



## Introduction

For the benefit of anyone who may attempt to replace his/her own timing belt I am providing the following technical procedure as a reference point to be used along with the Bentley manual and proper knowledge and experience. I don't feel the need to provide any further disclaimer as anyone considering doing this understands what it means to wrench on a car, but since it seems like tradition here it is: I am not responsible for your work on your car. If you screw up you can do astoundingly expensive damage, hurt or kill yourself, or both.

The timing belt on the 2.7T should be replaced, depending on who you ask, between 60K miles and 105K miles. The range is absurd, but that debate can be handled elsewhere. I did mine at about 80K miles.

The procedure requires removing the front bumper and at least partially removing the radiator support (AKA "Lock Carrier" in the shop manual.) I will refer to it as Audi does for the remainder of this write-up.

There are two reasons why it is important to replace much more than just the timing belt. As with many repair procedures there is significant labor involved to get to the part in question. Other parts that could fail based on age should be replaced "while you are in there" to save on future labor. Also - and more importantly - things like the water pump and pulleys should be replaced because if they lock up they will kill a new timing belt and potentially kill your engine. This is not the time to cut corners. Replace all the parts listed below.

The procedure below is how I did the job on my 2001 allroad quattro. There are obviously variations and improvements possible and bumper/body differences between my allroad and the S4 or A6. I am not going to attempt to explain the factory way, alternate ways, or differences between different models. I am simply going to document how I did it.

## Parts to Replace

As noted above, there are many "while you are in there" parts to replace as part of this procedure. It is widely known that [ECS Tuning](#) sells a [kit](#) that includes most of the major pieces the need to be replaced including:

- The timing belt
- Water pump with gasket
- Serpentine belt
- Idler roller
- Tensioner roller
- Thermostat with O-ring

In addition to the kit you will also need:

- G12 Coolant (1 gallon should do)
- *Feedback on my write-up has consistently suggested that it may be a good idea to also replace the timing belt hydraulic tensioner though that isn't included in the procedure below*

### **Tools and Supplies Required**

I didn't record an exhaustive list of every tool required but here is a decent list to be sure you are prepared:

- A full set of basic metric hand tools including sockets, wrenches, extensions, etc.
- Torx drivers (T-20, T-25, T-30, T-45)
- Cam Lock Bar (a special Audi tool that I borrowed as seen in pictures below)
- Crank lock pin (I made do without)
- Fan removal "chopsticks" (I made do without)
- Distilled water is best (I used soft tap water)
- RTV gasket goop
- Some solvent of some kind
- Toothbrush or similar
- Rags, paper towels, etc.
- Bentley Manual

### **Procedure**

Again please note that this was my procedure, not the only possible way.

#### *Preparation*

Jack front of car and support on jack stands. Remove front wheels. Remove belly pan ([detail here](#).) Open hood. Remove center "V6" logo plastic engine cover.



### *A - Remove Bumper*

A1. Partially remove fender liner in each wheel well by removing several T-25 torx fasteners and pulling the front part of the liner back so you can work behind it.



I temporarily zip tied it out of my way so I could work behind it in peace. Don't leave it like this too long or it may crease.



A2. Now look behind the liner toward the front bumper. What you are after are the three 10mm nuts on each side aligned in a vertical column. Remove them with an extension on your ratchet.



A3. Remove the intercooler grilles (they surround the fog lights). Just pull straight out with your hands on the strong part of the grille. It will pop right out.

A4. Remove 2x 8mm allen head bolts oriented vertically inside fog light enclosure.





A5. Remove 2x per side T-20 torx attaching bumper to the 'bumper guide' where you peeled back the fender liner.

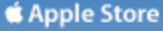
A6. Unplug fog lights

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A7. Disconnect headlight washer line using quick disconnect locate on driver side. You can see it in the earlier picture inside the front bumper. Be ready to catch some spillage or mop it up. "Cork" the open washer line with a bolt or turn it upward where it won't leak.



There is a simple clip to slide back and you can separate it like this:



A8. Pry the bumper (with strong hands) away from the fender at the wheel well to pop it out of the guide that it is mounted to. I had difficulty with this and was surprised how much force I had to use to free the bumper from the bumper guide. Pop out both sides.

