

## **Tools for composite kit manufacture (Europa, Lancair, Arion Lightning, etc.).**

**Updated March 2020**

There are instructions in the build manual for tools necessary to build your kit aircraft. I'm sorry to say that the manufacturers recommendation is so understated. Hand tools are excellent, however, there are many power tools that will speed your construction.

### **What basic tools you must have to start:**

I recommend starting with a full set of hand tools. For instance, for a little over \$200 Craftsman sells an excellent set of sockets, wrenches, and Allen Wrenches if you do not have a complete set. Go on line and do your shopping. For a single airplane projects, you don't need a top of the line tool to drill 30 holes in tight areas.

A full 200 part tool kit with all metric and SAE hand tools 1/4 , 3/8 and 1/2 inch.

Allen Wrenches SAE and Metric.

Vise Grips: Large, medium, small, and needle nose.

Pliers: Water pump or channel lock offset, common, needle nose,

Screw Drivers: Phillips from #1-3 and a jewelers set, straight tip from large to small.

Safety wire pliers.

Bolt cutter.

Hose cutter.

Side cutters. (these come in various type, Klein makes a great set)

Torque wrenches: Inch pound and foot pound.

Sheet metal snips with smooth jaws.

Propane torch and mini torch.

Soldering guns: 20 watt for circuits and 40 watt for general minimum.

Hammers, 16 oz minimum

Scale: grams/oz

Measuring Devices, Metal yard/meter sticks (2), tape measure, sliding combination square, carpenter steel squares large and small.

Long (8 foot) 1.5 5o 2 inch aluminum angle.

### **Special hand tools that are really handy to have:**

Metric and SAE ignition wrench sets (really small wrenches for tight places from 3/16 to 3/8 inch and metric equivalent).

Ball head Allen Wrenches long.

Crows foot sockets Metric and SAE

Safety wire pliers

Close quarter ratcheting wrenches.

Close quarter ratcheting six point screw driver handles.

Clecos K type or US standard spring type: 3/32 (50), 1/8(50), 3/16 (10) and pliers. (You can never have too many clecos and cleco clamps)

Reamers: 1/8, 3/16, 1/4, 1/2 and 16.5 mm for Mod 72

### **Hand Power Tools that are a must have:**

Drills: 90 degree and straight of at least 9 volts.

Special Drills: Close quarter 90 degree drill attachment or close quarter drill.

Electric screw driver with torque setting is nice for on and off operations.

**Hand Tools to speed building and rebuilding:**

Ratcheting Screw Driver with long and short extensions.

Drill/Electric Screwdriver Accessories: socket conversion 6 point to ¼ inch drive and various bits (Torx, Phillips, spade) for those tight areas.

Files: Bastard, straight, needle, in very fine and course.

Rasps: 4 way, straight fine, round. Primarily for rough finishing of foam, and filler.

Hole Saws: ¾, 7/8, 1, 2, 2 1/8, 3 ¼, 4, 5, 6

Drill bits: A complete numbered drill bit set.

Extra 3/32, 1/8, 3/16, ¼, #40, #10 drill bits.

Long drill bits (6 to 12 inches long 3/32, 1/8, 3/16, ¼)

Step drill bits from 1/8 to ½ and ¼ to 1 inch.

Metal 100 degree Countersink.

Cable swaging tool. Use for cables and some large cable crimp connectors.

**Permagrīts:**

Rotary Permagitrit tool bits: ¼ inch shank 100 degree countersink, 1/8 inch shank for Dremel tool of the Small drum, dome head and pancake.

Sanding block medium or large starter kit

Dremel type tool and bits: Metal Cutoff wheels, carbide cutters, sanding drums Dremel diamond cutoff wheel for fiberglass.

Sandpaper and blocks, long and short.

Clamps: Many spring clamps (30 to 50 of the spring type that open at least an inch.

Magnetic pickup tool

Inspection mirror

Center punch for drilling.

Drill bit guides: Numbered and inch

**Hand Saws:**

Hacksaw with fine, medium and course blades. A handle to hold just the blade.

Flush trim, coping, Japanese type.

Rivet gun, hand.

**Safety Equipment:**

Face shield/safety glasses or goggles.

N95 masks for lung protection.

**Additional Power tools:**

**Standing or bench power tools you should seriously consider:**

Drill Press 12 inch minimum,

Grinder and buffing wheel of at least six inch wheels.

Belt sander,

Disk sander (at least 6 inches)

Shop Vac with 5 micron dust bag (like the sheetrock bags) for dust control.

**Air Tools:**

If you have a 90cfm compressor. Air tools are faster and easier to use in tight quarters.

Straight Die Grinder

90 degree Die Grinder with carbide cutters, 3M sanding disks and at least a 3 inch cutoff wheel.

Compressed Air Blower, air filler chuck for tires, hose coiled type is fine.

Air Drill is handy as it turns faster.

**Really nice to have:**

Table saw

Band saw, 12-16 inch

Oscillating spindle sander

Metal cutting band saw or metal cutting blades for your wood band saw.

90 degree air drill for tight quarters. Expensive, but nice!

Whitney Punch for stainless steel.

**Here are some examples of some of the tools mentioned above:**

Close quarter drill kit that lasts for your electric drill:



Air close quarter air drills:



Your typical Aircraft Spruce tool kit:



Shop the sales and get a kit like below if you don't have a full hand tool set.



Pliers have to fall to hand. Klien, Channel Lock, Stanley tools work well.

Screw Drivers are personal when you drive many screws. I prefer ratcheting types. My Snap On drivers are a must have for me. Pricey so work the sales I got mine for \$100 but worth it. Other brands should be nearly as good.



Die Grinders don't have to cost more than \$40:



AircraftSpruce.com  
P/N 12-01124

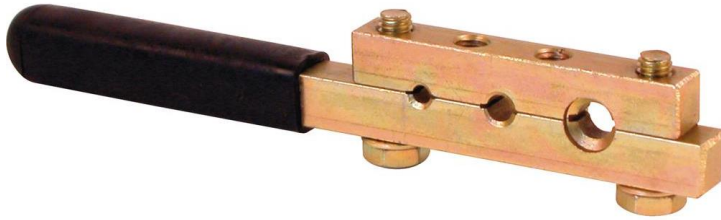
Whitney Punch kit is indispensable when working with stainless steel.



Cable swaging tool is not needed but is far more convenient than the cheap wrench on ones. Shown is a Home Depot 18 inch ( I like the longer ones, but on special for about \$35.



Wrench on type swagers (below) are only a few dollars cheaper and are frankly hit or miss but still cost \$25 or more.



Clamps are a must have:

But get stiff ones.

Hose cutters don't seem important until you have to change out 20 hose lines. Two types shown, I prefer the Craftsman on the right for \$30.



Close quarter ratcheting wrenches or gear wrenches speed things along:

