HINTS FOR HOMEBUILDERS

Snap-on®

HOSE MANDRELS

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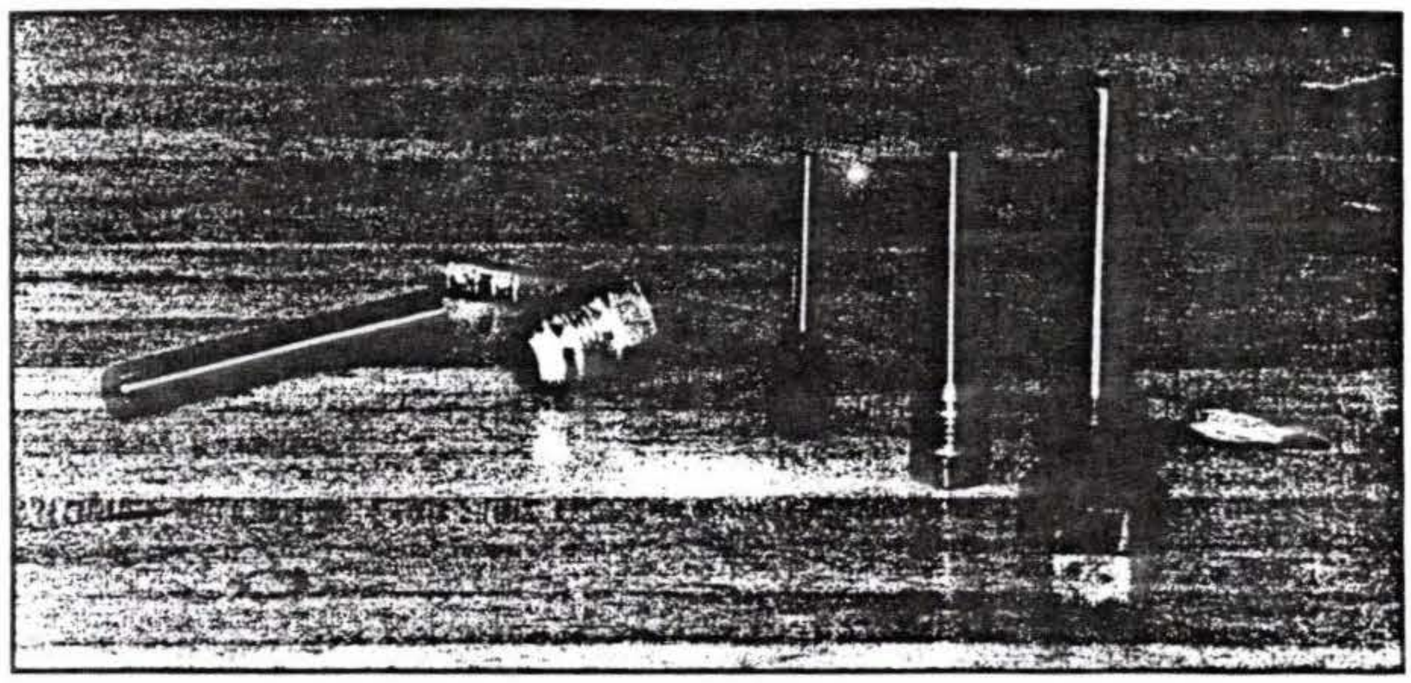
(Winner of Snap-on Tools' Award)



Aircraft hoses assembled from either Aeroquip 303 hose and 491 fittings or Stratoflex 111 hose and 300 fittings require the use of a special mandrel to prevent damage to the rubber wall lining. Mandrels are available commercially, but are very expensive and the waiting list is long. The set shown here is easy to make, works like the real thing but cost about one-tenth as much.

The main shank of the mandrel is made from a drill blank which is available at most local industrial tool stores. Drill blanks are similar to drill rod but are shorter and available in a larger variety of diameters. You will need the diameters given in the Table below. I made up a set of 3/16, 1/4, 3/8, 1/2 and 5/8 inch sizes and the whole set of drill blanks cost about $15. Each finished mandrel should protrude out of the hose end fitting about one diameter to provide proper support and guiding action during hose make up. Mark the drill blank for proper length, then chuck it in a drill press and use a handheld high-speed grinder with a thin abrasive cut-off wheel to do the cutting. Press the cut-off wheel, steadily, against the spinning drill blank and in a couple of minutes you will have a very clean, professional cut without using a lathe.

The end of the drill blank can be tapered using essentially the same technique. Use a hose end fitting to determine the proper taper angle and to mark where the taper should begin. Spin the drill blank in the drill press but this time use a fine grinding burr in the handheld grinder at the approximate correct angle. This also takes a couple of minutes but gives a nice precision ground professional look to the finished shank. The exact angle is not critical. A smooth transition from the shank to the hose fitting with no sharp corners is all that is needed.

The theaded end of the mandrel is a standard steel AN flared tube plug fitting. Get one for each mandrel size you plan to make and be sure it is the type with a hole already bored. This hole is exactly the right size to accept the shank and it is aligned much more accurately than trying to drill it yourself. Assemble the shank into the flare tube plug and you have the finished mandrel. It is not necessary to weld the drill blank into the plug, but if you want, it could probably be brazed. When you remove the mandrel from a finished hose assembly, the shank may remain in the hose if it is not welded into the plug. However, it can be pulled out by gripping the end of the shank in a bench vise, then by pulling and twisting on the hose assembly with your hands. Don't worry, the vise won't even scratch the hard drill blank shank. Use the finished mandrel in the normal manner to make up a hose assembly with lubrication on the hose I.D., the hose fitting and the mandrel shank. Follow the manufacturer's recommendations on assembly dimensions and pressure check levels.

The photo shows my set with the 1/2 inch one pulled apart for illustration.

DRILL BLANK SIZING CHART FOR HOSE MANDREL CONSTRUCTION

Tube Size (inch)	Hose Size (dash no.)	Drill Blank Size (inch)
3/16	3	8/64
1/4	4	11/64
3/8	6	19/64
1/2	8	25/64
5/8	10	31/64

Continued on following page

T/F/M'92
pg 10