



DIRECCION NACIONAL DE AERONAVEGABILIDAD (DNA)
DIRECCION AVIACION GENERAL (DAG)
REPUBLICA ARGENTINA

ADVERTENCIA 058/DAG

La presente ADVERTENCIA tiene por objeto dar a conocer una situación que puede afectar la seguridad de operación de las aeronaves que se detallan. La misma se emite solamente a los efectos de informar y cualquier recomendación de acción correctiva no tiene carácter mandatorio.

Buenos Aires, 30 de noviembre de 2005.

DIRIGIDO A: Talleres Aeronáuticos de Reparación (TAR), propietarios y operadores de aeronaves equipadas con motores marca Teledyne Continental Motors (TCM), modelos IO-360, TSIO-360 y LTSIO-360 Series.

MOTIVO: Posibilidad de fractura de bielas del motor por hallarse por debajo de las tolerancias mínimas recomendadas por el fabricante.

ANTECEDENTES:

- Como resultado de la investigación de un accidente ocurrido en mayo de 2005 a una aeronave Piper PA-28R-201T, equipada con un motor TCM TSIO-360-FB1A, la Junta de Investigaciones de Accidentes de Aviación Civil (JIAAC) estableció como causa principal la siguiente: *“En un vuelo de aviación general, con el objetivo de realizar adiestramiento, durante la fase de ascenso y con escasa altura, detención del motor y posterior aterrizaje de emergencia en terreno no preparado, por la rotura de la biela de un cilindro, por fatiga de material”.*
- Al inspeccionar el motor durante la investigación del accidente, se comprobó que en la sección superior y a ambos lados del block había perforaciones debido a la rotura de la biela del cilindro N° 1. Los restos de biela y pistón fueron hallados en el interior del cilindro, como así también se constató la rotura del árbol de levas, deformaciones en las bases de los cilindros N° 1 y N° 2, y corte de uno de los bulones que mantiene unido el muñón de la biela al cigüeñal. Se presume que estos daños fueron provocados por la libre rotación sin control del extremo restante de la biela unida al cigüeñal.
- Luego del desarme del motor, se comprobó que las bielas de los otros cilindros tenían un grabado de forja con el N° D © 626119, que corresponde a bielas fabricadas entre Junio-1976 y Septiembre-1981, conforme lo indicado en el Service Bulletin M86-11 Rev. 1 de TCM (actualmente cancelado por el Critical Service Bulletin CSB96-13 de fecha 14-Noviembre-1996). El CSB96-13, vigente actualmente, establece el reemplazo de las bielas si el ancho de su brazo, medido en un punto particular, es inferior a 0,625 pulgadas.

- Durante la inspección del motor accidentado, se midió una de las bielas sanas arrojando un ancho de 0,585 pulgadas, es decir, por debajo de las tolerancias mínimas establecidas en la documentación del fabricante antes mencionada.
- Se adjunta a la presente Advertencia, el Critical Service Bulletin CSB96-13 de TCM.

RECOMENDACION: Teniendo en cuenta lo anterior, esta Dirección recomienda:

- 1º) A los TAR, que en ocasión de ingresos de aeronaves equipadas con motores TCM IO-360, TSIO-360 y LTSIO-360 Series, cumplan con la recomendación establecida en el Critical Service Bulletin CSB96-13 de TCM.
- 2º) A los propietarios / operadores de aeronaves equipadas con motores TCM IO-360, TSIO-360 y LTSIO-360 Series, que concurren cuanto antes a su taller de confianza para proceder al cumplimiento del Critical Service Bulletin CSB96-13 de TCM.

Para obtener mayor información o efectuar consultas sobre la presente Advertencia dirigirse a la División Ingeniería de la DAG:

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TELEDYNE CONTINENTAL[®] AIRCRAFT ENGINE
CRITICAL SERVICE BULLETIN
 Compliance Necessary To Maintain Safety

CATEGORY 2
CSB96-13
 FAA APPROVED
 Supersedes M86-11 Rev.1

SUBJECT: IO-360, TSIO-360 AND LTSIO-360 SERIES ENGINE CONNECTING ROD INSPECTION AND REPLACEMENT.


PURPOSE: TCM Service Bulletin M86-11 Rev. 1 dated October 1, 1986 provided connecting rod inspection and replacement instructions for IO-360, TSIO-360 and LTSIO-360 model engines to be accomplished "at next engine overhaul, top overhaul or anytime the cylinders are removed for any reason". This required the replacement of forging number 626119 connecting rods that have a measured beam width below .625 inch. Field reports indicate that certain affected engines have yet to be inspected because of low aircraft utilization. Due to the potential for over stressed connecting rods associated with abnormal operating conditions or incidents, it is now required that connecting rod inspection and appropriate corrective action be accomplished on those engines that have not complied with M86-11 Rev. 1 prior to engine overhaul.

Beam width inspection criteria for 360 series engine connecting rods has been a requirement of the IO-360 and L/TSIO-360 Overhaul Manuals since the November 1983 manual revision. 360 series engines that have been overhauled in accordance with November 1983 or later overhaul manual revisions were required to meet the connecting rod minimum beam width of .625 inch prior to returning the engine to service.

