

INSPECTION

1. INSPECT CAMSHAFT TIMING GEAR ASSEMBLY

- (a) Check the lock of the camshaft timing gear.

- (1) Clamp the camshaft in a vise, then confirm that the camshaft timing gear is locked.

NOTICE:

Be careful not to damage the camshaft.

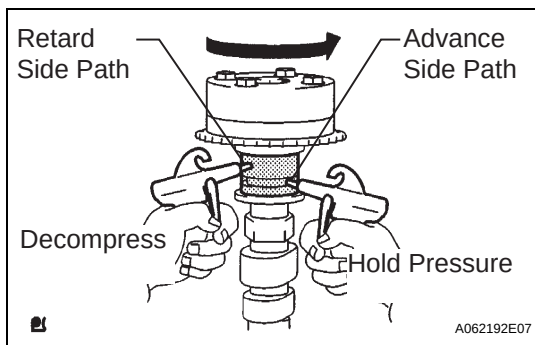
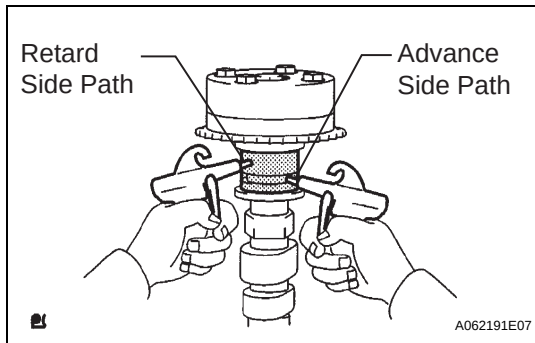
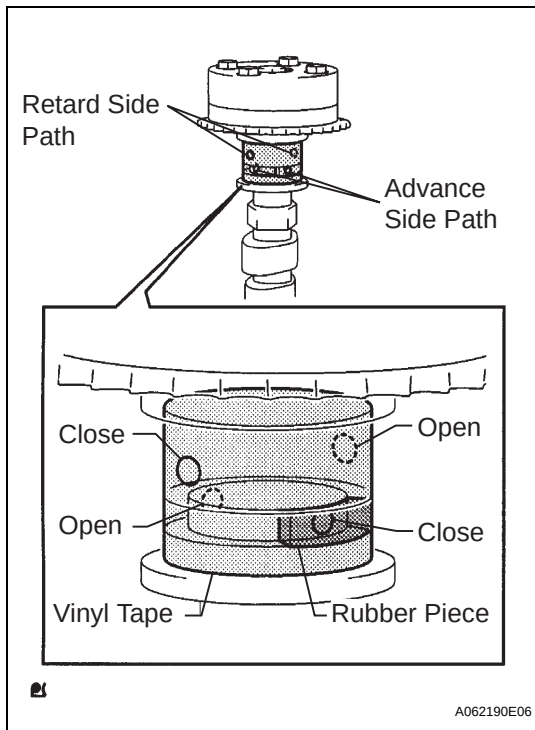
- (b) Release the lock pin.

- (1) Cover the 4 oil paths of the cam journal with vinyl tape as shown in the illustration.

HINT:

Two advance side paths are provided in the groove of the camshaft. Plug one of the paths with a piece of rubber.

- (2) Puncture the tape over the advance side path and retard side path on the opposite side of the groove.



- (3) Apply air pressure to the two broken paths (the advance side path and retard side path) of about 150 kPa (1.5 kgf/cm²).

CAUTION:

Cover the paths with a shop rag to avoid oil splashes.

- (4) Confirm that the camshaft timing gear revolves in the timing advance direction when weakening the air pressure of the timing retard path.

HINT:

The lock pin is released, and the camshaft timing gear revolves in the advance direction.

- (5) When the camshaft timing gear comes to the most advanced position, release the air pressure of the timing retard side path, then release that of the timing advance side path.

CAUTION:

The camshaft timing gear occasionally shifts to the retard side abruptly if the air compression of the advance side path is released before the retard side path. This often causes the breakage of the lock pin.

- (c) Check the smooth revolution.
 - (1) Revolve the camshaft timing gear several times within the movable range except for the most retarded position and check that it turns smoothly.

CAUTION:

Be sure to perform this check by hand, instead of using air pressure.

