

## Timing, Balancer Shaft, and Accessory Belt Replacement By anthony pazsd and Dad

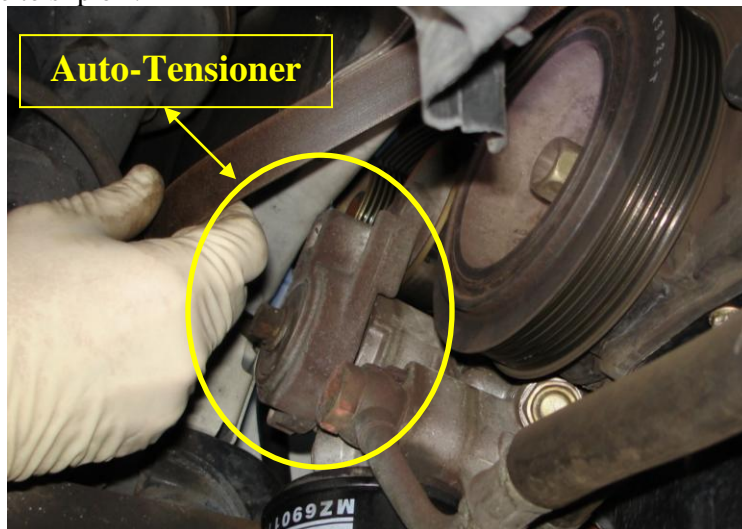
1- Start by lifting the car. I used Qty 2 4x4 wood blocks per wheel in the rear. Then Qty 2 Jack Stands under the frame towards the front of the car. Note: keep the Jacks Stands away from the area that you'll be working in.

2- Remove the Passenger Side Wheel and the bottom Engine Cover. Then setup your Jack with a 4x4 wood block on top of it. Position it under your Oil Pan and apply pressure.

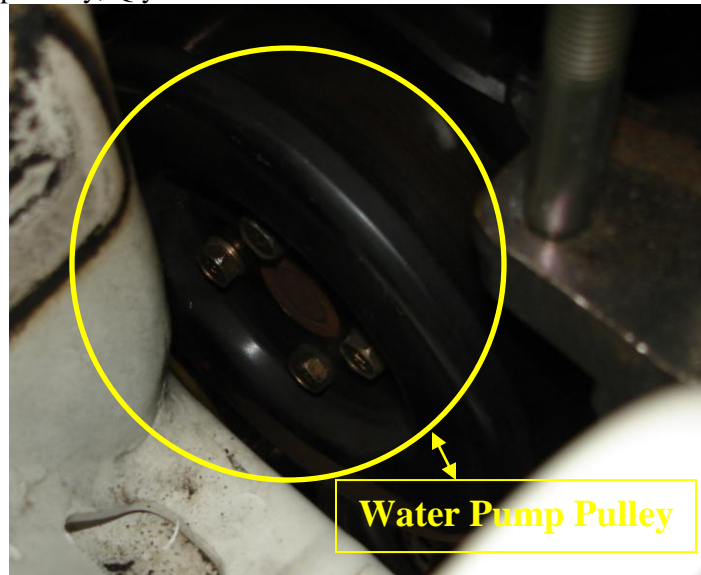


3- Relocate your Power Steering Reservoir Tank, Qty2 12mm, to the side in order to make room for your working area. Next remove the engine mount, Qty3 14mm nuts on engine side and 19mm socket with 17mm open end wrench on the backside. Remove complete mount with rubber inserts.

4- Remove the Accessory Belt. Using a ½ inch Breaker Bar, turn the Auto-Tensioner counter clockwise and the Accessory Belt should be free to slip off.



5- Remove the Water Pump Pulley, Qty4 10mm bolts.



6- Remove the Timing Belt Upper Cover, Qty4 10mm bolts.

7- Next, we want to remove the Timing Belt Lower Cover, but there are items that need to be removed prior in order to access the bolts of the lower cover.

