[4910-13-U]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. 2000-NE-47-AD; Amendment 39-12346; AD 2001-15-12

RIN 2120-AA64

Airworthiness Directives; Pratt and Whitney PW4000 Series Turbofan Engines

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final rule, request for comments.

SUMMARY: This amendment supersedes two airworthiness directives (AD's), 2000-22-01 and 2001-09-07, that both apply to Pratt and Whitney (PW) model PW4000 series turbofan engines. AD 2000-22-01 requires that operators limit the number of PW4000 engines equipped with the high pressure compressors (HPC) in the cutback stator (CBS) configuration to no more than one engine on each airplane, and prohibits the installation of engines with HPC modules in the CBS configuration after the effective date of that AD. AD 2001-09-07 requires that operators limit the number of engines with potentially reduced stability to no more than one engine on each airplane, and remove those engines before exceeding certain cyclic limits. Reports of HPC surges in PW4000 engines that have the HPC in the CBS configuration prompted those AD's.

This Amendment will limit the number of PW4000 engines with potentially reduced stability on each airplane by applying rules based on airplane and engine configuration, and require that engines that exceed HPC compressor cyclic limits based on cycles-since-overhaul (CSO) are removed from service. This AD will also limit the number of engines with HPC CBS configuration to one on each airplane, and will establish a minimum rebuild standard for engines that are returned to service. This Amendment is prompted by further analyses of compressor surges in PW4000 engines. The actions specified by this AD are intended to prevent multiple-engine power losses due to high pressure compressor (HPC) surge and to reduce the rate of single-engine surge events.

DATES: Effective August 10, 2001.
Comments for inclusion in the Rules Docket must be received on or before September 24, 2001.

ADDRESSES: Submit comments in triplicate to the Federal Aviation Administration (FAA), New England Region, Office of the Regional Counsel, Attention: Rules Docket No. 2000-NE-47-AD, 12 New England Executive Park, Burlington, MA 01803-5299. Comments may also be sent via the Internet using the following address: "9-ane-adcomment@faa.gov." Comments sent via the Internet must contain the docket number in the subject line.

FOR FURTHER INFORMATION CONTACT: Peter White, Aerospace Engineer, Engine Certification Office, FAA, Engine and Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803-5299; telephone (781) 238-7128; fax (781) 238-7199.

SUPPLEMENTARY INFORMATION: The FAA has noted a growing number of take-off (T/O) surge events in Pratt and Whitney PW4000 Series turbofan engines. These surges typically occur within 60 seconds after throttle advance to T/O power, a critical phase of flight. These events have resulted in numerous aborted T/O's, in-flight engine shutdowns, and diverted flights. A surge of this kind on a single engine of a multi-engine airplane would not normally result in an unsafe condition. To date, two dual-engine surge events have occurred, the latest in March 2001 involving a twin-engine aircraft.

The investigation into these events has revealed no special causes for these surges. The FAA believes that a low-stall margin results from open clearances in the aft stages of the HPC. The worst-case open clearance condition in the aft stage compressor of the HPC occurs about 60 seconds after the throttle is advanced for T/O. A binding of the compressor flowpath and stator segments within the outer case (causing out-of-round flowpath or local open clearances) adds to this normally worst-case condition. Pratt and Whitney has initiated a root-cause analysis program to verify this belief, and to identify other contributing factors that may contribute to the high rate of takeoff surges in the PW4000 fleet.

On October 25, 2000, the FAA issued AD 2000-22-01 (65 FR 63793, dated October 25, 2000), applicable to PW4000 series engines, to require limiting the number of engines with the HPC CBS configuration, which are used on Boeing 747, Boeing 767, and McDonnell Douglas MD-11 series airplanes, to one on each airplane according to the cyclic limits specified in that AD. AD 2000-22-01 also prohibits using engines with HPC modules that incorporated the HPC CBS configuration, after the effective date of that AD.

