



787

Flight Crew Operations Manual Bulletins Ethiopian Airlines Corporation

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Bulletin Package Date: June 8, 2016

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Document Number: D615Z003-ETH
Revision Number: 12
Revision Date: March 21, 2016



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General

The Boeing Company issues Flight Crew Operations Manual Bulletins to provide important information to flight crews prior to the next formal revision of the manual. The transmitted information may be of interest to only specific Operators or may apply to all Operators of this model airplane. Each bulletin will vary.

Bulletins are dated and numbered sequentially. Each bulletin identifies airplanes affected by the bulletin. Absence of airplane effectivity indicates the bulletin applies to all airplanes in an Operator's fleet. When appropriate, the next formal Flight Crew Operations Manual revision will include an updated Bulletin Addendum (BA) and bulletin record page to reflect current bulletin status.

Each bulletin identifies airplanes affected by the bulletin. The airplane effectivity is defined as follows:

- Effectivity range - effectivities in parentheses indicate the corrective service bulletin is planned to be accomplished and some airplanes may be complete
- All Airplanes - the bulletin applies to all airplanes in an Operator's fleet
- Descriptive statement - the bulletin applies to airplanes with specific equipment

Bulletin status is defined as follows:

- In Effect (IE) – the bulletin contains pertinent information not otherwise covered in the Flight Crew Operations Manual. The bulletin remains active and should be retained in the manual
- Incorporated (INC) – Operating information in this bulletin is incorporated into the Flight Crew Operations Manual. The bulletin will be cancelled and removed from the Bulletin Addendum for the next formal FCOM publication
- Cancelled (CANC) – the bulletin is no longer active and has been removed from the BA. All bulletins previously cancelled are no longer listed in the Bulletin Record

Replacement pages are no longer issued with bulletins. The FCOM (V1V2) and QRH updates are issued as a revision with the next formal publication.

If an operator chooses to print their FCOM/QRH for distribution, this Bulletin Addendum should be inserted directly behind the FCOM BA instructions (page 0.6.1).



787 Flight Crew Operations Manual

Number	Subject	Date	Status
ETH-1 R4	Annunciated and Unannunciated Cabin Temperature Non-Normal Checklists	May 17, 2013	IE
ETH-3 R1	Flight Director Erratic Behavior During GLS	August 31, 2012	IE
ETH-5 R10	Miscellaneous Operational Anomalies	December 21, 2015	IE
ETH-10 R1	Weather Radar and Transponder Settings on the TCP	May 8, 2012	IE
ETH-11 R7	Anomalous TAT Probe Logic Affecting Primary Ice Detection System (PIDS)	September 15, 2014	IE
ETH-14 R3	Nuisance Operation of the Parking Brake Lever	June 8, 2016	IE
ETH-18	EICAS Messages That May Show After Short Term Operation On Standby RAT Electrical Power In-flight.	December 15, 2011	IE
ETH-24 R2	APU Bowed Rotor Hung Start	August 19, 2013	IE
ETH-29 R3	Air Cycle Machine (ACM) Freezing	October 3, 2013	IE
ETH-30 R2	Potential Roll and Pitch Capture Logic Error	January 3, 2013	IE
ETH-35 R1	Anomalous TAT Probe Logic Affecting Manual Operation of Anti-ice Systems	October 24, 2013	IE
ETH-36 R1	Nuisance SPOILERS Message During Engine start	October 3, 2013	IE
ETH-39 R1	Uncommanded Pilot Seat Movement	September 15, 2014	IE
ETH-40 R1	Mode Control Panel (MCP) Altitude Select Knob Anomaly	November 25, 2015	IE
ETH-41 R1	Flight Director Guidance Error in Direct and Secondary Mode	February 12, 2016	IE



787 Flight Crew Operations Manual

Number	Subject	Date	Status
ETH-42 R3	VNAV Acceleration and Thrust Reduction Height Limitations	March 21, 2016	IE
ETH-44 R1	Uncommanded Selection of Glide Slope to OFF When Activating a Route	September 19, 2014	IE
ETH-45 R1	Center Fuel Pumps Fault After Engine Start	November 25, 2015	IE
ETH-47 R1	Ice Crystal Anti-Ice Indication (ICA)	September 14, 2015	INC
ETH-48 R1	V Speeds Deleted Due To Invalid TAT	November 25, 2015	IE
ETH-49	Possible LNAV Guidance Error in a Holding Pattern	September 14, 2015	IE
ETH-51	Early Localizer Capture Anomaly	January 15, 2016	IE
ETH-52	FMC Reset Anomaly - Procedure Turn	January 15, 2016	IE
ETH-54	Nuisance TAIL STRIKE Messages	February 1, 2016	IE
ETH-55 R1	Avoidance of abrupt flight control input as a result of a sudden drop in indicated airspeed.	April 15, 2016	IE
ETH-56 R1	Additional In-Flight Fan Ice Removal Procedure	April 15, 2016	IE
ETH-57	FMC Reset in the Air - Wind Uplink while Sequencing a Waypoint	April 1, 2016	IE
ETH-58	Administrative Bulletin	June 8, 2016	IE
ETH-59	Loss of Magenta Line on Navigation Display (ND)	June 8, 2016	IE



Flight Crew Operations Manual Bulletin for Ethiopian Airlines Corporation

The Boeing Company
Seattle, Washington 98124-2207



Number: ETH-1 R4

IssueDate: May 17, 2013

Airplane Effectivity: ET-AOP - ET-AOS

Subject: Annunciated and Unannunciated Cabin Temperature Checklists

Reason: Possible erroneous CABIN TEMPERATURE sensor data.

Added Boeing Service Bulletin number

Information in this bulletin is recommended by The Boeing Company, but may not be FAA approved at the time of writing. In the event of conflict with the FAA approved Airplane Flight Manual (AFM), the AFM shall supersede. The Boeing Company regards the information or procedures described herein as having a direct or indirect bearing on the safe operation of this model airplane.

THE FOLLOWING PROCEDURE AND/OR INFORMATION IS EFFECTIVE UPON RECEIPT

Background Information

The EICAS advisory message CABIN TEMPERATURE may show when excessively hot or cold conditions exist in the flight deck. Certification analysis has determined that the CABIN TEMPERATURE message may also be displayed as a nuisance message when excessive hot or cold conditions do not exist in the flight deck.

In addition, flight test and analysis have determined that certain combinations of failures can result in excessively cold cabin temperatures at intermediate flight altitudes when operating with a low passenger count. During these failure conditions, cold temperatures are more likely to occur at latitudes and during seasons when OAT is significantly below standard.

The failure combinations are:

- Engine failure + APU failure
- Engine failure + Engine Starter/Generator failure
- Engine failure + CAC failure
- CAC failure + opposite side CAC failure
- Add Heat Valve failure + opposite side Add Heat Valve failure
- CAC failure + opposite side Add Heat Valve failure

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Under some of these conditions, trim air distribution to the passenger cabin may be uneven, resulting in colder temperatures in the aft cabin. Selecting full cold on the passenger cabin temperature control and the flight deck temperature control results in a warmer air supply to the aft passenger cabin.

To respond to these possible conditions, in addition to the annunciated CABIN TEMPERATURE checklist, two unannunciated checklists, Cabin Temp Cold and Cabin Temp Hot have been developed.

Operating Instructions

The flight crew must assess the cabin temperature situation and use good judgment to determine the safest course of action. If the EICAS advisory message CABIN TEMPERATURE is shown but the flight crew determines that the flight deck and passenger cabin are not excessively hot or cold, the CABIN TEMPERATURE message is a nuisance and the non-normal checklist should not be accomplished.

If the EICAS advisory message CABIN TEMPERATURE is shown and the flight deck or passenger cabin is excessively hot or cold, accomplish the annunciated CABIN TEMPERATURE checklist.

If the passenger cabin is determined to be excessively hot and the EICAS advisory message CABIN TEMPERATURE is not shown, the flight crew should accomplish the Cabin Temp Hot unannunciated non-normal checklist.

If the passenger cabin is determined to be excessively cold and the EICAS advisory message CABIN TEMPERATURE is not shown, the flight crew should accomplish the Cabin Temp Cold unannunciated non-normal checklist.

All of the cabin temperature-related checklists are intended to be used for temperature conditions that present a health hazard to the crew or passengers, and not to address comfort issues alone.

Administrative Information

The Flight Crew Operations Manual Bulletin Record is amended to show bulletin ETH-1 R4 as "In Effect" (IE).

This bulletin will be cancelled after Boeing is notified that all affected airplanes have been modified by Boeing Service Bulletin B787-81205-SB210018-00.

Please send all correspondence regarding flight Crew Operations Manual Bulletin status to the 787 Manager, Flight Technical Data, through the Service Requests Application (SR App) on the MyBoeingFleet home page.

CS3 4742



Flight Crew Operations Manual Bulletin for Ethiopian Airlines Corporation

The Boeing Company
Seattle, Washington 98124-2207



Number: ETH-3 R1

IssueDate: August 31, 2012

Airplane Effectivity: ET-AOP

Subject: Flight Director Erratic Behavior During GLS

Reason: To inform flight crews of a F/D anomaly when switching approach modes between ILS or approaches using IAN and GLS.

Added Boeing Service Bulletin number.

Information in this bulletin is recommended by The Boeing Company, but may not be FAA approved at the time of writing. In the event of conflict with the FAA approved Airplane Flight Manual (AFM), the AFM shall supersede. The Boeing Company regards the information or procedures described herein as having a direct or indirect bearing on the safe operation of this model airplane.

THE FOLLOWING PROCEDURE AND/OR INFORMATION IS EFFECTIVE UPON RECEIPT

Background Information

When flying a Flight Director (FD) GLS approach (FLT DIR displayed on PFD) with LOC or GS modes active, if any non-GLS is loaded and executed without exiting the current GLS approach mode, the FD pitch bar may become erratic over a period of approximately 4 seconds or disappear from view. Similar FD behavior can also occur when a GLS approach is selected and executed without exiting the current FD only ILS or approach using IAN.

Also, selecting or deselecting a FD only GLS approach can result in large step changes in the FD pitch or roll bars. Autopilot engaged and ILS to IAN transitions are not affected.

Operating Instructions

During FD only GLS approaches with LOC or GS active, the flight crew must turn off both FD switches before selecting an ILS or an approach using IAN. In addition, during a FD only ILS approach (LOC/BCRS or GS) or an approach using IAN (FAC GP) the flight crew must turn off both FD switches before selecting a GLS approach. If both FD switches are not turned off, the flight crew should not follow the erroneous FD bar until the FD switches have been cycled.

Administrative Information

The Flight Crew Operations Manual Bulletin Record is amended to show bulletin ETH-3 R1 as "In Effect" (IE).

This bulletin will be cancelled after Boeing is notified that all affected airplanes have been modified by Boeing Service Bulletin B787-81205-SB270008-00.

