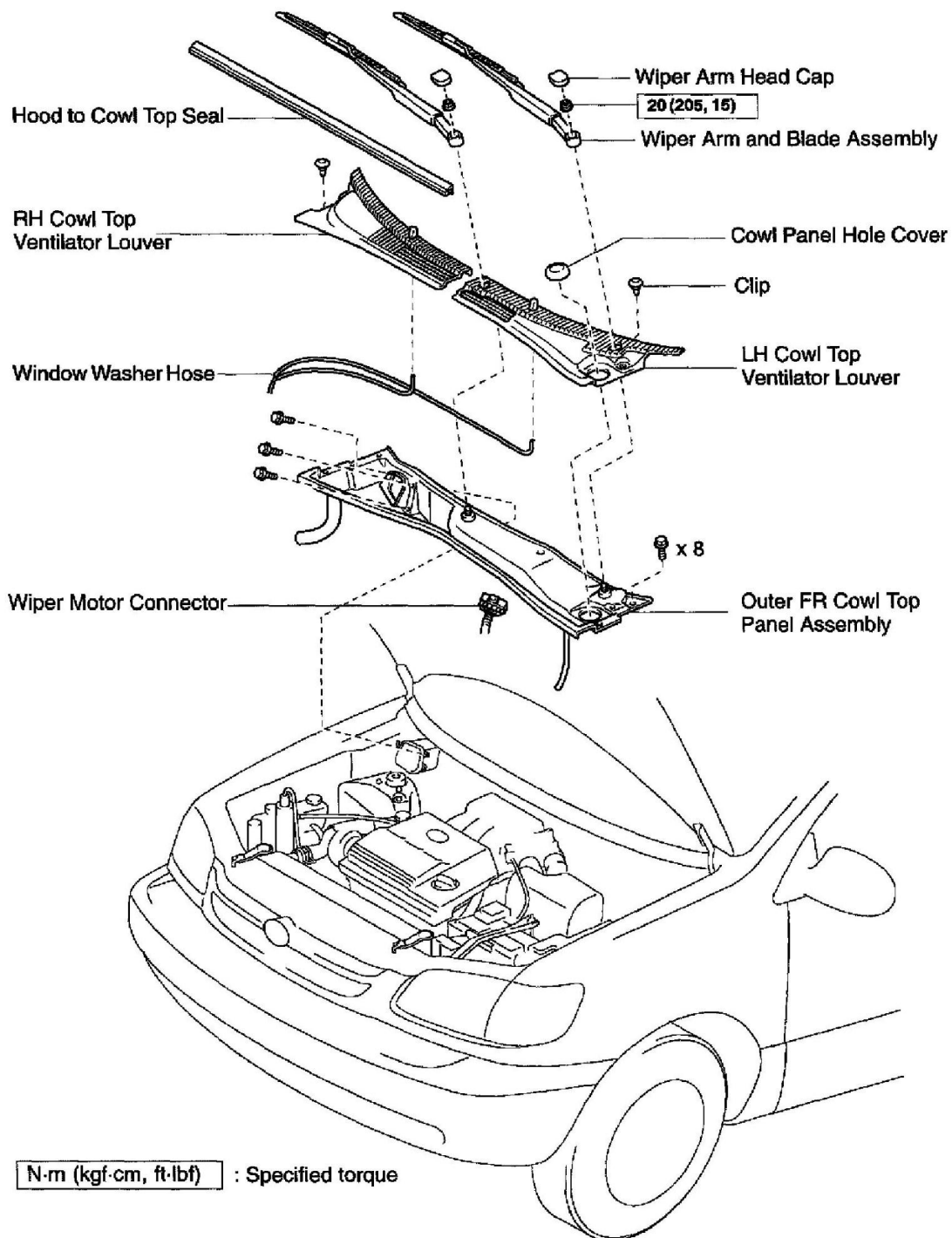
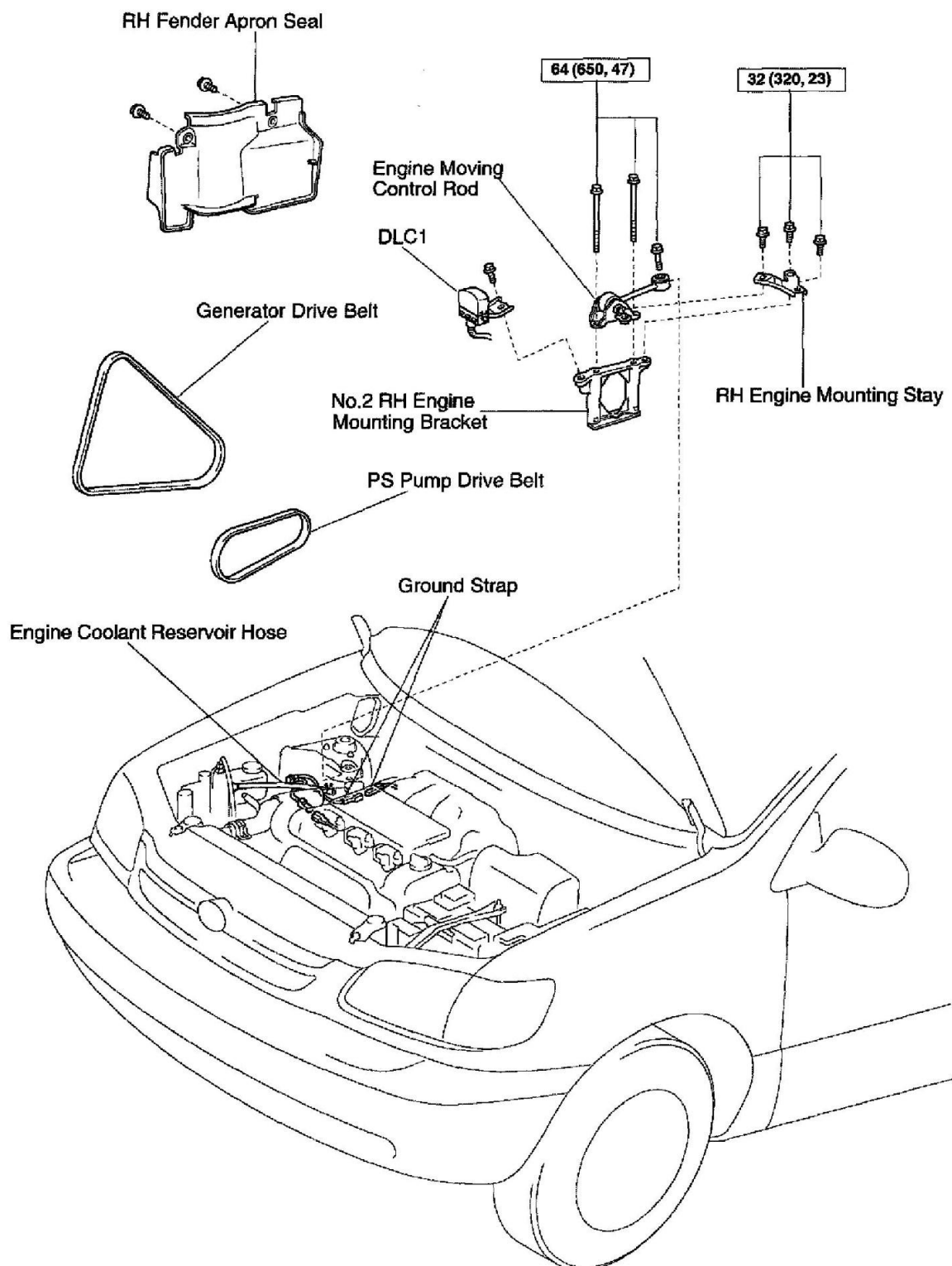




