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# Sky-Tec Flyweight™ Starters Aircraft Fit Guide

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# Caution:

## Please Read Before Using This Guide

1. This document is NOT the FAA-approved Applicable Models List. Matters of certification eligibility can be found at [www.skytecair.com/eligibility.htm](http://www.skytecair.com/eligibility.htm)
2. This document is simply intended as a *guide* for fitting most aircraft by type. However, due to variances between aircraft due to manufacturing changes, modifications, cumulative years of maintenance and/or conversion, *it is nearly impossible to definitively recommend the correct starter for any particular aircraft based on make/model alone.* So please only use this document AS A *GUIDE ONLY*. When in doubt, call the Sky-Tec factory for confirmation. **Installation of the wrong starter will void the factory warranty.** Sky-Tec will not warrant starter wear or damage on starters (or engines) where a starter is installed incorrectly (including wrong ring gear teeth or wrong voltage, etc.) or is used in an inappropriate application.
3. There may still be a starter to fit an aircraft whose entry shows “no starter available”. Many older aircraft have been converted and upgraded. Confirm the engine make/model before determining a Sky-Tec is or is not applicable.
4. Please note the use of ring gear tooth count (on Lycoming engines) and aircraft voltage in the model numbers of all Sky-Tec starters. If your aircraft ring gear teeth and/or voltage do not match the numbers in the model recommended for your aircraft, DO NOT ORDER THE STARTER without first contacting Sky-Tec or adjusting your model number accordingly.
5. Recommendations are suggested for aircraft with factory standard equipment. Factory or after-market installed options such as air conditioning may affect the applicability of the primary recommendation. Piper singles with air conditioning must utilize the NL-series starters.
6. Please do not assume ring gear tooth count (on Lycoming engines). Through the years, mechanics have been known to replace ring gears with whatever model they had laying around their shops at the time the work was performed. Therefore it is imperative that the installer CONFIRM RING GEAR TOOTH COUNTS ON ALL LYCOMING INSTALLATIONS.
7. IF YOU ARE UNSURE WHETHER THE STARTER YOU RECEIVE IS CORRECT, PLEASE DO NOT MOUNT IT. Call the factory first. Mounting the starter will preclude you from returning the starter to Sky-Tec as new/unused. Mounting the starter places ‘bite marks’ around the mounting holes and will have to be treated as *used* starters (no new exchange will be permitted).
8. Never use a PM or LS (permanent magnet) starter on a helicopter. Sky-Tec ONLY recommends HT or HTInline starters (NL models) for use on helicopters.
9. And finally, this list is only as comprehensive as we could attempt to make it. We realize there are omissions and variances. We’ve done our best to include the majority of general aviation aircraft models. If you cannot find what you are looking for (or what you are looking for is not where you’d expect it), we encourage you to speak with the factory to find the best starter for your particular application.
10. Aircraft with sandcast TCM 520 engines (alternator in rear) are notoriously difficult to crank smoothly. TCM utilized a 32:1 starter adaptor on sandcast motors that no known starter is especially good at cranking. Sky-Tec makes no claims that our ST3 starter will crank sandcast TCM520 engines any better than anyone else’s starter.

Please refer to [Caution](#) section (page 2) before recommending/ordering any starter

## WARRANTY

Sky-Tec Partners, Ltd. ("Sky-Tec") warrants its starters to be free from defects in materials and workmanship for a period of two years from the date of purchase. Sky-Tec will repair or replace any starter it determines to have failed under the terms of this warranty if and only if the customer's original starter is sent to Sky-Tec for evaluation.

Alternatively, Sky-Tec may offer a warranty exchange program to any customer requiring expedited replacement. The customer will be responsible for purchasing a replacement starter directly from Sky-Tec and returning their original starter directly to Sky-Tec for evaluation. If the starter is found to have failed under the terms of this warranty, appropriate credit will be given to the customer for the value of the starter plus domestic UPS Ground shipping charges. Customers will be responsible for any additional expedited shipping charges. Alternatively, a customer may receive core credit regardless of warrantability of the returned starter.

Sky-Tec makes no warranty as to suitability of its products for the intended application.

To be considered eligible for warranty credit, **DO NOT PURCHASE A REPLACEMENT STARTER FROM A DEALER.** Sky-Tec will not offer warranty credit for replacement starters purchased through a dealer. All warranty claims must be handled directly with the manufacturer, Sky-Tec Partners, Ltd.

If you suspect a starter to be defective, consult the [Aircraft Troubleshooting Guide](#) supplied. Before returning a starter to Sky-Tec for service, you must first obtain a return authorization electronically online.

Starters returned to the factory via UPS with a valid Return Authorization number will usually be repaired or replaced the same day as received. Other carriers and/or circumstances may increase turn around to 1-2 days.

### Warranty Details

Sky-Tec warrants its starters to be free from defects in materials and workmanship for a period of two years from the date of purchase.

Sky-Tec Warranty is *voided* if:

- A starter that is used in the wrong application\*.
- Customer attempts to service the starter in the field by removing or replacing any components not specifically instructed and/or supplied by Sky-Tec.
- The starter is determined to have failed by application of voltage in excess of amount specified on starter name plate (physical evidence: armature will be splayed and/or exploded due to the forces of over-rotation and the associated centripetal force WITHOUT discoloration of commutator bars or warping of brush insulator).
- The starter is determined to have failed by application of voltage in excess of cranking times specified on starter tag (shipped with all starters) which reads: "Crank for no more than 10 seconds then allow 20 seconds cool-down. Repeat up to 6 times. Then let starter cool for 30 min." (physical evidence: copper armature bars are discolored to white/purple hues, brush wires are discolored similarly, brush insulator is warped or scorched, smell of burnt metal evident, and/or melted insulation in motor area). This condition is often caused by the aircraft's starter contactor (solenoid) sticking "closed" beyond the pilot's intended period of cranking.
- The starter is determined to have failed by a counter-rotational force caused by the engine's ignition system failing to retard all sparks at or past piston TDC during the cranking period aka "kickback" (physical evidence: bent or broken mount, broken or displaced magnets, broken or chipped brush assemblies, broken drive components and/or excessively worn or damaged drive gear teeth)\*\*.
- The starter has any foreign substance located internally including motor oil, cleaning agents or foreign particles not found in the starter's normal composition (physical evidence: presence of substance within starter causing solenoids or motor brush assemblies to wear prematurely and/or function improperly).
- A starter returned to Sky-Tec under warranty-exchange is determined to perform to specifications (i.e. the starter is good). Warranty applies to starters with defects, not good starters. Core credit may be given to the customer should the core be determined to be rebuildable at Sky-Tec's sole discretion.
- The starter is damaged by impact, shock, excessive shaking or other physical abuse (physical evidence: dents to starter components, loose or stripped connection terminals, and bent components not caused by defects in components, design or workmanship).

### Additional Warranty Notes

\* Ring gear/starter mismatches are the sole responsibility of the installing mechanic and/or aircraft owner. A starter that has been mounted to an engine can no longer be returned for credit as a new starter and will be considered to be a used starter by the factory. **CHECK FOR ALL FIT/CLEARANCE ISSUES BEFORE INSTALLING THE STARTER.** Once mounted, some starters may be converted to the proper model by Sky-Tec's Repair Station at the starter owner's sole expense (time/materials cost). Obtain a Return Authorization before returning any starter to Sky-Tec for conversion.

\*\* Sky-Tec will waive the kickback exclusion above for up to two years from date of installation of the starter **only** for those aircraft with a valid logbook entry showing they were operating E-MAG Ignition's Electronic Ignition solution during the time of starter failure due to kickback.

Sky-Tec cannot and never will warrant damage to non-starter components or any non-starter-related expense(s) including labor, inconvenience, transportation or loss of business due to any starter failure.

### Additional Notes for Sky-Tec High-Torque Inline (NL Model) Starters Only:

The NL starter is designed to respond to kickback and other destructive engine cranking anomalies by shearing a shear pin on the starter's internal lay shaft. Sky-Tec will not warrant any damage to non-starter components (ring gear, etc.) should the shear pin fail to shear. However, should the pin fail to shear causing the starter nose housing to crack, Sky-Tec will warrant the replacement of the nose/mount housing(s) for a period of up to two years from date of purchase under the standard warranty terms above (return to factory for repair/replacement).

The NL starter is designed to fit nearly every Lycoming aircraft application by simulating the location of various mounting points found on the old, heavy OEM starters. As such, NL starters feature four machined aluminum bosses cast into the starter mount. These bosses are not required for proper function of the NL starter but serve only to support accessories on/around the starter. If a specific aircraft installation requires the alteration or removal of one or all four of these bosses, customers may remove the bosses without loss of any warranty privileges. Acceptable means of removal include cutting and/or grinding without incurring any damage to other starter components or features. However, starter damage or starter failure due to the **improper** or **inappropriate** removal of these bosses will **not** be covered under the factory warranty.

Please refer to [Caution](#) section (page 2) before recommending/ordering any starter

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Please refer to Caution section (page 2) before recommending/ordering any starter

# Starter Model Cross Reference by OEM Manufacturer

## PLEASE READ THIS CAUTION BEFORE USING THE TABLE BELOW!

THE PRIMARY SOURCE OF FIT DATA IS THE AIRCRAFT FIT GUIDE THAT BEGINS ON THE NEXT PAGE. USE THIS CROSS REFERENCE TABLE ONLY IF NO OTHER AIRFRAME DATA IS AVAILABLE OR TO REPLACE LISTED MANUFACTURER'S STARTER WITH A SKY-TEC. AS WITH ALL STARTER MODEL RECOMMENDATIONS IN THIS GUIDE, PLEASE FAMILIARIZE YOURSELF WITH NUMBERED ITEMS ON PAGE 2 OF THIS FIT GUIDE. THESE RECOMMENDATIONS ARE ONLY A GUIDE. THE INSTALLING MECHANIC HAS ULTIMATE RESPONSIBILITY FOR ENSURING THAT THE STARTER IS FULLY COMPATIBLE WITH THE AIRFRAME AND ENGINE BEFORE INSTALLING THE STARTER.