Engines that have had a complete set of part number 646320 or 646321 rods installed or had all connecting rods inspected and verified to have a beam width above .625 inch are not affected by this service bulletin. Also, all factory new and rebuilt engines other than those listed in "MODELS AFFECTED" are not affected unless connecting rods were replaced without compliance with the inspection requirements set forth in this service bulletin.


COMPLIANCE: Connecting rod inspection must be performed at the next 100 hour or annual inspection, but not later than one (1) year after the issue date of this service bulletin unless previous compliance with M86-11 Rev.1 has been accomplished.

MODELS AFFECTED: 1. The following engines must be inspected unless previous compliance with M86-11 Rev. 1 has been accomplished:

ISSUED			REVISED			 TELEDYNE CONTINENTAL MOTORS P.O. Box 90 • MOBILE ALABAMA 36601 334-438-3411	PAGE NO	REVISION
MO	DAY	YEAR	MO	DAY	YEAR		1 of 5	
11	14	96					CSB96-13	

NEW - ENGINE MODEL	SERIAL NUMBER
IO-360-C	350035 thru 350075.
IO-360-D	351332 thru 351358.
IO-360-DB	351350 thru 351363.
IO-360-G	352646 thru 352799.
IO-360-GB	352777 thru 352887.
IO-360-H	353318 thru 353351.
IO-360-K	355258 thru 356561.
IO-360-KB	356003 thru 356561.
TSIO-360-C	300482 thru 300599.
TSIO-360-CB	300571 thru 300667.
TSIO-360-E	303850 thru 311546.
TSIO-360-EB	307391 thru 311612.
TSIO-360-F	305039 thru 310469.
TSIO-360-FB	305737 thru 310732.
TSIO-360-G	309000 thru 309002.
TSIO-360-GB	309004 thru 309433.
TSIO-360-H	308000 thru 308062.
TSIO-360-HB	308063 thru 308127.
TSIO-360-JB	313002 thru 313018.
LTSIO-360-E	304850 thru 306360.
LTSIO-360-EB	306382 thru 312567.

REBUILT - ENGINE MODEL	SERIAL NUMBER
IO-360-A	20114 thru 20128.
IO-360-C	60330 thru 60525.
IO-360-CB	236501 thru 236502.
IO-360-D	62709 thru 62829.
IO-360-DB	239601 thru 239609.
IO-360-G	224720 thru 224858.
IO-360-GB	236601 thru 236606.
IO-360-H	226502 thru 226508.
IO-360-J	238701 thru 238704.

ISSUED			REVISED			 TELEDYNE CONTINENTAL MOTORS P.O. Box 90 • MOBILE ALABAMA 36601 334-438-3411	PAGE NO	REVISION
MO	DAY	YEAR	MO	DAY	YEAR		2 of 5	
11	14	96					CSB96-13	

REBUILT - ENGINE MODEL	SERIAL NUMBER
IO-360-K	230327 thru 230350.
IO-360-KB	235802 thru 235818.
TSIO-360-A	197057 thru 197087.
TSIO-360-AB	237601 thru 237609.
TSIO-360-C	224359 thru 230717.
TSIO-360-CB	236001 thru 236023.
TSIO-360-DB	238401.
TSIO-360-E	225002 thru 225086.
TSIO-360-EB	234551 thru 234638.
TSIO-360-F	232751 thru 232766.
TSIO-360-FB	237301 thru 237352.
TSIO-360-GB	237401 thru 237407.
TSIO-360-H	233251 thru 233253.
TSIO-360-HB	239952 thru 239956.
LTSIO-360-E	225501 thru 225596.
LTSIO-360-EB	233751 thru 233834.

- Any IO-360, TSIO-360 and LTSIO-360 model engine that has had a connecting rod or rods replaced with rods other than part number 646320 or 646321 that were not inspected in accordance with service bulletin M86-11 Rev. 1 where the rod beam width was not verified to be .625 inch or greater.

INSPECTION REQUIREMENTS

- Remove all cylinders in accordance with the applicable TCM Overhaul Manual.
- Inspect each connecting rod while it is positioned at its maximum stroke to allow clearance from the crankcase. Measure the beam width as indicated in Figure 1 and record the forging number.
- Any connecting rod that has a beam width less than .625 inch must be replaced. See Figure 1.

NOTE: Connecting rods are supplied in pairs due to the maximum weight differential of 14 grams in opposing cylinder bays. Therefore, the opposite cylinder connecting rod will also require replacement. Reference Table 1 for the applicable replacement connecting rod kit.

- Install and torque replacement connecting rods in accordance with the applicable TCM Overhaul Manual. Install cotter pins in accordance with Figure 2.
- Reassemble the engine in accordance with the applicable TCM Overhaul Manual. Make a engine log book entry as to compliance with this service bulletin.


ISSUED			REVISED			 TELEDYNE CONTINENTAL MOTORS P.O. Box 90 • MOBILE ALABAMA 36601 334-438-3411	PAGE NO	REVISION
MO	DAY	YEAR	MO	DAY	YEAR		3 of 5	
11	14	96					CSB96-13	

Table 1 - Connecting Rod Kits

Contact your TCM Distributor for special connecting rod exchange pricing. This pricing is only available to those customers who require replacement rods under the conditions set forth in this service bulletin.


