Tau-7 CO2 Pistol O-Ring Substitution Guide

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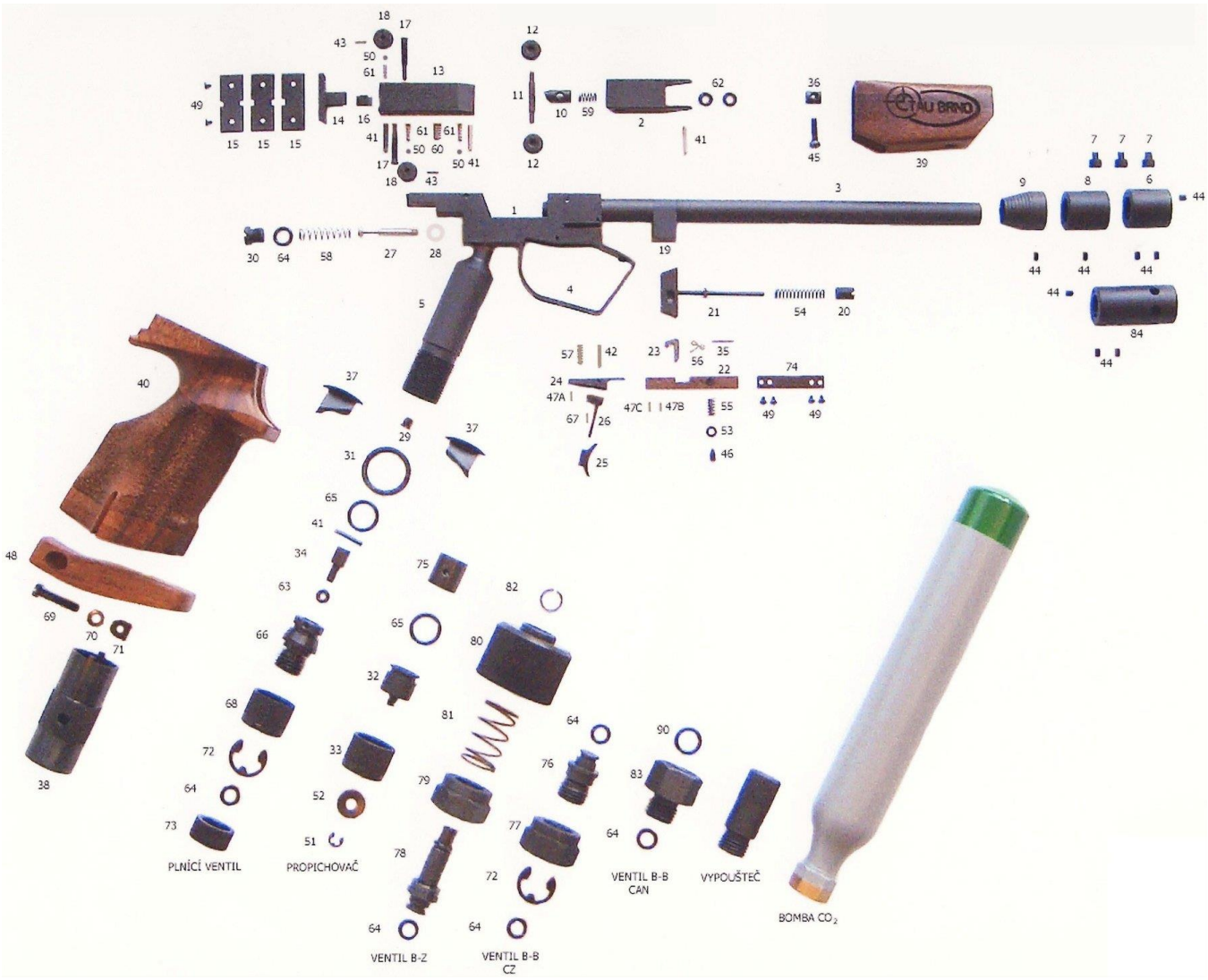
This will be an attempt to document the lessons learned about O-rings from several years of maintaining Tau-7 and Tau-7 Jr. air pistols used by the MIT Sport Pistol Club, as well as my own Tau-7. For some reason, the Tau-7's use oddball sized O-rings. They are metric, and standard metric O-rings come in either 2 mm cross section (width), or 2.4 mm. The Tau-7's mostly appear to use 2.2 mm rings, which are very hard to find, at least in the US. Recent parts lists claim they are 2.0 mm, so they may have switched to using the more common size.