On April 20, 2001, the FAA issued AD 2001-09-07 (66 FR 21083, dated April 27, 2001), applicable to PW4000 series turbofan engines, to require limiting the number of PW4000 engines to no more than one engine with potentially reduced stability on each airplane and removal of certain PW4000 engines before exceeding cyclic limits that are determined by airplane model. Those engines with potentially reduced stability are listed by serial number in the AD. AD 2001-09-07 superseded emergency AD 2001-08-52. AD 2001-09-07 also requires the removal of certain PW4000 engines that have an HPC with 1,500 or more CSO greater than the high pressure turbine (HPT) CSO, and establishes a minimum rebuild standard for engines that are returned to service.

Since AD 2000-22-01 and AD 2001-09-07 were issued, the FAA has reevaluated those requirements and found that the requirements of those AD's were not sufficient to meet the original safety intent of those AD's. The PW4000 fleet was evaluated by configuration, installation, thrust rating and other variables to determine which subpopulations are most prone to high power takeoff surges. This information was then evaluated to create cyclic limits for each airplane and engine combination to maintain the risk of a multiple-engine dual surge risk at an acceptable level. Cyclic limits were then developed for the HPC to reduce the single engine surge rate.

FAA's Determination of an Unsafe Condition and Proposed Actions

Since the unsafe condition described is likely to exist or develop on other PW4000 series turbofan engines of the same type design, this AD is being issued to prevent multiple-engine power losses due to HPC surge and to reduce the rate of single-engine surge events. This AD requires:

- Limiting the number of engines with the HPC CBS configuration to one on each airplane within 100 cycles-in-service (CIS) after the effective date of this AD, AND
- Limiting the number of PW4000 engines with potentially reduced stability on each airplane, based upon airplane and engine configuration, within 50 CIS after the effective date of this AD, AND
- Removing certain PW4000 engines from service, before exceeding cyclic limits on the HPC based on CSO, within 50 CIS after the effective date of this AD, AND
- Preventing the build-up of PW4000 engines that have an HPC with 1,500 or more CSO greater than the HPT CSO, AND
- A minimum rebuild standard for engines that are returned to service.

Interim Action

The actions specified in this AD are considered interim action and further action is anticipated based on the continuing investigation of the HPC surges. This AD has been coordinated with the FAA Transport Aircraft Directorate.

Immediate Adoption of This AD

Since a situation exists that requires the immediate adoption of this regulation, it is found that notice and opportunity for prior public comment hereon are impracticable, and that good cause exists for making this amendment effective in less than 30 days.

Comments Invited

Although this action is in the form of a final rule that involves requirements affecting flight safety and, thus, was not preceded by notice and an opportunity for public comment, comments are invited on this rule. Interested persons are invited to comment on this rule by submitting such written data, views, or arguments as they may desire. Communications should identify the Rules Docket number and be submitted in triplicate to the address specified under the caption "ADDRESSES." All communications received on or before the closing date for comments will be considered, and this rule may be amended in light of the comments received. Factual information that supports the commenter's ideas and suggestions is extremely helpful in evaluating the effectiveness of the AD action and determining whether additional rulemaking action would be needed.

Comments are specifically invited on the overall regulatory, economic, environmental, and energy aspects of the rule that might suggest a need to modify the rule. All comments submitted will be available, both before and after the closing date for comments, in the Rules Docket for examination by interested persons. A report that summarizes each FAA-public contact concerned with the substance of this AD will be filed in the Rules Docket.

Commenters wishing the FAA to acknowledge receipt of their comments submitted in response to this notice must submit a self-addressed, stamped postcard on which the following statement is made: "Comments to Docket Number 2000-NE-47-AD." The postcard will be date stamped and returned to the commenter.

Regulatory Impact

This final rule does not have federalism implications, as defined in Executive Order 13132, because it would not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. Accordingly, the FAA has not consulted with state authorities prior to publication of this final rule.

The FAA has determined that this regulation is an emergency regulation that must be issued immediately to correct an unsafe condition in aircraft, and is not a "significant regulatory action" under Executive Order 12866. It has been determined further that this action involves an emergency regulation under DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979). If it is determined that this emergency regulation otherwise would be significant under DOT Regulatory Policies and Procedures, a final regulatory evaluation will be prepared and placed in the Rules Docket. A copy of it, if filed, may be obtained from the Rules Docket at the location provided under the caption "ADDRESSES."

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Safety.

