the Initial Compliance Time for the Operational Check**

AA requested that 30 days be provided for the initial operational check after the airworthiness limitation (AWL) has been incorporated into its maintenance program. AA stated that this will allow for publishing the new criteria.

We partially agree with AA's request concerning the compliance time for the initial operational check. We have changed the initial compliance time specified in paragraph (g) of this AD for accomplishing the actions specified in figure 1 to paragraph (g) of this AD from 7 to 10 days. The compliance time of 10 days is consistent with other regulatory actions for other affected models in similar ADs. We have determined that 10 days for the initial inspection represents an appropriate time in which the required actions can be performed in a timely manner within the affected fleet, while still maintaining an adequate level of safety.

### **Request To Clarify Who Must Accomplish the Maintenance or Inspection Program Revision**

DAL requested that paragraph (g) of the proposed AD (79 FR 20834, April 14, 2014) be revised because it is not clear who must accomplish the action in this paragraph. DAL stated that operators do not control the AWL section of the ICA and, therefore, could not comply with the requirement. DAL stated that on Boeing Model 737NG airplanes, the AWLs are incorporated into Section 9 of the Maintenance Planning Document (MPD) by Boeing. DAL stated that the action in the NPRM would be one for the original equipment manufacturer to accomplish with a revision to the MPD, which would then be incorporated by the operators. DAL also stated that operators have control of their continuous airworthiness maintenance program (CAMP). DAL stated that in the NPRM, it is the intent of the operators to incorporate the AWL into their CAMP.

We find that clarification is necessary. The requirement in paragraph (g) of this AD is to change the Airworthiness Limitations of the ICA for each affected airplane. Once that change is complete, operators will be compelled to change their maintenance program to include the new requirements of the revised Airworthiness Limitations. For Part 121 operators, changes to the CAMP will become necessary; but for other operators, the maintenance program may take a different form. We have not changed the AD in this regard.

### **Request To Remove Redundant Language**

DAL requested that certain language be removed from the proposed AD (79 FR 20834, April 14, 2014) because it is redundant. DAL stated that paragraph (h) of the proposed AD can be excluded because it states that no alternative actions or intervals can be used unless approved as an alternative method of compliance (AMOC) in accordance with the procedures specified in paragraph (i)(1) of the proposed AD. (Paragraph (i) of the proposed AD specifies the procedures and requirements for an AMOC.)

We disagree with the commenter's request. It is necessary to include paragraph (h) of this AD ("No Alternative Actions or Intervals") because it ensures that changes made after accomplishment of the maintenance or inspection program revision, e.g., using new versions of the maintenance or inspection program, are done only when approval of an AMOC is obtained from the FAA. We have not changed this AD in this regard.

### **Request To Revise the Costs of Compliance Paragraph**

DAL stated that the cost estimate provided in the NPRM (79 FR 20834, April 14, 2014) is inaccurate. DAL stated that the cost reflected in the NPRM is for incorporating the proposed program

change into the operator's program only as a revision of the maintenance or inspection program." DAL stated the cost estimate presented is flawed in two aspects: It does not properly account for the cost operators will take on in implementing the program changes, and it does not account for the cost of actually performing the inspections specified by the proposed maintenance or inspection program changes.

We infer that DAL is requesting we revise the Costs of Compliance paragraph. We acknowledge the commenter's concern. In this AD, the required action is to revise the maintenance or inspection program, as applicable, to include a new airworthiness limitation. The added airworthiness limitation requires an inspection of the position of the MOV actuator daily. However, these repetitive inspections, which are expected to take a few seconds to complete, are required by section 91.403(c) of the Federal Aviation Regulations (14 CFR 91.403(c)) once incorporated into the maintenance or inspection program.

The cost analysis in AD rulemaking actions typically includes only the costs associated with complying with the AD. In this AD, the required action is the maintenance or inspection program revision, as applicable, to include the new airworthiness limitation. Accomplishing repetitive actions that are specified in the airworthiness limitation are not directly required by this AD. The FAA, as a matter of practice, does not include a cost estimate for these repetitive actions in an AD because these actions are required as part of the operating rules. Therefore, we have made no change to this AD in this regard.

### **Request To Clarify Wording for Operational Check Without Engine Operation**

UAL requested we revise the wording of the operational check without engine operation. UAL stated that in item C.3.a. and item C.4.a. in the Description column of figure 1 to paragraph (g) of this AD, either a tolerance should be added to the wording, or the word "approximately" should be added before the phrase "10 seconds."