Fortunately, O-rings are somewhat forgiving. You can often substitute a large or smaller O-ring, depending on the exact use. Over time, I've worked out a list of substitutes that work pretty well.

To start, here is a really nice color exploded view of the Tau-7 I found on-line, which includes part numbers for things like the fill adapter pieces I haven't seen elsewhere:
http://www.74fdc.files.wordpress.com/2012/02/tau-brno-exploded.jpg



Some of this should be used with caution, because BRNO has made some design changes over the years. For example, very early diagrams show a #63 O-ring used as a seal for a small plug in the bottom of the frame in the trigger area. This feature is entirely absent in the picture above, and I don't think I've ever actually seen a pistol that has one. Here's a list of the O-ring part numbers & what they are used for:

O-ring # 62: Hinged breech bottom & front seals.

O-ring # 63: Valve seal for bulk fill adapter.

O-ring # 64: Seal for the rear plug that contains the firing piston & seal. This O-ring is also used to seal against the internal valve stem of the small fill "bottles" in both the bulk fill adapter for the pistol, and the fill adapter for the bottles.

O-ring # 65: Seal for the bottom reservoir cap with the piercing pin for CO-2 cartridges, as well as for the seal between the bulk fill adapter and the pistol.

O-ring # 90: Tank seal for the adapter used to fill the small "bottles" from a large CO2 tank.

The O-ring that gets lost most often is the # 62 used on the hinging breech. People often fail to latch the breech down fully. It can then pop open on firing, usually tossing one or both O-rings. Unfortunately, that is also a place where the two standard sizes are a little marginal. A pair of 2.4 mm width O-rings makes closing the breech even harder, but 2.0 mm can be a little loose and easier to lose if the breech pops open. A 2.0mm O-ring in front and a 2.4mm O-ring in back seems to work better than any other approach we've tried.

The other O-rings that tend to need replacing are the #65's in the CO2 cartridge fill adapters. It's very important to ALTERNATE the two fill adapters that come with the pistol. CO2 is absorbed by the O-ring material over time. If you run out of CO2 and immediately remove the adapter, the absorbed gas can expand and swell the O-ring. If you then re-assemble the pistol using the same adapter, it will often shred the O-ring. Over time, the CO2 absorbed by the O-ring is released, and you can safely use it again. The constant expanding & contracting slowly destroys the O-ring. If you shoot a lot with CO2 cartridges, they will need replacing periodically.

If you are lucky, you may be able to purchase O-rings in standard metric sizes at a good hardware store, but they may cost as much as $1 a piece. The alternative is to buy them in bulk from an industrial suppler. Depending on the size, they run between ~ $3 to $9 for a bag of 100. We typically use McMaster Carr (http://www.mcmaster.com/). Except where indicated, these are all standard Durometer (hardness) D70 Buna Nitrile O-rings. The table below shows the size options, and the ones we've found that work best, along with the McMaster part number (Blue indicates probable best fit, or lowest cost):

Tau-7 Part	Width	ID	OD	McMaster	Width	ID	OD
# 62	2.2 mm	4.6 mm	9 mm	# 9262K165	2 mm	5 mm	9 mm
				# 9262K718	2.4 mm	4.6 mm	9.4 mm
# 63	2.2 mm	3.6 mm	8 mm	# 1247N167*	2 mm	4 mm	8 mm
				# 9262K717	2.4 mm	3.3 mm	8.1 mm
# 64	2.2 mm	7.6 mm	12 mm	#9262K169	2 mm	8 mm	12 mm
				#9262K217	2.4 mm	7.6 mm	12.4 mm
# 65	2.2 mm	14.6 mm	19 mm	# 9262K179	2 mm	15 mm	19 mm
				# 9262K226	2.4 mm	14.3 mm	19.1 mm
#90	2.5 mm?	11 mm?	16 mm?	# 93125K33	2.4 mm	11 mm	15.8 mm
				# 9262K234	2.5 mm	11 mm	16 mm
				# 5308T169*	2.6 mm	10.8 mm	16 mm

* Durometer 90

If anyone has any additional suggestions/comments, please let me know: gwhite@alum.mit.edu