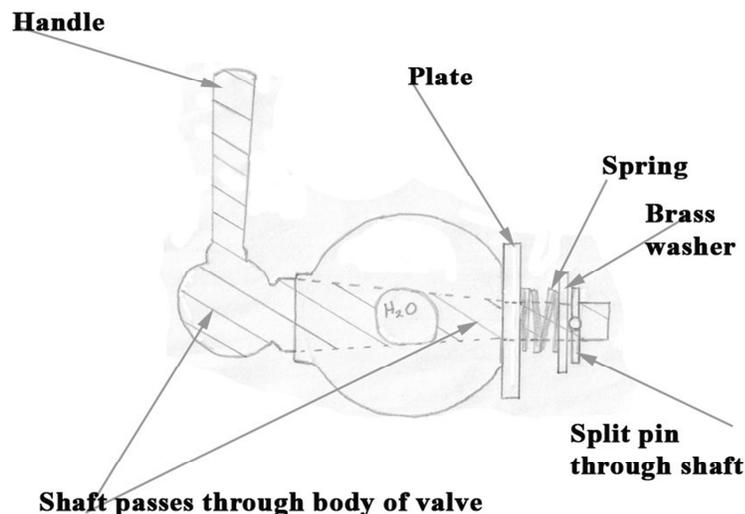


# Cooling System Drain Taps

Simon Lachlan. January 2010.

I have a 3000 and have taught myself something of its ways, but I know nothing specific about any of the four cylinder models. However, in this instance, I imagine that parts of this article will be relevant to most of our cars.

Apart from the temperature control on the Smith's heater, the 100-6s and 3000s all have three water valves, these being the heater tap and the engine block and radiator drain valves. These valves all work, or did 40 years ago, on the same principle. The diagram, below, is an amalgam of all three. The working principle is simple:- a tapered plug with a hole in it (the shaft) sits within a valve (the body) which also has a hole in it. Moving a handle on the shaft lines up the holes and permits the passage of coolant. The shaft is retained in the body by a spring which pulls the taper together and keeps the thing watertight. (You hope!) It is probably fair to say that I've found these valves to be pretty wretched things but that I'm not too surprised by their shortcomings which are understandable enough when taken in context: their age and vulnerable locations.