- (d) Check that the lock is in the most retarded position.
 - (1) Confirm that the camshaft timing gear is locked in the most retarded position.

2. REMOVE CAMSHAFT TIMING GEAR ASSEMBLY

- (a) Clamp the camshaft in a vise, then confirm that the camshaft timing gear is locked.

CAUTION:

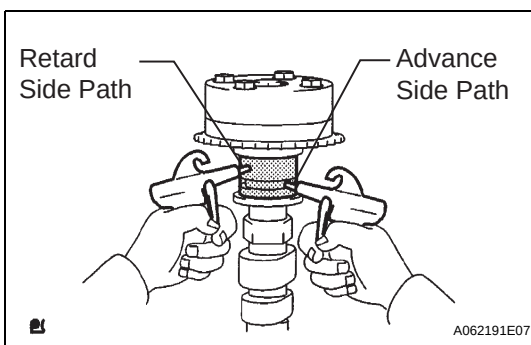
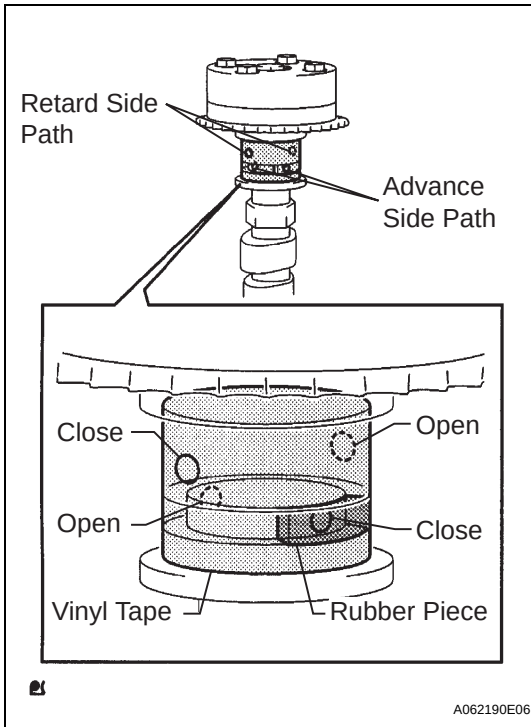
Be careful not to damage the camshaft.

- (b) Cover the 4 oil paths of the cam journal with vinyl tape as shown in the illustration.

HINT:

Two advance side paths are provided in the groove of the camshaft. Plug one of the paths with a piece of rubber.

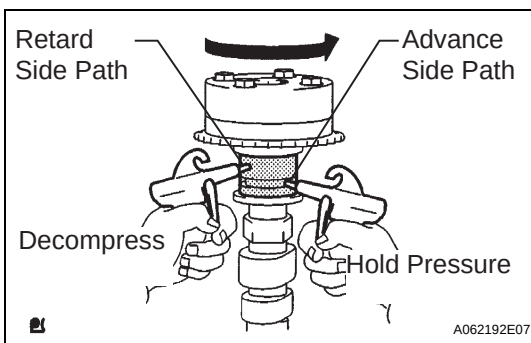
- (c) Puncture the tape over the advance side path and retard side path on the opposite side of the groove.



- (d) Apply air pressure to the two broken paths (the advance side path and retard side path) of about 150 kPa (1.5 kgf/cm²).

CAUTION:

Cover the paths with a shop rag to avoid oil splashes.



- (e) Confirm that the camshaft timing gear revolves in the timing advance direction when weakening the air pressure of the timing retard path.

HINT:

The lock pin is released, and the camshaft timing gear revolves in the advance direction.

- (f) When the camshaft timing gear comes to the most advanced position, release the air pressure of the timing retard side path, then release that of the timing advance side path.

