Service Bulletin B787-81205-SB280015-00 FUEL - Fuel Distribution - Fuel Shutoff Valve Actuator Test and Replacement

Publication:	B787-81205-SB280015-00	Issue 002, 19 Jun 2014

The applicability information below is referenced at the lower left of each page to indicate the page applicability. These references are valid for this print copy only.

PM Applicability (Publication Module applicability)
787-8 Airplanes. Refer to Data Module SB B787-A-28-00-0015-00A-932A-D, Paragraph 1., Effectivity for the list of affected airplanes.

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List of Illustrations

Description

Group 1:

Table 1 List of Illustrations - Service Bulletin B787-81205-SB280015-00

ICN	Used In
ICN-B787-A-000061-A-81205-06437-A-01-1	B787-A-28-00-0015-00A-931C-D Issue 002

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List of Effective Data Modules

Description

Group 1:

Table 1 List of Effective Data Modules - Service Bulletin B787-81205-SB280015-00

Data Module – Information Name	Issue	Issue Status	Issue Date
B787-A-28-00-0015-00A-00AA-D – List of Illustrations	002	Changed	2014-06-19
B787-A-28-00-0015-00A-00SA-D – List of Effective Data Modules	002	Changed	2014-06-19
B787-A-28-00-0015-00A-931B-D – Revision Transmittal Information	001	New	2014-06-19
B787-A-28-00-0015-00A-931C-D – Summary	002	Changed	2014-06-19
B787-A-28-00-0015-00A-932A-D – PLANNING INFORMATION	002	Changed	2014-06-19
B787-A-28-00-0015-00A-934A-D – MATERIAL INFORMATION	002	Changed	2014-06-19
B787-A-28-00-0015-00A-933A-D – ACCOMPLISHMENT INSTRUCTIONS	002	Changed	2014-06-19

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Revision Transmittal Information

References

Reference	Title
SB B787-A-28-00-0015-00A-932A-D Issue 002, Paragraph 1.A.	Airplanes

Description

Group 1:
This revision includes all pages of the service bulletin.

1. COMPLIANCE INFORMATION RELATED TO THIS REVISION

No more work is necessary on airplanes changed or inspected in accordance with Issue 001 of this service bulletin.

2. REASON FOR REVISION

This issue is sent to make these changes:

1. Change the compliance time for the terminating action from 60 months to 36 months.
2. Include the reference to the Eaton service bulletin 53-0037-28-01.
3. Include a note in the General Information section to inform operators that the external power is required for the PART 2 : APU FUEL SHUTOFF VALVE ACTUATOR TEST.
4. Clarify the engine and APU fuel shutoff valve actuator test procedures.

As a part of a service bulletin validation program, the engine and APU fuel shutoff valve actuator tests in this service bulletin were completed on airplane ZA188 before the release of Issue 002 of this service bulletin.

These sections were changed:

1. Planning Information - Paragraph 5, Compliance
2. Material Information - Paragraph 3, Parts Necessary for Each Airplane
3. Accomplishment Instructions - Paragraph 2, Work Instructions

Change marks are added, except in Data Module SB B787-A-28-00-0015-00A-932A-D, Paragraph 1.A., Airplanes and format changes, to show the location of all content changes.

3. REVISION HISTORY

Table 1

Issue 1:	January 30, 2014
Issue 2:	June 19, 2014

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Summary

References

Reference	Title
SB B787-A-28-00-0015-00A-932A-D Issue 002, Paragraph 1.B.	Spares Affected
SB B787-A-28-00-0015-00A-932A-D Issue 002, Paragraph 5.	Compliance
SB B787-A-28-00-0015-00A-932A-D Issue 002, Paragraph 8.	Weight and Balance Changes
SB B787-A-28-00-0015-00A-932A-D Issue 002, Paragraph 9.	Electrical Load Data
SB B787-A-28-00-0015-00A-932A-D Issue 002, Paragraph 11.	Publications Affected
SB B787-A-28-00-0015-00A-934A-D Issue 002, Paragraph 3.A.	Kits/Parts
SB B787-A-28-00-0015-00A-934A-D Issue 002, Paragraph 3.B.	Parts and Materials Supplied by the Operator
SB B787-A-28-00-0015-00A-934A-D Issue 002, Paragraph 6.	Special Tooling Necessary to do this Service Bulletin
SB B787-A-28-00-0015-00A-932A-D Issue 002, Paragraph 1.	Effectivity
SB B787-A-28-00-0015-00A-934A-D Issue 002, Paragraph 2.	Industry Support Information
SB B787-A-28-00-0015-00A-932A-D Issue 002, Paragraph 7.	Manpower
SB B787-A-28-00-0015-00A-934A-D Issue 002, Paragraph 1.	Material - Price and Availability

Description

Group 1:

1. CONCURRENT REQUIREMENTS

None.

2. BACKGROUND

This service bulletin gives instructions to test the engine and Auxiliary Power Unit (APU) fuel shutoff valve actuators to make sure that the valve operation and indication are working correctly. This service bulletin also provides the terminating action to replace the engine and APU fuel shutoff valve actuators and an option to replace the fuel crossfeed and defuel/isolation valve actuators. Incorporation of this service bulletin prevents possible operational disruptions.

The fuel shutoff valve actuator circuit design provides common input power through micro-switches to both the motor and position indication. It was identified that the valve actuator circuitry has a potential latent failure condition previously not identified during its development. The latent failure condition is with respect to the potential for a stuck micro-switch which could lead to a disagreement between the valve command and position indication. In a case where a command is sent to change valve position and one of the internal micro-switches is stuck in the depressed state, power would immediately provide indication that the valve transitioned to its commanded state when in reality the motor never received power to rotate. Changes were made to the actuator micro-switch circuit by the supplier to provide independence between the valve command and indication functions which prevent the latent failure condition. Refer to Fleet Team Digest 787-FTD-28-13002 for additional information.

Boeing Service Related Problem (SRP) 787 SRP-28-0147 is related to this service bulletin.

As a part of a service bulletin validation program, the engine and APU fuel shutoff valve actuator tests in this service bulletin were completed on airplane ZA188 before the release of Issue 002 of this service bulletin.

This table is provided to operators for planning purposes only. Refer to the applicable sections for more information.