Adoption of the Amendment

Accordingly, pursuant to the authority delegated to me by the Administrator, the Federal Aviation Administration amends part 39 of the Federal Aviation Regulations (14 CFR part 39) as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§39.13 [Amended]

2. Section 39.13 is amended by removing Amendment 39-11947 (65 FR 63793, dated October 25, 2000) and Amendment 39-12212 (66 FR 21083, dated April 27, 2001), and by adding a new airworthiness directive (AD), Amendment 39-12346, to read as follows:

AIRWORTHINESS DIRECTIVE

Aircraft Certification Service
Washington, DC

U.S. Department
of Transportation
**Federal Aviation
Administration**

We post ADs on the internet at "av-info.faa.gov"

The following Airworthiness Directive issued by the Federal Aviation Administration in accordance with the provisions of Title 14 of the Code of Federal Regulations (14 CFR) part 39, applies to an aircraft model of which our records indicate you may be the registered owner. Airworthiness Directives affect aviation safety and are regulations which require immediate attention. You are cautioned that no person may operate an aircraft to which an Airworthiness Directive applies, except in accordance with the requirements of the Airworthiness Directive (reference 14 CFR part 39, subpart 39.3).

2001-15-12 Pratt and Whitney: Amendment 39-12346. Docket No. 2000-NE-47-AD. Supersedes Amendment 39-11947, and Amendment 39-12212.

Applicability:

This airworthiness directive (AD) is applicable to Pratt and 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.

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 (l) 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 multiple-engine power losses due to high pressure compressor (HPC) surge and to reduce the rate of single-engine surge events, do the following:

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

5

Table 1. Engine Configuration Listing

Configuration	Configuration Designator	Description
(1) Phase 1 without high pressure turbine (HPT) 1st turbine vane cut back (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 SB PW4ENG 72-514.
(2) Phase 1 with 1TVCB.	B	Same as configuration (1) except that HPT 1TVCB has been incorporated using any revision of SB PW4ENG 72-514.
(3) Phase 3, 2nd Run.	B	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.	C	Same as configuration (3) except that that the engine has not had an HPC overhaul since new.
(5) HPC Cutback Stator Configuration Engines.	D	Engines that incorporated any revision of SB's PW4ENG72-706, PW4ENG72-704, or PW4ENG72-711.

(b) Within 50 cycles-in-service (CIS) after the effective date of this AD, and thereafter, remove engines from service that exceed the HPC cycles-since-new (CSN) or cycles-since-overhaul (CSO) limits in the following Table 2 of this AD:

Table 2. HPC Cyclic Limits by Engine Configuration

Engine Model	Engine Serial Number (SN)	Engine Configuration (CSO or CSN)			
		A	**B**	**C**	**D**
(1) PW4152	All	3,600	5,600	8,000	1,300
(2) PW4156, PW4156A, and PW4158.	717205, 717702, 717703, 717710, 717752, 717788, 717798, 717799, 724023, 724026, 724027, 724033, 724034, 724036, 724037, 724040, 724041, 724044, 724045, 724048, 724049, 724050, 724052, 724055, 724056, 724059, 724061, 724062, 724063, 724065, 724067, 724073, 724074, 724075, 724079, 724094, 724095, 724551, 724552, 724555, 724556, 724557, 724558, 724561, 724562, 724563, 724564, 724567, 724568, 724569, 724570, 724571, 724572, 724573, 724574, 724575, 724576, 724578, 724640, 724806, 724807, 724808, 724809, 724811, 724820, 724821, 724827, 724833, 724835, 724836, 724840, 724841, 724848, 724849, 724855, 724857, 724858, 724861, 724862, 724865, 724866, 724868, 724909, 724910, 724913, 724914, 724924, 724925, 724926, 724927, 727912, 728519, 728520, 728521, 728522, 728523, 728524, 728525, 728526, 728527, 728528, 728534, 728535, 728536, 728537, 728538, 728539, 728540, 728541, 728542, 728543, 728544, 728545, 728546, 728547, 728548, 728549, 728550, 728551, 728552, 728553, 728554, 728557, 728558, 728559, 728560, 728561, 728562, 728563, 728564	3,200	4,400	8,000	1,300

