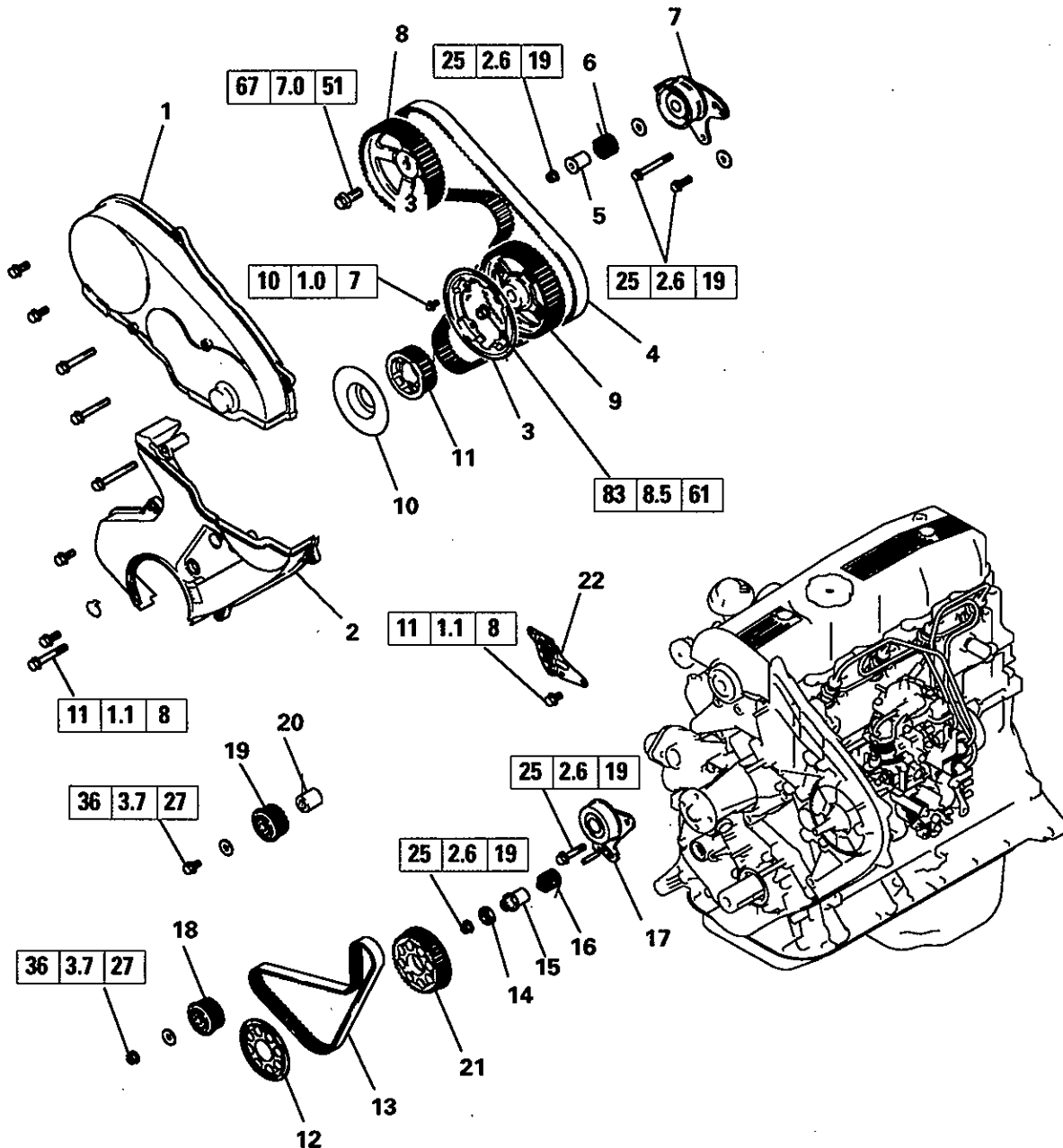


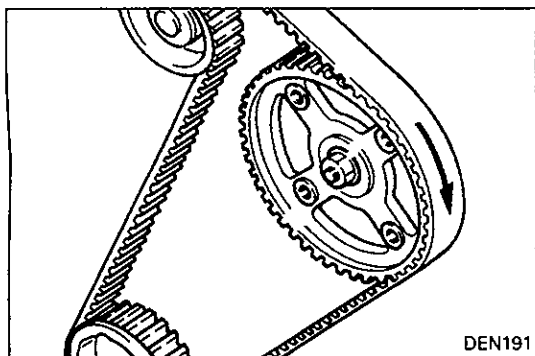
4. TIMING BELT

REMOVAL AND INSTALLATION



Removal steps

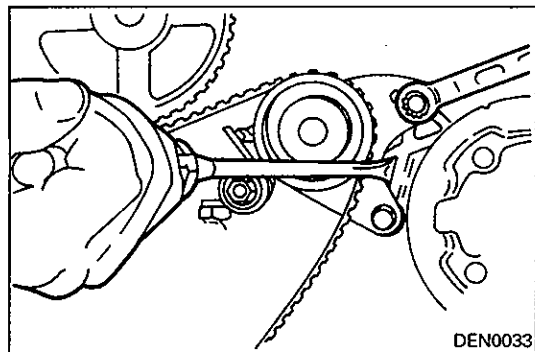
- | | | | |
|---------|---|---------|------------------------------------|
| | 1. Timing belt upper cover | | ▶F◀ 12. Flange |
| | 2. Timing belt lower cover | ◀E▶ ▶E◀ | 13. Timing belt "B" |
| | 3. Flange | | 14. Gasket |
| ◀A▶ ▶J◀ | 4. Timing belt | | 15. Tensioner spacer "B" |
| | 5. Tensioner spacer | | 16. Tensioner spring "B" |
| | 6. Tensioner spring | ▶D◀ | 17. Timing belt tensioner |
| ▶I◀ | 7. Timing belt tensioner | ◀F▶ ▶C◀ | 18. Balancer shaft sprocket, right |
| ◀B▶ ▶H◀ | 8. Camshaft sprocket | ◀G▶ ▶B◀ | 19. Balancer shaft sprocket, left |
| ◀C▶ ▶G◀ | 9. Injection pump sprocket | ▶A◀ | 20. Spacer |
| | 10. Front flange
(2001 model PAJERO) | ◀H▶ | 21. Crankshaft sprocket "B" |