Table 1

Planning Data	Affected	Data Module Reference
Spares Affected	No	Data Module SB B787-A-28-00-0015-00A-932A-D, Paragraph 1.B., Spares Affected
AD Related	Yes	Data Module SB B787-A-28-00-0015-00A-932A-D, Paragraph 5., Compliance
Weight and Balance Changed	No	Data Module SB B787-A-28-00-0015-00A-932A-D, Paragraph 8., Weight and Balance Changes
Electrical Load Changed	No	Data Module SB B787-A-28-00-0015-00A-932A-D, Paragraph 9., Electrical Load Data
Publications Affected	No	Data Module SB B787-A-28-00-0015-00A-932A-D, Paragraph 11., Publications Affected
Airplane Flight Operations Affected (Flight Crew Operations Manual and/or FAA Approved Airplane Flight Manual)	No	Data Module SB B787-A-28-00-0015-00A-932A-D, Paragraph 11., Publications Affected
Kits/Parts Required	No	Data Module SB B787-A-28-00-0015-00A-934A-D, Paragraph 3.A., Kits/Parts

Table 1

Planning Data	Affected	Data Module Reference
Operator Supplied Parts/Material	Yes	Data Module SB B787-A-28-00-0015-00A-934A-D, Paragraph 3.B., Parts and Materials Supplied by the Operator
Special Tooling Required	No	Data Module SB B787-A-28-00-0015-00A-934A-D, Paragraph 6., Special Tooling Necessary to do this Service Bulletin

3. ACTION

(CN-AC36420A)

Testing: Do the engine and APU fuel shutoff valve actuator test and replace the valve actuator if necessary.

Terminating Action: Replace the engine and APU fuel shutoff valve actuators.

Option: Replace the fuel crossfeed and defuel/isolation valve actuators.

4. EFFECTIVITY

787-8 Airplanes. Refer to Data Module SB B787-A-28-00-0015-00A-932A-D, Paragraph 1., Effectivity for the list of affected airplanes.

5. COMPLIANCE

The Federal Aviation Administration (FAA) will possibly release an Airworthiness Directive related to this service bulletin. The Airworthiness Directive will make the compliance tasks and times given in this service bulletin mandatory.

Refer to Data Module SB B787-A-28-00-0015-00A-932A-D, Paragraph 5., Compliance.

6. INDUSTRY SUPPORT INFORMATION

Boeing warranty remedies are available for airplanes in warranty as of February 21, 2013. Please refer to Data Module SB B787-A-28-00-0015-00A-934A-D, Paragraph 2., Industry Support Information. The warranty remedies will expire eight years from the original release date of this service bulletin.

7. MANPOWER

Refer to Data Module SB B787-A-28-00-0015-00A-932A-D, Paragraph 7., Manpower.

8. MATERIAL INFORMATION

Operator Supplied Parts/Materials.

Refer to Data Module SB B787-A-28-00-0015-00A-934A-D, Paragraph 1., Material - Price and Availability.

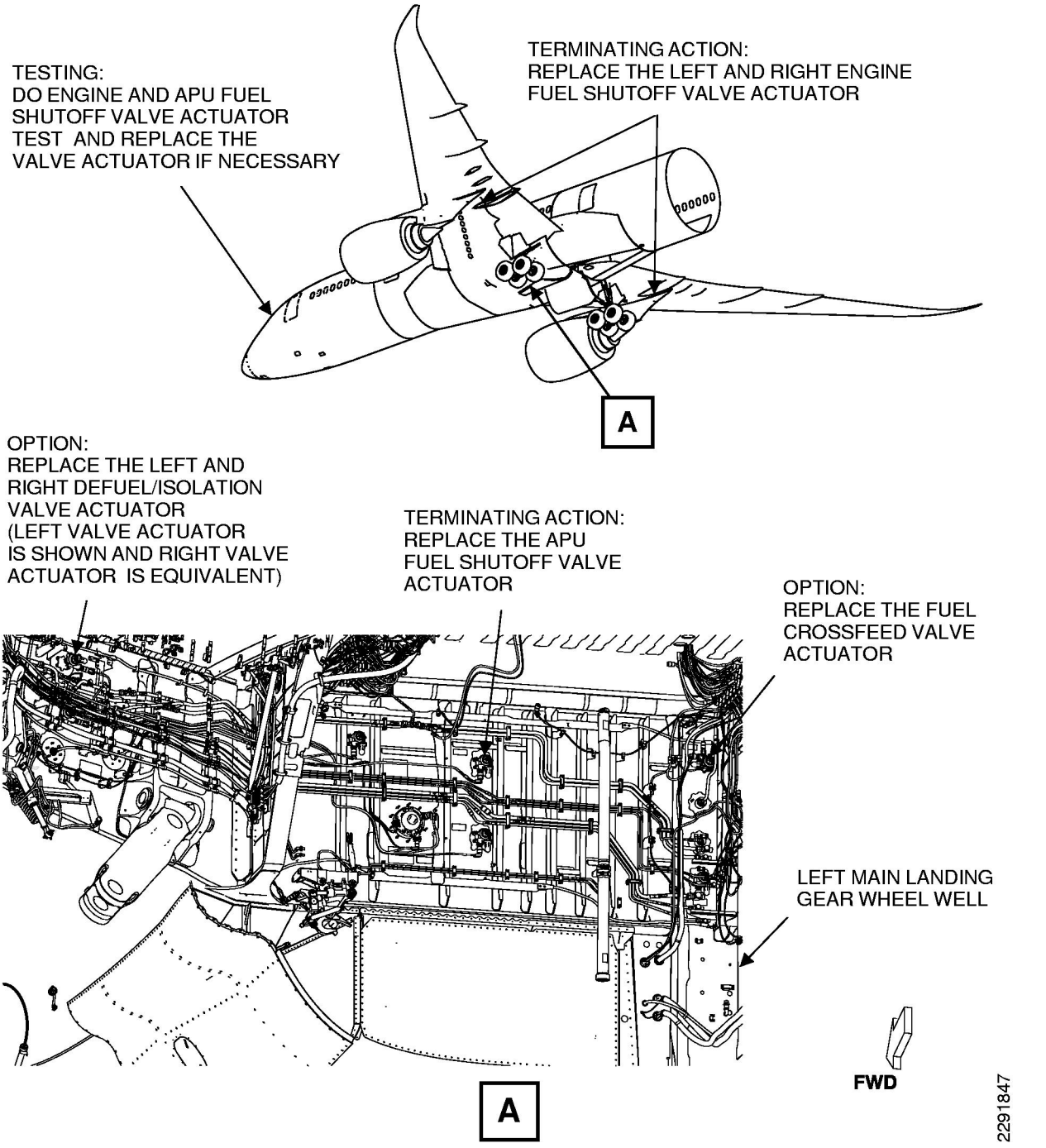

Figure 1

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PLANNING INFORMATION

References

Reference	Title
SB B787-A-28-00-0015-00A-933A-D Issue 002, Step 2.	Work Instructions
787 AMM 24-00-02	CIRCUIT BREAKER INDICATION AND CONTROL
787 AMM 28-22-02	ENGINE FUEL SHUTOFF VALVE ACTUATOR
787 AMM 28-22-04	FUEL CROSSFEED VALVE ACTUATOR
787 AMM 28-25-03	APU FUEL SHUTOFF VALVE ACTUATOR
787 AMM 28-26-02	DEFUEL/ISOLATION VALVE ACTUATOR
787 AMM 31-61-00	PRIMARY DISPLAY SYSTEM
787 AMM 46-13-00	ONBOARD BOEING ELECTRONIC DISTRIBUTION SYSTEM

Description

Group 1:

1. Effectivity

A. Airplanes

This service bulletin is for the airplanes shown below. An equivalent change is on subsequent production airplanes. Refer to CN-AA36420 for data about this change.

