

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 00-5B
 TECHNICAL PORTIONS
 FAA APPROVED
 Supersedes MSB 00-5
 And MSB 00-5A

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.

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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.

TCM's website at www.tcmlink.com will provide our customers with real-time service information regarding MSB 00-5. Customers may determine if their engine or crankshaft is subject to the required inspection by completing the customer contact information and entering an engine or crankshaft serial number. If you do not have access to www.tcmlink.com, 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
AVANTEL 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

Country	Phone number
DOM REPUBLIC	1-888-156-1483
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

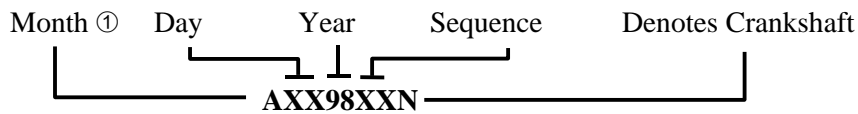
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Country	Phone number
LUXEMBOURG	8002-5015
MALAYSIA	1-800-80-3436
MEXICO 1	001-888-200-7565
MEXICO 2	001-888-200-7565
MEXICO 3	001-888-200-7565
MEXICO 4	001-888-200-7565
NETHERLAND	0800-0221015
NEW ZEALAND	0800-449606
NICARAGUA	011-800-2201302
PLDT PHILI	1-800-1-114-0749
PORTUGAL	800-8-12389

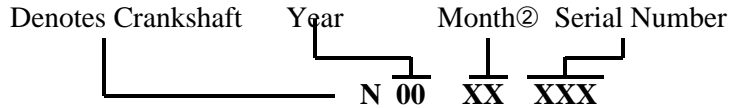
Country	Phone number
SINGAPORE	800-120-3346
SPAIN	900-951987
SWEDEN	020-79-0713
SWITZERLAND	0800-89-6791
TAIWAN	0080-13-9749
THAILAND	001-800-12-066-3179
TURKEY	00-800-151-0677
UNITED	08-000284583
URUGUAY	000-413-598-2436
VENEZUELA	8001-2411

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

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AFFECTED ENGINE MODELS

BY ENGINE MODEL, 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
	351397	K049814N
	351399	K109817N
	808799	I249807N
	808801	K049817N
	808802	K109802N
I0-360-ES	357114	I259804N
	357115	I299804N
	357116	I249806N
	357151	A219910N
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

Engine Model	Engine S/N	Crankshaft S/N
LTSI0-360-KB	812054	I239804N
	812056	J019812N
	812057	J019808N
	812059	I259809N
	812062	K059814N
	812063	K069811N
	812064	K069805N
	812065	K069808N
	812066	K069810N
	812067	K069802N
LTSI0-360-RB	321735	J019813N
	321736	J019807N
	321738	K059809N
	321739	I309802N
	321740	K059810N
	321741	I259810N
	321742	J019809N
	321743	K069809N
	321744	K069806N
	321745	K079802N
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

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AFFECTED ENGINE MODELS
BY ENGINE MODEL, ENGINE SERIAL NUMBER and CRANKSHAFT SERIAL NUMBER

Engine Model	Engine S/N	Crankshaft S/N
TSIO-360-FB	299714	I259807N
	299715	K049813N
	299716	K069816N
	299717	K109813N
	299718	K109810N
	299720	K109808N
TSIO-360-KB	320381	K069812N
	320383	J019802N
	811323	K099808N
	811324	I259811N
	811325	K049818N
	811328	K059803N
	811329	K099809N
	811330	K109816N
	811331	K099810N
	811332	K109811N
	811333	K109804N
	811334	K109806N
	TSIO-360-LB	247354
247356		I259802N
247357		K099802N
247358		K099811N
247359		K099804N
TSIO-360-MB	279293	I249809N
	279294	K099807N
	279295	K069815N
TSIO-360-RB	321483	I299802N
	321484	I249808N
	321485	I309805N
	321486	K049815N
	321487	K059802N
	321488	I299806N
	321489	K099803N
	321490	K099805N
	321491	K099806N
321492	K109809N	

Engine Model	Engine S/N	Crankshaft S/N
TSIO-360-SB	321791	K059804N
0-470-GCI	817751	H249809N
0-470-J	202210	H139808N
	202214	J139911N
0-470-K	049501	F249801N
	049505	A299903N
	049506	B199910N
	049507	D129904N
	049508	D139901N
	049509	D129901N
0-470-L	069890	F049806N
	069894	H129807N
	069895	A279923N
	069896	H149805N
	069897	E199926N
	069900	A289907N
	069902	A289903N
	069903	A289912N
	069904	B189912N
	069906	C169912N
	069907	D139904N
	069912	B189911N
	069915	J149903N
069916	J139921N	
069917	J139916N	
069920	K049903N	
0-470-R	466733	B189909N
	466737	J139910N
	466738	J159904N
	466740	J129907N
	466741	J129918N
	466758	J139903N
	811961	D079805N
	811962	E199919N
811996	D129902N	

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BY ENGINE MODEL, ENGINE SERIAL NUMBER and CRANKSHAFT SERIAL NUMBER

Engine Model	Engine S/N	Crankshaft S/N
O-470-R	815762	F209804N
	815765	F209812N
	815771	F199803N
	815776	F239808N
	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
	815824	L029812N
	815826	L029814N
	815829	L039812N
	815830	L039802N
	815834	L029811N
	815835	L039801N
	815838	L109809N
	815841	L029817N
	815843	L109811N
	815845	L109810N
	815849	A279924N
	815851	A289906N
	815852	A279921N
	815853	A289904N
	815855	A299911N
	815857	A299904N
	815858	A289910N
	815859	A289911N
	815860	L029813N
815861	B199904N	
815862	B199908N	
815863	B199907N	
815864	B199911N	
815865	C159914N	

Engine Model	Engine S/N	Crankshaft S/N
O-470-R	815866	C159917N
	815867	C179905N
	815868	C169906N
	815869	C169903N
	815871	C179903N
	815872	C179901N
	815873	C159911N
	815874	C169905N
	815875	C169907N
	815876	C169911N
	815877	D129903N
	815878	D129909N
	815880	D129910N
	815881	C159916N
	815882	C169908N
	815884	C169904N
	815886	E199923N
	815889	H139801N
	815892	C759909N
	815912	I109904N
	815925	I099928N
	815926	I099920N
	815927	I109905N
	815929	I099921N
	815930	I099924N
	815932	I099926N
	815933	I109911N
	815936	F199804N
	815940	J139914N
	815943	J149907N
	815944	J139901N
	815946	J159903N
	815954	J119911N
	815958	J159905N
	815986	J139912N
	815990	N00CA182
815992	N00CA197	
815993	N00CA177	

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BY ENGINE MODEL, ENGINE SERIAL NUMBER and CRANKSHAFT SERIAL NUMBER

Engine Model	Engine S/N	Crankshaft S/N
0-470-S	269469	F209810N
	269471	E319807R
	269473	F199802N
	269478	H129810N
	269487	L039803N
	269490	A279920N
	269491	A279922N
	269494	C169901N
	269496	B199906N
	269497	C149904N
	269498	C149902N
	269499	C179904N
	819001	C169910N
	819005	F259903N
	819006	F259917N
	819017	J149902N
	819018	J149911N
	819019	J119909N
819034	N00CA185	
0-470-U	470759	A299901N
	470764	J139915N
	470765	J139923N
	470767	J139924N
	470769	K049916N
	470776	N00CA183
	813396	F049801N
	813413	H149801N
	813418	H149806N
	813420	H149802N
	813440	L039804N
	813442	L039810N
	813445	L039805N
	813450	A289909N
	813452	A299910N
	813453	A299902N
	813455	A299916N
	813458	A289902N
	813462	C149905N
	813463	C159906N
	813464	C159910N

Engine Model	Engine S/N	Crankshaft S/N
0-470-U	813467	C159915N
	813469	C159913N
	813472	D139903N
	813474	D139902N
	813475	D129908N
	813478	D129907N
	813482	C159912N
	813486	E199921N
	820019	I099927N
	820033	J129911N
	820034	J139913N
	820035	J119908N
	820037	J139919N
	820038	K049905N
	820068	N00CA184
	820069	N00CA202
	820070	J119913N
	10-470-C	295552
295553		F249811N
295554		F259803N
295556		L089802N
295557		B199917N
295558		C189903N
295559		E079906N
295560		H029903N
295561		J189901N
295562		J189902N
295563		K059915N
295564		J159911N
295565		K059906N
295566		K059909N
295567	A030005N	
10-470-D	105644	F179805N
	105648	J079910N
	105649	J049918N
10-470-E	088768	J089924N
	088770	K029911N

