TELEDYNE CONTINENTAL ® AIRCRAFT ENGINE

MANDATORY SERVICE BULLETIN

The Subject Matter Of This Service Bulletin Is Incorporated In Whole Or In Part In An FAA Airworthiness Directive

CATEGORY 1

MSB 00-5

TECHNICAL PORTIONS FAA APPROVED

SUBJECT: CRANKSHAFT MATERIAL INSPECTION

BACKGROUND: Teledyne Continental Motors (TCM) has identified the cause of 11 crankshaft fractures which have occurred in the connecting rod journals on straight drive engines manufactured in 1998 and 1999. The cause of the fractures has been identified as composition and processing deficiencies during several discrete periods of steel production and/or forming operations by suppliers. The fractures have occurred in new, rebuilt and field overhauled engines with operational times varying from 15 to 1257 hours. TCM is working closely with its suppliers to insure future production integrity.

TCM has developed an inspection process to identify and replace any other crankshafts potentially affected by this problem. This will be accomplished by means of a metallurgical inspection of two small core samples removed from the crankshaft propeller flange. Review of Teledyne Continental Motors manufacturing processes, nitride characteristics, and dimensional characteristics have not identified any other contributing causes.

PURPOSE: To provide instructions for the removal of crankshaft core samples for metallurgical evaluation.

WARNING

The inspection required by this service bulletin is intended to detect metallurgical anomalies which if present and left uncorrected can result in engine failure.

This inspection requires the removal of the aircraft spinner, propeller and spinner bulkhead to provide access to the crankshaft propeller flange. Two equally sized core samples will be taken from the propeller flange 180 degrees from each other using a customized tool provided by Teledyne Continental Motors. The removed core samples will be placed into a plastic, zip closure bag and identified by engine model, engine serial number and crankshaft serial number. These core samples must be returned to Teledyne Continental Motors for evaluation.

COMPLIANCE: For affected engines or crankshafts this inspection must be performed within the next 10 hours of operation.

Uninstalled service spare crankshafts of the affected serial number range must be inspected prior to installation in any engine.

ENGINES and/or CRANKSHAFTS AFFECTED: IO-360, TSIO-360, LTSIO-360, O-470, IO-470, TSIO-470, IO-520, TSIO-520, LTSIO-520, IO-550, TSIO-550 and TSIOL-550 series new and rebuilt direct drive engines assembled utilizing a crankshaft that was manufactured from April 1, 1998 through March 31, 2000. Affected engine serial numbers are specified below.

Any of the preceding series engines that have had a replacement crankshaft installed during field overhaul or repair. Affected replacement crankshaft serial numbers are specified below. Refer to the Crankshaft Serial Number Identification below for identification of affected crankshafts.

Note: If your engine has recently had a crankshaft installed that may have been manufactured from April 1, 1998, through March 31, 2000, the crankshaft serial number must be examined to determine if this inspection procedure applies.

Visit TCM's website at www.tcmlink.com to determine if your engine or crankshaft is affected by this service bulletin. If you do not have access to the TCM website, you may contact TCM service department at 1-888-200-7565.

For International customers who do not have access to the Internet and TCM's website, you may contact TCM's Service Department via one of the International toll free numbers listed below or by dialing our direct number 334-438-3411 extension 5100.

Country	Phone number
AUSTRALIA	1-800-1-25131
AVANTEL 1	001-888-200-7565
AVANTEL 2	001-888-200-7565
AVANTEL 3	001-888-200-7565
AVENTEL 4	001-888-200-7565
BAHAMAS	1-888-200-7565
BELGIUM	0800-76267
BRAZIL	00081-4-550-3603
CHINA	10-800-120-0160
COLOMBIA	980-9-154606
COSTA RICA	0800-012-0140
CTC	800-201653
DENMARK	8088-2299
DOM REPUBLIC	1-888-156-1483

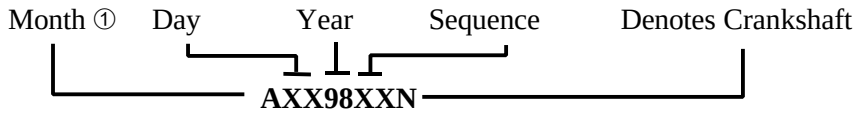
Country	Phone number
FINLAND	0-800-1-119686
FRANCE	0800-913943
GERMANY	0800-1006086
GOLDEN	1-800-9203143
GREECE	00800-12-15191
HONG KONG	800-908385
HUNGARY	06-800-13665
INDONESIA	001-803-011-2525
IRELAND	1-800-552252
ITALY	800-874516
JAPAN	00531-1-27656
KOREA-TELE	00798-14-800-4256
LUXEMBOURG	8002-5015
MALAYSIA	1-800-80-3436

Country	Phone number
MEXICO 1	001-888-200-7565
MEXICO 2	001-888-200-7565
MEXICO 3	001-888-200-7565
MEXICO 4	001-888-200-7565
NETHERLAND	0800-0221015
NEW ZEALAND	0800-449606
NICARAGUA	011-800-2201302
PLDT PHILI	1-800-1-114-0749
PORTUGAL	800-8-12389

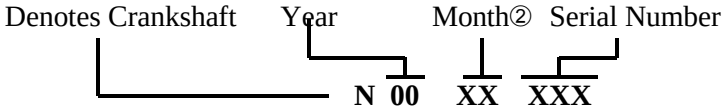
Country	Phone number
SINGAPORE	800-120-3346
SPAIN	900-951987
SWEDEN	020-79-0713
SWITZERLAND	0800-89-6791
TAIWAN	0080-13-9749
THAILAND	001-800-12-066-3179
TURKEY	00-800-151-0677
UNITED	08-000284583
URUGUAY	000-413-598-2436
VENEZUELA	8001-2411

CRANKSHAFT SERIAL NUMBER IDENTIFICATION

Each crankshaft is identified by a serial number steel stamped on the O.D. of the propeller flange that reflects its manufacturing date. Crankshafts produced prior to December 31, 1999 may be identified as follows:



Crankshafts produced beginning January 1, 2000 may be identified as follows:



① To determine month of manufacture use the following alpha code:

A= January	G= July
B= February	H= August
C= March	I= September
D= April	J = October
E= May	K= November
F= June	L= December

② To determine month of manufacturer use the following alpha code:
(X)- is a production alpha code for internal use.