| ◀D▶ | 11. Crankshaft sprocket | | 22. Timing belt rear cover |



SERVICE POINTS OF REMOVAL

◇A◇ TIMING BELT REMOVAL

- (1) Using chalk, etc., mark an arrow on the back of the timing belt to indicate the direction of rotation. This is to ensure correct installation of the belt in case it is reused.

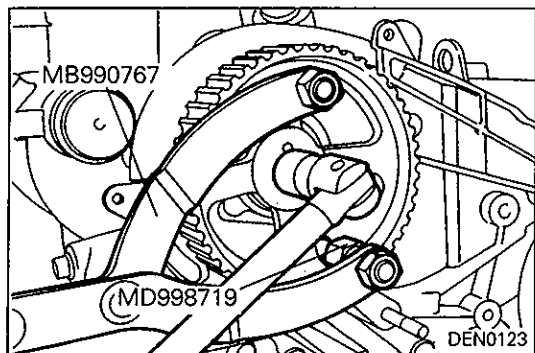


- (2) Push the timing belt tensioner toward the water pump and temporarily tighten the tensioner mounting bolt so that the tensioner cannot return.
- (3) Remove the timing belt.

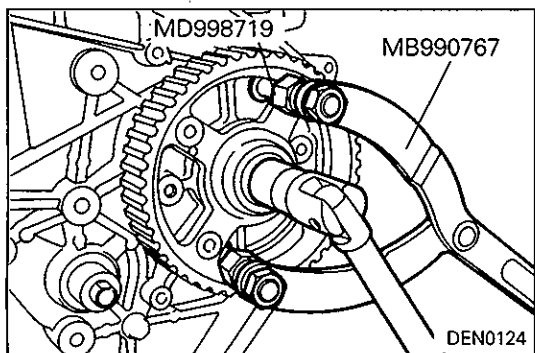
NOTE

- (1) Water or oil on the belt shortens its life drastically, so the removed timing belt, sprocket, and tensioner must be free from oil and water. Do not immerse parts in cleaning solvent.
- (2) If there is oil or water on any part, check front case oil seals, camshaft oil seal and water pump for leaks.

