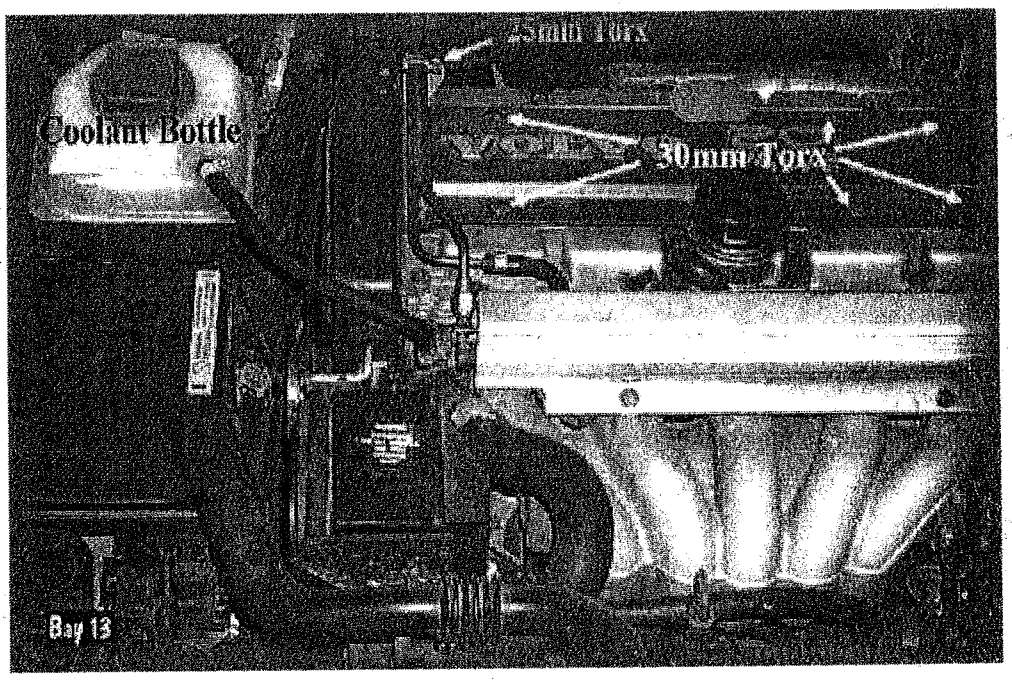
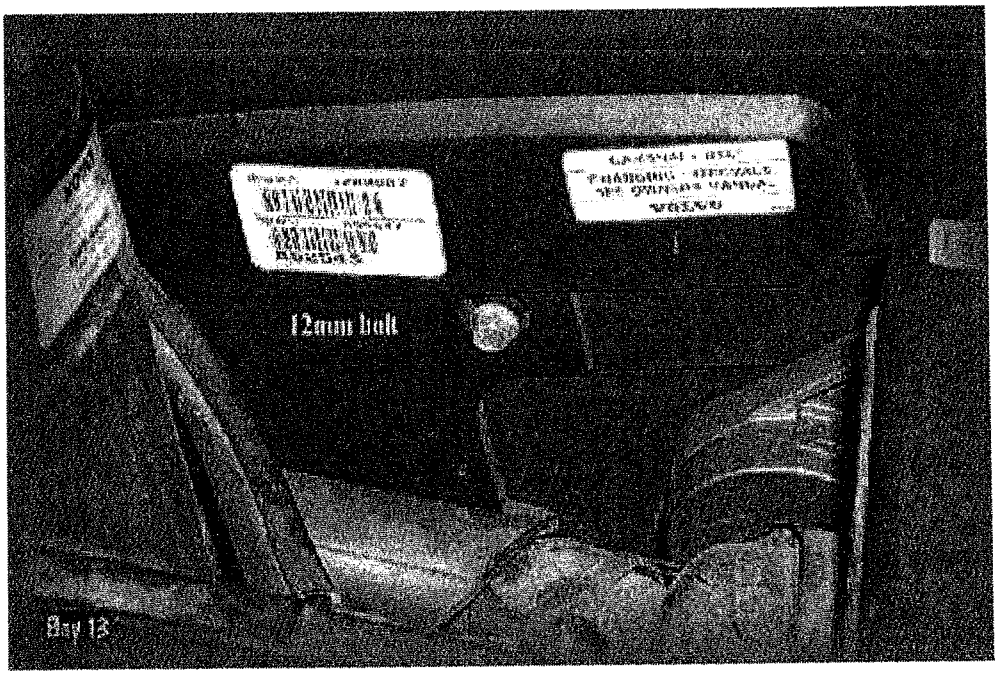
850 S/V/C 70 Timing Belt Replacement.

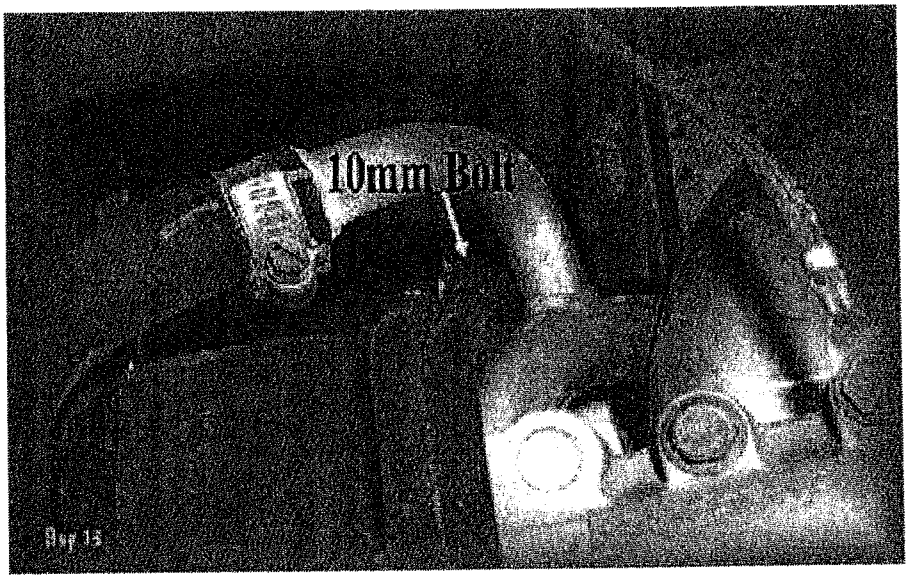
The timing belt is not the most difficult item to replace on your vehicle, however if attention to detail is not followed, it can cause some of the most expensive damage. The Timing belt (T-belt) should be replaced every 70,000 miles or after 5 years of use. The five years of use is something I have made up because of the condition I have observed the belts in after 5 years. The 1993 850 has a 50K mile replacement interval, because the belt is not as wide as the 1994 and later belts. These procedures outlined below are for the 850, however the same procedures will work for the S/V/C 70 as well. These directions try to assume you have no knowledge of T-belt removal and replacement.



