



CIVIL AVIATION AUTHORITY
CZECH REPUBLIC
Airworthiness Division

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AIRWORTHINESS DIRECTIVE

Number: CAA-AD-085/2003

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Pratt & Whitney

PW4050, PW4052, PW4056, PW4060, PW4060A,
PW4060C, PW4062, PW4152, PW4156,
PW4156A, PW4158, PW4160, PW4460, PW4462,
PW4650

ENGINE - HIGH PRESSURE COMPRESSOR (HPC) - INSPECTION/REPLACEMENT

Applicability: This airworthiness directive (AD) is applicable to Pratt & Whitney (PW) model PW4050, PW4052, PW4056, PW4060, PW4060A, PW4060C, PW4062, PW4152, PW4156, PW4156A, PW4158, PW4160, PW4460, PW4462, and PW4650 turbofan engines. These engines are installed on, but not limited to, certain models of Airbus Industrie A300, Airbus Industrie A310, Boeing 747, Boeing 767, and McDonnell Douglas MD-11 series airplanes.

Effective date: November 27, 2003

Compliance: Required as indicated FAA AD 2003-19-15.

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.

Ing. Pavel MATOUŠEK
Director

2003-19-15 Pratt & Whitney: Amendment 39-13318; Docket No. 2000-NE-47-AD. Supersedes AD 2003-11-18, Amendment 39-13177.

Applicability: This airworthiness directive (AD) is applicable to: Pratt & Whitney (PW) models PW4050, PW4052, PW4056, PW4060, PW4060A, PW4060C, PW4062, PW4152, PW4156, PW4156A, PW4158, PW4160, PW4460, PW4462, and PW4650 turbofan engines. These engines are installed on, but not limited to, certain models of Airbus Industrie A300, Airbus Industrie A310, Boeing 747, Boeing 767, and McDonnell Douglas MD-11 series airplanes.

Note 1: This AD applies to each engine 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 engines 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 (u) 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: Compliance with this AD is required as indicated, unless already done.

To prevent engine takeoff power losses due to high-pressure-compressor (HPC) surges, do the following:

(a) When complying with this AD, determine the configuration of each engine on each airplane using the following Table 1:

Table 1.-Engine Configuration Listing

Configuration	Configuration	Designator
(1) Phase 1 without high pressure turbine (HPT) 1st turbine vane cut back stator (1TVCB).	A	Engines that did not incorporate the Phase 3 configuration at the time they were originally manufactured, or have not been converted to Phase 3 configuration; and have not incorporated HPT 1TVCB using any Revision of service bulletin (SB) PW4ENG 72-514.
(2) Phase 1 with 1TVCB	B	Same as Configuration A except that HPT 1TVCB has been incorporated using any Revision of SB PW4ENG 72-514.
(3) Phase 3, 2nd Run	C	Engines that incorporated the Phase 3 configuration at the time they were originally manufactured, or have been converted to the Phase 3 configuration during service; and that have had at least one HPC overhaul since new.
(4) Phase 3, 1st Run	D	Same as Configuration C except that the engine has not had an HPC overhaul since new, except those engines that are defined as Configuration Designator G.
(5) HPC Cutback Stator Configuration Engines	E	Engines that currently incorporate any Revision of SBs PW4ENG 72-706, PW4ENG 72-704, or PW4ENG 72-711.
(6) Engines that have passed Testing-21	F	Engines which have successfully passed Testing-21 performed in accordance with paragraph (i) of this AD. Once an engine has passed a

		Testing-21, it will remain a Configuration F engine until the HPC is overhauled, or is replaced with a new or overhauled HPC, or the HPC is retrofitted to Configuration I.
(7) Phase 3, 1st Run Subpopulation Engines. These engines are identified by model and serial numbers (SNs) as follows: PW4152: SN 724942 through SN 724944 inclusive; PW4158: SN 728518 through SN 728533 inclusive; PW4052, PW4056, PW4060, PW4060A, PW4060C, PW4062: SN 727732 through SN 728000 inclusive and SN 729001 through SN 729010 inclusive; PW4460, PW4462: SN 733813 through SN 733840 inclusive.	G	Engines that incorporated the Phase 3 configuration and did not incorporate Haynes material HPC inner case rear hook at the time they were originally manufactured, that were built from August 29, 1997 up to the incorporation of the HPC inner rear case with Haynes material rear hook at the original engine manufacturer and have not had an HPC overhaul since new.
(8) Engines from Configuration G that have passed Testing-21.	H	Engines that have successfully passed Testing-21 performed in accordance with paragraph (i) of this AD. Once an engine has passed a Testing-21, it will remain a Configuration H engine until the HPC is overhauled, or is replaced with a new or overhauled HPC, or the HPC is retrofitted to Configuration I.
(9) Engines installed on Boeing, Airbus, or MD-11 airplanes with a build standard that incorporates a ring case configuration (RCC) rear HPC.	I	Engines that have incorporated PW SB PW4ENG 72-755, Revision 2, dated May 23, 2003; or Revision 3, dated September 16, 2003; or PW SB PW4ENG 72-756, dated July 7, 2003; or Revision 1, dated September 15, 2003; or PW SB PW4ENG 72-759, dated July 7, 2003; or Revision 1, dated September 16, 2003; PW SB PW4ENG 72-757, Revision 1, dated September 15, 2003; or have been manufactured with an RCC rear HPC.