Table 1

GROUP	CONFIGURATION	DESCRIPTION
1	-	787-8 airplanes.

Airplane Models: 787-8

Table 2

Variable Number	Group
ZA100-ZA105	1
ZA116-ZA122	1
ZA135	1
ZA176-ZA186	1

Table 2

Variable Number	Group
ZA233	1
ZA235-ZA243	1
ZA260-ZA264	1
ZA270-ZA274	1
ZA285-ZA292	1
ZA317-ZA320	1
ZA380-ZA387	1
ZA430-ZA431	1
ZA433-ZA434	1
ZA450-ZA453	1
ZA460-ZA468	1
ZA506-ZA514	1
ZA536-ZA540	1
ZA561-ZA562	1
ZA576-ZA577	1

B. Spares Affected

Examine your spares supply for the parts or components identified below. If any parts or components are found, refer to Data Module SB B787-A-28-00-0015-00A-933A-D, Step 2., Work Instructions for the recommended action.

Table 3

Part Number	Name
53-0037	Valve Actuator

2. Concurrent Requirements

None.

3. Reason

This service bulletin gives instructions to test the engine and Auxiliary Power Unit (APU) fuel shutoff valve actuators to make sure that the valve operation and indication are working correctly. This service bulletin also provides the terminating action to replace the engine and APU fuel shutoff valve actuators and an option to replace the fuel crossfeed and defuel/isolation valve actuators. Incorporation of this service bulletin prevents possible operational disruptions.

The fuel shutoff valve actuator circuit design provides common input power through micro-switches to both the motor and position indication. It was identified that the valve actuator circuitry has a potential latent

failure condition previously not identified during its development. The latent failure condition is with respect to the potential for a stuck micro-switch which could lead to a disagreement between the valve command and position indication. In a case where a command is sent to change valve position and one of the internal micro-switches is stuck in the depressed state, power would immediately provide indication that the valve transitioned to its commanded state when in reality the motor never received power to rotate. Changes were made to the actuator micro-switch circuit by the supplier to provide independence between the valve command and indication functions which prevent the latent failure condition. Refer to Fleet Team Digest 787-FTD-28-13002 for additional information.

Boeing Service Related Problem (SRP) 787 SRP-28-0147 is related to this service bulletin.

As a part of a service bulletin validation program, the engine and APU fuel shutoff valve actuator tests in this service bulletin were completed on airplane ZA188 before the release of Issue 002 of this service bulletin.

Issue 002 is sent to make these changes:

1. Change the compliance time for the terminating action from 60 months to 36 months.
2. Include the reference to the Eaton service bulletin 53-0037-28-01.
3. Include a note in the General Information section to inform operators that the external power is required for the PART 2 : APU FUEL SHUTOFF VALVE ACTUATOR TEST.
4. Clarify the engine and APU fuel shutoff valve actuator test procedures.

4. Description

Testing: Do the engine and APU fuel shutoff valve actuator test and replace the valve actuator if necessary.

Terminating Action: Replace the engine and APU fuel shutoff valve actuators.

Option: Replace the fuel crossfeed and defuel/isolation valve actuators.

Issue 002 - No more work is necessary on airplanes changed in accordance with Issue 001 of this service bulletin.

The work in this service bulletin is done in the maintenance zone(s) given below.

Table 4

Affected Maintenance Zones	
Model	**Zone**
787-8	143, 552, 562

5. Compliance

The Federal Aviation Administration (FAA) will possibly release an Airworthiness Directive related to this service bulletin. The Airworthiness Directive will make the compliance tasks and times given in this service bulletin mandatory.

Do the required actions in accordance with Data Module SB B787-A-28-00-0015-00A-933A-D, Step 2., Work Instructions.

The Conditions, Actions and Compliance times shown apply to each fuel shutoff valve independently.

When more than one OPTION is given for a CONDITION, do only one of the OPTION numbers. When more than one ACTION is given for a CONDITION number or an OPTION number, do all of the ACTION numbers for that CONDITION number or OPTION number.

Table 5 TESTING: ENGINE FUEL SHUTOFF VALVE ACTUATOR TEST

Condition	Action	Compliance Time	Repeat Interval (Not to Exceed)
All airplanes	Do PART 1: ENGINE FUEL SHUTOFF VALVE ACTUATOR TEST. *[1]	Within 3 months after the Issue 002 date of this service bulletin.	-
CONDITION 1: NO LATENT FAILURE CONDITION FOUND ON ALL ENGINE FUEL SHUTOFF VALVE ACTUATORS.	OPTION 1: Repeat PART 1: ENGINE FUEL SHUTOFF VALVE ACTUATOR TEST.	-	10 days. *[2]
	OPTION 2: Do PART 5: TERMINATING ACTION - ENGINE FUEL SHUTOFF VALVE ACTUATOR REPLACEMENT. *[2]	-	-
CONDITION 2: LATENT FAILURE CONDITION FOUND ON ANY ENGINE FUEL SHUTOFF VALVE ACTUATOR	OPTION 3 (ACTION 1): Do PART 3: ENGINE FUEL SHUTOFF VALVE ACTUATOR REPLACEMENT for any engine fuel shutoff valve that has the latent failure condition.	Before further flight.	-
	OPTION 3 (ACTION 2): Do PART 1: ENGINE FUEL SHUTOFF VALVE ACTUATOR TEST.	Within 10 days after PART 3: ENGINE FUEL SHUTOFF VALVE ACTUATOR REPLACEMENT was accomplished.	-
	OPTION 4: Do PART 5: TERMINATING ACTION - ENGINE FUEL SHUTOFF VALVE ACTUATOR REPLACEMENT. *[2]	Before further flight.	-

*[1] Accomplishment of PART 5: TERMINATING ACTION - ENGINE FUEL SHUTOFF VALVE ACTUATOR REPLACEMENT can be done instead of PART 1: ENGINE FUEL SHUTOFF VALVE ACTUATOR TEST.

