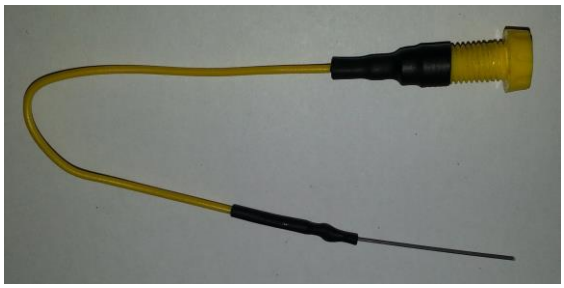
Making ‘Back Probe’ Tools (alternate versions)

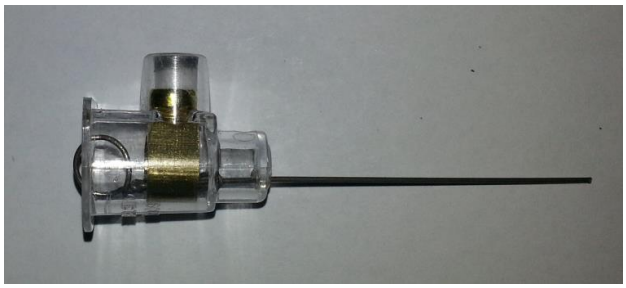
Introduction:
These 2 designs are alternatives to the ‘Ultimate’ version shown in our previous article, they are quicker and simpler to build, but not as ‘refined’.

Time is money- For any vehicle diagnostic work it is vital to have a quick, reliable method of testing electrical circuits that doesn’t pierce the wiring or damage the connectors. It’s not acceptable to compromise weather sealing protection in the harsh automotive environment.

The best method is ‘back probing’ connectors to perform your test measurements.



V1

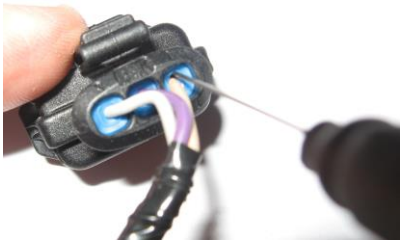


V2

Aim:
To show you how to make cheap and simple ‘back probe’ tools that are superior to nearly all the commercial products (see or previous article for building the ‘ultimate’ probe!).

Why make them:
What’s wrong with most commercial probes (or paper clips)?

- They often need an alligator clip to be attached, this leads to poor connection when the engine is running and vibrating. One of the designs here uses a direct banana plug connection.
- They are cheap to make at approximately $2 each, no need to cry when you lose them or have to bend them into unusual shapes.
- They are highly flexible to slide down past the wires and make positive contact with the actual terminals.



- The small diameter wire will slip into even the highest density connector shells and you can use even finer wire if required.
- Small body (especially version 1) allows use in tight areas and for probing pins that are extremely close together without the probes interfering with each other.

DIY Automotive Test Probes (alternate)

Materials:

Spring steel wire-
This wire is the secret; also called piano or music wire. Available from nearly all model shops in various diameters, they often make model parts such as landing gear from it.
I suggest 0.025” diameter as a compromise between strength and flexibility. 0.015” can be also used to make a few for special fine applications.

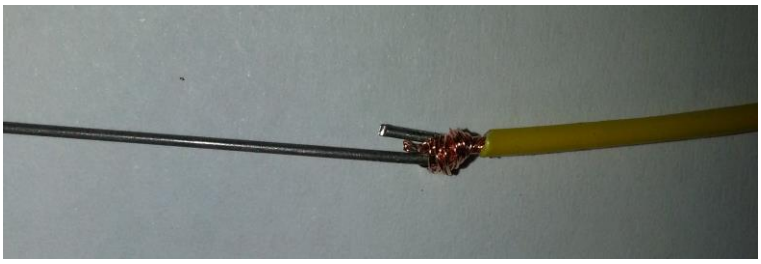
Banana sockets (Version 1 probes)-
Just about any variety are usable and are available from any electronics component supplier e.g. Altronics, www.Altronics.com.au . 4mm diameter is the most popular version for connecting to scope/multi-meter leads.

Glue shrink or heat shrink (Version 1 probes)-
Heat shrink with a meltable glue lining, available from most electronic/electrical component supplier e.g. Altronics. Diameter- must be able to slide over your banana socket as shown below and a smaller diameter s used for the soldered joint. Standard heat shrink can be used but glue shrink is more durable.

Mains ‘Cup’ connectors (Version 2 probes)-
Electrical termination connectors used in mains (house) wiring. These are available from most electronic/electrical component suppliers in several sizes. The larger ones allow more room to connect the test leads alligator clip into and provide good shielding from short circuits.

Insulated wire (Version 1 probes)-
Any flexible insulated wire is fine; we suggest different colours are used. About 120mm lengths do the job.