### Lycoming Engines

Manufacturer	Mfr PN	Lycoming PN	Volts	Pitch	Weight	Installed On	Replace With	Weight
Prestolite, Electrosystems, or Kelly Aerospace	31A21210	31A21210	12V.	10/12	11.4	320, 360, 540, 235, 540	122-NL	9.4
	ERB-8011	N/A	24V.	12/14	9.5	235,290,320,340,360,540	149-NL/ec	9.4
	ERB-8012	N/A	24V.	10/12	9.5	320, 340, 360, 540	122-NL/ec	9.4
	ERZ-8011	N/A	12V.	12/14	9.5	235,290,320,340,360,540	149-NL	9.4
	ERZ-8012	N/A	12V.	10/12	9.5	320, 340, 360, 540	122-NL	9.4
	MHB-4001	76212	24V.	12/14	18.0	320, 340, 360, 540	149-NL/ec*	9.4
	MHB-4002	75700	24V.	12/14	18.0	TIO-541-E	149-24HT/ec*	8.4
	MHB-4003	76214	24V.	12/14	18.0	360	149-NL/ec*	9.4
	MHB-4005	78791	24V.	12/14	18.0	TIGO-541	149-24HT/ec*	8.4
	MHB-4007	LW-11936	24V.	12/14	18.0	540	149-NL/ec*	9.4
	MHB-4008	LW-12023	24V.	12/14	18.0	TVO-435, VO-435	149-24HT/ec*	8.4
	MHB-4009	LW-12159	24V.	12/14	18.0	LTIO-540	149-NL/ec*	9.4
	MHB-4010	LW-14208	24V.	12/14	18.0	320, 340, 360, 540	149-NL/ec*	9.4
	MHB-4011	LW-14212	24V.	12/14	18.0	TIO-541-E	149-24HT/ec*	8.4
	MHB-4012	LW-14210	24V.	12/14	18.0	360	149-NL/ec*	9.4
	MHB-4013	LW-14213	24V.	12/14	18.0	540	149-NL/ec*	9.4
	MHB-4014	LW-14214	24V.	12/14	18.0	LTIO-540	149-NL/ec*	9.4
	MHB-4015	LW-15483	24V.	10/12	18.0	235	122-NL/ec*	9.4
	MHB-4016	LW-15572	24V.	12/14	18.0	320, 340, 360, 540	149-NL/ec*	9.4
	MHB-4016A	31B22462	24V.	10/12	18.0	720	122-NL/ec*	9.4
	MHB-4016A	31B22462	24V.	10/12	18.0	720	122-NL/ec*	9.4
	MHB-4017	LW-15576	24V.	12/14	18.0	TIO-541-E	149-24HT/ec*	8.4
	MHB-4018	LW-15577	24V.	12/14	18.0	540	149-NL/ec*	9.4
	MHB-4019	LW-15574	24V.	12/14	18.0	360	149-NL/ec*	9.4
	MHB-4020	LW-18990	24V.	12/14	18.0	360	149-NL/ec*	9.4
	MHB-6014	31B22477	24V.	12/14	8.0	540	149-NL/ec*	9.4
	MHB-6016	31B22474	24V.	12/14	8.0	720	149-NL/ec*	9.4
	MHB-6018	31B22476	24V.	12/14	8.0	235	149-NL/ec*	9.4
	MHB-EO-26102	LW-14447	24V.	12/14	18.0	360	149-NL/ec*	9.4
	MHJ-4004	77879	24V.	10/12	18.0	720	122-NL/ec*	9.4
	MHJ-4005	LW-12787	24V.	10/12	18.0	720	122-NL/ec*	9.4
	MMU-4001	LW-16207	24V.	10/12	18.0	235	122-NL/ec*	9.4
	MMU-6001	31B22475	24V.	10/12	8.0	320, 340, 360, 540	122-NL/ec*	9.4
	MZ-4204	76210	12V.	10/12	18.0	235, 290, 320	122-NL	9.4
	MZ-4205	76213	12V.	12/14	18.0	360	149-NL	9.4
	MZ-4206	76211	12V.	12/14	18.0	235,290,320,340,360,540	149-NL	9.4
	MZ-4207	75699	12V.	12/14	18.0	TIO-541-A	149-24HT/ec*	8.4
	MZ-4216	LW-10556	12V.	12/14	18.0	LIO-320,LO-360,LIO-360	149-NL	9.4
	MZ-4217	LW-14209	12V.	12/14	18.0	360	149-NL	9.4
	MZ-4218	LW-14207	12V.	12/14	18.0	235,290,320,340,360,540	149-NL	9.4
	MZ-4219	LW-14211	12V.	12/14	18.0	TIO-541-A	149-24HT/ec*	8.4
	MZ-4220	LW-14215	12V.	12/14	18.0	LIO-320,LO-360,LIO-360	149-NL	9.4
	MZ-4221	LW-15573	12V.	12/14	18.0	360	149-NL	9.4
	MZ-4222	LW-15571	12V.	12/14	18.0	235,290,320,340,360,540	149-NL	9.4
	MZ-4223	LW-15575	12V.	12/14	18.0	TIO-541-A	149-24HT/ec*	8.4
	MZ-4224	LW-16460	12V.	12/14	18.0	320	149-NL	9.4
	MZ-4225	LW-18047	12V.	12/14	18.0	360	149-NL	9.4
MZ-4226	LW-18989	12V.	12/14	18.0	360	149-NL	9.4	
MZ-6204	31A22473	12V.	10/12	8.0	235, 290, 320	149-NL	9.4	
MZ-6220	31A22472	12V.	12/14	8.0	LIO-320,LO-360,LIO-360	149-NL	9.4	
MZ-6222	31A22470	12V.	12/14	8.0	235,290,320,340,360,540	149-NL	9.4	
MZ-6224	31A22471	12V.	12/14	8.0	320	149-NL	9.4	
SRB-9021	N/A	24V.	12/14	7.6	235,290,320,340,360,540	149-24LS	8.0	
SRB-9022	N/A	24V.	10/12	7.6	320, 340, 360, 540	122-NL/ec	9.4	
SRB-9031	N/A	24V.	12/14	7.6	235,290,320,340,360,540	149-24PM	8.0	
SRB-9032	N/A	24V.	10/12	7.6	320, 340, 360, 540	122-NL/ec	9.4	
SRZ-9021	N/A	12V.	12/14	7.6	235,290,320,340,360,540	149-12LS	8.0	
SRZ-9022	N/A	12V.	10/12	7.6	235, 290, 320	122-NL	9.4	
SRZ-9031	N/A	12V.	12/14	7.6	235,290,320,340,360,540	149-12PM	8.0	
SRZ-9032	N/A	12V.	10/12	7.6	235, 290, 320	122-NL	9.4	

Please refer to [Caution](#) section (page 2) before recommending/ordering any starter

## Lycoming Engines (cont.)

Manufacturer	Mfr PN	Lycoming PN	Volts	Pitch	Weight	Installed On	Replace With	Weight
Delco-Remy	1109669	69953	24V.	10/12	18.0	235, 290, 320	122-NL/ec*	9.4
	1113471	72279	12V.	10/12	18.0	720	122-NL	9.4
Lycoming	31A21198	31A21198	12V.	12/14	11.4	235, 320	149-NL	9.4
	31B21064	31B21064	12V.	12/14	11.4	360, 540	149-NL	9.4
	31B21211	31B21211	12V.	10/12	11.4	235, 320	122-NL	9.4
	PM1201	31A22206	12V.	12/14	11.5	320, 360, 540	149-NL	9.4
Lamar	PM1203	31A22361	12V.	10/12	11.5	235, 320	122-NL	9.4
	PM2401	31B22207	24V.	12/14	11.5	320, 360, 540	149-NL/ec*	9.4
	PM2403	31B22362	24V.	10/12	11.5	235,320	122-NL/ec*	9.4
	PM2404	31B22553	24V.	12/14	11.5	LTIO-540	149-NLR/ec*	9.4
	PM1204	31A22552	12V.	12/14	11.5	320, 360, 540	149-NL	9.4

## Teledyne Continental Engines

Manufacturer	Mfr PN	Volts	Replace With	Weight
Delco-Remy	1109471	12V.	C12ST3	6.5
	1109681	12V.	C12ST3	6.5
	1109684	12V.	C12ST3	6.5
	1108249	12V.	C12ST3	6.5
	646275	12V.	C12ST3	6.5
	1108234	24V.	C24ST3	6.5
Teledyne Continental	537241	12V.	C12ST3	6.5
	535856	12V.	C12ST3	6.5
	539910	12V.	C12ST3	6.5
	626960	12V.	C12ST3	6.5
	627842	12V.	C12ST3	6.5
	628482	12V.	C12ST3	6.5
	629176	12V.	C12ST3	6.5
	637847	12V.	C12ST3	6.5
	634592	12V.	C12ST3	6.5
	646236	12V.	C12ST3	6.5
	646238	12V.	C12ST3	6.5
	655565	12V.	C12ST3	6.5
	627841	24V.	C24ST3	6.5
	634433	24V.	C24ST3	6.5
	655566	24V.	C24ST3	6.5
	656181	24V.	C24ST3	6.5
Lamar	XT-1207	12V.	C12ST3	6.5
	CT-2407	24V.	C24ST3	6.5

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# Recommended Starter by Aircraft Manufacturer

## Aero Commander

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
500	LYC O-540-A2B	149-Tooth Ring Gear	24	149-NL/ec*		149-24HT/ec*	
560	LYC GO-480			No fit			
100 DARTER	LYCOMING O-320-A2B	149-Tooth Ring Gear	12	149-NL		149-12LS	
100 LARK	LYCOMING O-360-A2F	149-Tooth Ring Gear	12	149-NL		149-12LS	
500A	CONT IC-470-M	TCM Starter Adaptor	24	C24ST3			
700 (Fuji Commander)	LYC TIO-540	149-Tooth Ring Gear	24	149-NL/ec*		149-24HT/ec*	

## Aeronca

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
11AC CHIEF	CONT A65-8				No fit unless upgraded to -12 Engine		
11BC CHIEF	CONT C-85				No fit unless upgraded to -12 Engine		
11CC SUPER CHIEF	CONT C85-8F				No fit unless upgraded to -12 Engine		
15AC SEDAN	CONT O-300	Pull-Start	12	KCST2	15		
65TC	CONT A65-7				No fit unless upgraded to -12 Engine		
7AC CHAMP	CONT A65-8				No fit unless upgraded to -12 Engine		
7AC CHAMPION	CONTINENTAL				No fit unless upgraded to -12 Engine		
7AC CHAMPION	CONTINENTAL				No fit unless upgraded to -12 Engine		
7ACA	FRANKLIN 2A-120	No fit					
7BCM CHAMP	CONT C-85				No fit unless upgraded to -12 Engine		
7CCM CHAMP	CONT C90-12	Pull-Start	12	KCST2	15		
7DC CHAMP	CONT C85-8				No fit unless upgraded to -12 Engine		
7EC CHAMP	CONT C-90-12F	Pull-Start	12	KCST2	15		
C-2	CONT?				No fit unless upgraded to -12 Engine		
K SCOUT	CONT?				No fit unless upgraded to -12 Engine		

## Aerostar Aircraft

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
601P	LYC IO-540-S1A5	149-Tooth Ring Gear	24	149-NL/ec*		149-24PM	
700P - Left Engine	LYC TIO-540	149-Tooth Ring Gear	24	149-NL/ec*		149-24PM	
700P - Right Engine	LYC LTIO540	149-Tooth Ring Gear	24	149-NLR/ec*			

## American Champion

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
ADVENTURE 7GCAA	LYC O-320-B2B	122-Tooth Ring Gear	12	122-LS	1	122-NL	
AER FC-90 TRI-TRAVLR	CONT C-90	Pull-Start	12	KCST2	15		
AERONCA 7EC TRAVELER	CONT C-90	Pull-Start	12	KCST2	15		
AURORA 7ECA	LYC O-235-K2C	122-Tooth Ring Gear	12	122-12LS	1	122-NL	
CITABRIA 7GCAA	LYC O-320-B2B	149-Tooth Ring Gear	12	149-12LS	1	149-NL	
CITABRIA 7KCAB	LYC IO-320-	149-Tooth Ring Gear	12	149-12LS	1	149-NL	

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EXPLORER 7GCBC	LYC IO-320-	149-Tooth Ring Gear	12	149-12LS	1	149-NL
SCOUT 8GCBC	LYC O-360-C2E	149-Tooth Ring Gear	12	149-NL		149-12LS

## American General

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
AG5B TIGER	LYC O-360-A4K	149-Tooth Ring Gear	24	149-NL		149-24LS	5

