

SUZUKI

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1.3L Engine

TIMING BELT REPLACE

Samurai

With the timing belt removed, avoid turning the camshaft or crankshaft. If movement is required, exercise extreme caution to avoid valve damage caused by piston contact.

1. Disconnect and isolate the battery ground cable.
2. Loosen the fan drive belt and remove the bolts securing the radiator fan shroud and the cooling fan.
3. Remove the shroud and fan.
4. Remove the accessory drive belts and the water pump pulley.
5. Remove the crankshaft pulley attaching bolts and the pulley, **Fig. 1**. It is not required to remove the crankshaft pulley center bolt.
6. Remove the timing belt cover.
7. Loosen the tensioner nut and bolt, **Fig. 2**, then remove the timing belt.
8. Remove the valve cover, then loosen all the valve adjusting screws all the way to allow free camshaft rotation.
9. **On models built before June 1993**, rotate the camshaft sprocket clockwise and align the timing mark on the camshaft sprocket with the V mark on the belt inside cover, **Fig. 3**.
10. **On models built since June 1993**, rotate the camshaft sprocket clockwise and align the timing mark, **Fig. 4**. **When properly installed, the camshaft pulley pin (7) should engage the camshaft sprocket slot No. 1. The camshaft sprocket timing mark visible above the "80°C" should align with the V mark on the cylinder head cover.**
11. **On all models**, rotate the crankshaft clockwise using a 17 mm wrench on the crankshaft timing belt pulley bolt, **Fig. 5**, and align the punch mark on the timing belt pulley with the oil pump arrow mark, **Fig. 6**.
12. With all the timing marks aligned, install the new timing belt so the belt drive side is free from any slack with the tensioner plate pushed up by finger, **Fig. 7**. **When installing the timing belt, match any arrow on the timing belt with the rotating direction of crankshaft.**
13. Rotate the crankshaft two complete revolutions to allow the belt to be free of any slack, then tighten the tensioner and tensioner bolt to specifications, **Fig. 7**.
14. Install the timing belt cover.
15. Install the crankshaft pulley bolts, **Fig. 1**.
16. Install the water pump pulley and the accessory drive belts, then connect the battery ground cable. **Refer to last page for proper belt tension.**
17. Adjust the valve lash as follows:
 - a. Remove the air cleaner assembly, then the valve cover.
 - b. Rotate the crankshaft to position the cam lobe and the rocker arm, **Fig. 8**.
 - c. Measure the clearance at gap (A) using a suitable feeler gauge. Clearance should be as indicated in **Fig. 8**.
 - d. If the clearance is not as specified, adjust by turning the adjusting screw until the proper clearance is obtained, **Fig. 8**.

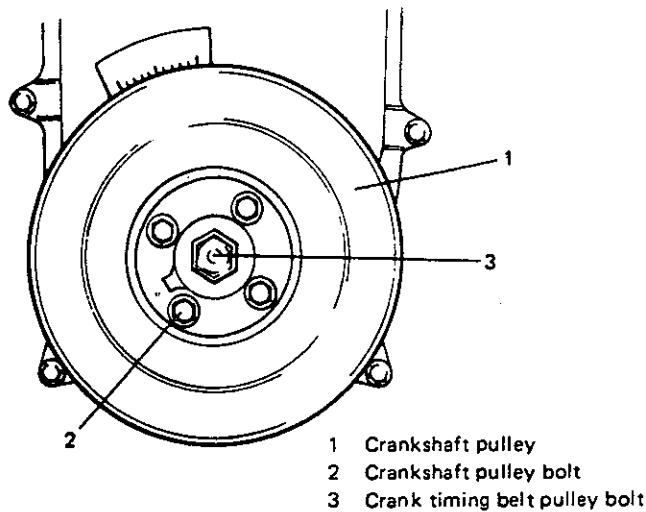
- e. After adjustment, torque the screw locknuts to 11–14 ft. lbs.
- f. Install the valve cover.
- g. Install the air cleaner assembly.

Swift

SOHC

With the timing belt removed, avoid turning the camshaft or crankshaft. If movement is required, exercise extreme caution to avoid valve damage caused by piston contact.

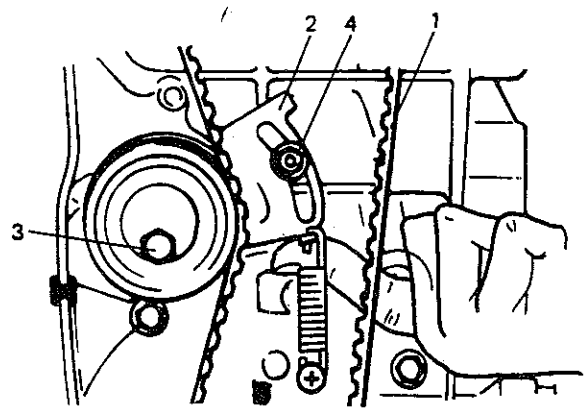
1. Disconnect and isolate the battery ground cable. On models equipped with an air bag, wait 1½ minutes after disconnecting the battery ground cable before proceeding with procedure.
2. Raise and safely support the vehicle with jackstands
3. Remove the righthand side fender apron extension. Do not push the center pin in too far. It might fall into the fender.
4. Remove the accessory drive belts and the water pump pulley.
5. Remove the crankshaft pulley as follows:
 - a. Lock the crankshaft to loosen the crankshaft timing belt sprocket bolt and the crankshaft pulley bolts, **Figs. 9 and 10**. Remove the crankshaft timing belt pulley bolt.
 - b. Remove the crankshaft pulley bolts and the timing belt pulley bolt using a 17 mm socket.
6. Remove the resonator and timing belt outer cover.
7. Loosen the tensioner bolt and stud, then push the tensioner plate fully upward and remove the timing belt from the sprockets.
8. Prior to installation, ensure the tensioner rotates smoothly.
9. Install the tensioner plate on the tensioner. The tensioner plate lug must fit in the tensioner hole.
10. Install the tensioner assembly. Hand tighten the tensioner bolt only at this time. Plate movement in the upward direction should cause the tensioner to move in the same direction.
11. **On 1989–93 models**, remove the cylinder head cover, then completely loosen all the intake and exhaust valve rocker arm adjusting screws and locknuts.
12. **On all models**, rotate the camshaft sprocket clockwise until the pulley marks align with the V mark on the belt inside cover, **Figs. 3 and 4**.
13. Turn the crankshaft timing belt pulley bolt clockwise until the sprocket punch mark aligns with the oil pump case arrow mark, **Fig. 6**.
14. Install the new timing belt on the sprockets with the belt drive side free of any slack and with the tensioner plate pushed up by finger. **Match the arrow mark on the timing belt with the rotating direction of the crankshaft (clockwise). In this position, the No. 4 piston is at TDC compression stroke.**
15. Turn the crankshaft two rotations clockwise after installing the belt to take up the slack of belt. Ensure all the sprocket marks are properly aligned.
16. Tighten the tensioner stud, then the tensioner bolt.
17. Ensure the seal is between the water pump and the oil pump case, then install the timing belt outside cover.
18. Remove the crankshaft timing belt pulley bolt, then install the crankshaft pulley. Torque the inner bolt to 94 ft. lbs., and the



