



CIVIL AVIATION AUTHORITY
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AIRWORTHINESS DIRECTIVE

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BOEING

737-100, -200, -300, -400, -500

AIRCRAFT - LAVATORY DRAIN SYSTEM - REPLACEMENT

Applicability: All Model 737-100, -200, -300, -400 and -500 series airplanes, certificated in any category.

Effective date: May 13, 2004

Compliance: Required as indicated FAA AD 2004-06-18.

Remarks: The compliance of this AD must be recorded in Aircraft Logbook, where applicable the requirements of this AD must be integrated into Aircraft Technical Documentation. Address inquiries concerning this AD to: Civil Aviation Authority, Airworthiness Division, Ruzyně Airport, 160 08 Prague 6, Czech Republic, tel.: 420 2 33320922, fax: 420 2 20562270.

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2004-06-18 Boeing: Amendment 39-13544. Docket 95-NM-111-AD. Supersedes AD 89-11-03, Amendment 39-6223.

Applicability: All Model 737-100, -200, -300, -400 and -500 series airplanes, certificated in any category.

Note 1: This AD applies to each airplane identified in the preceding applicability provision, regardless of whether it has been modified, altered, or repaired in the area subject to the requirements of this AD. For airplanes that have been modified, altered, or repaired so that the performance of the requirements of this AD is affected, the owner/operator must request approval for an alternative method of compliance in accordance with paragraph (h) of this AD. The request should include an assessment of the effect of the modification, alteration, or repair on the unsafe condition addressed by this AD; and, if the unsafe condition has not been eliminated, the request should include specific proposed actions to address it.

Compliance: Required as indicated, unless accomplished previously.

To prevent engine damage, airframe damage, and/or hazard to persons or property on the ground as a result of "blue ice" that has formed from leakage of the lavatory drain system or flush/fill systems and dislodged from the airplane, accomplish the following:

Replacing Valve Seals and Performing Leak Tests

(a) Except as provided by paragraph (d) of this AD, accomplish the applicable requirements of paragraphs (a)(1) through (a)(6) of this AD at the time specified in each paragraph. If the waste drain system incorporates more than one type of valve, only one of the waste drain system leak test procedures (the one that applies to the equipment with the longest leak test interval) must be conducted at each service panel location. Except as provided in paragraphs (b) and (c) of this AD, the waste drain system valve leak tests specified in this AD shall be performed in accordance with the following requirements: fluid shall completely cover the upstream end of the valve being tested; the direction of the 3 pounds per square inch differential pressure (PSID) shall be applied across the valve in the same direction as occurs in flight; the other waste drain system valves shall be open; and the minimum time to maintain the differential pressure shall be 5 minutes.

(1) Replace the valve seals in accordance with the applicable schedule specified in paragraph (a)(1)(i), (a)(1)(ii), or (a)(1)(iii) of this AD. If an in-line drain valve as specified in paragraph (a)(1)(i) of this AD is installed in the same lavatory drain line as the valves specified per paragraph (a)(1)(ii) or (a)(1)(iii) of this AD, seal replacement for the valves specified in paragraph (a)(1)(ii) or (a)(1)(iii) of this AD may be performed at the seal replacement interval for the in-line drain valve.

Note 2: The seals and o-rings in the service panel drain valve that are to be replaced in accordance with paragraph (a)(1) or (d)(1) of this AD are the seals and o-rings that seal against the valve door, lid, cap, or ball, which is opened to allow flow through the service panel drain valve or in-line drain valve. The seals and o-rings in the lavatory flush/fill line valve or cap that are to be replaced in accordance with paragraph (a)(5) or (d)(3) of this AD are the seals and o-rings that seal against a surface and prevent backflow from the lavatory waste tank through the flush/fill line.

(i) For each lavatory drain system that has an in-line drain valve installed, Kaiser Electroprecision part number (P/N) series 2651-278 or service panel ball valve, Kaiser Electroprecision P/N series 2651-357: Replace the seals within 5,000 flight hours after the effective date of this AD, or within 48 months after the last documented seal change, whichever occurs later. Thereafter, repeat the replacement of the seals at intervals not to exceed 48 months.

(ii) For each lavatory drain system that has a Pneudraulics P/N series 9527 valve: Replace the seals within 5,000 flight hours after the effective date of this AD, or within 18 months of the last documented seal change, whichever occurs later. Thereafter, repeat the replacement of the seals at intervals not to exceed 18 months or 6,000 flight hours, whichever occurs later.

(iii) For each lavatory drain system that has any other type of drain valve: Replace the seals within 5,000 flight hours after the effective date of this AD, or within 18 months after the last documented seal change, whichever occurs later. Thereafter, repeat the replacement of the seals at intervals not to exceed 18 months.