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CS3 4744



**Flight Crew Operations Manual Bulletin
for
Ethiopian Airlines Corporation**

**The Boeing Company
Seattle, Washington 98124-2207**



Number: ETH-5 R10

IssueDate: December 21, 2015

Subject: Miscellaneous Operational Anomalies

Reason: To inform flight crews of several minor system anomalies.

Information in this bulletin is recommended by The Boeing Company, but may not be FAA approved at the time of writing. In the event of conflict with the FAA approved Airplane Flight Manual (AFM), the AFM shall supersede. The Boeing Company regards the information or procedures described herein as having a direct or indirect bearing on the safe operation of this model airplane.

THE FOLLOWING PROCEDURE AND/OR INFORMATION IS EFFECTIVE UPON RECEIPT

Background Information

Several airplane systems operating anomalies have been observed during flight test. This bulletin summarizes these anomalies for flight crew reference.

Operating Instructions

Communications

| ET-AOO - ET-ATL

Lack of standby frequency synchronization with data mode commanded in active [affects all airplanes – to be corrected by a future software update]

This anomaly occurs when using the VHF communication manager page to command the right or center VHF into the DATA mode, or when using the HF communication manager page to command the left or right HF radio into the DATA mode. After the command is received by the radio, changes to the standby frequency on the radio will not synchronize with the other Tuning Control Panels (TCP). The anomaly does not occur if a radio is placed in the DATA mode manually using the TCP. Also, if the VHF or HF communication manager page is used to command radios out of the DATA mode, the standby frequencies will synchronize normally. Manual transfer of the standby frequency into the active frequency window works normally

| ET-ATJ - ZD008

Inability to terminate multiple ATIS or TWIP Automatic Update requests [affects all airplanes - to be corrected by Boeing Service Bulletin B787-81205-SB230009]

If multiple ATIS - ARRIVAL WITH AUTOMATIC UPDATE or multiple TWIP - AUTOMATIC UPDATE request are made only one can be terminated normally. After a request is terminated, the TERMINATE AUTOMATIC UPDATE selection is inhibited. Thus, it is recommended that only one ATIS-ARRIVAL WITH AUTOMATIC UPDATE and one TWIP-AUTOMATIC UPDATE be requested. To terminate automatic updates from multiple stations, repeat the request for one of the stations to be terminated. The TERMINATE AUTOMATIC UPDATE selection will then be available. This "re-select and terminate" action can be repeated to terminate additional automatic update requests.

Electrical

ET-ATJ - ZD008

Nuisance ELEC GEN OFF APU L, R Advisory message [affects all airplanes – to be corrected by Boeing Service Bulletin B787-81205-SB240002-00]

When an Auxiliary Generator Control Unit has failed, the ELEC GEN OFF APU L, R message will show even when the APU is not running. This is a temporary condition until a software change is made to allow this message to show when a fault is detected in the Auxiliary Generator Control Unit controller only while the APU is running.

Flight Controls

ET-AOP

Nuisance EICAS Caution, Advisory, and Status messages show during external power starts (2 or 3 EP). [affects all airplanes – to be corrected by Boeing Service Bulletin B787-81205-SB270008]

Due to power transfer behavior and timing issues when starting engines on external power, the following messages may show during or after the first engine start:

FLIGHT CONTROLS (Caution)

AUTO SPEEDBRAKE (Advisory)

SPOILERS (Advisory)

SPOILER PAIRS (Advisory)

All Alert level messages will clear following second engine start when all hydraulic systems are pressurized. Any ECIAS messages remaining should be considered valid.

Flight Management, Navigation

ET-AOP

Nuisance SGL SOURCE APPROACH Caution message [affects all airplanes – to be corrected by Boeing Service Bulletin B787-81205-SB270008-00]

The EICAS Caution message SGL SOURCE APPROACH may intermittently show and clear without any pilot action on the ground, and in flight when not using the glideslope and localizer for guidance. This nuisance condition is caused by overly sensitive fault detection logic in the INR and will be fixed in a future update to the INR. No crew action is needed.

Warning Systems

Nuisance EICAS Advisory message GND PROX SYS may show [affects all airplanes – to be corrected by a future software update]

When the airplane is flying faster than 250 knots, selecting FLAP OVRD or GEAR OVRD may cause the EICAS Advisory GND PROX SYS to show. No flight crew action is needed.

Administrative Information

The Flight Crew Operations Manual Bulletin Record is amended to show bulletin ETH-5 R10 as "In Effect" (IE).

Please send all correspondence regarding flight Crew Operations Manual Bulletin status to the 787 Manager, Flight Technical Data, through the Service Requests Application (SR App) on the MyBoeingFleet home page.

CS3 4746



Flight Crew Operations Manual Bulletin for Ethiopian Airlines Corporation

The Boeing Company
Seattle, Washington 98124-2207



Number: ETH-10 R1

IssueDate: May 8, 2012

Airplane Effectivity: ET-AOO - ET-ATL

Subject: Weather Radar and Transponder Settings on the TCP

Reason: To inform flight crews that the settings on the Tuning and Control Panel (TCP) can disagree with the weather radar and transponder indications on the ND.

Revised Background Information and Operating Instructions to reflect that transponder settings, in addition to the weather radar settings, are affected.

Information in this bulletin is recommended by The Boeing Company, but may not be FAA approved at the time of writing. In the event of conflict with the FAA approved Airplane Flight Manual (AFM), the AFM shall supersede. The Boeing Company regards the information or procedures described herein as having a direct or indirect bearing on the safe operation of this model airplane.

THE FOLLOWING PROCEDURE AND/OR INFORMATION IS EFFECTIVE UPON RECEIPT

Background Information

The weather radar (WXR) settings shown on the tuning and control panel (TCP) for tilt, gain, or mode, can disagree with the actual WXR settings. Actual WXR settings are always indicated correctly on the navigation display (ND). This situation can occur on any TCP when the WXR tilt, gain or mode settings were manually selected on the previous flight and the manual selections remained at the end of the flight. It can also occur on the center TCP in flight when using the center TCP to select weather radar settings.

Also, the transponder settings shown on the TCP for TCAS modes ABOVE, NORM, BELOW, and TCAS ALT (ABS/REL selection) can disagree with the actual TCAS settings. Actual TCAS settings are always indicated correctly on the ND. This situation can occur on any TCP when the TCAS modes ABOVE, NORM, BELOW, and TCAS ALT (ABS/REL selection) were manually selected on the previous flight and the manual selections remained at the end of the flight. It can also occur on the center TCP in flight when using the center TCP to select TCAS settings.

Operating Instructions

WXR and TCAS selections made on the TCPs should be verified on the ND. If the setting shown on the TCP disagrees with the actual setting shown on the ND, the flight crew should make an additional change to the affected setting on the TCP to force the TCP to synchronize correctly.

Administrative Information

The Flight Crew Operations Manual Bulletin Record is amended to show bulletin ETH-10 R1 as "In Effect" (IE).

This condition is temporary until the software is modified. This bulletin remains in effect until further notice.

Please send all correspondence regarding flight Crew Operations Manual Bulletin status to the 787 Manager, Flight Technical Data, through the Service Requests Application (SR App) on the MyBoeingFleet home page.

CS3 4752



Flight Crew Operations Manual Bulletin for Ethiopian Airlines Corporation

The Boeing Company
Seattle, Washington 98124-2207



Number: ETH-11 R7

IssueDate: September 15, 2014

Airplane Effectivity: (ET-AOO - ET-AOS)

Subject: Anomalous TAT Probe Logic Affecting Automatic Ice Detection System

Reason: To inform flight crews that the automatic engine and wing anti-ice system may not operate in icing conditions and that manual operation of the system is required.

Administrative Information - Revised per updated information.

Information in this bulletin is recommended by The Boeing Company, but may not be FAA approved at the time of writing. In the event of conflict with the FAA approved Airplane Flight Manual (AFM), the AFM shall supersede. The Boeing Company regards the information or procedures described herein as having a direct or indirect bearing on the safe operation of this model airplane.

THE FOLLOWING PROCEDURE AND/OR INFORMATION IS EFFECTIVE UPON RECEIPT

Background Information

The automatic ice detection system logic activates engine and wing anti-ice when moisture is detected and TAT is 10°C or less. Normally, the two engine TAT probes and the airplane TAT probe are combined to provide a voted TAT solution.

A logic anomaly between engine and airplane TAT probes can affect operation of the automatic ice detection system. In the remote case that two of the TAT probes provide erroneous data, indicated TAT may be higher or lower than actual TAT.

As a result, when in flight, icing conditions must be assumed to be possible at or less than 15°C instead of 10°C. Manual operation of engine and wing anti-ice is required in flight between 10°C and 15°C. On the ground, a different source of TAT is used to command engine anti-ice on. This TAT source is not subject to the TAT anomaly. Anti-ice operation on the ground in manual mode is normal.

Operating Instructions

Ground Operation and Takeoff

Operate anti-ice per normal and supplementary procedures. This anomaly does not affect TAT indications on the ground.

Initial Climb

When TAT is 15°C or less and greater than 10°C and visible moisture is present, engine and wing anti-ice must be ON. It is acceptable to operate engine and wing anti-ice in AUTO for all other TAT conditions. If performance permits, selecting engine and wing anti-ice ON may be delayed to 1500 feet AGL during climb, but no later than 2500 feet AGL.

Note: This procedure assumes that AFM performance data using anti-ice OFF shows that the airplane will achieve flaps-up, final climb speed and clear all obstacles at a height of 1500 feet AGL or less.

In-Flight

When TAT is 15°C or less and greater than 10°C and visible moisture is present, engine and wing anti-ice must be ON. It is acceptable to operate engine and wing anti-ice in AUTO for all other TAT conditions.

WARNING: Do not rely on airframe visual icing cues before turning ON engine and wing anti-ice. Use the temperature and visible moisture criteria because late activation of engine anti-ice may allow excessive ingestion of ice and result in engine damage or failure.

When engine and wing anti-ice are needed:

CAUTION: Do not use engine or wing anti-ice when TAT is above 15°C.

ENGINE ANTI-ICE selectors (both) ON PM

WING ANTI-ICE selector ON PM

Note: When the anti-ice system is ON and the displayed TAT is above 10°C the EICAS advisory message ANTI-ICE ON will show. Disregard this message and override the ANTI-ICE ON checklist in the electronic checklist (ECL).

When engine and wing anti-ice are no longer needed:

ENGINE ANTI-ICE selectors (both) AUTO or OFF PM

WING ANTI-ICE selector AUTO or OFF PM

If ice detection is available, position the selectors to AUTO. If ice detection is inoperative, position the selectors to OFF.

Administrative Information

The Flight Crew Operations Manual Bulletin Record is amended to show bulletin ETH-11 R7 as "In Effect" (IE).

This bulletin will be cancelled after Boeing is notified that all affected airplanes have been modified by Boeing Service Bulletin B787-81205-SB300005 (software part number HAM50-30WE-0040 or later).