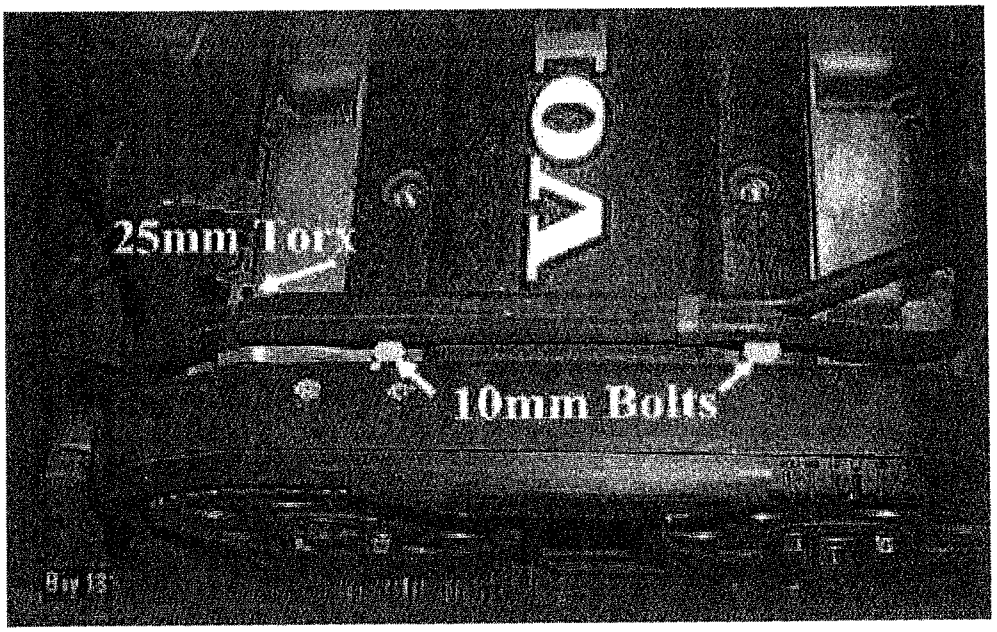
Start by removing some of the plastic coverings. Remove the six 30mm torx screws holding the cover plate for the spark plugs. The fuel lines will remain in place, however remove the 25mm torx that holds a bracket in place, this will allow you to slightly move the fuel lines to get to the 10mm bolts holding the top of the T-belt cover. Lift the coolant bottle out of the bracket and unplug the connector on the bottom that is for the level sensor, this will allow you to move the bottle around.



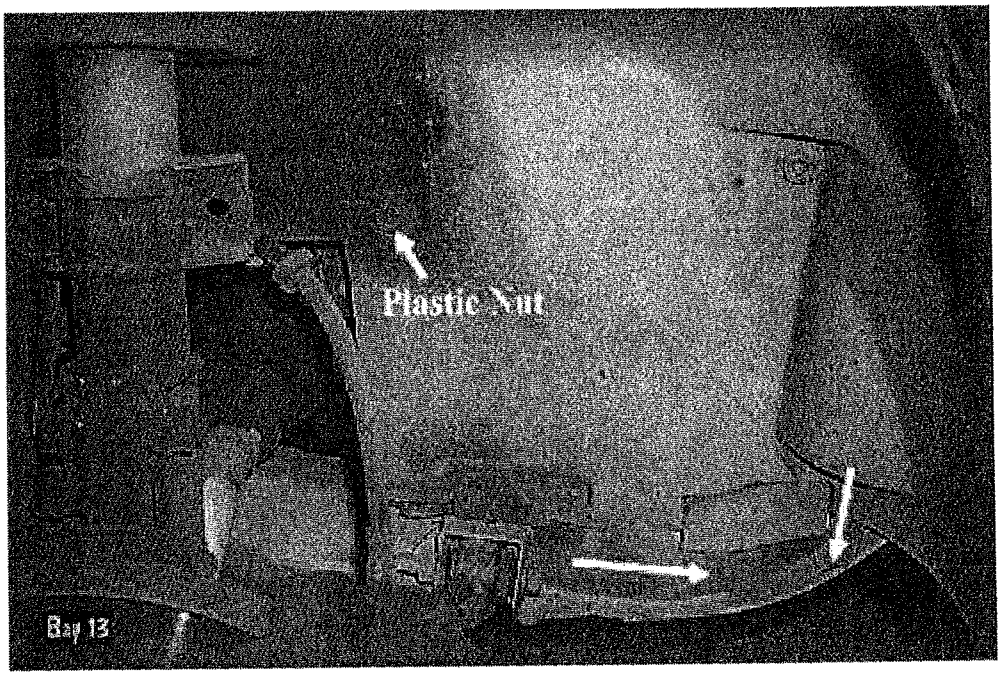
Leave the lines connected to the coolant bottle, lift and move the bottle to sit on top of the plugs. With a 12mm socket remove the bolt holding the front cover in place. After the bolt is removed, lift and pull the cover up and out of the way.