## Aviat Aircraft

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
EAGLE II	LYC AEIO-360	149-Tooth Ring Gear	12	149-12LS		149-NL	
PITTS S-1-11B	LYC IO-540	149-Tooth Ring Gear	12	149-NL		149-12LS	
PITTS S-1S	LYC AEIO-360	149-Tooth Ring Gear	12	149-12LS		149-NL	
PITTS S-2C	LYC AEIO-540	149-Tooth Ring Gear	12	149-NL			
PITTS S-2C	LYC AEIO-540	149-Tooth Ring Gear	12	149-NL			
A-1 HUSKY	LYC O-360-C1G	149-Tooth Ring Gear	12	149-12PM	1	149-NL	
A-1B HUSKY	LYC O-360-A1P	149-Tooth Ring Gear	12	149-12PM	1	149-NL	
PITTS S-1	LYC AEIO-360-A1E	149-Tooth Ring Gear	12	149-12LS		149-12LS	
PITTS S-2	LYC AEIO-540-D4A5	149-Tooth Ring Gear	12	149-12LS		149-NL	

## Beechcraft

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
23 MUSKETEER	LYC O-320-D2B	149-Tooth Ring Gear	12	149-NL		149-12PM	
23A MUSKETEER	LYC O-360-A4K	149-Tooth Ring Gear	12	149-NL		149-12PM	
33 DEBONAIR	CONT IO-470-J	TCM Starter Adaptor	12	C12ST3			
33 F.E.	CONT IO-470-K	TCM Starter Adaptor	12	C12ST3			
33-A&B 33 DEBONAIR	CONT IO-470-K	TCM Starter Adaptor	12	C12ST3			
33-C33 DEBONAIR	CONT IO-520-B	TCM Starter Adaptor	12	C12ST3			
33-C33A DEBONAIR	CONT IO-520-B	TCM Starter Adaptor	12	C12ST3			

Please refer to [Caution](#) section (page 2) before recommending/ordering any starter

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
33-E33A BONANZA	CONT IO-520-B	TCM Starter Adaptor	12	C12ST3			
33-F & E 33C	CONT IO-520-B	TCM Starter Adaptor	12	C12ST3			
33-F33 A BONANZA	CONT IO-520-B	TCM Starter Adaptor	12	C12ST3			
33-G33	CONT IO-470-N	TCM Starter Adaptor	12	C12ST3			
35 BONANZA	CONT E-185		V	No Fit			
35-135 BONANZA	CONT E-185-1		V	No Fit			
35-A35 BONANZA	CONT E-185-1		V	No Fit			
35-B35 BONANZA	CONT E-185-8		V	No Fit			
35-C35/D35 BONANZA	CONT E-185-11		V	No Fit			
35-E,F,&G 35 BONANZA	CONT E-225-8		V	No Fit			
35-H35 BONANZA	CONT O-470-G	TCM Starter Adaptor	12	C12ST3			
35-J35 BONANZA	CONT IO-470-C	TCM Starter Adaptor	12	C12ST3			
35-K & M 35 BONANZA	CONT IO-470-C	TCM Starter Adaptor	12	C12ST3			
35-N & P 35 BONANZA	CONT IO-470-N	TCM Starter Adaptor	12	C12ST3			
35-S35 BONANZA	CONT IO-520-B	TCM Starter Adaptor	12	C12ST3			
35-V35 BONANZA	CONT IO-520-B	TCM Starter Adaptor	V	C(V)ST3			
35-V35A & B TC	CONT TSIO-520-D	TCM Starter Adaptor	V	C(V)ST3			9 (p.2)
35-V35A BONANZA	CONT IO-520-B	TCM Starter Adaptor	V	C(V)ST3			
35-V35B BONANZA	CONT IO-520-BA	TCM Starter Adaptor	V	C(V)ST3			
35-V35TC BONANZA	CONT TSIO-520-D	TCM Starter Adaptor	V	C(V)ST3			9 (p.2)
36 A36 BONANZA	CONT IO-520-B	TCM Starter Adaptor	V	C(V)ST3			
36 A36TC BONANZA	CONT TSIO-520-UB	TCM Starter Adaptor	V	C(V)ST3			9 (p.2)
36 B36TC BONANZA	CONT TSIO-520-UB	TCM Starter Adaptor	V	C(V)ST3			9 (p.2)
50 B50 TWIN BONANZA	LYC GO-435-C2			No Fit			
50 C50 TWIN BONANZA	LYC GO-480-F1A6			No Fit			
50 D50 A,B,C,E	LYC GO-480-G2F6			No Fit			
50 E50 F&G SUPERCHAR	LYC GSO-480-A1A6			No Fit			
50 H & J 50	LYC GSO-480-A1A6			No Fit			
50 TWIN BONANZA	LYC GO-435-C2			No Fit			
55 A55 BARON	CONT IO-470-L	TCM Starter Adaptor	V	C(V)ST3			
55 B55 BARON	CONT IO-470-L	TCM Starter Adaptor	V	C(V)ST3			
55 BARON	CONT IO-470-L	TCM Starter Adaptor	V	C(V)ST3			
55 C & D 55 BARON	CONT IO-520-CB	TCM Starter Adaptor	V	C(V)ST3			
55 E55 BARON	CONT IO-520-CB	TCM Starter Adaptor	V	C(V)ST3			
56TC TURBO BARON	LYC TIO-541-E1B4	149-Tooth Ring Gear	24	NO FIT	alternator boss on wrong side		
58 BARON	CONT IO-520-C	TCM Starter Adaptor	V	C(V)ST3			
58P BARON	CONT TSIO-520-L	TCM Starter Adaptor	V	C(V)ST3			9 (p.2)
58P BARON	CONT TSIO-520-WB	TCM Starter Adaptor	V	C(V)ST3			9 (p.2)
58TC BARON	CONT TSIO-520-L	TCM Starter Adaptor	V	C(V)ST3			9 (p.2)
58TC BARON	CONT TSIO-520-WB	TCM Starter Adaptor	V	C(V)ST3			9 (p.2)
60 A60 DUKE	LYC TIO-541-E1A4	149-Tooth Ring Gear	24	149-24HT/ec*			16
60 B60 DUKE	LYC TIO-541-E1C4	149-Tooth Ring Gear	24	149-24HT/ec*			16
60 DUKE	LYC TIO-541-E1A4	149-Tooth Ring Gear	24	149-24HT/ec*			16
76 DUCHESS CR Right Engine	LYC LO-360 (R)	149-Tooth Ring Gear	V	149-NLR			
76 DUCHESS Left Engine	LYC O-360	149-Tooth Ring Gear	V	149-NL		149-v(V)LS	

Please refer to [Caution](#) section (page 2) before recommending/ordering any starter

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
76 DUCHESS Matched Engines	LYC O-360	149-Tooth Ring Gear	V	149-NL			
77 SKIPPER	LYC O-235-L2C	122-Tooth Ring Gear	12	122-12LS		122-NL	
95 B95 TRAVEL AIR	LYC O-360-A1A	122-Tooth Ring Gear	V	122-NL		122-??PM	
95 B95A,D95A	LYC IO-360-B1B	122-Tooth Ring Gear	V	122-NL		122-??PM	
95 E95 TRAVEL AIR	LYC IO-360-B1B	122-Tooth Ring Gear	V	122-NL		122-??PM	
A23 C 23	LYC O-360-A4K	149-Tooth Ring Gear	12	149-12LS		149-NL	
A23-19/19A SPORT	LYC O-320-E2C	149-Tooth Ring Gear	12	149-NL		149-12PM	
A23-24 SUPER III	LYC IO-360-A2B	149-Tooth Ring Gear	12	149-12LS		149-NL	
A23A II	CONT IO-346-A	TCM Starter Adaptor	12	C12ST3			
A24R SIERRA 200	LYC IO-360-A1B	149-Tooth Ring Gear	V	149-NL		149-(V)LS	
A56TC TURBO BARON	LYC TIO-541-E1B4	149-Tooth Ring Gear	24	149-24HT/ec*		149-24HT	
B19 SPORT	LYC O-320-E2C	?-tooth Ring Gear	12	?-NL		?-12PM	
B24R SIERRA 200	LYC IO-360-A1B6	149-Tooth Ring Gear	V	149-NL		149-(V)LS	
BARON 58	CONT IO-550-C	TCM Starter Adaptor	V	C(V)ST3			
BONANZA A36	CONT IO-550-B	TCM Starter Adaptor	V	C(V)ST3			
C23 SUNDOWNER	LYC O-360-A4G	149-Tooth Ring Gear	12	149-NL		149-12PM	
C24R SIERRA 200	LYC IO-360-A1B6	149-Tooth Ring Gear	V	149-NL		149-(V)LS	
MENTOR T-34	CONT IO-520	TCM Starter Adaptor	V	C(V)ST3			9 (p.2)
MENTOR T-34	CONT O-470	TCM Starter Adaptor	V	C(V)ST3			
QUEEN AIR '65	LYC IGSO-480-A1E6			No Fit			
QUEEN AIR '70	LYC IGO-480-A1E6			No Fit			
QUEEN AIR '80	LYC IGSO-540-A1A			No Fit			
QUEEN AIR '88	LYC IGSO-540-A1D			No Fit			
QUEEN AIR A65	LYC IGSO-480-A1E6			No Fit			
QUEEN AIR A80	LYC IGSO-540-A1A			No Fit			
QUEEN AIR B80	LYC IGSO-540-A1A			No Fit			
QUEEN AIR B80 TO'72	LYC IGSO-540-A1A			No Fit			

## Bell

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
214B	LYC T-550-8D			No Fit			
214B-1	LYC T-550-8D			No Fit			
47G2	LYC VO-435-A1B			No Fit			
47G2A	LYC VO-435-A1E			No Fit			
47G2A1	LYC VO-435-A1E			No Fit			
47G3B1	LYC TVO-435-G1A			No Fit			
47G3B2	LYC TVO-435-G1A			No Fit			
47G3B2A	LYC TVO-435-G1A			No Fit			
47G4 , 4A	LYC VO-540-B1B3			No Fit			
47G5 , 5A	LYC VO-435-B1A			No Fit			
47J2	LYC VO-540-B1B			No Fit			
47J2A	LYC VO-540-B1B3			No Fit			

Please refer to [Caution](#) section (page 2) before recommending/ordering any starter

## Bellanca

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
14-12-F3 CRUISAIR	FRANK 6AC264F3		12	F12ST1			
14-13 CRUISEMASTER	FRANK 6A4-150-B3		12	F12ST1			
14-19 CRUISEMASTER	LYC O-435-A			No Fit			
14-19-2 CRUISEMASTER	CONT O-470-K	TCM Starter Adaptor	12	C12ST3			
14-19-3,A 260A,B,C.	CONT IO-470-F	TCM Starter Adaptor	12	C12ST3			
17-30 VIKING	CONT IO-520-K1A	TCM Starter Adaptor	12	C12ST3			9 (p.2)
17-30A/B SUPR VIKING	CONT IO-520-K1A	TCM Starter Adaptor	12	C12ST3			9 (p.2)
17-31A	LYC IO-540-K1E5	149-Tooth Ring Gear	12	149-NL			
17-31ATC	LYC IO-540-K1E5	149-Tooth Ring Gear	12	149-NL			
17-31TC	LYC IO-540-K1E5	149-Tooth Ring Gear	12	149-NL			
7ACA CHAMP	FRANKLIN 2A-120-B			No Fit			
7ECA	LYC O-235-C1	122-Tooth Ring Gear	12	122-12LS		122-NL	
7GCAA	LYC O-320-A2D	149-Tooth Ring Gear	12	149-12LS		149-NL	
7GCBC	LYC O-320-A2D	149-Tooth Ring Gear	12	149-12LS		149-NL	
7KCAB	LYC A/IO-320-E2B	149-Tooth Ring Gear	12	149-12LS		149-NL	
8GCBC F/P SCOUT	LYC O-360-C2E	149-Tooth Ring Gear	12	149-12LS		149-NL	
8KCAB 150 DECATHALON	LYC IO-320-E2B	149-Tooth Ring Gear	12	149-12LS		149-NL	
8KCAB 180 DECATHALON	LYC AEIO-360-H1A	149-Tooth Ring Gear	12	149-12PM		149-12LS <sup>1</sup>	
SUPR DECATHALON 8KCAB	LYC AEIO-360-H1B	149-Tooth Ring Gear	12	149-12PM		149-12LS <sup>1</sup>	
T250 ARIES	LYC IO-540-C4B5	149-Tooth Ring Gear	V	149-NL			