A(X)= January	G(X)= July
B(X)= February	H(X)= August
C(X)= March	I(X) = September
D(X)= April	J(X) = October
E(X)= May	K(X) = November
F(X)= June	L(X) = December

AFFECTED ENGINE MODELS
BY ENGINE SERIAL NUMBER AND CRANKSHAFT SERIAL NUMBER

ENGINE MODEL	ENGINE S/N	CRANKSHAFT S/N
I0-360-C	060688	J059805N
I0-360-D	063038	J029809N
	063039	J059804N
	063040	J059801N
I0-360-DB	351396	I259805N
	351399	K109817N
	808799	I249807N
	808801	K049817N
	808802	K109802N
I0-360-ES	357114	I259804N
	357115	I299804N
	357116	I249806N
I0-360-G	244612	J059808N
	244613	J029808N
I0-360-KB	288733	I249801N
	288734	I259808N
	288736	I259806N
	288739	K099801N
	288740	K109807N
LTSI0-360-EB	807514	I239802N
	807516	J019810N
	807517	J019814N
	807518	J019811N
	807519	J019816N
	807520	K059812N
	807522	J019815N
	807523	K079803N
	807524	K059808N
	807525	K069803N
LTSI0-360-KB	319386	K059815N
	319388	J019817N
	812054	I239804N
	812056	J019812N
	812057	J019808N
	812059	I259809N
	812062	K059814N
	812063	K069811N
	812064	K069805N
	812065	K069808N
	812066	K069810N

ENGINE MODEL	ENGINE S/N	CRANKSHAFT S/N
LTSI0-360-KB	812067	K069802N
LTSI0-360-RB	321735	J019813N
	321736	J019807N
	321739	I309802N
	321741	I259810N
	321742	J019809N
	321743	K069809N
	321744	K069806N
	321745	K079802N
	321746	K069807N
TSI0-360-AB	237617	K109805N
	237618	K109815N
TSI0-360-C	283560	J029805N
TSI0-360-CB	236251	K109812N
	236252	K109801N
TSI0-360-D	817251	J029810N
TSI0-360-EB	809232	I259803N
	809235	I249805N
	809238	K069813N
	809239	K109803N
	809240	K109814N
TSI0-360-FB	299712	I299803N
	299713	J019804N
	299714	I259807N
	299715	K049813N
	299716	K069816N
	299717	K109813N
	299718	K109810N
	299720	K109808N
TSI0-360-KB	320381	K069812N
	320383	J019802N
	811323	K099808N
	811324	I259811N
	811325	K049818N
	811329	K099809N
	811330	K109816N
	811331	K099810N
	811332	K109811N
	811333	K109804N
	811334	K109806N

AFFECTED ENGINE MODELS (CONTINUED)

ENGINE MODEL	ENGINE S/N	CRANKSHAFT S/N
TSI0-360-LB	247356	I259802N
	247357	K099802N
TSIO-360-LB	247358	K099811N
	247359	K099804N
TSI0-360-MB	279293	I249809N
	279294	K099807N
TSIO-360-MB	279295	K069815N
TSI0-360-RB	321483	I299802N
	321484	I249808N
	321485	I309805N
	321486	K049815N
	321487	K059802N
	321488	I299806N
	321489	K099803N
	321490	K099805N
	321491	K099806N
	321492	K109809N
	321791	K059804N
0-470-GCI	817751	H249809N
0-470-J	202210	H139808N
0-470-K	049506	B199910N
	049507	D129904N
	049508	D139901N
	049509	D129901N
0-470-L	069890	F049806N
	069894	H129807N
	069895	A279923N
	069896	H149805N
	069897	E199926N
	069900	A289907N
	069903	A289912N
	069904	B189912N
	069907	D139904N
	069912	B189911N
0-470-R	466733	B189909N
	811962	E199919N
	815762	F209804N
	815765	F209812N
	815771	F199803N
	815776	F239808N

ENGINE MODEL	ENGINE S/N	CRANKSHAFT S/N
O-470-R	815779	H139803N
	815781	H139814N
	815782	H139816N
	815783	H139807N
	815784	H139811N
	815785	H139804N
	815786	E199917N
	815787	H139812N
	815788	H129811N
	815793	D129911N
	815801	H139806N
	815802	H139805N
	815805	E199915N
	815834	L029811N
	815852	A279921N
	815858	A289910N
	815861	B199904N
	815863	B199907N
	815864	B199911N
	815866	C159917N
	815867	C179905N
	815868	C169906N
	815869	C169903N
	815873	C159911N
	815874	C169905N
	815875	C169907N
	815876	C169911N
	815877	D129903N
	815881	C159916N
	815882	C169908N
	815884	C169904N
	815886	E199923N
	815889	H139801N
	815936	F199804N
0-470-S	269469	F209810N
	269473	F199802N
	269478	H129810N
	269490	A279920N
	269491	A279922N
	269494	C169901N

AFFECTED ENGINE MODELS (CONTINUED)

ENGINE MODEL	ENGINE S/N	CRANKSHAFT S/N
O-470-S	269496	B199906N
	819001	C169910N
	819006	F259917N
0-470-U	470759	A299901N
	813396	F049801N
	813413	H149801N
	813418	H149806N
	813420	H149802N
	813450	A289909N
	813458	A289902N
	813467	C159915N
	813472	D139903N
	813475	D129908N
	813478	D129907N
	813482	C159912N
	813486	E199921N
I0-470-C	295552	E079819N
	295553	F249811N
	295554	F259803N
	295558	C189903N
I0-470-D	105644	F179805N
I0-470-F	089920	F109815N
	089929	C159918N
	089930	E199909N
I0-470-K	092995	E059810N
	092997	F289908N
	092998	H249816N
I0-470-L	297803	E079807N
	297804	E079813N
	297807	E059811N
	297809	E079820N
	297810	E079815N
	297811	E079821N
	297812	E079810N
	297814	E069805N
	297815	E059807N
	297816	E059812N
	297817	E079816N
	297818	E079817N
	297823	F249806N

ENGINE MODEL	ENGINE S/N	CRANKSHAFT S/N
IO-470-L	297824	F249810N
	297825	F259802N
	297826	H259802N
	297827	H249813N
	297828	H259812N
	297830	H249810N
	297833	H249808N
	297835	H259806N
	297836	F249813N
	297837	H259816N
	297838	H259807N
	297841	H259815N
	297842	F249809N
	297843	F249807N
	297844	H259809N
	297845	H259813N
	297846	H249814N
	297857	L089804N
	297866	C189906N
	297868	C189902N
	297869	C189909N
	297873	C189904N
	297883	E079803N
	297884	E079808N
	297890	E079818N
	468607	E059808N
	468608	E079823N
	468611	E079812N
I0-470-N	096705	E079809N
	096707	E069804N
	096708	E069810N
	096710	E059809N
	096711	E069802N
	096712	F249815N
	096713	E079825N
	096714	E079814N
	096715	E069808N
	096716	F249808N
	096717	F249814N
	096718	F249816N

AFFECTED ENGINE MODELS (CONTINUED)

ENGINE MODEL	ENGINE S/N	CRANKSHAFT S/N
IO-470-N	096720	H259814N
	096722	H259817N
	096734	C189901N
I0-470-S	109391	E019915N
I0-470-V/VO	171213	C159905N
	171214	D099907N
	171216	E019914N
	171217	E019917N
	171218	E039904N
	171219	E049917N
	171220	E049913N
	171225	E039910N
	171232	F109816N
I0-520-A	112834	F159811N
	112855	B179901N
	112856	D089909N
	112861	F109812N
	112867	E069905N
IO-520-A	112870	G149915N
I0-520-BA	814346	J109803N
	814347	J119802N
	814348	J119805N
	814353	J099802N
	814365	K259809N
	814370	K309806N
	814371	L019807N
	814373	L029805N
	814375	B109911N
	814376	A159908N
	814383	B099915N
	814384	B119918N
	814390	D069905N
	814410	L019810N
I0-520-BB	580064	B159903N
	580065	C089905N
	813904	I169814N
	813908	I169816N
	813921	K139803N
	813926	A159917N
	813927	A189904N