(2) For each lavatory drain system that has an in-line drain valve installed having Kaiser Electroprecision P/N series 2651-278, or service panel drain valve installed having Kaiser Electroprecision P/N series 2651-357, or Pneudraulics P/N series 9527, or Shaw Aero valve having a P/N or serial number (S/N) as listed in Table 1 of this

AD: Within 4,500 flight hours after the effective date of this AD, or within 4,500 hours after the last documented leak test, whichever occurs later, accomplish the procedures specified in paragraphs (a)(2)(i) and (a)(2)(ii) of this AD. Thereafter, repeat the procedures at intervals not to exceed 18 months or 4,500 flight hours, whichever occurs later.

(i) Conduct a leak test of the toilet tank dump valve (in-tank valve that is spring loaded closed and operable by a T-handle at the service panel) and the in-line drain valve (Kaiser Electroprecision P/N series 2651-278) or service panel drain valve (Kaiser Electroprecision P/N series 2651-357, or Pneudraulics P/N series 9527, or Shaw Aero valve having a P/N or serial number (S/N) as listed in Table 1 of this AD). The toilet tank dump valve leak test must be performed by filling the toilet tank with a minimum of 10 gallons of water/rinsing fluid and, after a period of 5 minutes, testing for leakage. Take precautions to avoid overfilling the tank and spilling fluid into the airplane. Except as provided by paragraphs (b) and (c) of this AD, the in-line drain valve or service panel drain valve leak test must be performed with a minimum of 3 PSID applied across the valve in the same direction as occurs in flight.

(ii) If a service panel valve or cap is installed, perform a general visual inspection of the service panel drain valve outer cap/door seal and the inner seal (if the valve has an inner door with a second positive seal), and the seal mating surfaces for wear or damage that may allow leakage.

Note 3: For the purposes of this AD, a general visual inspection is defined as: "A visual examination of an interior or exterior area, installation, or assembly to detect obvious damage, failure, or irregularity. This level of inspection is made from within touching distance unless otherwise specified. A mirror may be necessary to enhance visual access to all exposed surfaces in the inspection area. This level of inspection is made under normally available lighting conditions such as daylight, hangar lighting, flashlight, or droplight and may require removal or opening of access panels or doors. Stands, ladders, or platforms may be required to gain proximity to the area being checked."

Table 1-Shaw Aero Valves Approved for 4,500 Flight Hour Leak Test Interval

Shaw waste drain valve part number	Serial numbers of part number valve approved for 4,500 flight hour leak test interval
331 Series	All.
10101000B-A-1	0207-0212, 0219, 0226 and higher.
10101000B-A-1	0001-0206, 0213-0218, and 0220-0225 that are marked "SBB38-1-58," and that incorporate the improvements outlined in Shaw Service Bulletin 10101000B-38-1, dated October 7, 1994.
10101000BA2	0130 and higher.
10101000BA2	0001-0129 that are marked "SBB38-1-58," and that incorporate the improvements outlined in Shaw Service Bulletin 10101000B-38-1, dated October 7, 1994.
10101000C-A-1	0277 and higher.
10101000C-A-1	0001-0276 that are marked "SBC38-2-58," and that incorporate the improvements outlined in Shaw Service Bulletin 10101000C-38-2, dated October 7, 1994.
10101000CN OR 10101000C-N	3649 and higher.
10101000CN OR 10101000C-N	0001-3648 that is marked "SBC38-2-58," and that incorporate the improvements outlined in Shaw Service Bulletin 10101000C-38-2, dated October 7, 1994.

(3) For each lavatory drain system with a lavatory drain system valve that incorporates either "donut" plug, Kaiser Electroprecision P/N 4259-20 or 4259-31; Kaiser Roylyn/Kaiser Electroprecision cap/flange P/N 2651-194C, 2651-197C, 2651-216, 2651-219, 2651-235, 2651-256, 2651-258, 2651-259, 2651-260, 2651-275, 2651-282, 2651-286; or other FAA-approved equivalent parts; accomplish the requirements at the specified times of paragraphs (a)(3)(i), (a)(3)(ii), and (a)(3)(iii) of this AD. For the purposes of paragraph (a)(3) of this AD, "equivalent part" means either a "donut" plug that mates with the cap/flange having part numbers listed in this paragraph, or a cap/flange that mates with the "donut" plug having part numbers listed in this paragraph, such that the cap/flange and "donut" plug are used together as an assembled valve.

(i) Within 200 flight hours after the effective date of this AD, and thereafter at intervals not to exceed 200 flight hours, conduct leak tests of the toilet tank dump valve and the service panel drain valve. The leak test of the toilet tank dump valve must be performed by filling the toilet tank with a minimum of 10 gallons of water/rinsing fluid and

testing for leakage after a period of 5 minutes. Take precautions to avoid overfilling the tank and spilling fluid on the airplane. Except as provided by paragraphs (b) and (c) of this AD, the service panel drain valve leak test must be performed with a minimum 3 PSID applied across the valve in the same direction as occurs in flight.

