

# service bulletin

M78-9  
Supersedes M66-4  
FAA-DER Approved

23 August 1978

TO: Distributors, Dealers, Aircraft Engine Overhaul Facilities, Owners and Operators of Teledyne Continental Motors' Aircraft Engines.

SUBJECT: CRANKCASE, CRANKSHAFT AND BEARING APPLICATIONS

MODELS

AFFECTED: All O-470, IO-470, IO-520, TSIO-470 and TSIO-520 Engines Referenced in this Bulletin.

Over the years, there have been several changes to the crankcase, crankshaft and bearing combinations used with various engine models. The following charts have been compiled to assist the customer in identifying the proper combination for his engine.

SPECIAL NOTE:

ALTHOUGH THE STUDDING ASSEMBLY PART NUMBER ON THE PHASE 2 STYLE CRANKCASES REMAINS, IN MOST INSTANCES, THE SAME AS THE PHASE 1 STYLE, THE ACTUAL MACHINING OF THE CRANKCASE IS DIFFERENT. FOR THIS REASON, IT IS IMPERATIVE TO MAKE ABSOLUTELY CERTAIN WHICH CRANKCASE YOU ARE WORKING WITH.

PHASE 1

Crankcases were machined for flanged type thrust bearings for O-470 and IO-470 engines.

PHASE 2

Crankcases for above listed models are machined to accommodate four thrust washers at the front mains. In addition, the rear main bearing was moved back .060 because of new crankshaft on O-470 and IO-470 engines as listed in Service Bulletin M74-12. Many of the new crankshafts have narrower rod bearings, smaller lightner holes and thicker cheeks. Because of the narrower crankpin bearings, it is necessary to use different connecting rods and rod bearings.

PHASE 3

Main bearing journals have been narrowed, which required relocation of bearing tangs. Identification can be made by way of new casting part number CA642360 and CA642361.

CAUTION:

BECAUSE OF THE CHANGE IN THE NEWER CRANKSHAFT, YOU MUST BE CERTAIN THAT WHEN INSTALLING THIS CRANKSHAFT IN THE PHASE 1 STYLE CRANKCASE, YOU INSERT TWO PIECES OF SERVICE BEARING, PART NO. 633334, AT THE REAR MAIN CRANKCASE LOCATION.

This bearing is for service use only. When installing the new crankshaft in an old Phase 1 style crankcase, simply substitute the 633334 bearings for the two rear main bearings listed.

The different location of the tang in this bearing moves it back enough to allow proper installation of the crankshaft. After the crankshaft is installed, you must check for clearance between the forward side of the rear main bearing boss and the crankshaft cheek. This must be .020 to .030. Provide necessary clearance by burring if required.

When installing either an old style crankshaft in a new style crankcase or a new style crankshaft in Phase 2 or 3 new style crankcase, there will be no clearance problem and you simply install the applicable thrust washers and bearings in new style crankcase and old style bearings per chart when using Phase 1 style crankcases.

You will also note that on this chart we have listed Phase 1, 2, and 3 new style and old (optional) crankshafts, crankcases, applicable bearings and bearing sets. For information on connecting rods and rod bearings, please refer to Bulletin M74-12.

