Reforming Aluminum Extrusions

Some airframe parts require that the 90-degree aluminum extrusion from which they are made be reformed to a greater, or lesser bend angle. This is easily accomplished with common tools.

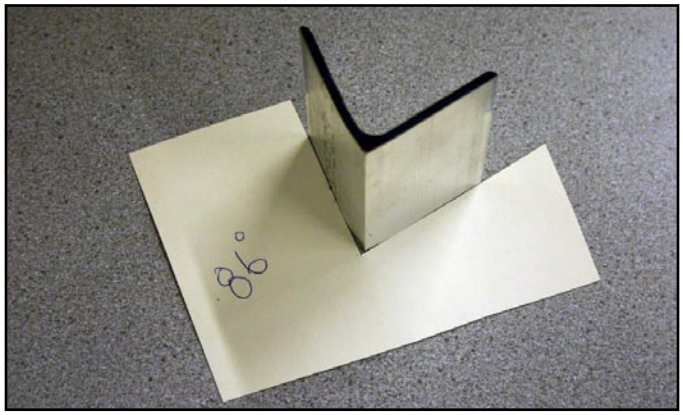
Accuracy

Angles are often noted very precisely on the plans (e.g. 93.7 degrees). However, there is NO NEED for an individual builder to be nearly that precise. Often being with a degree or two is more than enough.

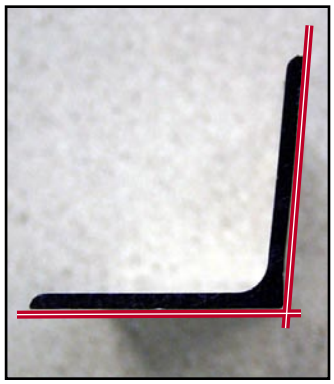
Measuring the Angle

Angles can be measured a number of ways - an adjustable protractor, an angle finder, lines drawn on your workbench. Perhaps the easiest and most useful is to make a template from a piece of non-corrugated cardboard.

After reforming an extrusion you'll want to check the new angle in a few spots, to make sure the extrusion has been uniformly reworked.



A file folder has been turned into a template to measure an angle - in this example 86°.

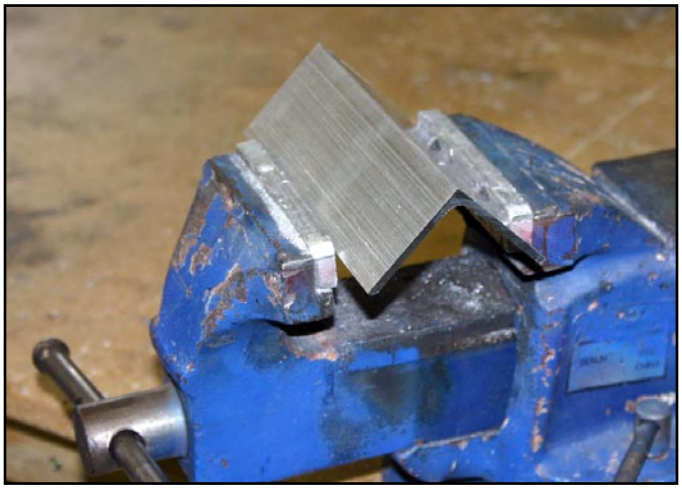


After the extrusions are reformed they will appear, in cross section, as seen in the photos. Note that often only one leg is reformed. This is normal. The angle will never bend perfectly at the apex (corner), and there will be a small gap near the apex.

Reducing the Bend Angle (Less than 90°)

Extrusion angles are easily reduced using one of two methods:

Squeezing in a Vise: With this method the part is clamped in a vise and squeezed to a reduced angle. When using this method you must account for springback and squeeze the part beyond the desired angle, as it will open up once the vise jaws are opened.



This extrusion's angle is being reduced by being squeezed in a vise. Pad the vise jaws to reduce marring of the part.

Striking with a Mallet: Clamp one leg in a vise and strike the other with a rubber mallet. The angle is progressively formed by walking the mallet across the length of the angle.

This extrusion's angle is being reduced by striking the unclamped leg with a rubber mallet. Pad the vise jaws to reduce marring clamped leg.

Increasing the Bend Angle (More than 90°)

To open an extrusion the best method for the typical builder is to clamp one leg of the extrusion in the padded jaws of a vise and use a large adjustable wrench to progressively pry the unclamped leg to the proper angle.

To avoid marring the extrusion's surface the jaws of the wrench should be padded and the free leg should be bent a little at a time, working back and forth across the length of the extrusion.

This extrusion's angle is being increased by prying up the free leg with a large adjustable wrench. Pad the wrench's jaws to reduce marring the extrusion.

Finishing Up

Check each reformed extrusion in several places to make sure it is uniformly bent.

Remove any scratches caused by the vise or tools while re-forming the extrusion.