7

(3) PW4158.	717704, 724001, 724002, 724004, 724005, 724006, 724007, 724008, 724009, 724010, 724011, 724019, 724020, 724031, 724035, 724038, 724039, 724042, 724043, 724047, 724068, 724069, 724071, 724076, 724077, 724080, 724085, 724086, 724087, 724092, 724093, 724096, 724097, 724801, 724802, 724803, 724804, 724805, 724813, 724814, 724819, 724823, 724824, 724825, 724826, 724828, 724831, 724832, 724843, 724846, 724847, 724851, 724852, 724853, 724854, 724859, 724860, 724863, 724864, 724867, 724869, 724870, 724871, 724872, 724873, 724874, 724875, 724876, 724880, 724881, 724882, 724883, 724884, 724885, 724886, 724887, 724888, 724889, 724890, 724892, 724893, 724894, 724895, 724896, 724897, 724898, 724899, 724900, 724932, 727315, 727436, 728501, 728502, 728503, 728504, 728505, 728506, 728507, 728508, 728509, 728510, 728511, 728515, 728518, 728531, 728532, 728533	6,500	7,500	8,000	1,300
(4) PW4156, PW4156A, and PW4158.	All others not listed by SN in this Table.	2,150	2,800	8,000	1,300
(5) PW4052 and 4056	All engines.	3,000	4,400	4,400	1,300
(6) PW4060, PW4060C, PW4062, PW4460, and PW4462.	All engines	2,150	3,600	4,400	1,300

Engines installed on Boeing 747 Airplanes

(c) Within 50 CIS after the effective date of this AD, and thereafter, for engines installed on Boeing 747 series aircraft, configure the airplane so that all of the following rules are met:

(1) At least one engine must be below the cyclic limits listed under Rule 1a in the following Table 3 of this AD:

8

Table 3. HPC CSO or CSN Cyclic Limits by Engine Configuration for Boeing 747 Airplanes

Number of engines in each Configuration on the Airplane			Rule 1a			Rule 1b			Rule 1c			Rule 1d (Quantity of Engines in each Configuration)		
A	B or C	D	A	B or C	D	A	B or C	D	A	B or C	D	A	B or C	D
(i) 4	0	0	700	-	-	1300	-	-	1800	-	-	(1) - 2400 (3) - 400	-	-
(ii) 3	1	0	700	2300	-	1300	2600	-	1800	3000	-	(1) - 2400 (2) - 400	(1) - 1800	-
(iii) 2	2	0	700	2300	-	1300	2600	-	1800	3000	-	(1) - 2400 (1) - 400	(2) - 1800	-
(iv) 1	3	0	700	2300	-	1300	2600	-	1800	3000	-	(1) - 2400	(3) - 1800	-
(v) 0	4	0	-	2300	-	-	2600	-	-	3000	-	-	(1) - 3300 (3) - 1800	-
(vi) 3	0	1	700	-	750	1300	-	750	1800	-	750	(1) - 2400 (2) - 400	-	(1) - 750
(vii) 2	1	1	700	2300	750	1300	2600	750	1800	3000	750	(1) - 2400 (1) - 400	(1) - 1800	(1) - 750
(viii) 1	2	1	700	2300	750	1300	2600	750	1800	3000	750	(1) - 2400	(2) - 1800	(1) - 750
(ix) 0	3	1	-	2300	750	-	2600	750	-	3000	750	-	(1) - 3300 (2) - 1800	(1) - 750

9

(2) At least two engines must be below the cyclic limits listed under Rule 1b in Table 3 of this AD.

(3) At least three engines must be below the cyclic limits listed under Rule 1c in Table 3 of this AD.

(4) At least one engine must be below the cyclic limits listed under Rule 1d in Table 3 of this AD. When applying Rule 1d of this AD, and two limits are shown for an engine configuration, the higher cyclic limit for that configuration must be applied only to the engine with the highest CSO or CSN of that configuration . The lower limit is then applied to the remaining engines of that configuration.

