
AIRWORTHINESS DIRECTIVE

On the effective date specified below, and for the reasons set out in the background section, the CASA delegate whose signature appears below revokes Airworthiness Directive (AD) AD/TPE 331/62 and issues the following AD under subregulation 39.001(1) of CASR 1998. The AD requires that the action set out in the requirement section (being action that the delegate considers necessary to correct the unsafe condition) be taken in relation to the aircraft or aeronautical product mentioned in the applicability section: (a) in the circumstances mentioned in the requirement section; and (b) in accordance with the instructions set out in the requirement section; and (c) at the time mentioned in the compliance section.

AlliedSignal (Garrett/AiResearch) Turbine Engines - TPE 331 Series**AD/TPE 331/62
Amdt 1****Reduction Gear and Shaft Assembly****8/2005**

Applicability: Honeywell International Inc. TPE331-11U, -12B, -12JR, -12UA, -12UAR, and -12UHR series turboprop engines.

Note 1: These engines are installed on, but not limited to, Fairchild SA227 series (Metro), CASA 212 and Jetstream 3201 series aeroplanes.

- Requirement:**
1. Except for the TPE331-12JR engine series, submit Spectrometric Oil Analysis Program (SOAP) samples of the oil and filter to Honeywell approved labs in accordance with Paragraph 2. A. (1) of the Accomplishment Instructions of Honeywell International Inc. Alert Service Bulletin (ASB) TPE331-A79-0034 Revision 3 dated 3 October 2001 or Revision 4 dated 5 April 2002.
 2. If either of the following conditions occur, make the necessary repairs in accordance with Paragraph 2.A.(3)(b)1 or 2.A.(3) of the Accomplishment Instructions of Honeywell International Inc. ASB TPE331-A79-0034 Revision 3, or Revision 4, from the unacceptable sample analysis or trend assessment:
 - (a) If the SOAP test lab sample is determined to be unacceptable in accordance with Paragraph 2.A.(2)(b)1 in the Accomplishment Instructions of Honeywell International Inc. ASB TPE331-A79-0034 Revision 3 or Revision 4 or
 - (b) If Honeywell's supplementary trend assessment is unacceptable in accordance with Paragraph 2.A.(3) in the Accomplishment Instructions of Honeywell International Inc. ASB TPE331-A79-0034 Revision 3 or Revision 4.

TPE331-12UA, -12UAR, and -12UHR Engines

3. (a) Initial inspection and replacement.

Inspect, replace, and if necessary, rework of specified gearbox components in accordance with:

Paragraphs 2.A. (2) through 2.A. (11) of the Accomplishment Instructions of Honeywell International Inc. ASB TPE331-A72-2087, Revision 1, dated 16 November 2001 or ASB TPE331-A72-2087, dated 10 October 2001.

AlliedSignal (Garrett/AiResearch) Turbine Engines - TPE 331 Series

AD/TPE 331/62 Amdt 1 (continued)

Paragraphs 2.A. (2) through 2.A. (8) of the Accomplishment Instructions of Honeywell International Inc. SB TPE331-72-2090RWK, dated 10 October 2001.

Paragraphs 2.A. (2) through 2.D. (4) of the Accomplishment Instructions of Honeywell International Inc. SB TPE331-72-2091RWK, dated 10 October 2001.

3. (b) Repetitive inspection and replacement.
 - (i) Inspect for wear and replace gearbox components and comply with limitations on interchangeability in accordance with Paragraphs 2.B. and 2.C. (2) through 2.C. (13) of the Accomplishment Instructions of Honeywell International Inc. ASB TPE331-A72-2087, Revision 1, or ASB TPE331-A72-2087, original issue.
 - (ii) Comply with limitations on interchangeability in accordance with Paragraph 2.B. of the Accomplishment Instructions of Honeywell International Inc. ASB TPE331-A72-2087, Revision 1, or ASB TPE331-A72-2087, original issue.
 - (iii) Comply with limitations on interchangeability and inspect for wear in accordance with Paragraphs 2.B. and 2.D. of the Accomplishment Instructions of Honeywell International Inc. ASB TPE331-A72-2087, Revision 1, or ASB TPE331-A72-2087, original issue.