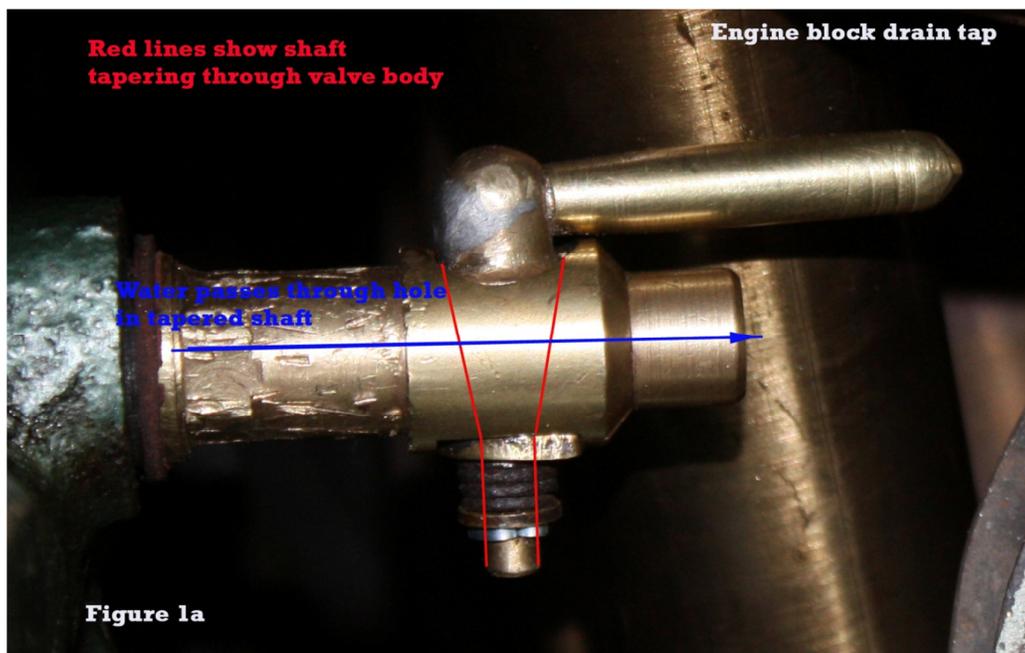
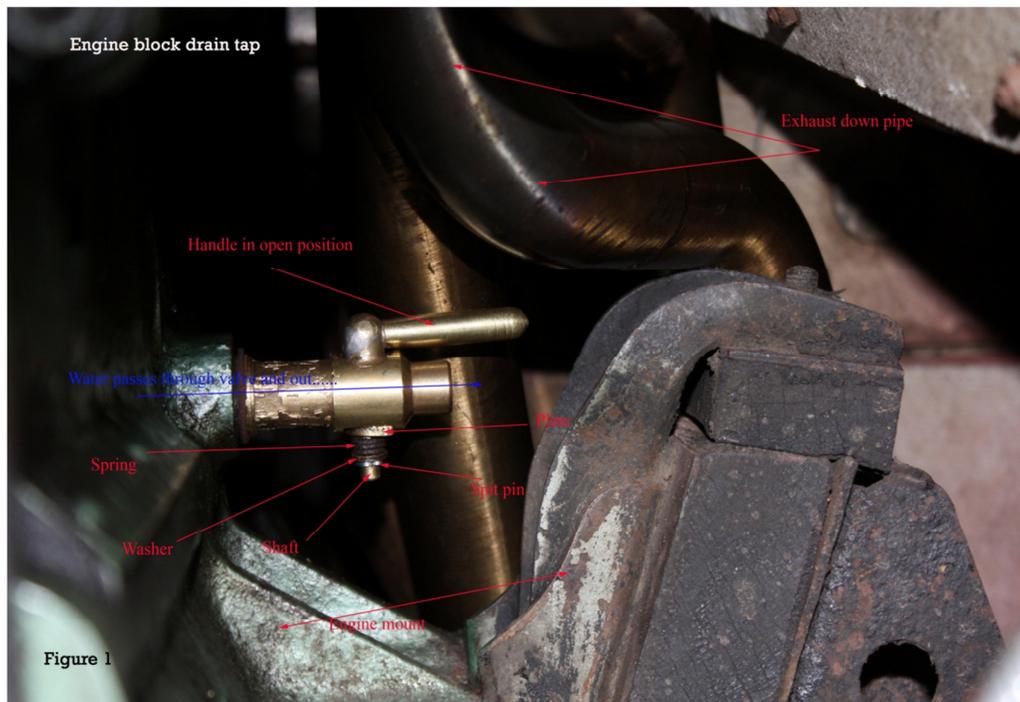
**The Heater Tap.** As one looks into the engine compartment on the RHS, this is near the back of the block between plugs 5 and 6. It is over the oil filter and behind the breather pipe going up to the T on top of the rocker box cover. It is attached to the block by two bolts, quite accessible but fairly awkward. Its most remarkable feature? The constriction it places on the heater system.....the hole through which the water rises up to the heater matrix is very small.

