Lotus Twin Cam Water Pump Replacement

Yep, the dreaded Lotus water pump replacement strikes again. Although to be fair, mine has lasted for almost 30yrs and I suspect the reason for failure now is because I don't drive the car often enough. But hey, it's failed for whatever reason and there's another job on the list.

For anyone yet to stumble into this job, you're in for a surprise when you read the workshop manual because it starts the "replace Water Pump" section with a casual reference to "remove engine & transmission unit as in EP29". Now that's a big job, dismantle the transmission, driveshafts and pulling the lot out just to replace a water pump ?

The main reason is that the current practice is to remove the cylinder head & sump to get the front cover off. And because the engine is hard up against the bulkhead, access is poor, so the Lotus manual says "pull the lot". That's easy enough I suppose when the warranty was unlikely to be called on to replace a water pump and a nice little earner for the dealers later on.

Is this really necessary ? The answer is no, and advice has changed over the years. In the very early days of the TC engine in the Elan S1, to replace the water pump all that was called for was to slacken the sump, leave the head in place and pull the front cover off with the engine in situ. Of course access is much easier on the Elan, but it's interesting that originally there was no mention of cylinder head removal. I wonder how they got round the wear plate on the cover, perhaps that wasn't a feature of the early engines or was it just a case of "wiggle until free" ?

But don't get too hopeful, I doubt anyone other than race mechanics in a pit-lane frenzy would consider replacing the front cover/pump without doing the head gasket as well, making that top seal is not going to be easy with the head clamped down.

Having accepted that head/sump need removing, do we need to pull the engine/gearbox as well ? The answer is no, and that's the advice I received from a well respected UK specialist way back in the 1980s when I had to do the first pump replacement. So this is how it's done…..

So, let's start off the job. This is easier of you remove the luggage tray which means you can sit inside the engine bay and have great access to all the bits you're going to need to remove anyway.

I have small supports for the lid which go from the sides of the rear body wings, but if you only have the standard rear deck support then you need something to hold the lid, or alternatively remove it completely. There's a case for getting it completely out of the way if only for better lighting.

Part way though dismantling, most things are loose, the engine is set to TDC although there's no great call for that at this stage because there's every chance things will move as the job progresses. But it's a nice thing to do…..

So here we are with the head removed and front cover still in place. You can now reach down quite easily to remove the 11 bolts holding the cover in place, I used a ¼" drive socket to give easier access, none of these bolts are highly torqued anyway.

The upper water pump pulley is removed from the engine bay, the crank pulley from underneath the car when you loosen off the sump. I suppose it's possible to get away with just dropping the front of the sump but I took it off completely so I'd have the best chance of getting a good seal on replacement.

And that's the working view, with the water pump pulley removed there's easy access from above to everything you need – apart from the bolts to the sump pan of course !

There is sufficient room to remove all 11 bolts from the front cover, slide it forward up to the bulkhead and pull it up through the engine bay. It would probably extract from beneath the car as well, but upwards is easier.

And it comes out easily into the engine bay, leaving the timing chain free to move and mess up the distributor timing, which is why setting to TDC at the start wasn't that important…..

With the front cover on the bench you can see the wear plate referred to earlier, just how those 1964 mechanics got the front cover off with the head in place is beyond me, but as I said, perhaps the wear plate was a later addition.

After that it's the usual assembly of a water pump, I use my heavy 6" vice to press in the bearing and impellor, it's nothing that difficult. This time I replaced not only the bearing/seal/impellor but also the Aluminium insert as well. I could have got away without doing so but the original has been there since 1972 so I reckoned I could afford to splash out on a new one.

And as they say in the Haynes manuals, "re-assembly is the reverse procedure of disassembly", or some other one-liner that replaces a day's work.

I used my engine hoist to replace the head because it just makes life easier. To ensure it goes down square without moving any of the head or front cover gaskets I use 4 sections of round bar to guide it in place.

Technically these should be threaded studs into the head bolt holes, but I find plain bar of the correct diameter works just as well.

And that's all there is to it. No need to remove the block or gearbox which is a great time saving for the DIY mechanic and of course if you are paying labour rates then there's a good few hours off the bill.

It helps if you have good access from below. The first time I did this job I used axle stands to raise the car and crawled underneath. This time I've got a pit in the workshop which makes jobs like this much easier.

On a related topic, I also replaced the pump drive belt at the same time and that might be worth noting. I had a replacement on the shelf but found this to be very tight and a struggle to fit. Yes, I could get it on but it was hard work and very tight once in place.

So I decided to look in a few catalogues and see what other belts are close to the size needed. Now I'll start by admitting that I don't like tight drive belts, as long as they drive the pulley, don't slip and the car doesn't overheat then that's good enough for me. So I generally run these slacker than most folks do and in the Europa we're only considering the water pump and not the alternator drive, so there's no great load.

In the end I decided to buy a range of belts and see what was best fit. This sounds expensive but without the "Lotus Parts" tag I had 5 belts delivered with various angle & diameter for only £15. I ended up with one great fit and two very close, better IMO than the officially correct belt. For anyone interested… the ones I bought from Bearing Shop UK

Best Fit: SPZ575, then SPZ580, finally Z21.5

SPZ575-PIX, SPZ575 Wedge Belt, £1.73 each
Top Width 9.7mm
Inside Length 537mm

Z21.5-PIX, Z21.5 V Belt, £2.90 each
Top Width 10mm
Inside Length 546mm (21.5")

SPZ580-PIX, SPZ580 Wedge Belt, £1.74 each
Top Width 9.7mm
Inside Length 542mm

Anything over 546mm Inside Length is too loose but as always YMMV…...
.