If you follow the gas lines back and down they are held in place with a bracket and 10mm bolt, remove the bolt and now the lines will be a lot easier to move around.



Gently push the fuel line back a little and work a 10mm socket in and remove the two bolts that hold the top of the cover plate in place. Once the bolts are off leave the cover in place for now.



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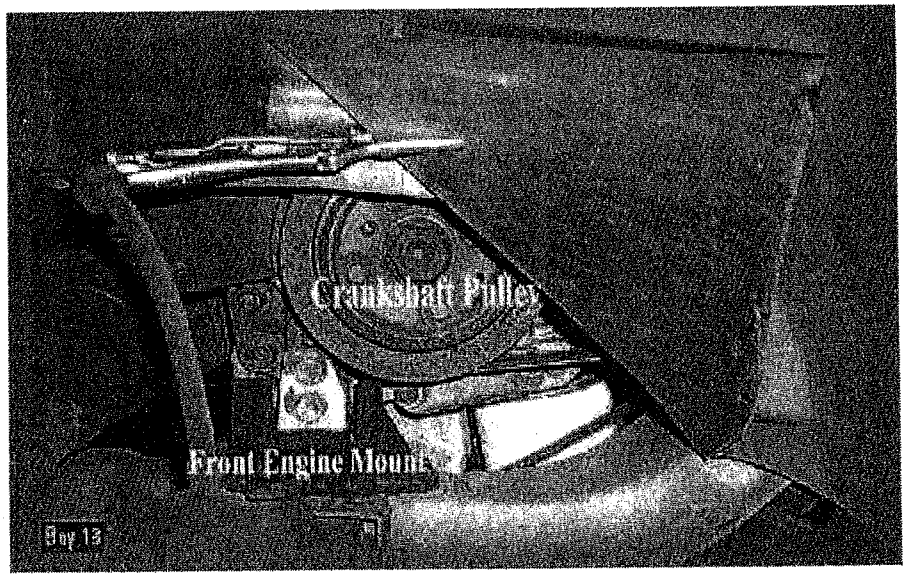
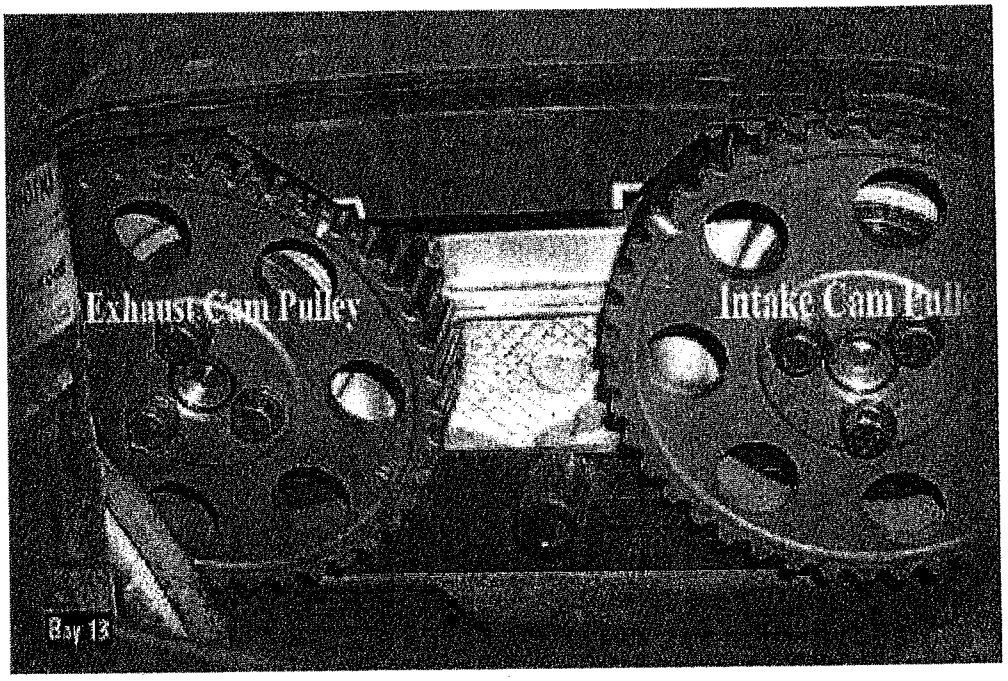
Raise the car up and remove the right front tire. Put the car on a jack stand, you will be working up and down in the wheel well and the car must be safely secured. Once the wheel is off, remove the plastic hold down nut and the plastic attached to the bottom of the inner wheel well. Pull down and forward to get the bottom piece off.