(ii) Perform a general visual inspection of the outer door/cap and seal mating surface for wear or damage that may cause leakage. This inspection shall be accomplished in conjunction with the leak tests of paragraph (a)(3)(i) of this AD.

(iii) Within 5,000 flight hours after the effective date of this AD, replace the donut valve (part numbers per paragraph (a)(3) of this AD) with another type of FAA-approved valve. Following installation of the replacement valve, perform the appropriate leak tests and seal replacements at the intervals specified for that replacement valve, as applicable.

(4) For each lavatory drain system not addressed in paragraph (a)(2) or (a)(3) of this AD: Within 1,000 flight hours or 6 months after the effective date of this AD, whichever occurs later, accomplish the actions specified in paragraphs (a)(4)(i) and (a)(4)(ii) of this AD. Thereafter, repeat those actions at intervals not to exceed 1,000 flight hours or 6 months, whichever occurs later.

(i) Conduct a leak test of the toilet tank dump valve and the service panel drain valve. The toilet tank dump valve leak test must be performed by filling the toilet tank with a minimum of 10 gallons of water/rinsing fluid and, after a period of 5 minutes, testing for leakage. Take precautions to avoid overfilling the tank and spilling fluid on the airplane. Except as provided by paragraphs (b) and (c) of this AD, the service panel drain valve leak test must be performed with a minimum of 3 PSID applied across the valve inner door/closure device.

(ii) Perform a general visual inspection of the outer cap/door and seal mating surface for wear or damage that may cause leakage.

(5) For flush/fill lines: Within 5,000 flight hours after the effective date of this AD, perform the requirements of paragraph (a)(5)(i), (a)(5)(ii), (a)(5)(iii), or (a)(5)(iv) of this AD, as applicable. Thereafter, repeat the requirements at intervals not to exceed 5,000 flight hours, or 48 months after the last documented seal change, whichever occurs later. For airplanes that contain auxiliary waste tanks, the leak tests may be performed per one of the leak test procedures in paragraph (b) or (c) of this AD, or by using the leak test procedures without filling the toilet tank bowl half-full of fluid per the applicable airplane or component maintenance manual.

Note 4: The seals/o-rings in the service panel drain valve that are to be replaced in accordance with paragraph (a)(1) or (d)(1) of this AD are the seals/o-rings that seal against the valve door/lid/cap/ball, which is opened to allow flow through the service panel drain valve or in-line drain valve. The seals/o-rings in the lavatory flush/fill line valve or cap that are to be replaced per paragraph (a)(5) or (d)(3) of this AD are the seals/o-rings that seal against a surface and prevent backflow from the lavatory waste tank through the flush/fill line.

(i) If a lever lock cap is installed on the flush/fill line of the subject lavatory, replace the seals on the toilet tank anti-siphon (check) valve and the flush/fill line cap with new seals. Perform a leak test of the toilet tank anti-siphon (check) valve with a minimum of 3 PSID across the valve in the same direction as occurs in flight, in accordance with paragraph (a)(5)(ii)(A) of this AD, as applicable.

Note 5: The leak test procedure described in Boeing 737 Maintenance Manual, 38-32-00/501, may be referred to as guidance for this test if the toilet tank is filled to the level specified in paragraph (a)(5)(ii)(A) of this AD.

(ii) If a vacuum breaker check valve, Monogram P/N series 3765-190, or Shaw Aero Devises P/N series 301-000, or other FAA-approved vacuum break check valve is installed on the subject lavatory, replace the seals/o-rings in the valve. Perform a leak test of the vacuum breaker check valve and verify proper operation of the vent line vacuum breaker in accordance with paragraphs (a)(5)(ii)(A) and (a)(5)(ii)(B) of this AD.

(A) Leak test the toilet tank anti-siphon valve or the vacuum breaker check valve by filling the toilet tank with water/rinsing fluid to a level such that the bowl is approximately half full (at least 2 inches above the flapper in the bowl.) Apply 3 PSID across the valve in the same direction as occurs in flight. The vent line vacuum breaker on vacuum breaker check valves must be pinched closed or plugged for this leak test. If there is a cap/valve at the flush/fill line port, the cap/valve must be removed/open during the test. Check for leakage at the flush/fill line port for a period of 5 minutes.

(B) Verify proper operation of the vent line vacuum breaker by filling the tank and testing at the fill line port for back drainage after disconnecting the fluid source from the flush/fill line port. If back drainage does not occur,

replace the vent line vacuum breaker or repair the vacuum breaker check valve in accordance with the component maintenance manual to obtain proper back drainage. As an alternative to the above test technique, verify proper operation of the vent line vacuum breaker in accordance with the procedures of the applicable component maintenance manual.