A9. Grab whole bumper and pull it forward off of the car. Be ready - it has more weight to it than you might think.



*B - Remove (partially) the "Lock Carrier"*

B1. Remove hood release cable from latch mechanism. This is easy after removing the rubber cover inside the engine compartment.

B2. Remove duct between snorkel and air box.

B3. Remove plastic shrouds from around radiator (sides and bottom). Pull the small screws back in the holes for safe keeping.

B4. Remove 2 wire retainers at bottom for air temperature sensor and move the sensor out of the way.

B5. Remove Intercooler ducts left and right. I also cleaned some gunk out of my intercoolers at this point.

B6. Disconnect power steering cooling line support brackets from lower lock carrier. Leave the hoses connect but let them bend down and tuck under the car out of the way. Be careful not to stress the hoses or connections more than necessary.



B7. Disconnect electrical connector on A/C condenser.



B8. Disconnect electrical connector on two horns left and right.

B9. Disconnect the three electrical connectors under the cover near the power steering reservoir.



B10. Unplug headlights.

B11. Drain radiator. I could not drain it per Bentley so I just did the old school remove lower radiator hose. You have to remove it anyway. Of course you must have something to catch the coolant and be sure that the car is completely cool by this time.

B12. While you are down there unplug the coolant temperature sender right near lower radiator hose.

B13. Disconnect upper radiator hose on driver side and top of radiator.

B14. Remove front fan with T-30 torx on lower lock carrier and 10mm bolts on top bar.

B15. Remove 10mm bolts and brackets supporting the A/C condenser. Swing the condenser out of the way to the passenger side (leaving the hoses connected) and support it trying to put as little stress as possible on the hoses and connections.



B16. Remove 4x T-30 torx bolts on top of lock carrier near fenders:



B17. Remove 2x T-30 torx bolts oriented horizontally in sides near turn signals.

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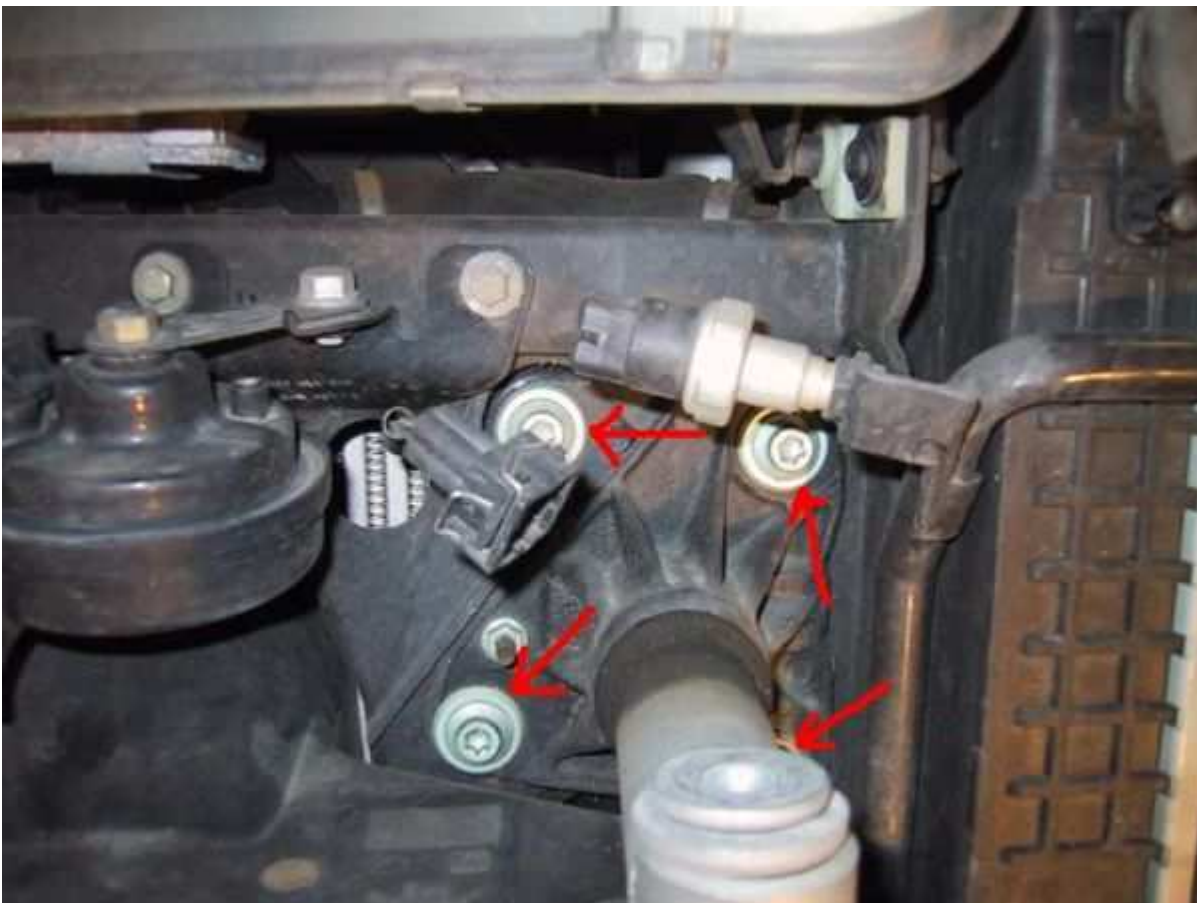
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B18. Remove 7x T-45 torx through impact absorbers and lock carrier. You can see three of them in this picture:



B19. Lift on whole lock carrier and slide it outward a few inches. Have something to support it with as it is fairly heavy. Now hinge it left a little bit like it is a gate. Be careful not to stress the hoses or connections. Just make enough room that you can work behind it. Figure out a good way to support it there for a while.





*C - Remove serpentine belt and accessories*

C1. Remove fan. It has reverse threads. If you have the special chopsticks tool this is easy. I figured out a way to improvise that was not too difficult either.

C2. Detension the serpentine belt tensioner using a 17mm socket. As you turn the ratchet to relieve tension pin the tensioner open with a small screwdriver or other suitable tool. Leave the tensioner and pin in place for now.



C3. Remove the serpentine belt.

C4. Remove both hard plastic intake pressure lines. Each has 3x hose clamps (2x ends plus 1x BPV) and 1x 10mm bolt.

C5. Remove the serpentine belt tensioner with 10mm allen socket but be sure to keep it pinned as you remove it and sit it aside. If you lose the tension it will fall apart and be impossible to put back together from what I understand.

#### *D - Remove Timing Belt and accessories*

D1. Remove driver side Timing Belt (TB) cover with 3x 5mm allen

D2. Remove passenger side TB cover with 2x 5mm allen.

D3. Remove center TB cover with 2x clip (pry off.)

D4. Using a big socket turn the crank to top dead center (TDC) using the reference mark provided.



When you get the mark lined up on the crank pulley take a look at the wing like brackets on the outside of the cam sprockets. If the larger holes are **OUTBOARD** as in this picture you are **not at TDC** and the cam lock bar will not fit on this way.



If your cam "wings" look like above rotate the crank another entire rotation and line the mark up again. You will now be at TDC.

D5. Install cam lock bar. *[you could get away without this special tool if you are especially careful and make numerous reference marks on the cams to be sure that you get them exactly where they are supposed to be. There is no 1 tooth margin of error. It needs to be right.]*



D6. Mark the harmonic balancer so you know which way it goes (probably not 100% necessary as it has its own mark, but what the heck) and remove it from the end of the crank shaft.

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D7. Remove lower (round) TB cover with 2x 10mm bolt.

D8. Remove serpentine belt idler pulley with 3x 6mm allen bolts (one is accessed through the pulley) and 1x 5mm bolt through pulley.

D9. Detension the timing belt by putting an allen driver through the hole in the tensioner and slowly applying pressure to compress the piston. When you get the piston in far enough pin it back with a piece of coat hanger or other strong wire.



D10. Remove timing belt.

D11. Remove timing belt tensioner pulley.

D12. Remove timing belt idler pulley.



