LUFTFARTSVERKET
Luftfartsinspektionen

LUFTVÄRDIGHETSDIREKTIV (LVD)

D. Motor
Teledyne
Continental
LVD Nr 2544 R1
Upphäver LVD 2544

Sektion 2. Utlandstillverkad flygmateriel

TITEL: **Sprickkontroll av ventilernas vipparmsfästen**

GÄLLER: Teledyne Continental Motors (TCM) modell C75, C85, C90, C125C, C145, O-200, O-300 och GO-300 motorer installerade i flygplan angivna i bifogad kopia av FAA AD 94-05-05 R1.

ÅTGÄRD: Utför åtgärder angivna i FAA AD 94-05-05 R1.

TID FÖR ÅTGÄRD: Vid nästa cylinderdemontering- eller motoröversyn, vilket som först inträffar och därefter vid varje översyn räknat från detta LVD's utgivningsdatum.

UNDERLAG: FAA AD 94-05-05 R1 och tillämpbara översynsmanualer.

REFERENS: FAA AD 94-05-05 R1.

UTGIVNINGS-DATUM: 1996-02-20

LFS: 1996:19

Åtgärd enligt LVD utgör nödvändig förutsättning för ifrågavarende flygmateriels luftvärdighet. Referens BCL M 1.11. Anteckning om åtgärd, som vidtagits i enlighet med LVD, skall införas i teknisk journal för berörd flygmateriel med hänvisning till ifrågavarande LVD-nummer. Angivet underlag refererar till senaste gällande revision/utgåva. LVD utges i luftfartsverkets författningssamlingar LFS.

L 1563-1

Postadress	Gatuadress	Telefon nr	Telegram	Telex
		Nat 011 - 19 20 00	Civilair	
601 79 NORRKÖPING	Vikboplan 11	Int +46 11 - 19 20 00	Norrköping	64250

REVISED AIRWORTHINESS DIRECTIVE

REGULATORY SUPPORT DIVISION
P.O. BOX 26460
OKLAHOMA CITY, OKLAHOMA 73125-0460

U.S. Department
of Transportation
Federal Aviation
Administration

The following Airworthiness Directive issued by the Federal Aviation Administration in accordance with the provisions of Federal Aviation Regulations, 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 FAR Subpart 39.3).

Revision issued January 1996.

94-05-05 R1 Teledyne Continental Engines and Rolls-Royce, plc: Amendment 39-9490. Docket 92-ANE-32. Revises AD 94-05-05, Amendment 39-8843.

Applicability: Teledyne Continental Motors (TCM) Model C75, C85, C90, €125, C145, O-200, O-300, and GO-300 series and Rolls-Royce, plc (R-R) C90, O-200 and O-300 series reciprocating engines, installed on but not limited to American Champion models 7BCM, 7CCM, 7DC, S7DC, S7CCM, 7EC, S7EC, 7FC, 7JC, and 7ECA; Cessna Models 120, 140, 150, 170, 172, 172A-H, and 175; Luscombe Models 8E, 8F, and T-8F; Maule Models Bee Dee M-4, M-4, M-4C, M-4S, M-4T, M-4-210, M-4-210C, M-4-210S, M-4-210T, and M-5-210C; Piper Models PA-18 and PA-19; Reims Aviation SA Models F172D, E, F, G, H, K; F150G, H, J, K, L, M; FA150K, L; FRA150L; Swift Models GC-1A and GC-1B; Univair (Erco) Models 415-D, E, and G; Univair (Forney) Models F-1 and F-1A; Univair (Alon) Model A-2 and Univair (Mooney) Model M-10 aircraft.

NOTE: This airworthiness directive (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 use the authority provided in paragraph (d) to request approval from the Federal Aviation Administration (FAA). This approval may address either no action, if the current configuration eliminates the unsafe condition, or different actions necessary to address the unsafe condition described in this AD. Such a request should include an assessment of the effect of the changed configuration on the unsafe condition addressed by this AD. In no case does the presence of any modification, alteration, or repair remove any engine from the applicability of this AD.

Compliance: Required as indicated, unless accomplished previously.

To prevent engine power loss and engine failure, accomplish the following:

(a) At the next cylinder removal from the engine, or engine overhaul, whichever occurs first, after the effective date of this AD, inspect the cylinder rocker shaft bosses for cracks using one of the following methods, and if cracked replace with a serviceable cylinder:

NOTE: Certain cylinder cracks may be repaired by FAA-approved repair stations specifically rated to do those repairs.

(1) Fluorescent penetrant inspection, as follows:

(i) The penetrant shall be a nontoxic, noncorrosive, highly fluorescent liquid capable of penetrating fine discontinuities and, for aluminum castings, conforming to Aerospace Material Specification (AMS) 3156. If a darkened enclosure is not used for examination, AMS 3157 penetrant shall be used.

