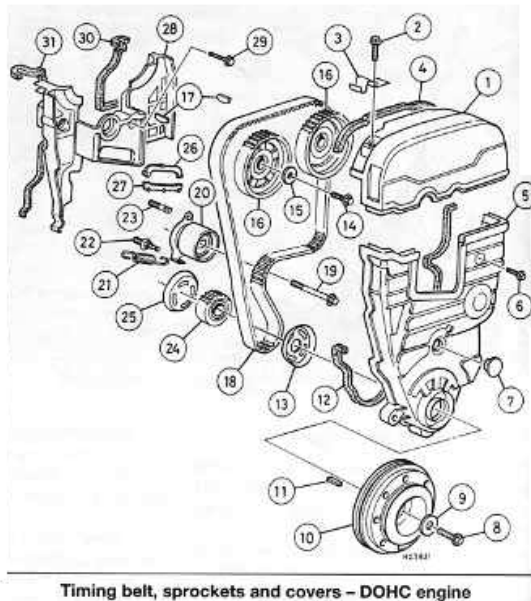


DOHC ZC Timing Belt Replacement

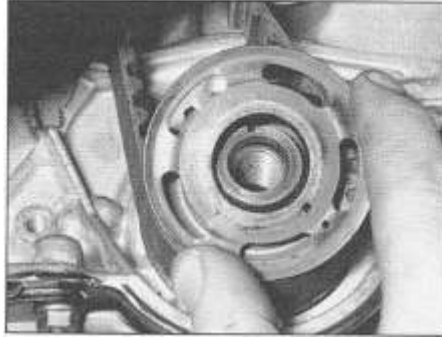


1 Timing belt upper cover	16 Camshaft sprocket
2 Bolt – upper cover-to-cylinder head	17 Camshaft sprocket Woodruff keys
3 Accelerator cable retaining clip	18 Timing belt
4 Upper cover seal	19 Tensioner pulley retaining bolt
5 Timing belt lower cover	20 Tensioner pulley assembly
6 Bolt – lower cover-to-cylinder block	21 Spring
7 Tensioner pulley access grommet	22 Pillar bolt
8 Crankshaft pulley retaining bolt	23 Tensioner locating stud
9 Washer	24 Crankshaft sprocket
10 Crankshaft pulley	25 Timing belt inner guide plate
11 Woodruff key	26 Seal – upper cover
12 Lower cover seal	27 Seal – lower cover
13 Timing belt outer guide plate	28 Timing belt inner cover
14 Camshaft sprocket retaining bolt	29 Bolt – inner cover-to-cylinder head
15 Washer	30 Inner cover seal
	31 Inner cover seal

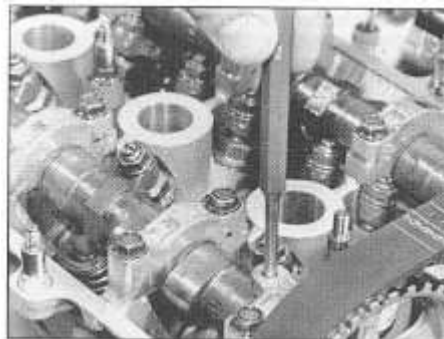
1. Remove (2) bolts securing top portion of timing belt cover and lift top portion of cover off. Remove the valve cover.
2. Place socket and ratchet on bolt attaching crankshaft pulley to crankshaft and rotate engine counterclockwise until the Top Dead Center mark on the crankshaft pulley is aligned with the mark on the front of the lower timing cover. On the crankshaft pulley, there are (4) marks, (3) of which are close together and (1) which is by itself a little ways to the right of the other (3). The one by itself is the TDC mark. With the Top Dead Center marks aligned, look at the camshaft gears and see if the “UP” arrows are pointing up. If they are down instead of up, you are at Top Dead Center on #4 instead of #1 and you need to continue rotating the engine counterclockwise until the Top Dead Center marks on the crankshaft are again aligned and the arrows are up. If they are pointing up, you are o.k.
3. Removing the crankshaft pulley: The bolt attaching the pulley to the crankshaft is a normal right hand thread bolt and loosens by turning it counterclockwise. In order to remove the bolt, you will need some way to prevent the engine from turning when you try to loosen it. Even with air impact wrench, it will sometimes still turn the engine. We use a flat steel strap with two (2) holes drilled in it with a bolt through one of the holes into the pressure plate attaching bolt hole in the flywheel and one bolt through the plate into one of the transmission attaching bolt holes in the block.
4. After you have loosened the crankshaft pulley bolt (before removing pulley), check to make sure that the Timing Marks on the pulley and timing cover

are still aligned. Remove the pulley. Be careful that you don't lose the woodruff key that fits in the keyway in the crank and pulley.