1 Crankshaft pulley
2 Crankshaft pulley bolt
3 Crank timing belt pulley bolt

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Fig. 1 Crankshaft pulley and retaining bolt



1 Timing belt
2 Tensioner plate
3 Tensioner bolt
4 Tensioner stud

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Fig. 2 Releasing timing belt tensioner

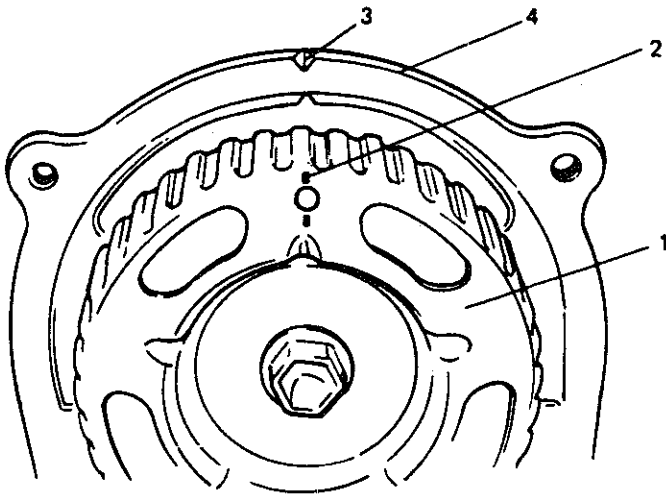
- outer bolts to 11–13 ft. lbs.
19. Install the water pump pulley and the accessory drive belts. **Refer to last page for proper belt tension.**
 20. **On 1989–93 models**, adjust the valve lash as follows:
 - a. Rotate the crankshaft to position the cam lobe and the rocker arm, **Fig. 8**.
 - b. Measure the clearance at gap (A) using a suitable feeler gauge, which should be as noted in **Fig. 8**.
 - c. If the clearance is not as specified, adjust by turning the adjusting screw until the proper clearance is obtained, **Fig. 8**.
 - d. After adjustment, torque the screw locknuts to 11–14 ft. lbs.
 - e. Install the valve cover and torque the bolts to 36–42 inch lbs.
 - f. Install the air cleaner assembly.
 21. **On all models**, install the water pump pulley and the drive belt.
 22. Install the righthand side fender apron extension, then connect the battery ground cable.
 23. Start the engine and ensure it operates properly.

DOHC

With the timing belt removed, avoid turning the camshaft or crankshaft. If movement is required, exercise extreme caution to avoid valve damage caused by piston contact.

1. Disconnect and isolate the battery ground cable. On models equipped with an air bag, wait 1½ minutes after disconnecting the battery ground cable before proceeding with procedure.
2. Remove the air cleaner assembly with the air flow meter and outlet hose, then the air cleaner bracket.
3. Raise and support the vehicle on jackstands.
4. Remove the righthand side fender apron extension. Do not push center the pin in too far. It may fall into the fender.
5. Remove the accessory drive belts and the water pump pulley.
6. Remove the crankshaft pulley as follows:
 - a. Lock the crankshaft to loosen the crankshaft timing belt pulley bolt and the crankshaft pulley bolts, **Figs. 9 and 10**. Remove the crankshaft timing belt pulley bolt.
 - b. Remove the crankshaft pulley bolts using a 5 mm hexagon socket.
 - c. Remove the crankshaft timing belt pulley bolt using a 17 mm socket.
7. Remove the timing belt upper and lower outside covers. It may be required to loosen the engine righthand side mounting bolt and pushing the air cleaner bracket to the right.