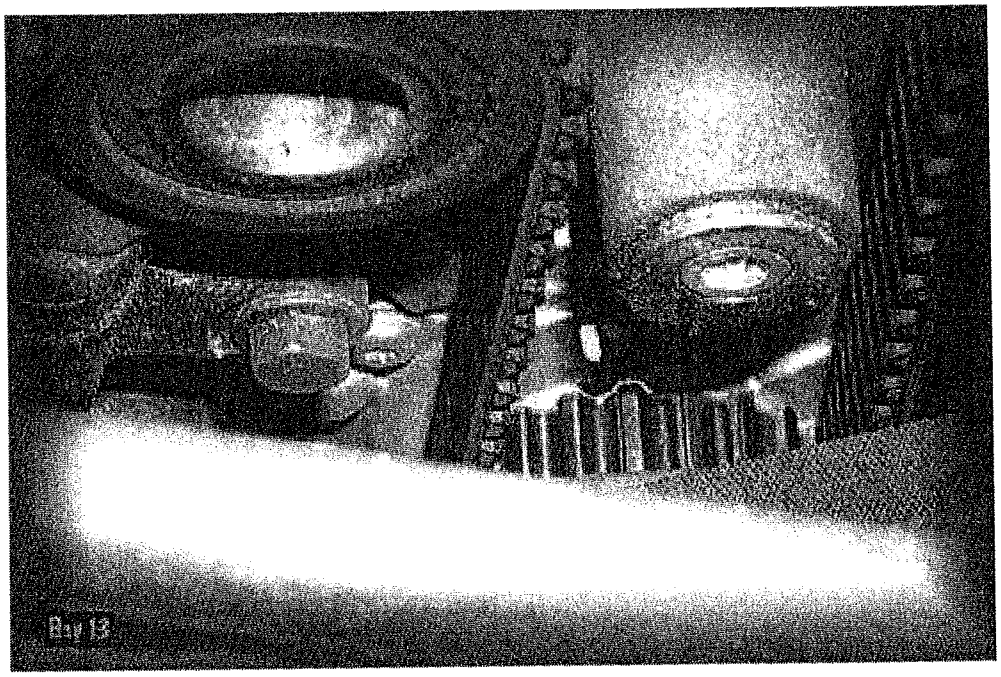


You need to fold back the plastic and use a pair of needle noise vice grips or similar to hold the plastic in place. The crankshaft pulley has a 30mm nut holding it in place. You will need a 30mm socket, extension, and ratchet to turn the nut that will turn the engine over to line up the timing marks on the crank and cam shaft pulleys. Before doing the alignment, now is a good time to remove the serpentine belt. Volvo has a special tool that fits on the end of a ½ inch breaker bar that makes it ¾ inch. Note the routing of the belt for when you have to put the belt back on. The older style tensioner can be worked with a 3/8-inch ratchet.

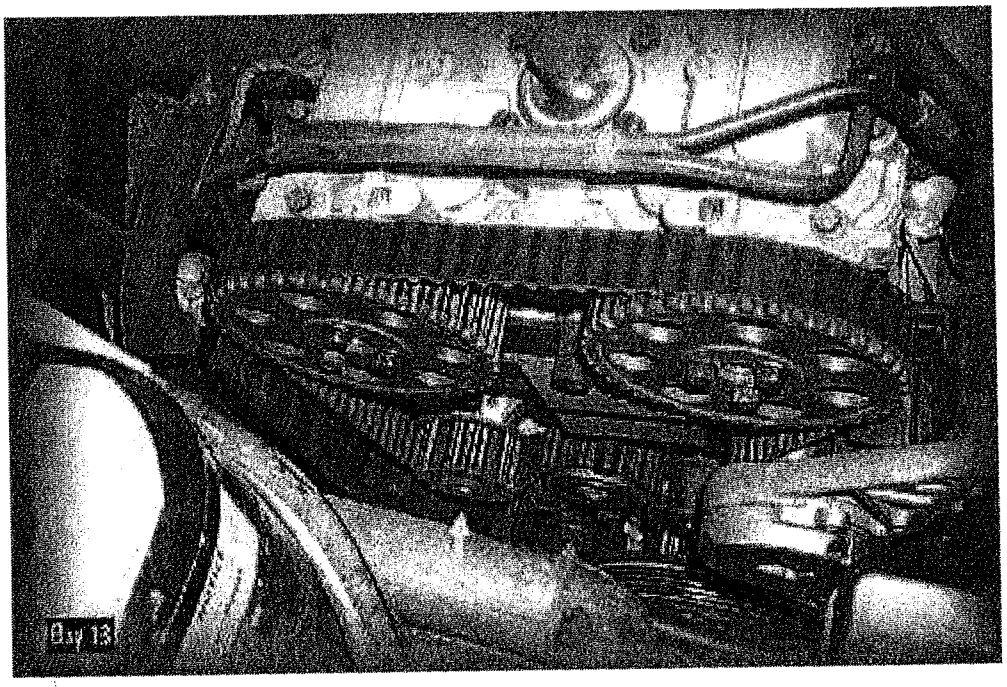


The alignment of the intake and exhaust camshaft pulleys is a little tricky. There are small scribe

marks on the outer edge, I have enhanced the drawings with white markings but in real life it can be hard to spot the marks. Don't make your own and assume as long as you don't move anything it won't matter. I have also enhanced the top cover marks that the pulley has to line up with.