Engine Model	Crankcase Studding & Machining Assembly	Crankshaft & Damper Assembly	Front Main Bearings		Thrust Washers At Front Main Bearings	Intermediate Main Bearings		Rear Bearings		Complete Bearing Sets
			Forward	Rear		Standard	Option	Main Bearings	Option	
<b>O-470 - Phase 3</b>										
G	642178	633256	642270(2)	642270(2)	637579(4)	642720(4)	642720(2)	642720(2)	642720A1	
F, J1, 8	642183									
J11, R14	642162									
J14	642191									
R3, 5, 7, 11, 15, 16 20, 23, 25, 37	642159									
R6	642164	633225								
R13, 17, 35	642161									
R32	642163									
S1	642194									
S2	642194				633136(2)	642720(4)	642720(2)	642720(2)		633136A3
K1	642183									
K17	642162									
L1, 9, 10	642182									
L16	642162	633219								
M22	642192									
M23, 26	642193									
U1, 3	642194	641905								
U2, 4	642195									
<b>O-470 - Phase 2</b>										
G	641213 626762	632256	530386(2)	630464(2)	637579(4)	630464(4)	630464(2)	537848(2)	630464A5	
F	539734									
F, J1, 8	641186 539500									
J11, R14	641215 628239									
J14	641271	633225								
R3, 5, 7, 11, 15, 16 20, 23, 25, 37	641212 632309									
R6	641435 640540									
R13, 17, 35	641185									
R32	641187 635635									
S1	641398									
S2	641373									
B	539501	633227								
N	629548									
					633136(2)	630464(4)	630464(2)	537848(2)	633136A1	633136A2

Engine Model	Crankcase Studding & Machining Assembly		Crankshaft & Damper Assembly	Front Main Bearings		Thrust Washers At Front Main Bearings	Intermediate Main Bearings		Rear Bearings		Complete Bearing Sets	
	Forward	Rear		Full Length	Standard		Option	Standard	Option			
O-470 - Phase 2 (cont.)	P	641213 626762	633258	530386(2)	630464(2)	637579(4)	630464(4)	537848(4)	630464(2)	537848(2)	630464A5	
	K1	641186	633129			633136(2)	637579(4)	530386(4)		530386(2)		633136A1
		539500										
	K17, L16	641215	633129			633136(2)	637579(4)	530386(4)		530386(2)		633136A1
		628239										
	L1, 9, 10	641226	633129			633136(2)	637579(4)	530386(4)		530386(2)		633136A2
		625193										
	M22	641225	633129			633136(2)	637579(4)	530386(4)		530386(2)		633136A1
		636433										
	M23, 26	641270	633129			633136(2)	637579(4)	530386(4)		530386(2)		633136A1
		625168										
	U1, 3 U2, 4	641398	641905			633136(2)	637579(4)	530386(4)		530386(2)		633136A1
641373												
O-470 - Phase 1	A	537498									37401A1	
	C	537498	537920			537401(2)	530386(4)		530386(2)			
		539734										
	F	539500	537920			537401(2)	626740(1) 626741(1)	630464(4)	537848(4)	630464(2)	537848(2)	538879A1
		539500										
	R	632309	539576			538879(2)		630464(4)	537848(4)	630464(2)	538897(2)	627795A1
		539501										
	N	629548	627576			627795(2)		630464(4)	537848(4)	630464(2)	538897(2)	627795A1
		626762										
	K	539500	539665			537401(2)		530386(4)		530386(2)		537401A1
		625193										
	M	625168	627587			538879(2)		630464(4)	537848(4)	630464(2)	537848(2)	538879A1
625168												
P	626762	627587			627795(2)		630464(4)	537848(4)	630464(2)	538897(2)	627795A1	
	626762											

Engine Model	Crankcase Studding & Machining Assembly	Crankshaft & Damper Assembly	Front Main Bearings		Thrust Washers At Front Main Bearings	Intermediate Main Bearings		Rear Bearings		Complete Bearing Sets
			Forward	Rear		Full Length	Standard	Option	Standard	
D	642172	630927	642720(2)	642720(2)	637579(4)	642720(4)	642720(2)	642720(2)	642720A1	
D42	642196									
E, S1, 3	642167									
F1	642173									
F3, 4, 5, 19	642175									
F7, 18, 23, 26	642174									
G	642178									
M	642166									
S2, 8	642168									
C	642178									633258
J	642189									633246
K	642178									630886
L	642177									630977
L	642176	632195								
H	642179									
U	642169									
V1, 2	642170									
V6, 8, 9, 10	642171									