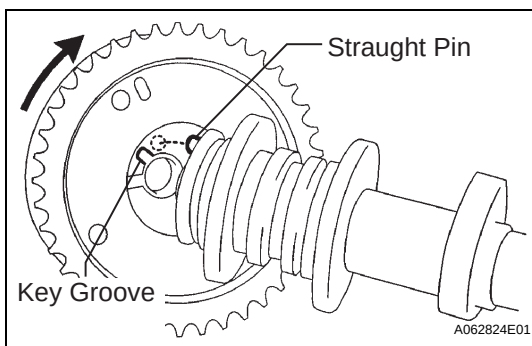
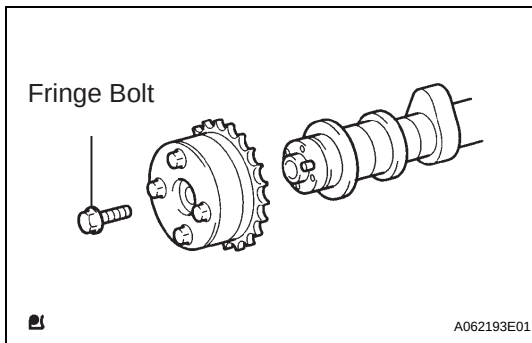
CAUTION:

The camshaft timing gear occasionally shifts to the retard side abruptly if the air compression of the advance side path is released before the retard side paths. This often causes the breakage of the lock pin.

- (g) Remove the fringe bolt and camshaft timing gear.

NOTICE:

- Be sure not to remove the other 4 bolts.
- When reusing the camshaft timing gear, release the straight pin locking first, then install the gear.

**INSTALLATION****1. INSTALL CAMSHAFT TIMING GEAR ASSEMBLY**

- (a) Put the camshaft timing gear together with the camshaft with the straight pin off the key groove.
- (b) Turn the camshaft timing gear in the left as shown in the illustration while pushing it gently against the camshaft. Push further at the position where the pin fits into the groove.

CAUTION:

Be sure not to turn the camshaft timing gear to the retard angle side (the right angle).

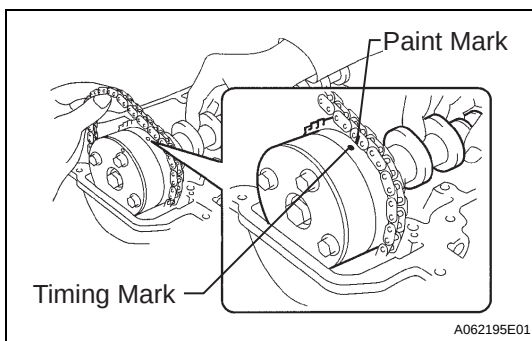
- (c) Check that there is no clearance between the gear fringe and camshaft.
- (d) Tighten the fringe bolt with the camshaft timing gear fixed.

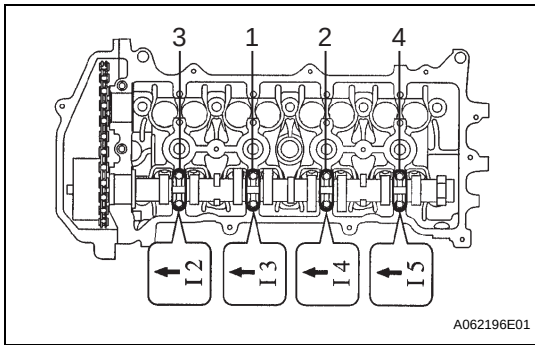
Torque: 54 N*m (551 kgf*cm, 40 ft.*lbf)

- (e) Check that the camshaft timing gear can move to the retard angle side (the right angle), and is locked in the most retarded position.

2. INSTALL CAMSHAFT

- (a) Install the timing chain onto the camshaft timing gear with the paint mark aligned with the timing mark on the camshaft timing gear as shown in the illustration.



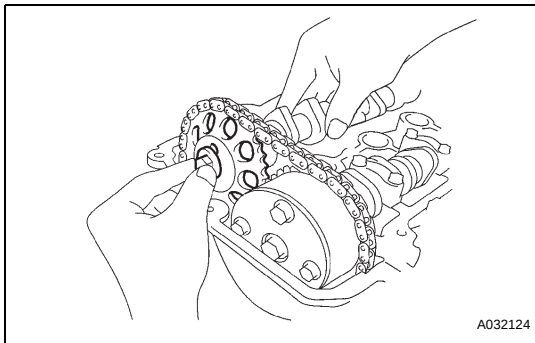
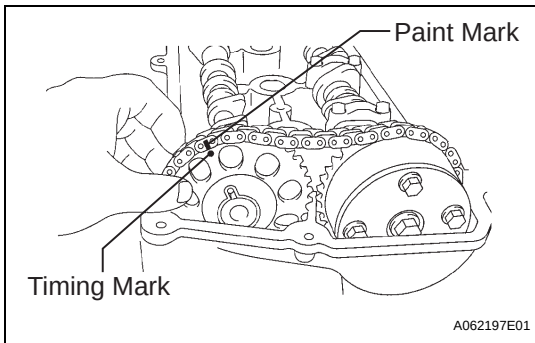


- (b) Examine the front marks and numbers and check that the sequence order is as shown in the illustration. Then tighten the bolts.