*[2] Accomplishment of PART 5: TERMINATING ACTION - ENGINE FUEL SHUTOFF VALVE ACTUATOR REPLACEMENT is terminating action to the repeat test in PART 1.

Table 6 TESTING: APU FUEL SHUTOFF VALVE ACTUATOR TEST

Condition	Action	Compliance Time	Repeat Interval (Not to Exceed)
All airplanes	Do PART 2: APU FUEL SHUTOFF VALVE ACTUATOR TEST.*[1]	Within 3 months after the Issue 002 date of this service bulletin.	-
CONDITION 3: NO LATENT FAILURE CONDITION FOUND ON APU FUEL SHUTOFF VALVE ACTUATOR	OPTION 5: Repeat PART 2: APU FUEL SHUTOFF VALVE ACTUATOR TEST.	-	10 days. *[2]
	OPTION 6: Do PART 6: TERMINATING ACTION - APU FUEL SHUTOFF VALVE ACTUATOR REPLACEMENT.*[2]	-	-
CONDITION 4: LATENT FAILURE CONDITION FOUND ON APU FUEL SHUTOFF VALVE ACTUATOR	OPTION 7 (ACTION 1): Do PART 4: APU FUEL SHUTOFF VALVE ACTUATOR REPLACEMENT.	Before further flight.	-
	OPTION 7 (ACTION 2): Do PART 2: APU FUEL SHUTOFF VALVE ACTUATOR TEST.	Within 10 days after PART 4: APU FUEL SHUTOFF VALVE ACTUATOR REPLACEMENT was accomplished.	-
	OPTION 8: Do PART 6: TERMINATING ACTION - APU FUEL SHUTOFF VALVE ACTUATOR REPLACEMENT.*[2]	Before further flight.	-

*[1] Accomplishment of Do PART 6: TERMINATING ACTION - APU FUEL SHUTOFF VALVE ACTUATOR REPLACEMENT can be done instead of PART 2: APU FUEL SHUTOFF VALVE ACTUATOR TEST.

*[2] Accomplishment of PART 6: TERMINATING ACTION - APU FUEL SHUTOFF VALVE ACTUATOR REPLACEMENT is terminating action to the repeat test in PART 2.

Table 7 TERMINATING ACTION: ENGINE AND APU FUEL SHUTOFF VALVE ACTUATOR REPLACEMENT

Condition	Action	Compliance Time	Repeat Interval (Not to Exceed)
All airplanes	Do PART 5: TERMINATING ACTION - ENGINE FUEL SHUTOFF VALVE ACTUATOR REPLACEMENT.	Within 36 months after the Issue 001 date of this service bulletin.	-
	Do PART 6: TERMINATING ACTION - APU FUEL SHUTOFF VALVE ACTUATOR REPLACEMENT.	Within 36 months after the Issue 001 date of this service bulletin.	-

Table 8 OPTION: FUEL CROSSFEED AND DEFUEL/ISOLATION VALVE ACTUATOR REPLACEMENT

Condition	Action	Compliance Time	Repeat Interval (Not to Exceed)
All airplanes	Do PART 7: FUEL CROSSFEED VALVE ACTUATOR REPLACEMENT.	*[1]	-
	Do PART 8: DEFUEL/ISOLATION VALVE ACTUATOR REPLACEMENT.	*[1]	-

*[1] No compliance time is given. Boeing recommends this service bulletin be done to introduce improvements and prevent possible operational disruptions.

6. Approval

This service bulletin was examined by the Federal Aviation Administration (FAA). The changes specified in this service bulletin comply with the applicable regulations and are FAA approved, as well as European Aviation Safety Agency (EASA)/Joint Aviation Authorities (JAA) approved for all EASA/JAA approved airplanes listed in the service bulletin effectivity. This service bulletin and its approval were based on the airplane in its original Boeing delivery configuration or as modified by other approved Boeing changes.

If an airplane has a non-Boeing modification or repair that affects a component or system also affected by this service bulletin, the operator is responsible for obtaining appropriate regulatory agency approval before incorporating this service bulletin.

7. Manpower

The table below shows an estimate of the task hours necessary to do this inspection for each airplane. This estimate is for direct labor only, done by an experienced crew. Adjust the estimate with operator task hour data if necessary. The estimate does not include lost time. These are some examples of lost time:

– Time to adjust to the workplace
– Time to schedule the work

– Time to inspect the work
– Time to cure the materials
– Time to make the parts
– Time to find the tools

Table 9 TESTING: ENGINE AND APU FUEL SHUTOFF VALVE ACTUATOR TEST

Task	Number of Persons	Task Hours	Elapsed Hours
Part 1	1	1.00	1.00
Part 2	1	0.50	0.50
Part 3	1	3.25 *[1]	3.25*[1]
Part 4	1	3.25 *[2]	3.25 *[2]
TOTAL FOR EACH AIRPLANE		1.50	1.50

*[1] Part 3 replacement is dependant upon results of Part 1 test. The estimate given in Part 3 is for removal, installation and test of the left or right engine fuel shutoff valve. If the work in Part 3 is necessary, the estimate given in Part 3 must be added to obtain the required total for each airplane.

*[2] Part 4 replacement is dependant upon results of Part 2 test. The estimate given in Part 4 is for removal, installation and test of the APU fuel shutoff valve. If the work in Part 4 is necessary, the estimate given in Part 4 must be added to obtain the required total for each airplane.

Table 10 TERMINATING ACTION: ENGINE AND APU FUEL SHUTOFF VALVE ACTUATOR REPLACEMENT

Task	Number of Persons	Task Hours	Elapsed Hours
Part 5	2	6.50	3.25
Part 6	1	3.25	3.25
TOTAL FOR EACH AIRPLANE		9.75	6.50

Table 11 OPTION: FUEL CROSSFEED AND DEFUEL/ISOLATION VALVE ACTUATOR REPLACEMENT

Task	Number of Persons	Task Hours	Elapsed Hours
Part 7	1	3.25	3.25
Part 8	2	6.50	3.25
TOTAL FOR EACH AIRPLANE		9.75	6.50

8. Weight and Balance Changes

None.

9. Electrical Load Data

Not changed.