Engines installed on McDonnell Douglas MD-11 Airplanes

(d) Within 50 CIS after the effective date of this AD, and thereafter, for engines installed on McDonnell Douglas MD-11 airplanes, configure the airplane so that all of the following rules are met:

(1) At least one engine must be below the cyclic limits listed under Rule 2a in the following Table 4 of this AD:

Table 4. HPC CSO or CSN Cyclic Limits by Engine Configuration for McDonnell Douglas MD-11

Number of engines in each Configuration the Airplane				Rule 2a				Rule 2b				Rule 2c (Quantity of Engines in each Configuration)			
A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
(i) 3	0	0	0	850	-	-	-	1000	-	-	-	(1) - 1600 (2) - 600	-	-	-
(ii) 2	1	0	0	850	1700	-		1000	2300	-	-	(1) - 1600 (1) - 600	(1) - 1400	-	-
(iii) 1	2	0	0	850	1700	-	-	1000	2300	-	-	(1) - 1600	(2) - 1400	-	-
(iv) 0	3	0	0	-	1700	-	-	-	2300	-	-	-	(1) - 3000 (2) - 1400	-	-
(v) 2	0	1	0	850	-	2650	-	1000	-	2900	-	(1) - 1600 (1) - 600	-	(1) - 2800	-
(vi) 1	0	2	0	850	-	2650	-	1000	-	2900	-	(1) - 1600	-	(2) - 2800	-
(v) 0	0	3	0	-	-	2650	-	-	-	2900	-	-	-	(1) - 3200 (2) - 2800	-
(vi) 2	0	0	1	850	-	-	750	1000	-	-	750	(1) - 1600 (1) - 600			(1) - 750
(vii) 0	2	1	0	-	1700	2650	-	-	2300	2900	-	-	(1) - 3000 (1) - 1400	(1) - 2800	-
(viii) 0	1	2	0	-	1700	2650		-	2300	2900	-	-	(1) - 3000	(2) - 2800	-
(ix) 0	2	0	1	-	1700	-	750	-	2300	-	750	-	(1) - 3000 (1) - 1400	-	(1) - 750
(x) 0	0	2	1	-	-	2650	750	-	-	2900	750	-	-	(1) - 3200 (1) - 2800	(1) - 750
(xi) 1	1	1	0	850	1700	2650	-	1000	2300	2900	-	(1) - 1600	(1) - 1400	(1) - 2800	-
(xii) 1	1	0	1	850	1700	-	750	1000	2300	-	750	(1) - 1600	(1) - 1400	-	(1) - 750
(xiii) 1	0	1	1	850	-	2650	750	1000	-	2900	750	(1) - 1600	-	(1) - 2800	(1) - 750
(xiv) 0	1	1	1	-	1700	2650	750	-	2300	2900	750	-	(1) - 3000	(1) - 2800	(1) - 750

(2) At least two engines must be below the cyclic limits listed under Rule 2b in Table 4 of this AD.

(3) At least one engine must be below the cyclic limits listed under Rule 2c in Table 4 of this AD. When applying Rule 2c of this AD, and two limits are shown for an engine configuration, the higher cyclic limit for that configuration must be applied only to the engine with the highest CSO or CSN of that configuration. The lower limit is then applied to the remaining engines of that configuration.

Engines installed on Boeing 767, Airbus A300, or Airbus A310 Airplanes

(e) Within 50 CIS after the effective date of this AD, and thereafter, for engines installed on Boeing 767 Series, Airbus A300 series or Airbus A310 series airplanes, configure the airplane so that no more than one engine may exceed the cyclic limits listed in the following Table 5 of this AD:

Table 5. HPC CSO or CSN Cyclic Limits by Engine Configuration for Twin-Engine Airplane

Engine Model	Engine Serial Number (SN)	Engine Configuration (CSO or CSN)			
		A	**B**	**C**	**D**
(1) PW4152	All	2,500	4,000	6,600	750
(2) PW4156, PW4156A, and PW4158.	717205, 717702, 717703, 717710, 717752, 717788, 717798, 717799, 724023, 724026, 724027, 724033, 724034, 724036, 724037, 724040, 724041, 724044, 724045, 724048, 724049, 724050, 724052, 724055, 724056, 724059, 724061, 724062, 724063, 724065, 724067, 724073, 724074, 724075, 724079, 724094, 724095, 724551, 724552, 724555, 724556, 724557, 724558, 724561, 724562, 724563, 724564, 724567, 724568, 724569, 724570, 724571, 724572, 724573, 724574, 724575, 724576, 724578, 724640, 724806, 724807, 724808, 724809, 724811, 724820, 724821, 724827, 724833, 724835, 724836, 724840, 724841, 724848, 724849, 724855, 724857, 724858, 724861, 724862, 724865, 724866, 724868, 724909, 724910, 724913, 724914, 724924, 724925, 724926, 724927, 727912, 728519, 728520, 728521, 728522, 728523, 728524, 728525, 728526, 728527, 728528, 728534, 728535, 728536, 728537, 728538, 728539, 728540, 728541, 728542, 728543, 728544, 728545, 728546, 728547, 728548, 728549, 728550, 728551, 728552, 728553, 728554, 728557, 728558, 728559, 728560, 728561, 728562, 728563, 728564	2,000	3,200	6,600	750