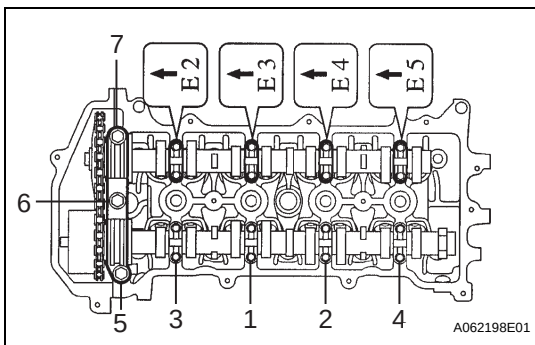
Torque: 13 N*m (133 kgf*cm, 10 ft.*lbf)

3. INSTALL NO.2 CAMSHAFT

- (a) Put the No. 2 camshaft on the cylinder head with the paint mark of the chain aligned with the timing mark on the camshaft timing gear.



- (b) Temporarily install the camshaft timing gear set bolt.

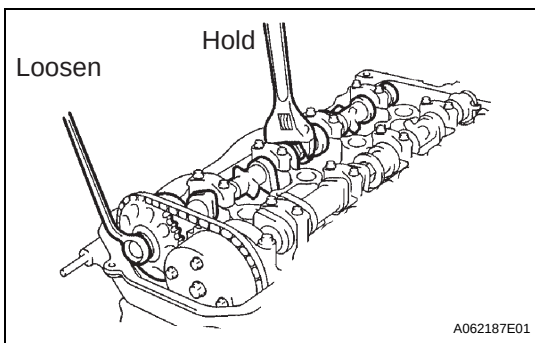


- (c) Examine the front marks and numbers and check that the sequence order is as shown in the illustration. Then tighten the bolts.

Torque: 13 N*m (133 kgf*cm, 10 ft.*lbf)

- (d) Install the bearing cap No. 1.

Torque: 23 N*m (235 kgf*cm, 17 ft.*lbf)

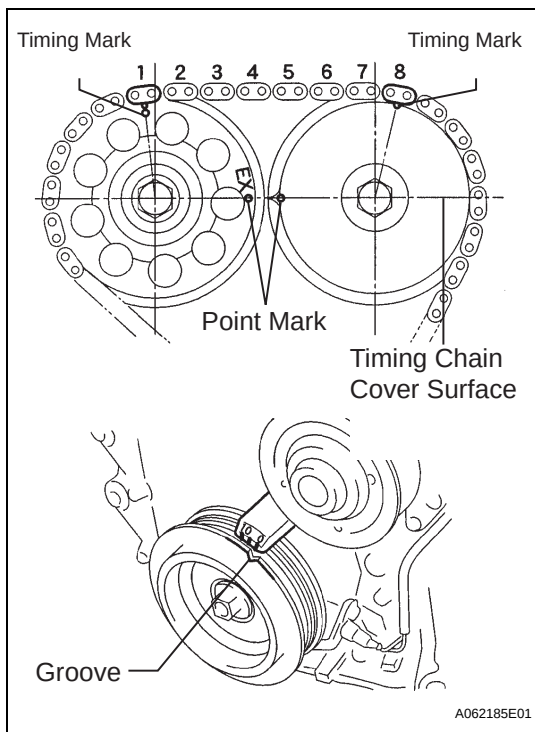


- (e) While holding the camshaft with a wrench, tighten the camshaft timing gear set bolt.