Configuration E Engines Installed on Boeing 747, 767, and McDonnell Douglas MD-11 Airplanes

(b) For Configuration E engines, do the following:

- (1) Before further flight, limit the number of engines with Configuration E as described in Table 1 of this AD, to one on each airplane.
- (2) Remove all engines with Configuration E from service before accumulating 1,300 cycles-since-new (CSN) or cycles-since-conversion (CSC) to Configuration E, whichever is later.

Configuration G and H Engines Installed on Boeing 747, 767, McDonnell Douglas MD-11, and Airbus A300

and A310 Airplanes

(c) For Configuration G and H engines installed on Boeing 747 and 767, McDonnell Douglas MD-11, and Airbus A300 and A310 airplanes, except as provided in paragraph (b) of this AD:

(1) Before further flight, remove from service engines that exceed the CSN or cycles-since-Testing-21 (CST) limits listed in the following Table 2, or perform on-wing Testing-21 on Boeing 747 or McDonnell Douglas MD-11 airplanes in accordance with paragraph (i)(3) or (i)(4) respectively, of this AD. Thereafter, ensure that no Configuration G or H engines exceed the HPC CSN or CST limits listed in Table 2 of this AD.

Table 2.-Configuration G and H Limits

Configuration designator	B747 PW4056	B767 PW4052	B767 PW4056	B767 PW4060 PW4060A PW4060C PW4062	MD-11 PW4460 PW4462	A300/310 PW4152 PW4156A PW4158
G	1,700 CSN	3,000 CSN	2,100 CSN	1,350 CSN	1,150 CSN	2,800 CSN.
H	600 CST	600 CST	600 CST	600 CST	600 CST	600 CST.

(2) Prior to return to service, Configuration G and H engines must meet the requirements of paragraph (i) of this AD.

Engines Installed on Boeing 767 and McDonnell Douglas MD-11 Airplanes

(d) For engines installed on Boeing 767 and McDonnell Douglas MD-11 airplanes, except as provided in paragraph (b) and (c) of this AD:

(1) Before further flight, limit the number of engines that exceed the HPC CSN, HPC cycles-since-overhaul (CSO), or HPC CST limits in Table 3 of this AD, to no more than one engine per airplane. Thereafter, ensure that no more than one engine per airplane exceeds the HPC CSN, CSO, or CST limit in Table 3 of this AD.

(2) Prior to return to service, engines must meet the requirements of paragraph (i) of this AD.

Engines Installed on Boeing 747 Airplanes

(e) Except as provided in paragraph (b) and (c) of this AD, before further flight, and thereafter, manage the engine configurations installed on Boeing 747 airplanes as follows:

(1) Limit the number of Configuration A, B, C, or E engines that exceed the HPC CSN or HPC CSO limits listed in Table 3 of this AD, to not more than one engine per airplane. Table 3 follows:

Table 3.-Engine Limits for Boeing Airplanes

Configuration designator	B747 PW4056	B767 PW4052	B767 PW4056	B767 PW4060 PW4060A PW4060C PW4062	MD-11 PW4460 PW4462
A	1,400 CSN or CSO	3,000 CSN or CSO	1,600 CSN or CSO	900 CSN or CSO	800 CSN or CSO.
B	2,100 CSN or CSO	4,400 CSN or CSO	2,800 CSN or CSO	2,000 CSN or CSO	1,200 CSN or CSO.
C	2,100 CSO	4,400 CSO	2,800 CSO	2,000 CSO	1,300 CSO.
D	2,600 CSN	4,400 CSN	3,000 CSN	2,200 CSN	2,000 CSN.
E	750 CSN or CSO	750 CSN or CSO	750 CSN or CSO	750 CSN or CSO	750 CSN or CSO.
F	800 CST	800 CST	800 CST	800 CST	800 CST.

(2) The single Configuration A, B, C, or E engine per airplane that exceeds the HPC CSN or CSO limits listed in Table 3 of this AD, must be limited to 2,600 HPC CSN or CSO for Configuration A, B, or C engines, or 1,300 HPC

CSN or CSC to Configuration E, whichever is later, for Configuration E engines.

(3) Remove from service or perform on-wing Testing-21 in accordance with paragraph (i)(3) of this AD for Configuration D engines, before accumulating 2,600 CSN.

(4) Remove from service or perform on-wing Testing-21 in accordance with paragraph (i)(3) of this AD for Configuration F engines, before accumulating 800 CST.

(5) Prior to return to service, Configuration A, B, C, D, and F engines must meet the requirements of paragraph (i) of this AD.

Engines Installed on Airbus A300 and A310 Airplanes

(f) For Airbus operators that began operation of their A300 fleet after the effective date of this AD, use paragraphs (f)(7) through (f)(9) of this AD to determine which Airbus A300 PW4158 engine category 1 or 3 limits of the following Table 4 of this AD apply to your engine fleet. For Airbus operators that have been in operation before the effective date of this AD, use your PW4158 engine category classification previously determined for your fleet and continue to apply the A300 PW4158 Category limits in Table 4 of this AD, to your fleet.

Table 4.-Engine Limits for Airbus Airplanes

Configuration designator	A300 PW4158 Category 1, and A310 PW4156 and PW4156A	A300 PW4158 Category 2, and A310 PW4152	A300 PW4158 Category 3
A	900 CSN or CSO	1,850 CSN or CSO	500 CSN or CSO.
B	2,200 CSN or CSO	4,400 CSN or CSO	1,600 CSN or CSO
C	2,200 CSO	4,400 CSO	1,600 CSO.
D	4,400 CSN	4,400 CSN	4,400 CSN.
E	Not Applicable	Not Applicable	Not Applicable.
F	800 CST	800 CST	800 CST.