## Brittain-Norman

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
ISLANDER (BN2B-20)	(2) LYC IO-540-K1B5	149-Tooth Ring Gear	V	149-NL			
ISLANDER (BN2B-26)	(2) LYC O-540-E4C5	149-Tooth Ring Gear	V	149-NL			
TRI ISLANDER	(3) LYC O-540-E4C5	149-Tooth Ring Gear	V	149-NL			

## Cessna

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
120 ('46-'49)	CONT C85-12	Pull-Start	12	KCST2	15		
140 ('46-'51)	CONT C85-12	Pull-Start	12	KCST2	15		
150 ('59-'67)	CONT O-200-A	Pull-Start	12	KCST2	15		
150 ('69-'77)	CONT O-200-A	Key-Start	12	C12ST2			
152 ('78-'85)	LYC O-235	122-Tooth Ring Gear	24	122-NL/ec*		122-24PM	
170 ('48-'56)	CONT C-145	Pull-Start	12	KCST2	15		
172 ('55-'59)	CONT O-300-A or O-300-B	Pull-Start	12	KCST2	15		
172A ('60) thru 172B ('61)	CONT O-300-C	Pull-Start	12	KCST2	15		8
172C ('62) thru 172H ('67)	CONT O-300-D	TCM Starter Adaptor	12	C12ST3			8
172D Powermatic '63	CONT GO-300	TCM Starter Adaptor	12	C12ST3			
172I ('68)	LYC O-320	149-Tooth Ring Gear	12	149-12LS		149-NL	
172J – Never introduced – Became the 177 (a little trivia for you)							
172K ('69-'70)	LYC O-320	149-Tooth Ring Gear	12	149-NL		149-12LS	5
172L ('71-'72)	LYC O-320	149-Tooth Ring Gear	V	149-NL			
Aircraft Model	Engine	Start Type	Volts	Primary	Note	Secondary	Note

Please refer to [Caution](#) section (page 2) before recommending/ordering any starter

				Recommendation	Recommendation			
172M ('73-'76)	LYC O-320	149-Tooth Ring Gear	V	149-NL				
172N ('77-'80)	LYC O-320	149-Tooth Ring Gear	V	149-NL				
R172K XP ('77-'81)	CONT IO-360	TCM Starter Adaptor	V	C(V)ST3	Both 12V and 24V R172K's were manufactured. Confirm voltage. Order appropriate starter.			
172P ('81-'86)	LYC O-320	149-Tooth Ring Gear	24	149-NL/ec*				
172Q ('83-'85)	LYC O-360	149-Tooth Ring Gear	24	149-NL/ec*				
172RG ('80-'85)	LYC O-360	149-Tooth Ring Gear	24	149-NL/ec*				
172R ('95-current)	LYC IO-360	149-Tooth Ring Gear	24	149-NL/ec*	1, 14	149-24LS or 149-24PM	4	
172S ('98-current)	LYC IO-360	149-Tooth Ring Gear	24	149-NL/ec*	1, 14	149-24LS or 149-24PM	4	
175 ('58-'62)	CONT GO-300-A	Pull-Start-CR Starter	12	KCST2/SR	15			
177 ('68-'78)	LYC O-320 or LYC O-360	149-Tooth Ring Gear	12	149-NL	149-12PM (except 177 & 177A)		5, 6	
177RG ('72-'78)	LYC IO-360	149-Tooth Ring Gear	12	149-NL				
180 ('53-'69)	CONT O-470	TCM Starter Adaptor	12	C12ST3				
180 ('70-'81)	CONT O-470	TCM Starter Adaptor	V	C(V)ST3				
182 ('56-'69)	CONT O-470	TCM Starter Adaptor	12	C12ST3				
182N ('70-'86)	CONT O-470	TCM Starter Adaptor	V	C(V)ST3				
T182 ('81-'85)	LYC O-540	149-Tooth Ring Gear	V	149-NL				
R182 RG ('78-'86)	LYC O-540	149-Tooth Ring Gear	24	149-NL/ec*				
182S ('96-2000)	LYC IO-540	149-Tooth Ring Gear	24	149-NL/ec*	1, 14	149-24LS or 149-24PM	4	
182T (2001-current)	LYC IO-540	149-Tooth Ring Gear	24	149-NL/ec*	1, 14	149-24LS or 149-24PM	4	
T182T (2001-current)	LYC IO-540	149-Tooth Ring Gear	24	149-NL/ec*	1, 14	149-24LS or 149-24PM	4	
185 ('61-'66)	CONT IO-470	TCM Starter Adaptor	12	C12ST3				
185E '66	CONT IO-520	TCM Starter Adaptor	12	C12ST3	9 (p.2)			
A185 ('67-'85)	CONT IO-520	TCM Starter Adaptor	V	C(V)ST3	9 (p.2)			
185F '84	CONT IO-520	TCM Starter Adaptor	V	C(V)ST3	9 (p.2)			
188 ('66-'79)	CONT 470 & CONT 520	TCM Starter Adaptor	V	C(V)ST3	9 (p.2)			
190 '47-'53	CONT W-670-23	No Fit						
205 ('63-'64)	CONT IO-470	TCM Starter Adaptor	12	C12ST3				
206 ('64-'77)	CONT IO-520	TCM Starter Adaptor	12	C12ST3	9 (p.2)			
206H (see T206H)	LYC 540	149-Tooth Ring Gear	24	149-24PM	1			
P206 ('65-'70)	CONT IO-520	TCM Starter Adaptor	V	C(V)ST3	9 (p.2)			
207 ('69-'84)	CONT IO-520	TCM Starter Adaptor	V	C(V)ST3	9 (p.2)			
210 ('60-'86)	CONT IO-470	TCM Starter Adaptor	V	C(V)ST3				
P210 ('78-'86)	CONT TSIO-520	TCM Starter Adaptor	24	C24ST3	9 (p.2)			
303 CRUSADER	CONT L/TSIO-520-AE	TCM Starter Adaptor	V	C(V)ST3	9 (p.2)			
310 ('55-'75)	CONT O-470 & 520	TCM Starter Adaptor	V	C(V)ST3	9 (p.2)			
320	CONT TSIO-470	TCM Starter Adaptor	V	C(V)ST3				
335 '80	CONT TSIO-520-EB	TCM Starter Adaptor	V	C(V)ST3	9 (p.2)			
336 SKYMASTER SL	CONT IO-360	TCM Starter Adaptor	V	C(V)ST3				
337 ('66-'71+)	CONT IO-360	TCM Starter Adaptor	V	C(V)ST3				
340	CONT TSIO-520-NB	TCM Starter Adaptor	V	C(V)ST3	9 (p.2)			
401A,B	CONT TSIO-520-E	TCM Starter Adaptor	V	C(V)ST3	9 (p.2)			
402 ('69-'71)	CONT TSIO-520	TCM Starter Adaptor	V	C(V)ST3	9 (p.2)			
404 TITAN	CONT GTSIO-520	TCM Starter Adaptor	24	C24ST3	9 (p.2)			
411A '67&'68	CONT GTSIO-520	TCM Starter Adaptor	24	C24ST3	9 (p.2)			
414 ('77-'85)	CONT TSIO-520	TCM Starter Adaptor	24	C24ST3	9 (p.2)			
421 ('67-'81)	CONT GTSIO-520	TCM Starter Adaptor	24	C24ST3	9 (p.2)			

Please refer to [Caution](#) section (page 2) before recommending/ordering any starter

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
T206	LYC O-540-series	149-Tooth Ring Gear	24	149-24PM	1		
T207 ('69-'84)	CONT TSIO-520	TCM Starter Adaptor	V	C(V)ST3			9 (p.2)
T210 ('66-'86)	CONT TSIO-520	TCM Starter Adaptor	V	C(V)ST3			9 (p.2)
T310 ('69-'75)	CONT TSIO-520	TCM Starter Adaptor	V	C(V)ST3			9 (p.2)
T337B ('67-'69+)	CONT TSIO-360	TCM Starter Adaptor	V	C(V)ST3			
TP206 ('66-'70)	CONT IO-520	TCM Starter Adaptor	V	C(V)ST3			9 (p.2)
TR182 RG ('79-'86)	LYC O-540	149-Tooth Ring Gear	V	149-NL/ec*			
TU206A ('66-'86)	CONT TSIO-520	TCM Starter Adaptor	V	C(V)ST3			9 (p.2)
U206 ('65-'86)	CONT IO-520	TCM Starter Adaptor	V	C(V)ST3			9 (p.2)

## Champion Aircraft

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
7EC	CONT C-90-12F	Pull-Start	12	KCST2	15		
7EC/FC TRAVELER	CONT C-90-12F	Pull-Start	12	KCST2	15		
7ECA CITABRIA (100)	CONT O-200	Pull-Start	12	KCST2	15		
7ECA CITABRIA (115)	LYC O-235-C1	122-Tooth Ring Gear	12	122-12LS		122-NL	
7GCAA	LYC O-320-A2D	149-Tooth Ring Gear	12	149-12LS		149-NL	
7GCB	LYC O-320-A2B	122-Tooth Ring Gear	13	122-12LS		122-NL	
7GCBC	LYC O-320-A2D	149-Tooth Ring Gear	12	149-12LS		149-NL	
7KCAB CITABRIA	LYC IO-320-E2A	149-Tooth Ring Gear	12	149-12LS		149-NL	
FC 115 TRI-TRAVELER	LYC O-235-C1	122-Tooth Ring Gear	12	122-12LS		122-NL	
LANCER	CONTINENTAL	Pull-Start	12	KCST2	15		

## Cirrus Design

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
SR 20	CONT IO-360	TCM Starter Adaptor	24	C24ST3			
SRV-G2	CONT IO-360	TCM Starter Adaptor	24	C24ST3			
SR 22	CONT IO-550	TCM Starter Adaptor	24	C24ST3			
VK30	CONT TSIO-550	TCM Starter Adaptor	24	C24ST3			

## Commander Aircraft

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
112	LYC IO-360	149-Tooth Ring Gear	12	149-NL		149-12LS	
114	LYC IO-540	149-Tooth Ring Gear	12	149-NL		149-12LS	
500	LYC O-540	149-Tooth Ring Gear	24	149-24HT		149-NL	
520	LYC GO-435			No Fit			
560	LYC GO-480			No Fit			
685	CONT GTSIO-520-	TCM Starter Adaptor	24	C24ST3			9 (p.2)
112TC-A ALPINE	LYC TO-360	149-Tooth Ring Gear	12	149-NL		149-12LS	
114A GRAN TURISMO	LYC IO-540	149-Tooth Ring Gear	V	149-NL		149-(V)LS	
114TC	LYC TIO-540	149-Tooth Ring Gear	V	149-NL		149-(V)LS	
500A	CONT IO-470	TCM Starter Adaptor	24	C24ST3			
500B	LYC IO-540	149-Tooth Ring Gear	24	149-NL/ec*		149-24HT	
500S SHRIKE	LYC IO-540	149-Tooth Ring Gear	24	149-NL/ec*		149-24HT	

Please refer to [Caution](#) section (page 2) before recommending/ordering any starter