(iii) If a flush/fill ball valve, Kaiser Electroprecision P/N series 0062-0009 is installed on the flush/fill line of the subject lavatory, replace the seals in the flush/fill ball valve and the toilet tank anti-siphon valve with new seals. Perform a leak test of the toilet tank anti-siphon valve with a minimum of 3 PSID across the valve in the same direction as occurs in flight, in accordance with paragraph (a)(5)(ii)(A) of this AD.

(iv) If an FAA-approved shut-off valve that uses a mechanical or electrical device to prevent overfilling of the toilet tank is installed, replace the seals/o-rings in the shut-off valve. Perform the leak test of the shut-off valve per the applicable airplane or component maintenance manual, or per the procedures specified in paragraph (b) or (c) of this AD.

(6) As a result of the leak tests and inspections required by paragraph (a) of this AD, or if evidence of leakage is found at any other time, accomplish the requirements of paragraph (a)(6)(i), (a)(6)(ii), or (a)(6)(iii), as applicable.

(i) If a leak is discovered, prior to further flight, repair the leak. Prior to further flight after repair, perform the appropriate leak test, as applicable. Additionally, prior to returning the airplane to service, clean the surfaces adjacent to where the leakage occurred to clear them of any horizontal fluid residue streaks; such cleaning must be to the extent that any future appearance of a horizontal fluid residue streak will be taken to mean that the system is leaking again.

Note 6: For purposes of this AD, "leakage" is defined as any visible leakage, if observed during a leak test. At any other time (than during a leak test), "leakage" is defined as the presence of ice in the service panel, or horizontal fluid residue streaks/ice trails originating at the service panel. The fluid residue is usually, but not necessarily, blue in color.

(ii) If any worn or damaged seal is found, or if any damaged seal mating surface is found, prior to further flight, repair or replace it with a new seal, in accordance with the valve manufacturer's maintenance manual.

(iii) In lieu of performing the requirements of paragraph (a)(6)(i) or (a)(6)(ii) of this AD: Before further flight, drain the affected lavatory system and placard the lavatory inoperative until repairs can be accomplished.

One Alternative to Accomplishing Test Procedures

(b) As an alternative to the test procedures for service panel drain valves and in-line drain valves specified in paragraph (a) or (d) of this AD, and flush/fill line valves as specified in paragraph (a)(5) or (d)(3) of this AD, a vacuum leak test may be done in accordance with "Shaw Aero Devices Document ILS-193C (Operation Instructions for the Waste Drain Valve Inner Flapper and Lavatory Rinse/Fill Valve Leak Test Tool), Revision C, dated July 1999. The tests shall be conducted with a minimum of 3 PSI differential pressures across the valve seal being tested in the same direction as occurs in flight. The duration of the test shall be 5 minutes. The test may be conducted with fluid completely covering the seal to be tested and checked for fluid leakage, or by subjecting the seal to a vacuum without fluid present, and checking for loss of vacuum. Any movement of the vacuum gauge needle indicates loss of vacuum and constitutes failure of the test. Failure of the test also occurs if fluid is behind the valve being tested and any leakage of fluid past the valve occurs during the test. Operators should note that the test rig may not work for all valve types. Confirm compatibility of the test rig to the valve by verifying compatibility with the manufacturer(s) of the test rig and valve. Other leak test tools may be used for this test if approved per paragraph (h) of this AD.

Another Alternative to Accomplishing Test Procedures

(c) As an alternative to the test procedures for service panel drain valves and in-line drain valves specified in paragraph (a) or (d) of this AD, and flush/fill line valves as specified in paragraph (a)(6) or (d)(3) of this AD, a vacuum test may be done in accordance with "Operating Instructions for Lavatory Waste Drain Valve and Flush/Fill Valve Leak Test Tool," AAXICO Industries, Ltd., Document AI 18, Issue 4, dated January 2002. The test shall be conducted with a minimum of 3 PSI differential pressures across the valve seal being tested in the same direction as occurs in flight. The duration of the tests shall be 5 minutes. The test may be conducted with fluid completely covering the seal to be tested and checked for fluid leakage, or by subjecting the seal to a vacuum without fluid present, and checking for loss of vacuum. Any movement of the vacuum gauge needle indicates loss of vacuum and constitutes failure of the test. Failure of the test also occurs if fluid is behind the valve being tested and any leakage

of fluid past the valve occurs during the test. Operators should note that the test rig might not work for all valve types. Confirm compatibility of the test rig to the valve by verifying compatibility with the manufacturer(s) of the test rig and valve. Other leak test tools may be used for this test if approved per paragraph (h) of this AD.