10. References

A. Existing Data:

1. Change Notice CN-AA36420D
2. Aircraft Maintenance Manual (AMM) 787 AMM 24-00-02, 787 AMM 28-22-02, 787 AMM 28-22-04, 787 AMM 28-25-03, 787 AMM 28-26-02, 787 AMM 31-61-00, 787 AMM 46-13-00
3. Boeing Service Related Problem (SRP) 787 SRP-28-0147
4. 787 Fleet Team Digest 787-FTD-28-13002
5. Eaton Service Bulletin 53-0037-28-01

B. Data Supplied with this Service Bulletin:

None.

C. Installation Requirement Modules Used in the Preparation of this Service Bulletin:

None.

11. Publications Affected

Table 12

Publication	Chapter-Section
787 Wiring Diagram Manual	28-21, 28-22, 28-25
787 Illustrated Parts Data	ZA1-33, ZA1-34, ZA5-21, ZA5-51, ZA5-52, ZA5-61, ZA6-21, ZA6-51, ZA6-52, ZA6-61

Damage Tolerance Based Structural Inspections:

Boeing has evaluated the repairs and/or changes in this service bulletin for effects on Fatigue Critical Structure (FCS) and for changes to Damage Tolerance Inspections (DTI) required in the Maintenance Program. This service bulletin does not affect FCS, therefore DTIs are not necessary.

12. Interchangeability and Intermixability of Parts

Accomplishment of this service bulletin does not affect interchangeability or intermixability of parts.

13. Software Accomplishment Summary

Not Affected.

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MATERIAL INFORMATION

References

Reference	Title
SB B787-A-28-00-0015-00A-932A-D Issue 002, Paragraph 10.	References

Description

Group 1:

1. Material - Price and Availability

The operator can supply the parts and materials shown in Paragraph 3., Parts Necessary for Each Airplane.

2. Industry Support Information

Boeing warranty remedies are available for 787 airplanes in warranty as of February 21, 2013. For task hour and material reimbursement for airplanes in warranty as of that date, send a warranty claim to Boeing Fleet Support Contracts - Warranty. The warranty remedies will expire eight years from the original release date of this service bulletin.

3. Parts Necessary for Each Airplane

A. Kits/Parts:

None.

B. Parts and Materials Supplied by the Operator:

Table 1

Part Number / Specification	QTY	Name	Existing Part Number	Notes
53-0037	As Re-quired	Valve Actuator	-	*[1] *[2]
53-0049	3	Valve Actuator	53-0037	*[3] *[4]
53-0049	3	Valve Actuator	53-0037	*[5] *[4]

*[1] The part is only necessary if the existing Engine or APU fuel shutoff valve actuator is found to have the latent failure condition during the test in the TESTING section.

*[2] Return the part with latent failure condition and order the part number directly from Eaton Aerospace Ltd, Abbey Park, Southampton Rd, Titchfield Hamshire P014 4QA, United Kingdom

*[3] The parts are necessary for the TERMINATING ACTION section

*[4] Return the existing part and order the part number directly from Eaton Aerospace Ltd, Abbey Park, Southampton Rd, Titchfield Hamshire P014 4QA, United Kingdom. Refer to the Eaton service bulletin 53-0037-28-01 for additional information.

Table 1

Part Number / Specification	QTY	Name	Existing Part Number	Notes

*[5] The parts are necessary for the OPTION section..

C. Parts Modified and Reidentified:

None.

D. Parts Removed and Not Replaced:

None.

4. Parts Necessary to Change Spares

None.

5. Special Tooling - Price and Availability

None.

6. Special Tooling Necessary to do this Service Bulletin

No special tools or equipment are necessary to do the change in this service bulletin. But, maintenance and overhaul tools in the manuals given in Data Module SB B787-A-28-00-0015-00A-932A-D, Paragraph 10., References, can be necessary. Examine operator tool supply to make sure all necessary tools are available.

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ACCOMPLISHMENT INSTRUCTIONS

References

Reference	Title
SB B787-A-28-00-0015-00A-932A-D Issue 002, Paragraph 10.	References
SB B787-A-28-00-0015-00A-932A-D Issue 002, Paragraph 5.	Compliance
787 AMM 46-13-00	ONBOARD BOEING ELECTRONIC DISTRIBUTION SYSTEM
787 AMM 28-22-00	ENGINE FUEL FEED SYSTEM
787 AMM 24-00-02	CIRCUIT BREAKER INDICATION AND CONTROL
787 AMM 31-61-00	PRIMARY DISPLAY SYSTEM
787 AMM 28-22-02	ENGINE FUEL SHUTOFF VALVE ACTUATOR
787 AMM 28-25-03	APU FUEL SHUTOFF VALVE ACTUATOR
787 AMM 28-22-04	FUEL CROSSFEED VALVE ACTUATOR
787 AMM 28-26-02	DEFUEL/ISOLATION VALVE ACTUATOR

Procedure

Group 1:

1. GENERAL INFORMATION

CAUTION: KEEP THE WORK AREA, WIRES AND ELECTRICAL BUNDLES CLEAN OF METAL PARTICLES OR CONTAMINATION WHEN YOU USE TOOLS. UNWANTED MATERIAL, METAL PARTICLES OR CONTAMINATION CAUGHT IN WIRE BUNDLES CAN CAUSE DAMAGE TO THE BUNDLES. DAMAGED WIRE BUNDLES CAN CAUSE SPARKS OR OTHER ELECTRICAL DAMAGE.

NOTE: 1. Manual titles are referred to by acronyms. Refer to Data Module SB B787-A-28-00-0015-00A-932A-D, Paragraph 10., References, for definition of the acronyms.

2. Obey all of the warnings and cautions given in the specified manual sections.

3. Unless shown differently, these dimensions and tolerances are used:

- Linear dimensions are in inches
- Tolerance on linear dimensions, other than rivet and bolt edge margins, is plus or minus 0.03 inch
- Tolerance on rivet and bolt edge margin is plus or minus 0.05 inch

- Angular tolerance is plus or minus 2 degrees
- Hole dimensions for standard solid rivets and fasteners are in SRM Chapter 51
- Torque Values:
  - Values for structural fasteners are given in 787 Structural Repair Manual, Chapter 51.
  - Values for airframe maintenance tasks are included in Chapter 20 of 787 Airplane Maintenance Manual (AMM).
  - Values for electrical maintenance tasks are included in Chapter 20 of Standard Wiring Practices Manual (SWPM).
  - Values for engine maintenance tasks are included in Chapter 70 of 787 Airplane Maintenance Manual (AMM).
  - Non-standard torque values for maintenance tasks are included in the applicable installation step.

