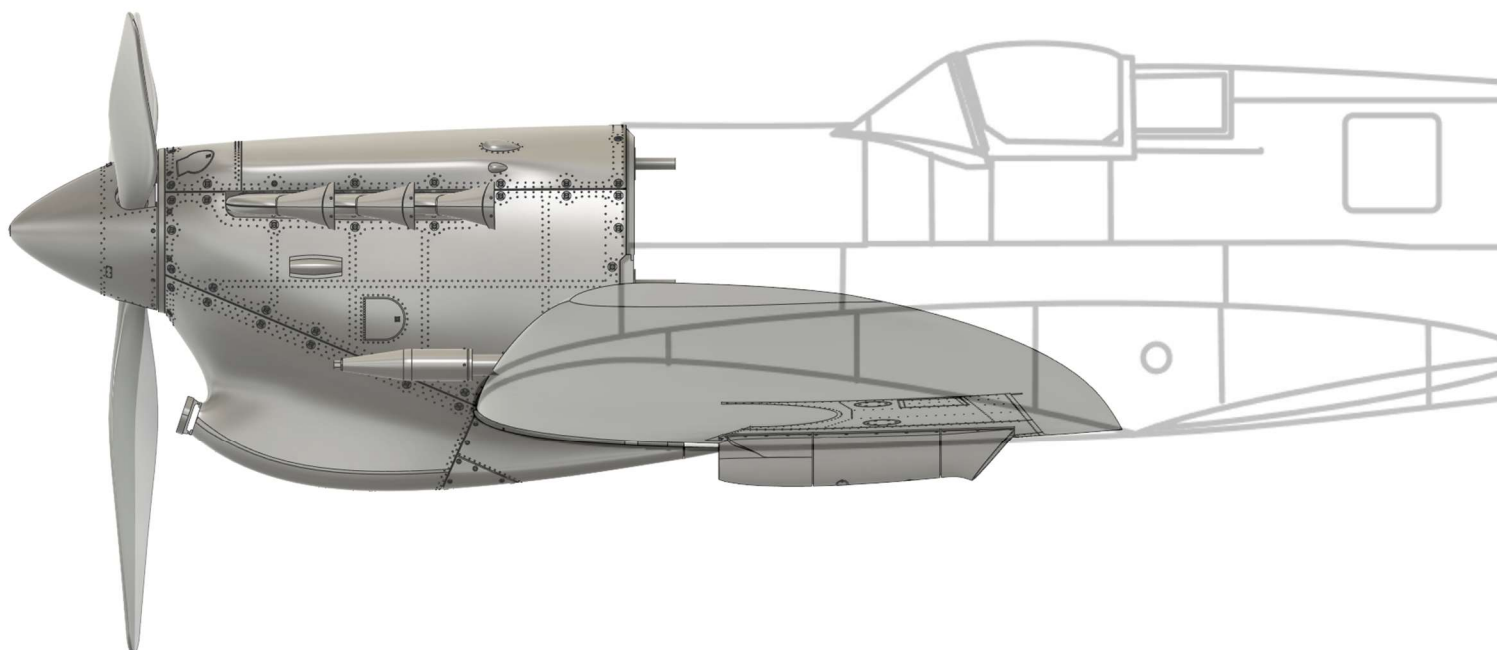


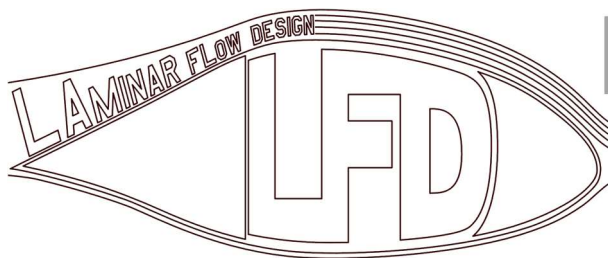
Early Spitfire fuselage rivet upgrade

1/32 Conversion Set for Tamiya Spitfire IX/LFD Spitfire Vc

Laminar Flow Design
Email : info@laminarflowdesign.com
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- Working with 3D printed parts.
 - Removal of the supports: Parts are printed into an enclosed cage that protects them in the different stages of production, transport and storage. Please cut the 4 pillars at their base on the corners and clean up the remaining mesh to access the parts. Then you can remove the parts from their support, starting with the most accessible on the sides and working your way to the center. Work support by support, using razor saw or new scalpel blade.
Avoid snapping the part off its supports as it could damage the part in the process.
 - Outer fuselage surfaces (ie: Sides of the cowling) might need Surfacer and sanding work for optimal result. Please try to avoid filling small rivets in the operation.
 - Avoid to “force fit” parts into assembly. Cured resin is very hard, but will break under pressure.
 - Washing agent residues can remain on some surfaces, fine grid sand to get rid of them
 - Parts Id in these instructions with an added (T) indicate part number from the base set