(1) Determine the number of Group 3 Takeoff surges experienced by engines in your fleet before April 13, 2001. Count surge events for engines that had an HPC overhaul and incorporated either SB PW4ENG 72-484 or SB PW4ENG 72-575 at the time of overhaul. Do not count surge events for engines that did not have the HPC overhauled (i.e. 1st run engine) or had the HPC overhauled but did not incorporate either SB PW4ENG 72-484 or SB PW4ENG 72-575. See paragraph (s)(5) of this AD for a definition of a Group 3 Takeoff surge.

(2) Determine the number of cumulative HPC CSO accrued by engines in your fleet before April 13, 2001. Count HPC CSO for engines that had an HPC overhaul and incorporated either SB PW4ENG 72-484 or SB PW4ENG 72-575 at the time of overhaul. Do not count HPC CSO accrued on your engines while operating outside your fleet.

(3) Calculate the surge rate by dividing the number of Group 3 Takeoff surges determined in paragraph (f)(1) of this AD, by the number of cumulative HPC CSO determined in paragraph (f)(2) of this AD, and then multiply by 1,000.

(4) If the surge rate calculated in paragraph (f)(3) of this AD is less than 0.005, go to paragraph (f)(5) of this AD. If the surge rate calculated in paragraph (f)(3) of this AD is greater than or equal to 0.005, go to paragraph (f)(6) of this AD.

(5) If the cumulative HPC CSO determined in paragraph (f)(2) of this AD is greater than or equal to 200,000 cycles, use A300 PW4158 Category 2 limits of Table 4 of this AD. If less than 200,000 cycles, go to paragraph (f)(7) of this AD.

(6) If the surge rate calculated in paragraph (f)(3) of this AD is greater than 0.035, use A300 PW4158 Category 3 limits of Table 4 of this AD. If less than or equal to 0.035, go to paragraph (f)(7) of this AD.

(7) Determine the percent of takeoffs with greater than a 1.45 Takeoff engine pressure ratio (EPR) data for engines operating in your fleet. Count takeoffs from a random sample of at least 700 airplane takeoffs that have occurred over at least a 3-month time period, for a period beginning no earlier than 23 months prior to the effective date of

this AD. See paragraph (s)(6) of this AD for definition of Takeoff EPR data.

(8) If there is insufficient data to satisfy the criteria of paragraph (f)(7) of this AD, use A300 PW4158 Category 3 limits of Table 4 of this AD.

(9) If the percentage of takeoffs with greater than a 1.45 Takeoff EPR data determined in paragraph (f)(7) of this AD is greater than 31%, use A300 PW4158 Category 3 limits listed in Table 4 of this AD. If the percentage of takeoffs with greater than a 1.45 Takeoff EPR data determined in paragraph (f)(7) of this AD is less than or equal to 31%, use A300 PW 4158 Category 1 limits listed in Table 4 of this AD.

(g) For engines installed on Airbus A300 or A310 airplanes, except as provided in paragraph (c) of this AD, before further flight, limit the number of engines that exceed the CSN, CSO, or CST limits listed in Table 4 of this AD, to no more than one engine per airplane. Thereafter, ensure that no more than one engine per airplane exceeds the HPC CSN, CSO, or CST limits listed in Table 4 of this AD. See paragraph (i) of this AD for return to service requirements.

(h) For Airbus A300 PW4158 engine operators, except those operators whose engine fleets are determined to be Category 3 classification based on surge rate in accordance with paragraph (f)(6) of this AD, re-evaluate your fleet category within 6 months from the last evaluation, and thereafter, at intervals not to exceed 6 months, using the following criteria:

(1) For operators whose engine fleets are initially classified as Category 1 or 3 in accordance with paragraph (f) of this AD, determine the percent of takeoffs with greater than a 1.45 Takeoff EPR data for engines operating in your fleet. Count takeoffs from a sample of at least 200 takeoffs that occurred over the most recent six month time period since the last categorization was determined, or the total number of takeoffs accumulated over 6 months if less than 200 takeoffs. See paragraph (s)(6) of this AD for definition of takeoff EPR data.

(i) If there is insufficient data to satisfy the criteria of paragraph (h)(1) of this AD, use A300 PW4158 Category 3 limits listed in Table 4 of this AD.

(ii) If the percentage of takeoffs with greater than a 1.45 Takeoff EPR data determined in paragraph (h)(1) of this AD is greater than 31%, use A300 PW4158 Category 3 limits listed in Table 4 of this AD.

(iii) If the percentage of takeoffs with greater than a 1.45 Takeoff EPR data determined in paragraph (h)(1) of this AD is less than or equal to 31%, use A300 PW4158 Category 1 limits listed in Table 4 of this AD.

(2) For operators whose engine fleets are initially classified as Category 2 in accordance with paragraph (f) of this AD, determine the percent of takeoffs with greater than a 1.45 Takeoff EPR data for engines operating in your fleet. Count takeoffs from a sample of at least 200 takeoffs that occurred over the most recent six month time period since the last categorization was determined, or the total number of takeoffs accumulated over 6 months if less than 200 takeoffs. See paragraph (s)(6) of this AD for definition of takeoff EPR data.

(i) If there is insufficient data to satisfy the criteria of paragraph (h)(2) of this AD, use A300 PW4158 Category 3 limits listed in Table 4 of this AD.