◇B◇ CAMSHAFT SPROCKET REMOVAL

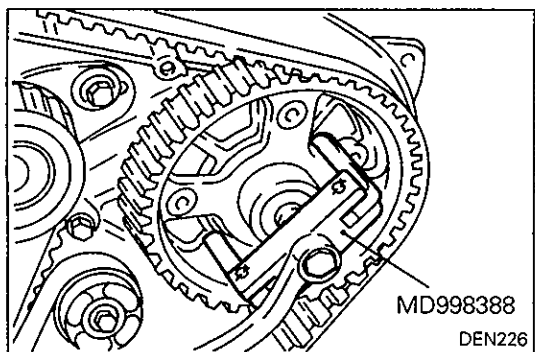


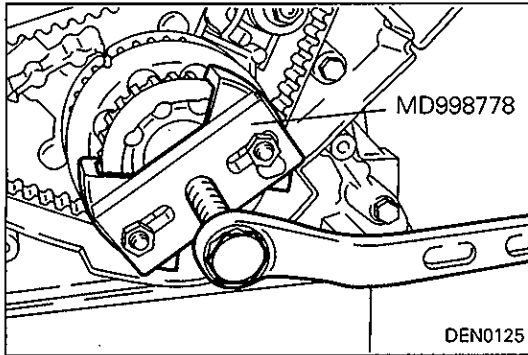
◇C◇ INJECTION PUMP SPROCKET REMOVAL



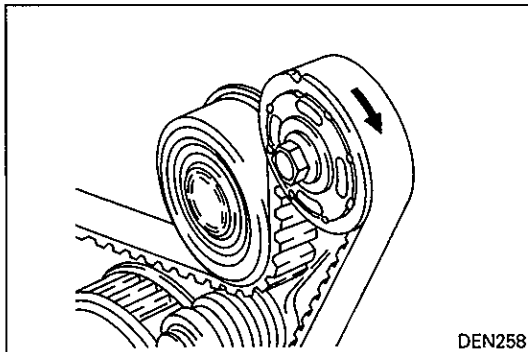
Caution

- **Never strike the shaft or sprocket to remove the sprocket. This may cause malfunction in the injection pump. Be sure to use a puller to remove the sprocket.**





◁D▷ CRANKSHAFT SPROCKET REMOVAL

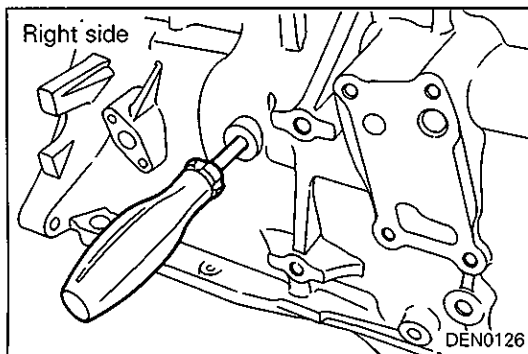


◁E▷ TIMING BELT "B" REMOVAL

- (1) Using chalk, etc., mark an arrow on the back of the timing belt to indicate the direction of rotation. This is to ensure correct installation of the belt in case it is reused.

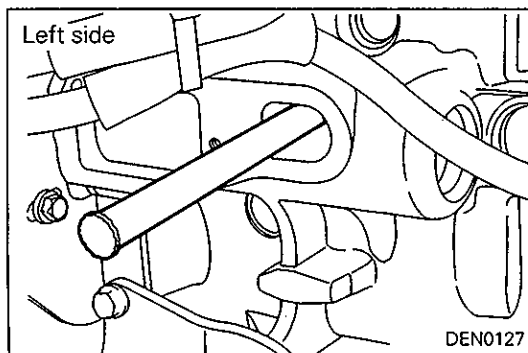
NOTE

- (1) Water or oil on the belt shortens its life drastically, so the removed timing belt, sprocket, and tensioner must be free from oil and water. Do not immerse parts in cleaning solvent.
- (2) If there is oil or water on any part, check front case oil seals, camshaft oil seal and water pump for leaks.



