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## DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39 [61 FR 29934 NO. 115 06/13/96]

Docket No. 93-ANE-07; Amendment 39-9649; AD 96-12-07

RIN 2120-AA64

Airworthiness Directives; Teledyne Continental Motors (formerly Bendix) S-20, S-1200, D-2000, and D-3000 Series Magnetos

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final rule.

**SUMMARY:** This amendment supersedes an existing airworthiness directive (AD), applicable to Teledyne Continental Motors (TCM) (formerly Bendix) S-20, S-1200, D-2000, and D-3000 series magnetos equipped with impulse couplings, that currently requires inspections for wear, and replacement, if necessary, of the impulse coupling assemblies. This amendment requires replacement, if necessary, of worn riveted impulse coupling assemblies with serviceable riveted impulse couplings or snap ring impulse couplings. This amendment is prompted by the availability of an improved design for the impulse coupling assembly. The actions specified by this AD are intended to prevent magneto failure and subsequent engine failure.

**DATES:** Effective July 18, 1996.

The incorporation by reference of certain publications listed in the regulations is approved by the Director of the Federal Register as of July 18, 1996.

**ADDRESSES:** The service information referenced in this AD may be obtained from Teledyne Continental Motors, P.O. Box 90, Mobile, AL 36601; telephone (334) 438-3411. This information may be examined at the Federal Aviation Administration (FAA), New England Region, Office of the Assistant Chief Counsel, 12 New England Executive Park, Burlington, MA 01803-5299; or at the Office of the Federal Register, 800 North Capitol Street, NW., suite 700, Washington, DC.

**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.

**SUPPLEMENTARY INFORMATION:** On January 4, 1983, the Federal Aviation Administration (FAA) issued airworthiness directive (AD) 78-09-07 R3, Amendment 39-4538 (48 FR 1482, January 13, 1983), to require inspections for wear, and replacement, if necessary,

of the impulse coupling assemblies on certain Teledyne Continental Motors (TCM) (formerly Bendix) S-20, S-1200, D-2000, and D-3000 series magnetos equipped with impulse couplings. That action was prompted by reports of numerous magneto failures. That condition, if not corrected, could result in magneto failure and subsequent engine failure.

A proposal to amend part 39 of the Federal Aviation Regulations was published as a notice of proposed rulemaking (NPRM) in the **Federal Register** on September 21, 1993 (58 FR 48987). That NPRM would have retained the repetitive inspections for wear required by the current AD, but would have also required replacement, if necessary, of the riveted impulse coupling assembly with newly designed, improved, snap ring impulse coupling assemblies. In addition, the proposed AD would have required marking the magneto data plate to indicate installation of a snap ring impulse coupling assembly. Installation of snap ring impulse coupling assemblies would have constituted terminating action to the inspection requirements of this AD. That NPRM was prompted by the manufacturer redesigning the impulse coupling assembly to include snap ring fastening technology which strengthens the cam axle and reduces wear. The snap ring impulse coupling assembly was believed not to have the failure mode of the previous design.

Since the issuance of that NPRM, the FAA received reports of snap ring impulse coupling assemblies being worn beyond limits. The FAA determined that it was necessary to reopen the proposal for public comment, so a Supplemental NPRM was published in the **Federal Register** on November 17, 1994 (59 FR 59391). That Supplemental NPRM proposed to retain the 500 hour repetitive inspections for wear required by the current AD, but would require these inspections for magnetos equipped with snap ring impulse coupling assemblies as well.

Since the issuance of that Supplemental NPRM, the FAA received comments that serviceable riveted impulse couplings should be permitted as replacement units as well as the snap ring design. The FAA concurred, since there has been no production of riveted impulse couplings since January 1992, distributors still have some left as this was a common, relatively high use item. The FAA determined that it was necessary to reopen the proposal for public comment, so a Supplemental NPRM was published in the **Federal Register** on October 16, 1995 (60 FR 53558). That Supplemental NPRM proposed to require replacement of worn impulse couplings with serviceable impulse couplings of either riveted or snap ring design.

Interested persons have been afforded an opportunity to participate in the making of this amendment. No comments were received since publication of the last Supplemental NPRM.

Since the issuance of that Supplemental NPRM, the manufacturer has advised the FAA that the cost for replacement of the impulse coupling assembly has increased from \$125 to \$140. The economic analysis of this final rule has been revised accordingly.

After careful review of the available data, the FAA has determined that air safety and the public interest require the adoption of the rule with the changes described previously. The FAA has determined that these changes will not increase the scope of the AD.

The FAA estimates that 130,000 magneto installed on aircraft of U.S. registry will be affected by this AD, that it will take approximately 1 work hour, plus 1 work hour to change the impulse coupling, and that the average labor rate is \$60 per work hour. The average utilization of the fleet of these airplanes is estimated to be evenly divided between commercial/commuter service and private owners. The commercial/commuter service population is estimated to operate 500 hours time in service (TIS) per year; therefore the cost to perform the inspections required by the AD will be approximately \$3,900,000 per year. The FAA estimates that private owners operate their

aircraft between 50 and 100 hours TIS per year; therefore it will take approximately 5 to 10 years to reach 500 hours time in service. The estimated cost for these owners will also be \$3,900,000 spread over a time period of 5 to 10 years or 780,000 per year for 5 years or \$390,000 for 10 years. The cost to replace the impulse coupling assembly is \$140 per magneto plus one work hour at \$60 per work hour for a total of \$200 per magneto. While all the riveted impulse coupling assemblies will eventually have to be replaced, it is not possible to estimate the cost per year. The total cost for replacement for U.S. operators is estimated to be \$26,000,000.