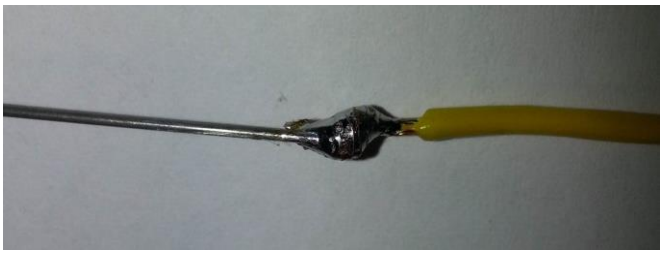
Steps V1:



Cut about a 50mm length of spring steel wire.

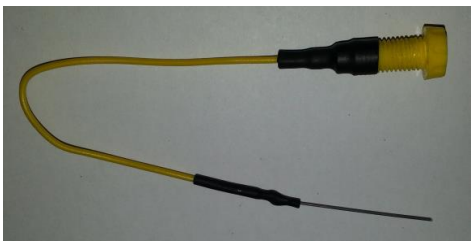
Roughen / clean about 10mm of one end with approx. 240 grade wet and dry or equivalent emery paper, this is to ensure that the solder adheres successfully.

Bend about 5mm of the roughened wire end back over and onto itself. Strip some insulated wire and securely wrap the bare copper around the spring steel wire.



Using a very hot soldering iron, patiently hold onto the junction whilst the wire heats up sufficiently. Feed solder into fill the joint when ready to flow. Cut off and squash down any protruding sharp ends of wire.

Normally, with a hot iron, clean and roughened wire, then standard solder is fine. If you have ‘acid core’ solder available then it can help the soldering to the spring steel wire. First to tin the wire and surface, then follow up with normal 60/40 solder (perhaps a suitable flux applied would also help if ‘acid core’ solder is not available).



Solder a banana socket to the other end of the insulated wire.

Slip over some heat shrink and grind a point on the probe wires end.

That’s it, job done!

DIY Automotive Test Probes (alternate)

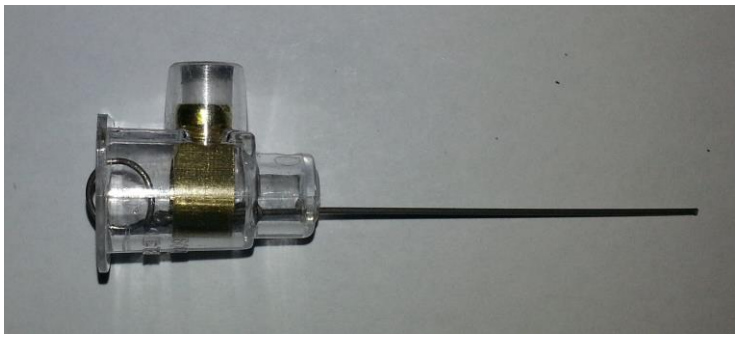
Steps V2:

Cut about a 70mm length of spring steel wire.

Fold the wire over a ‘former’ such as a screwdriver and using pliers twist the wire into a loop.

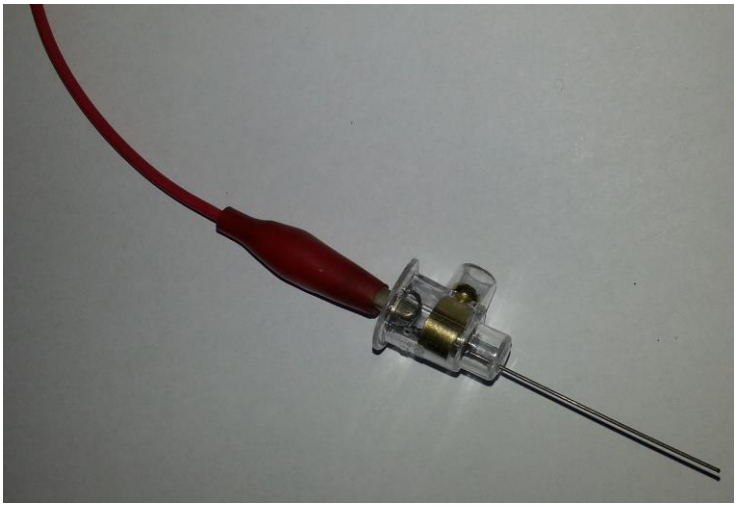
Leave a relatively long ‘tail’ on the twisted section (i.e. you want a thick section of wire created) the new larger diameter will help it be captured by the terminals internal screw.

Punch (a small nail works well) or drill a small hole in the terminals end to allow the wire to pass through.



Insert the wire through the terminal and tighten the screw.

If required, bend the loop to be central in the terminal hosing so that a test lead can clip on easily.



Grind a point on the probe wires end.

That’s it, job done!

Enjoy,
Darren Todd.