5. Remove the bottom portion of the timing belt cover.
6. Remove the timing belt outer guide plate from the crankshaft. Look carefully at how it is installed. The concave (dished in) portion is facing out.

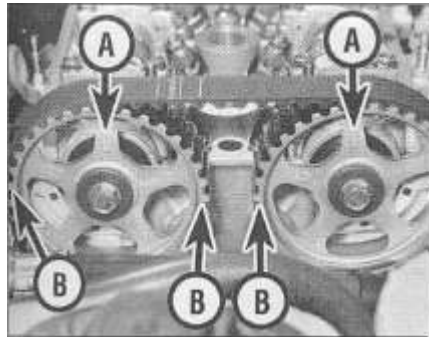


7. Going by "the book", this is how you are supposed to align the camshafts at Top Dead Center. Look at the top of the head just behind the cam gears at the first camshaft bearing caps (they are numbered I1 & E1). You will see a little projection on the back side of the bearing caps with a hole in it. Place a punch down through the holes in the caps into the holes in the camshaft. The punch needs to fit tight in the hole in the caps. This will hold the camshafts in the correct position and keep the valve spring pressure from rotating them once the belt is removed. Unfortunately, this does not always work the way it is supposed to. The holes in the camshafts are usually a little larger than the holes in the bearing caps and may be tapered. This allows the camshafts to rotate slightly and you may end up with the cams one tooth off. You will have a better chance of getting the camshafts aligned properly by just sighting down thru the holes in the caps and making sure that the holes in the cams are dead center on the holes in the caps.

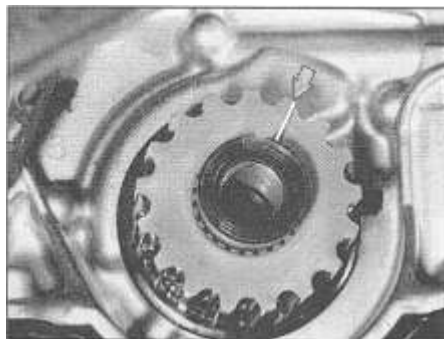


8. Check to make sure that the camshafts are actually in the correct position by looking at the camshaft gears. On the front of the gears, you will see (2)

small marks “B” on each gear. When the camshafts are correctly aligned, the marks on the side of the gears, where the gears are closest to each other (3 o’clock on exhaust and 9 o’clock on intake) will be aligned directly across from each other and will line up with the top surface of the cylinder head. The marks on the opposite sides of the gears will be about one tooth above the top of the cylinder head. The “UP” arrows (“A”) will not be pointing at exactly 12 o’clock. They will be slightly off. If you count the timing belt teeth between the “UP” arrows on the gears, there should be 12 teeth.



9. Loosen the bolt in the center of the belt tensioner pulley. Take hold of the belt on the right side (when looking from the driver’s side of the engine) between the intake camshaft gear and the water pump and pull up on the belt as far as you can, which will cause the tensioner pulley to move to the right. Hold the belt in this position and tighten the tensioner pulley bolt.
10. Remove the old belt.
11. Look at the timing belt gear on the crankshaft. It has a mark on the face of it. This mark should be aligned with the arrow which is cast into the oil pump housing. If it is not aligned, rotate crankshaft until it is.



12. Install the new timing belt onto the gears and behind the tensioner pulley. On the left side (opposite the water pump side) make sure that there is no slack in the belt and that it is tight between the crankshaft gear and the exhaust camshaft gear. Also make sure that there is no slack in the belt between the gears.

- 13. Check again to see that all of the marks are aligned – crankshaft mark aligned with arrow and marks on camshaft gears directly across from each other and lined up with the top of the head.**
- 14. Loosen tensioner pulley bolt which will allow tensioner to move back to the left causing the belt to tighten. Check to see that belt is tight between the intake camshaft gear and water pump. Just to make sure that everything is tight, push the tensioner pulley to the left to remove any slack.**
- 15. With tensioner pulley bolt still loose, remove punches or bolts holding camshafts in position and rotate engine counterclockwise 90 degrees or 1/4 turn. Tighten tensioner pulley bolt to 33 ft. lbs.**
- 16. Rotate engine counterclockwise back to Top Dead Center on #1 and check to make sure that all timing marks are still aligned.**
- 17. Replace timing belt outer guide plate on crankshaft, just like it came off.**
- 18. Replace lower timing belt cover, woodruff key and crankshaft pulley.**
- 19. Replace upper timing belt cover and valve cover. Good idea to install new valve cover gasket and spark plug hole seals at this time.**
- 20. You should now have a new timing belt correctly installed.**