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BY ENGINE MODEL, ENGINE SERIAL NUMBER and CRANKSHAFT SERIAL NUMBER

Engine Model	Engine S/N	Crankshaft S/N
I0470F18B	089920	F109815N
	089929	C159918N
	089930	E199909N
	089937	I099901N
I0470H6B	087344	F249812N
I0470K3B	092995	E059810N
	092997	F289908N
	092998	H249816N
	093000	L089809N
	818504	E079903N
	818505	H019902N
	818508	H019904N
	818510	J189903N
	818511	K059910N
	818512	L169908N
I0-470-L	297803	E079807N
	297804	E079813N
	297807	E059811N
	297809	E079820N
	297810	E079815N
	297811	E079821N
	297812	E079810N
	297813	E069908N
	297814	E069805N
	297815	E059807N
	297816	E059812N
	297817	E079816N
	297818	E079817N
	297819	E079904N
	297823	F249806N
	297824	F249810N
	297825	F259802N
	297826	H259802N
	297827	H249813N
	297828	H259812N
	297830	H249810N
	297833	H249808N

Engine Model	Engine S/N	Crankshaft S/N
IO-470-L	297835	H259806N
	297836	F249813N
	297837	H259816N
	297838	H259807N
	297841	H259815N
	297842	F249809N
	297843	F249807N
	297844	H259809N
	297845	H259813N
	297846	H249814N
	297847	L089811N
	297848	L089822N
	297851	L089812N
	297852	L089815N
	297854	L089810N
	297856	L089805N
	297857	L089804N
	297861	B199916N
	297862	B209903N
	297863	B209902N
	297866	C189906N
	297868	C189902N
	297869	C189909N
	297870	C189905N
	297872	B209901N
	297873	C189904N
	297877	E079902N
	297878	E069911N
	297879	E079901N
	297880	E069909N
	297881	E079905N
	297883	E079803N
	297884	E079808N
297885	F289901N	
297886	F289915N	
297887	F289912N	
297888	F289914N	
297889	F289916N	
297890	E079818N	
297893	H029905N	

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AFFECTED ENGINE MODELS
BY ENGINE MODEL, ENGINE SERIAL NUMBER and CRANKSHAFT SERIAL NUMBER

Engine Model	Engine S/N	Crankshaft S/N
IO-470-L	297894	H029906N
	297896	H019905N
	297898	H029901N
	297900	H019906N
	297901	J189908N
	297903	F289903N
	297907	J189909N
	297908	J189906N
	297909	J189911N
	297910	J189907N
	297911	J189904N
	297912	J159910N
	297916	K049920N
	297917	K049922N
	297918	K059912N
	297919	K059905N
	297921	K059914N
	297922	K059908N
	297923	K049923N
	297924	K059916N
	297925	J159912N
	297927	K059901N
	297928	K059913N
	297929	K059917N
	297930	K049921N
	297931	L169912N
	297932	L169907N
	297933	L239901N
	297934	L239912N
	297935	L239911N
	297936	A030007N
	297937	A030010N
	297938	A030006N
	297939	L239907N
	297940	A030008N
	297941	L239909N
	297942	L239908N
	297950	L239910N
	297953	A030011N
	468607	E059808N
	468608	E079823N

Engine Model	Engine S/N	Crankshaft S/N
IO-470-L	468611	E079812N
	468613	L169910N
IO-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
	096720	H259814N
	096722	H259817N
	096724	L089807N
	096725	L089816N
	096726	L089806N
	096727	L089801N
	096728	B199914N
	096729	B199912N
	096730	B209905N
	096732	E069910N
	096734	C189901N
	096735	H019901N
	096736	J189910N
	096737	J159909N
	096738	J159907N
	096739	K059902N
	096741	L239902N
	096742	L239904N
	096743	A030003N
	096745	L239906N
458174	K059904N	
458175	K059907N	
IO-470-S	109389	C119908N
	109390	D089912N

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Engine Model	Engine S/N	Crankshaft S/N
IO-470-S	109391	E019915N
	109397	J089922N
	109398	K019913N
IO-470-V	171207	L089819N
	171213	C159905N
	171214	D099907N
	171216	E019914N
	171217	E019917N
	171218	E039904N
	171219	E049917N
	171220	E049913N
	171222	I089930N
	171225	E039910N
	171228	I099905N
	171229	I079910N
	171231	J079911N
	171232	F109816N
	171234	J079901N
	171235	K019922N
	171236	J089918N
	171237	K029907N
	171239	K029904N
	171242	K029910N
171243	L089905N	
171247	K029909N	
IO-520-A	112834	F159811N
	112852	A229905N
	112855	B179901N
	112856	D089909N
	112860	E189916N
	112861	F109812N
	112867	E069905N
	112870	G149915N
	112873	I079931N
	112876	J079915N
	112877	J069911N
	112882	L079910N

Engine Model	Engine S/N	Crankshaft S/N
IO-520-BA	814329	K029806N
	814346	J109803N
	814347	J119802N
	814348	J119805N
	814350	J289811N
	814353	J099802N
	814354	J099803N
	814355	J289807N
	814357	J299811N
	814359	K029804N
	814361	J299812N
	814362	K249802N
	814363	J299805N
	814364	K259815N
	814365	K259809N
	814368	K259812N
	814369	K249803N
	814370	K309806N
	814371	L019807N
	814373	L029805N
	814375	B109911N
	814376	A159908N
	814382	B099916N
	814383	B099915N
	814384	B119918N
	814385	B119902N
	814388	D069907N
	814389	D079906N
	814390	D069905N
	814409	J299803N
814410	L019810N	
IO-520-BB	580063	B019914N
	580064	B159903N
	580065	C089905N
	813903	K129808N
	813904	I169814N
	813908	I169816N
813912	K169807N	

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Engine Model	Engine S/N	Crankshaft S/N
IO-520-BB	813913	K169803N
	813914	K189810N
	813915	K179801N
	813918	K169809N
	813921	K139803N
	813926	A159917N
	813927	A189904N
	813928	A159920N
	813929	A209907N
	813934	B019910N
	813938	A169910N
	813940	B019911N
	813942	B029902N
	813943	C089901N
	813944	B129907N
	813945	C109915N
	813946	C109907N
	813954	C279901N
	813955	C299901N
	813956	B129910N
	813959	D149902N
	813961	D149913N
	813963	D309904N
	813964	D149912N
	813965	D309902N
	813966	D299913N
	813968	E119911N
820261	K129806N	
IO-520-C	810995	G209802N
	810997	D059908N
	816761	D059905N
	816762	J089808N
	816764	J119808N
	816768	J289801N
	816769	J289809N
	816772	K309805N
	816773	K309807N
	816774	K259801N
	816783	J309810N

Engine Model	Engine S/N	Crankshaft S/N
	816784	J299807N
	816786	K259811N
	816787	L029807N
	816788	L019801N
	816789	K259804N
	816791	L029810N
	816792	K259802N
	816797	A129904N
	816798	A129902N
	816801	B099913N
	816802	B099907N
	816809	B109906N
	816810	B119909N
	816811	B109921N
	816812	B119915N
	816817	D069909N
	816818	D069908N
	816819	D059912N
	816820	D019910N
	816821	D069903N
	816824	D079904N
	816825	D059906N
	816826	D079901N
	816827	D079905N
	816834	J099806N
	816862	B099914N
	816898	L019924N
IO-520-CB	299011	Unknown
	299077	K169812N
	299078	K169805N
	299079	K169804N
	299086	K189809N
	299088	K129802N
	299090	K179811N
	299091	K179810N
	299092	K199802N
	299093	K189812N
299094	K199806N	
299096	K169806N	