ENGINE MODEL	ENGINE S/N	CRANKSHAFT S/N
IO-520-BB	813934	B019910N
	813942	B029902N
	813943	C089901N
	813946	C109907N
	813954	C279901N
	813956	B129910N
	813959	D149902N
	813961	D149913N
	813963	D309904N
	813964	D149912N
	813965	D309902N
	820261	K129806N
I0-520-C	810997	D059908N
	816761	D059905N
	816764	J119808N
	816772	K309805N
	816773	K309807N
	816774	K259801N
	816786	K259811N
	816787	L029807N
	816788	L019801N
	816791	L029810N
	816797	A129904N
	816798	A129902N
	816801	B099913N
	816810	B119909N
	816812	B119915N
	816817	D069909N
	816819	D059912N
	816820	D019910N
	816824	D079904N
	816825	D059906N
	816834	J099806N
	816862	B099914N
I0-520-CB	299002	K149704N
	299077	K169812N
	299078	K169805N
	299090	K179811N
	299096	K169806N
	299099	A159916N

AFFECTED ENGINE MODELS (CONTINUED)

ENGINE MODEL	ENGINE S/N	CRANKSHAFT S/N
IO-520-CB	299114	B049906N
	299117	B129908N
	299132	D079907N
	299134	D079909N
	299135	D079910N
	299138	D149903N
	299140	D149904N
I0-520-D	812981	F179811N
	812982	F099816N
	812983	F189805N
	812987	E059915N
	812997	F169801N
	816504	H039801N
	816512	H099809N
	816514	H119801N
	816517	H099802N
	816527	D109912N
	816535	H279818N
	816545	H129806N
	816550	G149908N
	816579	B169914N
	816580	B169906N
	816585	C119903N
	816591	D089905N
	816595	C159923N
	816598	C159901N
	816599	C159904N
	816600	C159902N
	816603	C159922N
	816608	D099904N
	816609	D099909N
	816612	D099908N
	816615	D269905N
	816621	E059902N
	816622	E019918N
	816623	E059906N
	816624	E049904N
	816625	E059904N
	816626	E059901N
	816630	E189921N

ENGINE MODEL	ENGINE S/N	CRANKSHAFT S/N
IO-520-D	816632	E189902N
	816638	F179808N
	816644	F179817N
	816651	D249906N
	816652	E039912N
	816679	G159902N
I0-520-E	215908	F269901N
	215926	C129917N
	215929	E199908N
I0-520-F	579250	F169813N
	579252	F109817N
	579258	B189904N
	579260	G149906N
	814814	D239809N
	814827	F049807N
	814837	F189801N
	814840	F169812N
	814843	F179803N
	814845	F179818N
	814846	E049907N
	814850	F059810N
	814851	E189926N
	814852	F109814N
	814854	F089809N
	814857	F119805N
	814859	F179816N
	814861	F169805N
	814865	E199911N
	814897	F109810N
	814907	H099821N
	814908	D109903N
	814921	E199910N
	814977	B169902N
	814978	B169915N
	814979	B169917N
	814980	B189905N
	814985	B179905N
	814986	B179907N
	814988	C119909N
	814990	C119913N

AFFECTED ENGINE MODELS (CONTINUED)

ENGINE MODEL	ENGINE S/N	CRANKSHAFT S/N
IO-520-F	814991	C119907N
	814994	B189906N
	814995	C129904N
	814996	C119911N
	814998	C119905N
	814999	C129911N
	815000	C129912N
	818751	C139901N
	818752	C159920N
	818753	C159919N
	818768	D109911N
	818769	D109901N
	818770	D089917N
	818772	D099903N
	818774	D239912N
	818777	D239907N
	818781	D269917N
	818782	D249904N
	818783	E059905N
	818784	E039903N
	818785	E039917N
	818788	E049908N
	818794	E189920N
	818796	E189911N
	818797	E189905N
	818801	E199914N
	818802	E199913N
	818803	F169817N
	818804	E059910N
	818807	D109905N
	818816	D239905N
	818835	E059903N
I0-520-L	294911	F059807N
	294912	F169806N
	294913	E189917N
	294916	F109809N
	294917	E039905N
	294930	E189925N
	294938	E059913N
	294947	E189915N

ENGINE MODEL	ENGINE S/N	CRANKSHAFT S/N
IO-520-L	294974	C159903N
	294977	D089911N
	294979	D109906N
	294980	D089907N
	294982	D239908N
	294983	D269908N
	294985	E039901N
	294988	E059917N
	294989	E199904N
	294991	E199906N
	294996	D109907N
	295039	F119804N
	577234	F269913N
I0-520-M	811625	J099809N
	811635	B109912N
	811644	D019912N
	811645	D019906N
	811646	D019903N
	811650	D019907N
I0-520-MB	277688	K189801N
	277721	I229809N
	277726	K139801N
	277748	C279902N
	277753	D149907N
LTSI0-520-AE	246675	G159915N
	246680	G159918N
TSI0-520-AE	246177	G169904N
	246179	G169903N
TSI0-520-AF	245248	F169815N
TSI0-520-B	176762	L029808N
	176763	J099810N
	176765	A139906N
	176767	B119914N
	176795	K309801N
TSI0-520-BB	287616	K169801N
	287618	C089904N
	287619	C089903N
TSI0-520-C	178542	F179813N
	178560	B169911N
	178566	E039908N

AFFECTED ENGINE MODELS (CONTINUED)

ENGINE MODEL	ENGINE S/N	CRANKSHAFT S/N
TSI0-520-CE	268586	C039919N
TSI0-520-E	183520	J109806N
	812601	J089809N
	812602	J109804N
	812603	I109810N
	812614	K309803N
	812617	K309808N
	812619	L029804N
	812621	K259813N
	812622	K259810N
	812623	K259807N
	812624	A139904N
	812625	A139901N
	812630	L029803N
	812631	A139903N
	812632	B099910N
	812635	D019905N
	812638	D019911N
TSI0-520-EB	815023	F169808N
	815035	C089906N
	815040	C269906N
	815042	D149915N
TSI0-520-G	216053	E039906N
TSI0-520-H	217409	F109808N
	217412	E189928N
	217420	B169904N
	217424	D109908N
	217426	E189918N
	217428	F269905N
	506894	F129806N
TSI0-520-J	218992	B099917N
TSI0-520-JB	237193	A159911N
TSI0-520-L	241973	A129901N
	241974	A129903N
TSI0-520-LB	815504	B049904N
TSI0-520-M	291964	F109803N
	291969	E199912N
	291981	F119806N
	532083	F049809N
	532085	H279804N