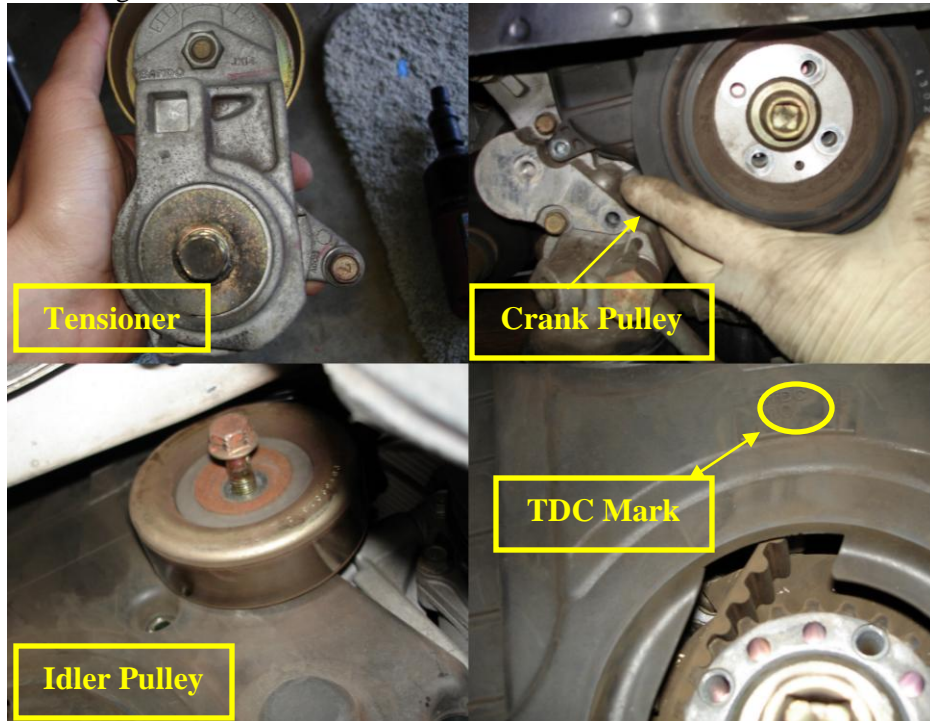
Remove Auto-Tensioner, 14mm and 12mm.

Remove Crank Pulley, Qty4 12mm.

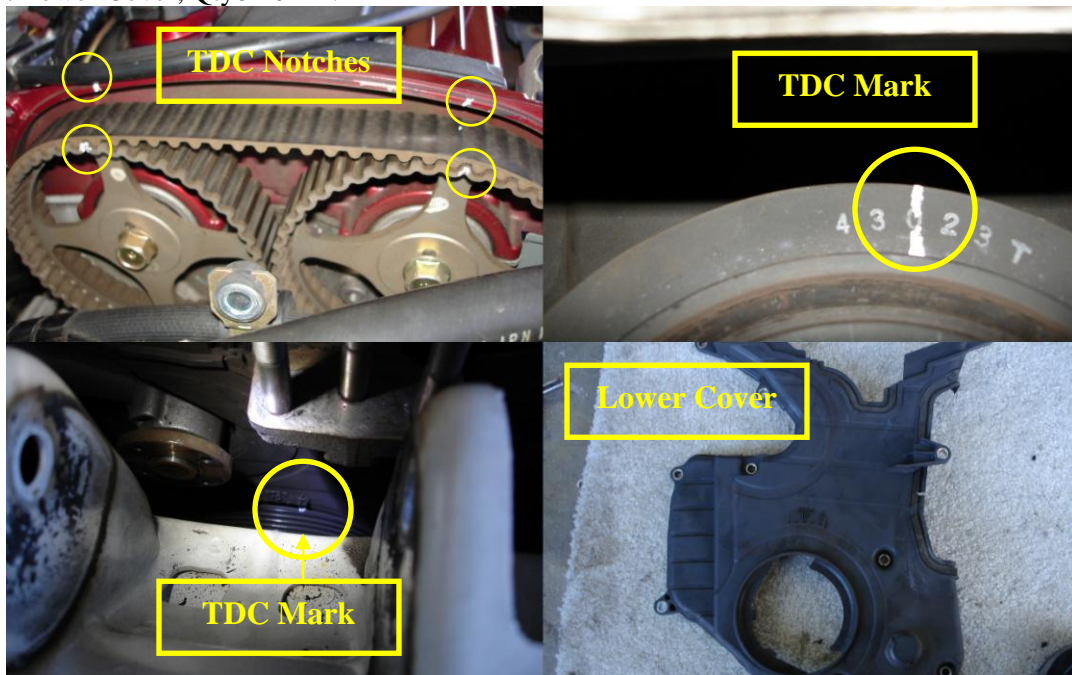
Remove Front Idler Pulley, 14mm.

Remove Generator Brace, Qty3 12mm. Note: insert the really long screw back into place once the brace is removed. This will keep coolant from seeping out.