4. These work instructions refer to procedures included in other Boeing documents. When the words "refer to" are used and the operator has an accepted alternative procedure, the accepted alternative procedure can be used. When the words "in accordance with" are included in the instruction, the procedure in the Boeing document must be used.

5. Refer to 787 AMM 46-13-00 for onboard electronic distribution system maintenance practices and operation as an accepted procedure.

6. If it is necessary to remove more parts for access, you can remove those parts. If you can get access without removing identified parts, it is not necessary to remove all of the identified parts. Jacking and shoring limitations must be observed.

7. This service bulletin includes functional test procedures for the systems changed by this service bulletin. More functional tests can possibly be necessary in accordance with standard maintenance practices because of interruption to other airplane systems.

8. If shading is used, shaded areas in Figures are to separate the non-critical and non-authoritative information from the critical and authoritative information.

9. When more than one OPTION is given for a CONDITION, do only one of the OPTION numbers. When more than one ACTION is given for a CONDITION number or an OPTION number, do all of the ACTION numbers for that CONDITION number or OPTION number.

10. The compliance times for the actions in Step 2., Work Instructions are in Data Module SB B787-A-28-00-0015-00A-932A-D, Paragraph 5., Compliance.

11. The CONDITIONS, ACTIONS and OPTIONS shown apply to each fuel shutoff valve actuator independently.

12. Some steps in the Work Instructions are identified as Required for Compliance (RC). If this service bulletin is mandated by an Airworthiness Directive (AD), then the steps identified as RC must be done to comply with the AD. Alternative procedures for steps not identified with RC can be used if the RC steps can still be done as specified, and the airplane can be put back in a serviceable condition. If a step in the Work Instructions identified as RC has substeps, then all of the substeps in the RC step must also be done. An Alternative Method of Compliance (AMOC) is not necessary for deviations to steps that are not identified as RC and is a substep of an RC step.

13. The external electrical ground power is required for the PART 2: APU FUEL SHUTOFF VALVE ACTUATOR TEST. Refer to 787 AMM 28-22-00 as an accepted procedure.

2. WORK INSTRUCTIONS

A. Do the TESTING: ENGINE AND APU FUEL SHUTOFF VALVE ACTUATOR TEST or TERMINATING ACTION: ENGINE AND APU FUEL SHUTOFF VALVE ACTUATOR REPLACEMENT.

(1) TESTING: ENGINE AND APU FUEL SHUTOFF VALVE ACTUATOR TEST

(a) RC - Do PART 1: ENGINE FUEL SHUTOFF VALVE ACTUATOR TEST.

1) CONDITION 1: NO LATENT FAILURE CONDITION FOUND ON ALL FUEL SHUTOFF VALVE ACTUATORS

a) OPTION 1: Repeat PART 1: ENGINE FUEL SHUTOFF VALVE ACTUATOR TEST.

b) OPTION 2: Do PART 5: TERMINATING ACTION - ENGINE FUEL SHUTOFF VALVE ACTUATOR REPLACEMENT to terminate the repeat test.

2) CONDITION 2: LATENT FAILURE CONDITION FOUND ON ANY ENGINE FUEL SHUTOFF VALVE ACTUATOR

a) OPTION 3:

<1> OPTION 3 (ACTION 1): Do PART 3: ENGINE FUEL SHUTOFF VALVE ACTUATOR REPLACEMENT for any engine fuel shutoff valve that has the latent failure condition.

<2> OPTION 3 (ACTION 2): Do PART 1: ENGINE FUEL SHUTOFF VALVE ACTUATOR TEST.

b) OPTION 4: Do PART 5: TERMINATING ACTION - ENGINE FUEL SHUTOFF VALVE ACTUATOR REPLACEMENT to terminate the repeat test.

(b) RC - Do PART 2: APU FUEL SHUTOFF VALVE ACTUATOR TEST.

1) CONDITION 3: NO LATENT FAILURE CONDITION FOUND ON APU FUEL SHUTOFF VALVE ACTUATOR

a) OPTION 5: Repeat PART 2: APU FUEL SHUTOFF VALVE ACTUATOR TEST.

b) OPTION 6: Do PART 6: TERMINATING ACTION - APU FUEL SHUTOFF VALVE ACTUATOR REPLACEMENT to terminate the repeat test.

2) CONDITION 4: LATENT FAILURE CONDITION FOUND ON APU FUEL SHUTOFF VALVE ACTUATOR

a) OPTION 7:

<1> OPTION 7 (ACTION 1): Do PART 4: APU FUEL SHUTOFF VALVE ACTUATOR REPLACEMENT.

<2> OPTION 7 (ACTION 2): Do PART 2: APU FUEL SHUTOFF VALVE ACTUATOR TEST.

b) OPTION 8: Do PART 6: TERMINATING ACTION - APU FUEL SHUTOFF VALVE ACTUATOR REPLACEMENT to terminate the repeat test.

(2) TERMINATING ACTION: ENGINE AND APU FUEL SHUTOFF VALVE ACTUATOR REPLACEMENT

(a) RC - Do PART 5: TERMINATING ACTION - ENGINE FUEL SHUTOFF VALVE ACTUATOR REPLACEMENT.

(b) RC - Do PART 6: TERMINATING ACTION - APU FUEL SHUTOFF VALVE ACTUATOR REPLACEMENT.

B. OPTION: FUEL CROSSFEED AND DEFUEL/ISOLATION VALVE ACTUATOR REPLACEMENT

(1) Do PART 7: FUEL CROSSFEED VALVE ACTUATOR REPLACEMENT.

(2) Do PART 8: DEFUEL/ISOLATION VALVE ACTUATOR REPLACEMENT.

C. Put the airplane back to a serviceable condition.

D. RC - PART 1: ENGINE FUEL SHUTOFF VALVE ACTUATOR TEST

(1) Make sure that no active or latched Engine SOV messages exist.

(2) Make sure that the following circuit breakers are closed using the Circuit Breaker Indication and Control (CBIC). Refer to 787 AMM 24-00-02 as an accepted procedure.

Table 1

Circuit Breaker Number	Nomenclature
CE7621813	SPAR VLV/EEC RESET CHB CTRL-L ENGINE
CE7621823	SPAR VLV/EEC RESET CHB CTRL-R ENGINE

(3) Open the following circuit breakers using the CBIC. Refer to 787 AMM 24-00-02 as an accepted procedure.

Table 2

Circuit Breaker Number	Nomenclature
CE2822803	ENG SOV - L
CE2822804	ENG SOV - R
CE2825804	FUEL SHUTOFF MODULE

(4) Open the following thermal circuit breakers and attach a DO-NOT-CLOSE tag.