ENGINE MODEL	ENGINE S/N	CRANKSHAFT S/N
TSIO-520-M	532093	C119906N
	532095	E049910N
	818015	B169908N
	818016	B179906N
	818017	B179916N
	818018	B169905N
	818021	C139908N
	818022	D099905N
	818023	D089913N
	818024	D099906N
	818026	D269906N
	818027	C119902N
	818028	E019912N
	818030	E189910N
	818031	E189903N
	818041	E069901N
	818072	F179814N
TSI0-520-NB	813631	K139802N
	813635	A159918N
	813636	A159914N
	813638	B159911N
	813641	B159908N
	813644	C109914N
	813646	D079911N
	813647	D079908N
	813654	D299907N
	813685	C109912N
TSI0-520-P	278820	E059912N
	278823	F129803N
	278833	E039915N
	278834	E069904N
	278835	E189914N
	278836	E199907N
	278845	E039913N
TSI0-520-R	293969	E069906N
	293978	F049808N
	293979	F089805N
	293992	F179804N
	293993	F169816N

AFFECTED ENGINE MODELS (CONTINUED)

ENGINE MODEL	ENGINE S/N	CRANKSHAFT S/N
TSIO-520-R	294052	B169907N
	294054	B189903N
	294055	C119901N
	294059	B169903N
	294063	E019919N
	294066	E059918N
	294068	E189922N
	294069	E189904N
	294070	E189924N
	294072	D099902N
	294073	D099911N
	294085	F269902N
	522703	E039918N
TSI0-520-T	239475	B189902N
	239476	C129910N
	239477	C129916N
	239484	D089908N
TSI0-520-UB	527425	I189807N
	527433	D149905N
	809354	A169905N
	809357	B159902N
TSI0-520-VB	816019	I189801N
	816038	K199804N
	816039	K149802N
	816047	K179805N
	816050	A169914N
	816055	A189901N
	816056	A169913N
	816057	B019915N
	816064	B159912N
	816065	B159904N
	816075	C279905N
	816079	C269909N
	816080	D149910N
	816081	D149906N
	816086	D149914N
TSI0-520-WB	274443	C279912N
I0-550-A	280493	J269804N
	280498	J239810N
	817001	J279805N

ENGINE MODEL	ENGINE S/N	CRANKSHAFT S/N
I0-550-B	297046	A169802N
	297062	A169805N
	297105	I229805N
	297108	I219802N
	297118	J259804N
	297119	J259805N
	297120	J269801N
	297121	J269812N
	297125	J279810N
	297128	J259812N
	297139	A199904N
	297140	A199906N
	297142	A209906N
	297149	B059901N
	297154	B039916N
	297157	B059908N
	297161	C249909N
	297165	C259902N
	297167	C299910N
	682997	A169804N
	684015	J259811N
	684016	J269808N
	684017	J269811N
	684026	B039913N
	684027	A199901N
	684029	A199903N
	684030	B039915N
	684032	B039907N
	684033	B039910N
	684043	C239917N
	684044	C259903N
	684045	C259904N
	684046	C259909N
	684048	C319910N
	684114	B059920N
	684121	C069905N
I0-550-C	684243	I229806N
	684259	J279804N
	684271	A189913N
	684276	B049910N

AFFECTED ENGINE MODELS (CONTINUED)

ENGINE MODEL	ENGINE S/N	CRANKSHAFT S/N
IO-550-C	684277	B039906N
	684278	B049907N
	684279	B049908N
	684280	B089901N
	684281	B059918N
	684282	B059922N
	684283	B059917N
	684291	C239914N
	684295	C259910N
	684419	B089910N
	684535	C259907N
	684536	C259905N
	815292	I219804N
	815307	J239807N
	815311	J269803N
	815317	A189906N
	815321	B099904N
	815322	B059916N
	815323	A199908N
	815325	B089907N
	815328	C069909N
	815329	C069903N
	815330	B059903N
	815335	C259906N
	815339	B059910N
	815344	B059913N
I0-550-D	284299	D179916N
	284313	A309910N
	284314	A309903N
	284315	A309902N
	284316	B019904N
	284317	B019905N
	284318	A309906N
	284319	A309904N
	284324	D179915N
	284330	G169910N
	680020	A309901N
I0-550-E	283391	B019906N
I0-550-F	284848	D179907N
	284900	A309909N

ENGINE MODEL	ENGINE S/N	CRANKSHAFT S/N
IO-550-F	284901	A309908N
	284902	B019903N
	284905	B019901N
	284914	D179911N
	679523	D179908N
I0-550-G	679343	I229801N
	679368	J269807N
	679370	J269802N
	679379	A189907N
	679380	B039909N
IO-550-G	679384	B039911N
	679385	B059914N
	679386	B059902N
	679387	B089902N
	679388	B059921N
	679389	B059911N
	679390	B089909N
	679391	B059905N
	679393	I219805N
	679394	C069906N
	679396	C069907N
	679398	B089906N
	679403	C299907N
	679405	C319908N
	679439	C319901N
	808508	J269809N
I0-550-L	289148	D199908N
I0-550-N	683356	B089908N
	683359	C269902N
TSI0-550-C	802589	J259803N
	802591	I219803N
	814509	J279811N
	814512	B059907N
TSI0-550-E	803067	C319905N
	803071	B059915N
	803072	B089903N
	803073	B059906N
	803074	B059912N
	803075	B059904N
	803077	I219801N

AFFECTED ENGINE MODELS (CONTINUED)

ENGINE MODEL	ENGINE S/N	CRANKSHAFT S/N
TSIO-550-E	803078	A189908N
	803081	A199907N
	803086	B049911N
	803088	B089905N
	803095	C249905N
TSI0L-550-A	809259	I219806N

AFFECTED CRANKSHAFTS
BY CRANKSHAFT PART NUMBER AND SERIAL NUMBER

CRANKSHAFT PART NUMBER	CRANKSHAFT SERIAL NUMBER
646623	A309905N
646623	A309907N
646623	D179904N
649133	D089912N
649134	B119903N
649134	B179904N
649134	B179909N
649134	B179910N
649134	B179918N
649134	B189901N
649134	C129902N
649134	C129905N
649134	C129906N
649134	C129907N
649134	C129909N
649134	C129915N
649134	C139904N
649134	C139906N
649134	C139909N
649134	C139910N
649134	C139911N
649134	D089903N
649134	D089915N
649134	D099901N
649134	D099910N
649134	D109904N

CRANKSHAFT PART NUMBER	CRANKSHAFT SERIAL NUMBER
649134	D109909N
649134	D239901N
649134	D239902N
649134	D239903N
649134	D239904N
649134	D239906N
649134	D239909N
649134	D239910N
649134	D239911N
649134	D249910N
649134	D249915N
649134	D249916N
649134	D249918N
649134	D269901N
649134	D269903N
649134	D269904N
649134	D269907N
649134	D269910N
649134	D269911N
649134	D269912N
649134	D269913N
649134	D269914N
649134	D269915N
649134	D269916N
649134	D269918N
649134	E039902N