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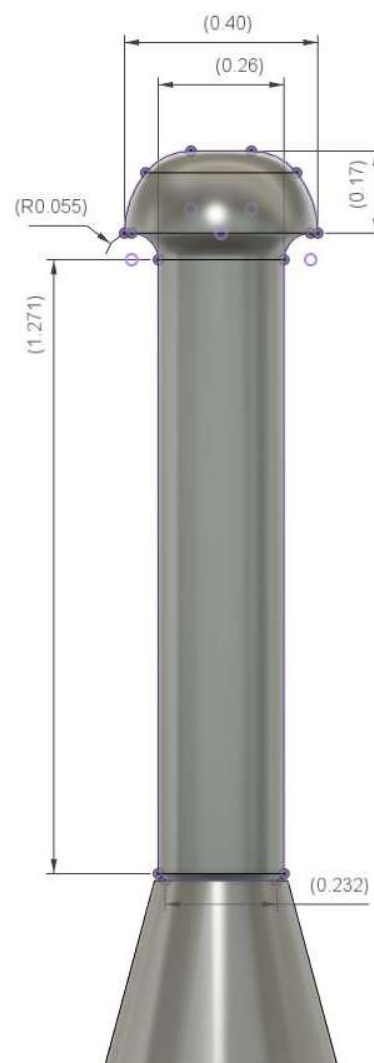
- Rivet Anatomy: note that the dimensions are the CAD design dimensions. Due to size, orientation and exposure, the printed version is slightly shrunk in the X and Y axis. For example, the pin diameter is theoreticaly 0.26mm, but will enter into a drilled 0.2mm hole. There is a breaking point at the pin base to cleanly remove them and facilitate insertion.

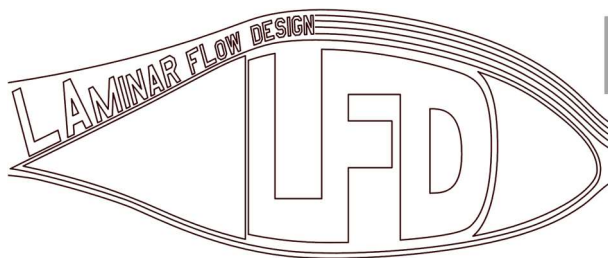
- Recommended material :

- 0.2mm diameter PCB drill bits
- Rotary tool with low r.p.m & good torque. Here pictured a pen screwdriver with printed drill bit adapter (1 provided in the set). Big advantage of using that type of tool is you initiate the rotation only once the drill tip is secured into the rivet hole reducing considerably the risk of drilling in the wrong location. The screwdriver must be qualitative enough to not have wobble on the rotation axis. Proxxon or similar rotary tool is also a good alternative.
- 0.2mm diameter steel wire to clean and even holes, or help push a broken drill bit out.

- Drilling holes consideration :

- Drill into the already existing rivet holes for maximum precision
- PCB drill bitst are very fragile, and will break under lateral pressure once inserted.
- To lessen breakage, it is advised to remove any (non visible) structure on the inner side of the fuselage, in order to have an uniform thickness of the plastic.
- In case of breakage, remove the broken bit in the plastic before going further. Drilling on a broken head will end up with another broken head. Pull with tweezers if the bit is still visible. Or push it inside with 0.2 steel rod.
- If using a pen screwdriver, for a firm hold into the adapter, the plastic ring of the bit has to be carved. So the key in the adapter could slot in. A rough rotary disk pass, or razor saw will do the job.
- It is possible to upscale the holes to 0.3mm diameter. The bits are less prone to breaking, but the at the expense of precision in the fitting. The pins will have to be more carefully centered before sealing.