Revising the FAA-Approved Maintenance Program

(d) As an alternative to the requirements of paragraph (a) of this AD, operators may revise the FAA-approved maintenance program to include the requirements specified in paragraphs (d), (f), and (g) of this AD, which constitutes terminating action for the AD. However, until the FAA-approved maintenance program is revised, operators must accomplish the requirements of paragraph (a) of this AD. If the waste drain system incorporates more than one type of valve, only one of the waste drain system leak test procedures (the one that applies to the equipment with the longest leak test interval) must be conducted at each service panel location. The waste drain system valve leak tests specified in paragraphs (a) and (d) of this AD shall be performed in accordance with the following requirements: Fluid shall completely cover the upstream end of the valve being tested unless a vacuum test is being performed in accordance with paragraph (b) or (c) of this AD; the direction of the 3 PSID shall be applied across the valve in the same direction as occurs in flight; the other waste drain system valves shall be open; and the minimum time to maintain the differential pressure shall be 5 minutes. A differential pressure greater than 3 psi may be used if specified by procedures referenced in paragraph (b) or (c) of this AD.

(1) Replace the valve seals in accordance with the applicable schedule specified in paragraph (d)(1)(i), (d)(1)(ii), or (d)(1)(iii) of this AD. If an in-line drain valve as specified in paragraph (d)(1)(i) of this AD is installed in the same lavatory drain line as the valves specified in paragraph (d)(1)(ii) or paragraph (d)(1)(iii) of this AD, seal replacement for the valves specified in paragraphs (d)(1)(ii) and (d)(1)(iii) of this AD may be performed at the seal replacement interval for the in-line drain valve. (See Note 2 of this AD.)

(i) For each lavatory drain system that has an in-line drain valve installed, Kaiser Electroprecision P/N series 2651-278 or service panel ball valve installed, Kaiser Electroprecision P/N series 2651-357: Replace the seals within 5,000 flight hours after the effective date of this AD, or within 48 months of the last documented seal change, whichever occurs later. Thereafter, repeat the replacement of the seals at intervals not to exceed 48 months.

(ii) For each lavatory drain system that has a Pneudraulics P/N series 9527 valve: Replace the seals within 5,000 flight hours after the effective date of this AD, or within 18 months of the last documented seal change, whichever occurs later. Thereafter, repeat the replacement of the seals at intervals not to exceed 18 months or 6,000 flight hours, whichever occurs later.

(iii) For each lavatory drain system that has any other type of drain valve: Replace the seals within 5,000 flight hours after the effective date of this AD, or within 18 months of the last documented seal change, whichever occurs later. Thereafter, repeat the replacement of the seals at intervals not to exceed 18 months.

(2) Conduct periodic leak tests of the lavatory drain systems in accordance with the applicable schedule specified in paragraph (d)(2)(i), (d)(2)(ii), or (d)(2)(iii) of this AD. Only one of the waste drain system leak test procedures (the one that applies to the equipment with the longest leak test interval) must be conducted at each service panel location.

(i) For each lavatory drain system that has an in-line drain valve installed having Kaiser Electroprecision P/N series 2651-278; service panel drain valve installed having Kaiser Electroprecision P/N series 2651-357; Pneudraulics part number series 9527; or Shaw Aero P/N/S/N as listed in Table 1 of this AD: Within 5,000 flight hours after the effective date of this AD, or within 5,000 hours of the last documented leak test, whichever occurs later, accomplish the procedures specified in paragraphs (d)(2)(i)(A) and (d)(2)(i)(B) of this AD. Thereafter repeat the procedures at intervals not to exceed 18 months or 5,000 flight hours, whichever occurs later.

(A) Conduct a leak test of the toilet tank dump valve (in-tank valve that is spring loaded closed and operable by a T-handle at the service panel) and the in-line drain valve (Kaiser Electroprecision P/N series 2651-278) or the service panel drain valve (Kaiser Electroprecision P/N series 2651-357, Pneudraulics part number series 9527, or Shaw Aero Part Number/Serial Number as listed in Table 1 of this AD). The leak test of the toilet tank dump valve must be performed by filling the toilet tank with a minimum of 10 gallons of water/rinsing fluid and testing for leakage after a period of 5 minutes. Take precautions to avoid overfilling the tank and spilling fluid on the airplane. Except as provided by paragraphs (b) and (c) of this AD, the in-line drain valve or service panel drain valve leak test must be performed with a minimum of 3 PSID applied across the valve in the same direction as occurs in flight.

(B) If a service panel valve or cap is installed, perform a general visual inspection of the service panel drain valve

outer cap/door seal and the inner seal (if the valve has an inner door with a second positive seal), and the seal mating surfaces, for wear or damage that may allow leakage.