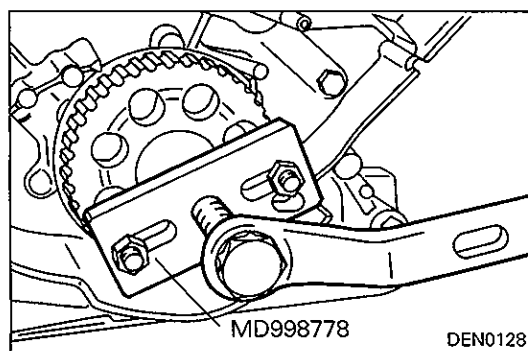
◁F▷ BALANCER SHAFT, RIGHT REMOVAL

- (1) Remove the plug at the right side of the cylinder block.
- (2) Insert a Phillips screwdriver [shank diameter 8 mm (0.32 in.)] through the plug hole and lock the balancer shaft.
- (3) Loosen the balancer shaft sprocket nut.

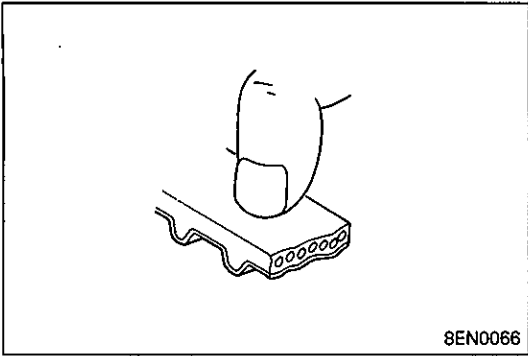


◁G▷ BALANCER SHAFT, LEFT REMOVAL

- (1) Remove the cover at the left side of the cylinder block.
- (2) Insert a wrench extension bar or similar rod and lock the balancer shaft.
- (3) Loosen the balancer shaft sprocket bolt.



◁H▷ CRANKSHAFT SPROCKET "B" REMOVAL

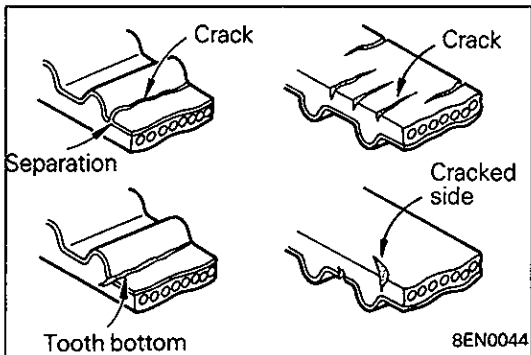


INSPECTION

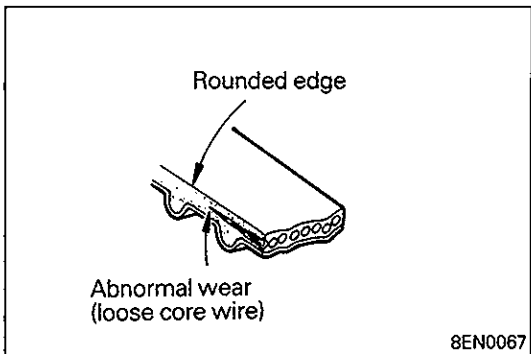
TIMING BELTS

The timing belts must be checked closely. Should the following defects be evident, replace the belt with a new one.

- (1) Hardened back surface rubber
Glossy, non-elastic, and so hard that no mark is produced even when scratched by fingernails.



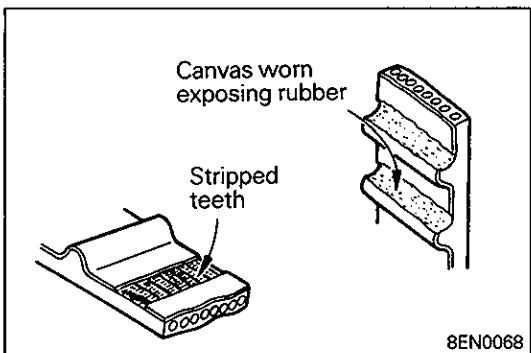
- (2) Cracked back surface rubber
- (3) Cracked or separated canvas
- (4) Cracked tooth bottom
- (5) Cracked side



- (6) Abnormal wear on side

NOTE

Normal belt should have clear-cut sides as if cut by a sharp knife.