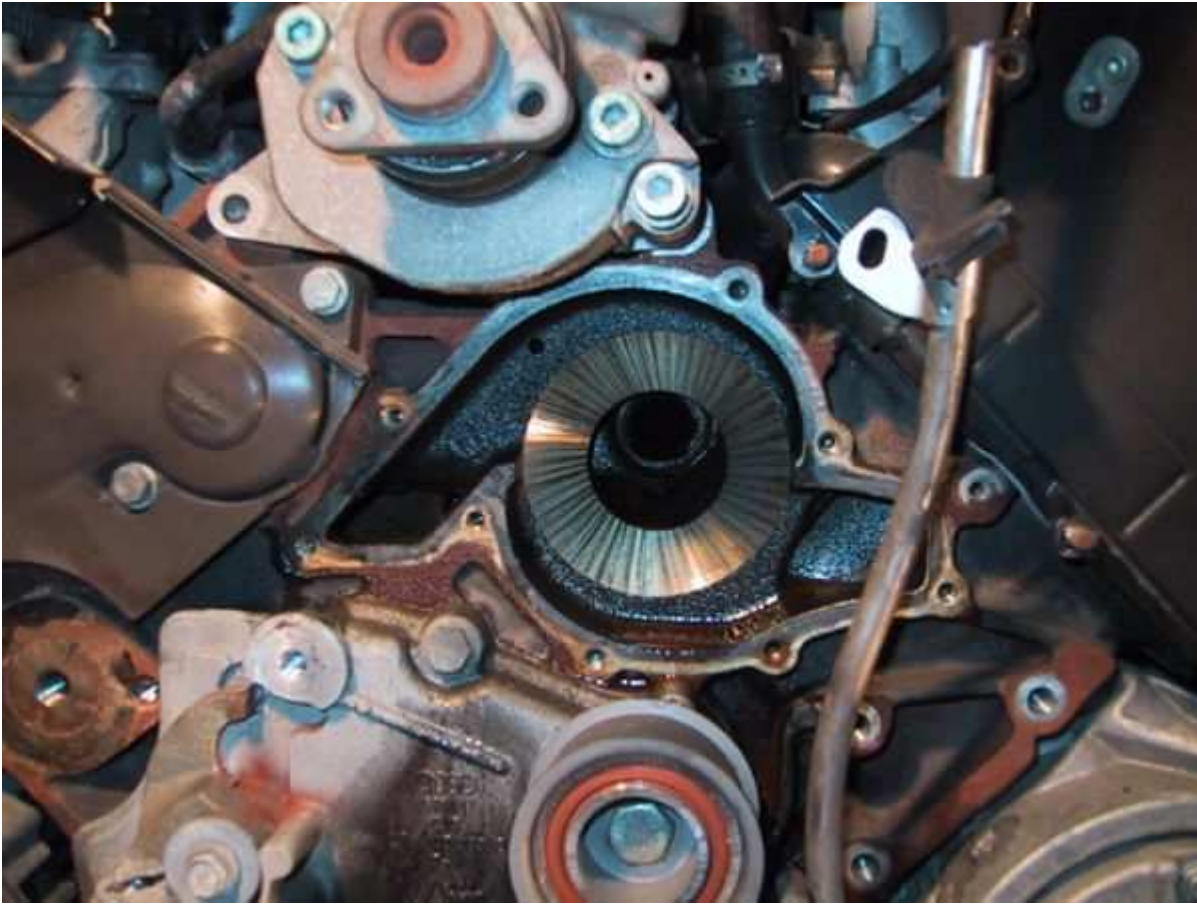
D13. Loosen dipstick tube with 1x 10mm bolt.

D14. Remove pulley on power steering pump. This is the top center silver pulley with 3x 6mm allen bolts.

D15. Loosen mounting bracket for power steering pump. There are 3x 6mm allen bolts - 2x on front and 1x vertically on top as shown. This is necessary to remove the water pump in the next steps.



D16. Remove water pump. 2x 10mm nut including dipstick nut already removed and 9x 10mm bolts.



D17. Clean gasket surface.

D18. Remove thermostat housing (just to left of water pump mounting. Remove thermostat and O-ring.