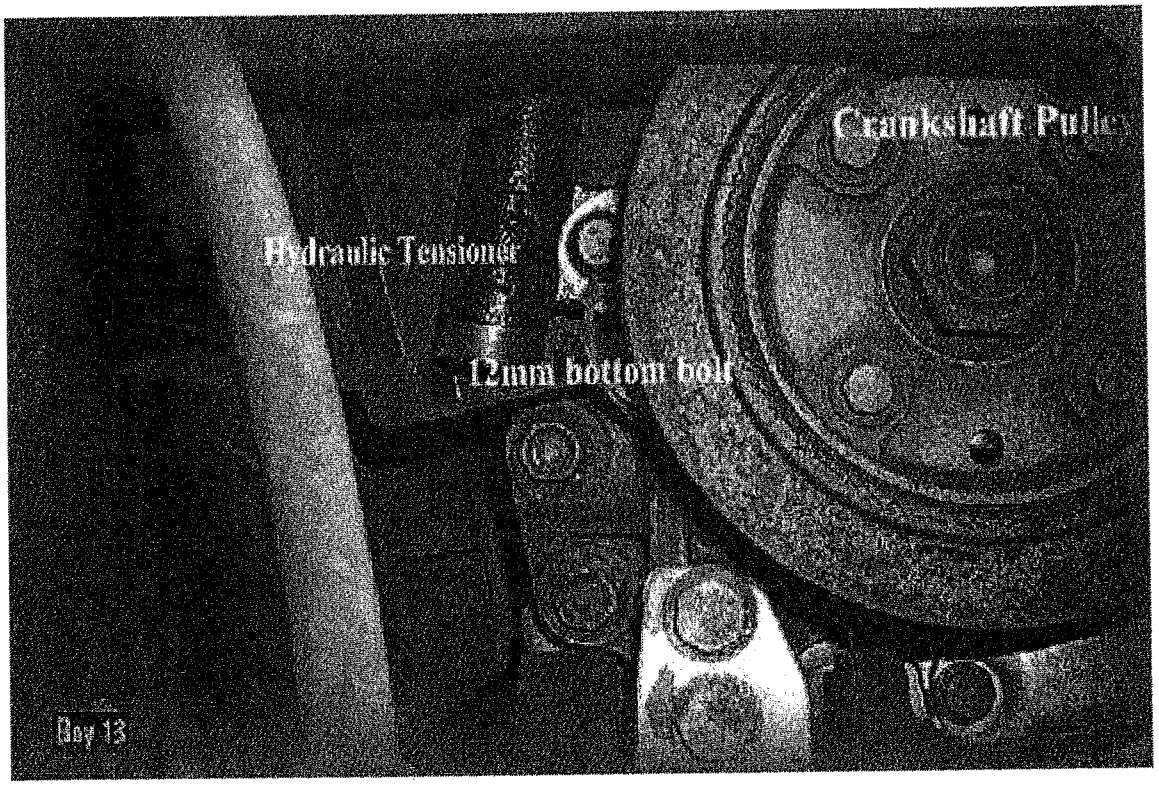


At the same time you are bringing the camshaft pulleys into alignment you have to be lining up the crankshaft marking. The crankshaft marking is the most critical of the alignments; if you line it up correctly the camshaft markings will fall into the two "V" marks on the upper cover. I use a ½ inch drive ratchet with a 12-inch extension to turn the engine in a clockwise direction to line up the marks. Finding the little cut out in the valley of the crankshaft gear is difficult. If you pass it, back up several teeth and then back again clockwise. Good lighting is critical.



Once you have the marks all lined up, gently push the fuel lines back and work the top alignment

cover up and out of the way. The white arrow is pointing to the water pump, inspect where it is fastened into the block. Look for coolant seepage from the pump, if you have a leak, replace the pump and seal. The blue/green arrow is pointing to the top 12mm bolt on the hydraulic tensioner. 3/8-inch ratchet with a 12mm socket will break the bolt loose and then you can reach down and unscrew it by hand, you can also reach up from the bottom to unscrew the bolt. Always do the top 12mm bolt first.



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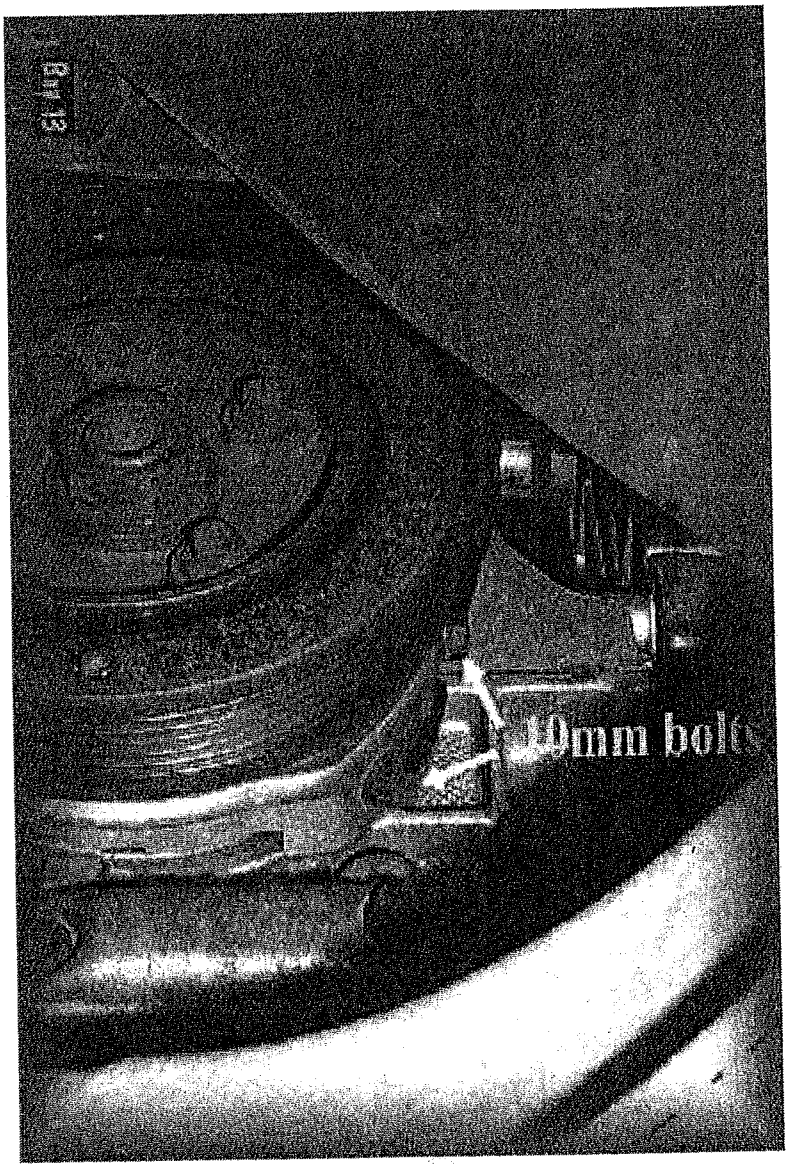
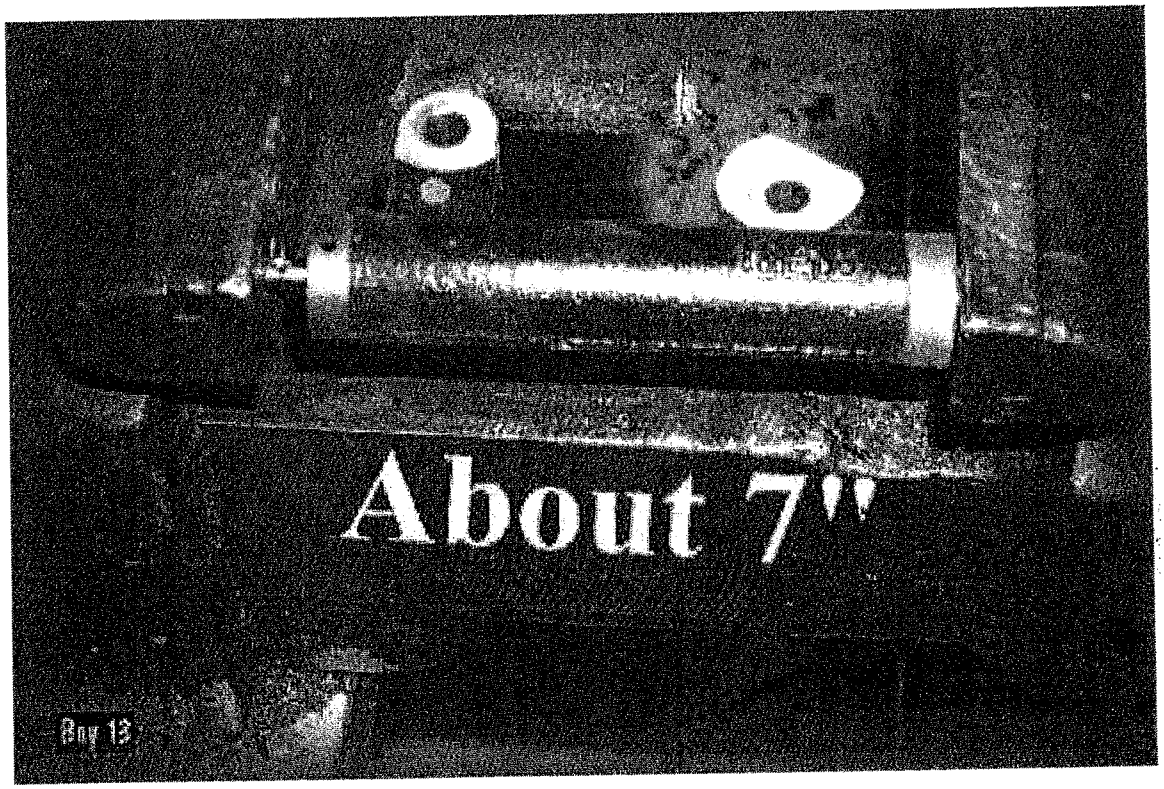
Back into the wheel well, remove the bottom 12mm bolt on the tensioner. I use a 3/8-inch drive with a swivel to avoid interference with the crankshaft pulley. Once the bottom bolt is out, you can work the tensioner out the bottom. You should notice a white plastic spacer on the top of the tensioner, remove it and trash it, there is a new one in the timing belt box. (Check when you buy it)

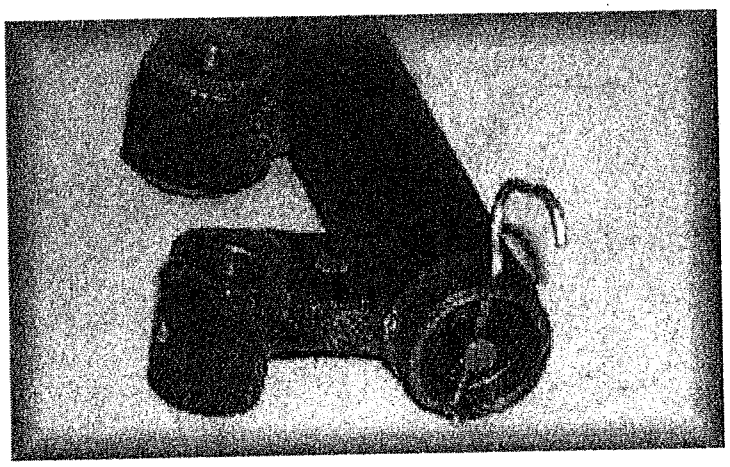


There is a plate that wraps around the bottom of the crankshaft pulley that needs to be removed. It is held in place by two 10mm bolts. I use a ¼ inch 10mm swivel on an air ratchet, but a ¼ inch drive would work as well. After the bolts are out, work the plate out with slight movements up and down. Now you are ready to remove the old timing belt. I start at the top, gently slide the belt off the water pump gear and then work your way to the exhaust pulley and then the intake pulley. Move slowly and try not to jar the pulleys. Should one of the pulleys move just a bit right or left, it can be corrected. Once the belt is off the upper section of the engine, work the belt free and begin to work it down. The right side of the belt going down to the crank shaft pulley will need to be worked free of the plastic backing. Get down on the ground and work your arms into the wheel well to begin working the belt off the crankshaft pulley. If you work your fingers behind the bottom of the crank pulley you can feel a stop with a rubber ring on it, the task is to work the belt towards you while working the belt down past the obstruction. Work the right side free first and once it's free and coming out the bottom of the pulley,

work the left side free of the plastic. This is not easy the first time, and even dealer Technicians find this hard and will break the 30mm nut loose with an impact gun (to not rotate the crankshaft), and pull the pulley out or off. With time and patients you can work it off without removing the crankshaft pulley. The belts off!

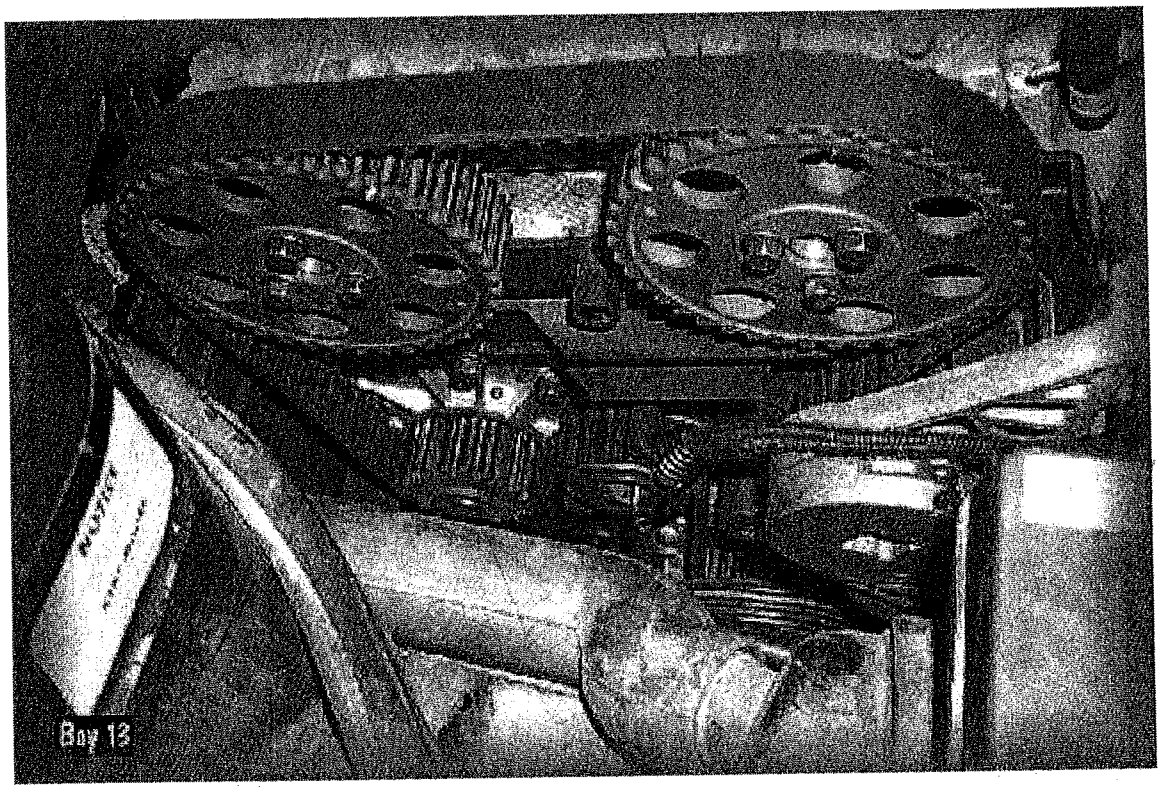


Items that need to be done prior to putting everything back together include, compressing the hydraulic tensioner. Volvo makes a special tool to compress the tensioner at a certain rate. Most people will not buy the tool for one or maybe two uses, so the alternative is to use a vice that will open to at least 7 inches. If you are using a vice, close it very very slowly. The Volvo tool takes 5-10 minutes, just to give you an idea how slowly you should compress the tensioner.