Note: ETH-35, "Anomalous TAT Probe Logic Affecting Manual Operation of Anti-ice Systems", takes effect in place of this OMB after incorporation of Boeing Service Bulletin B787-81205-SB300005 (software part number HAM50-30WE-0040 or later)

Please send all correspondence regarding flight Crew Operations Manual Bulletin status to the 787 Manager, Flight Technical Data, through the Service Requests Application (SR App) on the MyBoeingFleet home page.

CS3 4761

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Flight Crew Operations Manual Bulletin for Ethiopian Airlines Corporation

The Boeing Company
Seattle, Washington 98124-2207



Number: ETH-14 R3

IssueDate: June 8, 2016

Airplane Effectivity: All Airplanes

Subject: Nuisance Operation of the Parking Brake Lever

Reason: To inform flight crews parking brakes may not set or release when commanded.

Background Information - Added description of unintentional parking brake release.

Operating Instructions - Added additional instruction.

Administrative Information - Added Boeing Service Bulletin number.

Information in this bulletin is recommended by The Boeing Company, but may not be FAA approved at the time of writing. In the event of conflict with the FAA approved Airplane Flight Manual (AFM), the AFM shall supersede. The Boeing Company regards the information or procedures described herein as having a direct or indirect bearing on the safe operation of this model airplane.

THE FOLLOWING PROCEDURE AND/OR INFORMATION IS EFFECTIVE UPON RECEIPT

Background Information

There may be difficulties in setting and releasing the parking brake lever due to frictional interferences and switches operating near the limits of their tolerance band within the parking brake module.

The parking brake can release with no pilot input on the brake pedals or with unintentional pilot input, such as bumping the lever. The PARKING BRAKE SET memo message correctly shows when the parking brake is set and blanks when the parking brake releases.

Operating Instructions

If the parking brake module does not operate as expected while attempting to set or release the parking brake lever, move the parking brake lever from side to side and up and down while simultaneously depressing both brake pedals. Repeat this process as necessary until the parking brake lever sets or releases.

While the parking brake is set, avoid bumping the parking brake lever. If the parking brake releases unintentionally or the PARKING BRAKE SET memo message blanks, re-set the parking brake.

Administrative Information

The Flight Crew Operations Manual Bulletin Record is amended to show bulletin ETH-14 R3 as "In Effect" (IE).

This bulletin will be cancelled after Boeing is notified all affected airplanes have been modified by Boeing Service Bulletin B787-81205-SB320028.

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CS3 4776



Flight Crew Operations Manual Bulletin for Ethiopian Airlines Corporation

The Boeing Company
Seattle, Washington 98124-2207



Number: ETH-18

IssueDate: December 15, 2011

Airplane Effectivity: All Airplanes

Subject: EICAS Messages That May Show After Short Term Operation On Standby RAT Electrical Power In-flight.

Reason: Critical Systems Will Not Restore After Normal Electrical Power Is Restored.

Information in this bulletin is recommended by The Boeing Company, but may not be FAA approved at the time of writing. In the event of conflict with the FAA approved Airplane Flight Manual (AFM), the AFM shall supersede. The Boeing Company regards the information or procedures described herein as having a direct or indirect bearing on the safe operation of this model airplane.

THE FOLLOWING PROCEDURE AND/OR INFORMATION IS EFFECTIVE UPON RECEIPT

Background Information

Following restoration of normal electrical power after short term operation on standby RAT electrical power in-flight, critical systems such as CAC's and TAT will not restore. Autopilot will have limited functions.

Operating Instructions

The following EICAS messages and Flight Deck Effects may be present:

- FUEL PUMP CENTER R
- AUTOTHROTTLE DISC
- AUTOPILOT
- PACK L+R or PACK L or PACK R
- Loss of TAT data
 - ENG EEC MODE R
 - ICE DETECTORS
 - TCAS RA CAPTAIN
 - TCAS RA F/O
 - THRUST ASYM PROT
 - WEATHER RADAR SYS
 - WINDSHEAR SYS
 - LNAV is inoperative
 - VNAV is inoperative
 - FMC Predictions inoperative
 - Autothrottle is inoperative
 - FMC thrust limits are inoperative

Administrative Information

The Flight Crew Operations Manual Bulletin Record is amended to show bulletin ETH-18 as "In Effect" (IE).

This condition is temporary until the system is modified. This bulletin remains in effect until further notice.

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CS3 4846



Flight Crew Operations Manual Bulletin for Ethiopian Airlines Corporation

The Boeing Company
Seattle, Washington 98124-2207



Number: ETH-24 R2

IssueDate: August 19, 2013

Airplane Effectivity: ET-AOO - ET-AOS

Subject: APU Bowed Rotor Hung Start

Reason: To inform flight crews of a change to the APU shutdown procedure on the ground to improve APU thermal conditions.

Omitted reference to software revision in Administrative Information

Information in this bulletin is recommended by The Boeing Company, but may not be FAA approved at the time of writing. In the event of conflict with the FAA approved Airplane Flight Manual (AFM), the AFM shall supersede. The Boeing Company regards the information or procedures described herein as having a direct or indirect bearing on the safe operation of this model airplane.

THE FOLLOWING PROCEDURE AND/OR INFORMATION IS EFFECTIVE UPON RECEIPT

Background Information

On the ground, when the APU inlet door is closed after APU shutdown, hot air can collect in the APU. The trapped hot air can cause a rotor imbalance or bowed rotor. In rare cases, a bowed rotor can cause rotor rub that might lead to a hung start and APU damage. In flight, there is adequate airflow through the APU and APU compartment to prevent a bowed rotor hung start.

To prevent a bowed rotor hung start on the ground, the APU inlet door should be kept open for at least 40 minutes after APU shutdown. This prevents hot air from being trapped in the APU and allows the APU to be started at any time with no risk of a bowed rotor hung start.

The APU inlet door can be opened without starting the APU by setting the APU selector to the ON position without selecting START.

Operating Instructions

APU shutdown on the ground:

APU selector OFF

Wait approximately 3 minutes.

This allows the APU cool down cycle to complete.

APU selector ON

This opens the APU door. Do not select START.

Wait 40 minutes or longer.

APU selector OFF

Note: If takeoff occurs during the 40 minute wait, the APU selector can be set to OFF at a convenient time after takeoff (when workload is low) with no time restriction.

If the APU is needed during the 40 minute wait, it is acceptable to start the APU with no time restriction.

This procedure is not needed for APU shutdown in flight.

Closing the APU door (setting the APU selector to OFF) may be assigned to Maintenance if the flight crew leaves the airplane.

Administrative Information

The Flight Crew Operations Manual Bulletin Record is amended to show bulletin ETH-24 R2 as "In Effect" (IE).

This bulletin will be cancelled after Boeing is notified that all affected airplanes have been modified by Boeing Service Bulletin B787-81205-SB490002-00.

Please send all correspondence regarding flight Crew Operations Manual Bulletin status to the 787 Manager, Flight Technical Data, through the Service Requests Application (SR App) on the MyBoeingFleet home page.

CS3 5001



Flight Crew Operations Manual Bulletin for Ethiopian Airlines Corporation

The Boeing Company
Seattle, Washington 98124-2207



Number: ETH-29 R3

IssueDate: October 3, 2013

Airplane Effectivity: ET-AOP - ET-AOS, ET-ATJ - ZD008

Subject: Air Cycle Machine (ACM) Freezing

Reason: Ice formation in one or both pack air cycle machines may occur in flight.

Boeing Service Bulletin numbers B787-81205-SB210018-00 and
B787-81205-SB210024-00 removed

Information in this bulletin is recommended by The Boeing Company, but may not be FAA approved at the time of writing. In the event of conflict with the FAA approved Airplane Flight Manual (AFM), the AFM shall supersede. The Boeing Company regards the information or procedures described herein as having a direct or indirect bearing on the safe operation of this model airplane.

THE FOLLOWING PROCEDURE AND/OR INFORMATION IS EFFECTIVE UPON RECEIPT

Background Information

Ice can form in one or both pack ACMs in flight after the air conditioning packs are run for an extended time on the ground in hot and humid conditions. Water in the packs may freeze during initial climb. This can cause a PACK MODE message (ACM inoperative, pack operating in heat exchanger-only mode) or a PACK message (pack inoperative) to show. If both packs are in one of these conditions, trim air is lost, and flight deck and cabin temperatures may become too cold.

Descent to an altitude where the Total Air Temperatures (TAT) is above freezing (approximately 20,000 feet in a warm air mass) allows the ice to melt before cabin temperatures become too cold. Waiting 10 minutes at the lower altitude ensures that the water in the ACM evaporates.

Operating Instructions

If PACK or PACK MODE message shows for one pack, do the respective ECL checklist. If the PACK L+R message shows, do the respective ECL checklist.

If one of the following message combinations shows, do the Dual Pack Freezing unannunciated QRH/ECL checklist:

- PACK MODE L and PACK MODE R
- PACK L and PACK MODE R
- PACK R and PACK MODE L

Administrative Information

The Flight Crew Operations Manual Bulletin Record is amended to show bulletin ETH-29 R3 as "In Effect" (IE).

This bulletin will be cancelled after Boeing is notified that all affected airplanes have been modified by Boeing Service Bulletin B787-81205-SB210025-00.

Please send all correspondence regarding flight Crew Operations Manual Bulletin status to the 787 Manager, Flight Technical Data, through the Service Requests Application (SR App) on the MyBoeingFleet home page.

CS3 5096



Flight Crew Operations Manual Bulletin for Ethiopian Airlines Corporation

The Boeing Company
Seattle, Washington 98124-2207



Number: ETH-30 R2

IssueDate: January 3, 2013

Airplane Effectivity: Applies To Airplanes with Primary Flight Control
Function - Quick Turn 3 Software Version Installed

Subject: Potential Roll and Pitch Capture Logic Error

Reason: Inform flight crews of the potential for incorrect armed roll or pitch
FMA displays.

Added Boeing Service Letter reference number.

Information in this bulletin is recommended by The Boeing Company, but may not be FAA approved at the time of writing. In the event of conflict with the FAA approved Airplane Flight Manual (AFM), the AFM shall supersede. The Boeing Company regards the information or procedures described herein as having a direct or indirect bearing on the safe operation of this model airplane.

THE FOLLOWING PROCEDURE AND/OR INFORMATION IS EFFECTIVE UPON RECEIPT

Background Information

An update to the Primary Flight Controls Function - Quick Turn 3 software contains an error in the arming and capture logic. If the crew arms a roll or pitch mode by pushing the LOC/FAC, LNAV, VNAV, or APP switch before capturing a previously armed mode, the anomaly may occur.

This anomaly may cause the Flight Mode Annunciation (FMA) on the Captain's side (PFD and HUD) or on the First Officer's side (PFD and HUD), or on both sides, to not show the armed roll or pitch modes. This anomaly may also prevent capture of the armed roll or pitch modes if it occurs. There are no EICAS messages or other fault indications for this error.

