

How to use a Double-Hook Pick

The double hook pick is one of the most useful, and yet most dangerous picks in your scuba repair inventory. It has the unique ability to reach and retrieve o-rings that lie deep in an internal groove of a regulator or hose end. This brief essay will discuss the way to use a double hook pick without irretrievably damaging your gear.



The reason the double hook pick exists is to reach inside a regulator or hose end to snag an o-ring that a straight or curved pick simply won't lift. Service manuals that specify a pick other than a double hook inevitably do one or both of the following: spear the o-ring, damaging it irretrievably, and/or scratch the groove of the equipment with the point. This old service manual photograph, and a picture of a balance chamber scratched while using its prescribed technique are perfect examples:



That's one reason that plastic and brass picks are so popular. They are softer than the chrome plating of your equipment, and are less likely to scratch it as a result. Still, spearing and sacrificing an o-ring with a sharp curved pick is still a standard technique for many technicians. But it doesn't take much to scratch the soft brass of a regulator body with any metal pick.

You need the right tool for the job!



Most o-rings sit in a groove in whatever piece of equipment in which it is used. The crucial part of the groove is the smooth surface against which the o-ring seals. It needs to be smooth so that whatever gas pressure against which the o-ring seals, does not leak through the microscopic crevices created by a rough or scratched surface. At low pressures with soft o-rings (i.e., LP hoses with duro 70 o-rings), there is a lot of tolerance for abuse and corrosion, because the o-ring is often static, or not subject to much movement, in the part that gets abused.

Take a LP hose end, for example. The o-ring that seals the second stage to the hose sits in a groove (gland) in the tube beneath the sealing nut. Digging this out with a curved steel pick may deeply scar the groove, but the o-ring sits there generally unmoving, molding itself to the scarred gland. The outer side of the o-ring is what seals against the regulator connection, and as long as the inside of the reg barrel isn't scratched, your second stage may seal just fine.

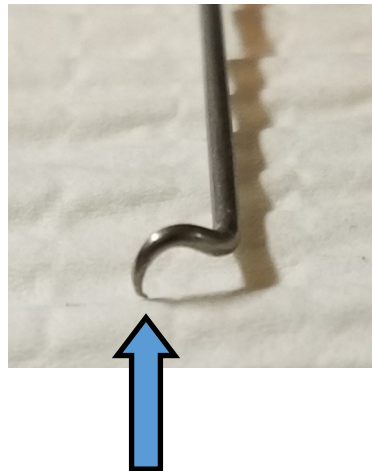
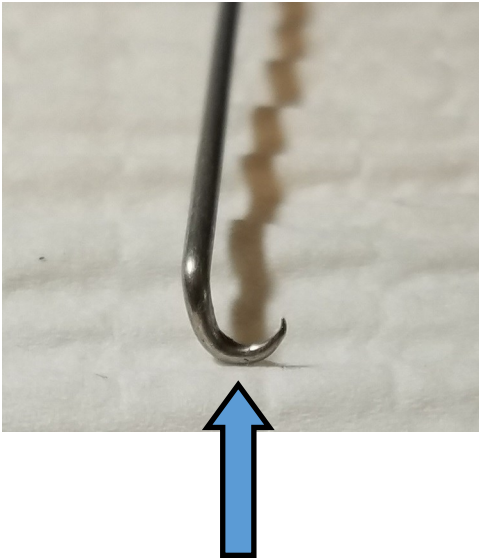


But at high pressures, it's a different matter. Scratching a similarly shaped groove inside an old Mk5 that you are trying to service will mean 3000 psi gas inevitably leaking into the ambient pressure chamber, giving you a bubbling first stage or worse. The o-ring has a harder duro (so as to handle the higher tank pressure) and is less able to mold itself to the scratched groove. Getting this o-ring out for replacement requires a double hook pick, and deft technique.

But a double hook pick cannot be made out of plastic or brass. It simply doesn't have enough strength to last long without losing its shape and becoming useless. A steel pick is required, but since it is harder than brass, it can mar a brass surface. In fact, a steel pick will even scratch titanium! Using a straight or curved steel pick is a recipe for disaster, especially when a brass pick will do just as well. But when you need a pick that can reach inside a recess, the only suitable pick is a steel double hook.

