

ASSEMBLY MANUAL

**Recoil Starter
Modification Kit**
for Rotax Engines

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ULTRAFLIGHT MANUFACTURING LIMITED

1.0

INTRODUCTION

The recoil starter supplied with this kit is manufactured by (or for) Tecumseh and has gained an excellent reputation for reliability within the industry. Although it weighs considerably less than the original Rotax starter and is less complex in design, it has performed extremely well in testing and is expected to provide a much longer service life than the original unit. In addition, the new starter also has a larger rope sheave, which makes engine starting noticeably easier.

Because of the small size and mounting configuration of the new starter, we have been able to incorporate a new engine mount which is lighter and stronger than the earlier configuration, and provides a substantial reduction in frontal area. Although this new mounting system is significantly different from the previous one, we have retained the same type and location of rubber shock mounts to facilitate mounting on existing nacelles.

In addition to the tools required for routine maintenance on your Lazair, installation of this modification kit will require a number 7 (or 13/16 inch) drill, a 1/4-20 UNC plug tap, and a small amount of loctite 242 or similar type of thread locking compound.

2.0

INSTALLATION

Remove the engine from the nacelle. Remove and discard the original mounting brackets and recoil starter from the engine.

2.1

Remove and discard the 1½ inch socket head setscrews or capscrews from the rubber mounts. Retain the rubber mounts and the 1 inch diameter ½ inch long spacers.

2.2

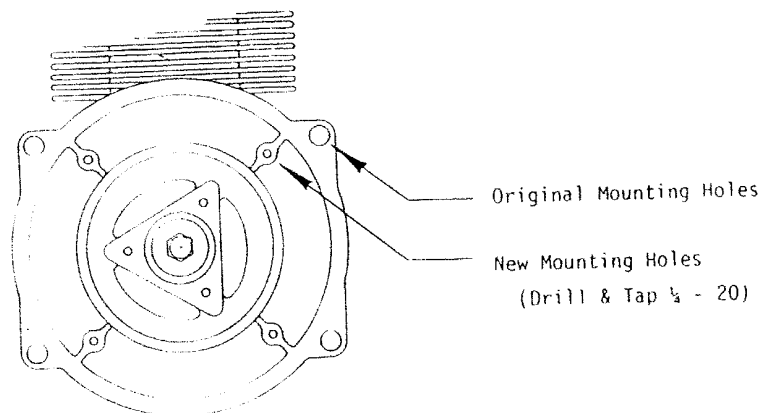
Remove the 3 nuts holding the aluminum starter pulley to the flywheel hub. Discard the pulley but retain the mounting hardware.

2.3

Drill and tap the new mounting holes in the crankcase as follows:-
Carefully drill out each hole using a number 7 (or 13/64) drill.
Drill the two top holes completely through the crankcase bell-housing but be careful to avoid damaging the spark plug wire.
Drill the bottom two holes through into the large tapped holes in the bottom of the crankcase.

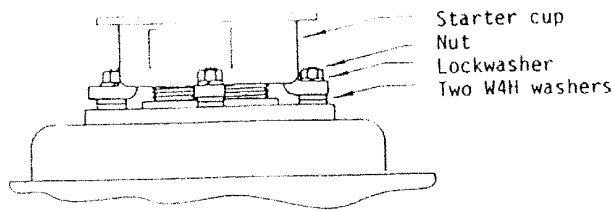
NOTE: Be sure the holes are drilled perpendicular to the face of the crankcase. Depending on the time of purchase, your engine will have either pilot holes or 4 tapped holes. These will provide a good guide for the drill if you don't force it the wrong way.

Tap all four holes using a $\frac{1}{4}$ -20 UNC tap. Make sure the tap is perpendicular to the face of the crankcase. Use lacquer thinner as a lubricant, and back the tap out to clear away the chips when necessary, to avoid breaking the tap. The two top holes should be tapped so that perfect threads extend almost (but not quite) all the way through the material. This will permit the engine mounting studs to be jammed into the few remaining imperfect threads: Note the depth of penetration of the tap in the top holes and tap the two bottom holes to the same depth.



2.4

Put two W4H washers on each of the three studs on the flywheel hub and fit the new starter cup in place as shown. (Note that it is keyed and will fit in only one orientation). Use a drop of Loctite 242 or equivalent on each stud and tighten the nuts securely.

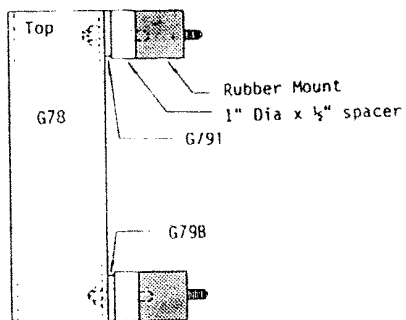


2.5 Screw the four S3 engine mounting studs into the crankcase and tighten them securely (you can use vise-grips if you stay away from the outer half inch of thread).