(ii) If the percentage of takeoffs with greater than a 1.45 Takeoff EPR data determined in paragraph (h)(2) of this AD is greater than 37%, use A300 PW4158 Category 3 limits listed in Table 4 of this AD.

(iii) If the percentage of takeoffs with greater than a 1.45 Takeoff EPR data determined in paragraph (h)(2) of this AD is greater than or equal to 21% and less than or equal to 37%, use A300 PW4158 Category 1 limits listed in Table 4 of this AD.

(iv) If the percentage of takeoffs with greater than a 1.45 Takeoff EPR data determined in paragraph (h)(2) of this AD is less than 21%, use A300 PW4158 Category 2 limits listed in Table 4 of this AD.

Return to Service Requirements

(i) Engines removed from service in accordance with paragraph (c), (d), (e), or (g) of this AD may be returned to service under the following conditions:

(1) After passing a cool-engine fuel spike stability test (Testing-21) that has been done in accordance with PW4000 Engine Manual (EM) 50A605, 71-00-00, Testing-21, dated June 15, 2003; or PW4000 EM 50A443, 71-00-00, Testing-21, dated March 15, 2002; or PW4000 EM 50A822, 71-00-00, Testing-21, dated March 15, 2002; except for engines configured with Configuration E; or engines that have experienced a Group 3 takeoff surge; or

(2) Engines tested before the effective date of this AD, in accordance with PW4000 EM 50A605, 71-00-00, Testing-21, dated March 15, 2002; or PW4000 EM 50A443, 71-00-00, Testing-21, dated November 14, 2001; or PW4000 EM 50A443, Temporary Revision No. 71-0026, dated November 14, 2001; or PW4000 EM 50A605, Temporary Revision No. 71-0035, dated November 14, 2001; or PW4000 EM 50A822, 71-00-00, Testing-21, dated November 14, 2001; or PW4000 EM 50A822, Temporary Revision No. 71-0018, dated November 14, 2001; or PW Internal Engineering Notice (IEN) 96KC973D, dated October 12, 2001, meet the requirements of Testing-21; or

(3) For PW4056 engines installed on Boeing 747 airplanes, after successfully completing on-wing Testing-21 in accordance with Major IEN 02KCW13E, dated November 21, 2002; or if done prior to the approval of Major IEN 02KCW13E, dated November 21, 2002; in accordance with Minor IENs 02KCW13, dated October 14, 2002; 02KCW13A, dated October 14, 2002; 02KCW13C, dated July 25, 2002; or 02KCW13D, July 29, 2002; except for engines configured with Configuration E, or engines that have experienced a Group 3 takeoff surge; or

(4) For PW4460 and PW4462 engines installed on McDonnell Douglas MD-11 airplanes, after successfully completing on-wing Testing-21, in accordance with Major IEN 02KCW13H, dated December 9, 2002; or if done prior to the approval of Major IEN 02KCW13H, dated December 9, 2002, in accordance with Minor IEN 02KCW13F, dated October 14, 2002; except for engines configured with Configuration E, or engines that have experienced a Group 3 takeoff surge; or

(5) An engine that is either below or exceeds the limits of Table 3 or Table 4 of this AD may be removed and installed on another airplane without Testing-21, as long as the requirements of paragraph (c), (d), (e), or (g) of this AD are met at the time of engine installation.

(6) An engine that has incorporated the RCC rear HPC in accordance with:

(i) PW SB PW4ENG 72-755, Revision 3, dated September 16, 2003, for engines installed in Boeing airplanes, or

(ii) PW SB PW4ENG 72-756, Revision 1, dated September 15, 2003, or PW SB PW4ENG 72-759, Revision 1, dated September 16, 2003, for engines installed in Airbus airplanes, or

(iii) PW SB PW4ENG 72-757, Revision 1, dated September 15, 2003, for engines installed in McDonnell Douglas MD-11 airplanes; or

(iv) RCC rear HPCs that were incorporated before the effective date this AD are allowed credit, in accordance with paragraph (t) of this AD.

(v) Completing the SBs referenced in paragraphs (i)(6)(i) through (i)(6)(iii) of this AD changes the engine configuration to Configuration I.

Phase 0 or Phase 1, FB2T or FB2B Fan Blade Configurations

(j) For Configuration A, B, C, D, E, F, G, and H engines with Phase 0 or Phase 1, FB2T or FB2B fan blade configurations complying with the requirements of AD 2001-09-05, (66 FR 22908, May 5, 2001); AD 2001-09-10, (66 FR 21853, May 2, 2001); or AD 2001-01-10, (66 FR 6449, January 22, 2001); do the following:

(1) Operators complying with the ADs listed in paragraph (j) of this AD using the weight restriction compliance method, must perform Testing-21 in accordance with paragraph (i) of this AD whenever any quantity of fan blades are replaced with new fan blades, overhauled fan blades, or with fan blades having the leading edges recontoured after the effective date of this AD, if during the shop visit the HPC is not overhauled and separation of a major engine flange, located between "A" flange and "T" flange, does not occur.

(2) If an operator changes from the weight restriction compliance method to the fan blade leading edge recontouring method after the effective date of this AD, Testing-21 in accordance with paragraph (i) of this AD is required each

time fan blade leading edge recontouring is done, if the fan blades accumulate more than 450 cycles since new or since fan blade overhaul, or since the last time the fan blade leading edges were recontoured.

Minimum Build Standard

(k) For engines to be installed on Boeing airplanes that are inducted into the shop after July 7, 2003; for engines to be installed on Airbus airplanes that are inducted into the shop after the effective date of this AD; and for engines to be installed on McDonnell Douglas MD-11 airplanes that are inducted into the shop 30 days after the effective date of this AD:

(1) Any Segmented Case Configuration (SCC) HPC module that is disassembled to a level that fully separates the HPC rear case assembly at H flange from the HPC module may not be returned to service unless the RCC rear HPC is incorporated in accordance with paragraphs (i)(6)(i) through (i)(6)(iii) of this AD.

(2) Any engine with a SCC HPC module that is not disassembled in accordance with paragraph (k)(1) of this AD, must meet the following minimum build standard:

(i) Do not install an engine with SCC HPC and HPT modules where the CSO of the HPC is 1,500 cycles or more than the CSN or CSO of the HPT.

(ii) Any engine that undergoes separation of the SCC HPC and HPT modules must not be installed on an airplane unless it meets the build standard defined by PW SB PW4ENG 72-514. Engines that incorporate the Phase 3 configuration meet the build standard defined by PW SB PW4ENG 72-514.

Stability Testing Requirements

(l) For engines to be installed on Boeing, Airbus, or McDonnell Douglas airplanes, after the effective date of this AD, Testing-21 must be performed in accordance with paragraph (i) of this AD, before an engine can be returned to service after having undergone maintenance in the shop, except under any of the following conditions:

(1) Engine HPC has incorporated the RCC rear HPC in accordance with paragraphs (i)(6)(i) through (i)(6)(iii) of this AD.

(2) Engine maintenance intended to maintain the airworthiness of the engine between planned shop visits, that requires separation of a major engine flange located between "A" flange and "T" flange, that results in the engine being reassembled with all gas path-related components remaining in the as-removed condition; or

(3) Engines that successfully passed Testing-21 with zero CST, and are split at Flange E for transportation reasons as specified in the applicable Storage/Transport section of the applicable EM.

Thrust Rating Changes, Installation Changes, and Engine Transfers for Non-Configuration I Engines

(m) When a thrust rating change has been made by using the Electronic Engine Control (EEC) programming plug, or an installation change has been made during an HPC overhaul period, use the lowest cyclic limit of Table 3 or Table 4 of this AD, associated with any engine thrust rating change or with any installation change made during this period. See paragraph (s)(2) for definition of HPC overhaul period.

(n) When a PW4158 engine is transferred to another PW4158 engine operator whose engine fleet has a different category, use the lowest cyclic limit in Table 4 of this AD that was used or will be used during the affected HPC overhaul period.

(o) When a PW4158 engine operator whose engine fleet changes category in accordance with paragraph (h) of this AD, use the lowest cyclic limits in Table 4 of this AD that were used or will be used during the affected HPC overhaul period.

(p) Engines with an HPC having zero CSN or CSO at the time of thrust rating change, or installation change, or engine transfer between PW4158 engine operators, or subsequent change in operator engine fleet category in accordance with paragraph (h) of this AD in the direction of lower to higher Table 4 limits of this AD, are exempt from the lowest cyclic limit requirement in paragraphs (m), (n), and (o) of this AD.

Engines That Surge

(q) For engines that experience a surge, and after troubleshooting procedures are completed for airplane-level surge during forward or reverse thrust, do the following:

(1) For engines that experience a Group 3 takeoff surge, do the following:

(i) Remove the engine from service before further flight and

(ii) Incorporate the RCC rear HPC in accordance with paragraphs (i)(6)(i) through (i)(6)(iii) of this AD.

(2) For any engine that experiences a forward or reverse thrust surge at EPR's greater than 1.25 that is not a Group 3 takeoff surge, do the following:

(i) For Configuration A, B, C, D, F, G, and H engines, remove engine from service within 25 CIS or before further flight if airplane-level troubleshooting procedures require immediate engine removal, and perform Testing-21 in accordance with paragraph (i) of this AD, as applicable.

(ii) For Configuration E engines, remove engine from service within 25 CIS or before further flight if airplane-level troubleshooting procedures require immediate engine removal.

(3) Paragraphs (q)(1) and (q)(2) of this AD are not applicable to engines that incorporate the RCC rear HPC in accordance with paragraphs (i)(6)(i) through (i)(6)(iii) of this AD.

Terminating Action for Boeing, Airbus, and McDonnell Douglas MD-11 Airplanes

(r) For Boeing, Airbus, and McDonnell Douglas operators with PW4000 engines installed on Boeing 747, 767, Airbus A300, A310, or McDonnell Douglas MD-11 airplanes, modify the engine HPC assembly by incorporating the RCC rear HPC in accordance with (i)(6)(i) through (i)(6)(iii) of this AD, as follows:

(1) For engines installed on Boeing 767 airplanes, manage the engine configuration installed on the airplanes in your fleet as follows:

(i) By May 31, 2006 and thereafter, ensure that at least one Configuration I engine is installed on the airplane.

(ii) After May 31, 2006, the non-Configuration I engine (SCC HPC module) installed on the airplane must have incorporated the Haynes material in the HPC inner case rear hook during the original engine build or during an HPC overhaul in accordance with PW4ENG 72-714, dated June 27, 2000; or Revision 1, dated November 8, 2001; or Revision 2, dated February 28, 2003; or SB PW4ENG 72-749, dated June 17, 2002; or Revision 1, dated January 8, 2003; or Chromalloy Florida Repair procedure 00CFL-039-0, dated December 27, 2000.