AFFECTED CRANKSHAFTS (Continued)
BY CRANKSHAFT PART NUMBER AND SERIAL NUMBER

CRANKSHAFT PART NUMBER	CRANKSHAFT SERIAL NUMBER
649134	E039907N
649134	E039909N
649134	E039911N
649134	E039914N
649134	E049901N
649134	E049902N
649134	E049906N
649134	E059908N
649134	E059914N
649134	E059916N
649134	E059919N
649134	E059920N
649134	E189913N
649134	E189923N
649134	E199902N
649134	E199903N
649134	E199905N
649134	F099810N
649134	F109804N
649134	F109811N
649134	F109818N
649134	F119801N
649134	F119802N
649134	F119803N
649134	F119807N
649134	F119808N
649134	F119809N
649134	F119810N
649134	F119811N
649134	F119812N
649134	F129801N
649134	F129805N
649134	F129811N
649134	F159807N
649134	F159809N
649134	F169802N
649134	F169814N
649134	F179802N
649134	F179812N
649134	F179815N
649134	F189802N
649134	F189803N

CRANKSHAFT PART NUMBER	CRANKSHAFT SERIAL NUMBER
649134	F199801N
649134	F269912N
649134	G149909N
649134	G149910N
649134	G149911N
649134	G149912N
649134	G149913N
649134	G149916N
649134	G159901N
649134	G159905N
649134	G159906N
649134	H099818N
649134	H109803N
649134	H109804N
649135	F109813N
649138	B189910N
649138	B199902N
649138	B199905N
649138	C169902N
649138	D129912N
649138	D139900N
649138	E199924N
649138	H149803N
649138	H149804N
649141	B189907N
649141	B189908N
649141	B199901N
649141	B199909N
649141	C159907N
649141	C179906N
649141	D129905N
649141	E199918N
649141	E199920N
649141	E199922N
649141	F049805N
649141	F209801N
649141	F209802N
649141	F209803N
649141	H139809N
649141	H139810N
649141	H139815N
649144	G159917N

AFFECTED CRANKSHAFTS (Continued)
BY CRANKSHAFT PART NUMBER AND SERIAL NUMBER

CRANKSHAFT PART NUMBER	CRANKSHAFT SERIAL NUMBER
649895	A139905N
649895	A159902N
649895	A159903N
649895	A159904N
649895	A159905N
649895	B099909N
649895	B099912N
649895	B099918N
649895	B109901N
649895	B109917N
649895	B109918N
649895	B109922N
649895	B119904N
649895	B119906N
649895	B119907N
649895	B119908N
649895	B119917N
649895	D019901N
649895	D019902N
649895	D019908N
649895	D019909N
649895	D059902N
649895	D059907N
649895	D059909N
649895	D069902N
649895	D069904N
649895	D069906N
649895	D079903N
649895	I109811N
649895	I119811N
649895	I119812N
649895	J089810N
649895	J099801N
649895	J099804N
649895	J099807N
649895	J099808N
649895	J099811N
649895	J099812N
649895	J099815N
649895	J119801N
649895	J119804N
649895	J319805N

CRANKSHAFT PART NUMBER	CRANKSHAFT SERIAL NUMBER
649895	K249801N
649895	K259803N
649895	K259805N
649895	K309802N
649895	L019803N
649895	L019805N
649895	L019806N
649895	L019809N
649895	L029801N
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649895	L309808N
649896	A159901N
649896	B099908N
649896	B109905N
649896	B109914N
649896	D019904N
649896	D059901N
649896	D079902N
649896	J109802N
649896	J119803N
649896	K309804N
649896	K309809N
649896	K309810N
649896	L019802N
649898	A159912N
649898	A159915N
649898	A159919N
649898	A169904N
649898	A169915N
649898	A189903N
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649898	C099901N
649898	C099902N
649898	C099904N
649898	C099905N
649898	C099906N
649898	C109901N
649898	C109903N
649898	C109904N

AFFECTED CRANKSHAFTS (Continued)
BY CRANKSHAFT PART NUMBER AND SERIAL NUMBER

CRANKSHAFT PART NUMBER	CRANKSHAFT SERIAL NUMBER
649898	C109906N
649898	C109911N
649898	D149909N
649898	I139813N
649898	I169813N
649898	I169815N
649898	I189808N
649898	K149801N
649898	K149805N
649898	K169802N
649898	K169814N
649898	K179804N
649898	K189804N
649898	L189808N
649900	A189911N
649900	A199902N
649900	B059909N
649900	C259901N
649900	C269901N
649900	C269904N
649900	C319907N
649900	C319909N
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649900	K229807N
652006	E079801N
652009	E079822N
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652009	H259803N
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652009	H259811N
652010	E069801N
652010	E069806N
652010	E069807N
652010	E069809N
652010	E079802N
652010	E079805N
652010	H249807N
652010	H249811N
652010	H249815N
652010	H249817N
652010	H249818N

CRANKSHAFT PART NUMBER	CRANKSHAFT SERIAL NUMBER
652010	H259801N
652010	H259804N
652010	H259808N
652010	H259818N
652011	B189914N
652011	C189907N
652011	C189908N
652011	E069803N
652011	E079804N
652011	E079806N
652011	E079811N
652011	E079824N
652011	H249812N
652039	F049803N
653129	I249803N
653129	I249804N
653129	I249810N
653129	I259801N
653129	I309803N
653129	I309804N
653129	J019801N
653129	J019803N
653129	J019805N
653129	K059803N
653129	K069804N
653129	K069814N
653136	I239801N
653136	I239803N
653136	I239805N
653136	I239806N
653136	I239807N
653136	I239808N
653136	I239810N
653136	I239811N
653136	K059809N
653136	K059811N
653136	K079804N
653136	K079810N
653137	J029802N
653137	J029803N
653137	J029804N
653139	J029807N

AFFECTED CRANKSHAFTS (Continued)
BY CRANKSHAFT PART NUMBER AND SERIAL NUMBER

CRANKSHAFT PART NUMBER	CRANKSHAFT SERIAL NUMBER
653139	J059802N
653139	J059803N
653139	J059807N
653139	J059809N
653139	J059810N
653139	J059811N
653139	J059812N
653139	N00AA049
654432	A189909N
654432	A189912N
654432	C299906N
654432	I229804N

A. GENERAL INFORMATION:

Teledyne Continental Motors will provide the following specialized tools and equipment required to perform the procedure detailed in this service bulletin:

MSB 00-5 Tool Kit Contents

1. 1 each-Crankshaft Boring Tool & Adapter
2. 1 each Instructional Video
3. 1 each-Positive Stop Depth Rod
4. 1 each .025 Feeler Gage
5. 1 each-End Mill
6. 2 each-Coring Bit (Rotobroach)
7. 1 each-De-burring Tool (1 spare blade)
8. 20 each-Core Sample Bags and Labels. One crankshaft (2) core samples per bag.

The following supplies must be obtained locally.

1. Zinc Chromate Primer- non aerosol
2. Acid brushes or cotton swabs
3. LPS-1 Spray Lubricant- non-silicon/non-Teflon based.
4. Dye Check Kit
5. Dial Type Torque Wrench; 0-200 inch lbs.
6. Spark plug gaskets.
7. Propeller hub O-ring.

WARNING

Do not use silicon or Teflon based coolants or lubricants during any part of this procedure. Silicon and/or Teflon based products will affect the reliability of the dye check procedure.

B. PRE-CORING PROCEDURE:

Verify that engine model and serial number, or replacement crankshaft serial number, is listed as affected by this service bulletin.