- (7) Abnormal wear in teeth

Initial stage:

Canvas on load side tooth flank worn (Fluffy canvas fibers, rubber gone and color changed to white, and unclear canvas texture)

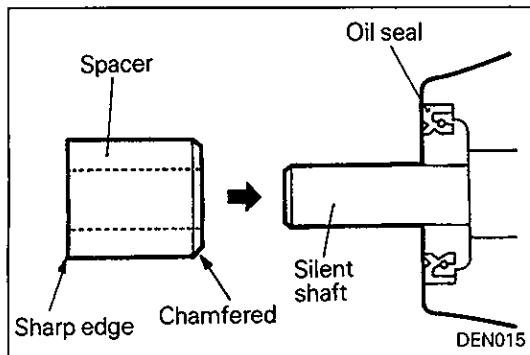
Last stage:

Canvas on load side tooth flank worn down and rubber exposed (tooth width reduced)

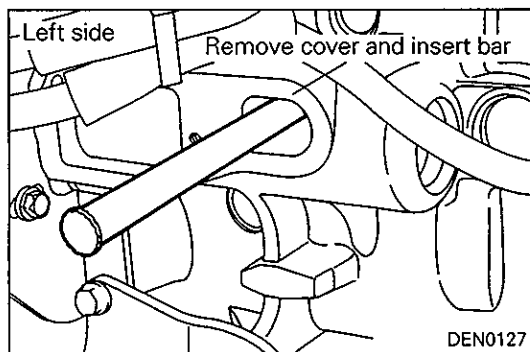
- (8) Missing tooth

TIMING BELT TENSIONER

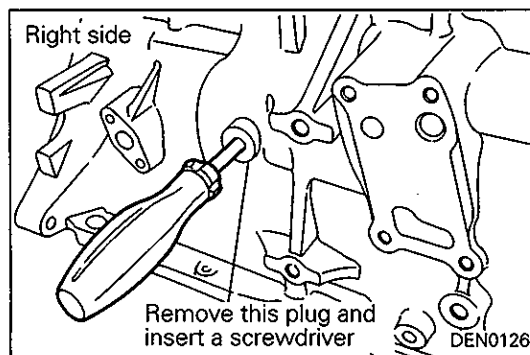
Replace the timing belt tensioner if the pulley rotates unsmoothly, has excessive play, or causes noise.

**INSTALLATION SERVICE POINTS****◆A◆ SPACER INSTALLATION**

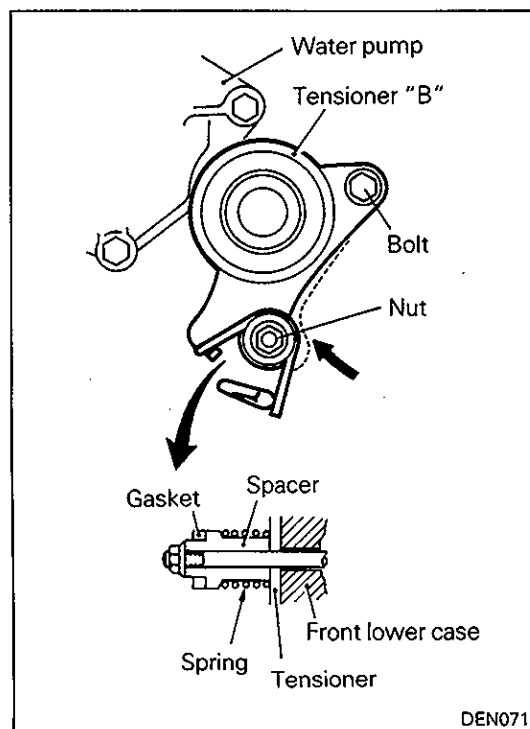
- (1) Install the spacer with its chamfered end toward the oil seal.

**◆B◆ BALANCER SHAFT SPROCKET, LEFT INSTALLATION**

- (1) Lock the balancer shaft in the same way as used in the removal procedure.
- (2) Install the balancer shaft sprocket and tighten the bolt to the specified torque.

**◆C◆ BALANCER SHAFT SPROCKET, RIGHT INSTALLATION**

- (1) Lock the balancer shaft in the same way as used in the removal procedure.
- (2) Install the balancer shaft sprocket and tighten the nut to the specified torque.