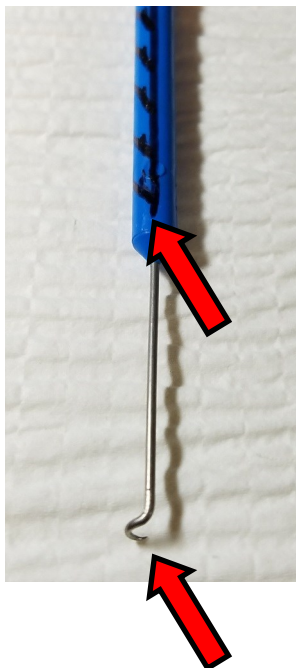
A double hook pick has a safe side:

...and a dangerous side (point):



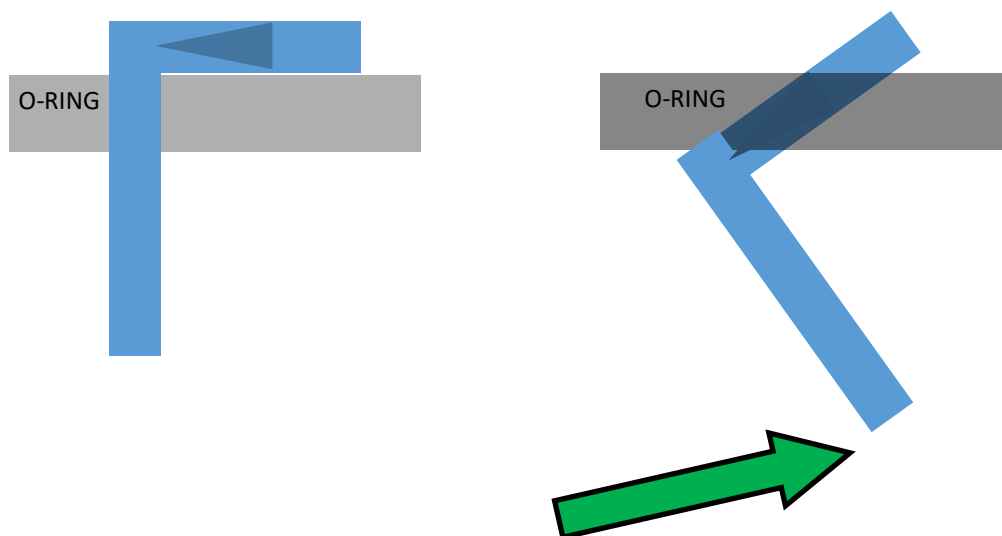
So when I buy a new double hook pick, the first thing I do is to draw a line down the handle exactly opposite the point of the hook, and hatch "the dangerous side" with a marking pen.

Conversely, when I roll my pick handle so the hatching is underneath, I know the smooth curved side of the hook is lowermost inside the groove.

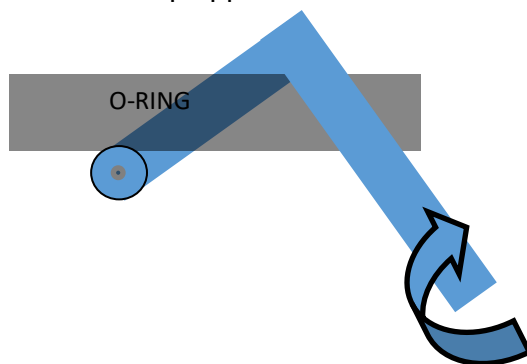


Whenever I can see hatching, I know I mustn't put any pressure in the groove.

Properly using a double hook pick, then, requires making use of both the safe side and the right angle formed by the second hook. The pick is placed adjacent to the o-ring, by pushing it down into the o-ring groove with the point protected. With the sharp tip lowermost (underneath the level of the o-ring), the handle is then angled to one side so the sharp tip passes under the o-ring but just above the groove.



At this point, the handle is rotated until the tip appears on the other side of the o-ring.



