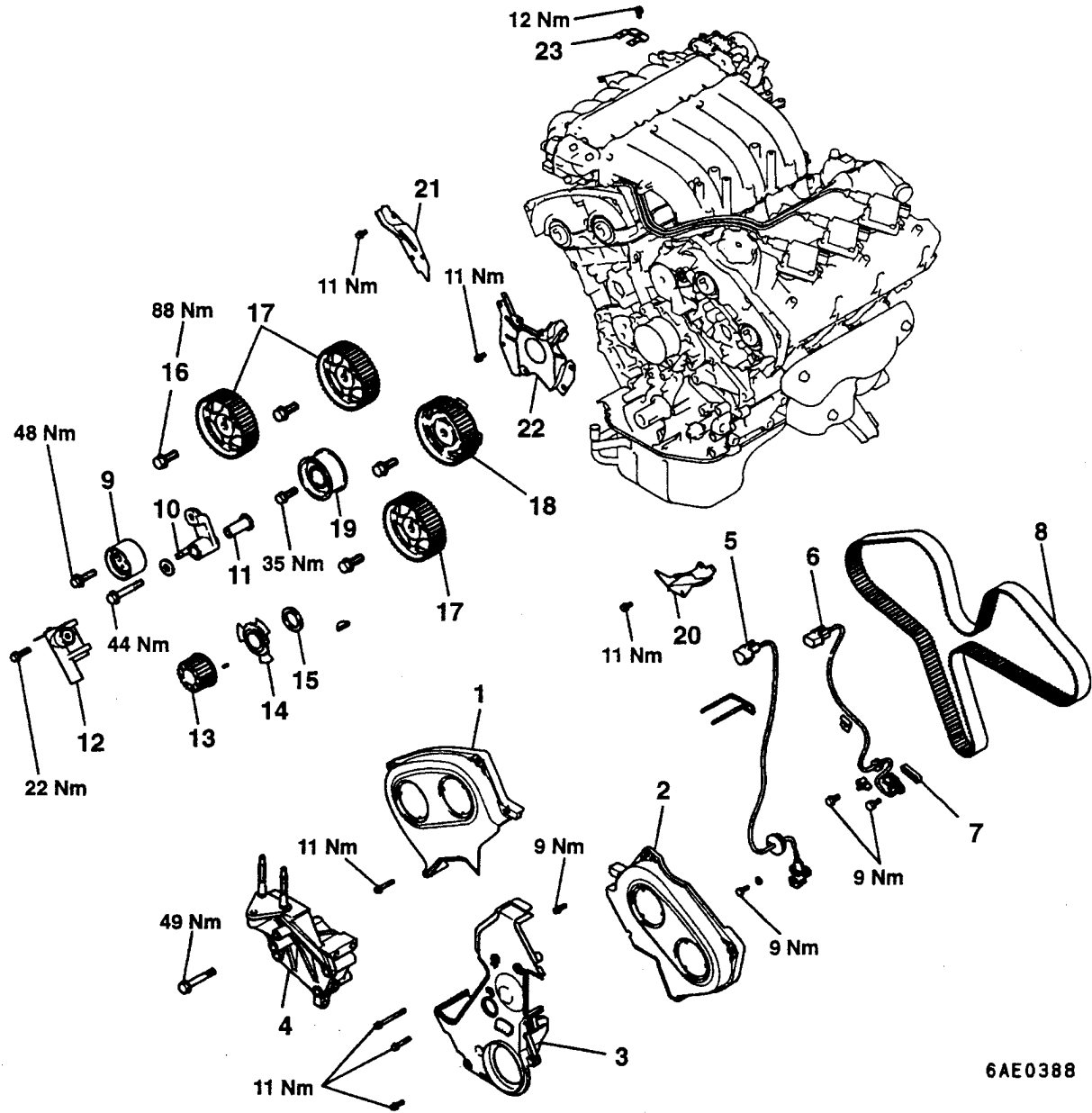


TIMING BELT

REMOVAL AND INSTALLATION



6AE0388

Removal steps

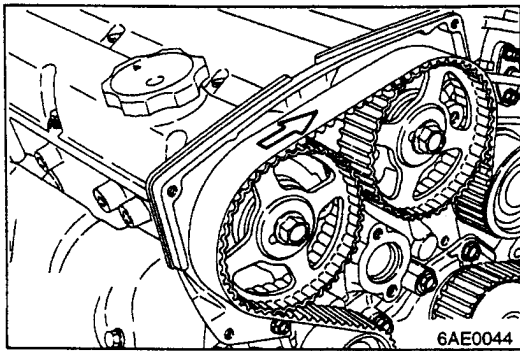
1. Timing belt front cover, upper right
2. Timing belt front cover, upper left
3. Timing belt front cover, lower
4. Engine support bracket
5. Angle sensor
6. Angle sensor
7. Spacer
8. Timing belt
9. Tensioner pulley
10. Tensioner arm
11. Tensioner spacer
12. Auto tensioner