Service spare crankshafts affected by this service bulletin which have not been installed in an engine must be inspected prior to being installed.

Affected engines installed in aircraft must be inspected within the next 10 hours of operation.

For engines installed in aircraft proceed as follows.

In accordance with the aircraft manufacturer's maintenance manual:

1. Remove engine cowling to gain access to the upper spark plugs and propeller mounting hardware. Remove upper spark plug ignition leads and spark plugs.
2. Remove propeller spinner, spinner bulkhead and propeller. If the aircraft is equipped with propeller de-ice or anti-ice, follow the aircraft manufacturer's instructions for removal of this equipment, if required for propeller removal.
3. Using a clean shop towel, clean the propeller flange.
4. Record engine model and serial number, crankshaft serial number and total engine time on shop repair work order and on the labels provided by TCM.

C. MOUNTING TOOLING:

Before installing the crankshaft boring tool and crankshaft flange adapter, insure that the adapter face and counter bore are clean and free of any debris. Insure that the mounting studs are secure in the propeller flange adapter mounting plate.

1. Plug the crankshaft opening with a clean shop towel to prevent any debris from entering the crankshaft oil transfer area.
2. Using a piece of plastic, fabricate a protective cover for the engine and nacelle area. In the approximate center of the piece of plastic, cut a slit 6 inches long. Slip the crankshaft propeller flange through the slit, drape the upper part of the plastic over the top of the engine and drape

the lower part in such a manner that the plastic protects the lower portion of the engine and the nacelle area.

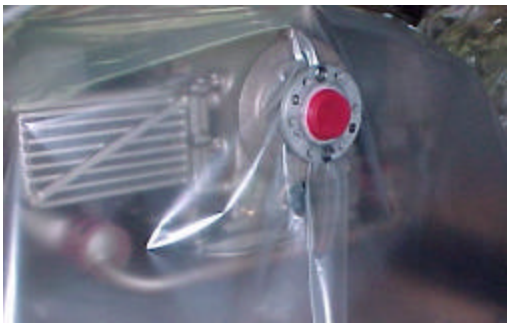

FIGURE 1
PROTECTIVE PLASTIC COVER

3. Place a drip pan under the plastic to catch cooling/lubricating fluid and metal shavings.
4. On the propeller flange, identify, and using a red magic marker, mark the location from which the core samples will be taken. See Figure 2.
5. Locate the two crankshaft flange holes that will be used to mount the adapter and boring tool. See Figure 2.

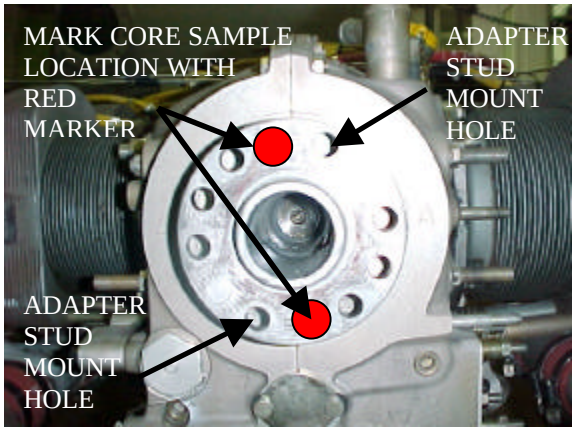

FIGURE 2
FLANGE CORE SAMPLE AREA MARKED

6. Rotate the crankshaft so that the crankshaft flange holes to be used to mount the adapter plate and boring tool (identified in step 4) are positioned so that, when installed, the adapter plate does not contact any portion of the engine surrounding the propeller flange or the aircraft cowling.
7. Position the boring tool propeller flange adapter plate mounting studs to align with selected propeller flange holes and slide the adapter studs through the propeller flange holes. Secure the coring tool flange to the propeller flange with the two nuts provided with the tooling. Tighten nuts to 150 inch lbs.
8. The red mark made on the propeller flange must be visible through the boring tool adapter plate hole. If the red mark is not visible, remove the boring tool from the propeller flange and repeat the above steps 5,6 and 7.

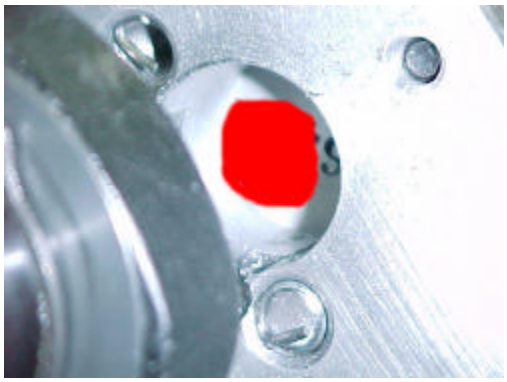

FIGURE 3
VERIFICATION OF CORING SAMPLE LOCATION & TOOL ALIGNMENT

D. REMOVAL OF NITRIDE LAYER:

Removal of the nitride layer from the forward face of the crankshaft flange will require spot facing an area .025 inches deep for each core sample. To remove the nitride layer proceed as follows:

1. With the boring tool and adapter plate correctly positioned and mounted, install the end mill provided with the tool kit into the boring chuck. Insure that the flats machined on the shank of the end mill align with the allen set screw in the chuck. Tighten the set screws with the allen

wrench provided in the tool kit. See FIGURES 4 and 5.

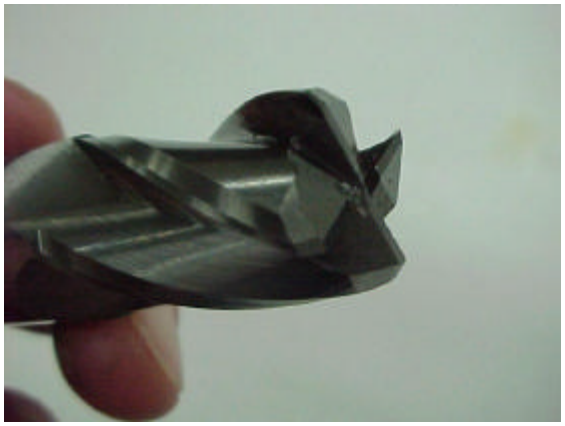

FIGURE 4
END MILL FOR SPOT FACING
PROPELLER FLANGE FRONT FACE

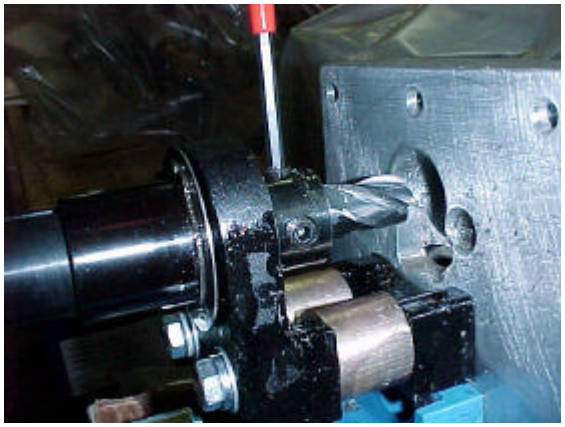

FIGURE 5
INSTALLING END MILL

2. Install a dial type inch pound torque wrench into the square drive on the side of the boring tool. Ensure that the range of motion is sufficient to allow the end mill to contact the work.
3. Install the positive stop rod provided into the holder mounted on the top of the boring tool motor.
4. Advance the end mill toward the front face of the crankshaft flange until the end mill contacts the flange.
5. To set the correct depth of the spot face, position a .025 feeler gage so that it is captured between the mounting adapter surface and the end on the positive stop rod as the rod is moved forward. Lock the positive stop rod in place using the thumb screw or set screw on top of the rod adapter. See Figure 6.