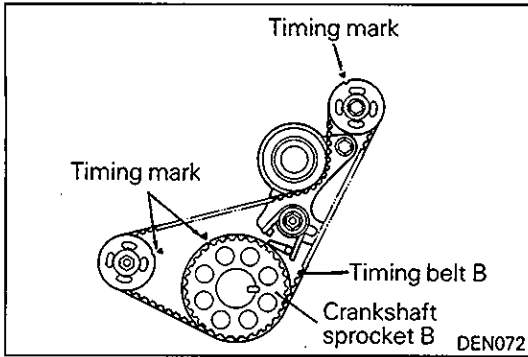
**◆D◆ TIMING BELT TENSIONER "B" INSTALLATION**

- (1) Install the tensioner, tensioner spring and spacer.

NOTE

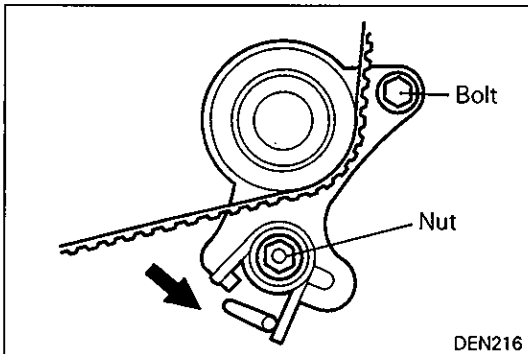
Be sure to install the tensioner spring with its shorter end toward the water pump.

- (2) Move tensioner "B" toward water pump and tighten mounting nut and bolt.



⚡E⚡ TIMING BELT "B" INSTALLATION

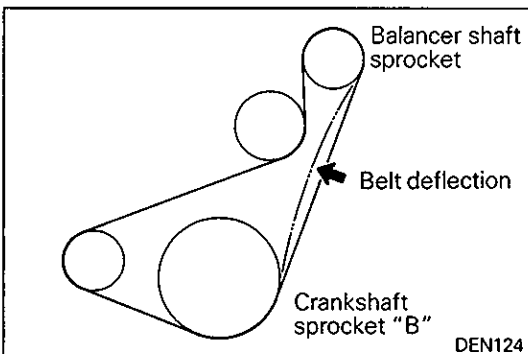
- (1) Align timing marks on the crankshaft sprocket "B", and silent shaft sprockets with their timing marks.
- (2) Install timing belt "B" onto sprockets and ensure that its tension side is not slack.



- (3) Loosen tensioner "B" mounting bolt and nut, one to two turns.
- (4) Tighten the tensioner "B" attaching nut.
- (5) Tighten the tensioner "B" attaching bolt.

NOTE

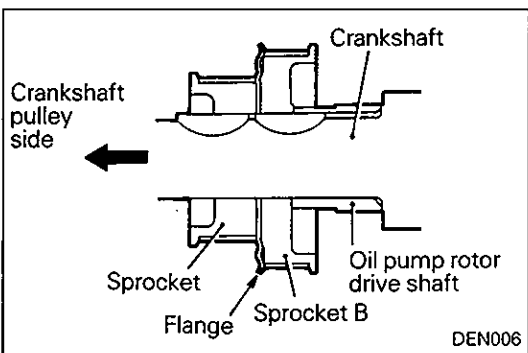
If the bolt is tightened first, the tension "B" should be turned together, resulting in reduced timing belt "B" tension.



- (6) Ensure that the deflection is specified when the belt is pushed by the index finger at the position indicated by an arrow.

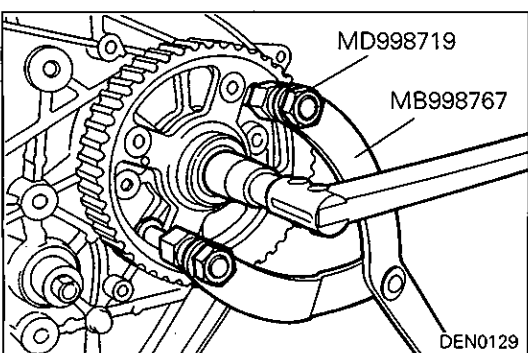
Belt deflection:

4 – 5 mm (0.16 – 0.20 in.)