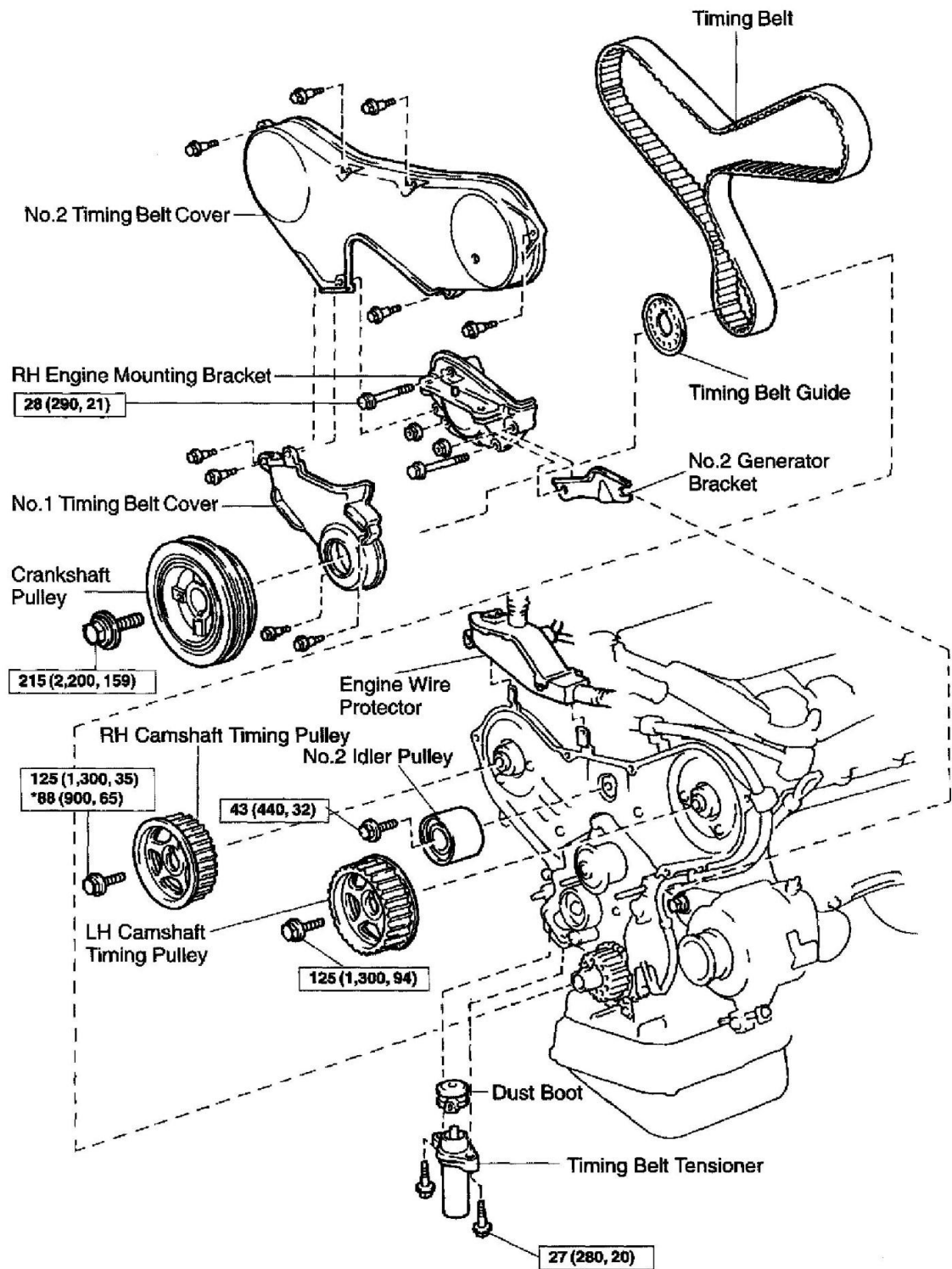
# Toyota Truck Sienna LE V6-3.0L (1MZ-FE) 2002