8- Now that we have removed 4 different items just to get the Timing Belt Lower Cover removed, leave it in place and take note of the TDC markings on the cover above the Crankshaft Pulley. There should be a “T” towards the right of the markings.



9- Before we remove the Timing Belt Lower Cover, we need to align the Camshaft Sprockets (cam gears), and the Crankshaft Sprocket to TDC. Using the Breaker Bar, turn the Crankshaft Sprocket Clockwise until the Camshaft Sprockets and Crankshaft Sprocket align with TDC. Note the Timing Marks (notches) on the Valve Cover. The Crankshaft Sprocket should also align with the “T” on the Timing Belt Lower Cover. Finally, we can remove the Timing Belt Lower Cover, Qty8 10mm.

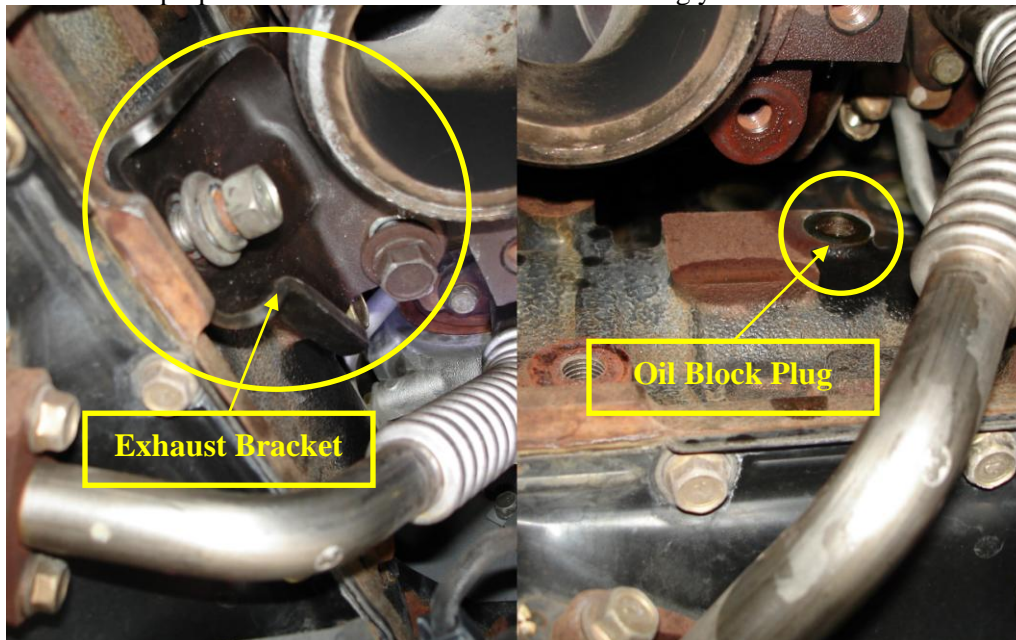


10- Remove the Timing Belt Auto Tensioner Adjuster, Qty2 12mm. The Tensioner is under hydraulic pressure so be careful not to damage it when removing. Once removed, use a C-Clamp to compress it very slowly and insert a tiny allen wrench or pin into both holes.