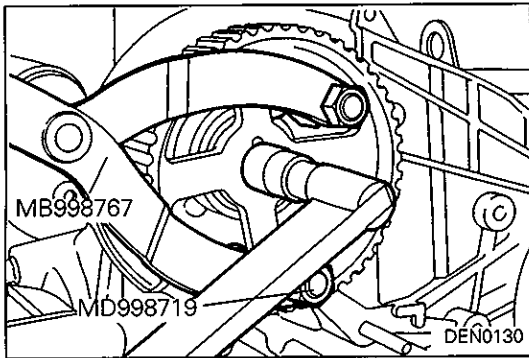


⚡F⚡ FLANGE / CRANKSHAFT SPROCKET INSTALLATION

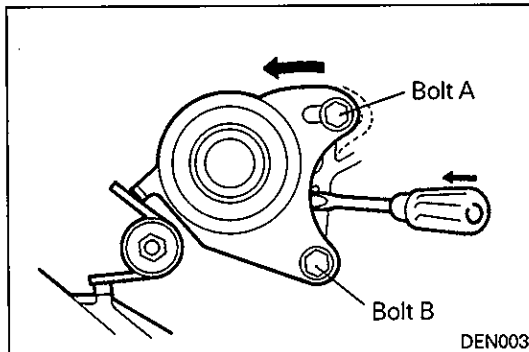
- (1) Pay special attention to direction of flange. If it is installed in wrong direction, a broke timing belt could result.



⚡G⚡ INJECTION PUMP SPROCKET INSTALLATION



◆H◆ CAMSHAFT SPROCKET INSTALLATION



◆I◆ TIMING BELT TENSIONER INSTALLATION

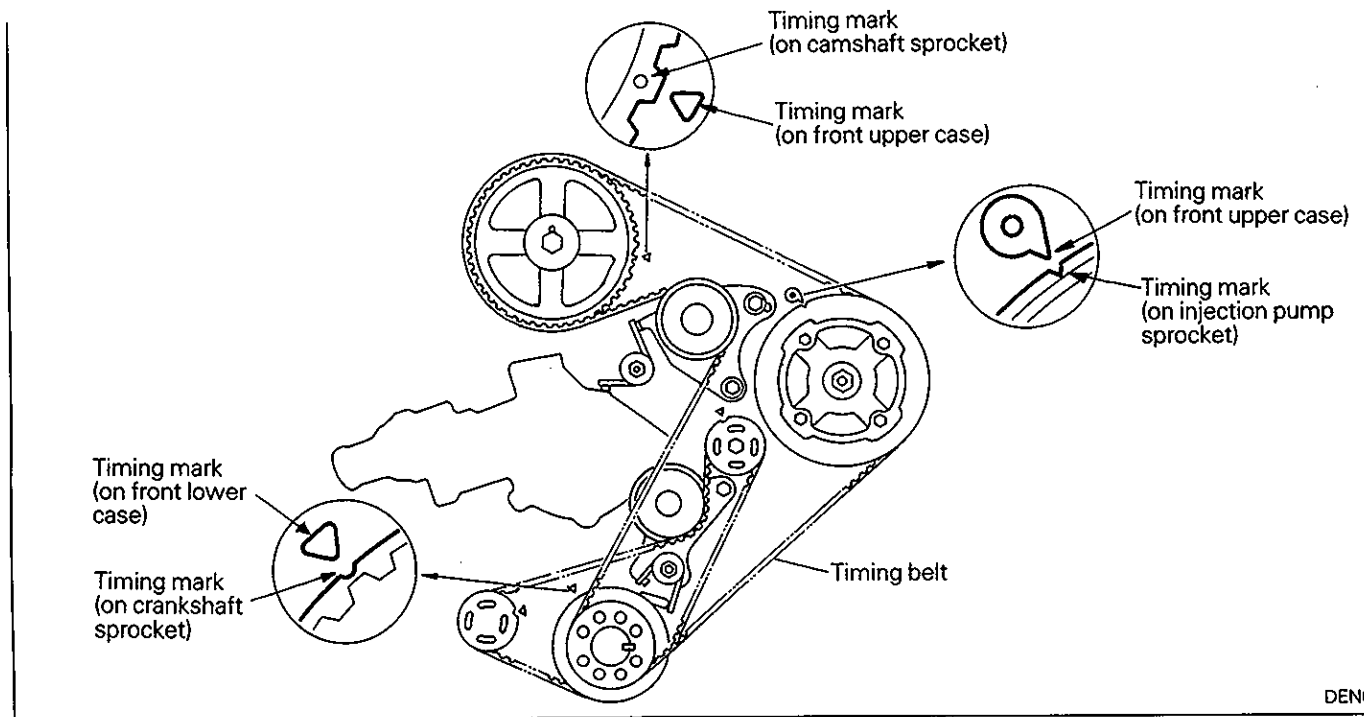
- (1) Move tensioner toward water pump and tighten mounting bolts.