We agree with the commenter's request. In item C.4.a. and item C.5.a. (which correspond to items C.3.a. and C.4.a. of the NPRM (79 FR 20834, April 14, 2014)) in the Description column of figure 1 to paragraph (g) of this AD, we have added wording that indicates to wait "approximately" 10 seconds after moving the ENG 1 and ENG 2 START LEVER on the CONTROL STAND to the IDLE position. We find that this change will allow flexibility during the operational check, while still maintaining an adequate level of safety.

### **Request To Correct Typographical Errors**

Boeing and DAL requested that we correct a typographical error in the proposed AD (79 FR 20834, April 14, 2014). Boeing and DAL stated that item A.1. in the Description column of figure 1 to paragraph (g) of the proposed AD, which states to "do all operational checks . . .," the word "all" should be removed because the operational check is a singular check.

We agree with the commenters' request. We have revised item A.1. in the Description column of figure 1 to paragraph (g) of this AD accordingly.

Boeing also requested that certain other typographical errors in the proposed AD (79 FR 20834, April 14, 2014) be corrected to reduce the possibility of confusion regarding the requirements.

Boeing stated that the Description column in figure 1 to paragraph (g) of the proposed AD should be revised as follows:

- Step B.2. has been skipped, and needs to be renumbered.
- In step B.1.a., the text "START LEVEL STAND" should be changed to "START LEVER ON CONTROL STAND."
- Steps C.2. and C.3. should be combined and renumbered.
- In step C.5.a., the text "ENG @" should be changed to "ENG 2."

We disagree with the comment. The stated typographical errors for step B.1.a., step B.2., and step C.5.a., do not exist in the regulatory text of the NPRM (79 FR 20834, April 14, 2014), as published. We disagree with combining steps C.2. and C.3 because the engine fire switches represent separate actions for the aft electronic panel and the forward overhead panel. We have not changed this AD in this regard.

**Effect of Winglets on This AD**

Aviation Partners Boeing stated that the installation of winglets per Supplemental Type Certificate (STC) ST00830SE ([http://rgl.faa.gov/Regulatory\\_and\\_Guidance\\_Library/rgstc.nsf/0/3ed73703f205e3b386257e2f0064f3b1/\\$FILE/ST00830SE.pdf](http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgstc.nsf/0/3ed73703f205e3b386257e2f0064f3b1/$FILE/ST00830SE.pdf)) does not affect the accomplishment of the manufacturer's service instructions.

**Conclusion**

We reviewed the relevant data, considered the comments received, and determined that air safety and the public interest require adopting this AD with the changes described previously and minor editorial changes. We have determined that these minor changes:

- Are consistent with the intent that was proposed in the NPRM (79 FR 20834, April 14, 2014) for correcting the unsafe condition; and
- Do not add any additional burden upon the public than was already proposed in the NPRM (79 FR 20834, April 14, 2014).

We also determined that these changes will not increase the economic burden on any operator or increase the scope of this AD.

**Interim Action**

We consider this AD interim action. The manufacturer is currently developing a modification that will address the unsafe condition identified in this AD. Once this modification is developed, approved, and available, we might consider additional rulemaking.

**Costs of Compliance**

We estimate that this AD affects 1,244 airplanes of U.S. registry. We estimate the following costs to comply with this AD:

**Estimated Costs**

Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
Incorporating Airworthiness Limitation	1 work-hour × \$85 per hour = \$85	\$0	\$85	\$105,740

**Authority for This Rulemaking**

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

We are issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: "General requirements." Under that section, Congress charges the FAA with

promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

### **Regulatory Findings**

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

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

- (1) Is not a "significant regulatory action" under Executive Order 12866,
- (2) Is not a "significant rule" under DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979),
- (3) Will not affect intrastate aviation in Alaska, and
- (4) 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):



**2015-19-03 The Boeing Company:** Amendment 39-18266; Docket No. FAA-2014-0194; Directorate Identifier 2014-NM-022-AD.

**(a) Effective Date**

This AD is effective October 21, 2015.

**(b) Affected ADs**

None.

**(c) Applicability**

This AD applies to all The Boeing Company Model 737-600, -700, -700C, -800, -900, and -900ER series airplanes, certificated in any category.

**(d) Subject**

Joint Aircraft System Component (JASC) Code 2823, Fuel Selector/Shutoff Valve.

**(e) Unsafe Condition**

This AD was prompted by reports of latently failed fuel shutoff valves discovered during fuel filter replacement. We are issuing this AD to detect and correct latent failures of the fuel shutoff valve to the engine, which could result in the inability to shut off fuel to the engine and, in case of certain engine fires, an uncontrollable fire that could lead to wing failure.