(ii) For each lavatory drain system with a lavatory drain system valve that incorporates either "donut" plugs Kaiser Electroprecision P/N 4259-20 or 4259-31; Kaiser Roylyn/Kaiser Electroprecision cap/flange part number 2651-194C, 2651-197C, 2651-216, 2651-219, 2651-235, 2651-256, 2651-258, 2651-259, 2651-260, 2651-275, 2651-282, 2651-286; or other FAA-approved equivalent part; accomplish the requirements at the times specified in paragraphs (d)(2)(ii)(A), (d)(2)(ii)(B), and (d)(2)(ii)(C) of this AD. For the purposes of this paragraph, (d)(2)(ii), "FAA-approved equivalent part" means either a "donut" plug that mates with the cap/flange having P/Ns listed in this paragraph, or a cap/flange that mates with the "donut" plug having P/Ns listed in this paragraph, such that the cap/flange and "donut" plug are used together as an assembled valve.

(A) Within 200 flight hours after the effective date of this AD, or within 200 flight hours after the last documented leak test, whichever occurs later, conduct leak tests of the toilet tank dump valve and the service panel drain valve. Thereafter, repeat the tests at intervals not to exceed 200 flight hours. The toilet tank dump valve leak test must be performed by filling the toilet tank with a minimum of 10 gallons of water/rinsing fluid and, after a period of 5 minutes, testing for leakage. Take precautions to avoid overfilling the tank and spilling fluid on the airplane. Except as provided in paragraphs (b) and (c) of this AD, the service panel drain valve leak test must be performed with a minimum of 3 PSI differential applied across the valve in the same direction as occurs in flight.

(B) Perform a visual inspection of the outer door/cap and seal mating surface for wear or damage that may cause leakage. Perform this inspection in conjunction with the leak tests specified in paragraph (d)(2)(ii)(A).

(C) Within 5,000 flight hours after the effective date of this AD, replace the donut valve with another type of FAA-approved valve. Following replacement of the valve, perform the subsequent leak tests and seal replacements at the intervals specified for the new valve.

(iii) For each lavatory drain system that incorporates any other type of approved valves: Within 1,000 flight hours after the effective date of this AD, or within 1,000 flight hours of the last documented leak test, whichever occurs later, accomplish the requirements of paragraphs (d)(2)(iii)(A) and (d)(2)(iii)(B) of this AD. Thereafter, repeat the requirements at intervals not to exceed 1,000 flight hours.

(A) Conduct leak tests of the toilet tank dump valve and the service panel drain valve. The toilet tank dump valve leak test must be performed by filling the toilet tank with a minimum of 10 gallons of water/rinsing fluid and, after a period of 5 minutes, testing for leakage. Take precautions to avoid overfilling the tank and spilling fluid on the airplane. The service panel drain valve leak test must be performed with a minimum of 3 PSID applied across the valve in the same direction as occurs in flight. If the service panel drain valve has an inner door with a second positive seal, only the inner door must be tested.

(B) Perform a general visual inspection of the outer cap/door and seal mating surface for wear or damage that may cause leakage.

(3) For flush/fill lines: Within 5,000 flight hours after the effective date of this AD, perform the requirements of paragraph (d)(3)(i), (d)(3)(ii), (d)(3)(iii), or (d)(3)(iv), as applicable. Thereafter, repeat the requirements at intervals not to exceed 5,000 flight hours, or 48 months after the last documented seal change, whichever occurs later. For airplanes that contain auxiliary waste tanks, the leak tests may be performed per one of the leak test procedures in paragraph (b) or (c) of this AD, or by performing the leak test procedures without filling the toilet tank bowl half-full of fluid per the applicable airplane or component maintenance manual.

(i) If a lever lock cap is installed on the flush/fill line of the subject lavatory, replace the seals on the toilet tank anti-siphon (check) valve and the flush/fill line cap. Perform a leak test of the toilet tank anti-siphon (check) valve with a minimum of 3 PSID across the valve in the same direction as occurs in flight, as specified in paragraph (d)(3)(ii)(A) of this AD.

(ii) If a vacuum breaker check valve having Monogram P/N series 3765-190; Shaw Aero Devices P/N series 301-0009-01; or other FAA-approved vacuum breaker check valve is installed on the subject lavatory; replace the seals/o-rings in the valve. Prior to further flight, leak test the vacuum breaker check valve, and test for proper operation of the vent line vacuum breaker as specified in paragraphs (d)(3)(ii)(A) and (d)(3)(ii)(B) of this AD.

(A) Leak test the toilet tank anti-siphon valve or the vacuum breaker check valve by filling the toilet tank with water/rinsing fluid to a level such that the bowl is approximately half full (at least 2 inches above the flapper in the

bowl). Except as provided in paragraphs (b) and (c) of this AD, apply 3 PSID across the valve in the same direction as occurs in flight. The vent line vacuum breaker on vacuum breaker check valves must be pinched closed or plugged for this leak test. If there is a cap/valve at the flush/fill line port, the cap/valve must be removed/opened during the test. Test for leakage at the flush/fill line port for a period of 5 minutes.