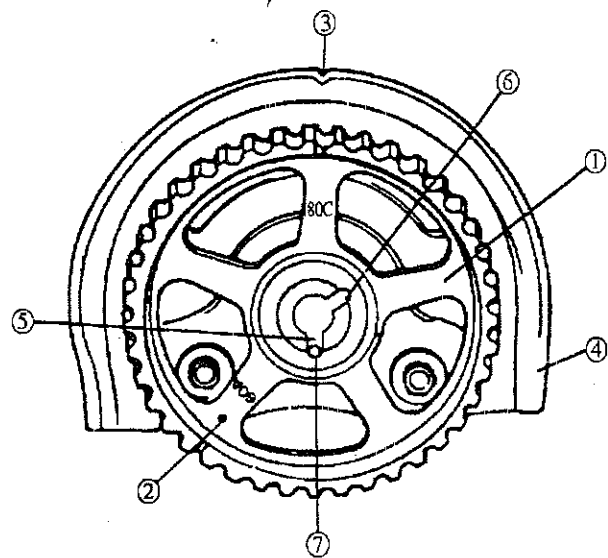
8. For installation of the timing belt, ensure that the camshaft timing belt sprocket and the crankshaft timing belt sprocket are properly aligned, **Fig. 11**.
9. Remove the timing belt as follows:
 - a. Loosen the tensioner stud and bolt.
 - b. Remove the tensioner spring and damper, then the timing belt. **Once the timing belt is removed, never turn the camshafts (1) or the crankshaft (2) independently more than, Fig. 12, or internal engine damage may occur.**
10. Prior to installation, ensure that the tensioner rotates smoothly.
11. Ensure the lug of the tensioner plate fits in the hole of the tensioner.
12. Hand tighten the tensioner bolt only at this time. Plate movement in the upward direction should cause the tensioner to move in the same direction.
13. Ensure that the camshaft timing belt sprocket punch marks align with the marks on the cylinder head. **Do not turn each pulley beyond the range specified in Fig. 12. If the sprockets do not stop in place due to counterforce of the valve spring, hold the sprockets in place using bolts, Fig. 13.**
14. Ensure that the crankshaft timing belt sprocket punch mark aligns with the arrow mark on the oil pump case. **Do not turn the sprocket beyond range specified in Fig. 13.**
15. Install the timing belt on the sprockets with the drive side of the belt free from any slack. **Match any arrow mark on the timing belt with the rotating direction of the crankshaft (clockwise).**
16. Install the tensioner spring and the spring damper. Hand tighten the tensioner stud.
17. Turn the crankshaft two rotations clockwise after installing the belt to take up the slack of the belt. Ensure all the sprocket marks are properly aligned.
18. Torque the tensioner stud to 84–108 inch lbs. Torque the tensioner bolt to 18–22 ft. lbs.
19. Ensure that the seal is between the water pump and the oil pump case, then install the timing belt outside covers. Torque the cover bolts and nuts to 84–108 inch lbs.
20. Remove the crankshaft pulley bolt, then install the crankshaft pulley. Torque the inner bolt to 94 ft. lbs. Torque the outer bolts to 11–13 ft. lbs.
21. Install the water pump pulley and the accessory drive belts. **Refer to last page for proper belt tension.**
22. Install the air cleaner bracket, then the air cleaner assembly.
23. Install the righthand side fender apron extension, then connect the battery ground cable.



- 1. Camshaft timing pulley
- 2. Timing mark
- 3. "V" mark
- 4. Belt inside cover

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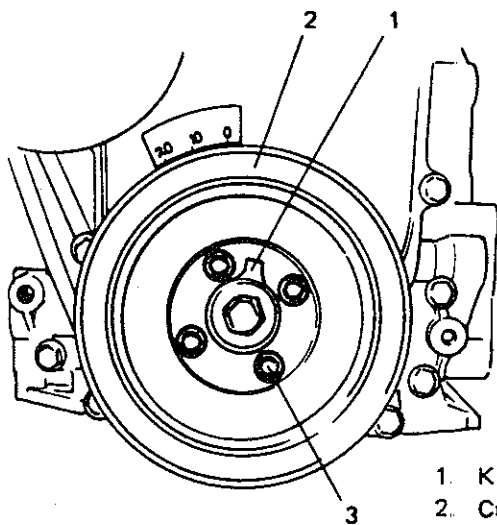
Fig. 3 Camshaft sprocket timing mark. 1.3L SOHC engine. Models built before June 1993



- 1 Camshaft Timing Pulley
- 2 Timing mark
- 3 "V" mark
- 4. Belt inside cover
- 5. Slot No. 1
- 6. Slot No. 2
- 7. Pulley Pin

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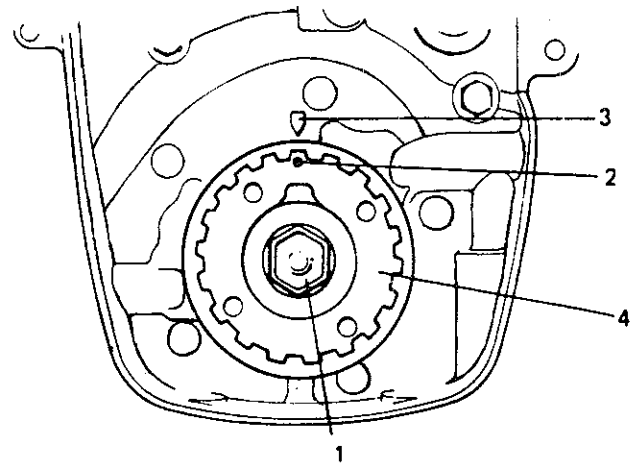
Fig. 4 Camshaft sprocket timing mark. 1.3L SOHC engine. Models built since June 1993



- 1. Key
- 2. Crankshaft pulley
- 3. Pulley bolt

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Fig. 5 Crankshaft pulley timing mark. 1.3L SOHC engine



- 1 Crankshaft timing belt pulley bolt
- 2 Punch mark
- 3 Arrow mark
- 4. Crankshaft timing belt pulley

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Fig. 6 Crankshaft sprocket timing mark. 1.3L SOHC engine

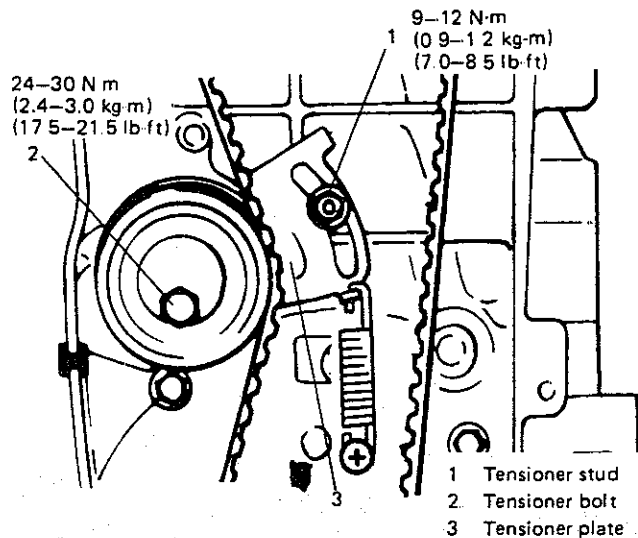


Fig. 7 Timing tensioner torque specifications. 1.3L SOHC engine

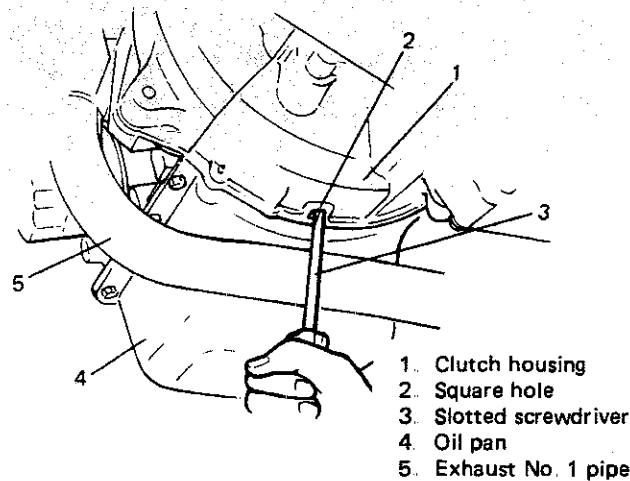


Fig. 9 Positioning screwdriver through clutch housing bore. Manual transaxle

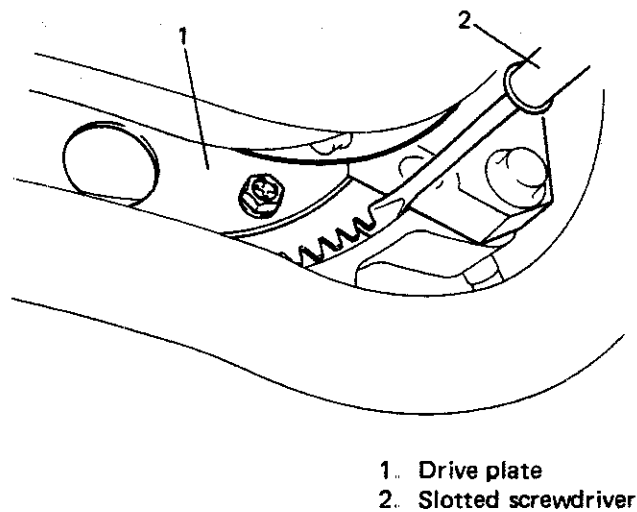


Fig. 10 Locking flexplate in position. Automatic transaxle

Valve lash (gap A) specification		When cold (Coolant temperature is 15 - 25°C or 59 - 77°F)	When hot (Coolant temperature is 60 - 68°C or 140 - 154°F)
		Intake	0.13 - 0.17 mm (0.0051 - 0.0067 in)
Exhaust		0.16 - 0.20 mm (0.0063 - 0.0079 in)	0.26 - 0.30 mm (0.0102 - 0.0118 in)

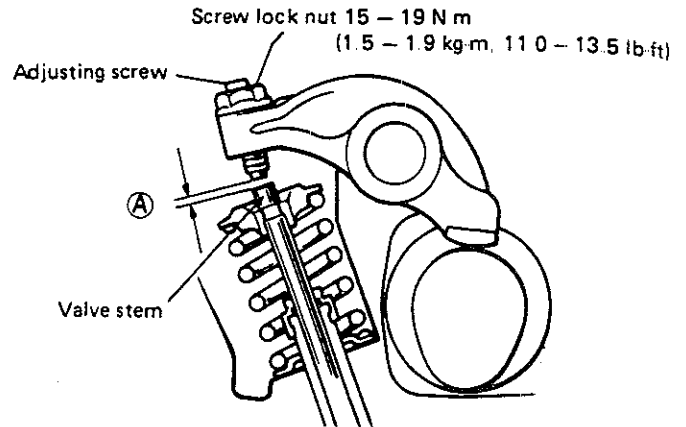
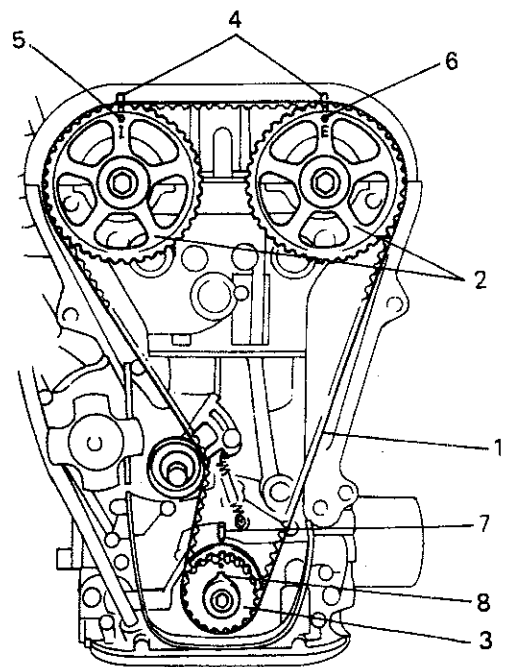
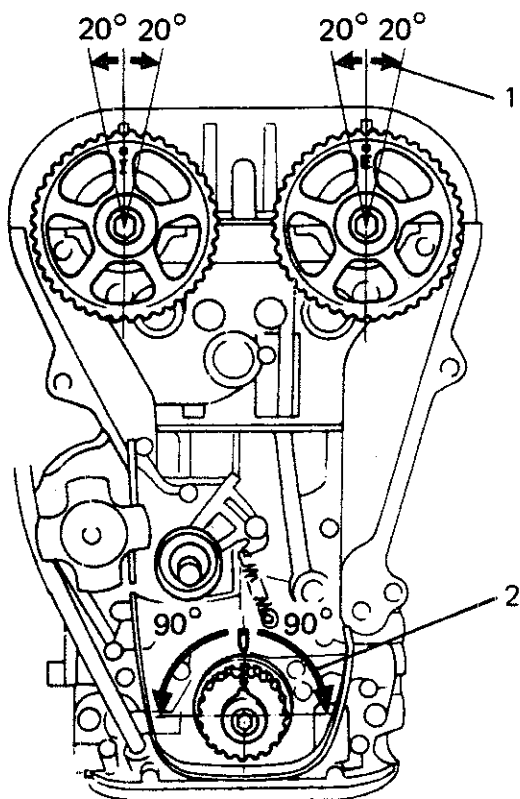


Fig. 8 Valve lash adjustment. 1994 & earlier 1.3L SOHC engine



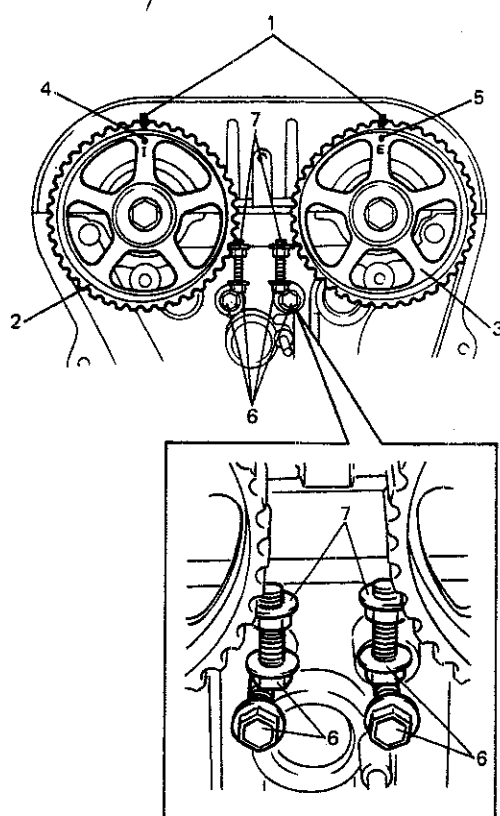
- 1. Timing belt
- 2. Camshaft timing belt pulleys
- 3. Crankshaft timing belt pulley
- 4. Marks on cylinder head cover
- 5. Punch mark by "I" (intake side)
- 6. Punch mark by "E" (exhaust side)
- 7. Mark on oil pump case
- 8. Key on crankshaft

Fig. 11 Camshaft & crankshaft sprocket timing marks. 1.3L DOHC engine



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Fig. 12 Sprocket movement limits. 1.3L DOHC engine



- 1. Mark on cylinder head cover
- 2. Intake side camshaft timing belt pulley
- 3. Exhaust side camshaft timing belt pulley
- 4. Punch mark at "I" mark
- 5. Punch mark at "E" mark
- 6. Bolts (M8)
- 7. Flanged nuts (M8)

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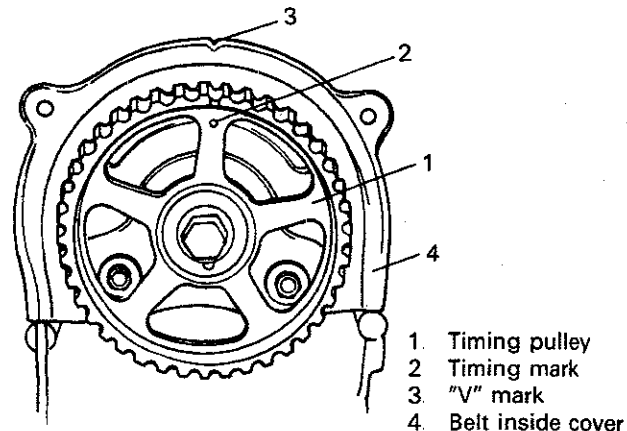
Fig. 13 Holding camshaft sprockets in position. 1.3L DOHC engine

1.6L Engine

TIMING BELT REPLACE

8 Valve Engine

1. Disconnect and isolate the battery ground cable. On models equipped with an air bag, wait 1½ minutes after disconnecting the battery ground cable before proceeding with procedure.
2. Remove the coolant reservoir tank, cooling fan and fan shroud.
3. **On models equipped with A/C**, recover the A/C system refrigerant into an approved container, then remove the compressor flexible suction hose from the suction pipe.
4. **On all models**, remove the accessory drive belts.
5. Remove the water pump and crankshaft pulleys, then the timing belt outer cover.
6. Remove the timing belt tensioner spring and stud, then loosen the tensioner bolt.
7. Remove the timing belt by pushing up the tensioner pulley by hand.
8. Remove the tensioner and tensioner plate.
9. Prior to installation, inspect the tensioner for smooth rotation, then insert the tensioner plate lock tab into the tensioner lock tab slot.
10. Install the tensioner assembly. Hand tighten the tensioner bolt only at this time. Plate movement in the upward direction should cause the tensioner to move in same direction.
11. Remove the cylinder head cover, then loosen all the valve lash adjusting screws and locknuts.
12. Turn the camshaft pulley clockwise and align the timing mark on the camshaft sprocket with the V mark on the inner belt cover, **Fig. 1**.
13. Turn the crankshaft clockwise and align the punch mark on the crankshaft with the arrow on oil pump, **Fig. 2**.
14. Install the new timing belt so there is no slack on the drive side of the belt, **Fig. 3**. **With the installation of the timing belt, ensure that the arrow mark on the belt matches the rotation of the crankshaft. At this point, No. 4 piston is at TDC of the compression stroke.**
15. Hook the tensioner spring to the tensioner plate and bolt, then hand tighten the tensioner stud.
16. Remove the slack in the timing belt by turning the crankshaft two full rotations clockwise after belt installation.
17. Torque the tensioner stud to 84–108 inch lbs. and the bolt to 18–22 ft. lbs.
18. Install the timing belt outer cover.
19. Install the crankshaft pulley. Torque the bolts to 12 ft. lbs.
20. Install the radiator shroud, water pump pulley, radiator cooling fan and the A/C compressor flexible suction hose.
21. Install the accessory drive belts. **Refer to last page for proper belt tension.**
22. Adjust the valve lash as follows:
 - a. Turn the crankshaft so the V mark on the pulley aligns with the 0 mark calibrated on the timing belt cover.
 - b. Remove the distributor cap to ensure that rotor is pointing to the No. 1 cylinder firing position, **Fig. 4**. No. 1 piston should be at TDC of compression stroke. If the rotor is out of place, rotate the crankshaft clockwise once. With piston at TDC, measure the valve lash of 1, 2, 5 and 7 valves, **Figs. 5 and 6**.
 - c. If the valve lash is out of specification, **Fig. 5**, adjust by turning the adjustment screws, then holding the screw, torque the locknut to 11–14 ft. lbs.
 - d. Rotate the crankshaft one full turn, then adjust the valve lash of valve Nos. 3, 4, 6 and 8 and repeat step c.
 - e. After inspecting all the valves and adjusting, replace the valve cover, distributor cap and the air cleaner.
23. **On models equipped with A/C**, evacuate and charge the A/C system.



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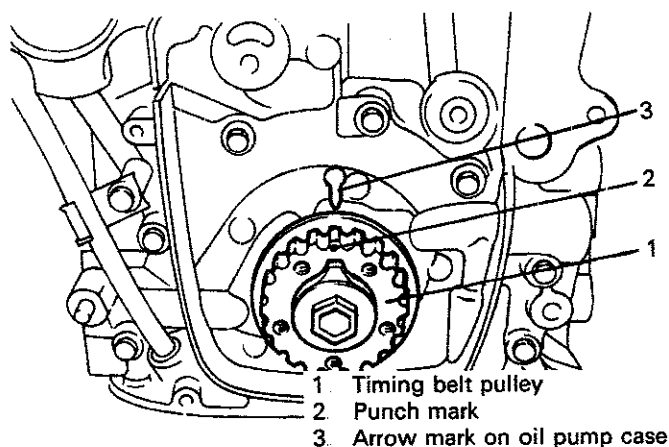
Fig. 1 Camshaft timing mark. 8 valve engine

24. **On all models**, connect the battery ground cable, then inspect the coolant level.

16 Valve Engine

With the timing belt removed, avoid turning the camshaft or crankshaft. If movement is required, exercise extreme caution to avoid valve damage caused by piston contact.

1. Disconnect and isolate the battery ground cable. On models equipped with an air bag, wait 1½ minutes after disconnecting the battery ground cable before proceeding with procedure.
2. **On Esteem and Vitara models**, proceed as follows:
 - a. Remove the righthand side of the engine undercover.
 - b. Remove the A/C compressor, power steering pump and drive belts with the hoses still attached.
 - c. Support the engine by using a suitable lifting device, then remove the air cleaner case with the air cleaner outlet hose.
 - d. Remove the engine righthand mounting bracket and stiffener, **Fig. 7**.
 - e. Remove the water pump pulley and drive belt.
3. **On Sidekick models**, proceed as follows:
 - a. Remove the A/C compressor and power steering pump drive belt.
 - b. Remove the engine cooling fan, water pump pulley and drive belt.
 - c. Remove the fan shroud. **If may be required to disconnect the upper radiator hose to facilitate the fan shroud removal.**
4. **On all models**, remove the crankshaft pulley attaching bolts, then the crankshaft pulley.
5. Remove the timing belt outer cover.
6. Align the crankshaft sprocket and camshaft sprocket timing marks, **Fig. 8**.
7. Remove the timing belt tensioner, tensioner plate and spring.
8. Remove the timing belt.
9. Ensure the crankshaft and camshaft sprocket timing marks are properly aligned, **Fig. 8**. With the timing marks aligned, the No. 4 cylinder is at the TDC position. The camshaft and crankshaft should never be moved beyond 20° in either direction from the TDC position with the timing belt removed.
10. Install the tensioner and the tensioner plate. Position the tensioner in the released position and hand tighten the bolt.
11. Install the new timing belt over the crankshaft and camshaft sprockets and the tensioner pulley. **Ensure the tension side of the timing belt is free of slack during installation.**
12. Install the tensioner spring, then loosen the tensioner bolt and allow the tensioner spring to tension the timing belt. After

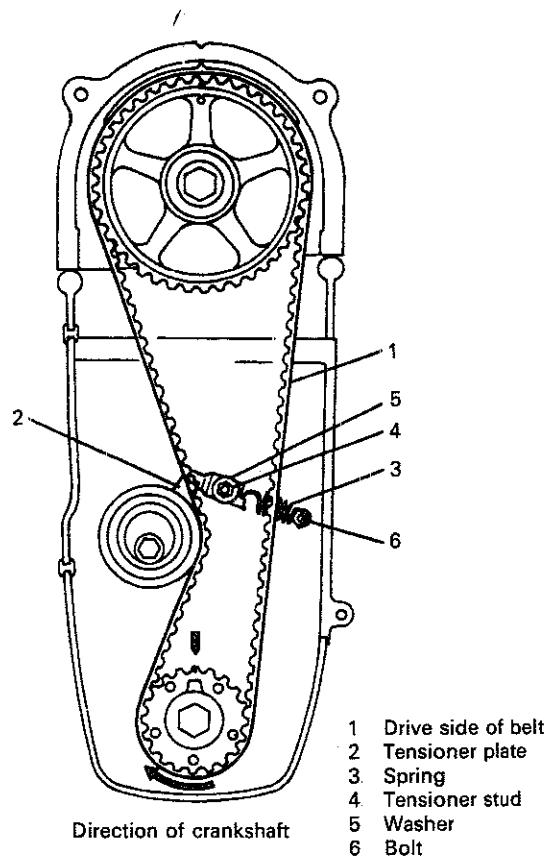


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Fig. 2 Crankshaft timing mark. 8 valve engine

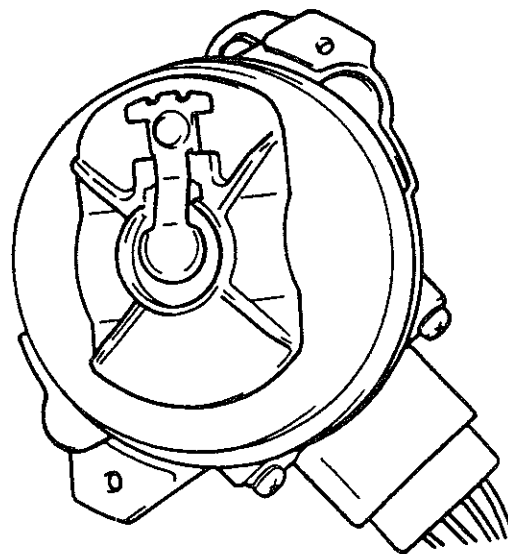
the belt has tensioned, hand tighten the tensioner stud nut.

- 13 Turn the crankshaft two revolutions clockwise. **Ensure the timing belt is free of slack.** Torque the tensioner stud nut to 96 inch lbs. Torque the tensioner bolt to 18 ft. lbs.
- 14 Ensure the crankshaft and camshaft sprocket timing marks are properly aligned, **Fig. 8.**
- 15 Install the timing belt cover. Torque the attaching bolts to 96 inch lbs.
- 16 **On 1995 Esteem models,** install the crankshaft pulley by aligning the key into its slot on the crankshaft sprocket. Torque the attaching bolts to 12 ft. lbs.
- 17 **On 1996–2002 Esteem and Vitar models,** install the crankshaft pulley by aligning the dowel pin into the hole on the crankshaft sprocket. Torque the attaching bolts to 12 ft. lbs.
- 18 **On Sidekick models,** proceed as follows:
 - a. Install the fan shroud. Connect the upper radiator hose and adjust the coolant level as required.
 - b. Install the water pump pulley, engine cooling fan and the drive belt. **Refer to last page for proper belt tension.**
 - c. Install the power steering pump and A/C compressor drive belt. **Refer to last page for proper belt tension.**
- 19 **On Esteem & Vitar models,** proceed as follows:
 - a. Install the water pump pulley and torque the bolts to 96 inch lbs.
 - b. Install the drive belt. **Refer to last page for proper belt tension.**
 - c. Install the engine righthand mounting bracket and stiffener, then torque the bolts to 40 ft. lbs.
 - d. Install the air cleaner case with the air cleaner outer pipe, then remove the lifting device.
 - e. Install the A/C compressor and power steering pump. **Refer to last page for proper belt tension.**
 - f. Adjust the power steering pump belt tension or A/C compressor belt tension. **Refer to last page for proper belt tension.**
- 20 **On all models,** connect the battery ground cable.
- 21 Inspect and adjust the ignition timing as required.



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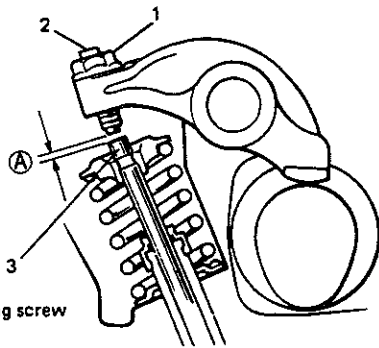
Fig. 3 Timing belt installation. 8 valve engine



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Fig. 4 Distributor rotor position. 8 valve engine

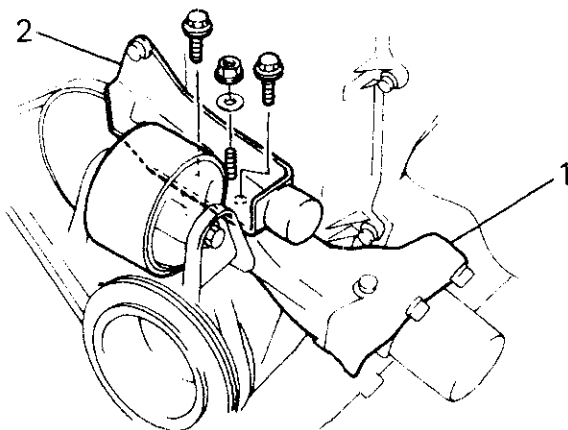
Valve lash (gap A) specification		When cold (Coolant temperature is 15 – 25°C or 59 – 77°F)	When hot (Coolant temperature is 60 – 68°C or 140 – 154°F)
		Intake	0.13 – 0.17 mm (0.0051 – 0.0067 in)
Exhaust		0.15 – 0.19 mm (0.0063 – 0.0075 in)	0.25 – 0.29 mm (0.0102 – 0.0108 in)



1. Adjusting screw lock nut
2. Adjusting screw
3. Valve stem

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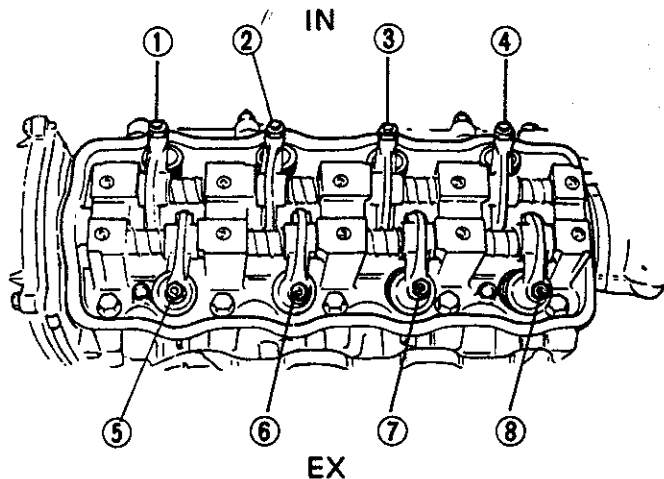
Fig. 5 Valve lash adjustment. 8 valve engine



1. Engine right mounting bracket
2. Engine right mounting bracket stiffener

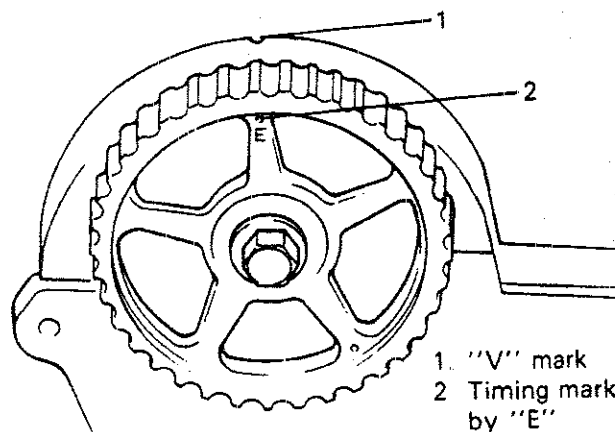
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Fig. 7 Engine mounting bracket & stiffener removal. Esteem & Vitara

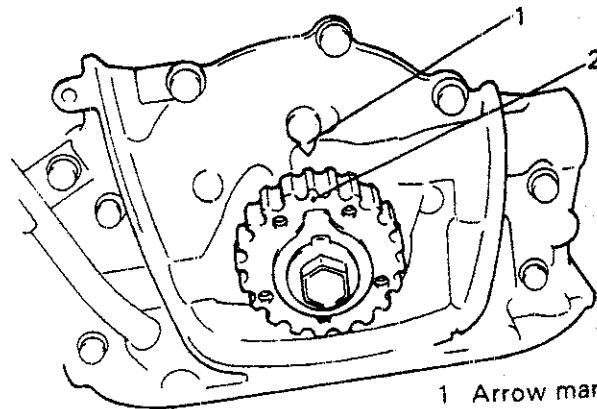


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Fig. 6 Valve identification. 8 valve engine