**(f) Compliance**

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

**(g) Revision of Maintenance or Inspection Program**

Within 30 days after the effective date of this AD, revise the maintenance or inspection program, as applicable, to add airworthiness limitation number 28-AWL-MOV, "Engine Fuel Shutoff Valve (Fuel Spar Valve) Position Indication Operational Check," by incorporating the information specified in figure 1 to paragraph (g) of this AD into the Airworthiness Limitations Section of the Instructions for Continued Airworthiness. The initial compliance time for accomplishing the actions specified in 28-AWL-MOV is within 10 days after accomplishing the maintenance or inspection program revision required by this paragraph.

**Figure 1 to Paragraph (g) of This AD–Engine Fuel Shutoff Valve (Fuel Spar Valve) Position Indication Operational Check**

AWL No.	Task	Interval	Applicability	Description
28-AWL-MOV	ALI	<p>DAILY INTERVAL</p> <p>NOTE: The operational check is not required on days when the airplane is not used in revenue service.</p> <p>The check must be done before further flight once the airplane is returned to revenue service.</p>	<p>737-600, -700, -700C, -800, -900, and -900ER series airplanes</p> <p>APPLICABILITY NOTE: Only applies to airplanes with a fuel spar valve actuator having part number MA20A2027 (S343T003-56) or MA30A1001 (S343T003-66) installed at the engine fuel spar valve positions.</p>	<p>Engine Fuel Shutoff Valve (Fuel Spar Valve) Position Indication Operational Check.</p> <p>Concern: The fuel spar valve actuator design can result in airplanes operating with a failed fuel spar valve actuator that is not reported. A latently failed fuel spar valve actuator could prevent fuel shutoff to an engine. In the event of certain engine fires, the potential exists for an engine fire to be uncontrollable.</p> <p>Perform one of the following checks of the engine fuel spar valve position (unless checked by the flightcrew in a manner approved by the principal operations inspector):</p> <p>A. Operational Check during engine shutdown.</p> <ol style="list-style-type: none"> <li>1. Do an operational check of the left engine fuel spar valve actuator.               <ol style="list-style-type: none"> <li>a. As the ENG 1 START LEVER on the CONTROL STAND is moved to the CUTOFF position, verify the SPAR VALVE CLOSED indication light on the OVERHEAD PANEL for No.1 Engine changes from OFF to BRIGHT then DIM.</li> <li>b. If the test fails (bright light fails to illuminate), before further flight, repair faults as required (refer to Boeing Aircraft Maintenance Manual (AMM) 28-22-11).</li> </ol> </li> <li>2. Do an operational check of the right engine fuel spar valve actuator.               <ol style="list-style-type: none"> <li>a. As the ENG 2 START LEVER on the CONTROL STAND is moved to the CUTOFF position, verify the SPAR VALVE CLOSED indication light on the OVERHEAD PANEL for No. 2 Engine changes from OFF to BRIGHT then DIM.</li> <li>b. If the test fails (bright light fails to illuminate), before further flight, repair faults as required (refer to Boeing AMM 28-22-11).</li> </ol> </li> </ol> <p>B. Operational check during engine start.</p> <ol style="list-style-type: none"> <li>1. Do an operational check of the left engine fuel spar valve actuator.</li> </ol>