*E - Replace timing belt and accessories*

E1. Replace thermostat and O-ring.

E2. With gasket goop re-install new water pump with new gasket.

E3. Reinstall 3 screws on power steering pump mounting.

E4. Reinstall power steering pulley.

E5. Reinstall new TB tensioner pulley.

E6. Install new timing belt. This is what we came in here for! Hard to even remember after all the work so far! The Bentley calls for a procedure that involves partially removing the cam sprockets. This seemed risky and unnecessary to me so I took the extra time and hassle to fit the new timing belt without loosening the pulleys.

First, I started the belt around the bottom of the crank and around the idler pulley. Then I pulled it as tight as possible to driver side to get the correct tooth on the

sprocket. I could see what tooth needed to be on but didn't have the strength to actually pull it on so I took the cam lock bar off and very, very carefully rotated the cam about 1/2 tooth to get the belt on then 1/2 tooth back to the original TDC position.

Then I kept the belt off the tensioner and pulled it tight across the top to get the proper tooth started on the passenger side cam. I could almost get the belt over the tensioner with the correct timing, but I needed just a little more help so I put my allen tool back in the tensioner to get a little more compression of the hydraulic piston. This, combined with the fact that the tensioner pulley has no lip allowed the belt to slip on.

Once the belt is on you can release the tension from the TB tensioner. The belt should be nice and tight all the way around with the cam lock bar still in place. Your timing should be fine.

E7. Reinstall serpentine belt idler pulley.

E8. Reinstall lower round TB cover.

E9. Reinstall harmonic balancer on crank. It only fits one way. Check to make sure that your timing mark still lines up and the cam lock bar is still in place and that the TB is nice and tight. Timing is good.

E10. To double check timing rotate the crank 2 full revolutions with a socket to ensure that everything runs smoothly and that there is no internal interference.

E11. Reinstall center TB cover, then passenger TB cover, then driver TB cover.

#### *F - Reinstall Serpentine belt and accessories*

F1. Reinstall serpentine belt tensioner with pin still in place.

F2. Reinstall intake pressure lines and connect all intake plumbing.

F3. Install new serpentine belt. Look at the pictures above if you forget the routing.

F4. Release tension from tensioner.

F5. Reinstall fan. Remember the reverse threads.

#### *G - Reinstall lock carrier*

G1. Position lock carrier back onto front of car but keep it out a couple inches.

G2. Reroute the cables and plug in the 3 connectors by power steering reservoir.

G3. Plug in headlights.

G4. Connect upper and lower radiator hoses.

- G5. Install and plug in coolant temperature sensor in lower radiator hose.
- G6. Push lock carrier into place and reinstall 7x torx into impact absorbers.
- G7. Swing condenser back into place and fasten with 2 top bolts only.
- G8. Put fan back in place and attach with 2 other bolts on top and torx on bottom.
- G9. Reinstall power steering cooler line and air temperature sensor.
- G10. Reconnect horns and condenser electrical connector.
- G11. Reinstall 6x T-30 torx on top and sides of lock carrier.
- G12. Reinstall intercooler ducts.
- G13. Replace 3x radiator shrouds.
- G14. Replace duct to air box.
- G15. Reconnect hood release cable.

#### *H - Reinstall bumper cover*

- H1. Slide bumper back onto car but leave loose.
- H2. Reconnect washer line and fog lights.
- H3. Guide bumper into place on the bumper guides on both sides. It should snap or lock into place.
- H4. Reinstall the 6x 10mm nuts behind fender liner.
- H5. Replace all fender liner hardware.
- H6. Replace vertical bolts in fog light housing area.
- H7. Reinstall fog light surrounds/intercooler grills.

#### *I - Final steps*

- I1. Reinstall belly pan.
- I2. Reinstall engine covers.
- I3. Fix a 50/50 coolant solution and fill coolant. You will have to run the car and refill to get it to the correct level. You may also have to burp or bleed the system by sliding back one of the heater core hoses to release air.

So that's it. Piece of cake. Start it up and make sure it sounds normal. Drive it and make sure it drives normal. You're done for another 3-5 years.

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