Operating Instructions

Crews should ensure that any armed roll or pitch mode (LOC/FAC, LNAV, VNAV, or APP) is either captured (active mode) or disarmed before arming a subsequent roll or pitch mode.

Administrative Information

The Flight Crew Operations Manual Bulletin Record is amended to show bulletin ETH-30 R2 as "In Effect" (IE).

This bulletin will be cancelled after Boeing is notified that all affected airplanes have been modified by Boeing Service Bulletin B787-81205-SB270004-00. (Ref: Boeing Service Letter 787-SL-27-008).

Please send all correspondence regarding flight Crew Operations Manual Bulletin status to the 787 Manager, Flight Technical Data, through the Service Requests Application (SR App) on the MyBoeingFleet home page.

CS3 5152



Flight Crew Operations Manual Bulletin for Ethiopian Airlines Corporation

The Boeing Company
Seattle, Washington 98124-2207



Number: ETH-35 R1

IssueDate: October 24, 2013

Airplane Effectivity: ET-AOT - ZD008 (ET-AOO - ET-AOS ; After incorporation of Service Bulletin B787-81205-SB300005-00 discontinue use of OMB "Anomalous TAT Probe Logic Affecting Automatic Ice Detection System".)

Subject: Anomalous TAT Probe Logic Affecting Manual Operation of Anti-ice Systems

Reason: To inform flight crews that the engine and wing anti-ice systems must be operated using a non-standard icing temperature threshold when operated manually.

Removed note in Operating Instructions.

Information in this bulletin is recommended by The Boeing Company, but may not be FAA approved at the time of writing. In the event of conflict with the FAA approved Airplane Flight Manual (AFM), the AFM shall supersede. The Boeing Company regards the information or procedures described herein as having a direct or indirect bearing on the safe operation of this model airplane.

THE FOLLOWING PROCEDURE AND/OR INFORMATION IS EFFECTIVE UPON RECEIPT

Background Information

Normally, the two engine TAT probes and the airplane TAT probe are combined to provide a voted TAT solution that is displayed on EICAS. A logic anomaly between engine and airplane TAT probes can affect the accuracy of the displayed TAT. In the remote case that two of the TAT probes provide erroneous data, indicated TAT may be higher or lower than actual TAT. As a result, when operating anti-ice systems manually in flight, icing conditions must be assumed to be possible at or less than 15°C instead of 10°C.

On the ground, and when anti-ice is operated in AUTO mode, a different source of TAT is used to command engine anti-ice on. This TAT source is not subject to the TAT anomaly. Anti-ice operation on the ground in manual mode is normal. Anti-ice operation in flight in the AUTO mode is also normal.

Operating Instructions

Ground Operation and Takeoff

Operate anti-ice per normal and supplementary procedures. This anomaly does not affect TAT indications on the ground.

Automatic Anti-Ice Operation - In-Flight

No crew action is required for automatic operation of anti-ice at any temperature.

Manual Anti-Ice Operation - Initial Climb

When TAT is 10°C or less, wing and engine anti-ice must be ON before entering icing conditions.

When TAT is 15°C or less, and greater than 10°C and visible moisture is present, engine and wing anti-ice must be ON. If performance permits, selecting engine and wing anti-ice ON may be delayed to 1500 feet AGL during climb, but no later than 2500 feet AGL.

Note: This procedure assumes that AFM performance data using anti-ice OFF shows that the airplane will achieve flaps-up, final climb speed and clear all obstacles at a height of 1500 feet AGL or less.

Manual Anti-Ice Operation - In-Flight

When TAT is 15°C or less and visible moisture is present, engine and wing anti-ice must be ON.

WARNING: Do not rely on airframe visual icing cues before turning ON engine and wing anti-ice. Use the temperature and visible moisture criteria because late activation of engine anti-ice may allow excessive ingestion of ice and result in engine damage or failure.

When engine and wing anti-ice are needed:

CAUTION: Do not use engine or wing anti-ice when TAT is above 15°C.

ENGINE ANTI-ICE selectors (both)	ON	PM
WING ANTI-ICE selector	ON	PM

Note: When the anti-ice system is ON and the displayed TAT is above 10°C the EICAS advisory message ANTI-ICE ON will show. Disregard this message and override the ANTI-ICE ON checklist in the electronic checklist (ECL).



Flight Crew Operations Manual Bulletin for Ethiopian Airlines Corporation

The Boeing Company
Seattle, Washington 98124-2207



Number: ETH-36 R1

IssueDate: October 3, 2013

Airplane Effectivity: ET-AOO, ET-AOP

Subject: Nuisance SPOILERS Message During Engine Start

Reason: Normal vibration during engine start can cause sensors to signal that the spoiler trailing edge has contacted the flaps, resulting in a SPOILERS advisory message.

Added Boeing Service Bulletin number

Information in this bulletin is recommended by The Boeing Company, but may not be FAA approved at the time of writing. In the event of conflict with the FAA approved Airplane Flight Manual (AFM), the AFM shall supersede. The Boeing Company regards the information or procedures described herein as having a direct or indirect bearing on the safe operation of this model airplane.

THE FOLLOWING PROCEDURE AND/OR INFORMATION IS EFFECTIVE UPON RECEIPT

Background Information

In-service reports have shown that the current design of the inboard electric spoiler panel position sensors may be affected by normal vibration during engine start. The vibration can cause the spoiler position sensors to signal that the spoiler trailing edge has contacted the flaps. This causes the flight control electronics to shut down the affected spoiler(s) and show the SPOILERS advisory EICAS message. If the SPOILERS message shows, the engines need to be shut down and maintenance action taken to clear the associated status message before dispatch.

Nuisance spoiler trailing edge contact signals during engine start can be prevented by commanding the electric spoilers to partially extend before engine start. This physically separates the spoilers from the flaps. The electric spoilers become active and will extend early in the engine start sequence. The spoilers should not be fully extended because this can cause abrupt motion of the spoilers when they become active. Hydraulic selectors can remain in the AUTO position.

To date, in-service occurrences of this condition have been isolated to airplanes equipped with GENx engines.

Operating Instructions

To reduce occurrences of nuisance spoiler trailing edge contact signals and nuisance SPOILERS messages, operators may extend the speedbrakes to approximately 1/3 lever travel before engine start. After engine start and before taxi, the speedbrakes should be fully retracted.

Administrative Information

The Flight Crew Operations Manual Bulletin Record is amended to show bulletin ETH-36 R1 as "In Effect" (IE).

This bulletin will be cancelled after Boeing is notified that all affected airplanes have been modified by Boeing Service Bulletin B787-81205-SB270017-00.

Please send all correspondence regarding flight Crew Operations Manual Bulletin status to the 787 Manager, Flight Technical Data, through the Service Requests Application (SR App) on the MyBoeingFleet home page.

CS3 5355



Flight Crew Operations Manual Bulletin for Ethiopian Airlines Corporation

The Boeing Company
Seattle, Washington 98124-2207



Number: ETH-39 R1

IssueDate: September 15, 2014

Airplane Effectivity: ET-AOO - ET-ARE

Subject: Uncommanded Pilot Seat Movement

Reason: To advise flight crews how to minimize damage to the seat actuator clutch so the seat does not move.

Administrative Information - Added Boeing Service Bulletin.

Information in this bulletin is recommended by The Boeing Company, but may not be FAA approved at the time of writing. In the event of conflict with the FAA approved Airplane Flight Manual (AFM), the AFM shall supersede. The Boeing Company regards the information or procedures described herein as having a direct or indirect bearing on the safe operation of this model airplane.

THE FOLLOWING PROCEDURE AND/OR INFORMATION IS EFFECTIVE UPON RECEIPT

Background Information

An operator reported an event where uncommanded pilot seat movement in the fore/aft direction occurred during landing roll out. The root cause was a failure of the seat fore/aft actuator clutch. This failure allowed the seat to move freely. Test data indicate that repeatedly releasing the manual control lever while the seat is in motion can cause the clutch to fail.

Pilot seat movement can interfere with the flight controls and the pilot's ability to control the airplane.

Operating Instructions

When the seat is being adjusted manually, flight crews should ensure the seat is stopped before releasing the manual control lever. This will minimize actuator clutch damage.

Administrative Information

The Flight Crew Operations Manual Bulletin Record is amended to show bulletin ETH-39 R1 as "In Effect" (IE).

This bulletin will be cancelled after Boeing is notified that all affected airplanes have been modified by Boeing Service Bulletin B787-81205-SB250054-001.

Please send all correspondence regarding Flight Crew Operations Manual Bulletin status to the 787 Manager, Flight Technical Data, through the Service Requests Application (SR App) on the MyBoeingFleet home page.

CS3 5508



Flight Crew Operations Manual Bulletin for Ethiopian Airlines Corporation

The Boeing Company
Seattle, Washington 98124-2207



Number: ETH-40 R1

IssueDate: November 25, 2015

Airplane Effectivity: ET-AOO - ET-ASH, ET-ATJ - ZD008

Subject: Mode Control Panel (MCP) Altitude Select Knob Anomaly

Reason: To advise operators of possible unexpected changes in the selected altitude when pushing the altitude selector.

Administrative Information - Added Boeing Service Bulletin number.

Information in this bulletin is recommended by The Boeing Company, but may not be FAA approved at the time of writing. In the event of conflict with the FAA approved Airplane Flight Manual (AFM), the AFM shall supersede. The Boeing Company regards the information or procedures described herein as having a direct or indirect bearing on the safe operation of this model airplane.

THE FOLLOWING PROCEDURE AND/OR INFORMATION IS EFFECTIVE UPON RECEIPT

Background Information

Operators have reported that there have been several occasions of unexpected changes in the MCP selected altitude when pushing the altitude selector. Pushing the altitude selector has occasionally caused it to rotate one or more detents, and the selected altitude to change unexpectedly.

This anomaly will be corrected in a future software revision which will prevent unexpected changes to the MCP altitude as a result of pressing the altitude selector.

Operating Instructions

Any time the altitude selector is pushed, confirm the selected altitude is correct.

Administrative Information

The Flight Crew Operations Manual Bulletin Record is amended to show bulletin ETH-40 R1 as "In Effect" (IE).

This bulletin will be canceled after Boeing is notified all affected airplanes have been modified by Boeing Service Bulletin B787-81205-B787-22-0002-03.

Please send all correspondence regarding Flight Crew Operations Manual Bulletin status to the 787 Manager, Flight Technical Data, through the Service Requests Application (SR Ape) on the MyBoeingFleet home page.

CS3 5599



Flight Crew Operations Manual Bulletin for Ethiopian Airlines Corporation

The Boeing Company
Seattle, Washington 98124-2207



Number: ETH-41 R1

IssueDate: February 12, 2016

Airplane Effectivity: ET-AOO - ET-ASI

Subject: Flight Director Guidance Error in Direct and Secondary Mode

Reason: To inform operators of incorrect FLCH SPD pitch guidance under certain conditions when flight controls are in direct or secondary mode.