The regulations adopted herein will not have substantial direct effects 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. Therefore, in accordance with Executive Order 12612, it is determined that this final rule does not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

For the reasons discussed above, I certify that this action (1) is not a "significant regulatory action" under Executive Order 12866; (2) is not a "significant rule" under DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979); and (3) will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act. A final evaluation has been prepared for this action and it is contained in the Rules Docket. A copy of it 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, Incorporation by reference, 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 USC 106(g), 40113, 44701.

#### **§39.13 - [AMENDED]**

2. Section 39.13 is amended by removing Amendment 39-4538 (48 FR 1482, January 13, 1983) and by adding a new airworthiness directive, Amendment 39-9649, to read as follows:

# AIRWORTHINESS DIRECTIVE

Aircraft Certification Service  
Washington, DC



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).

**96-12-07 TELEDYNE CONTINENTAL MOTORS:** Amendment 39-9649. Docket 93-ANE-07. Supersedes AD 78-09-07 R3, Amendment 39-4538.

Applicability: Teledyne Continental Motors (TCM) (formerly Bendix) S-20, S-1200, D-2000, and D-3000 series magnetos equipped with impulse couplings, installed on but not limited to reciprocating engine powered aircraft manufactured by Beech, Cessna, Mooney, and Piper.

NOTE 1: This airworthiness directive (AD) applies to each magneto 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 magnetos 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 (c) 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 magneto from the applicability of this AD.

NOTE 2: The FAA has received reports of some confusion as to what is meant by S-20, S-1200, D-2000, and D-3000 series magnetos as referenced in TCM Mandatory Service Bulletin (MSB) No. MSB645, dated April 4, 1994, and this airworthiness directive (AD). A typical example is S6RN-25, where the S designates single type ignition unit (a D designates a dual ignition unit), the 6 designates the number of cylinders, the R designates right hand rotation, the N is the manufacturer designation (this did not change when TCM purchased the Bendix magneto product line), and the number after the dash indicates the series (a -25 is a S-20 series magneto while a -3200 is a D-3000 series magneto, etc.).

Compliance: Required as indicated, unless accomplished previously.

To prevent magneto failure and subsequent engine failure, accomplish the following:

(a) For magnetos with riveted or snap ring impulse coupling assemblies, having less than 450 hours time in service (TIS) since new, or overhaul, or since last inspection, on the effective date of this AD, accomplish the following:

(1) Prior to the accumulation of 500 hours TIS since new, or overhaul, or since last inspection, inspect riveted or snap ring impulse coupling assemblies for wear, and replace, if necessary, prior to further flight, with serviceable riveted or snap ring impulse coupling assemblies, in accordance with the Detailed Instructions of TCM MSB No. MSB645, dated April 4, 1994, and TCM SB No. 639, dated March 1993.

(2) Thereafter, at intervals not to exceed 500 hours TIS since the last inspection, inspect riveted or snap ring impulse coupling assemblies for wear, and replace, if necessary, prior to further flight, with serviceable riveted or snap ring impulse coupling assemblies, in accordance with the Detailed Instructions of TCM MSB No. MSB645, dated April 4, 1994, and TCM SB No. 639, dated March 1993.

(b) For magnetos with riveted or snap ring impulse coupling assemblies, having 450 or more hours TIS since new, or overhaul, or since last inspection, on the effective date of this AD, or an unknown TIS on the effective date of this AD, accomplish the following:

(1) Within the next 50 hours TIS after the effective date of this AD, inspect riveted or snap ring impulse coupling assemblies for wear, and replace, if necessary, prior to further flight, with serviceable riveted or snap ring impulse coupling assemblies in accordance with the Detailed Instructions of TCM MSB No. MSB645, dated April 4, 1994, and TCM SB No. 639, dated March 1993.

(2) Thereafter, at intervals not to exceed 500 hours TIS since the last inspection, inspect riveted or snap ring impulse coupling assemblies for wear, and replace, if necessary, prior to further flight, with serviceable riveted or snap ring impulse coupling assemblies, in accordance with the Detailed Instruction of TCM MSB No. MSB645, dated April 4, 1994, and TCM SB No. 639, dated March 1993.

(c) 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, 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 airworthiness directive, if any, may be obtained from the Atlanta Aircraft Certification Office.

(d) 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.

(e) The actions required by this AD shall be done in accordance with the following TCM service documents:

Document No.	Pages	Revision	Date
MSB No. MSB645	1-6	Original	April 4, 1994

Total Pages: 6.

SB No. 639	1-2	Original	March 1993
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Total Pages: 2.

This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be obtained from Teledyne Continental Motors, P.O. Box 90, Mobile, AL 36601; telephone (334) 438-3411. Copies may be inspected at the FAA, New England Region, Office of the Assistant Chief 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.

- (f) This amendment becomes effective on July 18, 1996.

SUPERSEDED