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
500U	LYC IO-540	149-Tooth Ring Gear	24	149-NL/ec*		149-24HT	
560A	LYC GO-480	149-Tooth Ring Gear		No Fit			
560A HC	LYC GO-480	149-Tooth Ring Gear		No Fit			
560E	LYC GO-480	149-Tooth Ring Gear		No Fit			
560F	LYC IGO-540	149-Tooth Ring Gear		No Fit			
680 FL COURSER	LYC IGSO-540	149-Tooth Ring Gear		No Fit			
680 FL GRAND	LYC IGSO-540	149-Tooth Ring Gear		No Fit			
680 SUPER	LYC GSO-480	149-Tooth Ring Gear		No Fit			
680E	LYC GSO-480	149-Tooth Ring Gear		No Fit			
680F	LYC IGSO-540	149-Tooth Ring Gear		No Fit			
680FLP	LYC IGSO-540	149-Tooth Ring Gear		No Fit			
720 ALTI-CRUISER	LYC GSO-480	149-Tooth Ring Gear		No Fit			
114B	LYC IO-540-T4B5	149-Tooth Ring Gear	V	149-NL		149-v(V)LS	

## Culver

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
LAR 90 CADET/LARK	FRANKLIN 4AC199E3			No Fit			
LCA CADET	CONT A75-8			No fit unless upgraded to -12 Engine			
V 2	CONT C85-12J	Pull-Start	12	KCST2	15		

## Diamond Aircraft

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
DA20-C1	CONT IO-240-B		12	C12ST2/S			
DA40-180	LYC IO-360-MIA	149-Tooth Ring Gear	24	149-24LS	1		

## Enstrom

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
280	LYC HIO-360	149-Tooth Ring Gear	V	149-(V)HT		149-NL	
F28	LYC HIO-360	149-Tooth Ring Gear	V	149-(V)HT		149-NL	

## Ercoupe

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
415	CONT C-75			No Fit			
415C	CONT A-65-8			No Fit			
415 C-D	CONT C-85-12	Pull-Start		KCST2	15		
415D	CONT C-75-12F	Pull-Start		KCST2	15		
415G	CONT C-85-12F	Pull-start		KCST2	15		
ALON A-2	CONT C-90-16F	Pull-start		KCST2	15		
F-1 FORNEY	CONT C-90-12F	Pull-start		KCST2	15		
MOONEY M-10 CADET	CONT C-90	Pull-start		KCST2	15		

Please refer to [Caution](#) section (page 2) before recommending/ordering any starter

**Extra**

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
200	LYC AEIO-360	149-Tooth Ring Gear	12	149-12LS	1	149-NL	
300	LYC AEIO-540	149-Tooth Ring Gear	12	149-12LS	1	149-NL	
80 CANUCK	CONT C-85-12F	Pull-start		KCST2	15		
AIRSHARK I (AMPHIB)	LYC IO-360	149-Tooth Ring Gear	12	149-12LS		149-NL	
B (B85C)	CONT C-85-12F	Pull-start		KCST2	15		

**Grob**

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
115 BAVARIAN	LYC O-320-D2A	149-Tooth Ring Gear	24	149-24PM	1	149-NL	

**Grumman American**

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
AA1 YANKEE	LYC O-235-C2C	122-Tooth Ring Gear	12	122-12LS		122-NL	
AA1A	LYC O-235-C2C	122-Tooth Ring Gear	12	122-12LS		122-NL	
AA1B	LYC O-235-C2C	122-Tooth Ring Gear	12	122-12LS		122-NL	
AA1C LYNX	LYC O-235-L2C	122-Tooth Ring Gear	12	122-12LS		122-NL	
AA1C T-CAT	LYC O-235-L2C	122-Tooth Ring Gear	12	122-12LS		122-NL	
AA5 TRAVELER	LYC O-320-E2G	149-Tooth Ring Gear	12	149-12LS		149-NL	
AA5A CHEETAH	LYC O-320-E2G	149-Tooth Ring Gear	12	149-12LS		149-NL	
AA5B TIGER	LYC O-360-A4K	149-Tooth Ring Gear	12	149-12LS		149-NL	
TR2 AA1B	LYC O-235-C2C	122-Tooth Ring Gear	12	122-12LS		122-NL	

**Hiller**

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
UH12E & E4	LYC VO-540-C2A	149-Tooth Ring Gear	V	149-(V)HT		149-NL	
UH12L4	LYC TIVO-540-A2A	149-Tooth Ring Gear	V	149-(V)HT		149-NL	

**Johnson**

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
ROCKET 185	LYC O-435-A			No Fit			

**Lake**

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
C-1 AMPHIBIAN	LYC O-320-A2A	149-Tooth Ring Gear	12	149-12LS		149-NL	
CIV AMPHIBIAN	LYC O-360-A1A	149-Tooth Ring Gear	12	149-12LS		149-NL	
LA-4	LYC O-360-A1A	149-Tooth Ring Gear	12	149-12LS		149-NL	
LA-4 200 BUCCANEER	LYC IO-360-A1B	149-Tooth Ring Gear	V	149-(V)LS		149-NL	
LA-4 200EP BUCCANEER	LYC IO-360-A1B	149-Tooth Ring Gear	V	149-(V)LS		149-NL	
LA-4 250 RENEGADE	LYC IO-540-C4B5	149-Tooth Ring Gear	V	149-(V)LS		149-NL	
LA-4 TURBO LAKE	LYC IO-360-A1B6	149-Tooth Ring Gear	V	149-(V)LS		149-NL	
LA-4-180	LYC O-360-A1A	149-Tooth Ring Gear	V	149-(V)LS		149-NL	

Please refer to [Caution](#) section (page 2) before recommending/ordering any starter

## Luscombe Aircraft Co.

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
8, 8A, 8C, 8D	CONT A-50, A-65-8, A-75			No Fit			
8E	CONT C-85-12	Pull-Start		KCST2	15		
8F	CONT C-90-12F	Pull-Start		KCST2	15		
11A SEDAN '48-'50	CONT C-165	Pull-Start		KCST2/SR	15		
SPARTAN 185 11-E	CONT IO-360-ES	TCM Starter Adapter	V	C(V)ST3			

## Maule

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
M4 JETESON '62-'67	CONT O-300-A	Pull-start	12	KCST2	15		
M4-180 ASTRO ROCKET	FRANK 6A-335-B1	Franklin	12	F12ST1			
M4-210 ROCKET	CONT IO-360-A	TCM Starter Adapter	12	C12ST3			
M4-220 STRATA ROCKET	FRANK 6A-350-C1	Franklin	12	F12ST1			
M5-180C	CONT O-360-C1F	TCM Starter Adapter	12	C12ST3			
M5-210 LUNAR ROCKET	CONT IO-360-D	TCM Starter Adapter	12	C12ST3			
M5-210TC	LYC TO-360-C1A6D	149-Tooth Ring Gear	12	149-12LS		149-NL	
M5-220C	FRANK 6A350C1	Franklin	12	F12ST1			
M5-235C	LYC O-540-J1A5D	149-Tooth Ring Gear	12	149-12LS		149-NL	
M6-235 SUPER ROCKET	LYC IO-540-J1A5D	149-Tooth Ring Gear	12	149-12LS		149-NL	
M7-235/MT7-235	LYC IO-540-J1A5D	149-Tooth Ring Gear	12	149-12LS		149-NL	
M7-260C ORION	LYC IO-540-V4A5	149-Tooth Ring Gear	12	149-12LS		149-NL	
MX7-160	LYC O-320-B20	?-Tooth Ring Gear	12	149-12LS		149-NL	
MX7-180	LYC O-360-C1F	149-Tooth Ring Gear	12	149-12LS		149-NL	
MX7-235	LYC O-540-J1A5D	149-Tooth Ring Gear	12	149-12LS		149-NL	
MX7-260	LYC IO-540-V4A5	149-Tooth Ring Gear	12	149-12LS		149-NL	
MXT7-180	LYC O-360-C1F	149-Tooth Ring Gear	12	149-12LS		149-NL	

## Meyers

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
200A	CONT IO-470-D	TCM Starter Adaptor	12	C12ST3			
200B	CONT IO-470-D	TCM Starter Adaptor	12	C12ST3			
200D	CONT IO-520-A	TCM Starter Adaptor	12	C12ST3			9 (p.2)
MICCO SP20	LYC IO-360-C1E6	149-Tooth Ring Gear	V	149-NL			

## Mooney

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
201 M20J	LYC IO-360-A3B6D	149-Tooth Ring Gear	V	149-NL		149-v(V)LSM	5
A2A CADET	CONT C-90-16F	Pull-Start	12	KCST2	15		
M10 CADET	CONT C-90-16F	Pull-Start	12	KCST2	15		
M18 MITE	LYC O-145-B2	No Fit					
M20 '55-'57	LYC O-320	122-Tooth Ring Gear	12	122-NL		122-12LS	
M20A	LYC O-360-A1A	122-Tooth Ring Gear	12	122-NL		122-12LS	
M20B MARK 21	LYC O-360-A1A	?-Tooth Ring Gear	12	?-NL		149-12LS	
M20C MARK 21	LYC O-360-A1D	149-Tooth Ring Gear	12	149-12LS	5	149-NL	

Please refer to [Caution](#) section (page 2) before recommending/ordering any starter

M20C RANGER	LYC O-360-A1D	149-Tooth Ring Gear	12	149-12LS	149-NL
M20D	LYC O-360-A1D	149-Tooth Ring Gear	12	149-12LS	149-NL
M20E CHAPARRAL	LYC IO-360-A1A	149-Tooth Ring Gear	12	149-12LS	149-NL
M20E SUPER 21	LYC IO-360-A1A	149-Tooth Ring Gear	12	149-12LS	149-NL
M20F EXECUTIVE 21	LYC IO-360-A1A	149-Tooth Ring Gear	12	149-12LS	149-NL
M20G STATESMAN	LYC O-360-A1D	149-Tooth Ring Gear	12	149-12LS	149-NL
M20J MSE	LYC IO-360-A3B6D	149-Tooth Ring Gear	V	149-NL	
M20K 231	CONT TSIO-360-GBA	TCM Starter Adaptor	V	CvST3	
M20K 252 TSE	CONT TSIO-360-MB1	TCM Starter Adaptor	V	CvST3	
M20M TLS BRAVO	LYC TIO-540-AF1A	149-Tooth Ring Gear	24	149-24LS	1
M20R OVATION	CONT IO-550-G5B	TCM Starter Adaptor	24	C24ST3	
M20S EAGLE	CONT IO-550-G	TCM Starter Adaptor	24	C24ST3	

### Morrissey Aircraft Co.

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
MORRISEY 2000	LYC O-235	122-Tooth Ring Gear	12	122-12LS			

### Navion

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
205A	CONT E-185-9			No Fit			
B	LYC GO-435-C2			No Fit			
G/G-1	CONT IO-470-H	TCM Starter Adaptor	12	C12ST3			
H RANGEMASTER	CONT IO-520-B	TCM Starter Adaptor	12	C12ST3			
NAVION D	CONT O-470	TCM Starter Adaptor	12	C12ST3			
NAVION/NAVION A/B	CONT E-185-3			No Fit			

### Partenavia

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
P68C	LYC IO-360-A1B6	149-Tooth Ring Gear	12	149-NL			
P68C OBSERVER	LYC IO-360-A1B6	149-Tooth Ring Gear	12	149-NL			
P68C TC	LYC TIO-360-C1A6D	149-Tooth Ring Gear	12	149-NL			

Please refer to [Caution](#) section (page 2) before recommending/ordering any starter

