These engines have two timing belts. One connects the crankshaft and camshaft, the second one drives the right silent shaft.

- With the vehicle in Neutral (manual) or *P* (automatic), make certain the parking brake is set and the wheels are blocked. Disconnect the negative battery cable.
- Remove the water pump drive belt and water pump pulley. If the vehicle is equipped with air conditioning, loosen the compressor belt tensioner and remove the compressor belt.
- Remove the bolts holding the crankshaft pulley(s) and remove the pulley(s).
- Remove the upper and lower timing belt covers and their gaskets.
- Use a socket wrench on the projecting crankshaft bolt to turn the engine clockwise (only!) and align all the timing marks on the sprockets and cases. It may be necessary to wipe off the area to see the marks clearly. Do not use spray cleaners around the timing belt.When all of the marks align exactly, the engine is set to TDC/compression on No. 1 cylinder. From this point onward, the camshaft and crankshaft positions MUST NOT be changed.
- If the timing belt is to be reused, make a chalk or crayon arrow on the belt showing the direction of rotation so that it may be reinstalled correctly.
- Loosen the bolts holding the tensioner and pivot the tensioner towards the water pump. Temporarily tighten the bolts to hold the tensioner in its slack position.
- Carefully slide the belt off the sprockets. Place the belt in a clean, dry, protected location away from the work area.
- Remove the camshaft sprocket bolt and remove the sprocket.
- Remove the crankshaft sprocket retaining bolt. Remove the sprocket and flange.
- Remove the plug from the left side of the cylinder block and insert a suitable tool (with the shape of a screwdriver) to keep the left silent shaft in place. The suitable tool should have a shaft diameter of 0.3 in. (8mm) and a shaft length of at least 2.4 in. (60mm).
- Remove the bolt holding the oil pump sprocket and remove the sprocket.
- Loosen the mounting bolt for the right silent shaft sprocket until it can be turned with your fingers. Do not remove it.
- Remove the tensioner for the silent shaft belt (tensioner B).
- Remove the silent shaft belt (timing belt B). Remove the crankshaft pulley for the silent shaft belt if so desired.

WARNING

After the timing belt has been removed, do not attempt to loosen the silent shaft bolt by holding the sprocket with pliers. If the sprocket is to be removed, hold the pulley with your fingers.

These engines have two timing be

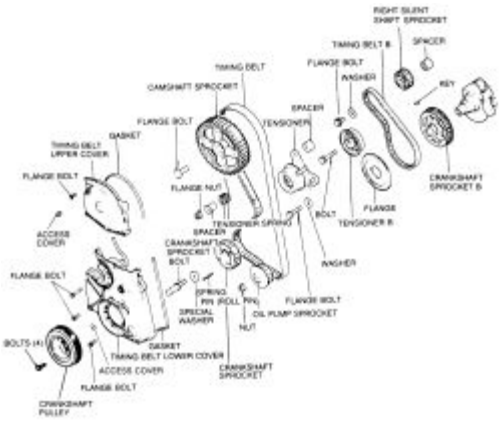

Fig. 1: Timing belt and components-2.0L engine

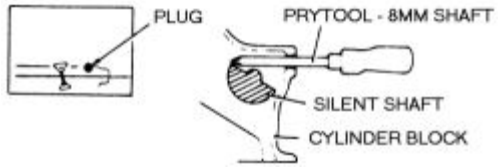

Fig. 2: Correct placement of the tool to block the left silent shaft

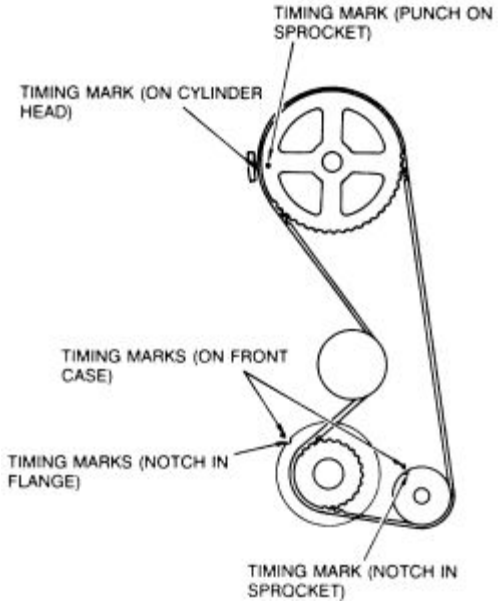

Fig. 3: Location and correct alignment of timing marks for the timing belt (camshaft)