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Engine Model	Engine S/N	Crankshaft S/N
IO-520-CB	299097	K189803N
	299099	A159916N
	299107	A169909N
	299108	A209909N
	299112	K189805N
	299114	B049906N
	299117	B129908N
	299124	B129906N
	299125	B019912N
	299126	C109909N
	299127	C269903N
	299129	C269910N
	299130	C269907N
	299131	C279907N
	299132	D079907N
	299134	D079909N
	299135	D079910N
	299138	D149903N
	299140	D149904N
	299143	E119913N
299146	E119906N	
299158	E109910N	
299220	K139805N	
IO-520-D	575935	D089901N
	575939	I099914N
	575942	I079924N
	575943	J119907N
	575946	K019902N
	575947	K019905N
	575948	K029914N
	812979	F179806N
	812981	F179811N
	812982	F099816N
	812983	F189805N
	812987	E059915N
	812996	I079915N
	812997	F169801N
	816504	H039801N
	816512	H099809N

Engine Model	Engine S/N	Crankshaft S/N
IO-520-D	816514	H119801N
	816517	H099802N
	816527	D109912N
	816528	H279812N
	816535	H279818N
	816543	H279814N
	816545	H129806N
	816550	G149908N
	816559	L039815N
	816560	L039813N
	816572	L109803N
	816579	B169914N
	816580	B169906N
	816582	B169916N
	816585	C119903N
	816589	C119910N
	816590	C119916N
	816591	D089905N
	816592	C119915N
	816593	C129908N
	816595	C159923N
	816598	C159901N
	816599	C159904N
	816600	C159902N
	816603	C159922N
	816608	D099904N
	816609	D099909N
	816610	D089914N
	816611	D089916N
	816612	D099908N
	816613	D249913N
	816615	D269905N
	816617	D249907N
	816621	E059902N
	816622	E019918N
	816623	E059906N
816624	E049904N	
816625	E059904N	
816626	E059901N	
816630	E189921N	

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Engine Model	Engine S/N	Crankshaft S/N
IO-520-D	816632	E189902N
	816638	F179808N
	816644	F179817N
	816651	D249906N
	816652	E039912N
	816657	F269906N
	816658	F269909N
	816673	I089927N
	816679	G159902N
	816683	J049917N
	816686	J049932N
	816687	J069913N
	816688	J089906N
	816699	K109939N
	816710	L069903N
IO-520-E	215908	F269901N
	215924	A259909N
	215926	C129917N
	215929	E199908N
	215931	I079902N
	215932	J049920N
	215933	J049937N
	215934	J059904N
	556632	J119905N
	IO-520-F	579250
579252		F109817N
579257		L039818N
579258		B189904N
579259		C129914N
579260		G149906N
579262		I089925N
579263		J049936N
579264		J059908N
579268		N00AA196
579279		N00CA058
814814		D239809N
814827		F049807N
814830		F099814N

Engine Model	Engine S/N	Crankshaft S/N
IO-520-F	814837	F189801N
	814838	F169818N
	814840	F169812N
	814843	F179803N
	814845	F179818N
	814846	E049907N
	814850	F059810N
	814851	E189926N
	814852	F109814N
	814854	F089809N
	814857	F119805N
	814859	F179816N
	814861	F169805N
	814865	E199911N
	814880	E049911N
	814897	F109810N
	814907	H099821N
	814908	D109903N
	814921	E199910N
	814952	L089817N
	814965	A219909N
	814967	A219904N
	814968	A219915N
	814969	A219912N
	814974	A259911N
	814976	A259914N
	814977	B169902N
	814978	B169915N
	814979	B169917N
	814980	B189905N
	814981	B179908N
	814984	B179911N
	814985	B179905N
	814986	B179907N
	814987	C119912N
	814988	C119909N
	814990	C119913N
	814991	C119907N
	814994	B189906N
	814995	C129904N

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Engine Model	Engine S/N	Crankshaft S/N
IO-520-F	814996	C119911N
	814998	C119905N
	814999	C129911N
	815000	C129912N
	818751	C139901N
	818752	C159920N
	818753	C159919N
	818757	C139912N
	818767	D098803N
	818768	D109911N
	818769	D109901N
	818770	D089917N
	818771	D109902N
	818772	D099903N
	818774	D239912N
	818775	D249912N
	818777	D239907N
	818779	D269902N
	818781	D269917N
	818782	D249904N
	818783	E059905N
	818784	E039903N
	818785	E039917N
	818788	E049908N
	818791	E059907N
	818794	E189920N
	818795	E189909N
	818796	E189911N
	818797	E189905N
	818800	H279815N
	818801	E199914N
	818802	E199913N
	818803	F169817N
	818804	E059910N
818807	D109905N	
818809	D109910N	
818816	D239905N	
818835	E059903N	
818890	J089909N	
818892	I089926N	

Engine Model	Engine S/N	Crankshaft S/N
IO-520-F	818901	J049915N
	818906	J049933N
	818907	J059927N
	818908	J049923N
	818909	J059902N
	818910	J079907N
	818915	J119904N
	818916	J089904N
	818929	K029918N
	818943	L079915N
	818949	L109921N
	818979	N00CA107
	818986	N00CA146
	IO-520-K	224140
IO-520-L	294911	F059807N
	294912	F169806N
	294913	E189917N
	294916	F109809N
	294917	E039905N
	294930	E189925N
	294938	E059913N
	294941	H279817N
	294943	E189919N
	294947	E189915N
	294958	A219905N
	294959	A229911N
	294960	A219914N
	294962	A219913N
	294963	A259913N
	294965	A279901N
	294970	C129903N
	294971	C119918N
	294973	C139907N
	294974	C159903N
	294977	D089911N
	294979	D109906N
	294980	D089907N
	294982	D239908N

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Engine Model	Engine S/N	Crankshaft S/N
IO-520-L	294983	D269908N
	294985	E039901N
	294988	E059917N
	294989	E199904N
	294990	E189807N
	294991	E199906N
	294992	E189908N
	294996	D109907N
	295001	L109801N
	295018	I099913N
	295019	I089923N
	295020	J079905N
	295021	J079902N
	295029	I089924N
	295039	F119804N
	295046	L029903N
	295067	N00CA132
	577234	F269913N
	577237	K029903N
	IO-520-M	811623
811625		J099809N
811630		K259814N
811632		A159907N
811634		B109920N
811635		B109912N
811642		B109909N
811644		D019912N
811645		D019906N
811646		D019903N
811650		D019907N
811652		D059910N
IO-520-MB		277688
	277721	I229809N
	277725	K129809N
	277726	K139801N
	277727	K179802N
	277728	K199803N
	277730	K179807N

Engine Model	Engine S/N	Crankshaft S/N
IO-520-MB	277733	A169906N
	277738	B029903N
	277739	B129915N
	277747	E019902N
	277748	C279902N
	277752	D149908N
	277753	D149907N
	277781	K139802N
	LTSIO-520-AE	246675
246676		G159913N
246679		G159909N
246680		G159918N
246684		G159914N
TSIO-520-AE	246177	G169904N
	246178	F1999203
	246179	G169903N
TSIO-520-AF	245248	F169815N
	246177	G169904N
	246178	F1999203
	246179	G169903N
TSIO-520-B	176762	L029808N
	176763	J099810N
	176765	A139906N
	176766	B119912N
	176767	B119914N
	176770	B109904N
	176776	D059904N
TSIO-520-BB	287616	K169801N
	287618	C089904N
	287619	C089903N
	287620	E119909N
	287621	D299911N
	287622	D149911N

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BY ENGINE MODEL, ENGINE SERIAL NUMBER and CRANKSHAFT SERIAL NUMBER

Engine Model	Engine S/N	Crankshaft S/N
TSIO-520-C	178539	L079909N
	178542	F179813N
	178560	B169911N
	178565	A039911N
	178566	E039908N
	178572	J079906N
	178573	J049916N
	178574	J059912N
	178575	J059910N
	178576	J089905N
TSIO-520-CE	268583	C039923N
	268585	C039920N
	268586	C039919N
	268590	L139901N
	530169	C039922N
	530172	L139902N
	530173	L139914N
TSIO-520-D	180110	J319803N
	180111	B109902N
TSIO-520-E	183520	J109806N
	812599	J089807N
	812601	J089809N
	812602	J109804N
	812603	I109810N
	812611	J319802N
	812612	J299808N
	812614	K309803N
	812615	K259806N
	812616	K259808N
	812617	K309808N
	812619	L029804N
	812620	K249805N
	812621	K259813N
	812622	K259810N
	812623	K259807N
	812624	A139904N
812625	A139901N	