13. Crankshaft sprocket
14. Sensing plate
15. Washer
16. Camshaft sprocket bolt
17. Camshaft sprocket
18. Camshaft sprocket with sensing plate
19. Idler pulley
20. Timing belt rear cover, left
21. Timing belt rear cover, right
22. Timing belt rear cover, center
23. Connector bracket

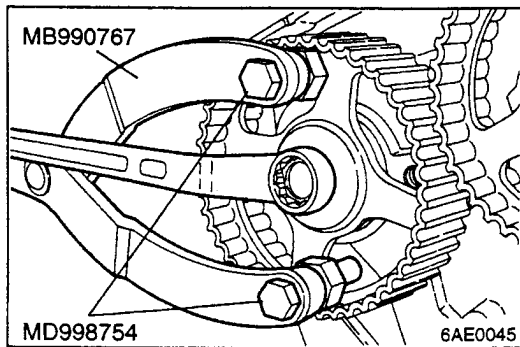
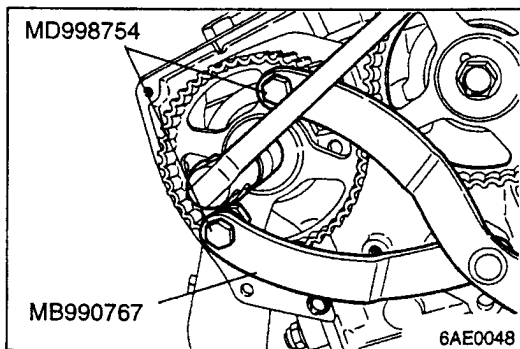
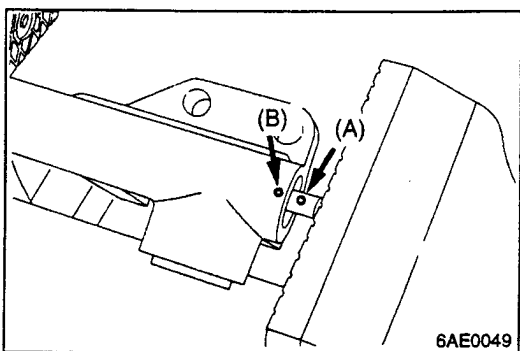
◀A▶ ▶C▶