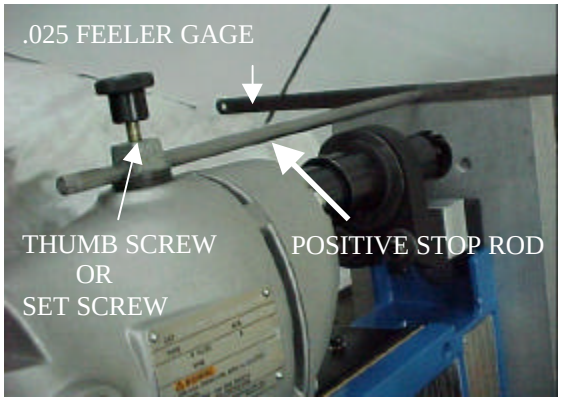

FIGURE 6
POSITIVE STOP ROD SET-UP FOR
.025 SPOT FACE

6. Back the end mill away from the front surface of the propeller flange and remove the feeler gage.

CAUTION

Eye protection must be worn during the machining processes. Steel shavings will be made during this procedure.

7. Turn the boring tool on using the switch provided on the tool.
8. Slowly advance the end mill toward the front face of the crankshaft flange by applying pressure to the handle of the dial type torque wrench.
9. Spray generous amounts of coolant/lubrication (LPS-1) onto the work and end mill during the spot facing operation.
10. Maintain a constant pressure on the torque wrench during the spot facing operation, but do not exceed 110 inch lbs. See Figure 7.

FIGURE 7
USING TORQUE WRENCH TO MAINTAIN CONSISTENT FEED RATE

11. Spot face the front face of the propeller flange until the positive stop rod contacts the adapter plate surface. Additionally, as the nitrided surface is penetrated an audible sound change will occur and the feed rate of the end mill will increase as the end mill cuts into the non-nitrided steel.
12. Back the end mill away from the propeller flange front face and turn OFF the boring tool.
13. Loosen the thumb screw or set screw securing the positive stop rod in place and sliding the rod aft remove it from the holder.
14. Remove the end mill from the boring tool chuck. Clean the machining debris from the boring tool and adapter flange.

E. PROPELLER FLANGE CORING SAMPLE PROCEDURE:

With the boring tool and adapter plate mounted to the propeller flange, proceed as follows:

1. Mount the coring rotobroach into the boring tool chuck. Ensure that the rotobroach is positioned so that a portion of the set screw flat protrudes from the end of the chuck. Secure the rotobroach by tightening the allen set screw in the chuck. See FIGURE 5 and 8.

FIGURE 8
ROTOBROACH CORING BIT

2. Ensure that the torque wrench has sufficient travel for the rotobroach to drill through the propeller flange.
3. Turn the boring tool on and advance the rotobroach toward the propeller flange by applying pressure to the handle of the torque wrench. Spray generous amounts of coolant/lubricant (LPS-1) onto the propeller flange and rotobroach as it contacts and bores into the propeller flange.
4. Apply consistent pressure of 100 to 110 inch lbs. to the torque wrench to control boring tool feed rate pressure during the initial stages of the coring operation. Apply generous amounts of coolant/lubricant (LPS-1) to the work surface and rotobroach throughout the machining operation. Occasionally back the rotobroach away form the work surface to clear the cutting flutes of machining debris. See Figure 9.

5. As the rotobroach contacts the nitrided back wall of the propeller flange, the feed rate will decrease. It may be necessary to increase the feed rate pressure to 140 to 180 inch lbs. Do not apply more than 200 inch lbs. of force to the rotobroach. If the rotobroach stops cutting, install new rotobroach and continue coring operation.

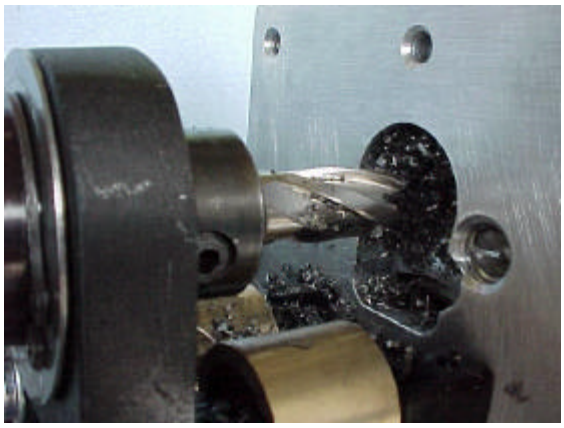

FIGURE 9
ROTOBROACH TAKING CORE SAMPLE

6. Once the rotobroach has cut through the back wall of the propeller flange, release the pressure on the torque wrench and pull the rotobroach out of the machined hole in the propeller flange and clear of the boring tool adapter plate.
7. Loosen the allen set screw and remove the rotobroach and propeller flange core sample from the boring tool chuck.
8. Remove the core sample from the rotobroach and place it in the self sealing plastic bag provided. See Figure 10.
9. Fill out the label on the front of the self-sealing plastic bag in its entirety.
10. Supporting the boring tool and propeller flange adapter plate loosen and remove the two nuts on the aft side of the propeller flange that secured the boring tool and adapter plate to the propeller flange.
11. Remove the boring tool and adapter plate from the propeller flange.

FIGURE 10
PROPELLER FLANGE CORE SAMPLES
(One crankshaft set (2) per sample bag)

12. Clean the machining debris from the boring tool adapter plate and from the propeller flange.
13. Position the boring tool and adapter plate 180 degrees from its previous position to machine the second core sample.
14. Mount and seat the boring tool and adapter plate onto the propeller flange and secure in place by installing the two nuts onto the studs protruding from the back side of the propeller flange.
15. Ensure that the red mark identifying the desired machining area of the propeller flange is visible through the adapter plate boring hole. See FIGURE 3.
16. To obtain the second propeller flange core sample repeat PART D steps 1 through 14 and PART E steps 1 through 12.