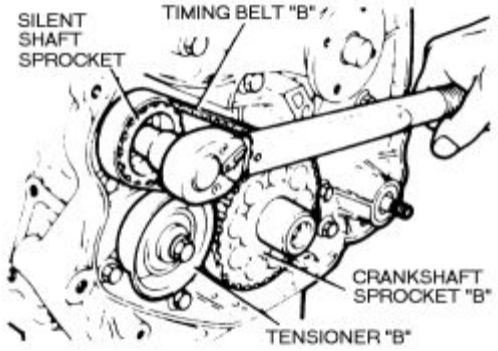

Fig. 4: Location of components for silent shaft belt (timing belt B)

These engines have two timing be

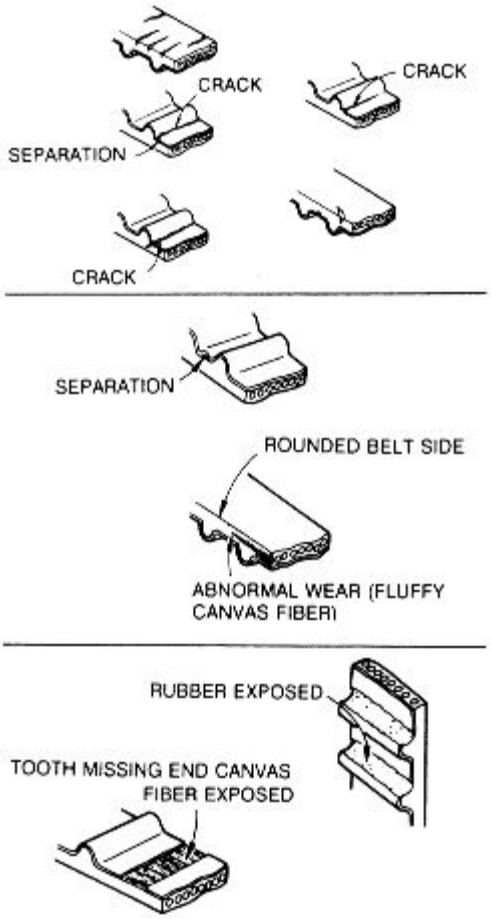

Fig. 5: Common timing belt faults-replace the belt if any of these conditions exist

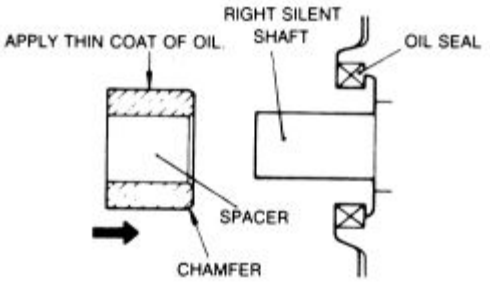

Fig. 6: Install spacer on the right silent shaft correctly

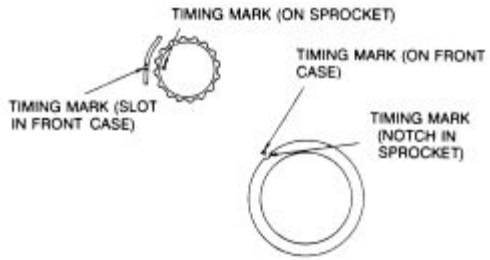

Fig. 7: Align the timing marks before installing the silent shaft

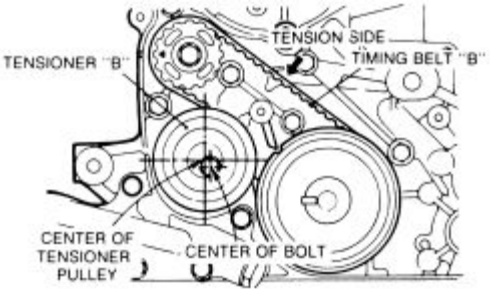

Fig. 8: Correct installation of tensioner B for the silent shaft belt-the center of the pulley is