## Timing Belt: Service and Repair





**N·m (kgf·cm, ft·lbf) : Specified torque**



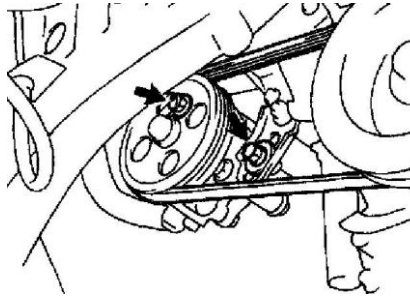
N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

\* For use with SST

## REMOVAL

1. REMOVE OUTER FR COWL TOP PANEL ASSEMBLY
2. REMOVE RH FRONT WHEEL
3. REMOVE RH FENDER APRON SEAL
4. REMOVE GENERATOR DRIVE BELT



5. REMOVE PS PUMP DRIVE BELT

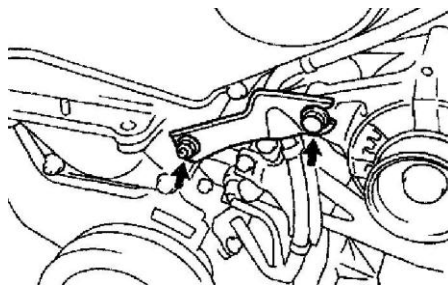
Loosen the 2 bolts, and remove the drive belt.

6. DISCONNECT ENGINE COOLANT RESERVOIR HOSE FROM WATER OUTLET

7. DISCONNECT GROUND STRAP CONNECTORS

8. DISCONNECT DLC1 FROM NO. 2 RH ENGINE MOUNTING BRACKET

9. REMOVE RH ENGINE MOUNTING STAY, ENGINE MOVING CONTROL ROD AND NO. 2 RH ENGINE MOUNTING BRACKET

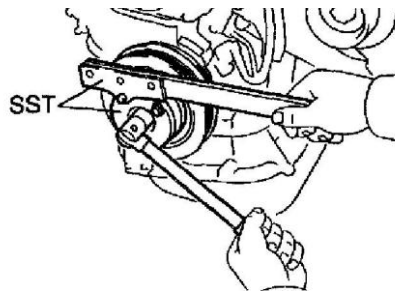


10. REMOVE NO. 2 GENERATOR BRACKET

a. Loosen the generator pivot bolt.

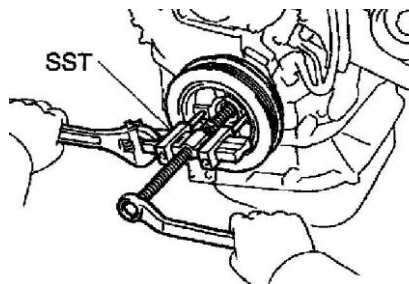
b. