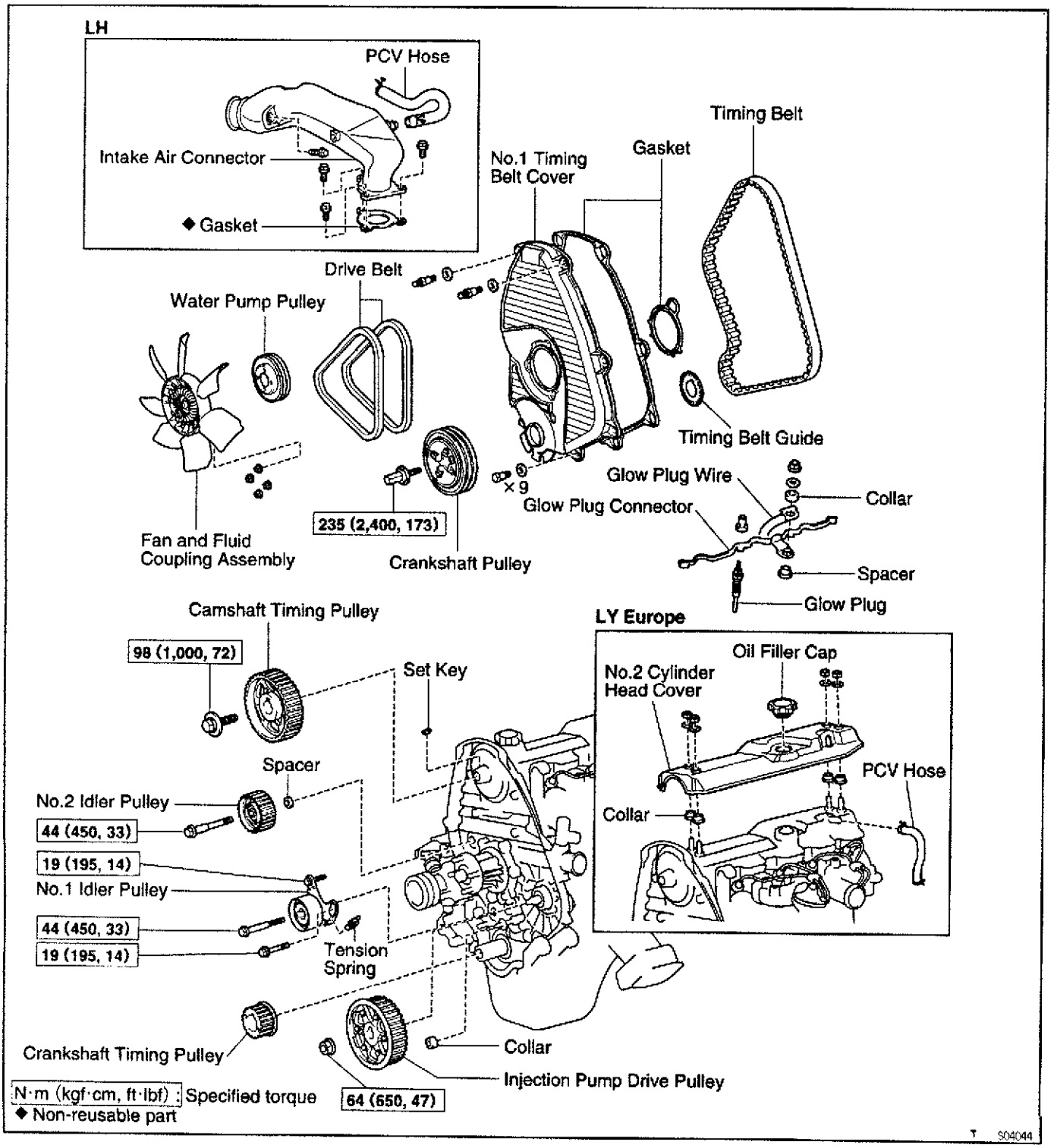
TIMING BELT

EG17P–00

HINT: If replacing the timing belt before the timing belt warning light comes on, (light comes on after 100,000 km of driving), be sure to reset the timing belt counter of the speedometer to zero.

COMPONENTS FOR REMOVAL AND INSTALLATION

EG

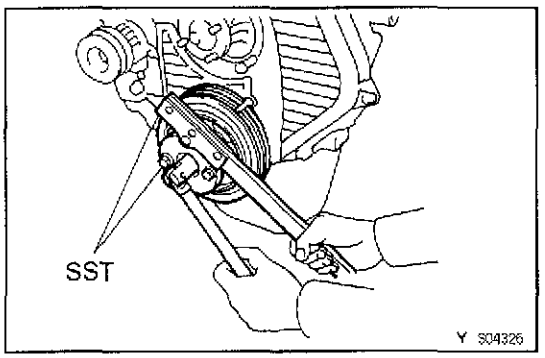


EG7A7-01

TIMING BELT REMOVAL

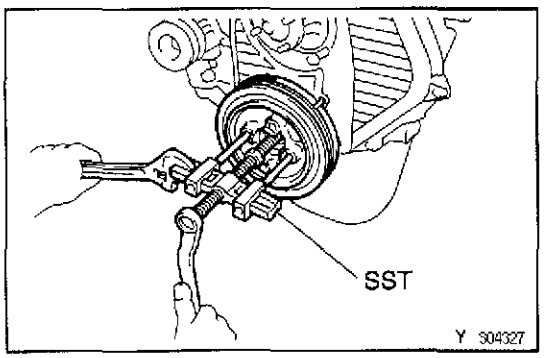
1. **REMOVE GLOW PLUGS**
   (See steps 2 to 5 in cylinder head removal)
2. ***REMOVE DRIVE BELTS, FAN, FLUID COUPLING ASSEMBLY AND WATER PUMP PULLEY***
   (See step 2 in water pump removal in Cooling System)

EG

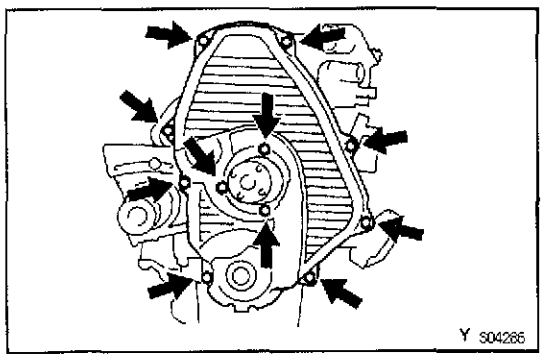


3. **REMOVE CRANKSHAFT PULLEY**

(a) Using SST, remove the pulley bolt.
SST 09213–54015 (91651–60855),
09330–00021



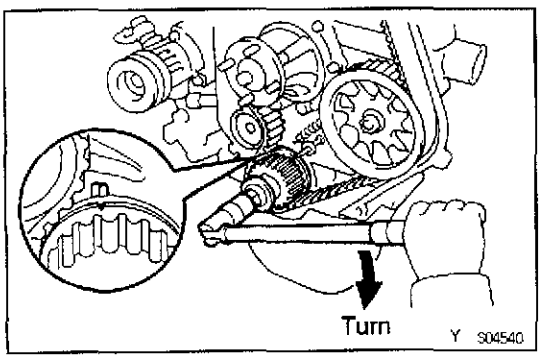
(b) Using SST, remove the pulley.
SST 09950–50010 (09951–05010, 09952–05010, 09953–05010, 09953–05020, 09954–05030)



4. **REMOVE NO.1 TIMING BELT COVER**

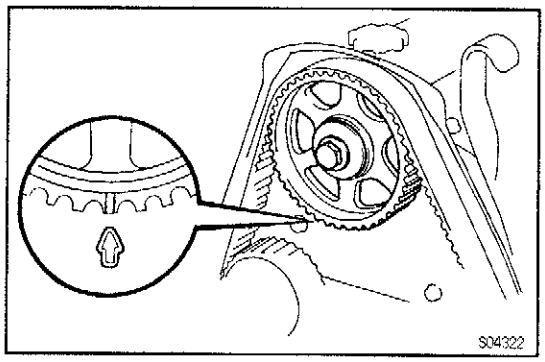
(a) Remove the 11 bolts, washers, timing belt cover and 2 gaskets.
(b) Remove the collar from the timing pointer.

5. **REMOVE TIMING BELT GUIDE**



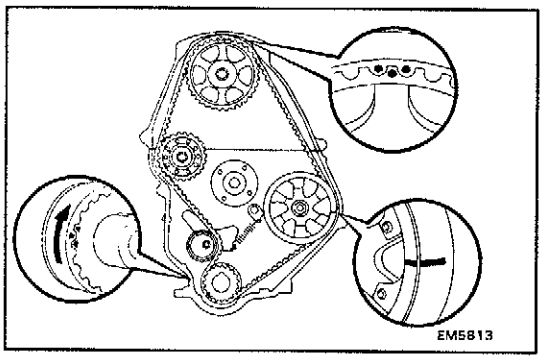
6. **SET NO.1 CYLINDER TO TDC/COMPRESSION**

(a) Using the crankshaft pulley bolt, align its groove with the timing pointer by turning the crankshaft clockwise.



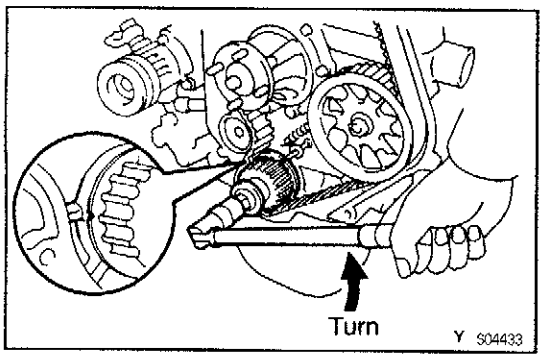
(b) Check that timing marks of the camshaft timing pulley and No.2 timing belt cover are aligned.
If not, turn the crankshaft 1 revolution (360°).

EG

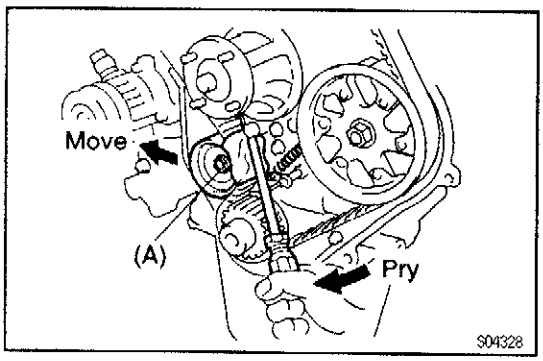


7. REMOVE TIMING BELT

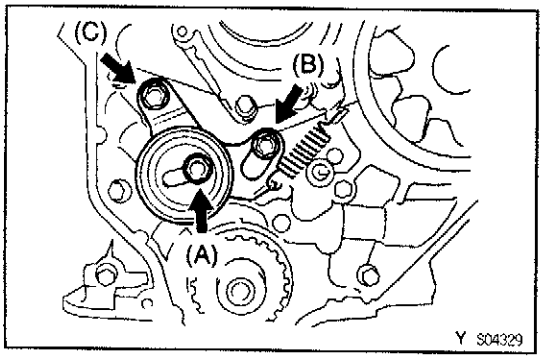
HINT: If re—using the timing belt, draw a direction arrow on the timing belt (in direction of engine revolution), and place matchmarks on the pulleys and timing belt.



(a) Turn the crankshaft 90° counterclockwise, and put the timing mark of the crankshaft timing pulley with the protrusion of the timing belt case.
NOTICE: If the timing belt is disengaged, having the crankshaft timing pulley at the wrong angle can cause the piston head and valve head to come into contact with each other when you remove the camshaft timing pulley (step 9), causing damage. So always set the crankshaft pulley at the correct angle.



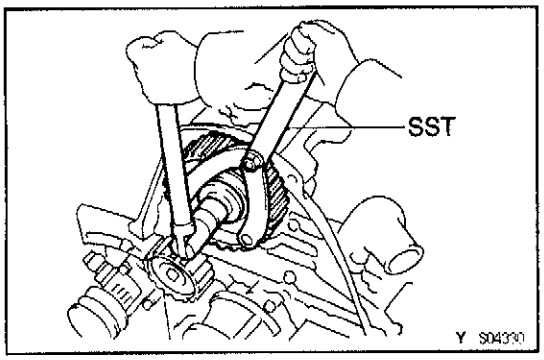
(b) Loosen the No.1 idler pulley bolt (A), and shift left as far as it will go.
(c) Temporarily tighten the pulley bolt (A), and then relieve the timing belt tension.
(d) Remove the timing belt.



8. REMOVE NO.1 IDLER PULLEY

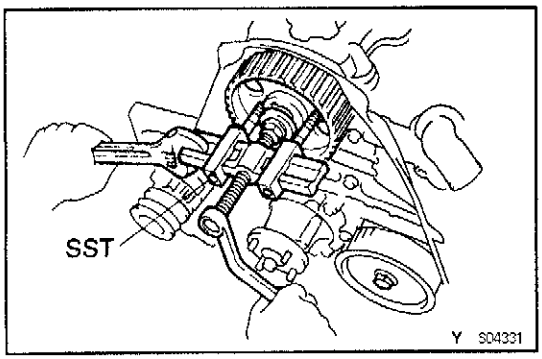
(a) Remove the 2 bolts (A and B).
(b) Loosen the bolt (C), and remove it, the idler pulley and tension spring.

EG

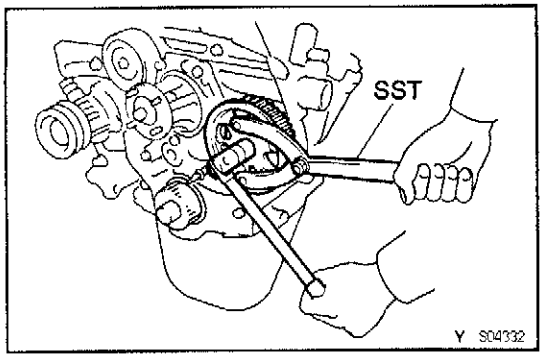


9. REMOVE CAMSHAFT TIMING PULLEY

(a) Using SST, remove the pulley bolt.
SST 09960–10010 (09962–01000, 09963–01000)

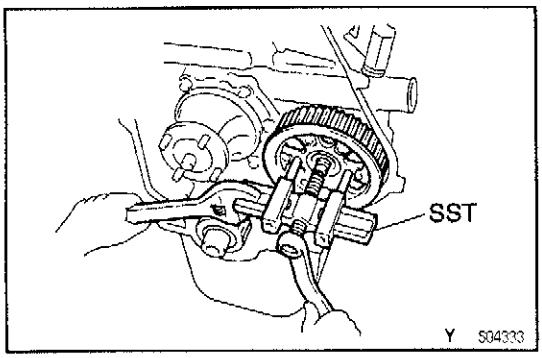


(b) Using SST, remove the timing pulley. Remove the set key.
SST 09950–50010 (09951–05010, 09952–05020, 09953–05010, 09954–05020)



10. REMOVE INJECTION PUMP DRIVE PULLEY

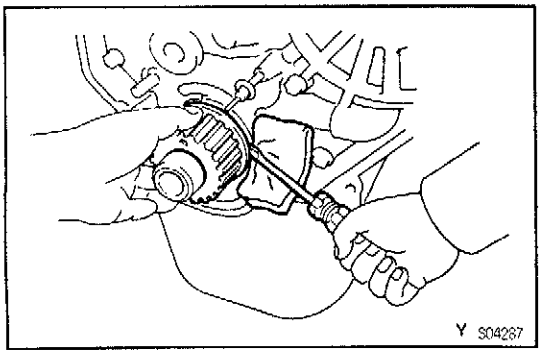
(a) Using SST, remove the pulley bolt.
SST 09960–10010 (09962–01000, 09963–01000)



(b) Using SST, remove the drive pulley.
SST 09950–50010 (09951–05010, 09952–05010, 09953–05020, 09954–05020)

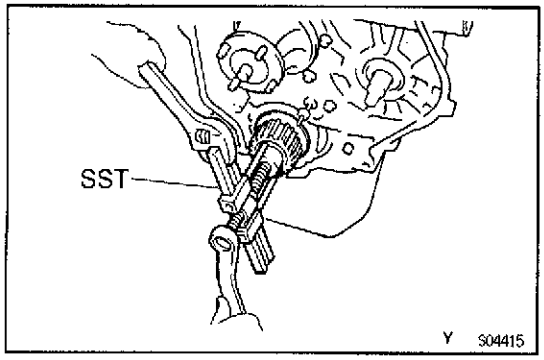
11. REMOVE NO.2 IDLER PULLEY

Remove the bolt, idler pulley and spacer.



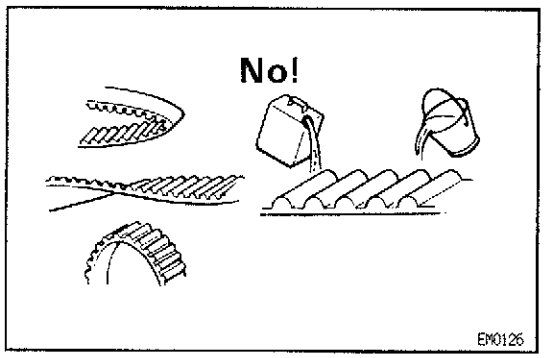
12. REMOVE CRANKSHAFT TIMING PULLEY

Using a screwdriver, remove the timing pulley.
HINT: Position shop rag as shown to prevent damage.



If the pulley cannot be remove by screwdriver, use SST, remove the timing pulley.
SST 09950–05010 (09951–05010, 09952–05010, 09953–05010, 09953–05020, 09954–05010)

EG



TIMING BELT COMPONENTS INSPECTION EGBV2-02

1. INSPECT TIMING BELT

NOTICE:

- **Do not bend, twist or turn the timing belt inside out.**
- **Do not allow the timing belt to come into contact with oil, water or steam.**
- **Do not utilize timing belt tension when installing or removing the mounting bolt of the camshaft timing pulley.**

If there are any defects, as shown in the illustration, check these points:

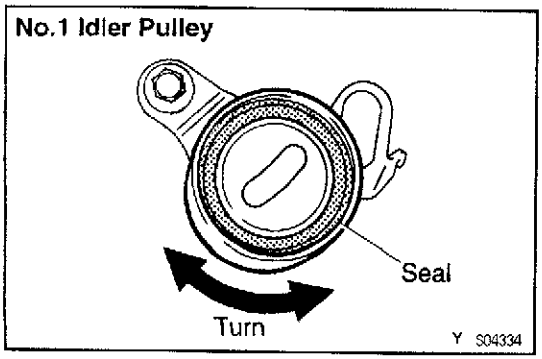
(a) Premature parting
- Check the proper installation.
- Check the timing cover gasket for damage and proper installation.

(b) If the belt teeth are cracked or damaged, check to see if either camshaft is locked.

(c) If there is noticeable wear or cracks on the belt face, check to see if there are nicks on the side of the idler pulley lock and water pump.

(d) If there is wear or damage on only one side of the belt, check the belt guide and the alignment of each pulley.

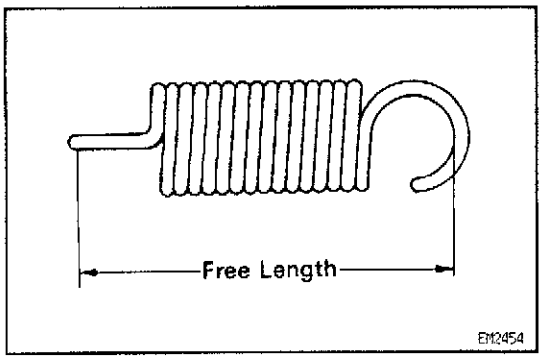
(e) If there is noticeable wear on the belt teeth, check the timing cover for damage, and check gasket has been installed correctly and for foreign material on the pulley teeth.
If necessary, replace the timing belt.



2. INSPECT IDLER PULLEYS

(a) No.1 Idler Pulley:
Visually check the seal portion of the idler pulley for oil leakage.
If leakage is found, replace the idler pulley.

(b) Check that the idler pulley turns smoothly.
If necessary, replace the idler pulley.



EG

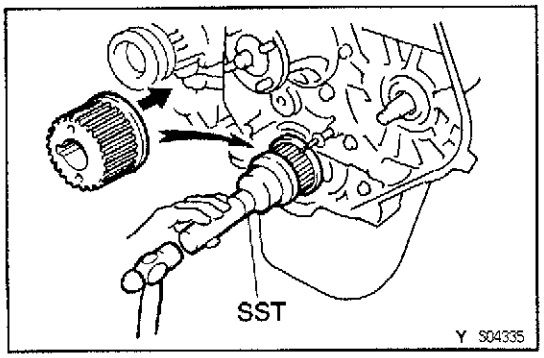
3. INSPECT TENSION SPRING

(a) Measure the free length of tension spring.
Free length:
44.4 – 45.4 mm (1.748 – 1.787 in.)
If the free length is not as specified, replace the tension spring.

(b) Measure the tension of the tension spring at the specified installed length.
Installed tension (at 52.1 mm (2.051 in.)):
53 – 59 N (5.42 – 5.98 kgf, 11.9 – 13.2 lbf)
If the installed tension is not as specified, replace the tension spring.

TIMING BELT INSTALLATION

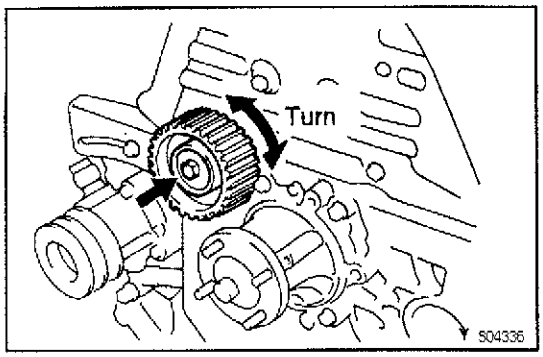
EG7A8-01



1. INSTALL CRANKSHAFT TIMING PULLEY

(a) Align the pulley set key with the key groove of the timing pulley.

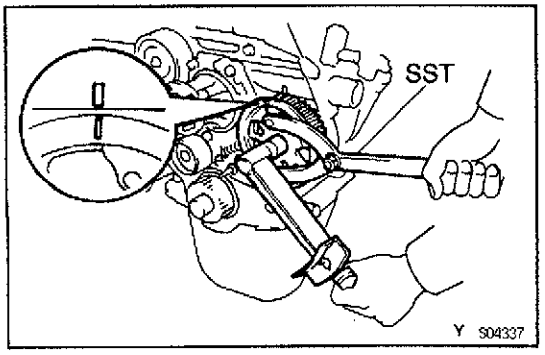
(b) Using SST and a hammer, tap in the timing pulley, facing the flange side inward.
SST 09223–46011



2. INSTALL NO.2 IDLER PULLEY

(a) Install the spacer and idler pulley with the bolt.
Torque: 44 N·m (450 kgf·cm, 33 ft·lbf)

(b) Check that the idler pulley moves smoothly.

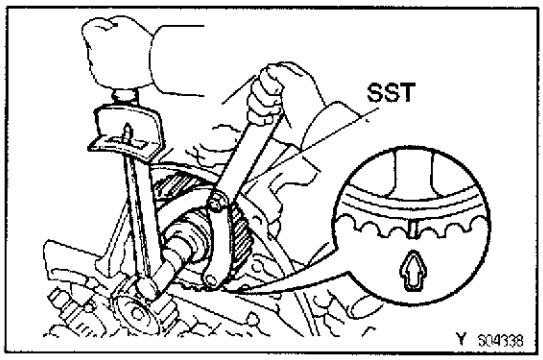


3. INSTALL INJECTION PUMP DRIVE PULLEY

(a) Align the pulley set key with the key groove of the drive pulley.

(b) Slide the drive pulley, facing the timing mark (or flange side) outward.

(c) Using SST, install the pulley bolt.
SST 09960–10010 (09962–01000, 09963–01000)
Torque: 64 N·m (650 kgf·cm, 47 ft·lbf)



4. INSTALL CAMSHAFT TIMING PULLEY

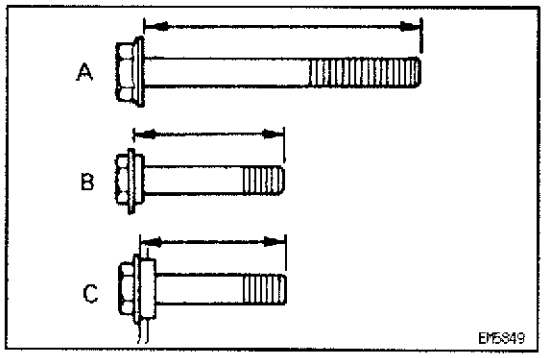
(a) Install the set key to the key groove of the camshaft.

(b) Align the pulley set key with the key groove of the timing pulley.

(c) Slide the timing pulley, facing the timing mark outward.

(d) Using SST, install the pulley bolt.
SST 09960–10010 (09962–01000, 09963–01000)
Torque: 98 N·m (1,000 kgf·cm, 72 ft·lbf)

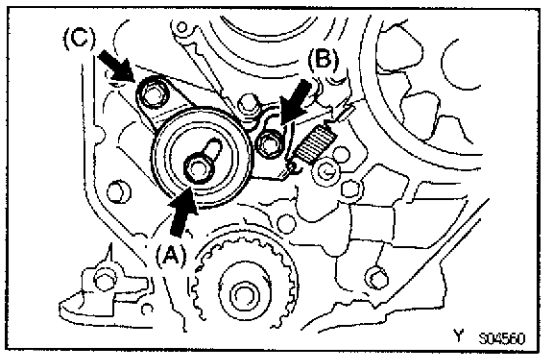
EG



5. TEMPORARILY INSTALL NO.1 IDLER PULLEY AND TENSION SPRING

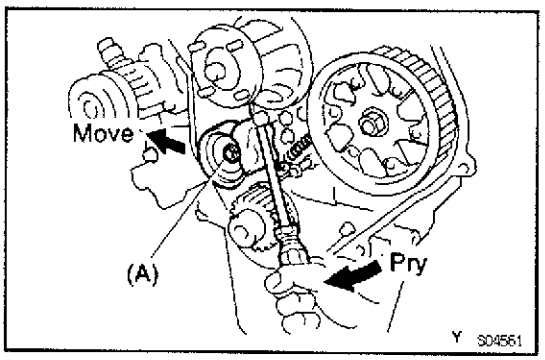
HINT:

- The bolt lengths for bolt types A, B and C shown in the illustration are:
  A 76.5 mm (3.012 in.)
  B 42.9 mm (1.689 in.) Color: Yellow
  C 41.3 mm (1.626 in.) Color: Silver
- Bolt C is combined with the idler pulley.



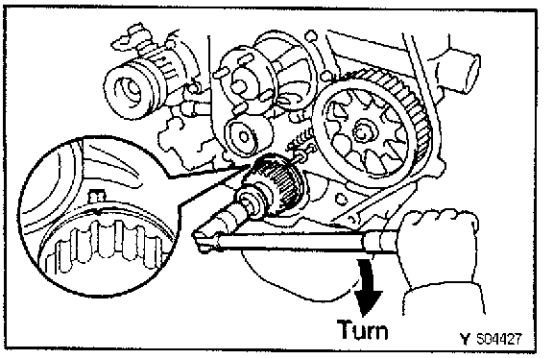
(a) Install the idler pulley with the 3 bolts. Tightening the 2 bolts (B and C).
Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)

(b) Install the tension spring.



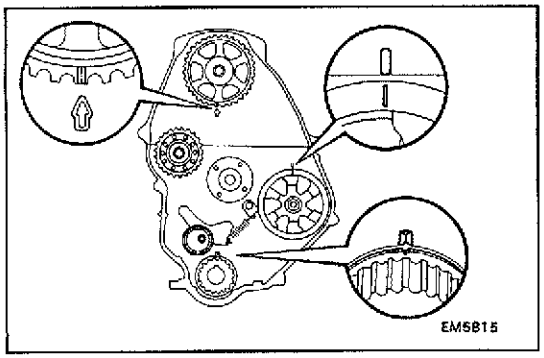
(c) Pry the bracket of the idler pulley toward the left as far as it will go and tighten the bolt (A).

(d) Check that the idler pulley moves smoothly.

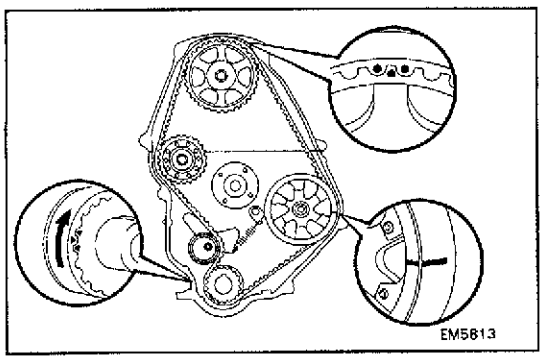


6. SET NO.1 CYLINDER TO TDC/COMPRESSION

(a) Using the crankshaft pulley bolt, align its groove with the timing pointer by turning the crankshaft clockwise.
NOTICE: Do not turn the crankshaft pulley counterclockwise.



(b) Set the timing and drive pulleys at each position.
NOTICE:
- **The engine should be cold.**
- **When turning the crankshaft or camshaft, the valve heads will hit against the piston top so do not turn them more than necessary.**

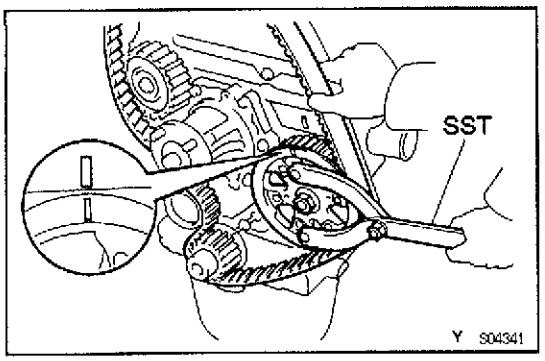


7. INSTALL TIMING BELT

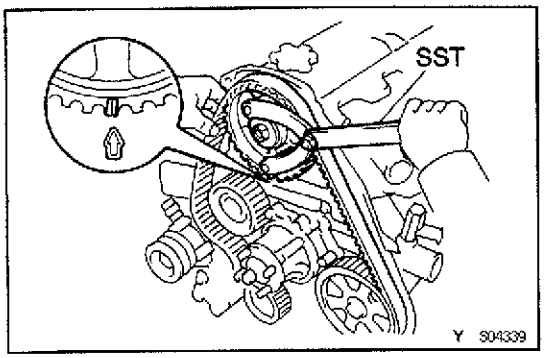
HINT: If re—using the timing belt, align the points marked during removal, and install the timing belt with the arrow pointing in the direction of engine revolution.

(a) Remove any oil or water on each pulleys, and keep them clean.

(b) Install the timing belt on the crankshaft timing and No.1 idler pulleys.



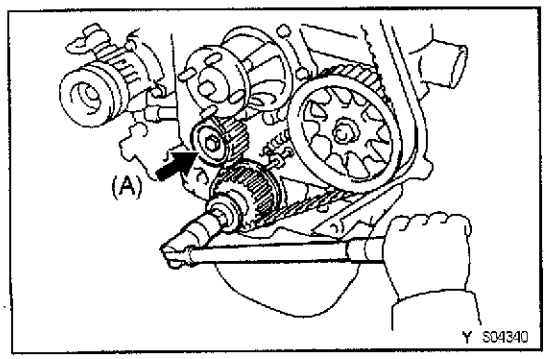
(c) Using SST, slightly turn the injection pump drive pulley clockwise. Hang the timing belt on the drive pulley, and align the timing marks of the drive pulley and timing belt case.
SST 09960—10010 (09962—01000, 09963—01000)



(d) Using SST, slightly turn the camshaft timing pulley clockwise. Hang the timing belt on the timing pulley, and align the timing marks of the timing pulley and timing belt case.
SST 09960—10010 (09962—01000, 09963—01000)

(e) Check that the timing belt has tension between the injection pump drive and camshaft timing pulleys.

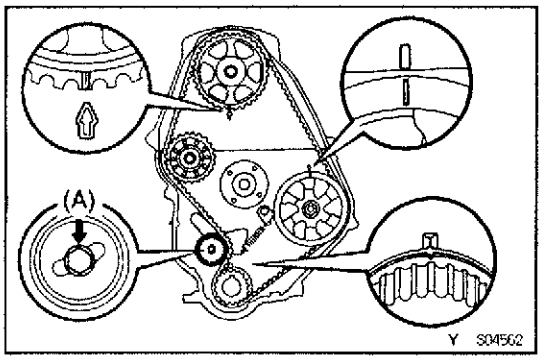
(f) Install the timing belt on the No.2 idler pulley.



8. CHECK VALVE TIMING

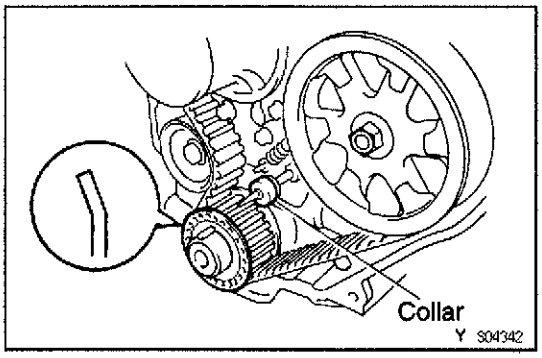
(a) Loosen the No.1 idler pulley bolt (A), and stretch the timing belt.

(b) Slowly turn the crankshaft pulley 2 revolutions from TDC to TDC.
NOTICE: Always turn the crankshaft clockwise.



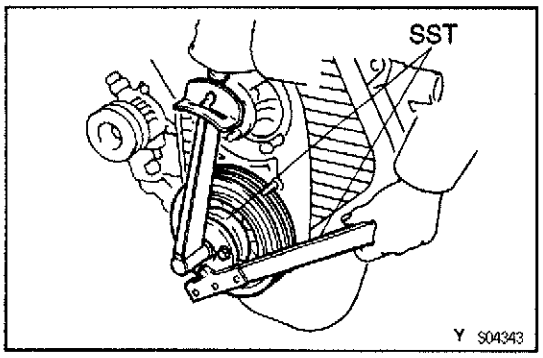
(c) Check that each pulley aligns with the timing marks as shown in the illustration.
If the timing marks do not align, remove the timing belt and reinstall it.

(d) Tighten the No.1 idler pulley bolt (A).
Torque: 44 N·m (450 kgf·cm, 33 ft·lbf)



9. INSTALL TIMING BELT GUIDE
Install the belt guide, facing the cup side outward.

10. INSTALL NO.1 TIMING BELT COVER
(a) Install the collar to the timing pointer.
(b) Install the 2 gaskets to the timing belt cover.
(c) Install the timing belt cover with the 11 bolts.



11. INSTALL CRANKSHAFT PULLEY
(a) Align the pulley set key with the key groove of the pulley, and slide the pulley to the crankshaft.
(b) Using SST, install the pulley bolt.
SST 09213–54015 (91651–60855),
09330–00021
Torque: 235 N·m (2,400 kgf·cm, 173 ft·lbf)

12. INSTALL WATER PUMP PULLEY, FAN, FLUID COUPLING ASSEMBLY AND DRIVE BELTS
(See step 4 in water pump installation in Cooling System)

13. INSTALL GLOW PLUGS
(See steps 14 to 17 in cylinder head installation)