These engines have two timing be

offset to the left of the bolt

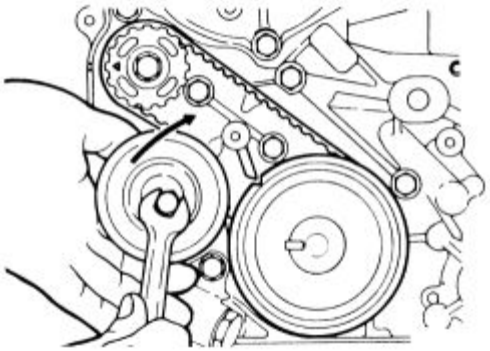

Fig. 9: Hold the tensioner while tightening the bolt

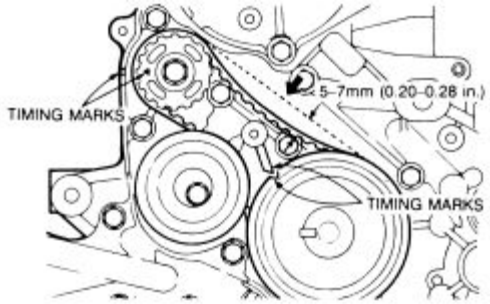

Fig. 10: Check the silent shaft belt for the proper deflection

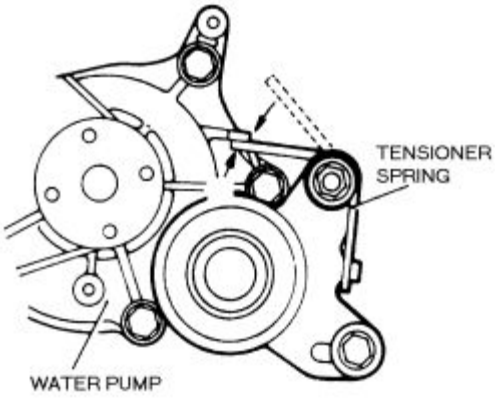

Fig. 11: Install the lower end of the tensioner spring first, then attach to the water pump

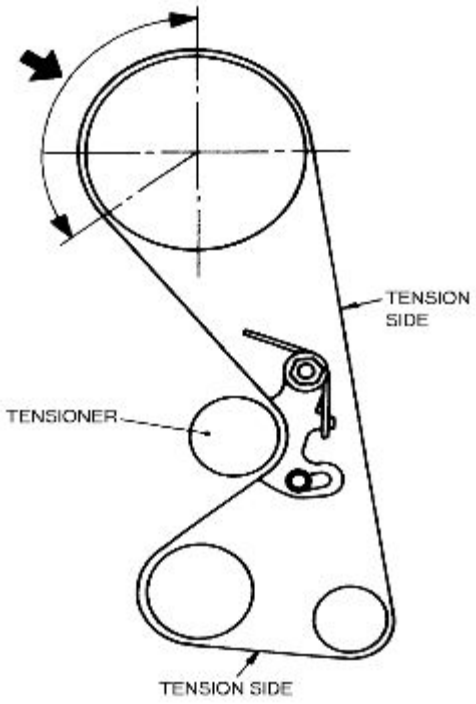

Fig. 12: Check the cam

sprocket in the area shown for any sign of the timing belt lifting after it is tensioned

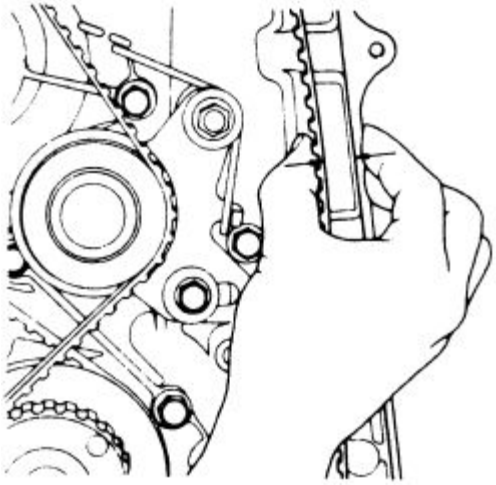

Fig. 13: The pinch test for checking timing belt deflection-refer to the service procedure

- Inspect the timing belts in detail for any flaw or wear. If the belt is not virtually perfect, replace it. A case can be made for replacing the belt every time it is removed, particularly on high-mileage engines. Some of the conditions to look for are:
  - Hardened back surface; non-elastic and glossy; hard to mark with a fingernail.
  - Cracking on back of belt, bottom of teeth or side of belt.
  - Missing teeth or teeth lifting from belt.
  - Side of belt worn or fuzzy. Normal belt should have clean sides as if cut with a sharp knife.
  - Wear on teeth as shown by distinct color change or worn rubber.
  - Separation of inner coating from backing.
  - Any uneven wear patterns on the teeth of the belt. Wear pattern should be even across each tooth and not differ from one tooth to another.
- Check the sprockets and tensioner for wear. The sprocket teeth should be well defined, not rounded and the valleys between the teeth should be clean. The tensioners should spin freely with no binding or unusual noise. Replace the tensioner if there is any sign of grease leaking from the seal. Clean everything with a clean, dry cloth.

WARNING

Do not spray or immerse the sprockets or tensioners in cleaning solvent. The sprocket may absorb the solvent and transfer it to the belt. The tensioners are internally lubricated and the solvent will dilute or dissolve the lubricant.