Alternative Means of Compliance and Terminating Action for TPE331-12UA, -12UAR, and -12UHR Engines.

Honeywell SB TPE331-A72-2114 is approved as a time extension and an alternative method of compliance with the requirements detailed in Requirement 3 of this Directive. Installation of Intermediate housing and Gear (Diaphragm) Assembly, Part No. 3107191-4 or 3102593-12, in compliance with Paragraph 2.A of Honeywell SB TPE331-A72-2114 constitutes terminating action for Requirements 1, 2 and 3 of this Directive.

TPE331-12B Engines

4. (a) Initial inspection and replacement.

Inspect, replace, and if necessary, rework specified gearbox components in accordance with:

Paragraphs 2.A. (2) through 2.A. (11) of the Accomplishment Instructions of Honeywell International Inc. ASB TPE331-A72-2092, Revision 2, dated 5 May 2003, Revision 1 dated 16 November 2001 or original issue dated 10 October 2001.

AlliedSignal (Garrett/AiResearch) Turbine Engines - TPE 331 Series

AD/TPE 331/62 Amdt 1 (continued)

Paragraphs 2.A. (2) through 2.A. (8) of the Accomplishment Instructions of Honeywell International Inc. SB TPE331-72-2094RWK, dated 10 October 2001.

Paragraphs 2.A. (2) through 2.C. (4) of the Accomplishment Instructions of Honeywell International Inc. SB TPE331-72-2095RWK, dated 10 October 2001.

4. (b) Repetitive inspection and replacement.
 - (i) Inspect for wear and replace gearbox components and comply with limitations on interchangeability in accordance with Paragraphs 2.B. and 2.C. (2) through 2.C. (13) of the Accomplishment Instructions of Honeywell International Inc. ASB TPE331-A72-2092, Revision 2, Revision 1 or original issue.
 - (ii) Comply with limitations on interchangeability in accordance with Paragraph 2.B. of the Accomplishment Instructions of Honeywell International Inc. ASB TPE331-A72-2092, Revision 2, Revision 1 or original issue.
 - (iii) Comply with limitations on interchangeability and inspect for wear in accordance with Paragraphs 2.B. and 2.D. of the Accomplishment Instructions of Honeywell International Inc. ASB TPE331-A72-2092, Revision 2, Revision 1 or original issue.

TPE331-11U Engines With Bull Gear P/N 3107161-1

5. (a) Initial inspection and replacement.

Inspect, replace and if necessary, rework specified gearbox components in accordance with:

Paragraphs 2.A. (2) through 2.A. (11) of the Accomplishment Instructions of Honeywell International Inc. ASB TPE331-A72-2088, Revision 2, dated 20 February 2002, Revision 1, dated 16 November 2001, or original, dated 10 October 2001.

Paragraphs 2.A. (2) through 2.A. (8) of the Accomplishment Instructions of Honeywell International Inc. SB TPE331-72-2090RWK, dated 10 October 2001.

Paragraphs 2.A. (2) through 2.D. (4) of the Accomplishment Instructions of Honeywell International Inc. SB TPE331-72-2091RWK, dated 10 October 2001.

AlliedSignal (Garrett/AiResearch) Turbine Engines - TPE 331 Series

AD/TPE 331/62 Amdt 1 (continued)

5. (b) Repetitive inspection and replacement.
 - (i) Inspect for wear and replace gearbox components and comply with limitations on interchangeability in accordance with Paragraphs 2.B. and C. (2) through C. (13) of the Accomplishment Instructions of Honeywell International Inc. ASB TPE331-A72-2088, Revision 2, Revision 1 or original issue.
 - (ii) Comply with limitations on interchangeability in accordance with Paragraph 2.B. of the Accomplishment Instructions of Honeywell International Inc. ASB TPE331-A72-2088, Revision 2, Revision 1 or original issue.
 - (iii) Comply with limitations on interchangeability and inspect for wear in accordance with Paragraphs 2.B. and 2.D. of the Accomplishment Instructions of Honeywell International Inc. ASB TPE331-A72-2088, Revision 2, Revision 1 or original issue.