Engine Model	Engine S/N	Crankshaft S/N
TSIO-520-E	812630	L029803N
	812631	A139903N
	812632	B099910N
	812633	B119901N
	812634	B109915N
	812635	D019905N
	812638	D019911N
	812640	J289810N
TSIO-520-EB	815023	F169808N
	815032	K179806N
	815035	C089906N
	815038	C279911N
	815040	C269906N
	815042	D149915N
	815043	E119918N
815057	K129801N	
TSIO-520-G	216053	E039906N
TSIO-520-H	217409	F109808N
	217412	E189928N
	217420	B169904N
	217423	C119904N
	217424	D109908N
	217426	E189918N
	217428	F269905N
	506894	F129806N
	506895	K019921N
TSIO-520-J	218992	B099917N
TSIO-520-JB	237193	A159911N
	237194	C279906N
TSIO-520-L	241973	A129901N
	241974	A129903N
TSIO-520-LB	815504	B049904N

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Engine Model	Engine S/N	Crankshaft S/N
TSIO-520-M	291964	F109803N
	291969	E199912N
	291978	I079932N
	291981	F119806N
	291985	H279805N
	291986	H279808N
	532083	F049809N
	532085	H279804N
	532088	L109804N
	532089	A219901N
	532091	D089906N
	532092	D249901N
	532093	C119906N
	532095	E049910N
	532096	E049903N
	532099	J049928N
	532100	J059906N
	532101	J069917N
	532102	J079903N
	532106	K029915N
	532115	N00AA186
	532118	N00CA065
	818001	L069802N
	818007	A229901N
	818008	A219917N
	818010	A229906N
	818011	L099809N
	818015	B169908N
	818016	B179906N
	818017	B179916N
	818018	B169905N
	818020	C159921N
	818021	C139908N
818022	D099905N	
818023	D089913N	
818024	D099906N	
818026	D269906N	
818027	C119902N	
818028	E019912N	
818030	E189910N	

Engine Model	Engine S/N	Crankshaft S/N
TSIO-520-M	818031	E189903N
	818041	E069901N
	818072	F179814N
	818075	I099906N
	818079	I089922N
	818081	J079916N
	818084	J089907N
	818087	K019912N
	818098	L109903N
	818107	L089906N
	818126	L099912N
	818144	N00CA135
TSIO-520-NB	813634	K179808N
	813635	A159918N
	813636	A159914N
	813637	B129913N
	813638	B159911N
	813639	B159910N
	813640	B159909N
	813641	B159908N
	813644	C109914N
	813645	C279909N
	813646	D079911N
	813647	D079908N
	813652	C109913N
	813654	D299907N
	813655	D309901N
	813657	E119903N
	813660	E119910N
813685	C109912N	
TSIO-520-P	278820	E059912N
	278823	F129803N
	278832	B169912N
	278833	E039915N
	278834	E069904N
	278835	E189914N
	278836	E199907N
	278845	E039913N

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BY ENGINE MODEL, ENGINE SERIAL NUMBER and CRANKSHAFT SERIAL NUMBER

Engine Model	Engine S/N	Crankshaft S/N
TSIO-520-P	278856	I089920N
	513922	J049924N
TSIO-520-R	293969	E069906N
	293978	F049808N
	293979	F089805N
	293992	F179804N
	293993	F169816N
	294008	E019910N
	294014	H279816N
	294051	B169909N
	294052	B169907N
	294054	B189903N
	294055	C119901N
	294059	B169903N
	294063	E019919N
	294066	E059918N
	294068	E189922N
	294069	E189904N
	294070	E189924N
	294072	D099902N
	294073	D099911N
	294076	H279807N
	294085	F269902N
	294105	C309909N
	294107	H209919N
	294111	J059901N
	294113	I099912N
	294115	I079925N
	294116	I089910N
	294118	I079923N
	294119	J049919N
	294121	J049922N
	294122	J059921N
	294123	J089927N
	294124	J069918N
294126	J089913N	
294128	J089916N	
294154	N00CA001	
294166	N00CA054	

Engine Model	Engine S/N	Crankshaft S/N
TSIO-520-R	294171	N00CA059
	522703	E039918N
	522706	J069909N
	522709	J089910N
	522712	J049926N
	522720	N00CA006
TSIO-520-T	239465	I089918N
	239474	A259910N
	239475	B189902N
	239476	C129910N
	239477	C129916N
	239478	C139903N
	239484	D089908N
	239489	F269910N
	239493	J059926N
	239498	L109904N
	TSIO-520-UB	527425
527427		K169811N
527428		A169908N
527430		B049905N
527431		C089902N
527432		C279908N
527433		D149905N
527434		D299916N
527477		E109913N
809347		K169813N
809352		K179803N
809354		A169905N
809357		B159902N
809358		E019907N
TSIO-520-VB	816019	I189801N
	816034	D299915N
	816036	K149804N
	816037	K189806N
	816038	K199804N
	816039	K149802N
816041	K189808N	

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Engine Model	Engine S/N	Crankshaft S/N
TSIO-520-VB	816044	K189802N
	816047	K179805N
	816050	A169914N
	816052	A169903N
	816053	A169902N
	816054	A169912N
	816055	A189901N
	816056	A169913N
	816057	B019915N
	816058	B039902N
	816061	A169907N
	816063	B159901N
	816064	B159912N
	816065	B159904N
	816067	B159905N
	816068	B159906N
	816069	B029904N
	816070	C269905N
	816072	C279904N
	816073	C279910N
	816075	C279905N
	816079	C269909N
	816080	D149910N
	816081	D149906N
	816086	D149914N
	816087	D299910N
	816088	E019904N
	816089	E109909N
	816090	E119905N
	816092	E119904N
	816093	E119902N
TSIO-520-WB	274437	K129805N
	274438	K199805N
	274439	K169815N
	274443	C279912N
	274450	E119901N
IO-550-A	280488	I189814N
	280490	I199805N

Engine Model	Engine S/N	Crankshaft S/N
IO-550-A	280491	I219815N
	280493	J269804N
	280495	I199802N
	280497	J239802N
	280498	J239810N
	280499	J239803N
	817001	J279805N
	817002	K209806N
	817005	J279806N
	817006	A209902N
IO-550-B	296625	K229809N
	297088	K229810N
	297102	I169810N
	297103	I189815N
	297104	I199804N
	297105	I229805N
	297106	I219821N
	297108	I219802N
	297114	I189813N
	297115	J249810N
	297116	I209802N
	297117	I189816N
	297118	J259804N
	297119	J259805N
	297120	J269801N
	297121	J269812N
	297122	K209807N
	297124	K219801N
	297125	J279810N
	297128	J259812N
	297129	K219803N
	297131	K229802N
	297133	K239808N
	297134	K209801N
	297136	K209802N
	297138	K199808N
	297139	A199904N
297140	A199906N	

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BY ENGINE MODEL, ENGINE SERIAL NUMBER and CRANKSHAFT SERIAL NUMBER

Engine Model	Engine S/N	Crankshaft S/N
IO-550-B	297141	A189910N
	297142	A209906N
	297144	A209904N
	297145	A209905N
	297149	B059901N
	297153	K209813N
	297154	B039916N
	297157	B059908N
	297161	C249909N
	297163	C299911N
	297164	C249901N
	297165	C259902N
	297166	C259908N
	297167	C299910N
	297170	K239802N
	297172	K199807N
	297187	J239809N
	684005	I169807N
	684006	I219812N
	684009	J249806N
	684010	J279807N
	684011	J279809N
	684015	J259811N
	684016	J269808N
	684017	J269811N
	684020	K239807N
	684021	K239805N
	684022	K239803N
	684023	K209810N
	684025	K199812N
	684026	B039913N
	684027	A199901N
	684029	A199903N
	684030	B039915N
	684031	B039912N
684032	B039907N	
684033	B039910N	
684034	B099901N	
684035	B099905N	

Engine Model	Engine S/N	Crankshaft S/N	
IO-550-B	684036	B099903N	
	684037	B099902N	
	684038	C059907N	
	684039	C059903N	
	684040	C059905N	
	684041	C069901N	
	684042	C239916N	
	684043	C239917N	
	684044	C259903N	
	684045	C259904N	
	684046	C259909N	
	684048	C319910N	
	684050	C309901N	
	684051	C309903N	
	684052	D299906N	
	684053	D299905N	
	684110	I179802N	
	684113	K199811N	
	684114	B059920N	
	684115	C069911N	
	684119	A319916N	
	684121	C069905N	
	684745	J279808N	
	IO-550-C	684239	I219823N
		684240	I219819N
		684243	I229806N
		684247	I229807N
		684248	I219811N
684249		I219809N	
684250		J249805N	
684252		J249811N	
684253		J269805N	
684254		J249807N	
684255		J249809N	
684256		J279803N	
684257		J279802N	
684258		J279801N	
684259	J279804N		
684261	K209815N		