To install:

- Install the sprocket for the silent shaft belt onto the crankshaft. Make certain it is installed correctly.
- If the sprocket for the right silent shaft was removed, coat the spacer with a light coating of clean engine oil and install the spacer to the shaft. Be sure to install it in the correct direction. Install the silent shaft sprocket and tighten the bolt finger-tight.
- Double check the timing marks on the silent shaft sprocket and crankshaft sprocket. Carefully align the marks if necessary.
- Install the silent shaft belt, observing the direction of rotation mark made earlier. Handle the belt carefully and do not use metal tools to guide or force the belt into place. When installing the belt, make sure the tension side (opposite from the tensioner) has no slack in it.
- Install the tensioner (B) with the center of the pulley located to the left side of the mounting bolt and with the pulley flange to

the front of the engine.

- Lift the tensioner with your hand so that the belt becomes taut. Hold the tensioner in this position and tighten its bolt. Use care that only the bolt and not the tensioner shaft is turned during tightening. The bolt should be tightened to 13 ft. lbs. (18 Nm).
- Tighten the right silent shaft bolt to 26 ft. lbs. (35 Nm).
- Check that the timing marks are still aligned. Push down on the center of the tension side of the belt with your finger. Correct belt deflection is 0.25 in. (5-7mm). If the deflection is not correct, the tensioner must be released fully and the belt re-tensioned.
- Install the flange and the crankshaft sprocket onto the crankshaft. Make certain the flange is installed in the correct direction. If it is put on incorrectly, the belt will wear and break.
- Install the special washer and the sprocket retaining bolt to the crankshaft. Tighten the bolt to 88 ft. lbs. (119 Nm).
- Install the camshaft sprocket to the camshaft and tighten the bolts to 66 ft. lbs. (89 Nm).
- Install the spacer, tensioner and tensioner spring if they were removed. Install the lower end of the spring to its position on the tensioner, then place the upper end in position at the water pump. Move the tensioner towards the water pump and temporarily tighten it in this position.
- Install the oil pump sprocket, tightening the nut to 40 ft. lbs. (54 Nm). Remember that the oil pump drives the left silent shaft, which is still blocked by the tool. Hold the sprocket by hand when tightening the nut.
- Double check the alignment of the timing marks for the cam, crank and oil pump sprockets. If any adjustment is needed to the oil pump sprocket, remove the tool blocking the silent shaft before adjusting the sprocket. Once everything is aligned, replace the tool in the left side of the block and leave it there until installation of the timing belt is complete.
  If the tool can only be inserted about 1 in. (25mm) or less, the shaft is out of position. Turn the oil pump sprocket through one full turn clockwise; the screwdriver should then go in about 2.5 in. (63mm).
- Install the timing belt onto the crankshaft sprocket, the oil pump sprocket and the cam sprocket in that order. Keep the belt taut between sprockets. If reusing an old belt, make certain that the direction of rotation arrow is properly oriented.
- Loosen the tensioner mounting nut and bolt. The spring will move the tensioner against the belt and tension it.
- Check the belt as it passes over the camshaft sprocket. The belt may tend to lift in the area to the left of the sprocket. (Roughly 7 o'clock to 12 o'clock when viewed from the pulley end.) Make certain the belt is well seated and not rubbing on any flanges or nearby surfaces.
- At the tensioner, tighten the bolt in the slotted hole first, then tighten the nut on the pivot. If this order is not followed, the belt will become too tight and break.
- Once again, check all the timing marks for alignment. Nothing should have changed; check anyway.
- Remove the tool blocking the left side silent shaft. Using a socket on the crankshaft bolt, turn the crankshaft smoothly one full turn (360°). Do NOT turn the engine backwards.
- Loosen the tensioner nut and bolt. The spring will allow the tensioner to tighten a little bit more because of the slack picked up during engine rotation. Tighten the bolt, then the nut to 36 ft. lbs. (49 Nm).

- Check the deflection of the belt. At the middle of the right (tension) side of the belt, deflect the belt outward with your finger, toward the timing case. The distance between the belt and the line of the cover seal should be about 0.5 in. (14mm).
- Install the lower and upper timing belt covers. Make certain the gaskets are properly seated in the covers and that they don't come loose during installation.
- Install the crankshaft pulley.
- Install the water pump pulley, tightening the bolts and install the belt. Adjust the belt to the correct tension.
- Connect the negative battery cable. Start the engine and let it idle, listening for any unusual noises from the area of the timing belt. Possible causes of noise are the belt rubbing against the covers or a sprocket flange, the belt being too loose and slapping, or a tensioner binding. Do not accelerate the engine if abnormal noises are heard from the timing belt assembly-severe damage can result.