All Other TPE331-11U Engines Without Bull Gear P/N 3107161-1

6. (a) Initial inspection and replacement.

Inspect, replace, and if necessary, rework specified gearbox components in accordance with:

Paragraphs 2.A. (2) through 2.A. (11) of the Accomplishment Instructions of Honeywell International Inc. ASB TPE331-A72-2088, Revision 2, Revision 1 or original issue.

Paragraphs 2.A. (2) through 2.A. (8) of the Accomplishment Instructions of Honeywell International Inc. SB TPE331-72-2090RWK.

Paragraphs 2.A. (2) through 2.D. (4) of the Accomplishment Instructions of Honeywell International Inc. SB TPE331-72-2091RWK.

6. (b) Repetitive inspection and replacement.
 - (i) Inspect for wear and replace gearbox components and comply with limitations on interchangeability in accordance with Paragraphs 2.B. and 2.C. (2) through 2.C. (13) of the Accomplishment Instructions of Honeywell International Inc. ASB TPE331-A72-2088, Revision 2, Revision 1 or original issue.
 - (ii) Comply with limitations on interchangeability in accordance with Paragraph 2.B. of the Accomplishment Instructions of Honeywell International Inc. ASB TPE331-A72-2088, Revision 2, Revision 1 or original issue.

AlliedSignal (Garrett/AiResearch) Turbine Engines - TPE 331 Series

AD/TPE 331/62 Amdt 1 (continued)

- (iii) Comply with limitations on interchangeability and inspect for wear in accordance with Paragraphs 2.B. and 2.D. of the Accomplishment Instructions of Honeywell International Inc. ASB TPE331-A72-2088, Revision 2, Revision 1 or original issue.

Alternative Means of Compliance and Terminating Action for TPE331-11U Engines With Bull Gear P/N 3107161-1 and All Other TPE331-11U Engines Without Bull Gear P/N 3107161-1.

Honeywell SB TPE331-A72-2115 is approved as a time extension and an alternative method of compliance with the requirements detailed in Requirements 5 and 6 of this Directive. Installation of Intermediate housing and Gear (Diaphragm) Assembly, Part No. 3107191-1 through -5 or 3102593-12, in compliance with Paragraph 2.A of Honeywell SB TPE331-A72-2114 constitutes terminating action for Requirements 1, 2, 5 and 6 of this Directive.

TPE331-12JR Engines

- 7. (a) Initial inspection and replacement.

Inspect, replace, and if necessary, rework specified gearbox components in accordance with:

Paragraphs 2.A. (2) through 2.A. (11) of the Accomplishment Instructions of Honeywell International Inc. ASB TPE331-A72-2093, Revision 2, dated September 17 2003, Revision 1, dated 16 November 2001 or original issue dated 10 October 2001.

Paragraphs 2.A. (2) through 2.A. (8) of the Accomplishment Instructions of Honeywell International Inc. SB TPE331-72-2090RWK.

Paragraphs 2.A. (2) through 2.D. (4) of the Accomplishment Instructions of Honeywell International Inc. SB TPE331-72-2091RWK.

- 7. (b) Repetitive inspection and replacement

- (i) Inspect for wear and replace gearbox components and comply with limitations on interchangeability in accordance with Paragraphs 2.B. and 2.C. (2) through C. (13) of the Accomplishment Instructions of Honeywell International Inc. ASB TPE331-A72-2093, Revision 2, Revision 1 or original issue.
- (ii) Comply with limitations on interchangeability in accordance with Paragraph 2.B. of the Accomplishment Instructions of Honeywell International Inc. ASB TPE331-A72-2093, Revision 2, Revision 1 or original issue.