Table 3

Circuit Breaker Number	Nomenclature	Panel	Grid
CT7411811	IGNITION 1 CHAN A-L ENGINE	P300	E5
CT7411812	IGNITION 2 CHAN B-L ENGINE	P400	G15
CT7411821	IGNITION 1 CHAN A-R ENGINE	P400	F8
CT7411822	IGNITION 2 CHAN B-R ENGINE	P300	F5

(5) Make sure that the L and R FUEL CONTROL switches on the P8 Control Stand are in the CUTOFF position.

(6) Make sure that the left and right Engine Fire handles on the P8 Control Stand are in normal stowed position.

(7) Display the Fuel Management Maintenance page on the Central Maintenance Computing Function (CMCF) . Refer to 787 AMM 31-61-00 as an accepted procedure.

(8) LEFT ENGINE FUEL SHUTOFF VALVE ACTUATOR TEST

(a) Display the circuit breaker status for the left engine fuel shutoff valve on the flight deck display using CBIC. Refer to 787 AMM 24-00-02 as an accepted procedure.

(b) Close the circuit breaker CE2822803 using CBIC. Refer to 787 AMM 24-00-02 as an accepted procedure.

(c) On the CBIC data display screen, open the data screen of the circuit breaker CE2822803 and monitor the LOAD CURRENT value during this test. Refer to 787 AMM 24-00-02 as an accepted procedure.

(d) Make sure that the STATUS for the L FUEL SPAR VALVE shown on the Fuel Management Maintenance page is CLOSED.

(e) Set the L FUEL CONTROL switch on the P8 Control Stand to RUN position and make sure the following is observed during the test. The valve may require up to 15 seconds to reach its commanded position.

1) The COMMAND for the L FUEL SPAR VALVE shows as OPEN condition on the Fuel Management Maintenance page.

2) The STATUS for the L FUEL SPAR VALVE shows as IN/TRANS and then OPEN on the Fuel Management Maintenance page.

3) The LOAD CURRENT value for the circuit breaker CE2822803 changes to a value of 0.1 Amps or more during the valve transition.

(f) Set the L FUEL CONTROL switch on the P8 Control Stand to CUTOFF position and make sure the following is observed during the test. The valve may require up to 15 seconds to reach its commanded position.

1) The COMMAND for the L FUEL SPAR VALVE shows as CLOSE condition on the Fuel Management Maintenance page.

2) The STATUS for the L FUEL SPAR VALVE shows as IN/TRANS and then CLOSE on the Fuel Management Maintenance page.

3) The LOAD CURRENT for the circuit breaker CE2822803 changes to a value of 0.1 Amps or more during the valve transition.

(g) Open the circuit breaker CE2822803 using CBIC. Refer to 787 AMM 24-00-02 as an accepted procedure.

(h) The condition of the left engine fuel shutoff valve actuator is determined as follows:

1) If the LOAD CURRENT value for the circuit breaker changed, as required during the test, the left engine fuel shutoff valve actuator has passed the test and does not have the latent failure condition.

2) If the LOAD CURRENT for the circuit breaker did not change, as required during the test, the left engine fuel shutoff valve actuator has failed this test and has the latent failure condition.

(9) RIGHT ENGINE FUEL SHUTOFF VALVE ACTUATOR TEST

(a) Display the circuit breaker status for the right engine fuel shutoff valve on the flight deck display using CBIC. Refer to 787 AMM 24-00-02 as an accepted procedure.

(b) Close the circuit breaker CE2822804 using CBIC. Refer to 787 AMM 24-00-02 as an accepted procedure.

(c) On the CBIC data display screen, open the data screen of the circuit breaker CE2822804 to monitor the LOAD CURRENT value during this test. Refer to 787 AMM 24-00-02 as an accepted procedure.

(d) Make sure that the STATUS for the R FUEL SPAR VALVE on the Fuel Management Maintenance page is CLOSED.

(e) Set the R FUEL CONTROL switch on the P8 Control Stand to RUN position and make sure the following is observed during the test. The valve may require up to 15 seconds to reach its commanded position.

1) The COMMAND for the R FUEL SPAR VALVE shows as OPEN condition on the Fuel Management Maintenance page.

2) The STATUS for the R FUEL SPAR VALVE shows as IN/TRANS and then OPEN on the Fuel Management Maintenance page.

3) The LOAD CURRENT value for the circuit breaker CE2822804 changes to a value of 0.1 Amps or more during the valve transition.

(f) Set the R FUEL CONTROL switch on the P8 Control Stand to CUTOFF position and make sure the following is observed during the test. The valve may require up to 15 seconds to reach its commanded position.

1) The COMMAND for the R FUEL SPAR VALVE shows as CLOSE on the Fuel Management Maintenance page.

2) The STATUS for the R FUEL SPAR VALVE shows as IN/TRANS and then CLOSE on the Fuel Management Maintenance page.

3) The LOAD CURRENT value for the circuit breaker CE2822804 changes to a value of 0.1 Amps or more during the valve transition.

(g) Open the circuit breaker CE2822804 using CBIC. Refer to 787 AMM 24-00-02 as an accepted procedure.

(h) The condition of the right engine fuel shutoff valve actuator is determined as follows:

1) If the LOAD CURRENT value for the circuit breaker changed, as required during the test, the right engine fuel shutoff valve actuator has passed the test and does not have the latent failure condition.

2) If the LOAD CURRENT for the circuit breaker did not change, as required during the test, the right engine fuel shutoff valve actuator has failed this test and has the latent failure condition.

(10) Close the following circuit breakers using the CBIC. Refer to 787 AMM 24-00-02 as an accepted procedure.

Table 4

Circuit Breaker Number	Nomenclature
CE2822803	ENG SOV - L
CE2822804	ENG SOV - R
CE2825804	FUEL SHUTOFF MODULE

(11) Close the following thermal circuit breakers and remove the DO-NOT-CLOSE tag.

Table 5

Circuit Breaker Number	Nomenclature	Panel	Grid
CT7411811	IGNITION 1 CHAN A-L ENGINE	P300	E5
CT7411812	IGNITION 2 CHAN B-L ENGINE	P400	G15
CT7411821	IGNITION 1 CHAN A-R ENGINE	P400	F8
CT7411822	IGNITION 2 CHAN B-R ENGINE	P300	F5

E. RC - PART 2: APU FUEL SHUTOFF VALVE ACTUATOR TEST

(1) Provide external electrical ground power to the airplane. Refer to 787 AMM 28-22-00 as an accepted procedure.

(2) Make sure that no active or latched APU FUEL SOV messages exist.