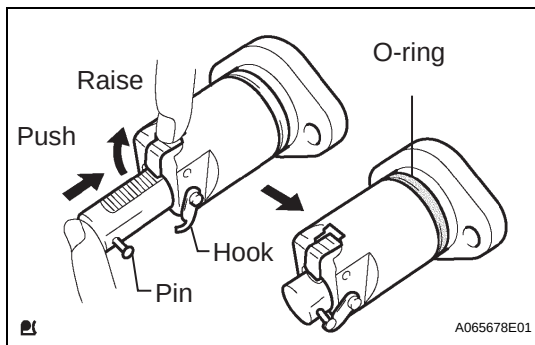
Torque: 54 N*m (551 kgf*cm, 40 ft.*lbf)

NOTICE:

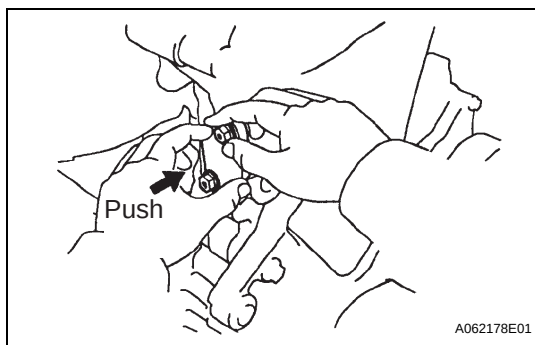
Be careful not to damage the valve lifter.



- (f) Check that the 2 point marks are aligned on the timing chain cover surface. Also, check that each timing mark is aligned with its corresponding painted link on the timing chain as shown in the illustration. In addition, check that the groove is aligned with timing mark "0" of the chain cover.



- (g) Install the chain tensioner.
- (1) Check that the O-ring is clean, and set the hook as shown in the illustration.
 - (2) Apply a light coat of engine oil to the O-ring.

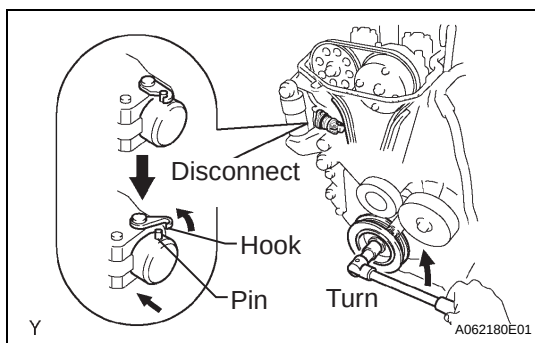


- (3) Install the chain tensioner with the 2 nuts.

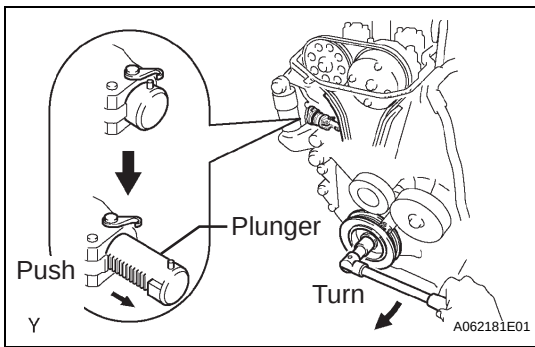
Torque: 9.0 N*m (92 kgf*cm, 80 in.*lbf)

NOTICE:

- Be careful not to twist the O-ring.
- When installing the chain tensioner, set the hook again if the hook releases the plunger.



- (4) Turn the crankshaft counterclockwise to disconnect the plunger knock pin from the hook.



- (5) Turn the crankshaft clockwise, then check that the slipper is pushed by the plunger. If the plunger is not extended, push the slipper into the chain tensioner using a screwdriver so that the hook is released from the knock pin and the plunger can be extended.

4. CHECK VALVE CLEARANCE

- (a) Check the valve clearance (See page [EM-6](#)).

5. ADJUST VALVE CLEARANCE

- (a) Adjust the valve clearance (See page [EM-6](#)).

6. INSTALL CYLINDER HEAD COVER SUB-ASSEMBLY

- (a) Install the cylinder head cover sub-assembly (See page [EM-20](#)).

7. INSTALL IGNITION COIL ASSEMBLY

- (a) Install the ignition coil assembly (See page [EM-20](#)).

8. CONNECT BATTERY NEGATIVE TERMINAL

Torque: 5.4 N*m (55 kgf*cm, 48 in.*lbf)

9. CHECK ENGINE OIL LEAKAGE

10. INSTALL CYLINDER HEAD COVER NO.2

- (a) Install the cylinder head cover No. 2 (See page [EM-20](#)).

11. INSTALL ENGINE UNDER COVER RH

EM