Administrative Information - Added Boeing Service Bulletin.

Information in this bulletin is recommended by The Boeing Company, but may not be FAA approved at the time of writing. In the event of conflict with the FAA approved Airplane Flight Manual (AFM), the AFM shall supersede. The Boeing Company regards the information or procedures described herein as having a direct or indirect bearing on the safe operation of this model airplane.

THE FOLLOWING PROCEDURE AND/OR INFORMATION IS EFFECTIVE UPON RECEIPT

Background Information

An error has been identified in the flight director logic for FLCH SPD pitch guidance while in direct or secondary flight control mode. FLCH SPD provides minimum speed protection at a speed near the top of the amber band for the existing flap setting. This minimum speed does not change if the flaps are extended after entering direct or secondary mode. As a result FLCH SPD flight director pitch guidance will be erroneous when a target speed is selected below the minimum speed for the original flaps setting.

This error does not affect stick shaker speeds. Crews should respond to stick shaker or other approach to stall indications as appropriate.

Operating Instructions

Flight crews should be aware that when operating in direct or secondary flight control mode, that flight director pitch guidance in FLCH SPD mode may be incorrect.

When flaps are extended, do not follow the flight director pitch guidance when operating in FLCH SPD pitch mode.

Administrative Information

The Flight Crew Operations Manual Bulletin Record is amended to show bulletin ETH-41 R1 as "In Effect" (IE).

This bulletin will be canceled after Boeing is notified all 787-8 airplanes have been modified by Boeing Service Bulletin B787-81205-SB270029-00, or all 787-9 airplanes have been modified by Boeing Service Bulletin B787-81205-SB270036-00.

Please send all correspondence regarding Flight Crew Operations Manual Bulletin status to the 787 Manager, Flight Technical Data, through the Service Requests Application (SR App) on the MyBoeingFleet home page.

CS3 5612



Flight Crew Operations Manual Bulletin for Ethiopian Airlines Corporation

The Boeing Company
Seattle, Washington 98124-2207



Number: ETH-42 R3

IssueDate: March 21, 2016

Airplane Effectivity: ET-AOO - ET-ASI

Subject: VNAV Acceleration and Thrust Reduction Height Limitations

Reason: To inform operators of temporary limitations for takeoff from airports at certain pressure altitudes, VNAV must be armed and certain maximum acceleration and thrust reduction heights be used for GENx equipped airplanes.

Operating Instructions - One or both tables may be deleted by Boeing Service Bulletin completion.

Information in this bulletin is recommended by The Boeing Company, but may not be FAA approved at the time of writing. In the event of conflict with the FAA approved Airplane Flight Manual (AFM), the AFM shall supersede. The Boeing Company regards the information or procedures described herein as having a direct or indirect bearing on the safe operation of this model airplane.

THE FOLLOWING PROCEDURE AND/OR INFORMATION IS EFFECTIVE UPON RECEIPT

Background Information

A software design error associated with the GENx engines has been identified that may cause a slight difference in the takeoff thrust calculated by the Flight Management System (FMS) and the Electronic Engine Control (EEC). This error can cause a difference between the EEC commanded thrust and the displayed target thrust on the EICAS display. This may also cause slight oscillations in the commanded thrust.

The thrust target difference is only possible at some specific pressure altitudes and only when takeoff thrust is being commanded. The affected altitudes vary depending on the engine thrust rating. This anomaly is no longer present when a change is made to the thrust target (ie: CLB, CON, etc.)

New engine operating limitations have been added to the 787 Airplane Flight Manual (AFM) to require the use of VNAV, maximum thrust reduction and engine out acceleration heights when departing from airports at certain pressure altitudes. These limitations will ensure the thrust target will be changed prior to the altitudes where the error would be present. For airport pressure altitudes where the error would be present immediately upon takeoff (prior to any reasonable thrust reduction or acceleration height), no dispatch is permitted.

Some operators, based on an analysis of the following factors, may determine that their flights will never be affected by this bulletin:

- engine thrust rating
- elevations of all airports in the 787 route structure
- standard thrust reduction and engine out acceleration heights
- thrust reduction and engine out acceleration heights at special airports

If the operator determines they will never be affected, they can instruct their flight crews that the Operating Instructions of this bulletin should be considered complete. Operators who use this method of complying with the bulletin must continually watch for changes to any of the factors listed above (such as the addition of new routes) that can affect the outcome of the analysis.

Operating Instructions

AFM Maximum Thrust Reduction and Engine Out Acceleration Heights

When operating at the airport pressure altitudes provided in the following tables, the maximum thrust reduction height and engine-out acceleration height restrictions must be followed and prior to takeoff, VNAV must be armed:

Note: The thrust ratings below can be identified on the FMC, INIT/REF IDENT page 1R.

Thrust Rating: GENx-1B70/75

The following table is no longer applicable upon incorporation of Boeing Service Bulletin B787-81205-SB340020-00 or B787-81205-SB340021-00 or production equivalent.

Airport Pressure Altitude (ft)	Maximum Thrust Reduction Height and Engine-out Acceleration Height	
	Feet	Meters
2,500 or below	No restriction	
2,501 up to 5,500	1,500	457
5,501 up to 7,000	1,000	305
7,001 up to 8,000	1,500	457
8,001 and above	No dispatch	

Thrust Ratings: GENx-1B64, GENx-1B67, and GENx-1B70

No dispatch is allowed at airport pressure altitudes of 11,001 feet or above.

Administrative Information

The Flight Crew Operations Manual Bulletin Record is amended to show bulletin ETH-42 R3 as "In Effect" (IE).

This condition is temporary until the software is modified. This bulletin remains in effect until further notice.

Please send all correspondence regarding Flight Crew Operations Manual Bulletin status to the 787 Manager, Flight Technical Data, through the Service Requests Application (SR App) on the MyBoeingFleet home page.

CS3 5602



Flight Crew Operations Manual Bulletin for Ethiopian Airlines Corporation

The Boeing Company
Seattle, Washington 98124-2207



Number: ETH-44 R1

IssueDate: September 19, 2014

Airplane Effectivity: All Airplanes

Subject: Uncommanded Selection of Glideslope to OFF When Activating a Route

Reason: To notify crews of a software anomaly which can cause the glide slope selection on the FMC to switch to OFF when a route with an ILS approach is activated.

Operating Instructions - Corrected FMC glideslope ON/OFF line select key.

Information in this bulletin is recommended by The Boeing Company, but may not be FAA approved at the time of writing. In the event of conflict with the FAA approved Airplane Flight Manual (AFM), the AFM shall supersede. The Boeing Company regards the information or procedures described herein as having a direct or indirect bearing on the safe operation of this model airplane.

THE FOLLOWING PROCEDURE AND/OR INFORMATION IS EFFECTIVE UPON RECEIPT

Background Information

Several operators have reported events where an ILS was armed for the approach and G/P was shown armed on the Flight Mode Annunciators (FMA) instead of G/S.

Analysis of these events and a review of the FMC software have found an anomaly which can cause the glide slope selection to switch to OFF without command. This can occur when the crew activates a route with an ILS approach that was loaded when the route was inactive.

This anomaly can occur on the ground during FMC preflight activities or in the air when switching active routes.

Operating Instructions

When activating a route which contains an ILS approach, verify the G/S selection (FMC – APPROACH REF, 5L) is ON, as required, after activating the route.

If the flight crew fails to do this and the anomaly is discovered:

After Arming the Approach

- With an ILS approach loaded, if the flight crew notes that the G/S is inappropriately selected to OFF after arming the approach, (FMA annunciation of G/P armed instead of G/S) the crew must disarm the approach mode to allow selecting the G/S to ON.

After Capturing the Approach

- With an ILS approach loaded, if the flight crew notes that G/S is inappropriately selected to OFF after capturing the approach (FMA annunciation of LOC or G/P captured), the crew must disconnect the autopilot and select both flight directors to OFF to be able to make changes (selecting G/S to ON) to the approach.

Administrative Information

The Flight Crew Operations Manual Bulletin Record is amended to show bulletin ETH-44 R1 as "In Effect" (IE).

This condition is temporary until the software is modified. This bulletin remains in effect until further notice.

Please send all correspondence regarding Flight Crew Operations Manual Bulletin status to the 787 Manager, Flight Technical Data, through the Service Requests Application (SR App) on the MyBoeingFleet home page.

CS3 5655



Flight Crew Operations Manual Bulletin for Ethiopian Airlines Corporation

The Boeing Company
Seattle, Washington 98124-2207



Number: ETH-45 R1

IssueDate: November 25, 2015

Airplane Effectivity: ET-AOO - ET-ASI

Subject: Center Fuel Pumps Fault After Engine Start

Reason: To provide operators a method to reduce the possibility of a fault that causes the center fuel pumps to fail after engine start.

Administrative Information - Added Boeing Service Bulletin.

Information in this bulletin is recommended by The Boeing Company, but may not be FAA approved at the time of writing. In the event of conflict with the FAA approved Airplane Flight Manual (AFM), the AFM shall supersede. The Boeing Company regards the information or procedures described herein as having a direct or indirect bearing on the safe operation of this model airplane.

THE FOLLOWING PROCEDURE AND/OR INFORMATION IS EFFECTIVE UPON RECEIPT

Background Information

The center fuel pumps can fail during electrical power transfers after engine start. If this fault occurs, one or both of the EICAS messages FUEL PUMP CENTER L and FUEL PUMP CENTER R show. A maintenance ground test must be run to restore pump operation.

Operating Instructions

To reduce the possibility of the center fuel pump fault, operators may choose to modify their preflight and engine start procedures as follows:

If the FUEL IN CENTER message shows, do not select the CENTER PUMPS switches ON before engine start. When both engines are running and all of the GEN CTRL switch OFF lights are extinguished, select the CENTER PUMPS switches to ON.

Verify that the FUEL IN CENTER message is blank before taxi.

Administrative Information

The Flight Crew Operations Manual Bulletin Record is amended to show bulletin ETH-45 R1 as "In Effect" (IE).

This bulletin will be canceled after Boeing is notified all affected airplanes have been modified by Boeing Service Bulletin B787-81205-B787-280019-00.

Please send all correspondence regarding Flight Crew Operations Manual Bulletin status to the 787 Manager, Flight Technical Data, through the Service Requests Application (SR App) on the MyBoeingFleet home page.

CS3 5667



Flight Crew Operations Manual Bulletin for Ethiopian Airlines Corporation

The Boeing Company
Seattle, Washington 98124-2207



Number: ETH-47 R1

IssueDate: September 14, 2015

Airplane Effectivity: EEC B180 or later and DCA CBP3 software.

Subject: Ice Crystal Anti-Ice Indication (ICA)

Reason: To provide system description information and a non-normal checklist for new EICAS indications and messages.

Revised to add information that the ICA indication can show after engine maintenance.