AlliedSignal (Garrett/AiResearch) Turbine Engines - TPE 331 Series

AD/TPE 331/62 Amdt 1 (continued)

- (iii) Comply with limitations on interchangeability and inspect for wear in accordance with Paragraphs 2.B. and 2.D. of the Accomplishment Instructions of Honeywell International Inc. ASB TPE331-A72-2093 Revision 1, or ASB TPE331-A72-2093, original issue.

Alternative Means of Compliance and Terminating Action for TPE331-12JR Engines.

Honeywell SB TPE331-A72-2116 is approved as a time extension and an alternative method of compliance with the requirements detailed in Requirement 7 of this Directive. Installation of Intermediate housing and Gear (Diaphragm) Assembly, Part No. 3107191-7 or 3102593-13, in compliance with Paragraph 2.A of Honeywell SB TPE331-A72-2116 constitutes terminating action for Requirements 7 of this Directive.

Note 2: FAA AD 2002-12-09 Amdt 39-12781 refers.

Compliance: Requirement 1: At 80 to 120 hours time-in-service (TIS) after the effective date of this Directive and at 80 to 120 hour TIS intervals thereafter.

Requirement 2: Within 50 hours TIS after receiving the results from the unacceptable sample analysis or trend assessment.

TPE331-12UA, -12UAR, and -12UHR Engines

Requirement 3(a): Unless previously accomplished; At the next turbine (hot) section inspection, gearbox inspection, engine overhaul, or when the gearbox diaphragm module is out of the engine, whichever occurs first, after the effective date of this Directive.

Requirement 3(b)(i): At intervals not to exceed 3,600 hours TIS since the last replacement of the bull gear, part number (P/N) 3108295-1, and the HSP, P/N 3101741-2, or since the last overhaul of the diaphragm matched housing set, whichever occurs first.

Requirement 3(b)(ii): Whenever certain gearbox parts, identified in Paragraph 2.B. of ASB TPE331-A72-2087, are removed from the engine following compliance with Requirement 3(a) or 3(b)(i) of this Directive.

Requirement 3(b)(iii): Whenever the engine is removed from the aircraft and disassembled to the extent that the diaphragm module is accessed after 500 hours TIS following compliance with Requirement 3(a) or 3(b)(i) of this Directive.

TPE331-12B Engines

Requirement 4(a): Unless previously accomplished; At the next engine overhaul or when the bull gear first requires replacement, whichever occurs first, after the effective date of this Directive.

AlliedSignal (Garrett/AiResearch) Turbine Engines - TPE 331 Series

AD/TPE 331/62 Amdt 1 (continued)

Requirement 4(b)(i): At intervals not to exceed 3,100 hours TIS since the last replacement of the bull gear, P/N 3108296-1, and the HSP, P/N 3101741-4, or since the last overhaul of the diaphragm matched housing set, whichever occurs first.

Requirement 4(b)(ii): Whenever certain gearbox parts, identified in Paragraph 2.B. of ASB TPE331-A72-2092, are removed from the engine following compliance with Requirement 4(a) or 4(b)(i) of this Directive.

Requirement 4(b)(iii): Whenever the engine is removed from the aircraft and disassembled to the extent that the diaphragm module is accessed after 500 hours TIS following compliance with Requirement 4(a) or 4(b)(i) of this Directive.

TPE331-11U Engines With Bull Gear P/N 3107161-1

Requirement 5(a): Unless previously accomplished; At the next hot section inspection, gearbox inspection, engine overhaul, or when the gearbox diaphragm module is out of the engine, whichever occurs first after the effective date of this Directive.

Requirement 5(b)(i): At intervals not to exceed 9,000 hours time-in-service (TIS) since the last replacement of the bull gear, P/N 3108295-1, and the HSP, P/N 3101741-2, or since the last overhaul of the diaphragm matched housing set, whichever occurs first.