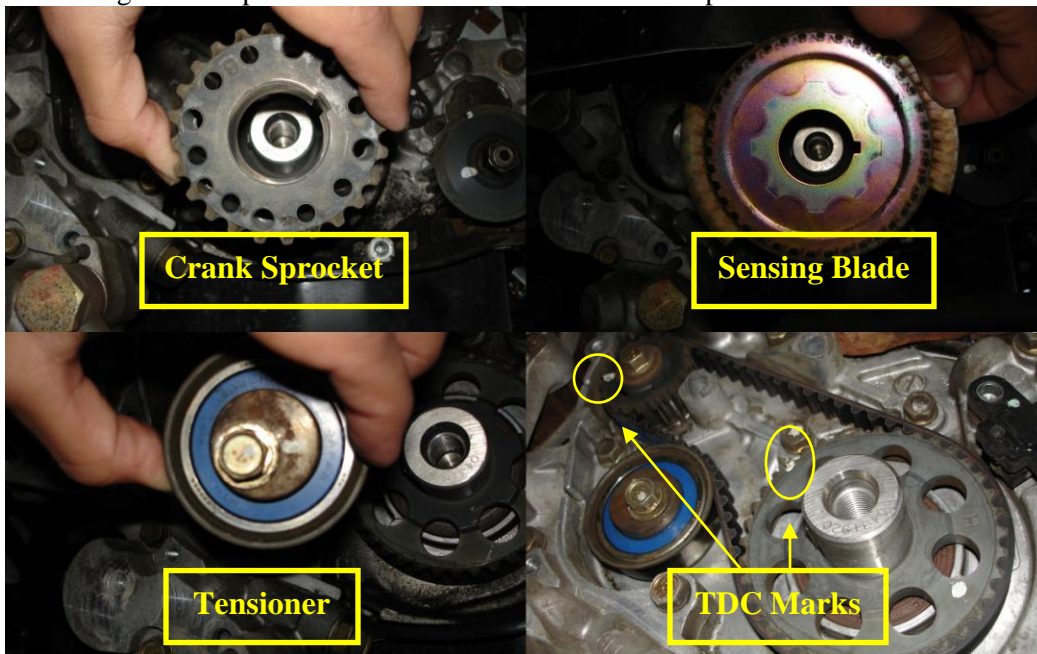
11- Remove Front Axle Crossmember Bars, Qty4 14mm. Lower the Downpipe, QTY2 14mm. Take the Downpipe off the rubber mounts just before the Catalytic Converter. I used some WD40 and a flat head screwdriver to pry it off. The entire front-end of the exhaust should lower. Note: we are lowering the exhaust in order to access the Oil Cylinder Block Plug.

12- Remove the Oil Cylinder Block Plug, 14mm. This Bolt is a real pain. With the Downpipe lowered, you might have access with a swivel socket. I had to remove an Exhaust Bracket which provided some extra room to access the bolt with an extension and swivel socket. Once the Plug is removed, insert a Philips Screw Driver into the hole ensuring that at least 60mm of the shaft is inside the hole. If the Screw Driver doesn't go as far as it should, you can rotate the Oil Pump Sprocket once the belt is removed allowing you to insert the driver.

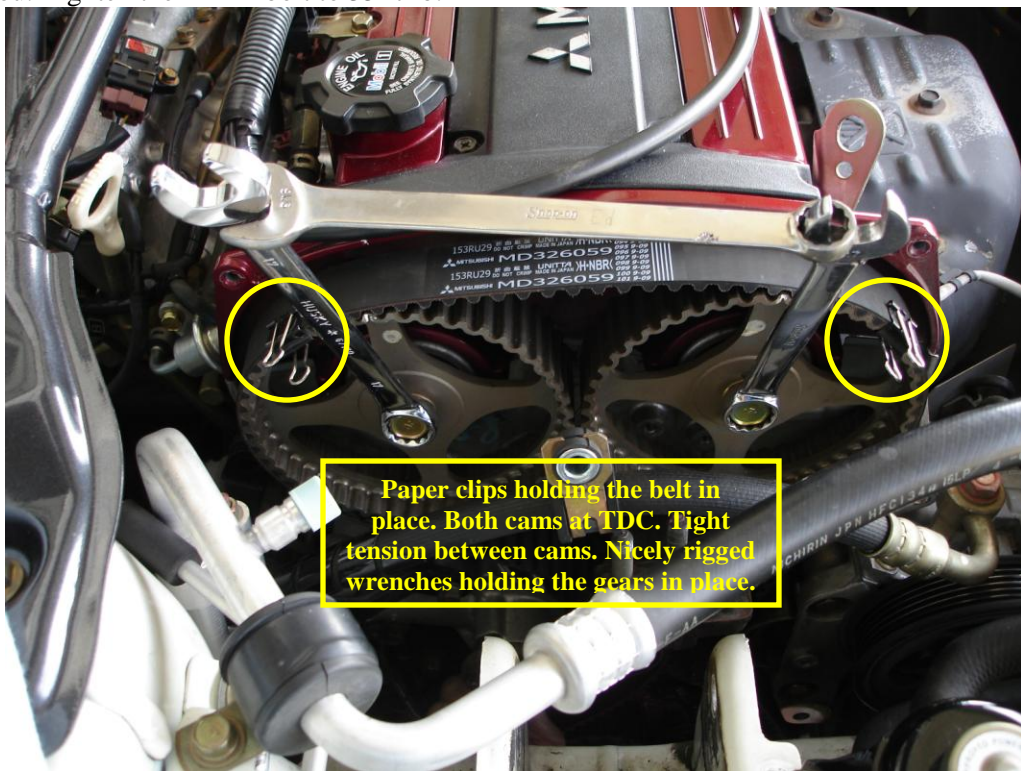


13- Check that the Camshaft Sprockets, Crankshaft Sprocket, and Oil Pump Sprocket are All ALIGNED with TDC. We can now remove the Timing Belt.