(2) For engines installed on Boeing 747 airplanes, manage the engine configuration installed on the airplanes in your fleet as follows:

(i) By January 31, 2007 and thereafter, ensure that no more than one non-Configuration I engine is installed on the airplane.

(ii) After January 31, 2007, the non-Configuration I engine (SCC HPC module) installed on the airplane must have incorporated the Haynes-material in the HPC inner case rear hook during the original build or during an HPC overhaul in accordance with SB PW4ENG 72-714, dated June 27, 2000; or Revision 1, dated November 8, 2001; or Revision 2, dated February 28, 2003; or SB PW4ENG 72-749, dated June 17, 2002; or Revision 1, dated January 8, 2003; or Chromalloy Florida Repair procedure 00CFL-039-0, dated December 27, 2000.

(3) For engines installed on Airbus A300, A310, or McDonnell Douglas MD-11 airplanes, manage the engine configuration installed on the airplanes in your fleet as follows:

(i) By August 31, 2006 and thereafter, ensure that at least one Configuration I engine is installed on the Airbus A300 or A310 airplane, and ensure that no more than one non-Configuration I engine is installed on the McDonnell

Douglas MD-11 airplane.

(ii) After August 31, 2006, the non-Configuration I engine installed on the airplane must have incorporated the Haynes-material in the HPC inner case rear hook during the original build or during an HPC overhaul in accordance with SB PW4ENG 72-714, dated June 27, 2000; or Revision 1, dated November 8, 2001; or Revision 2, dated February 28, 2003; or SB PW4ENG 72-749, dated June 17, 2002; or Revision 1, dated January 8, 2003; or Chromalloy Florida Repair procedure 00CFL-039-0, dated December 27, 2000.

(4) Prior to June 30, 2009, or whenever the HPC module is disassembled to a level that fully separates the HPC rear case assembly at H flange from the HPC module, whichever occurs first, incorporate the RCC rear HPC in accordance with paragraphs (i)(6)(i) through (i)(6)(iii) of this AD. Engines incorporating the RCC rear HPC are Configuration I engines. See paragraph (s)(7) of this AD for definition of HPC rear case assembly.

(5) Incorporation of the RCC rear HPC constitutes terminating action to the Testing-21 requirements as specified in paragraph (l) of this AD, and engine stagger and or hard time limit requirements as specified in paragraphs (c), (d), (e) and (g) of this AD for engines installed on Boeing, Airbus, and McDonnell Douglas airplanes.

Definitions

(s) For the purposes of this AD, the following definitions apply:

(1) An HPC overhaul is defined as restoration of the HPC stages 5 through 15 blade tip clearances to the limits specified in the applicable fits and clearances section of the engine manual.

(2) An HPC overhaul period is defined as the time period between HPC overhauls.

(3) An HPT overhaul is defined as restoration of the HPT stage 1 and 2 blade tip clearances to the limits specified in the applicable fits and clearances section of the engine manual.

(4) A Phase 3 engine is identified by a (-3) suffix after the engine model number on the data plate if incorporated at original manufacture, or a "CN" suffix after the engine serial number if the engine was converted using PW SBs PW4ENG 72-490, PW4ENG 72-504, or PW4ENG 72-572 after original manufacture.

(5) A Group 3 takeoff surge is defined as the occurrence of any of the following engine symptoms that usually occur in combination during an attempted airplane takeoff operation (either at reduced, derated or full rated takeoff power setting) after takeoff power set, which can be attributed to no specific and correctable fault condition after completing airplane-level surge during forward thrust troubleshooting procedures:

(i) Engine noises, including rumblings and loud "bang(s)."

(ii) Unstable engine parameters (EPR, N1, N2, and fuel flow) at a fixed thrust setting.

(iii) Exhaust gas temperature (EGT) increase.

(iv) Flames from the inlet, the exhaust, or both.

(6) Takeoff EPR data is defined as Maximum Takeoff EPR if takeoff with Takeoff-Go-Around (TOGA) is selected, or Flex Takeoff EPR if takeoff with Flex Takeoff (FLXTO) is selected. Maximum Takeoff EPR or Flex Takeoff EPR may be recorded using any of the following methods:

(i) Manually recorded by the flight crew read from the Takeoff EPR power management table during flight preparation (see Aircraft Flight Manual (AFM) chapter 5.02.00 and 6.02.01, or Flight Crew Operation Manual (FCOM) chapter 2.09.20) and then adjusted by adding 0.010 to the EPR value recorded; or

(ii) Automatically recorded during Takeoff at 0.18 Mach Number (Mn) (between 0.15 and 0.20 Mn is acceptable) using an aircraft automatic data recording system and then adjusted by subtracting 0.010 from the EPR value recorded; or

(iii) Automatically recorded during takeoff at maximum EGT, which typically occurs at 0.25-0.30 Mn, using an

aircraft automatic data recording system.

(7) HPC rear case assembly is defined as the HPC rear case with heat shields and other minor detail parts installed within the HPC rear case, but not including the HPC rear segmented stators.

Credit for Incorporating the RCC Rear HPC Before the Effective Date of This AD

(t) Engines that have incorporated the RCC rear HPC before the effective date of this AD, in accordance with the following, comply with the RCC rear HPC incorporation requirements of this AD:

(1) PW SB PW4ENG 72-755, Revision 3, dated September 16, 2003, or with PW SB PW4ENG 72-755, Revision 2, dated May 23, 2003 for engines installed in Boeing airplanes; or

(2) PW SB PW4ENG 72-756, Revision 1, dated September 15, 2003, or PW SB PW4ENG 72-756, dated July 7, 2003, or PW SB PW4ENG 72-759, Revision 1, dated September 16, 2003, or PW SB PW4ENG 72-759, dated July 7, 2003, for engines installed in Airbus airplanes, or

(3) PW SB PW4ENG 72-757, Revision 1, dated September 15, 2003, for engines installed in McDonnell Douglas airplanes.