◀B▶ ▶A▶

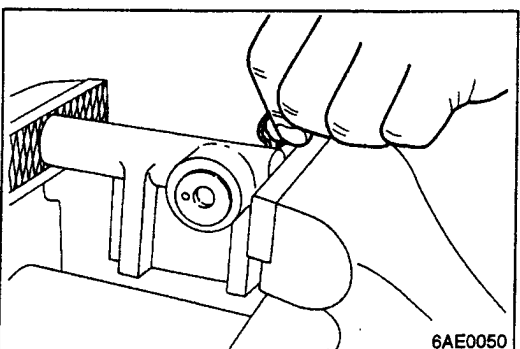
▶B▶

**REMOVAL SERVICE POINTS****◀A▶ TIMING BELT REMOVAL**

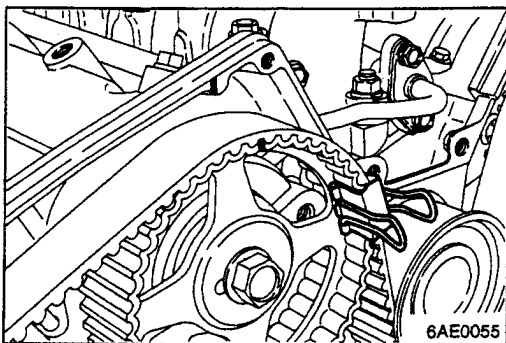
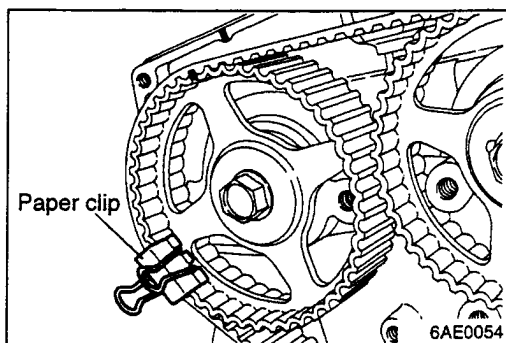
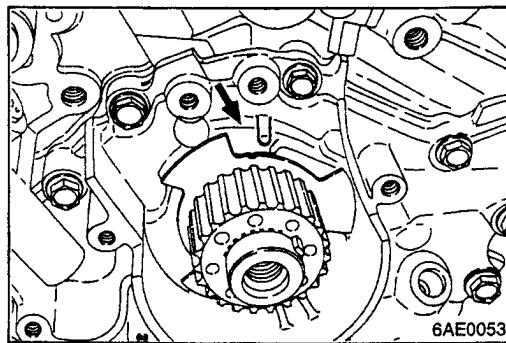
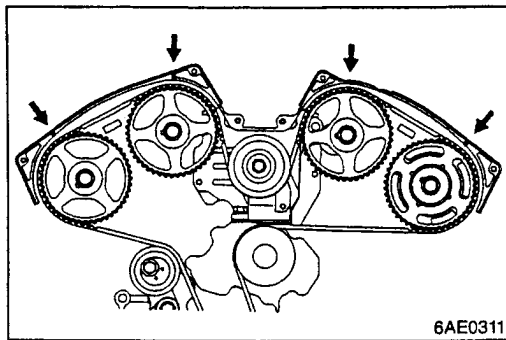
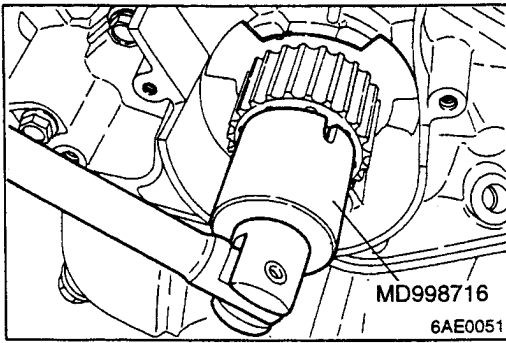
- (1) Mark the belt running direction for reference in reinstallation.
- (2) Loosen the bolt that secures the tensioner pulley to remove the timing belt.

**◀B▶ CAMSHAFT SPROCKET BOLT REMOVAL****INSTALLATION SERVICE POINTS****▶A◀ CAMSHAFT SPROCKET BOLT INSTALLATION****▶B◀ AUTO TENSIONER SETTING**

- (1) Set the auto tensioner in a vice, while making sure it is not tilted.
- (2) Slowly close the vice to force the rod in until the set hole (A) of the rod is lined up with the set hole (B) of the cylinder.



- (3) Insert a 1.4 mm wire in the set hole.
- (4) Remove the auto tensioner from the vice.



►◀ TIMING BELT INSTALLATION

- (1) Turn the crankshaft sprocket so that its timing mark will be away from the mating timing mark by approx. three teeth.

Caution

If the timing marks are aligned, the piston is brought to the TDC. When the camshaft is turned under this condition, the valves may interfere with the piston.

- (2) Bring the timing marks of the camshaft sprockets as shown in the illustration.

Caution

If one of the camshaft sprockets on the right bank is turned with the timing mark on the other sprocket aligned, there may be danger for the intake and exhaust valves to interfere with each other.

- (3) Align the timing mark on the crankshaft sprocket with the mating timing mark, and then turn the crankshaft counterclockwise by one tooth.

- (4) Place the timing belt over the sprockets in the following method.

Caution

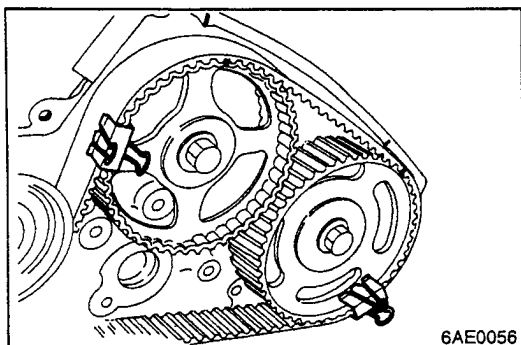
The camshaft sprockets on the right bank can turn very easily because of the valve spring tension. Use care not to allow your fingers to get caught between the sprockets.