ENGINE MODEL	KIT PART NUMBER	QTY	KIT CONTENTS	
			PART#	DESCRIPTION
IO-360-A,C,D,G,H,J,K TSIO-360-A,B,C,D,E,F,G,H. LTSIO-360-E.	(1) 646321A2	2	646321	CONNECTING ROD
		4	639640	BEARING
		4	639292	PIN, COTTER
IO-360-AB,CB,DB,ES,GB,HB,JB,KB. TSIO-360-AB,BB,CB,DB,EB,FB,GB, HB,KB,LB,MB. LTSIO-360-EB,KB.	(2) 646320A4	2	646320	CONNECTING ROD
		4	642338	BEARING
		4	639292	PIN, COTTER

(1) - This kit is for standard small bore diameter crankshafts. For .010" undersize small bore crankshafts, order connecting rod kit P/N 646321A2M010 which contains 4 each P/N 639640M010 bearings.

(2) - This kit is for standard big bore diameter crankshafts. For .010" undersize big bore crankshafts, order connecting rod kit P/N 646320A4M010 which contains 4 each P/N 642338M010 bearings.

AFFECTED PUBLICATIONS:

Insert a copy of this service bulletin into the appropriate section of the IO-360 and L/TSIO-360 Series Overhaul Manuals.

ISSUED			REVISED			 TELEDYNE CONTINENTAL MOTORS P.O. Box 90 • MOBILE ALABAMA 36601 334-438-3411	PAGE NO	REVISION
MO	DAY	YEAR	MO	DAY	YEAR		4 of 5	
11	14	96					CSB96-13	

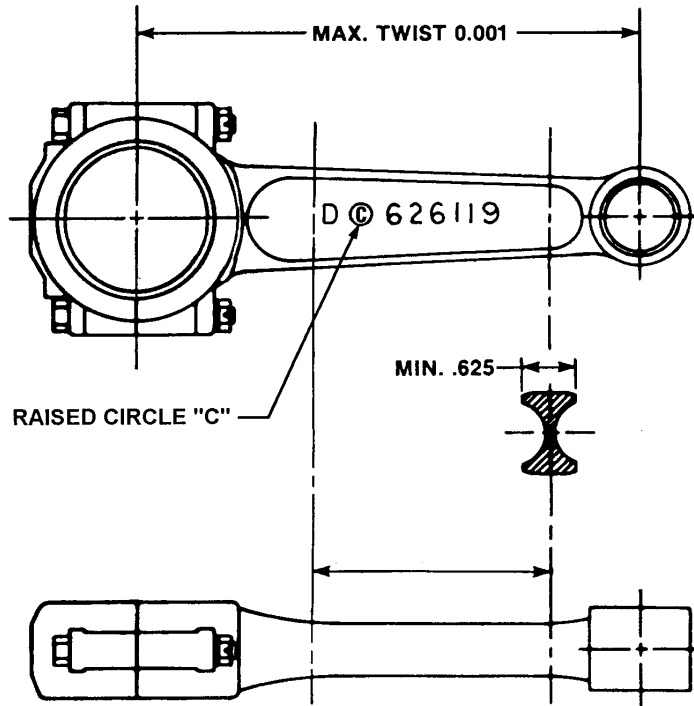


FIGURE 1. CONNECTING ROD.

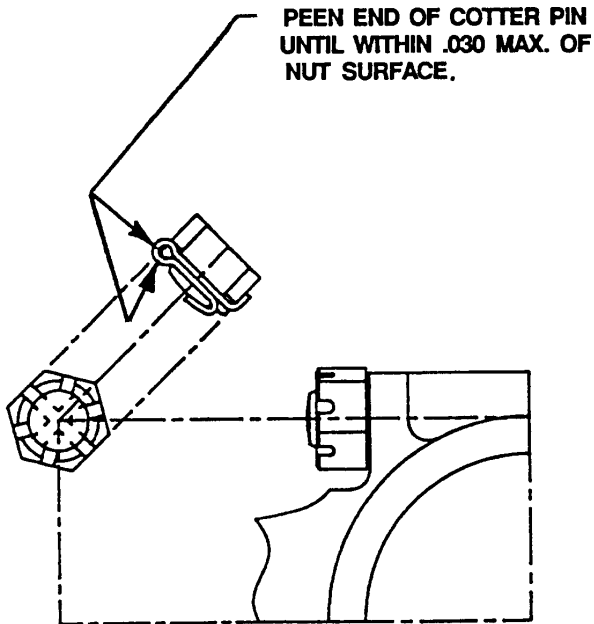



FIGURE 2
CONNECTING ROD
COTTER PIN INSTALLATION.

ISSUED			REVISED			 TELEDYNE CONTINENTAL MOTORS P.O. Box 90 • MOBILE ALABAMA 36601 334-438-3411	PAGE NO	REVISION
MO	DAY	YEAR	MO	DAY	YEAR		5 of 5	
11	14	96				CSB96-13		