Alternative Methods of Compliance

(u) 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, Engine Certification Office (ECO). Operators must submit their request through an appropriate FAA Principal Maintenance Inspector, who may add comments and then send it to the Manager, ECO.

Note 2: Information concerning the existence of approved alternative methods of compliance with this AD, if any, may be obtained from the ECO.

Special Flight Permits

(v) Special flight permits may be issued in accordance with §§ 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 done.

Testing-21 Reports

(w) Within 60 days of test date, report the results of the cool-engine fuel spike stability assessment tests (Testing-21) and on-wing Testing-21 to the ANE-142 Branch Manager, Engine Certification Office, 12 New England Executive Park, Burlington, MA 01803-5299, or by electronic mail to 9-ane-surge-ad-reporting@faa.gov. Reporting requirements have been approved by the Office of Management and Budget and assigned OMB control number 2120-0056. Be sure to include the following information:

(1) Engine serial number.

(2) Engine configuration designation per Table 1 of this AD.

(3) Date of the cool-engine fuel spike stability test or on-wing Testing-21, as applicable.

(4) HPC Serial Number, and HPC time and cycles-since-new and since-compressor-overhaul at the time of the test.

(5) Results of the test (Pass or Fail).

Documents That Have Been Incorporated By Reference

(x) The actions must be done in accordance with the following Pratt and Whitney (PW) service bulletins (SBs), Internal Engineering Notice (IEN), Temporary Revisions, (TR's), engine manual (EM) sections, and Chromalloy Florida Repair Procedure:

Document No.	Pages	Revision	Date
PW SB PW4ENG 72-714	All	Original	June 27, 2000.
Total pages: 12.			
PW SB PW4ENG 72-714	1-2	1	November 8, 2001.
	3	Original	June 27, 2000.
	4	1	November 8, 2001.
	5-12	Original	June 27, 2000.
Total pages: 12.			
PW SB PW4ENG 72-714	All	2	February 28, 2003.
Total pages: 14.			
PW SB PW4ENG 72-749	All	Original	June 17, 2002.
Total pages: 14.			
PW SB PW4ENG 72-749	1	1	January 8, 2003.
	2-4	Original	June 17, 2002.
	5-7	1	January 8, 2003.
	8	Original	June 17, 2002.
	9-10	1	January 8, 2003.
	11	Original	June 17, 2002.
	12-14	1	January 8, 2003.
Total pages: 14.			
PW SB PW4ENG 72-755	1	2	May 23, 2003.
	2-37	1	April 8, 2003.
	38-39	2	May 23, 2003.
	40-54	1	April 8, 2003.
	55	2	May 23, 2003.
	56-152	1	April 8, 2003.
	153	2	May 23, 2003.
	154-166	1	April 8, 2003.
	167-171	2	May 23, 2003.
	172-179	1	April 8, 2003.
	180-183	2	May 23, 2003.
	184-195	1	April 8, 2003.
	196	2	May 23, 2003.
	197-233	1	April 8, 2003.
	234	2	May 23, 2003.
	235-287	1	April 8, 2003.
Total pages: 287.			
PW SB PW4ENG 72-755	1	3	September 16, 2003.
	2	1	April 8, 2003.
	3-294	3	September 16, 2003.
Total pages: 294.			
PW SB PW4ENG 72-756	All	Original	July 7, 2003.

Total pages: 283.			
PW SB PW4ENG 72-756	1	1	September 15, 2003.
	2-4	Original	July 7, 2003.
	5-6	1	September 15, 2003.
	7-13	Original	July 7, 2003.
	14	1	September 15, 2003.
	15-48	Original	July 7, 2003.
	49	1	September 15, 2003.
	50-51	Original	July 7, 2003.
	52-64	1	September 15, 2003.
	65-109	Original	July 7, 2003.
	110	1	September 15, 2003.
	111-123	Original	July 7, 2003.
	124	1	September 15, 2003.
	125-165	Original	July 7, 2003.
	166	1	September 15, 2003.
	167-172	Original	July 7, 2003.
	173	1	September 15, 2003.
	174-189	Original	July 7, 2003.
	190-192	1	September 15, 2003.
	193	Original	July 7, 2003.
	194-196	1	September 15, 2003.
	197-204	Original	July 7, 2003.
	205-206	1	September 15, 2003.
	207-224	Original	July 7, 2003.
	225	1	September 15, 2003.
	226-241	Original	July 7, 2003.
	242-243	1	September 15, 2003.
	244	Original	July 7, 2003.
	245	1	September 15, 2003.
	246-247	Original	July 7, 2003.
	248	1	September 15, 2003.
	249-255	Original	July 7, 2003.
	256-258	1	September 15, 2003.
	259-281	Original	July 7, 2003.
	282-283	1	September 15, 2003.
Total pages: 283.			
PW SB PW4ENG 72-757	1	1	September 15, 2003.
	2-3	Original	August 15, 2003.
	4	1	September 15, 2003.
	5-34	Original	August 15, 2003.
	35	1	September 15, 2003.