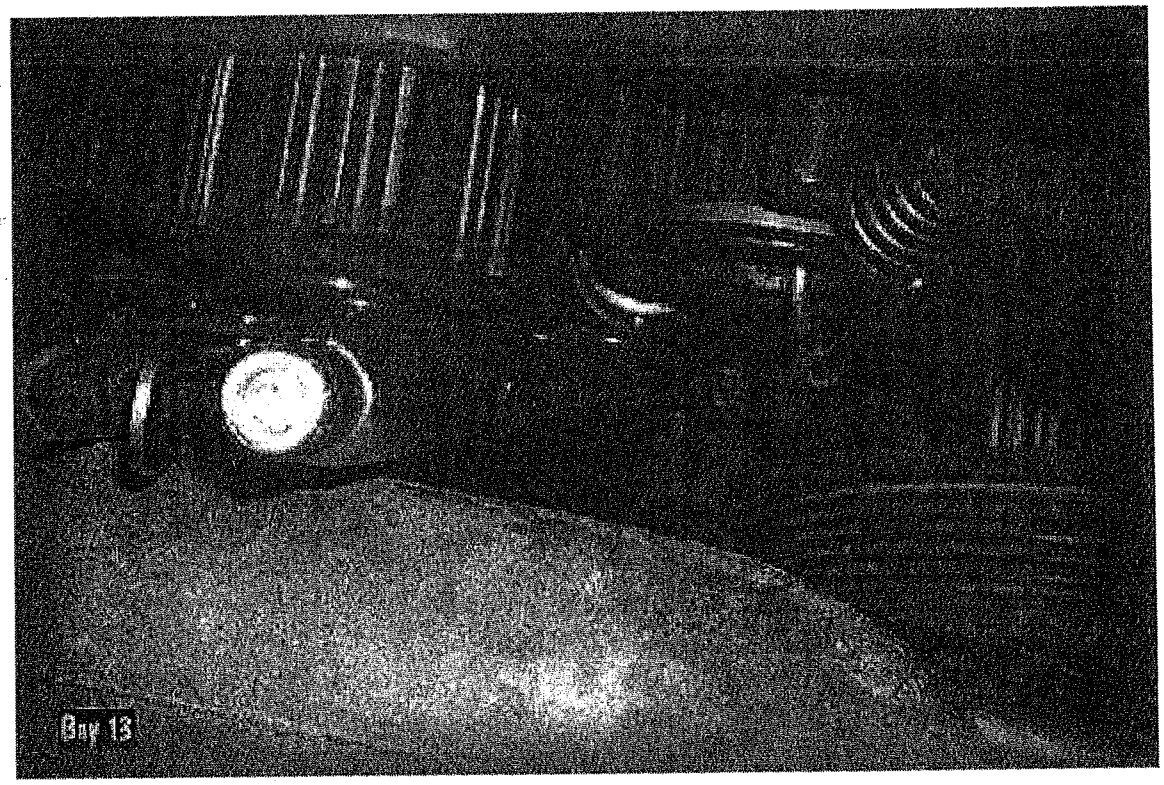


You need to have some tool to "pin" the tensioner with after you have it compressed. The pin in the picture is actually the pin that comes with a replacement tensioner and has been bent out a bit to make it easier to fit when using the Volvo compressor. An Allen wrench small enough to fit in the hole will work, or even a small drill bit. What ever you decide to use ensure you leave enough sticking out to grab

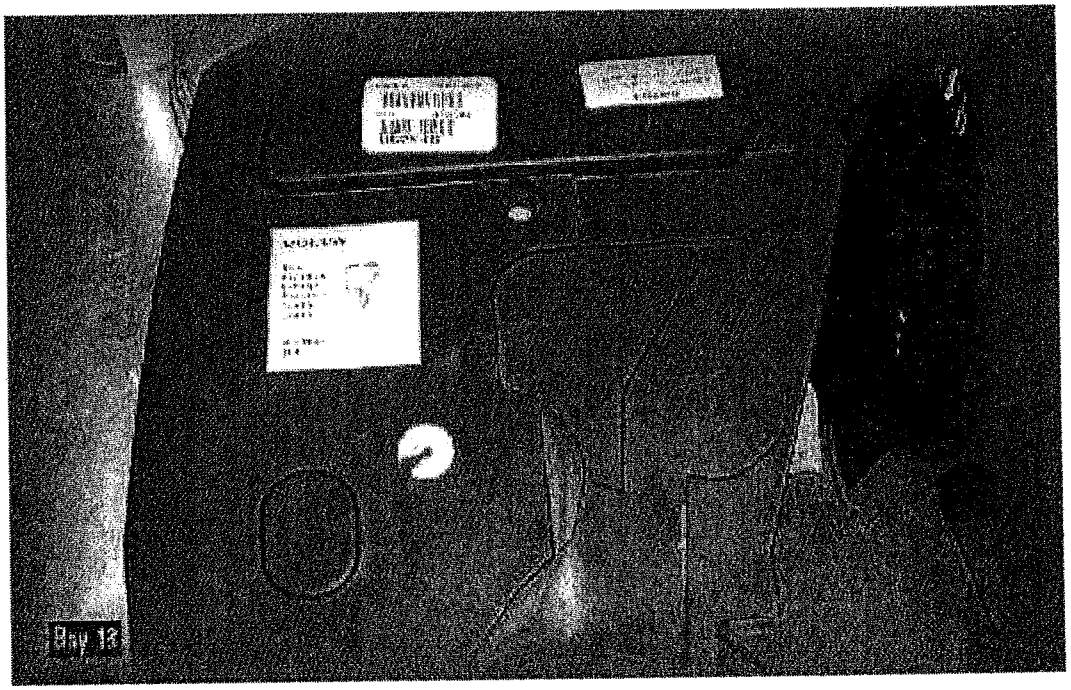
with a needle nose vice grip to remove the pin. Also make sure you pin it on the correct side, the picture is the correct side. Prior to compressing the hydraulic tensioner, check for oil leaks, try to push the endpin down, if it moves then the hydraulic function of the tensioner is not working and the tensioner should be replaced.



Compare the T-belt you removed with the new one to ensure they are both the same size. To install the belt start down in the wheel well. Slip the belt between the crankshaft pulley and the stand off with the rubber on it. (the thing you had to get past to get the belt off) Work the right side in first and then the left. Once you have worked the belt into the bottom of the crankshaft pulley, shove the belt up and move up top to route the belt further. Start by pulling the belt up so it is snug with the crankshaft pulley, wrap the left side around the tensioner idler and the water pump gear. Next begin routing the belt to the right, keeping tension on the belt as you route it. Once you get up to the intake pulley make sure the belt is still tight on the right side and then walk it onto the teeth on the intake camshaft pulley, then to the exhaust pulley. When you are working it on to the exhaust pulley use your right hand to lift up on the tensioner pulley to maintain the tension. So you can get you hands free to finish the job, I connect a bungee cord as shown to keep the tension on. Once your hands are free, check to ensure the routing to the right is indeed tight, if not, do it again. Once you are sure the belt is tight, put the top plastic cover on and see if the marks are still lined up. (they should be). If the exhaust cam is off one tooth, (it happens) keep the tension to the right and take the belt off the exhaust pulley and slowly move the pulley in the direction it needs to go. I put a screwdriver between the 10mm bolts on the front of exhaust pulley to help tweak it into position. Once everything is lined up you need to put the tensioner in. I do it from the bottom, put the 12mm bolts in the tensioner and work it into place and hand tighten the bolts, then tighten with a ratchet. Don't knock the bungee cord off while working from below.



Clamp a pair of vice grips on the pin and use a pry bar to push against the vice grips to quickly pull/push the pin out of the tensioner. Once the pin is pulled, carefully rotate the engine two times around, and then check your alignment marks one more time. By now the tensioner has expanded and you can take the white plastic spacer and put it on to the top of the tensioner. Just reach down and push the spacer on, it will snap onto the tensioner shaft so you can rotate it around to make sure it's on correct.



The box the belt came in has a sticker you can affix to the cover to keep track of the interval. Put everything back together in reverse order, and then start your car. Allow yourself half a day to do this if

you have no experience with replacing timing belts on interfering valve vehicles.