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BY ENGINE MODEL, ENGINE SERIAL NUMBER and CRANKSHAFT SERIAL NUMBER

Engine Model	Engine S/N	Crankshaft S/N
IO-550-C	684262	K229804N
	684263	K239809N
	684264	K209805N
	684266	K209811N
	684267	K199809N
	684268	K209808N
	684269	K209812N
	684270	A209901N
	684271	A189913N
	684274	B039914N
	684276	B049910N
	684277	B039906N
	684278	B049907N
	684279	B049908N
	684280	B089901N
	684281	B059918N
	684282	B059922N
	684283	B059917N
	684284	C059910N
	684285	C059904N
	684287	C059906N
	684288	C239913N
	684290	C239915N
	684291	C239914N
	684292	C309904N
	684293	C29990GN
	684294	C309905N
	684295	C259910N
	684296	D289903N
	684297	D289901N
	684298	D279904N
	684300	D279902N
	684301	D289904N
	684303	D299903N
	684304	D299904N
	684368	I169812N
684369	I179803N	
684370	I199801N	
684371	I179804N	
684419	B089910N	

Engine Model	Engine S/N	Crankshaft S/N
IO-550-C	684532	C069910N
	684533	C069908N
	684535	C259907N
	684536	C259905N
	815291	I209804N
	815292	I219804N
	815293	J259801N
	815294	J259802N
	815298	I219813N
	815299	I219814N
	815301	I219818N
	815302	I219824N
	815304	I199806N
	815306	J239805N
	815307	J239807N
	815308	J239808N
	815309	J239806N
	815310	J239801N
	815311	J269803N
	815313	J279812N
	815314	K229801N
	815316	K199810N
	815317	A189906N
	815319	K209818N
	815321	B099904N
	815322	B059916N
	815323	A199908N
	815325	B089907N
	815328	C069909N
	815329	C069903N
	815330	B059903N
	815333	C249902N
	815335	C259906N
	815339	B059910N
	815340	C299908N
	815342	C009904N
815344	B059913N	
815347	C319902N	
815378	F129905N	
815383	I169809N	

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BY ENGINE MODEL, ENGINE SERIAL NUMBER and CRANKSHAFT SERIAL NUMBER

Engine Model	Engine S/N	Crankshaft S/N
10-550-D	284299	D179916N
	284313	A309910N
	284314	A309903N
	284315	A309902N
	284316	B019904N
	284317	B019905N
	284318	A309906N
	284319	A309904N
	284321	D179909N
	284322	D179903N
	284323	D199904N
	284324	D179915N
	284330	G169910N
	284331	G169911N
	284335	J019903N
	284336	J019922N
	284340	J019913N
	284341	J019918N
	284342	J019911N
	284351	J049912N
284355	K069906N	
680020	A309901N	
10-550-E	283391	B019906N
	283395	D179902N
	283398	D199905N
	283405	N00CA227
10-550-F	284848	D179907N
	284881	J049909N
	284887	J049902N
	284900	A309909N
	284901	A309908N
	284902	B019903N
	284904	B019902N
	284905	B019901N
	284909	D199911N
	284911	D199907N
	284913	D179913N
	284914	D179911N

Engine Model	Engine S/N	Crankshaft S/N
10-550-F	284915	D189902N
	284924	J019912N
	284931	J019904N
	284932	J019920N
	284933	J019915N
	284949	N00CA215
	679523	D179908N
	679532	J049908N
	913750	D199910N
10-550-G	679339	I169808N
	679343	I229801N
	679347	I209801N
	679348	J259810N
	679349	J259808N
	679352	I209803N
	679353	I229802N
	679363	I189817N
	679364	J259809N
	679366	C319906N
	679367	K219804N
	679368	J269807N
	679370	J269802N
	679371	J239804N
	679372	K209809N
	679373	K229806N
	679377	K229808N
	679378	K209814N
	679379	A189907N
	679380	B039909N
	679381	K229805N
	679382	K209816N
	679383	A189911N
	679384	B039911N
	679385	B059914N
	679386	B059902N
	679387	B089902N
679388	B059921N	
679389	B059911N	
679390	B089909N	

AFFECTED ENGINE MODELS
BY ENGINE MODEL, ENGINE SERIAL NUMBER and CRANKSHAFT SERIAL NUMBER

Engine Model	Engine S/N	Crankshaft S/N
IO-550-G	679391	B059905N
	679392	B089904N
	679393	I219805N
	679394	C069906N
	679395	C059902N
	679396	C069907N
	679397	C059913N
	679398	B089906N
	679399	C249906N
	679400	C2999909
	679401	C249903N
	679402	C249904N
	679403	C299907N
	679404	C309906N
	679405	C319908N
	679437	C249910N
	679438	C059914N
	679439	C319901N
	808508	J269809N
	808509	C309902N
IO-550-L	289130	D179901N
	289148	D199908N
	289149	D199909N
	289152	J019902N
	289153	J019907N
	289154	J049910N
	289155	J049911N
	289161	N00BA593
	289163	N00CA228
IO-550-N	683354	J269810N
	683356	B089908N
	683357	C059911N
	683358	C059916N
	683359	C269902N
TSIO-550-C	802589	J259803N
	802590	K219805N
	802591	I219803N

Engine Model	Engine S/N	Crankshaft S/N
TSIO-550-C	802592	C319904N
	814506	I169811N
	814507	J249802N
	814509	J279811N
	814512	B059907N
	814514	A209903N
TSIO-550-E	803067	C319905N
	803071	B059915N
	803072	B089903N
	803073	B059906N
	803074	B059912N
	803075	B059904N
	803077	I219801N
	803078	A189908N
	803079	J269806N
	803080	K219802N
	803081	A199907N
	803086	B049911N
	803087	C069902N
	803088	B089905N
803089	C059912N	
803090	C249907N	
803091	C249911N	
803095	C249905N	
803097	C259911N	
TSIO-L550-A	809259	I219806N

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BY CRANKSHAFT PART NUMBER AND SERIAL NUMBER

Part Number	Serial Number	Part Number	Serial Number	Part Number	Serial Number
646623	A309905N	649134	B119903N	649134	D249905N
646623	A309907N	649134	B179902N	649134	D249908N
646623	D179904N	649134	B179904N	649134	D249910N
646623	D179905N	649134	B179909N	649134	D249911N
646623	D179906N	649134	B179910N	649134	D249914N
646623	D179910N	649134	B179913N	649134	D249915N
646623	D179912N	649134	B179914N	649134	D249916N
646623	D179914N	649134	B179918N	649134	D249917N
646623	D189901N	649134	B189901N	649134	D249918N
646623	D189903N	649134	C119914N	649134	D269901N
646623	D189904N	649134	C119917N	649134	D269903N
646623	D189905N	649134	C129902N	649134	D269904N
646623	D189906N	649134	C129905N	649134	D269907N
646623	D199901N	649134	C129906N	649134	D269909N
646623	D199902N	649134	C129907N	649134	D269910N
646623	D199903N	649134	C129909N	649134	D269911N
646623	D199906N	649134	C129913N	649134	D269912N
646623	J019908N	649134	C129915N	649134	D269913N
646623	J019914N	649134	C139904N	649134	D269914N
646623	J019923N	649134	C139905N	649134	D269915N
646623	J049907N	649134	C139906N	649134	D269916N
646623	J049913N	649134	C139909N	649134	D269918N
646623	N00CA212	649134	C139910N	649134	E039902N
646623	N00CA218	649134	C139911N	649134	E039907N
646623	N00CA219	649134	C149913N	649134	E039909N
646623	N00CA225	649134	D089903N	649134	E039911N
649131	B179917N	649134	D089915N	649134	E049901N
649131	N00CA340	649134	D099901N	649134	E049902N
649131	N00CA342	649134	D099910N	649134	E049906N
649131	N00CA363	649134	D109904N	649134	E059908N
649131	N00CS353	649134	D109909N	649134	E059914N
649133	K029912N	649134	D239901N	649134	E059916N
649134	A219916N	649134	D239902N	649134	E059919N
649134	A229902N	649134	D239903N	649134	E059920N
649134	A229903N	649134	D239904N	649134	E069902N
649134	A229913N	649134	D239906N	649134	E189913N
649134	A259908N	649134	D239909N	649134	E189923N
649134	A259912N	649134	D239910N	649134	E189927N
649134	A259916N	649134	D239911N	649134	E199902N
649134	A279902N	649134	D249902N	649134	E199903N
649134	A279903N	649134	D249903N	649134	E199905N