(ii) The emulsifier shall be composed of suitable oil or oil-like components together with such additives as are necessary to provide a stable, nontoxic, noncorrosive, oil-miscible, oil-emulsifying solution. Emulsifier shall not be used when AMS 3156 is used.

(iii) The developer shall be a highly absorbent, nonfluorescent and nontoxic powder, capable of being used dry or a similar powder capable of being suspended in water. When the suspension is used, the powder shall be thoroughly mixed with water to a concentration, unless otherwise permitted, of not less than 0.2 lb per gallon and a uniform distribution maintained by mechanical agitation.

(iv) The penetrant, the emulsifier (if used) and the developer shall be checked as often as necessary to maintain proper control. The penetrant shall be discarded if it shows a noticeable loss in penetrating power or marked contamination or when wax begins to form on the sides of the tank and dip basket.

(v) A darkness booth or a similar darkness area with a filtered black light shall be provided. The black light shall be at least equal to that produced by a 100 watt mercury vapor projection spot lamp equipped with a filter to transmit wave lengths of between 3200 and 4000 Angstrom units and absorb substantially all visible light. The intensity of the light at normal working distance shall be as specified by the purchaser but in no case shall be lower than 580 micro-watts per square centimeter as measured with an appropriate black light meter.

(vi) All parts shall be cleaned and dried in such a manner as to leave them free from grease, oil, soaps, alkalis and other substances which would interfere with inspection. Vapor degreasing is generally suitable for this purpose.

(vii) Parts shall be immersed in the penetrant or shall be sprayed or brushed with the penetrant and shall be allowed to remain immersed in the penetrant or to stand for sufficient time to allow satisfactory penetration into all discontinuities. This time shall, unless otherwise specified, not be less than 5 minutes. The time for immersion or standing will depend upon the character and fineness of the discontinuities, the effectiveness of penetration increasing with time. Parts may be resprayed or re-immersed after standing to increase sensitivity and aid in removal of penetrant.

(viii) Parts shall be removed from the penetrant and cleaned thoroughly using a medium which will remove penetrant from the surface of parts; washing with water shall be used when the penetrant is water washable or when an emulsifying agent is applied to surfaces of parts to render the penetrant water washable. When emulsifiers are used, the parts shall be dipped in the emulsifier and removed slowly for draining or shall be sprayed with emulsifier and drained. Unless otherwise specified, the combined dipping and draining time shall be 1 to 5 minutes. When other than water washable penetrants are used, the penetrant shall be removed with a suitable cleaner or a suitable cleaner and lint-free cloths. During cleaning, the parts may be viewed under a suitable black light to ensure removal of the penetrant from the surface of the part. Excessive cleaning which would remove the penetrant from discontinuities shall be avoided.

(ix) When a wet developer is used, the developer shall be applied to the parts, immediately after washing, by immersing the parts in the tank containing the water-suspended powder or by spraying or flowing the suspension onto the parts. The suspension shall be suitably agitated either during or immediately prior to application to parts. Immersed parts shall be removed from the wet developer; excess developer shall be allowed to drain off all parts. Special care shall be taken to remove excess developer from pockets, recesses, holes, threads, and corners so that the developer will not mask indications.

(x) When a dry developer or no developer is used, the parts shall be dried as thoroughly as possible by exposure to clean air. Drying of parts may be accomplished by evaporation at room temperature or by placing the parts in a circulating warm air oven or in the air stream of a hot air dryer. Excessive drying time or part temperatures higher than 80°C (180°F) should be avoided to prevent evaporation of the penetrant.

(xi) When a dry developer is used, the developing powder shall be applied uniformly over the areas of the parts to be inspected by either dusting or powder-box immersion.

(xii) After sufficient time has been allowed to develop indications, parts shall be examined under a black light. Examination shall be made in a darkened enclosure unless AMS 3157 penetrant is used, in which case examination may be made under normal shop lighting but shaded from direct sunlight.

(xiii) When greater sensitivity is desired, the parts may be heated to 65°-85°C (150°-185°F) before immersion in the penetrant and/or before black light examination. To prevent evaporation, preheated parts shall remain fully immersed in the penetrant until cooled.

(xiv) Parts shall be cleaned, as necessary, to remove penetrant and developer.

(xv) Interpretation of the indications revealed by this inspection procedure and final disposition of the parts shall be the responsibility of only qualified personnel having experience with fluorescent penetrant inspection.

(xvi) Parts having discontinuities (cracks) shall be rejected.

(2) Dye penetrant inspection, as follows:

NOTE: Military Specification MIL-I-6866 and American Society of Testing Materials specifications ASTM E1417-93 and E165-9 contain additional information on dye penetrant inspection processes.

(i) **Preparation**: clean and dry all parts in such a manner as to leave the surfaces free from grease, oil, soaps, alkalis, and other substances which would interfere with inspection. Vapor degreasing is generally suitable for this purpose.