- 1) Align the timing mark of the right bank exhaust camshaft sprocket with the mating timing mark and hold the timing belt on the sprocket with a paper clip.
- 2) Align the timing mark of the intake camshaft sprocket and place the timing belt around that sprocket. Then, clip the belt at the location shown.

Caution

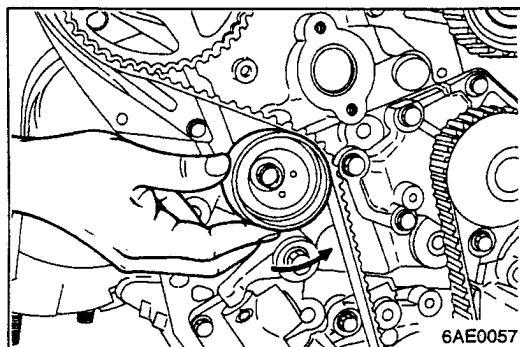
The camshaft sprockets can turn easily and do not give excessive tension to the timing belt.

- 3) Place the timing belt around the idler pulley.



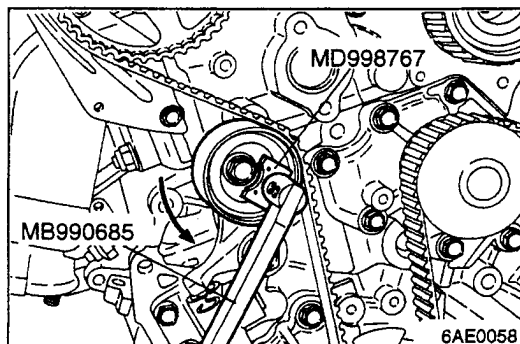
6AE0056

- 4) On the left bank, make sure that the timing marks of the camshaft sprockets are aligned and then hold the timing belt on these sprockets with paper clips.
- 5) Place the timing belt around the water pump pulley.
- 6) Place the timing belt around the crankshaft sprocket.
- 7) Place the timing belt around the tensioner pulley.



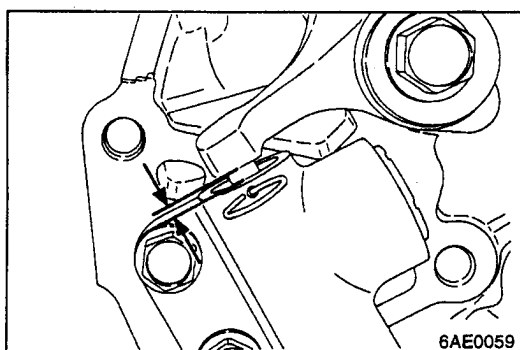
6AE0057

- (5) Move the tensioner pulley in the direction of the arrow and hold it in raised position by tightening the tensioner pulley bolt.
- (6) Check that all timing marks are aligned correctly.
- (7) Turn the crankshaft counterclockwise a quarter turn.
- (8) Turn back the crankshaft clockwise until the timing marks align again.



6AE0058

- (9) Install the special tool and a torque wrench of 0 – 5 Nm to the tensioner pulley.
- (10) Torque the tensioner pulley to 3 Nm with the torque wrench.
- (11) While holding the tensioner pulley, tighten the center bolt to specification.
- (12) Turn the crankshaft clockwise 2 turns and let it stand for about 5 minutes.



6AE0059

- (13) Make sure that the wire, which has been inserted when installing the auto tensioner, can be removed easily. Belt tension should be acceptable if the wire can be easily removed. Remove the wrench. The belt tension can also be verified by checking the protrusion amount of the auto tensioner rod which should conform to the following.

Standard value: 3.8 – 4.5 mm

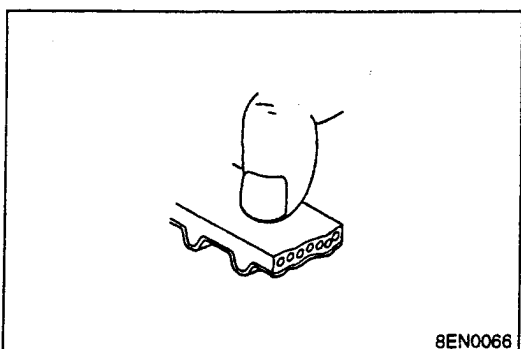
- (14) If the wire cannot be removed easily or the rod protrusion is not up to specification, repeat steps (9) through (12) to obtain the correct tension.