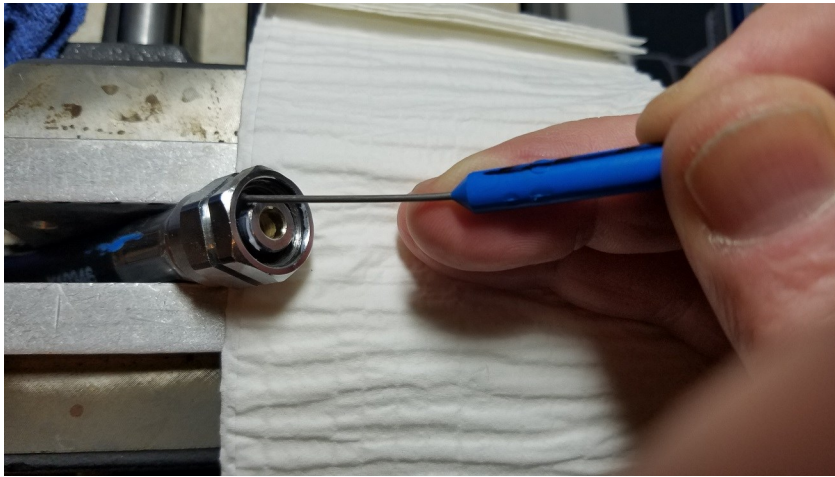
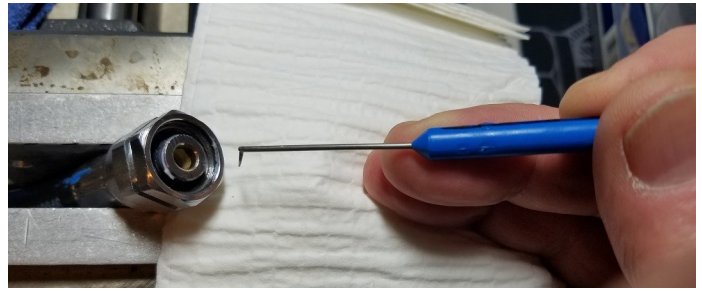
This can be done from the near side of the o-ring or the far side. The side chosen will determine the side to which the handle is swung. Here are pics of a hypothetical visible o-ring extraction from the far side, similar to the diagrams above:



An actual extraction from the other side of an oring is shown on the next page:

Position the hook so the point is lowermost, and then roll the handle slightly away, to keep the point away from the groove.

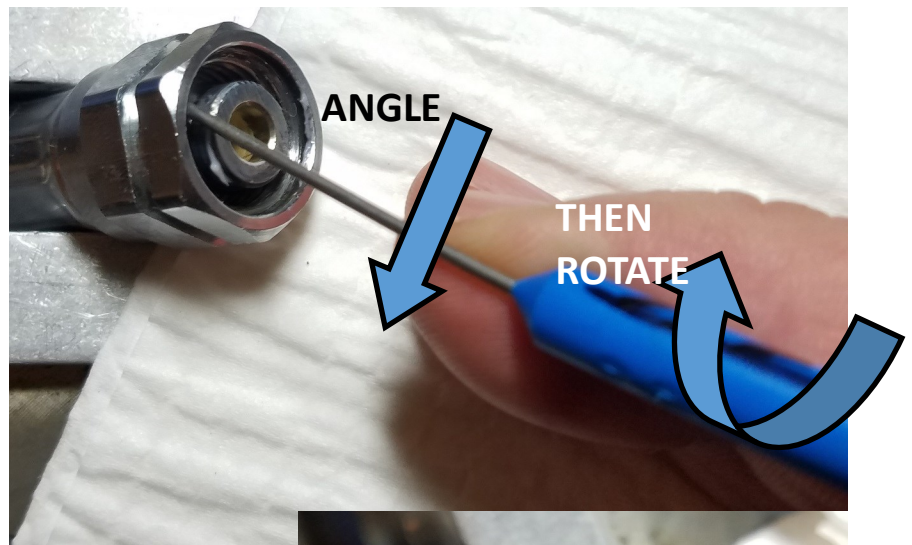
Slide it into position (in this case on the near side of the oring), and press the smooth curve of the bottom of the hook into the crevice between the groove and oring. Note the slight bend in the wire from the pressure exerted to force the curve into the crevice.