## Piper

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
J3 CUB	CONT A-65-8			No Fit			
J4-A CUB COUPE	CONT A-65			No Fit			
J4-CUB	CONT A-50-1			No Fit			
J4-E	CONT A-75			No Fit			
J4-F	LYC O-145	Pull-Start		C12ST2/SR			
J5A-75	CONT A75-8			No Fit			
PA11	CONT C-90	Pull-Start	12	KCST2	15		
PA11 CUB SPECIAL	CONT A-65			No Fit			
PA12 CRUISER	LYC O-235	122-Tooth Ring Gear	12	122-NL		122-12PM	2
PA12 SUPER CRUISER	LYC O-235-C	122-Tooth Ring Gear	12	122-NL		122-12PM	2
PA14 CRUISER	LYC O-235-C1	122-Tooth Ring Gear	12	122-NL		122-12PM	2
PA15 VAGABOND	LYC O-145-B2	122-Tooth Ring Gear	12	122-NL		122-12PM	2
PA16 CLIPPER	LYC O-235-C1	122-Tooth Ring Gear	12	122-NL		122-12PM	2
PA17 VAGABOND	CONT A-65-8			No Fit			
PA18-108	LYC O-235-C1	122-Tooth Ring Gear	12	122-NL		122-12PM	2
PA18-125 SUPER CUB	LYC O-290-D	122-Tooth Ring Gear	12	122-NL		122-12PM	2
PA18-135 SUPER CUB	LYC O-290-D2	122-Tooth Ring Gear	12	122-NL		122-12PM	2
PA18-150 SUPER CUB	LYC O-320-A2A	122-Tooth Ring Gear	12	122-NL		122-12PM	2
PA18-90 SUPER CUB	CONT C-90-F	Pull-Start	12	KCST2	15		
PA20-125 PACER	LYC O-290-D	122-Tooth Ring Gear	12	122-NL		122-12PM	2
PA20-135 PACER	LYC O-290-D2	122-Tooth Ring Gear	12	122-NL		122-12PM	2
PA22 TRI-PACER	LYC O-290-D	122-Tooth Ring Gear	12	122-NL		122-12PM	2
PA22-108 COLT	LYC O-235-C1B	122-Tooth Ring Gear	12	122-NL		122-12PM	2
PA22-125	LYC O-290-D	122-Tooth Ring Gear	12	122-NL		122-12PM	2
PA22-135 TRI-PACER	LYC O-290-D2	122-Tooth Ring Gear	12	122-NL		122-12PM	2
PA22-150 TRI-PACER	LYC O-320-A1A	122-Tooth Ring Gear	12	122-NL		122-12PM	2
PA22-160 TRI-PACER	LYC O-320-B2A	122-Tooth Ring Gear	12	122-NL		122-12PM	2
PA23-150 APACHE	LYC O-320	122-Tooth Ring Gear	12	122-NL		122-12PM	
PA23-160G&H APACHE	LYC O-320-B3B	122-Tooth Ring Gear	12	122-NL		122-12PM	
PA23-235 APACHE	LYC O-540	149-Tooth Ring Gear	12	149-NL			
PA23-23B AZTEC	LYC O-540-A1B5	149-Tooth Ring Gear	12	149-NL			
PA23C AZTEC	LYC IO-540-C4B5	149-Tooth Ring Gear	12	149-NL			
PA23C&D TURBO AZTEC	LYC IO-540-J4A5	149-Tooth Ring Gear	12	149-NL			
PA23D&E AZTEC	LYC IO-540-C4B5	149-Tooth Ring Gear	12	149-NL			
PA23E TURBO AZTEC	LYC TIO-540-C1A	149-Tooth Ring Gear	12	149-NL			
PA23F AZTEC	LYC IO-540	149-Tooth Ring Gear	12	149-NL			
PA23F TURBO AZTEC	LYC TIO-540-C1A	149-Tooth Ring Gear	12	149-NL			
PA24 260 T COMANCHE	LYC IO-540-N1A5	149-Tooth Ring Gear	12	149-NL			
PA24-180 COMANCHE	LYC O-360-A1A	?-Tooth Ring Gear	12	?-NL			
PA24-250 COMANCHE	LYC O-540-A1A5	149-Tooth Ring Gear	12	149-NL			
PA24-260B COMANCHE	LYC O-540-D	149-Tooth Ring Gear	12	149-NL			
PA24-260C COMANCHE	LYC IO-540-N	149-Tooth Ring Gear	12	149-NL			

Please refer to [Caution](#) section (page 2) before recommending/ordering any starter

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
PA24-260TC COMMANCHE	LYC IO-540-N1A5	149-Tooth Ring Gear	12	149-NL			
PA24-400 COMANCHE	LYC IO-720-A1A	122-Tooth Ring Gear	12	122-NL			
PA25 235 C,D. PAWNEE	LYC O-540-B2B5	149-Tooth Ring Gear	12	149-NL			
PA25 260C,D PAWNEE	LYC O-540-G1A5	149-Tooth Ring Gear	12	149-NL			
PA25-150 PAWNEE	LYC O-320-A2A	122-Tooth Ring Gear	12	122-NL			
PA28-140 CHEROKEE	LYC O-320-E2A	122-Tooth Ring Gear	12	122-NL		122-12PM	4
PA28-140 CRUISER	LYC O-320-E2D	122-Tooth Ring Gear	12	122-NL		122-12PM	4
PA28-140B,C,D,E.	LYC O-320-E2A	122-Tooth Ring Gear	12	122-NL		122-12PM	4
PA28-150 CHEROKEE	LYC O-320-A2B	122-Tooth Ring Gear	12	122-NL		122-12PM	4
PA28-150C CHEROKEE	LYC O-320-A2B	122-Tooth Ring Gear	12	122-NL		122-12PM	4
PA28-151 WARRIOR	LYC O-320-D3D	?-Tooth Ring Gear	12	?-NL		?-12LS	
PA28-160 CHEROKEE	LYC O-320-B2B	?-Tooth Ring Gear	12	?-NL		122-12PM	4
PA28-160C CHEROKEE	LYC O-320-B2B	?-Tooth Ring Gear	12	?-NL		122-12PM	4
PA28-161 WARRIOR II	LYC O-320-D3D	?-Tooth Ring Gear	12	?-12LS		?-NL	
PA28-180 ARCHER	LYC O-360-A4M	?-Tooth Ring Gear	12	?-NL		?-LS	3
PA28-180 D,E,F,G	LYC O-360-A3A	?-Tooth Ring Gear	12	?-NL		?-LS	3
PA28-180 R&RB ARROW	LYC IO-360-BE	149-Tooth Ring Gear	12	149-12LS		149-NL	
PA28-181 ARCHER II	LYC O-360-A4M	149-Tooth Ring Gear	V	149-(V)LS		149-NL	
PA28-200R ARROW II	CONT TSIO-360-F	TCM Starter Adaptor	V	C(V)ST3			
PA28-200R&RB ARROW	LYC IO-360-C1C	149-Tooth Ring Gear	12	149-12LS		149-NL	
PA28-201T T DAKOTA	CONT TSIO-360-FB	TCM Starter Adaptor	V	C(V)ST3			
PA28-235 CHARGER	LYC O-540-B4B5	149-Tooth Ring Gear	12	149-NL			
PA28-235 PATHFINDER	LYC O-540-B4B5	149-Tooth Ring Gear	12	149-NL			
PA28-235B CHEROKEE	LYC O-540-B4B5	149-Tooth Ring Gear	12	149-NL			
PA28-235 C,D,E,F.	LYC O-540-B4B5	149-Tooth Ring Gear	12	149-NL			
PA28-236 DAKOTA	LYC O-540-J3A5D	149-Tooth Ring Gear	V	149-NL			
PA28B&C-180 CHEROKEE	LYC O-360-A3A	149-Tooth Ring Gear	V	149-(V)LS		149-NL	
PA28R ARROW III,IV	LYC IO-360-C1C6	149-Tooth Ring Gear	12	149-12LS		149-NL	
PA28R-201T T ARROW 3	CONT TSIO-360-F	TCM Starter Adaptor	12	C12ST3			
PA28RT-201 ARROW IV	LYC IO-360-C1C6	149-Tooth Ring Gear	12	149-12LS		149-NL	
PA28RT-201T ARROW3/4	CONT TSIO-360-FB	TCM Starter Adaptor	12	C12ST3			
PA30B TURBO T COMMAN	LYC IO-320-C1A	?-Tooth Ring Gear	12	?-12LS		?-NL	
PA30B TWIN COMMANCHE	LYC IO-320-B1A	?-Tooth Ring Gear	12	?-12LS		?-NL	
PA30C TURBO TWN COMM	LYC IO-320-C1A	?-Tooth Ring Gear	12	?-12LS		?-NL	
PA30C TWN. COMMANCHE	LYC IO-320-B1A	?-Tooth Ring Gear	12	?-12LS		?-NL	
PA31-300 NAVAJO	LYC IO-540-M1A5	149-Tooth Ring Gear	24	149-NL/ec*			
PA31-310 B&C NAVAJO	LYC TIO-540-A2C	149-Tooth Ring Gear	24	149-NL/ec*			
PA31-310 NAVAJO TURB	LYC TIO-540-A1A	149-Tooth Ring Gear	24	149-NL/ec*			
PA31-325 NAVAJO (Left Engine)	LYC TIO-540-F2BD	149-Tooth Ring Gear	24	149-NL/ec*			
PA31-325 NAVAJO (Right Engine)	LYC LTIO-540-F2BD	149-Tooth Ring Gear	24	149-NLR/ec*	10		
PA31-350 CHIEFTAN (Left Engine)	LYC TIO-540-J2BD	149-Tooth Ring Gear	24	149-NL/ec*			

Please refer to [Caution](#) section (page 2) before recommending/ordering any starter

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
PA31-350 CHIEFTAN (Right Engine)	LYC LTIO-540-J2BD	149-Tooth Ring Gear	24	149-NLR/ec*	10		
PA31P-350 MOJAVE (Left Engine)	LYC TIO-540	149-Tooth Ring Gear	24	149-NL/ec*			
PA31P-350 MOJAVE (Right Engine)	LYC L/TIO-540	149-Tooth Ring Gear	24	149-NLR/ec*	10		
PA32-260 '74-'78 Cherokee 6	LYC O-540-E4B5	149-Tooth Ring Gear	12	149-NL			
PA32-260C,D,E Cherokee 6	LYC O-540-E4B5	149-Tooth Ring Gear	12	149-NL			
PA32-300 '73&'74 6 (Lance)	LYC IO-540-K1G5D	149-Tooth Ring Gear	12	149-NL			
PA32-300B,C,D,E. 6 (Lance)	LYC IO-540-K1G50	149-Tooth Ring Gear	12	149-NL			
PA32-301 SARATOGA	LYC IO-540-K1G5	149-Tooth Ring Gear	12	149-NL			
PA32-301T SARATOGA	LYC TIO-540-S1AD	149-Tooth Ring Gear	12	149-NL			
PA32R TURBO LANCE	LYC IO-540-S1AD	149-Tooth Ring Gear	12	149-NL			
PA32R&RT LANCE II	LYC IO-540-K1G5D	149-Tooth Ring Gear	12	149-NL			
PA32R-300 LANCE	LYC IO-540-K1G5D	149-Tooth Ring Gear	12	149-NL			
PA32R-301 SARATOGA SP	LYC IO-540-K1G5D	149-Tooth Ring Gear	V	149-NL			
PA32R-301T SARATOGA	LYC TIO-540-S1AD	149-Tooth Ring Gear	V	149-NL			
PA34 200 SENECA I (Left Engine)	LYC IO-360-C1E6	149-Tooth Ring Gear	12	149-NL			
PA34 200 SENECA I (Right Engine)	LYC L/IO-360-C1E6	149-Tooth Ring Gear	12	149-NLR			
PA34-200T SENECA II	CONT LT/TSIO-360-E	TCM Starter Adaptor	12	C12ST3			
PA34-220T SENECA III	CONT LT/TSIO-360-KB	TCM Starter Adaptor	12	C12ST3			
PA36-300 BRAVE	LYC IO-540-K1G5	149-Tooth Ring Gear	V	149-NL			
PA36-375 BRAVE	LYC IO-720-D1CD	?-Tooth Ring Gear	V	?-NL			
PA38 TOMAHAWK	LYC O-235-L2C	122-Tooth Ring Gear	12	122-12LS		122-NL	
PA39C/R TWN COMANCHE (Left Engine)	LYC IO-320	149-Tooth Ring Gear	12	149-NL			
PA39C/R TWN COMANCHE (Right Engine)	LYC LIO-320	149-Tooth Ring Gear	12	149-NLR			
PA44-180 SEMINOLE (Left Engine)	LYC TO-360	149-Tooth Ring Gear	V	149-NL		149-(V)LS	
PA44-180 SEMINOLE (Right Engine)	LYC LTO-360	149-Tooth Ring Gear	V	149-NLR			
PA46 MALIBU MIRAGE	LYC TIO-540-AE2A	149-Tooth Ring Gear	24	149-NL/ec*	13		
PA46-310P MALIBU	CONT TSIO-520-BE	TCM Starter Adaptor	24	C24ST3			
PA60-60X AEROSTAR	LYC IO-540 -series	149-Tooth Ring Gear	24	149-NL/ec*			
PA60-700P AEROSTAR (Left Engine)	LYC TIO-540	149-Tooth Ring Gear	24	149-NL/ec*		149-24HT	
PA60-700P AEROSTAR (Right Engine)	LYC LTIO-540	149-Tooth Ring Gear	24	149-NLR/ec*			