Information in this bulletin is recommended by The Boeing Company, but may not be FAA approved at the time of writing. In the event of conflict with the FAA approved Airplane Flight Manual (AFM), the AFM shall supersede. The Boeing Company regards the information or procedures described herein as having a direct or indirect bearing on the safe operation of this model airplane.

THE FOLLOWING PROCEDURE AND/OR INFORMATION IS EFFECTIVE UPON RECEIPT

Background Information

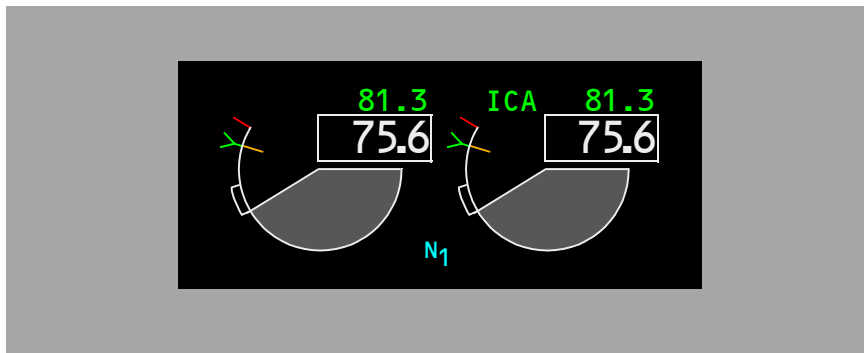
An FAA mandate requires an indication when the ice crystal anti-ice system is activated and an indication when the ice crystal anti-ice system has failed. The ice crystal anti-ice system for the GE engine has indications that are enabled by EEC B180 or later software and DCA CBP3 software. These will be on airplanes delivered before the next scheduled revision of the FCOM and QRH in September 2015. Airplanes in your fleet can also have this configuration when Boeing Service Bulletin B787-81205-SB310011 (DCA CBP3) and either B787-81205-SB730032 (B185) or B787-81205-SB730034 (B180) are completed.

Operating Instructions

Use the following information for airplanes that have EEC B180 or later software and DCA CPB3 software. The ENG ICA SYS L, R message is for crew awareness only.

The ECL database must be updated to include the new non-normal checklist. Boeing will make the ECL database update available for the DCA CBP3 incorporation.

Chapter 7, Section 10, Controls and Indications



Ice Crystal Anti-Ice Indication (ICA)

Displayed (green):

- ice crystal anti-ice function is on
- ice crystal icing conditions may not be present

Note: Each engine's ice crystal icing function is independent from the other.

Chapter 7, Section 20, Engine Systems Description

Ice Crystal Anti-Ice (ICA) Function

Ice Crystal Anti-Ice (ICA) is an automatic feature that provides engine protection against ice crystal icing (ICI). The ICA function activates only above 30,000 feet. The ICA function activates for at least 30 minutes and may continue in additional 15 minute increments, for as long as ICI conditions are encountered. If the airplane descends below 28,500 feet the ICA function terminates.

When ICA is active, "ICA" shows on either one or both N1 engine displays. In addition, engine parameters N1, N2, and EGT may fluctuate independently without any flight crew inputs. This is considered normal behavior.

Each engine's ice crystal icing function is independent from the other. Each engine's parameters may fluctuate differently, and each engine's ICA indication may appear, independently or not at all.

An ICA indication does not mean that the engine is currently encountering ICI conditions. After engine maintenance activities, for example after an engine change or an EEC change, the ICA indication can show in cruise flight, in any weather conditions, for 75 minutes or more.

Chapter NNC, Section 7, Engines, APU

ENG ICA SYS L, R

Condition: The engine ice crystal anti-ice system is failed.



Administrative Information

The Flight Crew Operations Manual Bulletin Record is amended to show bulletin ETH-47 R1 as "Incorporated" (INC).

This bulletin remains in effect until the next publication of the FCOM/QRH scheduled for September 2015.

Please send all correspondence regarding Flight Crew Operations Manual Bulletin status to the 787 Manager, Flight Technical Data, through the Service Requests Application (SR App) on the MyBoeingFleet home page.

CS3 5795

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Flight Crew Operations Manual Bulletin for Ethiopian Airlines Corporation

The Boeing Company
Seattle, Washington 98124-2207



Number: ETH-48 R1

IssueDate: November 25, 2015

Airplane Effectivity: ET-AOO - ET-ASI

Subject: V Speeds Deleted Due To Invalid TAT

Reason: To recover V speeds if TAT becomes invalid.

Background Information - Added reference to status message ENG TCMA L, R for Rolls Royce Engines Only.

Information in this bulletin is recommended by The Boeing Company, but may not be FAA approved at the time of writing. In the event of conflict with the FAA approved Airplane Flight Manual (AFM), the AFM shall supersede. The Boeing Company regards the information or procedures described herein as having a direct or indirect bearing on the safe operation of this model airplane.

THE FOLLOWING PROCEDURE AND/OR INFORMATION IS EFFECTIVE UPON RECEIPT

Background Information

When an airplane is on the ground and airspeed is less than 50 knots, Total Air Temperature (TAT) comes from sensors in the Cabin Air Compressor (CAC) inlet for the CAC Inlet Ice Protection System (CIPS). If the left and right CAC inlet temperatures have a difference of 5 degrees C or more, TAT becomes invalid. Temperature differences can be caused by uneven heating or cooling of the left and right sides of the airplane. Some operators have reported this may be caused by jet exhaust from other aircraft during taxi and while waiting for takeoff. Also, if the CIPS sensors fail on one side, the TAT becomes invalid.

If TAT is invalid, the OAT field on the FMC THRUST LIM page (1L) shows box prompts and the FMC cannot show takeoff reference speeds (V speeds). Also, the EICAS advisory message ICE DETECTORS can show.

If TAT becomes invalid after V speeds have been accepted:

- V speeds are deleted
- EICAS advisory message FMC MESSAGE shows

- CDU Help Window TAKEOFF SPEEDS DELETED shows with the text "SPEEDS DELETED DUE TO CHANGE IN TAKEOFF CONDITIONS ON THE FMC ENTER SPEEDS ON TAKEOFF REF PAGE"
- Takeoff Reference Speeds (V speeds) blank from the PFD airspeed indicator
- Amber PFD failure flag NO VSPDS shows

After engine start, the FMC checks the performance data. If there is a significant difference between the current OAT, altimeter setting, or gross weight and the data used for the original performance calculations, the V speeds are deleted.

The Fleet Team Digest article 787-FTD-34-14004 has more information on this issue.

Operating Instructions

If the ICE DETECTORS message shows or the OAT field on the THRUST LIM page (1L) shows box prompts, enter the current OAT on the THRUST LIM page. If the ICE DETECTORS message still shows, that fault is valid.

If V speeds are deleted at any time, verify the current OAT (per ATIS) on the THRUST LIM page, then do the Performance Data steps in the CDU/EFB Preflight Procedure again.

An invalid TAT cannot be resolved by entering the outside air temperature on the EFB Performance page; OAT must be entered on the THRUST LIM page.

Administrative Information

The Flight Crew Operations Manual Bulletin Record is amended to show bulletin ETH-48 R1 as "In Effect" (IE).

This bulletin will be canceled after Boeing is notified that all affected airplanes have been modified by Boeing Service Bulletin B787-81205-SB270029-00-001.

Please send all correspondence regarding Flight Crew Operations Manual Bulletin status to the 787 Manager, Flight Technical Data, through the Service Requests Application (SR App) on the MyBoeingFleet home page.

CS3 5828



Flight Crew Operations Manual Bulletin for Ethiopian Airlines Corporation

The Boeing Company
Seattle, Washington 98124-2207



Number: ETH-49

IssueDate: September 14, 2015

Airplane Effectivity: ET-AOO - ET-ASI

Subject: Possible LNAV Guidance Error in a Holding Pattern

Reason: Inform flight crews of the potential for incorrect LNAV guidance while descending in a holding pattern.

Information in this bulletin is recommended by The Boeing Company, but may not be FAA approved at the time of writing. In the event of conflict with the FAA approved Airplane Flight Manual (AFM), the AFM shall supersede. The Boeing Company regards the information or procedures described herein as having a direct or indirect bearing on the safe operation of this model airplane.

THE FOLLOWING PROCEDURE AND/OR INFORMATION IS EFFECTIVE UPON RECEIPT

Background Information

FMC software BP2A and earlier can cause the airplane to turn the wrong direction during the first outbound leg in a hold.

When a hold is programmed above 14,000 feet MSL (FL 140) (1.5 minute legs), then the airplane descends through 14,000 feet (FL 140) during the first outbound leg, the FMC resizes the holding pattern to 1 minute legs. When this resizing occurs, a software error can cause the airplane to turn away from the inbound course instead of following the correctly depicted LNAV path. If the error occurs, and the LNAV guidance is followed without intervention, the airplane turns away from the inbound leg, parallels the outbound leg, then back onto the outbound leg and resumes the holding pattern with no further anomalies.

The anomaly can occur only when all of the following conditions are true:

- The default holding pattern inbound course is modified by the pilot
- The holding pattern entry is direct
- The airplane has sequenced the holding fix only once (at the entry to the holding maneuver)
- The airplane descends through 14,000 feet MSL (FL 140) while on the first outbound leg

Operating Instructions

If the airplane descends through 14,000 feet MSL (FL 140) during the first outbound leg of a hold, ensure the airplane stays on the correct path until the first inbound turn.

If the airplane turns away from the correct path, engage HDG SEL or TRK SEL and turn to a heading to intercept the inbound leg. When the airplane is on an intercept heading to the inbound leg, arm LNAV and continue the hold.

Administrative Information

The Flight Crew Operations Manual Bulletin Record is amended to show bulletin ETH-49 as "In Effect" (IE).

This bulletin remains in effect until Boeing is notified that all affected airplanes have been updated to FMC BP3 by Boeing Service Bulletin B787-81205-SB340013.

Please send all correspondence regarding Flight Crew Operations Manual Bulletin status to the 787 Manager, Flight Technical Data, through the Service Requests Application (SR App) on the MyBoeingFleet home page.

CS3 5917



Flight Crew Operations Manual Bulletin for Ethiopian Airlines Corporation

The Boeing Company
Seattle, Washington 98124-2207



Number: ETH-51

IssueDate: January 15, 2016

Airplane Effectivity: All Airplanes

Subject: Early Localizer Capture Anomaly

Reason: To advise flight crews of the possibility for the airplane to capture a localizer signal early and then prematurely turn toward the final approach course.

Information in this bulletin is recommended by The Boeing Company, but may not be FAA approved at the time of writing. In the event of conflict with the FAA approved Airplane Flight Manual (AFM), the AFM shall supersede. The Boeing Company regards the information or procedures described herein as having a direct or indirect bearing on the safe operation of this model airplane.

THE FOLLOWING PROCEDURE AND/OR INFORMATION IS EFFECTIVE UPON RECEIPT

Background Information

In-service events and Boeing testing have identified a software anomaly which can cause the autoflight system to capture the localizer signal early and start a turn toward the final approach course before intercepting the localizer.