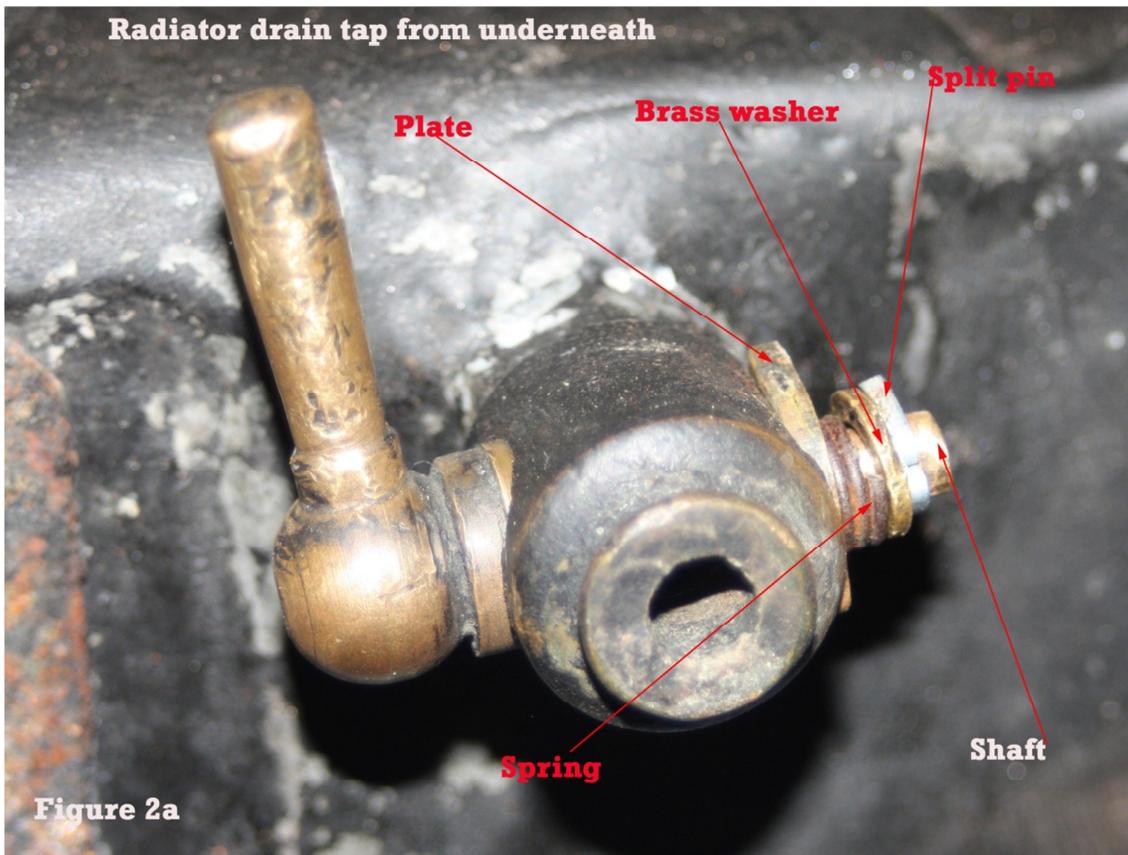
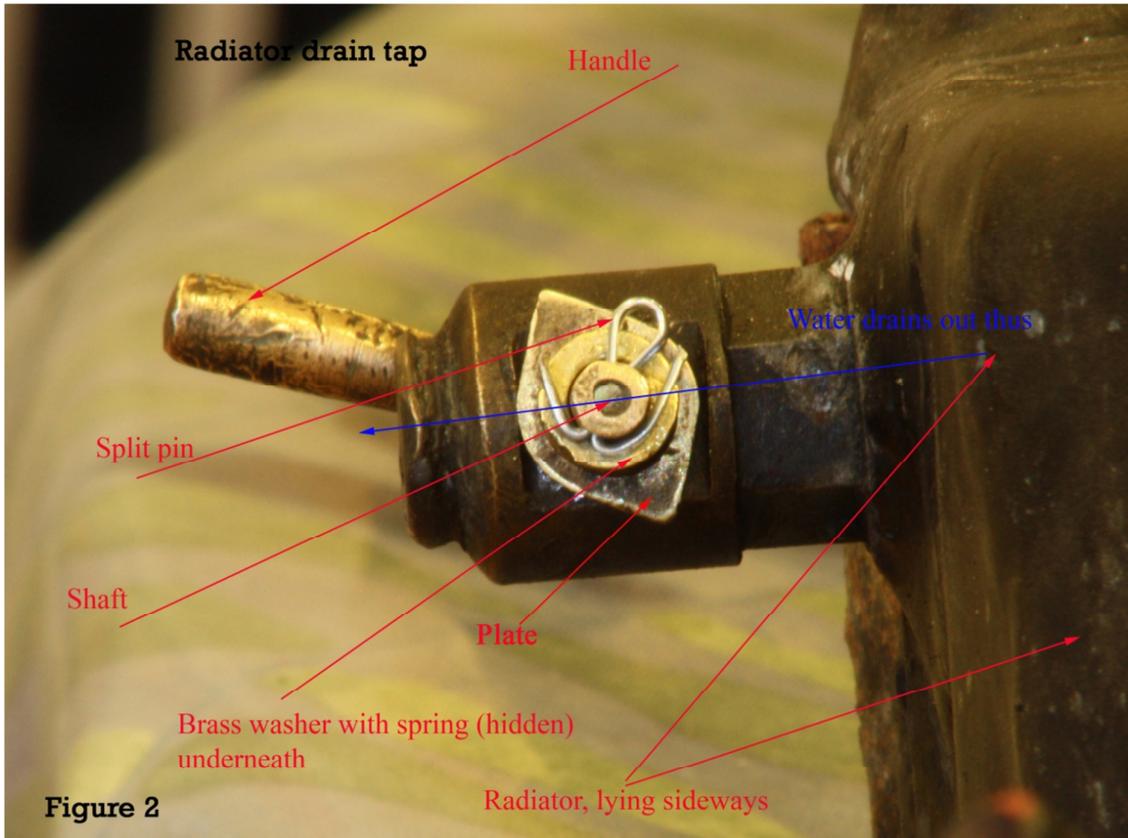
**The Radiator Drain Tap.** As one looks at the radiator from the front, it is on the bottom RHS. Its location makes it vulnerable to damage from stones etc but the fact that it may actually be used from time to time makes it the least likely of the three valves to be seized solid. Again, its bore is fairly small and, for example, if one is flushing the radiator, one may find oneself having to jab thin wire up through the hole to keep water running. It could usefully be replaced by a brass nut (plug) and copper washer.