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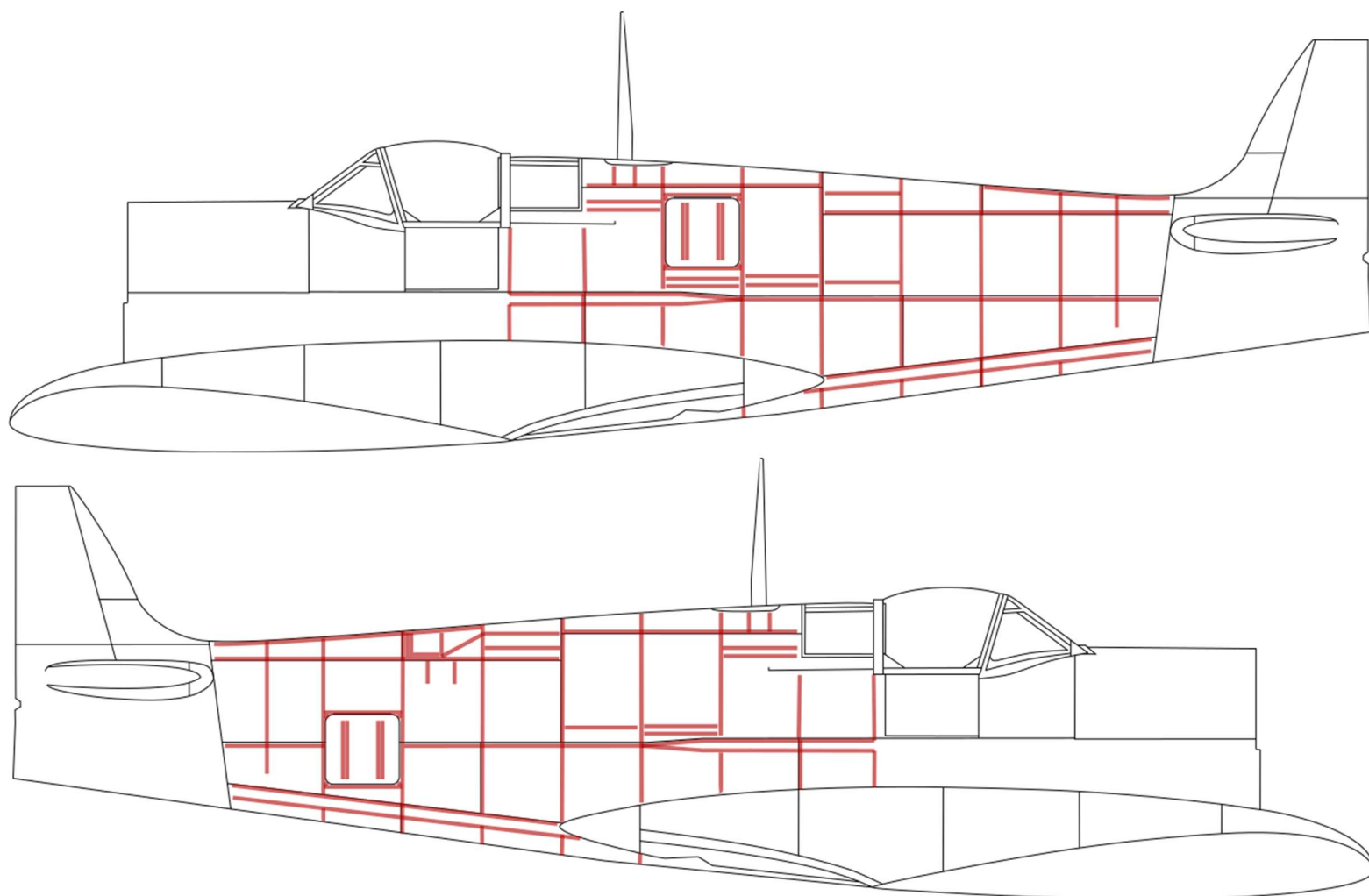
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- Sealing the rivets :
 - One method that work good, is to drop very fluid CA glue or microfiller (AK interactive) on the inner fuselage face. The capilarity will do the job. Microfiller has the advantage of allowing more time to settle everything in line and evened.
 - Its better to work line by line, and seal a greater quantity at once.

- Rivet lines to adress :
 - Rivet lines highlighted in red are to be replaced by domehead rivets.
 - Some lines are omitted on the base kit, manually add them using a riveting wheel, treat them like others



This drawing was made using reference : « Spitfire Mk. IX & XVI Engineered » by Paul H. Monforton, ISBN: 978-0-9784001-0-2