Please refer to [Caution](#) section (page 2) before recommending/ordering any starter

## Robinson

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
R22-All	LYC O-360	149-Tooth Ring Gear	12	149-12HT/H	1, 12	149-NL	11
R44-Raven I	LYC O-540	149-Tooth Ring Gear	12	149-12HT/H	1, 12	149-NL	11
R44-Raven II	LYC IO-540	149-Tooth Ring Gear	24	149-24HT/H	1, 12		

## Rockwell

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
100 DARTER	LYC O-320-A2B	?-Tooth Ring Gear	12	?-12LS		?-NL	
100-180 LARK	LYC O-360-A2F	149-Tooth Ring Gear	12	149-12LS		149-NL	
112 COMMANDER	LYC IO-360	149-Tooth Ring Gear	12	149-NL			
114 COMMANDER	LYC IO-540	149-Tooth Ring Gear	V	149-(V)LS		149-NL	

## Schweizer

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
200 (269A)	LYC HIO-360-B1A	149-Tooth Ring Gear	24	149-24HT			
300 (269B)	LYC HIO-360-A1A	149-Tooth Ring Gear	24	149-24HT			
300C (F269C)	LYC HIO-360-D1A	149-Tooth Ring Gear	24	149-24HT			

## Siai Marchetti

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
S202-22/R	FRANKLIN	Franklin	24	F24ST1			
SF260D	LYC O-540-E4A5	149-Tooth Ring Gear	24	149-24HT		149-NL	

## Socata

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
RALLYE 100ST/100T	CONT O-200-A	Pull-Start	12	KCST2	15		
RALLYE 150 ST	LYC O-320-E2A	122-Tooth Ring Gear	12	122-NL		122-12LS	
RALLYE 180 GT	LYC O-360-A3A	149-Tooth Ring Gear	12	149-NL		149-12LS	
RALLYE 235 GT/E	LYC O-540-B4B5	149-Tooth Ring Gear	12	149-NL			
TB 10 TOBAGO	LYC O-360-A1AD	149-Tooth Ring Gear	12	149-NL		149-12LS	
TB 20 TRINIDAD	LYC IO-540-C4D5D	149-Tooth Ring Gear	12	149-NL			
TB 200 TOBAGO XL	LYC IO-360-A1B6	149-Tooth Ring Gear	12	149-NL		149-12LS	
TB 21TC TRINIDAD	LYC TIO-540-AB1AD	149-Tooth Ring Gear	12	149-NL		149-12LS	
TB 30 EPSILON	LYC AEIO-540-L1B5D	149-Tooth Ring Gear	12	149-NL			
TB 360 TANGARA	(2) LYC O-360-A1G6	149-Tooth Ring Gear	12	149-NL		149-12LS	
TB 9 TAMPICO CLUB	LYC O-320-D2A	149-Tooth Ring Gear	12	149-NL		149-12LS	

## Stinson

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
105	CONT A-80-6			No Fit			
108	FRANK 6A4-150-B31	Franklin	12	F12ST1			
108-1 '46 & '47	FRANK 6A4-150-B23	Franklin	12	F12ST1			
108-2/2 VOYAGER&S/W	FRANK 6A4-165-B3	Franklin	12	F12ST1			

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10A	FRANK 4AC199E2	Franklin	12	F12ST1
76/L5 SENTINEL	LYCOMING	?-Tooth Ring Gear	V	?(V)LS
SR10 RELIANT	LYCOMING			No Fit

### Taylorcraft

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
BC-12	CONT A-65			No Fit			
BC-12D	CONT A-65-8A			No Fit			
BL65	LYC O-145-B2	Pull-Start		KCST2	15		
F15	CONTINENTAL						
F19	CONT C-85	Pull-Start		KCST2	15		
F19 SPORTSMAN 100	CONT O-200A	Pull-Start		KCST2	15		
F21	LYC O-235-L2C	122-Tooth Ring Gear	12	122-12LS			
F21B	LYC O-235-L2C	122-Tooth Ring Gear	12	122-12LS			

### Varga

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
2180	LYC O-360-A4AD	149-Tooth Ring Gear	12	149-12LS			
2150A KACHINA	LYC O-320-A2C	?-Tooth Ring Gear	12	?-12LS			

### Zenair

Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
STOL CH 801	LYC O-360	149-Tooth Ring Gear	12	149-12LS			
TRI ZENITH CH 300	LYC O-320	?-Tooth Ring Gear	12	?-12LS			
ZENITH CH 200/250	LYC O-320	?-Tooth Ring Gear	12	?-12LS			
ZENITH CH 2000	LYC O-235-N2C	?-Tooth Ring Gear	12	?-12LS			

### Experimental & Rare Aircraft

Aircraft Model	Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
ACE AIRCRAFT	JUNIOR ACE E	CONT C-85-12	Pull-Start	12	KCST2	15		
ACES HIGH LT A/C	ACRO SPORT II	LYCOMING O-320	?-Tooth Ring Gear	12	?-12LS		?-NL	
ACRO SPORT INC	ACRO SPORT I	LYC IO-360	149-Tooth Ring Gear	12	149-12LS		149-NL	
ACRO SPORT INC	JUNIOR ACE	CONT C-85-12	Pull-Start	12	KCST2	15		
ADVENTURE AIR	ADVENTURER 2+2	LYC IO-360	149-Tooth Ring Gear	12	149-12LS		149-NL	
AERO DESIGN	OUTBACK	CONT IO-240-B	Key Start	12	C12ST2/S			
AERO DESIGN	OUTBACK	CONT O-200	Pull-Start	12	KCST2	15		
AERO DESIGN	OUTBACK	LYC O-235-L2C	122-Tooth Ring Gear	12	122-NL		122-12LS	
AERO DESIGN	VOYAGER	CONT IO-240-B	Key Start	12	C12ST2/S			
AERO DESIGN	VOYAGER	CONT O-200	Pull-Start	12	KCST2	15		
AERO DESIGN	VOYAGER	LYC O-235-L2C	122-Tooth Ring Gear	12	122-NL		122-12LS	
AEROCAD INC	AERO CANARD	LYC LIO-360	149-Tooth Ring Gear	12	149-NLR	RT		
AEROCAD INC	AERO CANARD SB	LYC O-360	149-Tooth Ring Gear	12	149-NL		149-12LS	
AEROCOMP INC	CA 6	FRANKLIN		12	F12ST1			

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AEROCOMP INC	CA 6 TW	FRANKLIN		12	F12ST1	
AEROCOMP INC	COMP MONSTER	LYC O-360	149-Tooth Ring Gear	12	149-NL	149-12LS
AIRCRAFT DESIGNS	SPORTSTER GYRO	LYC O-320	149-Tooth Ring Gear	12	149-NL	149-12LS
AIRCRAFT PARTS	A9A SPARROW	LYC O-540-B2B5	149-Tooth Ring Gear	12	149-NL	
AIRCRAFT PARTS	A9B QUAIL	LYC IO-540-K1A5	149-Tooth Ring Gear	12	149-NL	
AIRCRAFT PARTS	A9B QUAIL 290HP	LYC IO-540-B1C5	149-Tooth Ring Gear	12	149-NL	
AIRCRAFT SPRUCE	BABY LAKES	CONT C-85-12	Pull-Start	12	KCST2	15
AIRCRAFT SPRUCE	BUDDY LAKES	C-85-12 or higher	Pull-Start	12	KCST2	15
AIRCRAFT SPRUCE	ONE DESIGN	LYC AEIO-320	149-Tooth Ring Gear	12	149-NL	149-12LS
AIRCRAFT SPRUCE	RIHN DR-109	LYC AEIO-540-D4A5	149-Tooth Ring Gear	12	149-NL	
AIRCRAFT SPRUCE	SUPER LAKES	LYC O-235	122-Tooth Ring Gear	12	122-NL	
AIRCRAFT SPRUCE	W-10 TAILWIND	CONT O-300	Pull-Start	12	KCST2	15
AIRCRAFT TECHNOLOGIE	ACRO 1	LYC IO-360	149-Tooth Ring Gear	12	149-NL	149-12LS
AIRCRAFT TECHNOLOGIE	ATLANTIS	LYC IO-360	149-Tooth Ring Gear	12	149-NL	149-12LS

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Aircraft Model	Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
AKROTECH AVIA INC	GILES G-200	LYCOMING	149-Tooth Ring Gear	12	149-NL		149-12LS	
AKROTECH AVIA INC	GILES G-202	LYC 360	149-Tooth Ring Gear	12	149-NL		149-12LS	
ANGEL	44	(2) LYC IO-540	149-Tooth Ring Gear	12	149-NL			
ASSOCIATED AIR	LIBERTY 181	CONT O-470	TCM Starter Adaptor	12	C12ST3			
AVIABELLANCA	SKY ROCKET III	CONT GTSIO-520	TCM Starter Adaptor	24	C24ST3			9 (p.2)
AVID AIRCRAFT	MAGNUM	LYC O-320	122-Tooth Ring Gear	12	122-NL		122-12LS	
BARNETT ROTORCRAFT	BARNETT J4B	CONT O-200	Pull-Start	12	KCST2	15		
BARNETT ROTORCRAFT	BARNETT J4B2	CONT O-200	Pull-Start	12	KCST2	15		
BARR AIRCRAFT	SIX	LYC TIO-540	149-Tooth Ring Gear	12	149-NL			
BD-4 AIRCRAFT	BD-4/BD-6	LYC IO-360	149-Tooth Ring Gear	12	149-NL			
BROKAW AVIATION INC	BROKAW BULLETT BU133C	LYC TIO-541	149-Tooth Ring Gear	V	149-NL			
BUCKER PRADO SL	JUNGMEISTER	LYC O-360	149-Tooth Ring Gear	V	149-??LS		149-NL	
CANADIAN HOME ROTORS	BABY BELLE	LYCOMING	149-Tooth Ring Gear	12	149-12HT		149-NL	
COMMONWEALTH CONSOLIDATED VULTEE	SKYRANGER	CONT C-85-12	Pull-Start	12	KCST2	15		
	L-13 CONVAIR	FRANKLIN	Franklin Engine	V	F(V)ST1			
CURTISS-WRIGHT	C1 ROBIN	CONT W-670-K			No Fit			
D2 INC	DAVIS 5-A	CONT A-65			No fit unless upgraded to -12 Engine			
DURAND ASSOCIATES	DURAND MARK V	LYC O-320	?-tooth Ring Gear	12	?-12LS		?-NL	
DYKE AIRCRAFT	DYKE DELTA	LYC O-360	149-Tooth Ring Gear	12	149-12LS		149-NL	
DYN' AERO SA	CR.100	LYC IO-360	149-Tooth Ring Gear	12	149-12LS		149-NL	
EAGLE	DW-1	LYC IO-540-M1B5B	149-Tooth Ring Gear	V	149-(V)LS		149-NL	
EDI	WHEELER EXPRESS	CONT IO-360	TCM Starter Adaptor	12	C12ST3			
EXPRESS A/C CO LLC	EXPRESS	LYC IO-540	149-Tooth Ring Gear	V	149-NL			
EXPRESS A/C CO LLC	EXPRESS SERIES 90	LYC IO-540	149-Tooth Ring Gear	V	149-NL			
GLASSIC COMP	SQ2000 ES	LYC IO-360	149-Tooth Ring Gear	12	149-12LS		149-NL	
GLASSIC	SQ2000 XP	LYC IO-360	149-Tooth Ring Gear	12	149-12LS		149-NL	
GREAT AIRPLANES	SPORT TRAINER	LYC O-360	149-Tooth Ring Gear	12	149-12LS		149-NL	
GREAT LAKES	BIPLANE 2T-1A	LYCOMING	149-Tooth Ring Gear	12	149-12LS		149-NL	
KELLY	KELLY D	LYC O-235	?-tooth Ring Gear	12	?-12LS		?-NL	
MARQUART	MA-5 CHARGER	LYC O-290	?-tooth Ring Gear	12	?-12LS		?-NL	
MAURICE BOYER	SUPER CHIPMUNK	CONT IO-360	TCM Starter Adapter	V	C(V)ST3			
MURPHY AIRCRAFT	REBEL	LYC O-235	122-Tooth Ring Gear	12	122-12LS			
MURPHY AIRCRAFT	REBEL	LYC O-320	122-Tooth Ring Gear	12	122-12LS			
MURPHY AIRCRAFT	REBEL ELITE	LYC O-235	122-Tooth Ring Gear	12	122-12LS			
MURPHY AIRCRAFT	REBEL ELITE	LYC O-320	122-Tooth Ring Gear	12	122-12LS			
MURPHY AIRCRAFT	REBEL ELITE	LYC O-360	149-Tooth Ring Gear	12	149-12LS			
MURPHY AIRCRAFT	SUPER REBEL	LYC O-540	149-Tooth Ring Gear	12	149-12LS			
MURPHY AIRCRAFT	SUPER REBEL 2500	LYC IO-360	149-Tooth Ring Gear	12	149-12LS			
MURPHY AIRCRAFT	SUPER REBEL 2500	LYC O-360	149-Tooth Ring Gear	12	149-12LS			
OSPREY AIRCRAFT	GP 4	LYC IO-360	149-Tooth Ring Gear	12	149-12LS		149-NL	
OSPREY AIRCRAFT	OSPREY II	LYC O-320	?-Tooth Ring Gear	12	?-12LS		149-NL	

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Aircraft Model	Aircraft Model	Engine	Start Type	Volts	Primary Recommendation	Note	Secondary Recommendation	Note
LANCAIR INT'L	LANCAIR 235	LYC O-235	?-Tooth Ring Gear	12	?-12LS		?-NL	
LANCAIR INT'L	LANCAIR 320	LYC IO-320	?-Tooth Ring Gear	12	?-12LS		?-NL	
LANCAIR INT'L	LANCAIR MK II	LYC IO-360	149-Tooth Ring Gear	12	149-12LS		149-NL	
LANCAIR INT'L	LANCAIR ES	LYC IO-360-ES	149-Tooth Ring Gear	12	149-12LS		149-NL	
LANCAIR INT'L	LANCAIR IV	CONT TSIO-550-E	TCM Starter Adapter	V	C(V)ST3			9 (p.2)
LANCAIR INT'L	LANCAIR IV-P	CONT TSIO-550-E	TCM Starter Adapter	V	C(V)ST3			9 (p.2)
LANCAIR INT'L	LANCAIR S ES	CONT IO-550-G	TCM Starter Adapter	V	C(V)ST3			
LANCAIR INT'L	LEGACY 2000	LYC IO-550-N	TCM Starter Adapter	V	C(V)ST3			
RANS INC	S-16 SHEKARI	CONT IO-240		12	C12ST2/S			
REARWIN	185 SKYRANGER	CONT C-85-12	Pull-Start	12	KCST2	15		
RILEY	340 ROCKET	LYC TIO-540-R2AD	149-Tooth Ring Gear	V	149-NL			
RILEY	414 ROCKET	LYC IO-720-B1BD	?-Tooth Ring Gear	V	?-NL			
RILEY	SUPER 310	(2) CONT TC	TCM Starter Adaptor	V	C(V)ST3			
RILEY	SUPER 340	(2) CONT TC	TCM Starter Adaptor	V	C(V)ST3			
SEQUOIA AIRCRAFT	F8L FALCO	LYCOMING	149-Tooth Ring Gear	24	149-NL			
SORRELL AIRCRAFT	SNS-7 HIPERBIPE	LYC IO-360	149-Tooth Ring Gear	12	149-12LS		149-NL	
SORRELL AIRCRAFT	SPENCER AMPHIB	CONT IO-520	TCM Starter Adaptor	12	C12ST3			9 (p.2)
SPORT AVIATION	THORP T (S) 18	LYC O-320	?-Tooth Ring Gear	12	?-12LS			
STEEN AERO LAB	KNIGHT TWISTER	LYCOMING	?-Tooth Ring Gear	12	?-12LS			
STEEN AERO LAB	PITTS S1	LYC IO-360	149-Tooth Ring Gear	12	149-12LS			
STEEN AERO LAB	SKYBOLT	LYC IO-540	149-Tooth Ring Gear	12	149-12LS		149-NL	
STODDARD-HAMILTON	GLASTAR	LYC O-320	?-Tooth Ring Gear	12	?-12LS			
STODDARD-HAMILTON	GLASTAR	LYC O-360	149-Tooth Ring Gear	12	149-12LS		149-NL	
STODDARD-HAMILTON	GLASAIR III TURBO	LYC TIO-540	149-Tooth Ring Gear	12	149-12LS		149-NL	
STODDARD-HAMILTON	GLASAIR II-S FT	LYC IO-360	149-Tooth Ring Gear	12	149-12LS		149-NL	
STODDARD-HAMILTON	GLASAIR SUPR II-S RG	LYC IO-360	149-Tooth Ring Gear	12	149-12LS		149-NL	
STOLP	STARDUSTER TOO ACRODUSTER TOO	LYC O-360	149-Tooth Ring Gear	12	149-12LS		149-NL	
STOLP	SA750	LYC IO-360	149-Tooth Ring Gear	12	149-12LS		149-NL	
TEMCO	TE-18 BUCKEROO	FRANKLIN	Franklin	12	No Fit			
VAN'S AIRCRAFT	RV-3	LYC 320	?-Tooth Ring Gear	12	?-12LS			
VAN'S AIRCRAFT	RV-4	LYC 320	?-Tooth Ring Gear	12	?-12LS		149-NL	7
VAN'S AIRCRAFT	RV-6	LYC 360	149-Tooth Ring Gear	12	149-12LS		149-NL	7
VAN'S AIRCRAFT	RV-7	LYC 360	149-Tooth Ring Gear	12	149-12LS		149-NL	7
VAN'S AIRCRAFT	RV-8	LYC 360	149-Tooth Ring Gear	12	149-12LS		149-NL	7
VAN'S AIRCRAFT	RV-9	LYC 360	149-Tooth Ring Gear	12	149-12LS		149-NL	7
VAN'S AIRCRAFT	RV-10	LYC 540	149-Tooth Ring Gear	12	149-NL			
VELOCITY	VELOCITY	LYC 360, 540	149-Tooth Ring Gear	V	149-(V)LS		149-NL	
WAG-AERO	SPORT TRAINER	CONT C-85-12	Pull-Start	12	KCST2	15		
WAG-AERO	SPORTSMAN 2+2 WAG-A-BOND	LYC O-290-D2	122-Tooth Ring Gear	12	122-12LS			
WAG-AERO	TRAVELER	LYC O-235	122-Tooth Ring Gear	12	122-12LS			

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## Notes

1. Sky-Tec Starter is the original equipment starter
2. Modification of oil cooler bracket may be required
3. If oil cooler is in front of engine, choose PM model
4. BCE-6 (battery cable extension) may be required
5. Baffle modification required
6. Cowl bumper bracket modification required
7. If using RV-7 “Snorkel” induction, may have to use 149-12LS (was used by Van’s to form the snorkel)
8. Airframe manufacturer mounted the aircraft starter contactor (“firewall” solenoid) directly to the OEM Starter – you will need to straighten mounting tabs and relocate to suitable place on the firewall
9. Aircraft with sandcast TCM 520 engines (alternator in rear) are notoriously difficult to crank smoothly. TCM utilized a 32:1 starter adaptor on sandcast motors that no known starter is especially good at cranking. Sky-Tec makes no claims that our ST3 starter will crank sandcast TCM520 engines any better than anyone else’s starter.
10. Installing the Sky-Tec 149-NLR starter on some LIO-540 and LTIO-540 engines on PA-31 aircraft may require the use of an installation spacer, Sky-Tec PN 25099. See [http://www.skytecair.com/images/PA31\\_NLR\\_Install.jpg](http://www.skytecair.com/images/PA31_NLR_Install.jpg) for details.
11. Some Robinson Helicopters originally configured with Prestolite starters utilized a firewall-mounted starter contactor relay. The 149-NL starter can be installed on those ships that still have the firewall-mounted starter contactor relay. Robinson Helicopters originally configured with B&C starters or Sky-Tec HT starters cannot utilize the 149-NL starter as the aircraft has no installed/certified firewall-mounted starter contactor relay and the NL starter S-terminal is not accessible for this function. However, 149-NL/ec starters (due for availability late 2007) may be used as their S-terminal is accessible for dual function as the starter contactor relay. Confused yet? Call Sky-Tec now.
12. Robinson Helicopters originally configured with B&C starters utilized a proprietary starter-alternator strap that is used only on these aircraft (Robinson PN ?). When replacing the B&C starter with any Sky-Tec starter, you must also order and replace the starter-alternator strap with the standard length starter-alternator strap either Lycoming 74323 (steel) or Robinson PN ?
13. One customer has called the factory to claim the NL will not fit on his Mirage. Dozens (if not hundreds) of other Mirage owners have used the NL starter for years with no installation issues.
14. Cessna OEM production replaced the Lamar series starters with Sky-Tec starting in 2006. Via SB07-80-01, Cessna recommends purchasing MK172-80-01 or MK182-80-01, which includes all parts required to do a first class upgrade to the Sky-Tec 149-NL starter. Order the starter separately.
15. The KCST2 is an STC eligible kit requiring modification to the engine & airframe for installation.
16. NO FIT on aircraft with electronic tach sensors mounted to the nose of OE Electrosystems Starter.

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