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

649134	F099810N	649134	H109804N	649134	J059919N
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649134	F109811N	649134	H209910N	649134	J059922N
649134	F109818N	649134	H209917N	649134	J059923N
649134	F119801N	649134	H239906N	649134	J059924N
649134	F119802N	649134	H239916N	649134	J069901N
649134	F119803N	649134	I079913N	649134	J069902N
649134	F119807N	649134	I079914N	649134	J069914N
649134	F119808N	649134	I079917N	649134	J069916N
649134	F119809N	649134	I079919N	649134	J079904N
649134	F119810N	649134	I079920N	649134	J079909N
649134	F119811N	649134	I079921N	649134	J079912N
649134	F119812N	649134	I079926N	649134	J079913N
649134	F129801N	649134	I079928N	649134	J079914N
649134	F129805N	649134	I089901N	649134	J079917N
649134	F129811N	649134	I089904N	649134	J089902N
649134	F159807N	649134	I089907N	649134	J089919N
649134	F159809N	649134	I089908N	649134	J089920N
649134	F169802N	649134	I089909N	649134	J089923N
649134	F169814N	649134	I089911N	649134	J089926N
649134	F179802N	649134	I089912N	649134	J119901N
649134	F179812N	649134	I089913N	649134	K019910N
649134	F179815N	649134	I089914N	649134	K019915N
649134	F189802N	649134	I089915N	649134	K019923N
649134	F189803N	649134	I089916N	649134	K029901N
649134	F199801N	649134	I089917N	649134	K029902N
649134	F269911N	649134	I089919N	649134	L039816N
649134	F269912N	649134	I089921N	649134	L039817N
649134	F269915N	649134	I089928N	649134	L049803N
649134	F269916N	649134	I089929N	649134	L079908N
649134	G149909N	649134	I099902N	649134	L089901N
649134	G149910N	649134	I099903N	649134	L089903N
649134	G149911N	649134	I099904N	649134	L099909N
649134	G149912N	649134	I099910N	649134	L099911N
649134	G149913N	649134	I099916N	649134	L099913N
649134	G149916N	649134	J059903N	649134	L099917N
649134	G149919N	649134	J059905N	649134	L109802N
649134	G159901N	649134	J059907N	649134	L109906N
649134	G159905N	649134	J059909N	649134	N00AA189
649134	G159906N	649134	J059911N	649134	N00AA190
649134	H099818N	649134	J059914N	649134	N00AA192
649134	H109803N	649134	J059915N	649134	N00AA193

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

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649134	N00CA344	649141	C179902N	649895	B099912N
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649134	N00CA352	649141	D129905N	649895	B109901N
649134	N00CA353	649141	E199918N	649895	B109903N
649134	N00CA354	649141	E199920N	649895	B109917N
649134	N00CA355	649141	E199922N	649895	B109918N
649134	N00CA358	649141	F049805N	649895	B109922N
649134	N00CA377	649141	F209801N	649895	B119904N
649134	N00CA381	649141	F209802N	649895	B119905N
649135	F109813N	649141	F209803N	649895	B119906N
649135	H029908N	649141	H139809N	649895	B119907N
649135	L089902N	649141	H139810N	649895	B119908N
649138	A289905N	649141	H139815N	649895	B119910N
649138	A289913N	649141	I099925N	649895	B119916N
649138	B189910N	649141	I109907N	649895	B119917N
649138	B199905N	649141	J119919N	649895	D019901N
649138	C149901N	649141	J129916N	649895	D019902N
649138	C149903N	649141	J139909N	649895	D019908N
649138	C149906N	649141	J139920N	649895	D019909N
649138	C169902N	649141	J139922N	649895	D059902N
649138	D129912N	649141	K049904N	649895	D059903N
649138	D139900N	649141	K049912N	649895	D059907N
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649138	H149804N	649141	L029816N	649895	D069901N
649138	J119910N	649141	L039807N	649895	D069902N
649138	J129903N	649141	L109812N	649895	D069904N
649138	J149904N	649144	G159917N	649895	D069906N
649138	L039806N	649148	L139904N	649895	D079903N
649138	N00CA174	649148	L139906N	649895	F189908N
649138	N00CA203	649148	L139910N	649895	I109811N
649141	A279919N	649148	L139911N	649895	I119811N
649141	A2799A9N	649148	L139912N	649895	I119812N
649141	A299905N	649148	N00BA523	649895	J089802N
649141	A299907N	649895	A139902N	649895	J089810N
649141	A299909N	649895	A139905N	649895	J099801N
649141	B189907N	649895	A159902N	649895	J099804N
649141	B189908N	649895	A159903N		

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Part Number	Serial Number	Part Number	Serial Number	Part Number	Serial Number
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649895	J099811N	649896	B109916N	649898	B129901N
649895	J099812N	649896	D019904N	649898	B129902N
649895	J099815N	649896	D059901N	649898	B129903N
649895	J099816N	649896	D079902N	649898	B129904N
649895	J119801N	649896	G209816N	649898	B129905N
649895	J119804N	649896	J109802N	649898	B129909N
649895	J289802N	649896	J119803N	649898	B129911N
649895	J289803N	649896	J289804N	649898	B129912N
649895	J289806N	649896	J289805N	649898	B129914N
649895	J289808N	649896	K029801N	649898	B129916N
649895	J299801N	649896	K029803N	649898	C099901N
649895	J299809N	649896	K309804N	649898	C099902N
649895	J299813N	649896	K309809N	649898	C099903N
649895	J309803N	649896	K309810N	649898	C099904N
649895	J309807N	649896	L019802N	649898	C099905N
649895	J309808N	649898	A139915N	649898	C099906N
649895	J309809N	649898	A159912N	649898	C109901N
649895	J319801N	649898	A159913N	649898	C109903N
649895	J319804N	649898	A159915N	649898	C109904N
649895	J319805N	649898	A159919N	649898	C109905N
649895	K249801N	649898	A169901N	649898	C109906N
649895	K259803N	649898	A169904N	649898	C109908N
649895	K259805N	649898	A169911N	649898	C109910N
649895	K309802N	649898	A169915N	649898	C109911N
649895	L019803N	649898	A189903N	649898	C109916N
649895	L019805N	649898	A209908N	649898	C109917N
649895	L019806N	649898	A209910N	649898	C269908N
649895	L019808N	649898	A209912N	649898	C299902N
649895	L019809N	649898	A209913N	649898	C299903N
649895	L029801N	649898	A209914N	649898	C299904N
649895	L029802N	649898	B019907N	649898	C299905N
649895	L029806N	649898	B019909N	649898	D149909N
649895	L029809N	649898	B019913N	649898	D299908N
649895	L309808N	649898	B029901N	649898	D299909N
649896	A159901N	649898	B039901N	649898	D299912N
649896	B099908N	649898	B039903N	649898	D299914N
649896	B099911N	649898	B039904N	649898	D309905N
649896	B109905N	649898	B049901N	649898	E019903N
649896	B109908N	649898	B049903N	649898	E019905N
649896	B109910N	649898	B109907N	649898	E109908N