Note 7: The leak test procedure in the appropriate section of Boeing 737 Maintenance Manual 38-32-00 may be used as guidance for this test if the toilet tank is filled approximately half full (at least 2 inches above the flapper in the bowl).

(B) Verify proper operation of the vent line vacuum breaker by filling the tank and testing at the fill line port for back drainage after disconnecting the fluid source from the flush/fill line port. If back drainage does not occur, replace the vent line vacuum breaker or repair the vacuum breaker check valve in accordance with the component maintenance manual as required to obtain proper back drainage.

(iii) If a flush/fill ball valve, Kaiser Electroprecision P/N series 0062-009 is installed on the flush/fill line of the subject lavatory, replace the seals in the flush/fill ball valve and the toilet tank anti-siphon valve. Perform a leak test of the toilet tank anti-siphon valve in accordance with paragraph (d)(3)(ii)(A) of this AD.

(iv) If an FAA-approved shut-off valve that uses a mechanical or electrical device to prevent overfilling the toilet tank is installed, replace the seals/o-rings in the shut-off valve. Perform a leak test of the shut-off valve per the applicable airplane or component maintenance manual, or per the procedures specified in paragraph (b) or (c) of this AD.

(4) Provide procedures for accomplishing visual inspections to detect leakage, to be conducted by maintenance personnel at intervals not to exceed 4 calendar days or 45 flight hours, whichever ever occurs later.

(5) Provide procedures for reporting leakage. These procedures shall provide that any "horizontal blue streak" findings must be reported to maintenance and that, prior to further flight, the leaking system shall either be repaired, or be drained and placarded inoperative.

(6) Provide training programs for maintenance and servicing personnel that include information on "blue ice awareness" and the hazards of "blue ice."

(7) If a leak is discovered during a leak test required by paragraph (d) of this AD; or if evidence of leakage is found at any other time; or if repair/replacement of a valve (or valve parts) is required as a result of a visual inspection required in accordance with this AD; prior to further flight, accomplish the requirements of paragraph (d)(7)(i), (d)(7)(ii), or (d)(7)(iii) of this AD, as applicable.

Note 8: For purposes of this AD, "leakage" is defined as any visible leakage, if observed during a leak test. At any other time (than during a leak test), "leakage" is defined as the presence of ice in the service panel, or horizontal fluid residue streaks/ice trails originating at the service panel. The fluid residue is usually, but not necessarily, blue in color.

(i) Repair the leak and, prior to further flight after repair, perform a leak test. Additionally, prior to returning the airplane to service, clean the surfaces adjacent to where the leakage occurred to clear them of any horizontal fluid residue streaks; such cleaning must be to the extent that any future appearance of a horizontal fluid residue streak will be taken to mean that the system is leaking again.

(ii) Repair or replace the valve or valve parts.

(iii) In lieu of either paragraph (d)(7)(i) or (d)(7)(ii), drain the affected lavatory system and placard the lavatory inoperative until repairs can be accomplished.

Requesting Extension of Leak Test Intervals

(e) Requests for extensions of the leak test intervals required by paragraph (a) or (d) of this AD must be approved by the Manager, Seattle Aircraft Certification (ACO), FAA. Requests for such revisions must be submitted to the Manager of the Seattle ACO through the FAA Principal Maintenance Inspector (PMI), and must include the following information:

(1) The operator's name;

(2) A statement verifying that all known cases/indications of leakage or failed leak tests are included in the submitted material;

(3) The type of valve (make, model, manufacturer, vendor part number, and serial number);

(4) The period of time covered by the data;

(5) The current FAA leak test interval;

(6) Whether or not seals have been replaced between the seal replacement intervals required by this AD;

(7) Whether or not a service panel drain valve is installed downstream of an in-line drain valve, Kaiser Electroprecision P/N series 2651-278: Data on a service panel valve installed downstream of an in-line drain valve will not be considered as an indicator of the reliability of the service panel drain valve because the in-line valve prevents potential leakage from reaching the service panel drain valve.

(8) Whether or not leakage has been detected between leak test intervals required by this AD, and the reason for leakage (i.e., worn seals, foreign materials on sealing surface, scratched or damaged sealing surface on valve, etc.); and

(9) Whether or not any cleaning, repairs, or seal changes were performed on the valve prior to conducting the leak test. (If such activities have been accomplished prior to conducting the periodic leak test, that leak test shall be recorded as a "failure" for purposes of the data required for this request submission. The exception to this is the normally-scheduled seal change in accordance with paragraph (a)(1) and (d)(1) of this AD. Performing this scheduled seal change prior to a leak test will not cause that leak test to be recorded as a failure. Debris removal of major blockages done as part of normal maintenance for previous flights is also allowable and will not cause a leak test to be recorded as a failure. Minor debris removal that is not commonly removed during the normal ground maintenance test should not be removed prior to the leak test).