(3) Make sure the following circuit breakers are opened using the Circuit Breaker Indication and Control (CBIC). Refer to 787 AMM 24-00-02 as an accepted procedure.

Table 6

Circuit Breaker Number	Nomenclature
CE2825801	APU DC PUMP
CE2825804	FUEL SHUTOFF MODULE

(4) Set the GND TEST switch on the Cargo Fire/Engine Control panel to ENABLE position.

(5) Make sure that the following circuit breakers are closed using the CBIC. Refer to 787 AMM 24-00-02 as an accepted procedure.

Table 7

Circuit Breaker Number	Nomenclature
CE2825802	APU SOV CLOSE
CE2825803	APU SOV OPEN

(6) Make sure that the APU Fire handle on the P5 Overhead panel is in normal stowed position.

(7) Display the Fuel Management Maintenance page on the Central Maintenance Computing Function (CMCF). Refer to 787 AMM 31-61-00 as an accepted procedure.

(8) Display the CE2825803 circuit breaker status for the APU fuel shutoff valve using the CBIC on the flight deck display. Refer to 787 AMM 24-00-02 as an accepted procedure.

(9) Make sure that the STATUS for the APU FUEL FEED S/O VLV shown on the Fuel Management Maintenance page is CLOSED.

(10) On the CBIC data display screen, open the data screen of the circuit breaker CE2825803 to monitor the LOAD CURRENT value during this test. Refer to 787 AMM 24-00-02 as an accepted procedure.

(11) Make sure that the CMCF ground test passes after it is initiated.

ATA Chapter: 28 Fuel Quality Management Systems

Test Type: LRU Replacement Test

Name: APU FUEL SHUTOFF VALVE

Make sure the following is observed during the ground test.

(a) The STATUS for the APU FUEL FEED S/O VLV shows as IN/TRANS and then OPEN on the Fuel Management Maintenance page during the CMCF ground test sequence.

(b) The LOAD CURRENT value for the circuit breaker CE2825803 changes to a value of 0.1 Amps or more during the valve transition from IN/TRANS to OPEN.

NOTE: It is not necessary to observe the LOAD CURRENT value during the valve transition from IN/TRANS to CLOSE.

(12) After the ground test passes successfully, exit the data screen for the circuit breaker CE2825803 on the CBIC display. Refer to 787 AMM 24-00-02 as an accepted procedure.

(13) On the CBIC display, open the data screen for circuit breaker CE2825802 to monitor the LOAD CURRENT value for the steps that follow.

(14) Make sure that the CMCF ground test passes after it is initiated

ATA Chapter: 28 Fuel Quality Management Systems

Test Type: LRU Replacement Test

Name: APU FUEL SHUTOFF VALVE

Make sure the following is observed during the ground test.

(a) The STATUS for the APU FUEL FEED S/O VLV shows the following sequence: IN/TRANS and then OPEN and back to CLOSE on the Fuel Management Maintenance page during the CMCF Ground Test sequence.

(b) The LOAD CURRENT value for the circuit breaker CE2825802 changes to a value of 0.1 Amps or more during the valve transition from IN/TRANS to CLOSE.

NOTE: It is not necessary to observe the LOAD CURRENT value during the valve transition from IN/TRANS to OPEN.

(15) After the CMCF Ground Test passes successfully, exit the data screen for the circuit breaker CE2825802 on CBIC display.

(16) Set the GND TEST switch on the Cargo Fire/Engine Control panel to NORM position.

(17) The condition of the APU fuel shutoff valve actuator is determined as follows:

(a) If the LOAD CURRENT value for the circuit breaker changed, as required during the test, the APU fuel shutoff valve actuator has passed the test and does not have the latent failure condition.

(b) If the LOAD CURRENT for the circuit breaker did not change, as required during the test, the APU fuel shutoff valve actuator has failed this test and has the latent failure condition.

(18) Close these circuit breakers using the Circuit Breaker Indication and Control (CBIC). Refer to 787 AMM 24-00-02 as an accepted procedure.

Table 8

Circuit Breaker Number	Nomenclature
CE2825801	APU DC PUMP
CE2825804	FUEL SHUTOFF MODULE

F. PART 3: ENGINE FUEL SHUTOFF VALVE ACTUATOR REPLACEMENT

(1) Remove the left or right engine fuel shutoff valve actuator. Refer to 787 AMM 28-22-02 as an accepted procedure.

(2) Install a new or serviceable left or right engine fuel shutoff valve actuator with part number 53-0037 and do the installation test. Refer to 787 AMM 28-22-02 as an accepted procedure.

G. PART 4: APU FUEL SHUTOFF VALVE ACTUATOR REPLACEMENT

(1) Remove the APU engine fuel shutoff valve actuator. Refer to 787 AMM 28-25-03 as an accepted procedure.

(2) Install a new or serviceable APU fuel shutoff valve actuator with part number 53-0037 and do the installation test. Refer to 787 AMM 28-25-03 as an accepted procedure.

H. RC - PART 5: TERMINATING ACTION - ENGINE FUEL SHUTOFF VALVE ACTUATOR REPLACEMENT

(1) Remove the left and right engine fuel shutoff valve actuator. Refer to 787 AMM 28-22-02 as an accepted procedure.

(2) Install the new left and right engine fuel shutoff valve actuator with part number 53-0049 and do the installation test. Refer to 787 AMM 28-22-02 as an accepted procedure.

I. RC - PART 6: TERMINATING ACTION - APU FUEL SHUTOFF VALVE ACTUATOR REPLACEMENT

(1) Remove the APU engine fuel shutoff valve actuator. Refer to 787 AMM 28-25-03 as an accepted procedure.

(2) Install the new APU fuel shutoff valve actuator with part number 53-0049 and do the installation test. Refer to 787 AMM 28-25-03 as an accepted procedure.

J. PART 7: FUEL CROSSFEED VALVE ACTUATOR REPLACEMENT

(1) Remove the fuel crossfeed valve actuator. Refer to 787 AMM 28-22-04 as an accepted procedure.

(2) Install the fuel crossfeed valve actuator with part number 53-0049 and do the installation test. Refer to 787 AMM 28-22-04 as an accepted procedure.

K. PART 8: DEFUEL/ISOLATION VALVE ACTUATOR REPLACEMENT

(1) Remove the left and right defuel/isolation valve actuators. Refer to 787 AMM 28-26-02 as an accepted procedure.

(2) Install a new left or right defuel/isolation valve actuator with part number 53-0049 and do the installation test. Refer to 787 AMM 28-26-02as an accepted procedure.