IO-470 - Phase 3

Engine Model	Crankcase Studding & Machining Assembly	Crankshaft & Damper Assembly	Front Main Bearings		Thrust Washers At Front Main Bearings	Intermediate Main Bearings		Rear Bearings		Complete Bearing Sets
			Forward	Rear		Full Length	Standard	Option	Standard	
D	541193 627490	630927	530386(2)	630464(2)	637579(4)	630464(4)	630464(2)	630464(2)	630464A5	
D42	641227									
E, S1, 3	641192 628137									
F1	641191 627856									
F3, 4, 5, 19	641195 629398									
F7, 18, 23, 26	641194 632545									
G	641213 628137									537848 (4) IO-470-G Only
M	641197 628858									538897 (4) IO-470-G Only
S2, 8	641210 636611									
C	641213 626762									633258

IO-470 - Phase 2

Engine Model	Crankcase Studding & Machining Assembly	Crankshaft & Damper Assembly	Front Main Bearings		Thrust Washers At Front Main Bearings	Intermediate Main Bearings		Rear Bearings		Complete Bearing Sets
			Forward	Rear		Full Length	Standard	Option	Main Bearings Standard	
J	641214 628509	633246	530386(2)	630464(2)	637579(4)	630464(4)	537848(4)	630464(2)	538848(2)	630464A5
K	641213 632285	633246	530386(2)	630464(2)	637579(4)	630464(4)	537848(4)	630464(2)	538848(2)	630464A5
L	641189 628500	630886								
L	641188 629300									
N1, 7, 10, 11	641273 641072 633363A1	630932	530386(2)	630464(2)	637579(4)	630464(4)		630464(2)		630464A5
N3	641274									
N12	641211 640881									
H	641273 641072 633363A1	630977								
U1, 3	642276	632195								
V1, 2	641190 633170									
V6, 8, 9, 10	641206 635006									

10-470 P Phase 2 (cont.)

Engine Model	Crankcase Studding & Machining Assembly	Crankshaft & Damper Assembly	Front Main Bearings		Thrust Washers At Front Main Bearings	Intermediate Main Bearings		Rear Bearings		Complete Bearing Sets
			Forward	Rear		Full Length	Standard	Option	Main Bearings Standard	
D	627490	627530	530386(2)	627795(2)	626740(1) and 626741(1)	630464(4)		630464(2)		627795A1
E	628137									
F	627586									
G	628137	628358								
M	628858									
S	628137	626784								
C	626762									
J	628509	628694								
K	632285									
L	628500	627348								
H	627816A2									
R	628137	629366								
N	627816A2									

10-470 - Phase 1

Engine Model	Crankcase Studding & Machining Assembly	Crankshaft & Damper Assembly	Front Main Bearings		Thrust Washers At Front Main Bearings	Intermediate Main Bearings		Rear Main Bearings		Complete Bearing Sets
			Forward	Rear		Full Length	Standard	Option	Standard	
TSIO-470 PHASE 2	B	642155	628995	642720(2)	642720(2)	642720(4)	642720(2)	642720(2)	642720A1	
	B2, 3	642190								
	C	642157								
	D	642157								
IO-70 - Phase 1	B	641207 629254	628995	630464(2)	637579(4)	630464(4)	630464(2)	630464A5		
	B2, 3	641208 629288								
	C	641209 631977								
	D	641209 631977								
IO-520 - Phase 3	A, D, F2, 3, 4, 5 7, 9, J, L	631716	631716	642720(2)	637579(4)	642720(4)	642720(2)	642720A1		
	D10, 15, F6, K E	642186 642158								
IO-520 - Phase 2	A, D, F2, 3, 4, 5 7, 9, J, L	641200 631596	631716	630464(2)	637579(4)	630464(4)	630464(2)	630464A1		
	D10, 15, F6, K	641199 634685								
	E	641201 635133								
	B, BA	642088 641315 640471 630969								
	BA12	642089 641501								
	C2, 3, 6	642090 641316 640472 631096								
	C5, 7	642091 641318 640474 638101								
633620	635439(2)	635439(2)	635439A2							

