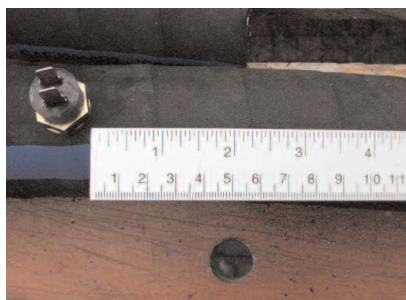


A guide to fitting a Vetus XHSH temperature sender into an exhaust hose.

The Vetus fitting instructions give you this information:

In the exhaust hose a hole must be drilled of 8 mm (5/16").

Using an ordinary twist drill does not work in rubber, because as soon as it penetrates out of the back of the tube wall it pushes the material aside and when you remove the drill the hole closes back up. In order to fit the sensor you need a good clean hole as you will be fitting it several inches up the inside of a pipe.



Another thing they omit to mention is that the hose has wire reinforcements which on the two pieces of hose I tried were at a pitch of 12mm and 18mm so there is a very good chance that you are going to hit wire in a random drilling. My experience was that if you do hit the wire, the break-out on the inside of the pipe tends not to be clean with the internal rubber delaminating from its reinforcing.

I did some research on the internet and it seems that the best way to drill rubber is to freeze it first and make it hard. I do not have a walk in freezer, a plumber's pipe freezing kit or any dry ice to hand so I began experimenting with what I did have.

First I tried a hole punch. The material of the hose is too dense and too thick so that even using a large club hammer I couldn't get any penetration.

An 8mm drill with the tip ground flat (88°) was quite successful but was difficult to keep "on station".

So next I tried putting the hole punch in the drill-press, I set the drill to high speed and, using either water or ptfе lubricant, with a block of wood pushed up the pipe for support I pressed hard on the drill until the smell of burning rubber was getting rather

off-putting. I backed off and applied more lubricant and the job was done... almost. Despite careful measuring and my pre-drilling a pilot hole to check, I still hit the reinforcing wire on one edge of the 8mm hole. I removed the exposed wire in the hole with a round file and the hole cutter was re-sharpened for use another day.



Next, to fit the sensor inside the tube, drill an 8mm or slightly less hole in a handy piece of wood (I used a broom handle), push the sensor in tight so that it

doesn't twist when you screw up the outside fittings. Push the handle up the exhaust pipe until the sensor is aligned with its hole, then pack it from behind with whatever is handy



so that the sensor is pushed up through the hole in the exhaust pipe wall. Screw the outside fittings onto the sensor and remove the packing which will give you clearance to extract the broom handle/whatever.

I used some high-temperature gasket sealer and some thread-lock just to be sure.

A possible alternative that I did not try would be to burn an 8mm hole using a soldering iron. You would have to really love the smell of burning rubber though.