	36-39.	Original.	August 15, 2003.
	40-57	1	September 15, 2003.
	58-105	Original	August 15, 2003.
	106	1	September 15, 2003.
	107-147	Original	August 15, 2003.
	148	1	September 15, 2003.
	149-154	Original	August 15, 2003.
	155-156	1	September 15, 2003.
	157-167	Original	August 15, 2003.
	168	1	September 15, 2003.
	169-195	Original	August 15, 2003.
	196	1	September 15, 2003.
	197-218	Original	August 15, 2003.
	219-220	1	September 15, 2003.
	221-237	Original	August 15, 2003.
Total pages: 237.			
PW SB PW4ENG 72-759	All	Original	July 7, 2003.
Total pages: 228.			
PW SB PW4ENG 72-759	1	1	September 16, 2003.
	2-4	Original	July 7, 2003.
	5-12	1	September 16, 2003.
	13-99	Original	July 7, 2003.
	100	1	September 16, 2003.
	101-134	Original	July 7, 2003.
	135	1	September 16, 2003.
	136-143	Original	July 7, 2003.
	144-146	1	September 16, 2003.
	147-174	Original	July 7, 2003.
	175	1	September 16, 2003.
	176-203	Original	July 7, 2003.
	204	1	September 16, 2003.
	205-224	Original	July 7, 2003.
	225-226	1	September 16, 2003.
	227	Original	July 7, 2003.
Total pages: 227.			
PW IEN 02KCW13E	All	Original	November 21, 2002.
Total pages: 20.			
PW IEN 02KCW13H	All	Original	December 9, 2002.
Total pages: 21.			
PW IEN 96KC973D	All	Original	October 12, 2001.
Total pages: 19.			
PW TR 71-0018	All	Original	November 14, 2001.

Total pages: 24.			
PW TR 71-0026	All	Original	November 14, 2001.
Total pages: 24.			
PW TR 71-0035	All	Original	November 14, 2001.
Total pages: 24.			
PW4000 EM 50A443, 71-00-00, TESTING-21	All	Original	March 15, 2002.
Total pages: 20.			
PW4000 EM 50A605, 71-00-00, TESTING-21	All	Original	March 15, 2002.
Total pages: 20.			
PW4000 EM 50A605, 71-00-00, TESTING-21	1-7	Original	March 15, 2002.
	8-25	N/A	June 15, 2003.
Total pages: 25.			
PW4000 EM 50A822, 71-00-00, TESTING-21	All	Original	March 15, 2002.
Total pages: 20.			
Chromalloy Florida Repair Procedure, 00 CFL-039-0:			
Summary	1-3	Original	December 27, 2000.
Insp/chk-01	801	Original	December 27, 2000.
Repair-01	901-903	Original	December 27, 2000.
Total pages: 7.			

The incorporation by reference of PW SB PW4ENG 72-714, Revision 1, dated November 8, 2001, PW IEN 96KC973D, dated October 12, 2001; PW TR 71-0018, PW TR 71-0026, and PW TR 71-0035, all dated November 14, 2001; was approved by the Director of the Federal Register as of January 17, 2002 (67 FR 1, January 2, 2002). The incorporation by reference of PW SB PW4ENG 72-749, dated June 17, 2002; PW4000 EM 50A443, Section 71-00-00, Testing-21, dated March 15, 2002; PW4000 EM 50A822, Section 71-00-00, Testing-21, dated March 15, 2002; PW4000 EM 50A605, Section 71-00-00, Testing-21, dated March 15, 2002; and Chromalloy Florida Repair Procedure, 00 CFL-039-0, dated December 27, 2000; was approved by the Director of the Federal Register as of November 12, 2002 (67 FR 65484, October 25, 2002). The incorporation by reference of PW SB PW4ENG 72-714, Revision 2, dated February 28, 2003; PW SB PW4ENG 72-755, Revision 2, dated May 23, 2003; PW SB PW4ENG 72-749, Revision 1, dated January 8, 2003; and PW EM 50A605, Section 71-00-00, Testing-21, dated June 15, 2003, was approved by the Director of the Federal Register as of July 7, 2003 (68 FR 33844; June 6, 2003). The Director of the Federal Register approves the incorporation by reference of PW SB PW4ENG 72-714, dated June 27, 2000; PW SB PW4ENG 72-755, Revision 3, dated September 16, 2003; PW SB PW4ENG 72-756, dated July 7, 2003; PW SB PW4ENG 72-756, Revision 1, dated September 15, 2003; PW SB PW4ENG 72-757, Revision 1, dated September 15, 2003; PW SB PW4ENG 72-759, dated July 7, 2003; PW SB PW4ENG 72-759, Revision 1, dated September 16, 2003; PW IEN 02KCW13E, dated November 21, 2002; and PW IEN 02KCW13H, dated December 9, 2002, in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. PW document copies may be obtained from Pratt and Whitney, 400 Main St., East Hartford, CT 06108; telephone (860) 565-7700; fax (860) 565-1605. Chromalloy Florida document copies may be obtained from Chromalloy Florida, 630 Anchors St., NW., Walton Beach, FL 32548; telephone (850) 244-7684; fax (850) 244-6322. Copies may be inspected at the FAA, New England Region, Office of the Regional Counsel, 12 New England Executive Park, Burlington, MA; or at the Office of the Federal Register, 800 North Capitol Street, NW, suite 700, Washington, DC.

Effective Date

(y) This amendment becomes effective on October 30, 2003.

▼ Footer Information

Issued in Burlington, Massachusetts, on September 19, 2003.

Jay J. Pardee,

Manager, Engine and Propeller Directorate,

Aircraft Certification Service.

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