

Volvo 850 Timing Belt

» Sun Apr 12, 2009 1:46 am

I bought my Platinum showing 136k on the broken odometer with the last timing belt at 68k so I just went to the nearest parts store and bought a "stay alive" belt and changed it out. Lately the car has made a horrible groan, the colder it is the more it groans for the first 2 or 3 minutes after I started it. I yanked the serpentine belt off and the groan persisted so I was certain that the problem was with a bearing in the timing system.

My rule of thumb is that I should change the entire timing belt system and the water pump on every other timing belt change (140k, 280k - if I ever get there 420k).

Today was the first major service for the Platinum at 149k miles (after my "stay alive" belt change).

The way I went about mine was as follows:

1: Block the rear wheels and set the parking brake.

2: Remove the air guide from the bottom of the car. My air guide is missing so I cannot tell you what the socket size is but from the other cars that I have I believe it is either a 10mm or a 12mm. There are two bolts that hold the air guide on.



3: Jack up the front (US) drivers side of the car until you can slide a 5 gallon bucket under the radiator.

4: Remove the lower radiator hose and drain the coolant into the bucket.



5: While the coolant is draining use a T-30 Torx to remove the spark plug cover. If you have a turbo some extra long extensions help to get around the turbo pipes.



6: Remove the spark plugs. A 6" extension plus a 3" extension, stacked together, is very helpful on cylinders 4 and 5 to get around the turbo pipes.

7: Use a T-25 Torx to remove the fuel line clamp.



8: If you plan to reuse the serpentine belt mark its original direction of travel so that you can put it back on in the same direction.



9: Remove the serpentine belt. I have an IPD serpentine belt tool but you can make your own tool with plumbing parts from the hardware store. The serpentine belt tensioner has a dog ear with a hole in it and there is a corresponding hole behind the tensioner where the entire assembly can be locked. I used a small Allen wrench to lock the tensioner.



9: Use a 12 mm socket to remove the front timing belt cover (I actually did this earlier to do diagnostics but now is the appropriate time).



10: Loosen the (US) passenger's side lug bolts.

11: Re-attach the lower radiator hose and tighten the hose clamp, move the jack to the (US) passenger's side of the car and jack the car up. Remove the wheel and place a jack stand under the subframe.

12: Remove the plastic nut that holds the inner wheel well flap. A pair of vice grips to hold the flap back is helpful at this point but mine are at my cabin so I just fought with it.



13: Use a 30mm socket to rotate the crankshaft, clockwise, until your timing marks align.





If you don't have a 30mm socket you can use a 10 mm on the harmonic balancer bolts to crank the crankshaft around to #1 TDC as shown, go clockwise.

14: Use a 10mm socket to remove the lower timing cover. A short 1/4" drive socket is well suited for this but for the purpose of the picture I used a combination wrench.



15: Flex the fuel lines away and with a 10mm deep socket remove the bolts to the upper portion of the rear timing belt cover.

16: Use a 12mm socket to loosen the upper and lower bolts on the tensioner. Next completely

remove the upper tensioner bolt with a short 12mm socket and slide the tensioner toward the back of the car. Use a deep socket to remove the lower bolt from below. At this point you can remove the tensioner.

17: You can either fight the old timing belt off around the bottom of the crankshaft or just cut it in half, I choose to do the latter. Tin snips or cable cutters will both work fine to cut the old belt off.



Don't make fun of my rusty old tools, they work.

18: Once the belt is removed use a 12 mm deep socket to remove the idler roller. It has 2 bolts.



19: This is the tricky part due to the lack of clearance. You need to use a T-45 to remove the tensioner roller assembly but there is not sufficient clearance between the bolt on the roller and the inner wheel well to get a ratchet and the T-45 bit in place. I use a T-45 with a hex shank, a 5/16" combination wrench, and a pipe to get it off. I couldn't get a good picture of the actual removal but here is a picture of what I used to remove the tensioner roller.



20: Once the rollers are removed I next changed my water pump. There is a lot of argument on the various boards as to whether you need to change the pump at this stage or not. This was my pump on my '94 at 210k where it had just barely begun to leak.