14- Now its time to remove to the Balancer Belt, but first are items that must be removed. Remove the Crankshaft Bolt, 22mm. (our Matco 600lb ½ inch impact had no problem) Remove the Crankshaft Sprocket by sliding it off the shaft. Remove the Crankshaft Angle Sensor, Qty 2 10mm. Remove the Crankshaft Sensing Blade. Before proceeding, take note of the tension of the belt by pressing down on the belt several times. My Balancer Belt had too much slack for some strange reason. Remove the Balancer Belt Tensioner, 12mm and the Belt should be free to remove. Note: The Crankshaft Sprocket B and Counterbalance Shaft Sprocket must be at TDC prior to installing the new Balance Belt. You will notice notches towards the left of the sprockets indicating TDC. Install the new Balancer Belt with tension towards the top and slack towards the bottom. Install the Balancer Belt Tensioner rotating clockwise with your hand until the tension is set, and then tighten the 12mm bolt to 14 ft-lb. Install the Crankshaft Sensing Blade followed by the Crankshaft Angle Sensor, Qty 2 10mm to 78 in-lb. Note: Clean and degrease the previous items. Install the Crankshaft Sprocket.



15- Install the Timing Belt. This next step took me a very long time, the longest of the entire install. Take your time, be patient, and hope for an extra set of hands. Before installing the Timing Belt, loosen the Timing Belt Tensioner Pulley, 14mm. Note: Make sure all your marks are at TDC and that you have a helper. Take your new Timing Belt and wrap it around the Crankshaft Sprocket and Oil Pump Sprocket keeping the tension tight. After several failing attempts, we decided on a C-Clamp to hold the Timing Belt to the Crankshaft Sprocket. Pass the Belt up the through the Idler Pulley and onto the Exhaust Cam Gear. Use 2 17mm open end wrenches holding the Cam Gears at TDC. Pass the Belt over the Intake Cam Gear. I had to rotate the Intake Cam Gear clockwise passed TDC, lay down the belt, and rotate the Cam Gear counter-clockwise back to TDC. This insured me that the Timing Marks were spot on and that the tension was tight. I also used 2 paper clips to hold the belt down on the cam gears. At this point, the bottom side, right side, and top side of the belt should be tight. You will also want to check your Timing Marks to insure that everything is at TDC. Now you will adjust the Timing Gear Tensioner Pulley located on the left side. This Tensioner requires a special tool but we created our own. We inserted a small Allen Wrench into one of the 2 small holes and used a Flat Head Screw Driver to pry the Pulley around counter-clockwise until the Tension on the Belt was tight. Take caution when tightening the 14mm bolt because the Pulley can turn on you. Tighten the 14mm bolt to 35 ft-lb.



16- Install the Timing Belt Auto Tensioner Adjuster. I needed to pry the Tensioner Arm to fit the Auto Tensioner back into its location. Tighten the Qty 2 12mm bolt to 18 ft-lb. Carefully remove the Allen Wrench or pin from the Auto Tensioner.