			<p>a. As the ENG 1 START LEVER on the CONTROL STAND is moved to the IDLE position, verify the SPAR VALVE CLOSED indication light on the OVERHEAD PANEL for No. 1 Engine changes from DIM to BRIGHT then OFF.</p> <p>b. If the test fails (bright light fails to illuminate), before further flight, repair faults as required (refer to Boeing AMM 28-22-11). 2. Do an operational check of the right engine fuel spar valve actuator.</p> <p>a. As the ENG 2 START LEVER on the CONTROL STAND is moved to the IDLE position, verify the SPAR VALVE CLOSED indication light on the OVERHEAD PANEL for No. 2 Engine changes from DIM to BRIGHT then OFF.</p> <p>b. If the test fails (bright light fails to illuminate), before further flight, repair faults as required (refer to Boeing AMM 28-22-11).</p> <p>c. Operational check without engine operation.</p> <ol style="list-style-type: none"> <li>1. Supply electrical power to airplane using standard practices.</li> <li>2. Make sure No. 1 and No. 2 Engine FIRE switches on the Aft Electronic Panel are in the NORMAL (IN) position.</li> <li>3. Make sure No. 1 and No. 2 Engine Start Switches on the Forward Overhead Panel are in the OFF or AUTO position.</li> <li>4. Do an operational check to the left engine fuel spar valve actuator.</li> </ol> <p>a. Move ENG 1 START LEVER on the CONTROL STAND to the IDLE position and wait approximately 10 seconds.</p> <p>NOTE: It is normal under this test condition for the ENG VALVE CLOSED indication light on the OVERHEAD PANEL to transition from DIM to BRIGHT and stay BRIGHT.</p> <p>b. Move ENG 1 START LEVER on the CONTROL STAND to the CUTOFF position.</p> <p>c. Verify the SPAR VALVE CLOSED indication light on the OVERHEAD PANEL for No. 1 Engine changes from OFF to BRIGHT then DIM.</p>
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				<p>d. If the test fails (bright light fails to illuminate), before further flight, repair faults as required (refer to Boeing AMM 28-22-11).</p> <p>5. Do an operational check of the right engine fuel spar valve actuator.</p> <p>a. Move ENG 2 START LEVER on the CONTROL STAND to the IDLE position and wait approximately 10 seconds.</p> <p>NOTE: It is normal under this test condition for the ENG VALVE CLOSED indication light on the OVERHEAD PANEL to transition from DIM to BRIGHT and stay BRIGHT.</p> <p>b. Move ENG 2 START LEVER on the CONTROL STAND to the CUTOFF position.</p> <p>c. Verify the SPAR VALVE CLOSED indication light on the OVERHEAD PANEL for No. 2 Engine changes from OFF to BRIGHT then DIM.</p> <p>d. If the test fails (bright light fails to illuminate), before further flight, repair faults as required (refer to Boeing AMM 28-22-11).</p> <p>D. Perform an inspection of the engine fuel spar valve actuator position.</p> <p>NOTE: This inspection may be used whenever the SPAR VALVE light does not function properly.</p> <p>1. Make sure the L FUEL CONTROL switch on the quadrant control stand is in the CUTOFF position.</p> <p>NOTE: It is not necessary to cycle the FUEL CONTROL switch to do this inspection.</p> <p>2. Inspect the left engine fuel spar valve actuator located in the left rear spar.</p> <p>NOTE: The left engine fuel spar valve actuator is on the left wing front spar outboard of the engine strut. Access is through access panel 521BB on the left wing leading edge.</p> <p>a. Verify the manual override handle on the engine fuel spar valve actuator is in the CLOSED position.</p> <p>b. Repair or replace any engine fuel spar valve actuator that is not in the CLOSED position (refer to Boeing AMM 28-22-11).</p>
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				<p>3. Make sure the R FUEL CONTROL switch on the quadrant control stand is in the CUTOFF position.</p> <p>NOTE: It is not necessary to cycle the FUEL CONTROL switch to do this inspection.</p> <p>4. Inspect the right engine fuel spar valve actuator located in the right rear spar.</p> <p>NOTE: The right engine fuel spar valve actuator is on the right wing front spar outboard of the engine strut. Access is through access panel 621BB on the right wing leading edge.</p> <p>a. Verify the manual override handle on the engine fuel spar valve actuator is in the CLOSED position.</p> <p>b. Repair or replace any engine fuel spar valve actuator that is not in the CLOSED position (refer to Boeing AMM 28-22-11).</p>
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**(h) No Alternative Actions or Intervals**

After accomplishment of the maintenance or inspection program revision required by paragraph (g) of this AD, no alternative actions (e.g., inspections) or intervals may be used unless the actions or intervals are approved as an alternative method of compliance (AMOC) in accordance with the procedures specified in paragraph (i)(1) of this AD.

**(i) Alternative Methods of Compliance (AMOCs)**

(1) The Manager, Seattle Aircraft Certification Office (ACO) 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 ACO, send it to the attention of the person identified in paragraph (j) 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.

**(j) Related Information**

For more information about this AD, contact Rebel Nichols, Aerospace Engineer, Propulsion Branch, ANM-140S, FAA, Seattle Aircraft Certification Office, 1601 Lind Avenue SW., Renton, WA 98057-3356; phone: 425-917-6509; fax: 425-917-6590; email: rebel.nichols@faa.gov.

**(k) Material Incorporated by Reference**

None.

Issued in Renton, Washington, on September 7, 2015.  
Jeffrey E. Duven,  
Manager, Transport Airplane Directorate,  
Aircraft Certification Service.

SUPERSEDED