Changes in the autoflight software localizer capture logic were made to improve the ability to capture and intercept a localizer from large intercept angles. An unintended consequence of this change was to increase the possibility of early localizer capture due to noise in the localizer signal before normal capture criteria.

A review of in-service events confirms that, in all cases, the correct localizer signal had been tuned. Laboratory testing found that after starting an early turn toward the final approach course, if the flight crew does not intervene, the airplane rolls wings level on a shallow intercept angle and joins the intended localizer path. This early turn and shallow intercept does not follow the intended flight path.

Operating Instructions

Flight crews are advised to use normal procedures and information (ND, raw data, etc.) to monitor the flight path of the airplane during localizer-based approaches. After arming the approach, if the FMA shows LOC active and the airplane turns to the final approach course earlier than desired, select HDG SEL or TRK SEL to re-intercept the final approach course and then arm the approach mode again. Then the airplane will follow a normal capture and intercept maneuver.

Administrative Information

The Flight Crew Operations Manual Bulletin Record is amended to show bulletin ETH-51 as "In Effect" (IE).

This condition is temporary until the software is modified. This bulletin remains in effect until further notice.

Please send all correspondence regarding Flight Crew Operations Manual Bulletin status to the 787 Manager, Flight Technical Data, through the Service Requests Application (SR App) on the MyBoeingFleet home page.

CS3 5975



Flight Crew Operations Manual Bulletin for Ethiopian Airlines Corporation

The Boeing Company
Seattle, Washington 98124-2207



Number: ETH-52

IssueDate: January 15, 2016

Airplane Effectivity: All Airplanes

Subject: FMC Reset Anomaly - Procedure Turn

Reason: To advise flight crews of an FMC software anomaly that can cause a reset when a procedure turn is the 28th leg of an active flight plan.

Information in this bulletin is recommended by The Boeing Company, but may not be FAA approved at the time of writing. In the event of conflict with the FAA approved Airplane Flight Manual (AFM), the AFM shall supersede. The Boeing Company regards the information or procedures described herein as having a direct or indirect bearing on the safe operation of this model airplane.

THE FOLLOWING PROCEDURE AND/OR INFORMATION IS EFFECTIVE UPON RECEIPT

Background Information

In-service reports and testing have identified an anomaly in the flight management function software which can cause an FMC reset if a procedure turn is the 28th leg of an active flight plan. The 28th leg is the third line on the 6th LEGS page.

This anomaly can occur if a procedure turn is loaded (by selection of an approach transition) beyond the 28th leg in the flight plan and then the flight plan progresses normally until the procedure turn becomes the 28th leg. It can also occur if a flight plan is modified in a way that causes a procedure turn to become the 28th leg, either by loading an approach transition or by other modification that causes an existing procedure turn to move into the 28th leg.

If a procedure turn is the 28th leg, the FMC resets. This causes the flight plan to become inactive and a loss of all performance data. Performance data must be reloaded and the flight plan must be activated and executed after removing the procedure turn from the 28th leg. The procedure turn can be removed from the 28th leg by either loading an approach without a procedure turn or by making a modification to the flight plan so the procedure turn is before the 28th leg.

If a procedure turn is the 28th leg, the FMC will not accept selection of the EXEC key. Repeated selection of the EXEC key can cause a complete FMC reset with loss of the flight plan and performance data.

Operating Instructions

Flight crews should not load an approach transition that contains a procedure turn when the procedure turn will be placed on or after the 28th leg of the flight plan.

Note: When loading an approach with a procedure turn, any waypoints in the transition (and any associated STAR) need to be considered when determining if the procedure turn will be on or after the 28th leg.

If a flight plan contains a procedure turn on the 28th leg, as a result of either normal flight sequencing or a flight crew modification, the FMC can reset and may not accept selection of the EXEC key. If this occurs, do the following steps:

- Do not repeatedly select the EXEC key
- Reload the performance data
- Modify the flight plan to prevent a procedure turn on the 28th leg
- Activate and execute the changes

Administrative Information

The Flight Crew Operations Manual Bulletin Record is amended to show bulletin ETH-52 as "In Effect" (IE).

This condition is temporary until the software is modified. This bulletin remains in effect until further notice.

Please send all correspondence regarding Flight Crew Operations Manual Bulletin status to the 787 Manager, Flight Technical Data, through the Service Requests Application (SR App) on the MyBoeingFleet home page.

CS3 5976



Flight Crew Operations Manual Bulletin for Ethiopian Airlines Corporation

The Boeing Company
Seattle, Washington 98124-2207



Number: ETH-54

IssueDate: February 1, 2016

Airplane Effectivity: All Airplanes

Subject: Nuisance TAIL STRIKE Messages

Reason: To advise flight crews a nuisance TAIL STRIKE message can show in flight.

Information in this bulletin is recommended by The Boeing Company, but may not be FAA approved at the time of writing. In the event of conflict with the FAA approved Airplane Flight Manual (AFM), the AFM shall supersede. The Boeing Company regards the information or procedures described herein as having a direct or indirect bearing on the safe operation of this model airplane.

THE FOLLOWING PROCEDURE AND/OR INFORMATION IS EFFECTIVE UPON RECEIPT

Background Information

Boeing has received reports of the EICAS caution message TAIL STRIKE showing in flight. Completing the TAIL STRIKE checklist results in depressurization of the airplane and landing at the nearest suitable airport.

The tail strike sensor is on the bottom of the fuselage, just forward of the aft pressure bulkhead. The sensor has two independent wire loops. When a tail strike occurs, the wire loops in the tail strike sensor break and the TAIL STRIKE message shows immediately.

Note: Master Caution Light and Aural Alert are inhibited until either 400 feet RA or 800 feet RA per airline selectable option.

Engineering analysis of the events found that no tail strikes occurred. Corrosion in the tail strike sensor caused breaks in the wire loops which caused the message to show. The TAIL STRIKE message did not show during takeoff in any of the reported events; the message first showed later in flight.

A TAIL STRIKE message that first shows during takeoff indicates a tail strike. A TAIL STRIKE message that first shows later in flight does not indicate that a tail strike occurred.

This bulletin does not provide dispatch relief if the TAIL STRIKE message shows on the ground.

Operating Instructions

If the TAIL STRIKE message first shows during takeoff, the crew should consider the message valid and complete the TAIL STRIKE checklist.

Note: Master Caution Light and Aural Alert are inhibited until either 400 feet RA or 800 feet RA per airline selectable option.

If the TAIL STRIKE message does not show during takeoff, but first shows later in flight, the crew may consider it a nuisance message. The crew does not need to do the TAIL STRIKE checklist. The crew may override the non-normal checklist in ECL.

If the crew is not sure if the TAIL STRIKE message first showed during takeoff or after takeoff, the crew should consider the message as valid and the crew should complete the TAIL STRIKE checklist.

Administrative Information

The Flight Crew Operations Manual Bulletin Record is amended to show bulletin ETH-54 as "In Effect" (IE).

This bulletin remains in effect until further notice.

Please send all correspondence regarding Flight Crew Operations Manual Bulletin status to the 787 Manager, Flight Technical Data, through the Service Requests Application (SR App) on the MyBoeingFleet home page.

CS3 5991



Flight Crew Operations Manual Bulletin for Ethiopian Airlines Corporation

The Boeing Company
Seattle, Washington 98124-2207



Number: ETH-55 R1

IssueDate: April 15, 2016

Airplane Effectivity: All Airplanes

Subject: Avoidance of abrupt flight control input as a result of a sudden and unrealistic drop in indicated airspeed.

Reason: To provide crews a new unannounced procedure with instructions to avoid rapid or abrupt flight control input as a result of a sudden extreme drop in indicated airspeed, and to disconnect the autopilot prior to making any desired manual flight control inputs.

Revised the Airspeed Drop Condition statement.

Information in this bulletin is recommended by The Boeing Company, but may not be FAA approved at the time of writing. In the event of conflict with the FAA approved Airplane Flight Manual (AFM), the AFM shall supersede. The Boeing Company regards the information or procedures described herein as having a direct or indirect bearing on the safe operation of this model airplane.

THE FOLLOWING PROCEDURE AND/OR INFORMATION IS EFFECTIVE UPON RECEIPT

Background Information

There have been several events where the indicated airspeed shown to the pilots dropped rapidly (within a few seconds) to below 50kts. These events are suspected to have been caused by temporary blockage of multiple pitot tubes when near weather systems with high moisture content. In all events, the blockage cleared within several seconds. During some events, the FLIGHT CONTROL MODE, AUTOPILOT DISC, and other messages were shown (along with a flight control reversion to secondary mode). In one event, the PFD automatically switched to AOA speed; and in another event, the AIRSPEED UNRELIABLE message was shown. Depending on the duration and nature of the pitot blockage, FLIGHT CONTROL MODE, NAV AIRDATA SYS, NAV AIRSPEED DATA, AIRSPEED UNRELIABLE, AUTOPILOT DISC, AIRSPEED LOW EICAS messages can show during similar events.

While, in all these events, the air data system recovered and the fault detection system provided alert level EICAS messages where expected, a possible flight crew response to an initial sudden drop in indicated airspeed could be to apply pitch inputs which may result in ‘G’ excursions. If the crew applies strong nose down force to the yoke without disconnecting the autopilot, when the autopilot disconnects (as a result of the manual force applied), a sudden nose down command would be applied to the airplane. This nose down input could be amplified by the low column forces being fed back to the pilot as a result of the low airspeed being indicated.


As a result of the above events, Boeing is making improvements to the flight control system and force feedback to mitigate the negative effect of large control inputs in these scenarios, and is also making improvements to the EICAS Alert logic related to air data faults. In addition, Boeing is continuing to investigate the pitot blockage event rate to determine if any design improvements are warranted.

In response to concerns about possible negative crew reaction to an initial sudden drop in airspeed, the FAA intends to issue an Airworthiness Directive to require operators to incorporate a procedure into their AFM which instructs crews to avoid abrupt control inputs in response to sudden unrealistic drops in indicated airspeed. This procedure also reminds pilots that if manual flight is desired, the autopilot should be disconnected prior to any manual flight control inputs.

Operating Instructions

While the procedure provided here does not include specific memory items, crews are expected to be familiar with the possibility of a sudden unrealistic drop in indicated airspeed, and to respond within the guidelines of this procedure.

If crews see a significant drop in indicated airspeed over a short period of time, they should comply with the following:

Airspeed Drop	
Condition:	There is a sudden and unrealistic drop in indicated airspeed.
Objective:	To avoid abrupt control inputs and continue flight at normal pitch and power settings and continue until the airspeed indications recover or an EICAS alert message shows.
<ol style="list-style-type: none"> 1 Do not apply large, abrupt control column inputs. Fly the airplane at normal pitch and power settings. 2 If manual flight is needed, disconnect the autopilot via the control column switch or MCP switch before making manual flight control inputs. 3 All EICAS alert messages are valid. Accomplish the appropriate checklist(s). 	
	

