Craftsmans—Corner

Edited By Chuck Larsen, Designee Director

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BULLETS FOR ALIGNMENT

By Bud Oliver

MANY TIMES I have shivered and cringed as I watched fellows hammer bolts into strut and wing fittings as they assemble and rig an aircraft. In many cases the assemblers are unaware of the proper techniques to use to avoid trouble.

When you are holding something in alignment, such as a wing to fuselage root fitting, and then proceed to take the actual bolt that you are going to secure it with and attempt to drive it into place with a hammer, you are certain to get varying degrees of the following results (sometimes **all** of them): ruined bolt threads; galled bolt and fittings; bent bolt; elongated fitting holes; bent, twisted and cracked fittings; loss of paint or plating.

Two persons can assemble any plane whose component parts they are able to lift with absolutely no damage by using the following procedure. Assemble the entire plane by using bolts of at least one size diameter smaller than the bolts that you will use on the completed job. If possible, these bolts should be inserted opposite to the direction that the actual bolts will go in. In this way the entire plane will easily go into approximate alignment and the bolts will go in easily by inserting them with the fingers. (Fig. 2).

Now make a bullet of the proper diameter and length for the alignment of all fittings. To make the bullet, just take an old bolt that is the same diameter that the fitting requires and grind one end to a bullet nose shape and cut the other end off square. Only the unthreaded bolt shank is used. The head of the bolt is cut off and the threaded end is used for the bullet head end so that the threads are ground away (Fig. 1). For tight places where a long bullet cannot be used, make up a short one as shown.

The bullet is given a thin coat of Parker Threadlube or Lubriplate, or white lead and oil (to stop galling of similar metals) and inserted into the fitting in the same direction that the final bolt will go in. The bullet is then tapped in place with a soft drift and hammer until it is flush with the face of the fitting (Fig. 3). The bolt is then tapped into place. It will push the bullet out of the fitting ahead of it (Fig. 4).

You may notice that I illustrated one bullet with an eye at the point. This is the cotter pin hole of the original bolt from which the bullet was made. Often there are places where the bullet cannot be driven in. In these cases you can often pull the bullet into the hole with stainless steel safety wire inserted through this hole (Fig. 5).