Requirement 5(b)(ii): Whenever certain gearbox parts, identified in Paragraph 2.B. of ASB TPE331-A72-2088, are removed from the engine following compliance with Requirement 5(a) or 5(b)(i) of this Directive.

Requirement 5(b)(iii): Whenever the engine is removed from the aircraft and disassembled to the extent that the diaphragm module is accessed after 500 hours TIS following compliance with Requirement 5(a) or 5(b)(i) of this Directive.

All Other TPE331-11U Engines Without Bull Gear P/N 3107161-1

Requirement 6(a): Unless previously accomplished; At the next gearbox inspection, engine overhaul, or when the gearbox diaphragm module is out of the engine, whichever occurs first after the effective date of this Directive.

Requirement 6(a)(i): At intervals not to exceed 9,000 hours TIS since the last replacement of the bull gear, P/N 3108295-1, and the HSP, P/N 3101741-2, or since the last overhaul of the diaphragm matched housing set, whichever occurs first.

Requirement 6(a)(ii): Whenever certain gearbox parts, identified in Paragraph 2.B. of ASB TPE331-A72-2088, are removed from the engine following compliance with Requirement 6(a) or 6(b)(i) of this Directive.

AlliedSignal (Garrett/AiResearch) Turbine Engines - TPE 331 Series

AD/TPE 331/62 Amdt 1 (continued)

Requirement 6(a)(iii): Whenever the engine is removed from the aircraft and disassembled to the extent that the diaphragm module is accessed after 500 hours TIS following compliance with Requirement 6(a) or 6(b)(i) of this Directive.

TPE331-12JR Engines

Requirement 7(a): At the next gearbox inspection, engine overhaul, or when the bull gear requires replacement, whichever occurs first.

Requirement 7(b)(i): At intervals not to exceed 5,100 hours TIS since the last replacement of the bull gear, P/N 3108295-1, and the HSP, P/N 3101741-2, or since the last overhaul of the diaphragm matched housing set, whichever occurs first.

Requirement 7(b)(ii): Whenever certain gearbox parts, identified in Paragraph 2.B. of ASB TPE331-A72-2093, are removed from the engine following compliance with Requirement 7(a) or 7(b)(i) of this Directive.

Requirement 7(b)(iii): Whenever the engine is removed from the aircraft and disassembled to the extent that the diaphragm module is accessed after 500 hours TIS following compliance with Requirement 7(a) or 7(b)(i) of this Directive.

This Amendment becomes effective on 4 August 2005.

Background: This Directive supersedes AD/TPE 331/55 Amdt 3, AD/TPE 331/57 Amdt 1 and AD/TPE 331/58 Amdt 2. Those Directives were in response to failure of reduction gears in TPE 331 -11 and -12 model engines. Those Directives required certain parts to be replaced and inspection of the affected parts to prevent further failures from occurring.

Since mandating the requirements of the above mentioned Directives there have been further failures involving engines, both locally and overseas. In response to those failures the manufacturer has released a new bull gear, high-speed pinion and diaphragm assembly that have been designed to address the current problems.

This Directive also provides an alternative to mandatory requirements by approving the use of the manufacturers referenced service bulletins as an alternative to both the compliance times given and the requirement to replace certain parts with other parts for certain model engines. The fitment of the new designed parts will provide terminating action for the repetitive inspections detailed in this Directive.

Amendment 1 includes an alternative means of compliance for TPE 331-12JR engines. There have been no other changes to the requirements for other models of the TPE 331 engines listed in this Directive.

AlliedSignal (Garrett/AiResearch) Turbine Engines - TPE 331 Series

AD/TPE 331/62 Amdt 1 (continued)

The original issue of this Directive became effective 25 November 2004.

A handwritten signature in black ink, appearing to read 'James Coyne', with a stylized flourish at the end.

James Coyne
Delegate of the Civil Aviation Safety Authority

24 June 2005