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

Part Number	Serial Number	Part Number	Serial Number	Part Number	Serial Number
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649898	E119908N	649900	D279906N	652010	E069806N
649898	E119912N	649900	D299901N	652010	E069807N
649898	E119915N	649900	D299902N	652010	E069809N
649898	I139813N	649900	E079909N	652010	E079802N
649898	I169813N	649900	I179801N	652010	E079805N
649898	I169815N	649900	I219816N	652010	F259806N
649898	I189808N	649900	I219820N	652010	F289905N
649898	K129803N	649900	J039809N	652010	F289910N
649898	K129807N	649900	J239811N	652010	F289913N
649898	K129810N	649900	J249808N	652010	F289917N
649898	K129811N	649900	K198910N	652010	H019903N
649898	K139804N	649900	K209803N	652010	H029902N
649898	K149801N	649900	K209817N	652010	H029904N
649898	K149803N	649900	K229803N	652010	H249807N
649898	K149805N	649900	K229807N	652010	H249815N
649898	K149806N	652004	N00CA556	652010	H249817N
649898	K169802N	652004	N00CA560	652010	H249818N
649898	K169808N	652004	N00CA561	652010	H259801N
649898	K169810N	652004	N00CA565	652010	H259804N
649898	K169814N	652004	N00CA566	652010	H259808N
649898	K179804N	652004	N00CA567	652010	H259818N
649898	K179809N	652004	N00CA569	652010	K049918N
649898	K189804N	652006	E079822N	652010	K049919N
649898	K189807N	652009	B199913N	652010	K059903N
649898	K189811N	652009	E079801N	652010	K059911N
649898	K199801N	652009	F259801N	652010	L089803N
649898	L189808N	652009	F259804N	652010	L089813N
649900	A199902N	652009	F289906N	652010	N00CA562
649900	B059909N	652009	H259803N	652010	N00CA570
649900	C059915N	652009	H259805N	652011	A030002N
649900	C069904N	652009	H259811N	652011	A030004N
649900	C259901N	652009	J159908N	652011	B189914N
649900	C269901N	652009	L169909N	652011	B209906N
649900	C269904N	652009	N00CA557	652011	C189907N
649900	C299909N	652009	N00CA559	652011	C189908N
649900	C319903N	652009	N00CA571	652011	E069803N
649900	C319907N	652009	N00CA576	652011	E069907N
649900	C319909N	652010	A030009N	652011	E079804N
649900	C319911N	652010	B199915N	652011	E079806N
649900	D279901N	652010	B209904N	652011	E079811N

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BY CRANKSHAFT PART NUMBER AND SERIAL NUMBER

Part Number	Serial Number
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652011	F289904N
652011	F289907N
652011	H249812N
652011	J189905N
652011	L089808N
652011	L089814N
652011	L239903N
652011	L239905N
652011	N00CA575
652039	A299908N
652039	F049803N
653129	I249803N
653129	I249804N
653129	I249810N
653129	I259801N
653129	I309803N
653129	I309804N
653129	J019801N
653129	J019803N
653129	K069814N
653136	I239801N
653136	I239803N
653136	I239805N
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653136	I239807N
653136	I239808N
653136	I239809N
653136	I239810N
653136	I239811N
653136	K059811N
653136	K079804N
653136	K079810N

Part Number	Serial Number
653137	J029802N
653137	J029803N
653137	J029804N
653138	J259705N
653139	J029807N
653139	J059802N
653139	J059803N
653139	J059807N
653139	J059809N
653139	J059810N
653139	J059811N
653139	J059812N
653139	N00AA049
654432	A189909N
654432	A189912N
654432	A199905N
654432	C059909N
654432	C299906N
654432	I219808N
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654432	I219817N
654432	I229804N
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655213	B019908N

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AFFECTED CRANKSHAFTS
BY CRANKSHAFT SERIAL NUMBER AND PART NUMBER

Serial Number	Part number	Serial Number	Part number	Serial Number	Part number
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A030004N	652011	A299905N	649141	B119916N	649895
A030009N	652010	A299907N	649141	B119917N	649895
A139902N	649895	A299908N	652039	B129901N	649898
A139905N	649895	A299909N	649141	B129902N	649898
A139915N	649898	A309905N	646623	B129903N	649898
A159901N	649896	A309907N	646623	B129904N	649898
A159902N	649895	B019907N	649898	B129905N	649898
A159903N	649895	B019908N	655213	B129909N	649898
A159904N	649895	B019909N	649898	B129911N	649898
A159905N	649895	B019913N	649898	B129912N	649898
A159912N	649898	B029901N	649898	B129914N	649898
A159913N	649898	B039901N	649898	B129916N	649898
A159915N	649898	B039903N	649898	B179902N	649134
A159919N	649898	B039904N	649898	B179904N	649134
A169901N	649898	B049901N	649898	B179909N	649134
A169904N	649898	B049903N	649898	B179910N	649134
A169911N	649898	B059909N	649900	B179913N	649134
A169915N	649898	B099906N	649895	B179914N	649134
A189903N	649898	B099908N	649896	B179917N	649131
A189909N	654432	B099909N	649895	B179918N	649134
A189912N	654432	B099911N	649896	B189901N	649134
A199902N	649900	B099912N	649895	B189907N	649141
A199905N	654432	B099918N	649895	B189908N	649141
A209908N	649898	B109901N	649895	B189910N	649138
A209910N	649898	B109903N	649895	B189914N	652011
A209912N	649898	B109905N	649896	B199901N	649141
A209913N	649898	B109907N	649898	B199905N	649138
A209914N	649898	B109908N	649896	B199909N	649141
A219808N	649895	B109910N	649896	B199913N	652009
A219916N	649134	B109913N	649898	B199915N	652010
A229902N	649134	B109914N	649896	B209904N	652010
A229903N	649134	B109916N	649896	B209906N	652011
A229913N	649134	B109917N	649895	C059909N	654432
A259908N	649134	B109918N	649895	C059915N	649900
A259912N	649134	B109922N	649895	C069904N	649900
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A279902N	649134	B119904N	649895	C099902N	649898
A279903N	649134	B119905N	649895	C099903N	649898
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A2799A9N	649141	B119907N	649895	C099905N	649898

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BY CRANKSHAFT SERIAL NUMBER AND PART NUMBER

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C109901N	649898	C299902N	649898	D179910N	646623
C109903N	649898	C299903N	649898	D179912N	646623
C109904N	649898	C299904N	649898	D179914N	646623
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C109917N	649898	C319911N	649900	D199902N	646623
C119914N	649134	D019901N	649895	D199903N	646623
C119917N	649134	D019902N	649895	D199906N	646623
C129902N	649134	D019904N	649896	D239901N	649134
C129905N	649134	D019908N	649895	D239902N	649134
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C139910N	649134	D069904N	649895	D249908N	649134
C139911N	649134	D069906N	649895	D249910N	649134
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Serial Number	Part number	Serial Number	Part number	Serial Number	Part number
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BY CRANKSHAFT SERIAL NUMBER AND PART NUMBER

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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

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

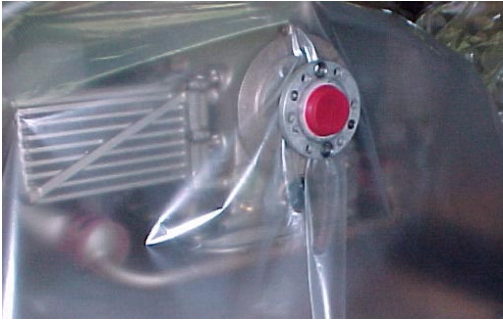


FIGURE 1
PROTECTIVE PLASTIC COVER

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.

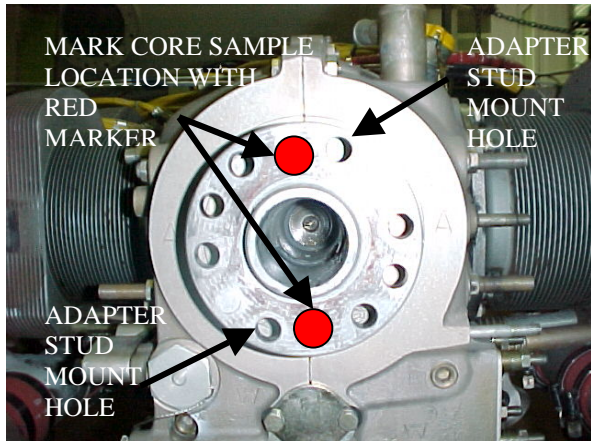


FIGURE 2
FLANGE CORE SAMPLE AREA MARKED

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.

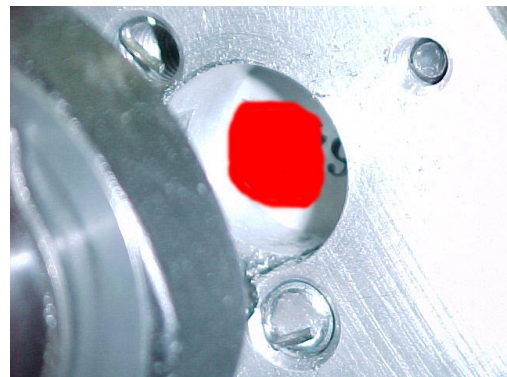


FIGURE 3
VERIFICATION OF CORING SAMPLE LOCATION & TOOL ALIGNMENT

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

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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

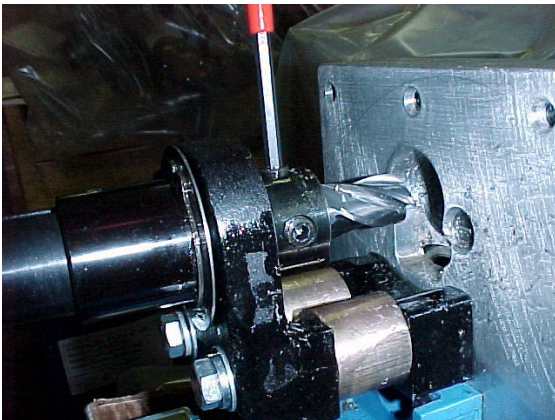


FIGURE 5
INSTALLING END MILL

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.