INSPECTION

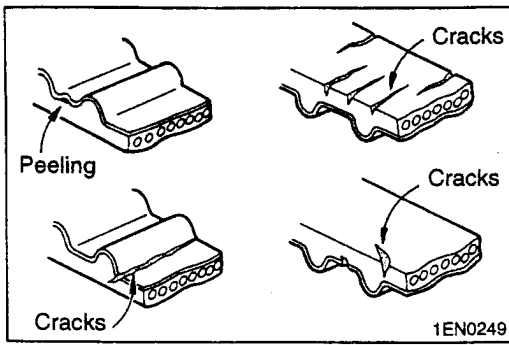
TIMING BELT

Replace belt if any of the following conditions exist.

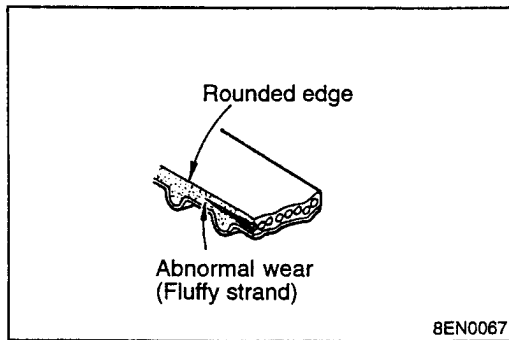
- (1) Hardening of back rubber.
Back side is glossy without resilience and leaves no indent when pressed with fingernail.



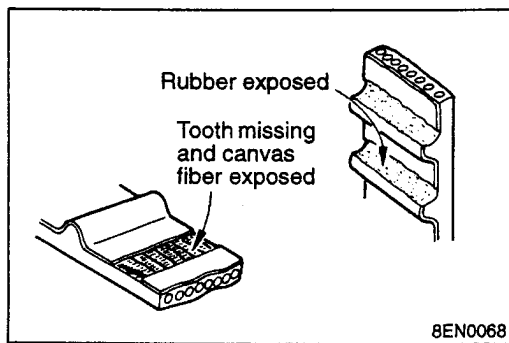
8EN0066



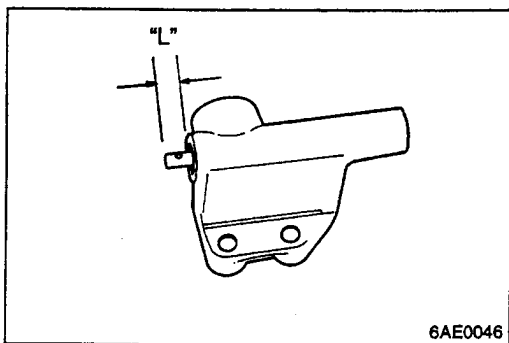
- (2) Cracks on rubber back.
- (3) Cracks or peeling of canvas.
- (4) Cracks on tooth bottom.
- (5) Cracks or belt sides.



- (6) Abnormal wear of belt sides. The sides are normal if they are sharp as if cut by a knife.



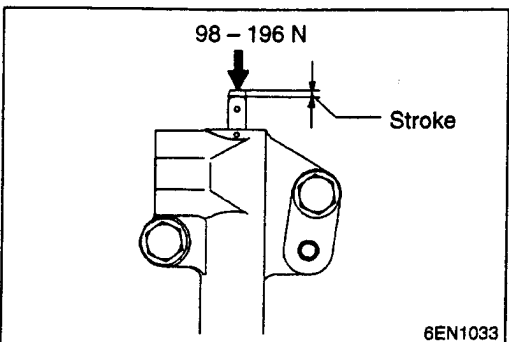
- (7) Abnormal wear on teeth.
- (8) Missing tooth.



AUTO-TENSIONER

- (1) Check for oil leaks. If oil leaks are evident, replace the auto-tensioner.
- (2) Check the rod end for wear or damage and replace the auto-tensioner if necessary.
- (3) Measure the rod projection length "L". If the reading is outside the standard value, replace the auto tensioner.

Standard value "L": 12 mm



- (4) Press the rod by a force of 98 to 196 N and measure the rod stroke. If the measured value exceeds the standard value, replace the tensioner.

Standard value: 1 mm or less