Don Morrisey's Sight Gauges; http://www.donsbushcaddy.com

These are an adaptation of sight gauges originally developed by home builder Peter Stevens.

What makes these gauges work without clamps is that the thickness of the plastic tubing and hose fitting exceed the ID of the aluminum tubing. The aluminum tube acts as the clamp.

The materials for the sight gauges are as follows:

- About three feet Superthane Ether clear plastic tubing, 5/16 ID, 7/16 OD, # SEH-313A. Make sure you get Superthane Ether it will resist discoloring and is more rigid than other tubing so it serves well as a "clamp". I got it at Amazon.com: http://www.amazon.com/Clear-NSF-61-Polyurethane-Tubing-Length/dp/B000FN11YQ/ref=sr_1_1?ie=UTF8&s=industrial&qid=1281470796&sr=8-1
- About three feet Rigid Alum. Tube, 1/2" OD, .430 ID , .035 Wall. Aircraft Spruce Part Number 03-35800: http://www.aircraftspruce.com/catalog/mepages/alumtube_6061t6.php
- Four brass hose adapters from Wicks, Part Number 1556: http://www.wicksaircraft.com/catalog/product_detail.php/pid=640~subid=8763/index.html
- Two Piper Fuel Float Balls (orange). As far as I know you can only get these at Univair at $4 each, you need two. Part Number: U10853-000: http://univairparts.com/shopping/product_info.php?products_id=10373
- From either Aircraft Spruce or Wicks , four AN-816-4D fittings and four AN-910-1D fittings. From Aircraft Spruce, 2 oz of pro seal, PN: 09-38500,
- http://www.aircraftspruce.com/catalog/appages/prosealant.php

Process:

- Cut the Aluminum tubes to the length needed. This should be 7 9/32" if your sight gauge holes are the same as mine (R-120). You will need room on each end for the hose fittings and this length takes that into account, the finished Sight Gauge will be 7 6/8" center to center.
- Starting about 1" (I used 7/8") from each end of the aluminum tube, remove about 170 degrees of material, lengthwise, such that when you pull the tubing through you can push it into place so it will be captured by the remaining 190 degree semicircle. The reason you leave the section of full tube on each end is that it will serve as a CLAMP when you insert the fittings. You will see what I mean when you get to that point.
- Clean up all of the edges so everything is nice and smooth. I painted the inside of the tubes with some white spray enamel, waited a day for it to dry and then placed three ¼" black vinyl dots at the halfway and quarter marks. When ready to assemble put a light coat of Vaseline or other non toxic lubricant inside the ends of the alum tube, I used a Q tip to do this.
- To feed the plastic tube, first, cut the end of the plastic tube in about three places lengthwise about two inches long. This will allow you to feed it in far enough to grab it with some pliers. Pull it until you have enough to fill the alum tube plus a couple of inches. While the plastic tube is still out of it's bed, insert the shredded part in the opposite end, grab it and pull it tight with pliers. Now proceed to push the plastic into it's alum bed the full length of the cut out. Once this is accomplished, cut the plastic off at each end precisely at the edge of the Alum tube.
- Next, start to push the hose fitting into the plastic tube, about halfway in, push the fitting to the side and add a couple drops of the Pro Seal then push the fitting to the opposite side and add another couple drops. Work it around a little bit then push it in to the hilt. Twist it until properly lined up.
- Next, **AND DON'T FORGET TO DO THIS RIGHT NOW**, drop one of the ball floats into the tube, then repeat the step of inserting the second fitting.
- Clean up any goop with a little MEK.
- I added an AN 816 4D double female fitting with 1/8 NPT thread on either end to correct for the offset needed in the cabin around the alum angle above the door. I used an AN 910 1D flared fitting on the other side that will connect to a hose coming from the tank fitting.
- The holes in the false wing rib for the sight gauge are 7/8". I riveted in 1 ½ by 3/8 washers at these locations to accommodate the sight gauge. I enlarged the 3/8th hole in the washer to 7/16th.