F. CLEANING AND CHAMFERING CORE SAMPLE HOLES:

After removing the boring tool and adapter plate from the propeller flange, clean and chamfer the core sample hole as follows:

1. Ensure that the front and aft face of the propeller flange is clean and free of any machining debris.

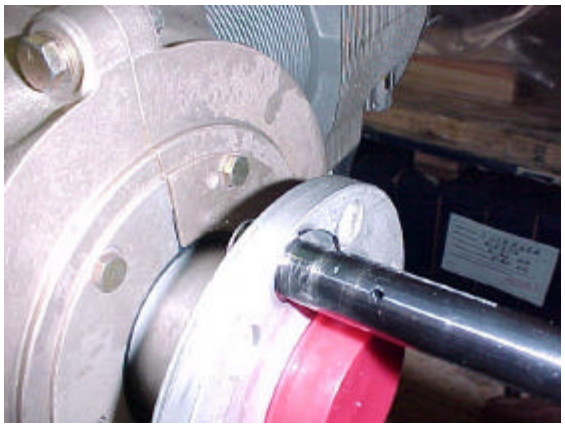

FIGURE 11
CHAMFERING CORE SAMPLE HOLE

NOTE: The chamfering tool has a spring loaded cutting blade. To chamfer the aft side of the core sample hole, apply enough pressure to the chamfering tool to cause the blade to retract sufficiently to allow the tool to pass through the core sample hole.

2. Using the chamfering tool provided in the tool kit, chamfer the core sample hole I.D. on the front and aft faces of the propeller flange. See Figure 11.
3. Apply a light even pressure to the tool during the chamfering process.

FIGURE 12
CORE SAMPLE HOLE
AFTER CHAMFERING

4. Using 180 crocus cloth or emery paper polish the core sample hole I.D.
5. Clean the core sample holes and propeller flange using a lint free shop towel dampened with Acetone.
6. Measure edge distance of core sample hole to propeller flange O.D. Minimum edge distance is .090 inches. If edge distance is less than .090 inches, contact TCM at 1-888-200-7565.

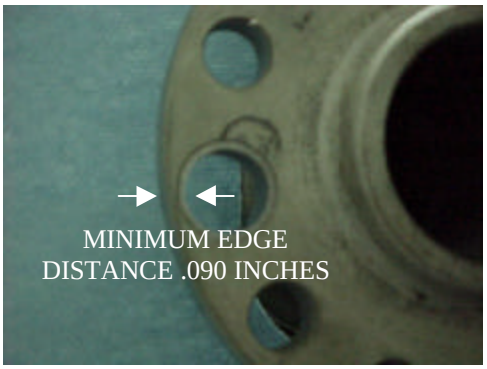

FIGURE 13
CORE SAMPLE HOLE MINIMUM
EDGE DISTANCE

7. Visually inspect core sample holes for sharp edges and burrs. Remove any sharp edges or burrs prior to proceeding. See Figure 12.

G. DYE CHECK OF CORE SAMPLE HOLES:

In accordance with ASTM E 1417 perform a complete Dye Check Inspection of the core sample holes and the adjacent front and aft flange surfaces ¼ inches around the holes.

1. Brush red visible dye check penetrant in the core sample holes and the surrounding area on the front and aft flange faces.
2. Allow penetrant to dwell for a minimum of 20 minutes.
3. Clean off residual penetrant with a clean lint free shop towel dampened with penetrant remover.

4. Apply removable dye check developer by spraying a light, uniform coating to cover the core sample hole I.D. and the surrounding area.
5. Allow developer to dwell for 15 minutes.
6. Visually inspect affected area surrounding the core sample holes on the front and aft face of the propeller flange for crack indications. If no crack indications are noted, proceed to Part H.
7. If crack indications are noted, contact Teledyne Continental Motors Service Representative at 1-888-200-7565.

H. PAINTING CORE SAMPLE HOLES:

1. Clean all dye check residue from the core sample holes and surrounding area with penetrant remover or acetone.
2. Using an acid brush or cotton swab, apply zinc chromate primer to core sample holes and chamfered areas on the front and aft faces of propeller flange. Allow the primer to cure completely prior to installation of the propeller. See Figure 14.

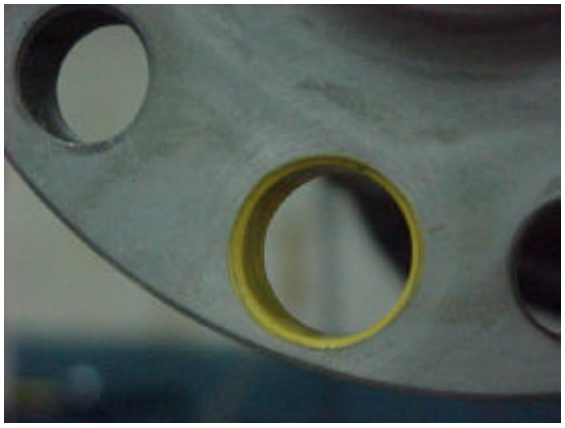

FIGURE 14
CORE SAMPLE HOLE AFTER APPLICATION OF ZINC CHROMATE PRIMER

I. MAILING SAMPLE:

Ensure that the label on the plastic bag containing the core samples is completed in its entirety.

Place plastic core sample bag in an overnight envelope and mail to:

Teledyne Continental Motors

2039 Broad Street

Mobile, Alabama 36615

ATTN: MSB 00-5

J. RETURNING AIRCRAFT AND ENGINE TO SRVICE:

In accordance with the aircraft manufacturer's maintenance manual and Teledyne Continental Motors engine maintenance manual or overhaul manual perform the following:

1. Remove protective plastic covering from around the crankshaft propeller flange and engine.
2. Remove the shop towel or other protective device that was used to protect the interior of the crankshaft during the sample coring process.
3. Insure that propeller flange is clean and free of any debris that would interfere with correct seating and installation of the aircraft propeller.
4. In accordance with the aircraft manufacturer's maintenance manual install propeller, propeller spinner bulkhead and spinner. Torque attaching hardware to values specified in the aircraft manufacturer's maintenance manual.
5. Install upper sparkplugs using new gaskets and torque to 300 to 360 inch lbs.
6. Install ignition leads and torque "B" nuts to 110-120 inch lbs.
7. Install engine cowling.

8. Perform a complete engine ground run up in accordance with the aircraft manufacturer's maintenance manual.

Teledyne Continental Motors will notify the FBO via Internet e-mail, FAX or telephone upon completing the testing on the core samples. Evaluation of core samples should be completed in 24 to 48 hours after the samples are received by Teledyne Continental Motors.

Engines with crankshaft core samples meeting the acceptance criteria may be returned to service. Teledyne Continental Motors will provide a logbook attachment indicating the core samples from the specified engine are acceptable and that the engine may be returned to service.

Make an engine logbook entry stating compliance with TCM MSB 00-5.

Make an aircraft logbook entry referring to removal and installation of the propeller, propeller spinner and spinner bulkhead to facilitate compliance with TCM MSB 00-5.

K. WARRANTY

The labor and material required to comply with this service bulletin will be covered by Teledyne Continental Motors New, Rebuilt or Gold Medallion Warranty policy as applicable to the affected engine.

Labor hours approved to comply with this service bulletin will not exceed 3 ½ manhours per affected engine.

Reimbursement for compliance with the inspection specified in this service bulletin will be process using the "Crankshaft Material Inspection Reimbursement Form" on the last page of the service bulletin. To insure prompt process of you reimbursement, complete the form in its entirety.

Mail reimbursement form to:

Teledyne Continental Motors

2039 Broad Street

Mobile, Alabama 36615

ATTN: WARRANTY ADMINISTRATION