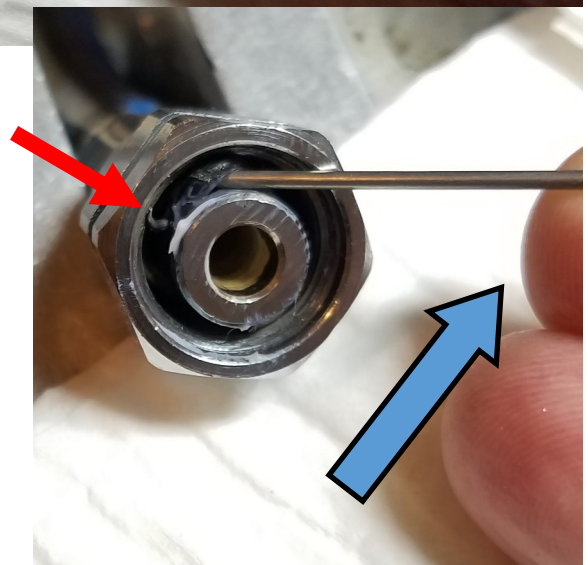
The tip of the hook is now deep in the groove on the near side of the o-ring.



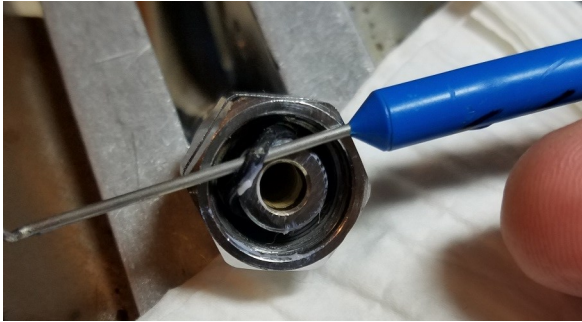
Now change the angle of the handle so the tip of the hook slides under the o-ring, and rotate the handle away until the sharp tip can just be seen on the other side of the o-ring.



Once you can see the point, angle the handle a second time (in the opposite direction) until the exposed tip of the hook protrudes from the hose end fitting.



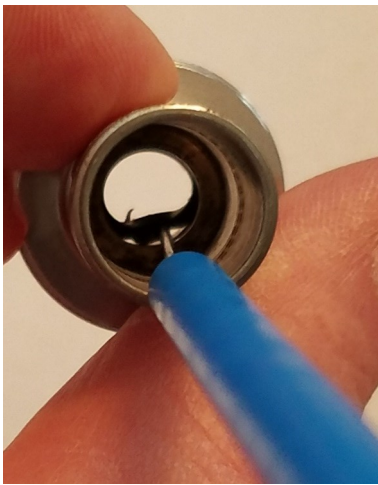
Rotate the handle even more away from you until the o-ring twists, and you can begin sliding the handle under the o-ring (to move the sharp tip away from both fingertips and the equipment),



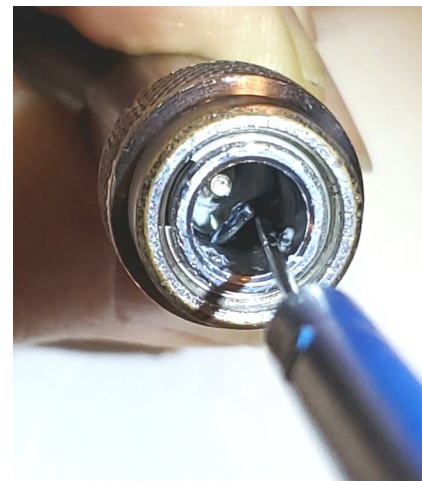
and then pop the oring out with the shaft of the tool.



Working inside the bore of a piece of equipment is where a double hook pick is made to order. There's no room to slide the shaft of the tool under the oring, so the oring is carefully retrieved with the hook itself:



While the best example is retrieving the HP piston shaft o-ring from the bore of a classic Scubapro Mk10, the most common example where a double hook pick is invaluable is in retrieving the almost-invisible o-ring in a common bcd hose connection:



Remember that the point of the hook is harder than anything you're working on. Treat it like the dangerous weapon it is when inside your gear, and enjoy the ease with which otherwise difficult o-ring extractions can be made.

Robert Singler
Equipment Repair Technician
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