1. "V" mark
2. Timing mark by "E"



1. Arrow mark
2. Punch mark

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Fig. 8 Crankshaft sprocket & camshaft sprocket timing marks. 16 valve engine

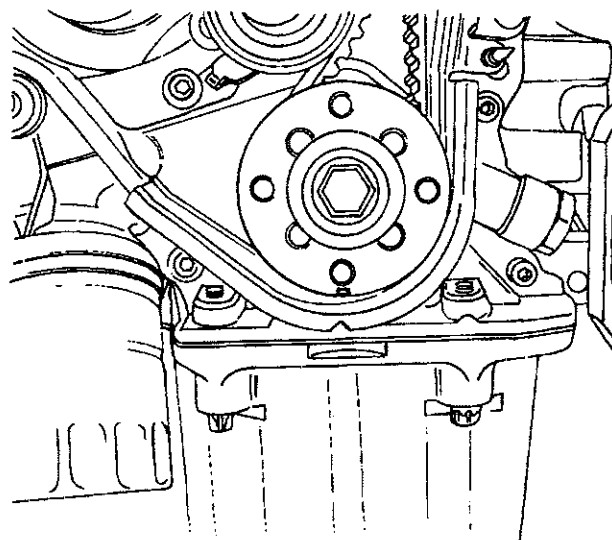
2.0L DOHC Engine

TIMING BELT

REPLACE

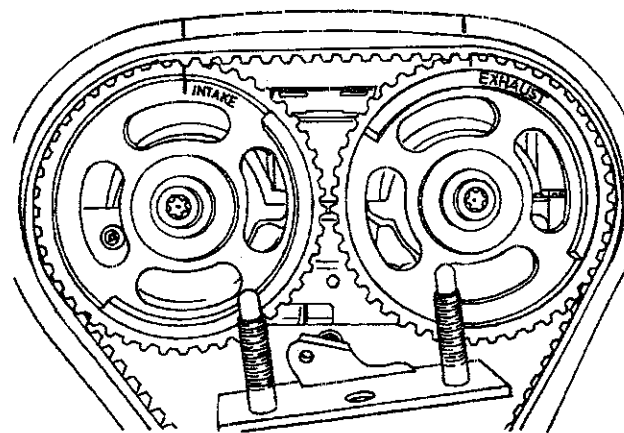
With the timing belt removed, avoid turning the camshaft or crankshaft. If movement is required, exercise extreme caution to avoid valve damage caused by piston contact.

1. Disconnect and isolate the battery ground cable.
2. Disconnect the MAT sensor electrical connector.
3. Disconnect the air outlet hose from the throttle body.
4. Disconnect the breather tube from the valve cover.
5. Remove the air cleaner housing bolts, then the housing.
6. Loosen the righthand front wheel lugnuts.
7. Raise and safely support the vehicle with jackstands.
8. Remove the righthand front tire and wheel.
9. Remove the righthand front wheelwell splash shield.
10. Remove the engine serpentine drive belt.
11. Remove the crankshaft pulley center and outer bolts, then the pulley.
12. Install Suzuki engine support fixture tool No. J-28467-B, or equivalent.
13. Remove the engine righthand mount bracket retaining bolts, then the bracket.
14. Remove the timing belt front cover retaining bolts, then the cover.
15. Install the crankshaft pulley center bolt.
16. Rotate the crankshaft clockwise until the sprocket timing mark aligns with the timing belt lower rear cover notch, **Fig. 1**.
17. Align the camshaft sprocket marks with the valve cover notches, **Fig. 2**.
18. Loosen the automatic tensioner bolt and rotate the hex key tab to relieve the timing belt tension.
19. Remove the timing belt.
20. Ensure the crankshaft and camshaft sprocket timing marks are all still properly aligned.
21. Note any running direction marks, then install the new timing belt.
22. Rotate the automatic tensioner hex key tab clockwise to tension the timing belt. Continue rotating until the pointer aligns with the notch, **Fig. 3**.
23. Install the tensioner bolt. Torque to 18 ft. lbs.
24. Rotate the crankshaft clockwise two full turns and ensure the automatic tensioner pointer has properly aligned.
25. Install the timing belt front cover. Torque the bolts to 53 inch lbs.
26. Install the righthand engine mount bracket. Torque the bolts to 41 ft. lbs.
27. Remove the engine support fixture.
28. Install the crankshaft pulley bolts. Torque to 15 ft. lbs.
29. Install the engine serpentine drive belt.
30. Install the splash shield.
31. Install the tire and wheel, then lower the vehicle.
32. Torque the lugnuts to 74 ft. lbs.
33. Install the air filter housing. Torque the bolts to 89 inch lbs.
34. Connect the air intake tube to the throttle body.
35. Connect the breather tube to the valve cover.
36. Connect the MAT sensor electrical connector.
37. Connect the battery ground cable.
38. Start the engine and ensure it operates properly.



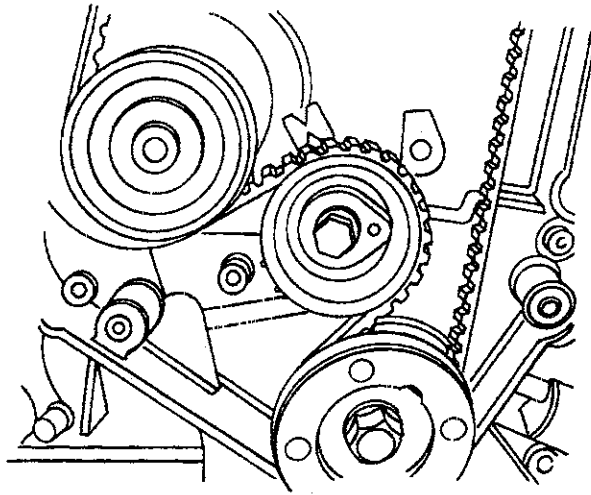
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Fig. 1 Crankshaft sprocket mark alignment



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Fig. 2 Camshaft sprocket mark alignment



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Fig. 3 Automatic tensioner pointer & notch alignment

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