I am sufficiently scared by that failure and near catastrophe on the '94 that I bought a new pump for this job. This pump had a noisy bearing but it was not nearly as bad as the '94 pump was.

Use a 1/4" ratchet with a 10mm deep socket to remove the 7 bolts that hold the water pump in place. As you remove the water pump you will lose an additional cup or so of coolant. Clean up any residual water pump gasket material that is stuck to the block.

At this point the teardown is complete and the job becomes very much a reverse of what you have done thus far.

21: Replace the water pump with the new one. The OEM water pump appears to have had a dry gasket. That is just fine when you are installing it out of the car but you need to thread the pump around a number of things to get the replacement back on. I used a very thin layer of blue RTV on both sides of the gasket to hold it in place on the locator pins on the block. Hand start each bolt to make sure the gasket is aligned. I then tightened the bolts to snug in a star pattern to draw the pump into position on the locator pins. Using the same star pattern torque the water pump bolts to 25 lb/ft on each bolt. You will need to change between a deep 10mm socket and a small 10mm socket as well as from the top and the bottom to get all of the bolts torqued correctly.

22: Using the same T-45 tools that I used to remove it I replaced the tensioner roller. There is no way I can get my torque wrench into the available space so I did this by the German method, *Gutantight* with the pipe cheater. It should be 18 lb/ft.

23: Replace the idler roller with the 12mm socket, torque the 2 bolts to 18 lb/ft.

24: Thread the new timing belt on from the bottom, below the crankshaft. It will fight with you a bit but it will slip on. Do it with the flat side of the belt out. From there you can do a rough layout of the belt to its final position.



25: Install the tensioner with the locking pin in place. If you are just replacing the belt you should have been, very slowly, compressing the tensioner as you were doing everything else. I put my last one that I compressed and gave the clamp about 1/4 turn every 5 minutes as I was doing other stuff. Once it is fully compressed use a small Allen wrench or a nail to lock it. The tensioner should be torqued to 22 lb/ft on each bolt.

26: This step is critical and it is where most people get one tooth off. Once the belt is roughed in there will likely be slack in the belt between the crankshaft and the intake camshaft across the idler roller. That is bad. With your left hand pull the tensioner roller up and then re-thread the belt from the crankshaft to the intake cam sprocket to a point where it is very taught, don't move the intake cam sprocket in the process. From there lift the upper portion of the rear cam cover and thread the belt onto the exhaust cam sprocket. It will not be as taught as the belt is from the crankshaft to the intake cam but it should not be loose. From there roll the water pump sprocket until the slack is out of the belt from the exhaust cam to the water pump.



You should be holding tension on the tensioner pulley with one hand or the other at all times during this process.

Double check your timing marks on the camshafts.

27: If the timing marks look good it is now time to pull the "grenade pin" on the tensioner. Once the tensioner is released rotate the crankshaft, by hand, 2 revolutions and recheck your timing marks.

28: Snap the plastic spacer back onto the tensioner shaft.

29: Put the rest of the stuff back together. The lower timing belt cover, the spark plugs, the spark plug cover (I used the occasion to use some black caliper paint that I had in the garage to paint the heads of the spark plug cover bolts and cover the rust - the timing belt box was a great place to poke them in and hold them while I painted them). Check the gap on the spark plugs and use anti seize compound on the spark plugs and the spark plug cover bolts before replacing them. I hand thread the spark plugs in to make sure I don't cross thread them.

Be sure tighten the upper portion of the timing belt cover and re-install and tighten the fuel line clamp as well as the lower timing belt cover. Replace the inner wheel well and replace the tire. Torque the wheel to 81 lb/ft in a star pattern. Don't forget to remove the block from behind the rear wheel as you remove the jack stand and the jack. Fill the coolant and let the car idle a couple of minutes. It will take around 1 gallon at the outset and another 1/2 gallon after it runs and is shut off. It may take a couple of trips to completely bleed the air out of the system so don't be

alarmed if you get a low coolant light unless you are leaking.

...Lee