◆J◆ TIMING BELT INSTALLATION

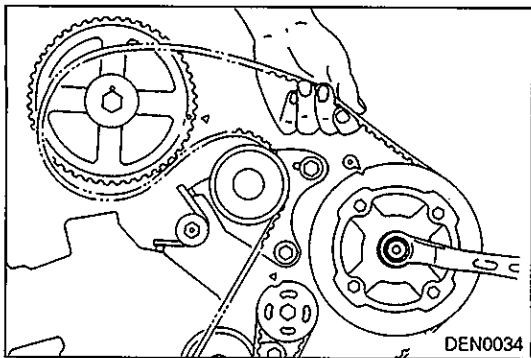
- (1) Align the timing marks on the three sprockets with their mating marks.

NOTE:

If the injection pump sprocket is freed, the timing mark on it will move back counterclockwise by about one tooth. Therefore, align the mark while engaging the timing belt.



DEN002

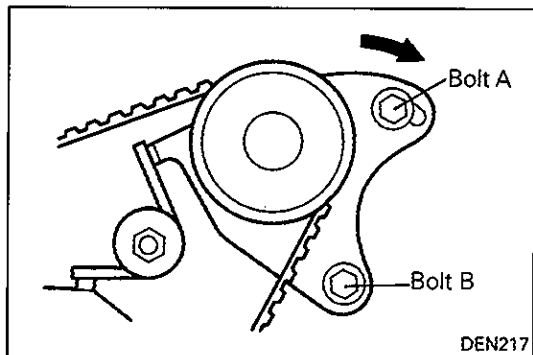


- (2) Install the timing belt over the crankshaft sprocket.
- (3) Align the timing mark on the injection pump sprocket and while holding the sprocket to prevent rotation, install the timing belt.

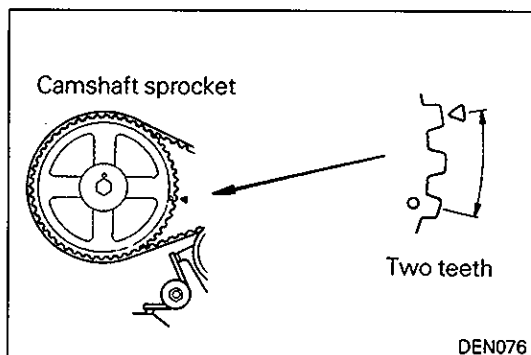
NOTE:

Make sure that the timing belt does not become loose on the tension side.

- (4) Install the timing belt over the tensioner pulley.
- (5) While tensioning the timing belt on the tension side, install the timing belt over the camshaft sprocket.
- (6) Check if all timing marks are aligned correctly.
- (7) Back off tensioner bolt "A", that have previously been secured to the water pump side, one to two turns to give tension to the belt using tensioner spring tension.
- (8) Confirm that the timing belt is correctly engaged with three sprockets.



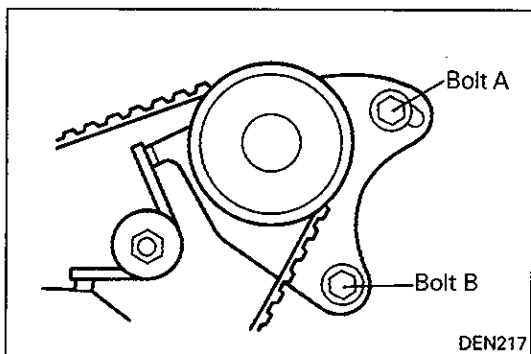
- (9) Turn crankshaft clockwise by the two teeth of the camshaft sprocket and keep the position.



- (10) Tighten the tensioner bolt "A".
- (11) Tighten the tensioner bolt "B".

NOTE

If the bolt "B" is tightened first, the tensioner should be turned together, causing an undue tension to be applied to the timing belt.



- (12) Turn the crankshaft in the direction of backward rotation to line up timing marks. In this condition, ensure that the deflection is specified when the center of belt is pushed by the index finger.

Belt deflection:

4 - 5 mm (0.16 - 0.20 in.)