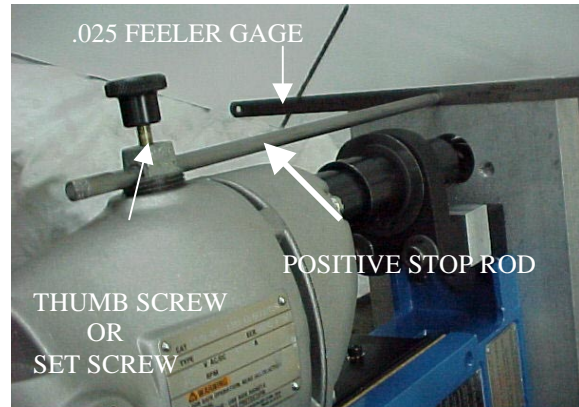


FIGURE 6
POSITIVE STOP ROD SET-UP FOR
.025 SPOT FACE

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.

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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 from the work surface to clear the cutting flutes of machining debris. See Figure 9.

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- 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.**

NOTE: Rotobroach will require replacement after coring 2 to 3 crankshafts. Tool life is dependent on maintaining the proper feed rate pressure and providing a continuous and generous flow of lubricant/coolant (LPS-1) during the coring operation.

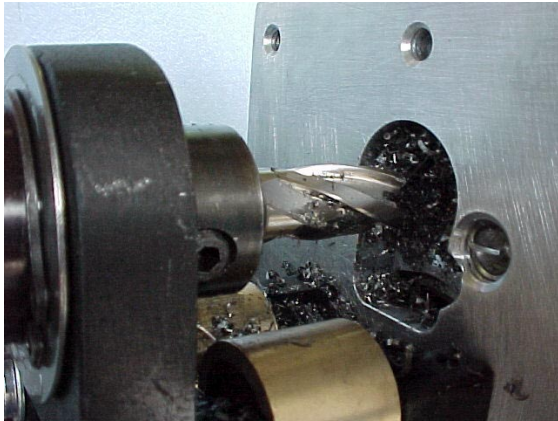


FIGURE 9
ROTOBROACH TAKING CORE SAMPLE

- 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.
- Loosen the allen set screw and remove the rotobroach and propeller flange core sample from the boring tool chuck.
- Remove the core sample from the rotobroach and place it in the self sealing plastic bag provided. See Figure 10.
- Fill out the label on the front of the self-sealing plastic bag in its entirety.

- 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.
- Remove the boring tool and adapter plate from the propeller flange.



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

- Clean the machining debris from the boring tool adapter plate and from the propeller flange.
- Position the boring tool and adapter plate 180 degrees from its previous position to machine the second core sample.
- 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.
- 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.
- To obtain the second propeller flange core sample repeat PART D steps 1 through 14 and PART E steps 1 through 12.

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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.

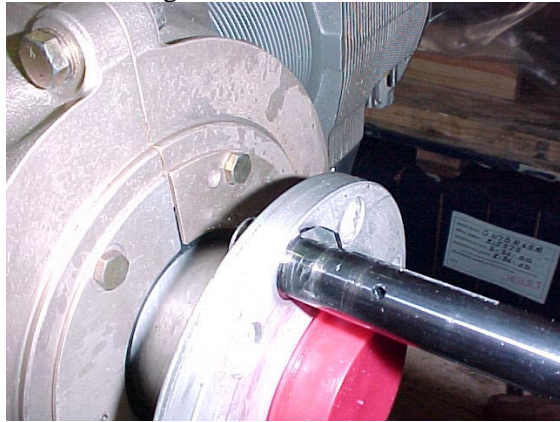


FIGURE 11
CHAMFERING CORE SAMPLE HOLE

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 .080 inches. If edge distance is less than .080 inches, contact TCM at 1-334-438-3411 for removal and replacement of crankshaft.

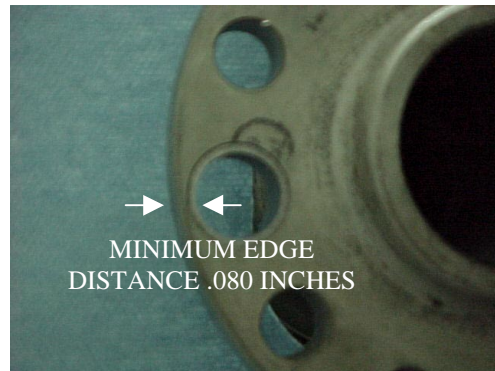


FIGURE 13
CORE SAMPLE HOLE MINIMUM EDGE DISTANCE

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

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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. Brush red visible dye check penetrant in the core sample holes and the surrounding area on the front and aft flange faces.
3. Allow penetrant to dwell for a minimum of 20 minutes.
4. Clean off residual penetrant with a clean lint free shop towel dampened with penetrant remover.
5. Apply removable dye check developer by spraying a light, uniform coating to cover the core sample hole I.D. and the surrounding area.
6. Allow developer to dwell for 15 minutes.
7. 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.
8. 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 SERVICE:

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

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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 processed using the "Crankshaft Material Inspection Reimbursement Form" on the last page of the service bulletin. To ensure prompt processing of you reimbursement, complete the form in its entirety and attach a copy of the repair work order and customer invoice.

Mail reimbursement form to:

Teledyne Continental Motors

2039 Broad Street

Mobile, Alabama 36615

ATTN: WARRANTY ADMINISTRATION

If crankshaft replacement is required, the following labor allowances will apply:

1. Removing and reinstalling engine.
 - Non- turbocharged : 29 manhours
 - Tubrocharged: 36 manhours

If field replacement of the crankshaft is authorized by Teledyne Continental Motors, the following labor allowances will apply:

1. Engine disassembly to facilitate crankshaft replacement only and reassembly after replacement crankshaft installation:
 - Non-turbocharged: 35 manhours
 - Turbocharged: 37 manhours

NOTE: Claims submitted that include labor and material charges not related to crankshaft replacement will be denied and returned to the submitter. Do not separate pistons from

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cylinders, Remove cylinder sufficiently to remove the piston pin only. If a varnish layer has formed on the piston pin between the piston pin bosses and the connecting rod bushing, lightly spray the effected area with carburetor cleaner to soften the varnish and aid in piston pin removal. Do not use tools that may damage the aluminum end plugs of the piston pin.

Engine test run after crankshaft replacement:

1. In an engine test cell: 16 man hours
2. In the aircraft: 4 man hours

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CRANKSHAFT MATERIAL INSPECTION REIMBURSEMENT FORM

For Compliance of MSB 00-5

Attach a copy of the shop work order and invoice to this form.

DATE: _____

Complete the following information:

ENGINE MODEL: _____

ENGINE SERIAL NUMBER: _____

ENGINE TOTAL TIME: _____

CRANKSHAFT SERIAL NUMBER: _____

AIRCRAFT MODEL: _____ AIRCRAFT REG. NUMBER: _____

OWNER NAME: _____

ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

COUNTRY: _____

PHONE: _____ FAX: _____

E-MAIL ADDRESS: _____

AMOUNT of Reimbursement Requested _____.

MAKE REIMBURSEMENT CHECK PAYABLE TO:

OWNER: _____ or FBO: _____

FBO NAME: _____

ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

COUNTRY: _____

PHONE: _____ FAX: _____

E-MAIL ADDRESS: _____

MAIL COMPLETED FORM TO:

TELEDYNE CONTINENTAL MOTORS

P.O. BOX 90

MOBILE, AL 36601

ATTN: WARRANTY ADMINISTRATION

TCM USE ONLY

DATE: _____

APPROVED SIGNATURE: _____

AMOUNT: _____

ACCOUNTING VERIFICATION: _____

CHECK NUMBER: _____