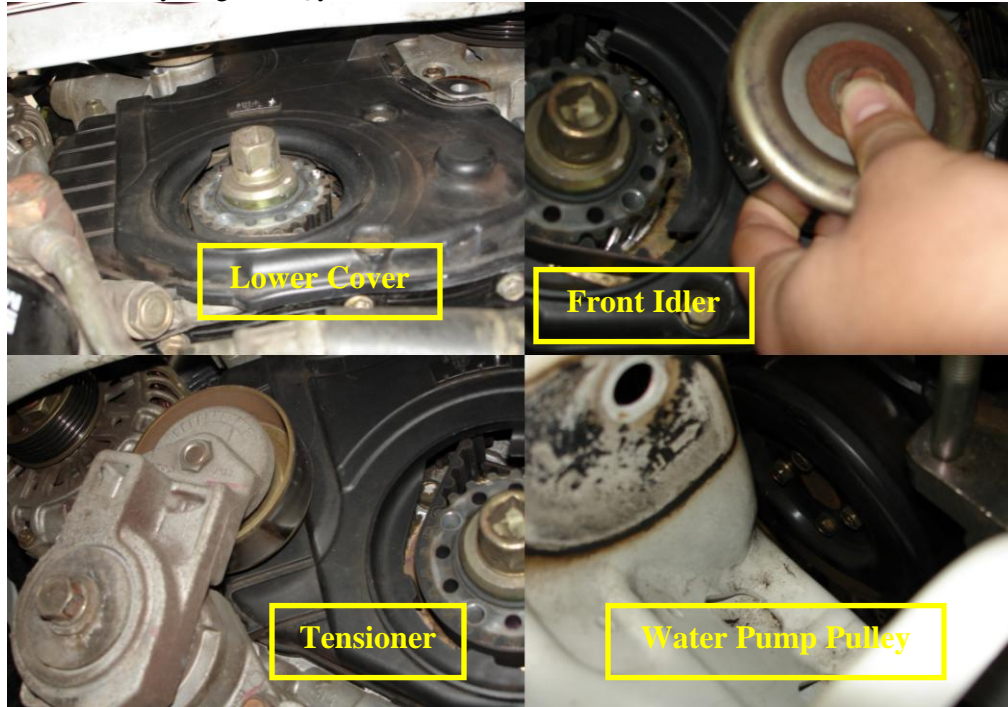


17- Install the Crankshaft Bolt and tighten the 22mm bolt to 123 ft-lb.

18- Install the Oil Cylinder Block Plug. Remove the Philips Screw Driver from its location in the block. Tighten the 14 mm Block Plug to 23 ft-lb.

19- Check your Timing Belt Installation. Using your ½ inch ratchet and 22mm socket, turn the Crankshaft Bolt clockwise 3 rotational turns. Check that the Camshaft Sprockets, Crankshaft Sprocket, and Oil Pump Sprocket are ALL ALIGNED with TDC. The belt should feel nice and tight. The Oil Sprocket will line up with TDC every 3<sup>rd</sup> rotation. Note: The manual states to wait 15 minutes before doing this so that the Auto Tensioner Adjuster has time to settle into position.

20. Install the Lower Timing Belt Cover, Qty8 10mm.  
Install the Front Idler Pulley. Tighten 14mm to 58 ft-lb.  
Install the Accessory Belt Tensioner. Tighten the 14mm to 33 ft-lb and 12mm to 18 ft-lb.  
Install the Water Pump Pulley. Tighten Qty4 10mm to 78 in-lb.  
Install the Upper Timing Belt Cover, Qty4 10mm.  
Install the Crankshaft Pulley. Tighten Qty4 12mm to 19 ft-lb.



21. Install the New Accessory Belt. Start at the top and move your way down. I started at the Power Steering Pulley, Front Idler, Crank Pulley, and then the Tensioner. I went back up top and then left to the Water Pump Pulley, and then the Generator. 2 people are ideal because one can turn the Tensioner counter-clockwise and really torque it to provide extra slack. The other can pry the Belt onto the Generator. Release the Tensioner and inspect the entire area. This process should take about 15 minutes.

22. Install the Passenger Side Motor Mount. Tighten the Qty3 14mm bolts to 50 ft-lb. Then tighten the 19mm screw and 17mm bolt to 73 ft-lb. Tighten down the Power Steering hose and Reservoir tank.

23. Install the Exhaust Bracket, Exhaust, and Front Axle Crossmember Bars. Note: The bracket was removed in order to have access to the Engine Bolt Plug. Almost done...

24. Start your Car! Since you took great pre-caution during the entire install checking and double-checking TDC marks, the motor will start and idle just fine. Turn off your vehicle after a couple minutes of idling. Bolt up the lower engine cover, torque your lug nuts, and marvel on your success.



After searching for a Timing Belt replacement guide, I was surprised to see that there weren't very many posts based on the subject. Since I had to replace my Belts regardless of the information available on this site, I decided to thoroughly document my install. I used the service manual as my main source of information.

I would classify this install as difficult. Easier than my clutch replacement, but still difficult. This install would not have been possible without the help of my dad, his garage, ingenuity, and assortment of tools. This task is not for the the beginner. If you feel any hesitation in the task at hand then please pay someone to do the replacement of your Belts. In no way am I responsible for any decision you make based on the information provided. This install took me 8 hours(taking pics and referencing) but I'm confident I could do the job again in 4 hours.

Open the attached word document and enjoy. Any feedback, positive or negative, is welcomed.

Thank you  
Anthony