Administrative Information

The Flight Crew Operations Manual Bulletin Record is amended to show bulletin ETH-55 R1 as "In Effect" (IE).

This condition is temporary until the system is modified. This bulletin remains in effect until further notice.

Please send all correspondence regarding Flight Crew Operations Manual Bulletin status to the 787 Manager, Flight Technical Data, through the Service Requests Application (SR App) on the MyBoeingFleet home page.

CS3 6028



Flight Crew Operations Manual Bulletin for Ethiopian Airlines Corporation

The Boeing Company
Seattle, Washington 98124-2207



Number: ETH-56 R1

IssueDate: April 15, 2016

Airplane Effectivity: ET-AOO - ET-ASI

Subject: Additional In-Flight Fan Ice Removal Procedure

Reason: To provide crews a temporary additional Fan Ice Removal procedure to reduce the likelihood of engine damage due to fan ice shedding on airplanes with GENx engines installed.

Added Fan Ice Removal Procedure Briefing.

Information in this bulletin is recommended by The Boeing Company, but may not be FAA approved at the time of writing. In the event of conflict with the FAA approved Airplane Flight Manual (AFM), the AFM shall supersede. The Boeing Company regards the information or procedures described herein as having a direct or indirect bearing on the safe operation of this model airplane.

THE FOLLOWING PROCEDURE AND/OR INFORMATION IS EFFECTIVE UPON RECEIPT

Background Information

Analysis of a recent GENx PIP2 in-flight engine failure has indicated the engine may have experienced a fan ice shed which led to a fan imbalance with significant contact with the fan case resulting in severe engine damage and failure.

GE and Boeing are analyzing the engine design; and in particular, fan blade clearance requirements to determine corrective action. Prior to corrective action being available, it has been determined an additional fan ice removal procedure is required to limit fan ice accumulation.

These instructions are applicable to airplanes with GENx engines installed, to reduce the risk of a dual engine event.

Operating Instructions

Operating Limitation:

The AFM requires compliance with the following limitation:

Crews shall do the following Fan Ice Removal procedure when an Engine Anti-Ice (EAI) EICAS indication is shown above 12500 feet MSL in place of the existing procedure. At or below 12500 feet MSL, do the existing published Fan Ice Removal procedure in Supplementary Procedures (SP.16).

The Fan Ice Removal Procedure briefing contained in the Operating Procedure must be briefed before engine start for the first flight of the day, and whenever an unbriefed pilot crewmember joins the flight deck crew.

Cold Weather Operations

Fan Ice Removal Procedure

When an EAI EICAS indication is shown with N1 settings below 85%, or when fan icing is suspected due to high engine vibration, the fan blades must be cleared of any ice. Do the following procedure every 5 minutes on both engines, one engine at a time: increase to a minimum of 85% N1 momentarily, then resume normal operation.

Fan Ice Removal Procedure Briefing

The following briefing is to ensure the flight crew understands the importance of complying with the revised Fan Ice Removal procedure. This is also necessary to remind the crew they will need to monitor and react to an indication not normally used for any crew action, but now requires timely, mandatory crew actions.

The briefing must include the following items:

Whenever airborne above 12500 feet MSL and either or both Engine Anti-Ice (EAI) indications show and N1 is below 85%:

- Immediately start a timer
- At 5 minute intervals, accelerate each engine to at least 85% N1 momentarily, one engine at a time
- Continue this procedure as long as the EAI indication remains shown
- If both EAI indications blank before the 5 minute interval, perform a fan ice clearance procedure per the second step above, then resume normal operation

Perform the “Fan Ice Removal” procedure any time fan ice is suspected due to high engine vibrations.

Administrative Information

The Flight Crew Operations Manual Bulletin Record is amended to show bulletin ETH-56 R1 as "In Effect" (IE).

This condition is temporary until the corrective action is identified. This bulletin remains in effect until further notice.

Please send all correspondence regarding Flight Crew Operations Manual Bulletin status to the 787 Manager, Flight Technical Data, through the Service Requests Application (SR App) on the MyBoeingFleet home page.

CS3 6029

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Flight Crew Operations Manual Bulletin for Ethiopian Airlines Corporation

The Boeing Company
Seattle, Washington 98124-2207



Number: ETH-57

IssueDate: April 1, 2016

Airplane Effectivity: All Airplanes

Subject: FMC Reset in the Air - Wind Uplink when Sequencing a Waypoint

Reason: To advise flight crews of an FMC software anomaly than can cause a reset in the air if a waypoint is sequenced while uplinked wind data is being loaded.

Information in this bulletin is recommended by The Boeing Company, but may not be FAA approved at the time of writing. In the event of conflict with the FAA approved Airplane Flight Manual (AFM), the AFM shall supersede. The Boeing Company regards the information or procedures described herein as having a direct or indirect bearing on the safe operation of this model airplane.

THE FOLLOWING PROCEDURE AND/OR INFORMATION IS EFFECTIVE UPON RECEIPT

Background Information

Boeing engineering has identified an anomaly in the flight management function software blockpoint CBP3. The FMC software part number shows on the FMC IDENT page. CBP3 has part number HNP58-AL11-5006.

This anomaly causes an FMC reset in the air if a waypoint sequences while wind uplink data is being loaded. Testing shows the longest time to load uplinked winds is 8 seconds after LOAD or RELOAD is selected.

This FMC reset causes the flight plan to become inactive, the flight number to blank, and a loss of all performance data. After the FMC reset, the performance data can be reloaded, the flight number can be entered, and the flight plan can be reactivated and executed.

Operating Instructions

Do not LOAD or RELOAD uplinked wind data if the ETA at the next waypoint is within one minute. If the ETA at the next waypoint is within one minute, LOAD or RELOAD the uplinked wind data after the waypoint has sequenced.

If an FMC reset occurs as a result of this anomaly, reload performance data, enter the flight number, activate and execute the flight plan, then, RELOAD the uplinked wind data.

Administrative Information

The Flight Crew Operations Manual Bulletin Record is amended to show bulletin ETH-57 as "In Effect" (IE).

This condition is temporary until the software is modified. This bulletin remains in effect until further notice.

Please send all correspondence regarding Flight Crew Operations Manual Bulletin status to the 787 Manager, Flight Technical Data, through the Service Requests Application (SR App) on the MyBoeingFleet home page.

CS3 6036



Flight Crew Operations Manual Bulletin for Ethiopian Airlines Corporation

The Boeing Company
Seattle, Washington 98124-2207



Number: ETH-58

IssueDate: June 8, 2016

Subject: Administrative Bulletin

Reason: Change to Supplementary Procedure, “Instrument Approach Using Vertical Speed (V/S) or Flight Path Angle (FPA)”.

Information in this bulletin is recommended by The Boeing Company, but may not be FAA approved at the time of writing. In the event of conflict with the FAA approved Airplane Flight Manual (AFM), the AFM shall supersede. The Boeing Company regards the information or procedures described herein as having a direct or indirect bearing on the safe operation of this model airplane.

THE FOLLOWING PROCEDURE AND/OR INFORMATION IS EFFECTIVE UPON RECEIPT

Background Information

In the March 21, 2016 revision to the Flight Crew Operations Manual, Supplementary Procedures, SP.4.5, a procedural step was omitted from the “Instrument Approach Using Vertical Speed (V/S) or Flight Path Angle (FPA)” procedure.

Operating Instructions

Use the corrected procedure below.

Instrument Approach Using Vertical Speed (V/S) or Flight Path Angle (FPA)

Pilot Flying	Pilot Monitoring
Initially <ul style="list-style-type: none"> • If on radar vectors <ul style="list-style-type: none"> • HDG SEL • Pitch mode (as needed) • If enroute to a fix <ul style="list-style-type: none"> • LNAV or other roll mode • VNAV or other pitch mode 	
Call "FLAPS___" according to the flap extension schedule.	Set the flap lever as directed.

Administrative Information

The Flight Crew Operations Manual Bulletin Record is amended to show bulletin ETH-58 as "In Effect" (IE).

This administrative bulletin remains in effect until the next FCOM/QRH revision scheduled for September 19, 2016.

Please send all correspondence regarding Flight Crew Operations Manual Bulletin status to the 787 Manager, Flight Technical Data, through the Service Requests Application (SR App) on the MyBoeingFleet home page.

FD 22



Flight Crew Operations Manual Bulletin for Ethiopian Airlines Corporation

The Boeing Company
Seattle, Washington 98124-2207



Number: ETH-59

IssueDate: June 8, 2016

Airplane Effectivity: ET-ATJ - ZD008

Subject: Loss of Magenta Line on Navigation Display (ND)

Reason: To inform flight crews of the possibility of a loss of the active route magenta line on the navigation display.

Information in this bulletin is recommended by The Boeing Company, but may not be FAA approved at the time of writing. In the event of conflict with the FAA approved Airplane Flight Manual (AFM), the AFM shall supersede. The Boeing Company regards the information or procedures described herein as having a direct or indirect bearing on the safe operation of this model airplane.

THE FOLLOWING PROCEDURE AND/OR INFORMATION IS EFFECTIVE UPON RECEIPT

Background Information

Operators have reported occurrences of loss of the active route magenta line from one or both navigation displays (ND). This anomaly occurs only on airplanes with FMC BPv3.0 software installed. This anomaly can occur during any phase of flight. The magenta line may not show when the route is executed; or, it can disappear at any time.

This anomaly does not affect the FMF active route or any other navigation functions. The active route magenta line can reappear later in flight. If the magenta line reappears, it shows correctly. The magenta line in the Mini-Map is not affected by this anomaly.

Boeing has determined there is no action the flight crew or maintenance can take to prevent or recover from this anomaly. This bulletin is intended to make flight crews aware of this anomaly to minimize distraction or attempts to recover from the anomaly.

This anomaly will be corrected in FMC BPv3A.

Operating Instructions

The active route magenta line can disappear from one or both Navigation Displays (ND). This can occur during any phase of flight. There is no action the flight crew can take that will cause this or prevent this from occurring.

This anomaly only affects the display of the magenta line on the ND. It does not affect any other navigation function. The magenta line in the Mini-Map is not affected by this anomaly. The flight plan can be monitored on the LEGS page.

If this anomaly occurs during an LNAV/VNAV or RNP-AR approach, the flight crew should consider a go-around or missed approach if that is the safest course of action. If this anomaly occurs before starting an LNAV/VNAV or RNP-AR approach, the flight crew should consider an alternative type of approach, such as an ILS.

Administrative Information

The Flight Crew Operations Manual Bulletin Record is amended to show bulletin ETH-59 as "In Effect" (IE).

This condition is temporary until FMC BPv3A software is installed. This bulletin remains in effect until further notice.

Please send all correspondence regarding Flight Crew Operations Manual Bulletin status to the 787 Manager, Flight Technical Data, through the Service Requests Application (SR App) on the MyBoeingFleet home page.

CS3 6065