Note 9: Requests for approval of revised leak test intervals may be submitted in any format, provided the data give the same level of assurance specified in paragraph (e) of this AD. Results of an Environmental Quality Analysis (EQA) examination and leak test on a randomly selected high-flight-hour valve, with seals that have not been replaced during a period of use at least as long as the desired interval, may be considered a valuable supplement to the service history data, reducing the amount of service data that would otherwise be required.

Note 10: For the purposes of expediting resolution of requests for revisions to the leak test intervals, the FAA suggests that the requester summarize the raw data; group the data gathered from different airplanes (of the same model) and drain systems with the same kind of valve; and provide a recommendation from pertinent industry group(s) and/or the manufacturer specifying an appropriate revised leak test interval.

Note 11: In cases where changes are made to a valve design approved for an extended leak test interval such that a new valve dash number or P/N is established for the valve, the FAA may not require extensive service history data to approve the new valve to the same leak test interval as the previous valve design. The FAA will consider similarity of design, the nature of the design changes, the nature and amount of testing, and like factors to determine the appropriate data requirements and leak test interval for a new or revised valve based upon an existing design.

Certain Installations

(f) For all airplanes: Unless already accomplished, within 5,000 flight hours after the effective date of this AD, perform the actions specified in paragraph (f)(1), (f)(2), (f)(3), or (f)(4) of this AD:

(1) Install an FAA-approved lever/lock cap on the flush/fill lines for all lavatories; or

(2) Install a vacuum break check valve having Monogram P/N series 3765-190, Shaw Aero Devises P/N series 301-0009, or other FAA-approved vacuum break check valve in the flush/fill lines for all lavatories; or

(3) Install a flush/fill ball valve Kaiser Electroprecision P/N series 0062-0009 on the flush/fill lines for all lavatories; or

(4) Install an FAA-approved shut-off valve that uses a mechanical or electrical device on the flush/fill lines for all

lavatories to prevent overfilling the toilet tank.

For Airplanes Acquired After the Effective Date of This AD

(g) For any affected airplane acquired after the effective date of this AD: Before any operator places into service any airplane subject to the requirements of this AD, a schedule for the accomplishment of the leak tests required by this AD shall be established in accordance with either paragraph (g)(1) or (g)(2) of this AD, as applicable. After each leak test has been performed once, each subsequent leak test must be performed in accordance with the new operator's schedule, in accordance with either paragraph (a) or (d) of this AD as applicable.

(1) For airplanes previously maintained in accordance with this AD, the first leak test to be performed by the new operator must be accomplished in accordance with the previous operator's schedule or with the new operator's schedule, whichever would result in the earlier accomplishment date for that leak test.

(2) For airplanes that have not been previously maintained in accordance with this AD, the first leak test to be performed by the new operator must be accomplished prior to further flight, or in accordance with a schedule approved by the FAA PMI, but within a period not to exceed 200 flight hours.

Alternative Method of Compliance

(h) Alternative method(s) of compliance with this AD:

(1) An alternative method of compliance or adjustment of the compliance time that provides an acceptable level of safety may be used if approved by the Manager, Seattle ACO, FAA. Operators shall submit their requests through an appropriate FAA PMI, who may add comments and then send it to the Manager, Seattle ACO.

(2) All previously issued alternative methods of compliance approved for AD 89-11-03 (54 FR 21933, May 22, 1989) are hereby terminated as of the effective date of this AD and are no longer in effect.

Note 12: Information concerning the existence of approved alternative methods of compliance with this AD, if any, may be obtained from the Seattle ACO.

Note 13: For any valve that is not eligible for the extended leak test intervals of this AD: To be eligible for the extended leak test intervals specified in paragraph (a) or (d) of this AD, the service history data of the valve must be submitted to the Manager, Seattle ACO, with a request for an alternative method of compliance. The request should include an analysis of known failure modes for the valve, if it is an existing design, and known failure modes of similar valves, with an explanation of how design features will preclude these failure modes, results of qualification tests, and approximately 25,000 flight hours or 25,000 flight cycles of service history data which include a winter season, collected in accordance with the requirements of paragraph (e) of this AD, or a similar program. One of the factors that the FAA will consider in approving alternative valve designs is whether the valve meets Boeing Specification S417T105 or 10-62213. However, meeting the Boeing specification is not a prerequisite for approval of alternative valve designs.

Special Flight Permits

(i) Special flight permits may be issued in accordance with sections 21.197 and 21.199 of the Federal Aviation Regulations (14 CFR 21.197 and 21.199) to operate the airplane to a location where the requirements of this AD can be accomplished.

Effective Date of This AD

(j) This amendment becomes effective on April 29, 2004.

▼ Footer Information

Issued in Renton, Washington, on March 19, 2004.

Kevin M. Mullin,

Acting Manager, Transport Airplane Directorate,

Aircraft Certification Service.

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