NOTE: It is essential that loctite or equivalent be used to lock these studs in place.

2.6 Screw a 1½ inch setscrew into each rubber mount using loctite and tighten securely using an Allen key, but *do not* hold the rubber mounts with pliers while tightening (they are not designed to withstand large torsional loads).

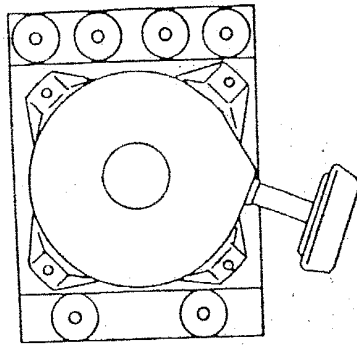
2.7 Assemble the rubber mounts onto the G78 engine mount tube as shown, using the G79 doublers and N4CL nuts.



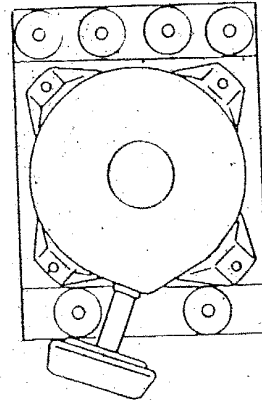
2.8 Make sure the four S1.75 spacers are inserted in the G78 engine mounting tube and that they are properly aligned with the mounting holes. Fit the G78 over the four studs, making sure that the four rubber mounts are at the top.

2.9

Slide the recoil starter over the studs, noting that the orientation is different for a left or right engine.

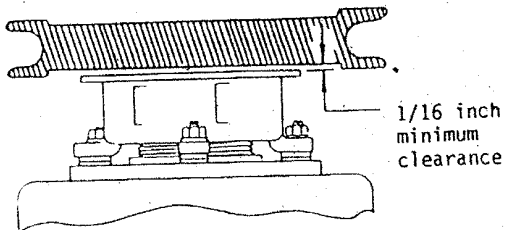


Left Engine

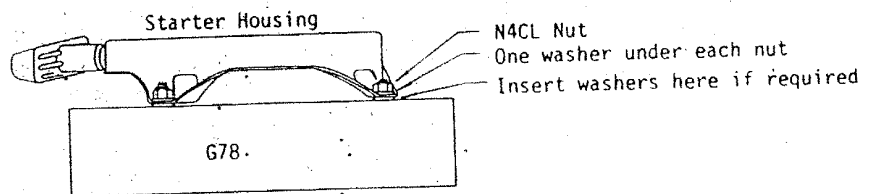


Right Engine

Before putting on the nuts, check that the spacing between the starter cup and the rope sheave is at least 1/16 of an inch. Insert washers between the starter housing and the G78 mounting tube if necessary to achieve the correct clearance. Put on the N4CL nuts and tighten securely.



1/16 inch minimum clearance



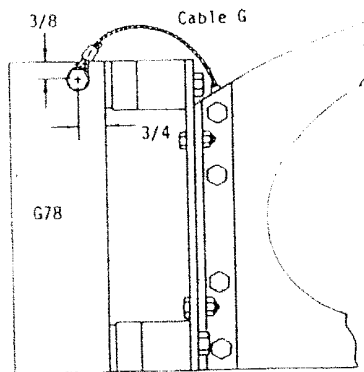
2.10

Fit the engine assembly onto the engine mounting plate on the nacelle, and secure with N4C (non-locking) nuts and loctite.

NOTE: On some installations it may be necessary to remove the centre bolts holding the engine mounting plate to the F60 nacelle front angles to provide sufficient clearance for the starter housing.

2.11

Drill 3/16 inch holes and secure the ground cables (cable G) to the G78 as shown.



- 2.12 Refit the choke cable using the original mounting clip and a 5/16 inch bolt through the mounting ear on the crankcase. If necessary, pry the clamp open with a screwdriver and slide it along the cable to obtain a smooth bend in the cable.
- 2.13 With the engines mounted on the aircraft, sit in the cockpit and pull on the starter ropes. Note any areas where the rope could possibly contact any exposed metal edges. File a large radius on these edges and sand smooth to avoid chafing the rope.

PARTS LIST

Recoil Starter Modification Kit
(for 2 engines)

<u>Qty.</u>	<u>Part No.</u>	<u>Description</u>
2	RSA	Recoil Starter Assembly
2	SC	Starter Cup
2	G78	Engine Mount Tube
2	G79T	Engine Mount Doubler, Top
2	G79B	Engine Mount Doubler, Bottom
8*	S1.75	Engine Mount Spacer
8	S3	Engine Mount Stud
12	SHSS1.5	Socket Head Setscrew
20	N4CL	1/4-20 Elastic Stopnut
28	W4H	Washer
1	82021	Assembly Manual

* Installed in G78