(ii) **Penetrant Application Procedure**: after preparation, spray or brush the parts with the penetrant, and allow to stand for not less than 5 minutes. The effectiveness of the penetrant increases if left standing for a longer time, as the penetrant will reach finer discontinuities.

(iii) **Penetrant Cleaning**: clean the parts thoroughly using a medium which will remove penetrant from the surfaces of parts; wash with water when the penetrant is water soluble. When other than water soluble penetrants are used, the penetrant shall be removed with a suitable cleaner. Avoid excessive cleaning which would remove the penetrant from discontinuities.

(iv) **Drying**: dry the parts as thoroughly as possible. Drying of parts may be accomplished by evaporation at room temperature or by placing the parts in a circulating warm air oven or in the air stream of a hot air dryer. Avoid excessive drying time or drying temperatures above 75°C (165°F) to prevent excessive evaporation of the penetrant. If heat is used for drying parts, cool parts to approximately 50°C (120°F) before proceeding to the developing procedure.

(v) **Developing**: apply the developer to the dry parts as lightly and as evenly as possible, using as thin a coating of developer as is possible. A translucent film is adequate. Mix wet developer by agitation immediately prior to applying it. After applying the developer, take care that no penetrant indication is disturbed or obliterated in subsequent handling.

(vi) **Examination**: examine the developed penetrant indications in accordance with the dye penetrant manufacturer's instructions. Examine parts for indications of discontinuities open to the surface.

(vii) **Final cleaning**: clean the parts following the inspection to remove penetrant and developer.

NOTE 1: **Caution**: because of differences among penetrants, take care to ensure that the final cleaner, the penetrant, the penetrant remover, and the developer are suitable for use with each other.

NOTE 2: **Caution**: all penetrant materials should be kept as free from moisture as possible.

NOTE 3: **Caution**: most penetrants, cleaning agents, and developer suspensions are low flash point material; use caution to prevent fires.

(3) Etching inspection, as follows:

(i) For TCM C75, C85, C90, O-200 and R-R C90 and O-200 series engines, in accordance with paragraph 13-7 of TCM Overhaul Manual Form X-30010, dated January 1984.

(ii) For TCM C125, C145, O-300, GO-300 and R-R O-300 series engines, in accordance with paragraphs 5(b)(1), 5(b)(2), and 5(b)(3) of TCM Overhaul Manual Form X-30013, dated June 1982.

(b) At the next cylinder removal from the engine, or engine overhaul, whichever occurs first, after the effective date of this AD, dimensionally inspect cylinders for looseness of the rocker shaft in accordance with page 22, paragraph 5, and Table IX of TCM Overhaul Manual Form X-30013, dated June 1982, for TCM C125, C145, O-300, GO-300 and R-R O-300 series engines, and the dimensions table in paragraph 13-8 of TCM Overhaul Manual Form X-30010, dated January 1984, for TCM C75, C85, C90, O-200 and R-R C90 and O-200 series engines; as applicable.

(1) Cylinders that do not exhibit dimensional looseness of the rocker shaft beyond the limits specified in the applicable TCM overhaul manual may be returned to service.

(2) For cylinders that exhibit dimensional looseness of the rocker shaft, beyond the limits specified in the applicable TCM overhaul manual, accomplish the following:

(i) Replace with a serviceable cylinder; or

(ii) Install bushings in accordance with the instructions on page 27 of TCM Overhaul Manual, Form X-30013, dated June 1982, for TCM C125, C145, O-300, GO-300 and R-R O-300 series engines; or the instructions on page 85 of TCM Overhaul Manual Form X-30010, dated January 1984, for TCM models C75, C85, C90, O-200 and RR C90 and O-200 series engines, as applicable.

(iii) After repairing a cylinder perform an additional inspection of the cylinder rocker shaft bosses for cracks using fluorescent penetrant, dye penetrant, or etching methods, and replace, if necessary, with a serviceable cylinder.

(c) Thereafter, at each subsequent cylinder or engine overhaul, reinspect cylinder rocker bosses and rocker shafts in accordance with paragraphs (a) and (b) of this AD.

(d) An alternative method of compliance or adjustment of the initial compliance time that provides an acceptable level of safety may be used if approved by the Manager, Atlanta Aircraft Certification Office. The request should be forwarded through an appropriate FAA Maintenance Inspector, who may add comments and then send it to the Manager, Atlanta Aircraft Certification Office.

NOTE: Information concerning the existence of approved alternative methods of compliance with this AD, if any, may be obtained from the Atlanta Aircraft Certification Office.

(e) 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 aircraft to a location where the requirements of this AD can be accomplished.

(f) This amendment becomes effective on February 13, 1996.

FOR FURTHER INFORMATION CONTACT:

Jerry Robinette, Aerospace Engineer, Atlanta Certification Office, FAA, Small Airplane Directorate, Campus Building, 1701 Columbia Avenue, Suite 2-160, College Park, GA, 30337-2748; telephone (404) 305-7371, fax (404) 305-7348.