**The Engine Block Drain Tap.** Its location makes it virtually redundant. Perhaps, if one has the car sufficiently elevated, one can reach it from below. It is just above the front LHS engine mount, below the manifolds and behind the exhaust down pipes. I can reach mine now, but only because the radiator and front grille assembly are out. Otherwise one needs long arms, multi-jointed elbows and tiny hands with superhuman strength because the thing will be seized solid and one will not be able to get much leverage at it.

- 1) As it happens, getting leverage onto these valves' handles is the obvious temptation. "the \*\* thing won't budge, so I'll put a tube over the handle and \*\* make it budge". That is the road to ruin. The head of the shaft into which the handle is secured is too small to take much of a fitting and the handle cannot be very securely mounted. And the whole issue is brass anyway, so the handle will come away in your hand. If it won't move, don't force it. If you do, it'll break. For sure.
- 2) If one can't move the shaft with the handle, what then? The valve shaft is seized within the body of the valve and must be released. It is probably impossible to fix the valves in the car, except, maybe, the radiator tap. In its case, I'd not try to spanner it out of the radiator for fear of breaking something but would remove the radiator and leave the valve body attached...
- 3) So, take a small hammer and tap on the end of the shaft where it emerges from the brass washer. This might(!) push the shaft from right to left as one looks at my diagram and thus break the dried up verdigris and gunge which has built up over the decades between shaft and valve body. Don't tap too hard as brass is soft and one needs to be able to move onto the next stage without burring and flattening off the end of the shaft. What will probably happen at this stage is the collapse of the spring, if any of it is indeed still there. I suppose the springs were made from some form of steel, not stainless for sure, and they rust away over the decades. They are only small and pretty exposed.
- 4) So, the spring is gone or broken and the valve, though free to turn, is now useless as the shaft won't be held tight into the body and it will leak. Remove the split pin – probably with a drill – and then the brass washer and plate. Tap the shaft out through the body – once it's free it will virtually fall out – and put the little bits somewhere safe. Polish up the shaft with the finest wet and dry and then metal polish. Do the same for the inside of the valve body, ensuring that the shaft is now free to rotate. Clean up the plate, where it locates and the washer likewise.
- 5) Find an appropriate spring in one of your treasure troves of "useful stuff" and cut it to size. Lubricate the shaft – I used graphite grease as it won't melt. Put on the plate then the spring followed by the washer. Squeeze it all together and put in a new split pin. A helper is useful at this stage. Finally splodge a great glob of graphite grease over the whole spring/plate area which might just keep the spring from rusting out again.

Figures 1 & 1a show my engine block drain tap (in the open position). The scars in the brass where I fought it out of the block are easily visible. Its handle appeared to be stuck in with, say, Secotone or something from that era because it broke off almost as soon as I touched it. So the handle in the picture is one that I made up. I shall be flushing out the cooling system once the car is back together but I don't know if I'll be able to access the tap or if its tiny bore will permit any serious flushing anyhow. But at least it works now!





Another new handle in figure 3. The handles are almost worth an article in themselves and probably stand more as a memorial to my destructive methods than to my skills as a handle maker!