13

(3) PW4158.	717704, 724001, 724002, 724004, 724005, 724006, 724007, 724008, 724009, 724010, 724011, 724019, 724020, 724031, 724035, 724038, 724039, 724042, 724043, 724047, 724068, 724069, 724071, 724076, 724077, 724080, 724085, 724086, 724087, 724092, 724093, 724096, 724097, 724801, 724802, 724803, 724804, 724805, 724813, 724814, 724819, 724823, 724824, 724825, 724826, 724828, 724831, 724832, 724843, 724846, 724847, 724851, 724852, 724853, 724854, 724859, 724860, 724863, 724864, 724867, 724869, 724870, 724871, 724872, 724873, 724874, 724875, 724876, 724880, 724881, 724882, 724883, 724884, 724885, 724886, 724887, 724888, 724889, 724890, 724892, 724893, 724894, 724895, 724896, 724897, 724898, 724899, 724900, 724932, 727315, 727436, 728501, 728502, 728503, 728504, 728505, 728506, 728507, 728508, 728509, 728510, 728511, 728515, 728518, 728531, 728532, 728533	4,300	5,600	6,600	750
(4) PW4156, PW4156A, and PW4158.	All others not listed by SN in this Table.	1,050	1,600	6,600	750
PW4052.	All engines.	3,000	4,400	4,400	750
PW4056.	All engines.	1,800	3,000	3,000	750
PW4060, PW4060A, PW4060C, and PW4062.	All engines	1,100	2,300	3,000	750

Minimum Build Standard

(f) After the effective date of this AD, do not install an engine with HPC and HPT modules where the CSO of the HPC is 1,500 cycles or more greater than the CSO of the HPT.

(g) After the effective date of this AD, any engine that undergoes an HPC overhaul must meet the build standard of the following PW SB's: PW4ENG 72-484, PW4ENG 72-486, PW4ENG 72-514, and PW4ENG 72-575. Engines that incorporate the Phase 3 configuration meet the build standard defined by PW SB PW4ENG 72-514.

(h) After the effective date of this AD, any engine that undergoes separation of the HPC and HPT modules after the effective date of this AD, must meet the build standard of PW SB PW4ENG 72-514. Engines that incorporate the Phase 3 configuration meet the build standard defined by PW SB PW4ENG 72-514.

(i) Within 100 CIS after the effective date of this AD, and thereafter, limit the number of engines with configuration D from Table 1 of this AD to one on each airplane.

(j) When a thrust rating change has been made by using the Electronic Engine Control (EEC) programming plug in the affected HPC overhaul period, the cyclic limits associated with the highest thrust rating must be utilized.

Definitions

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

(1) HPC Overhaul – 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.

14

(2) HPT Overhaul – an HPT overhaul is defined as restoration of the HPT module stage 1 and 2 HPT blade tip clearances to the applicable fits and clearances section of the engine manual.

(3) 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 (-3C) suffix after the engine model number if the engine was converted using PW SB's PW4ENG 72-490, PW4ENG 72-504, or PW4ENG 72-572 after original manufacture.

Alternative Methods of Compliance

(l) 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 shall submit their requests through an appropriate FAA 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 airworthiness directive, if any, may be obtained from the ECO.

Special Flight Permits

(m) 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 accomplished.

Effective Date

(n) This amendment becomes effective August 10, 2001.

Issued in Burlington, Massachusetts on July 17, 2001.
Francis A. Favara,
Acting Manager, Engine and Propeller Directorate, Aircraft Certification Service.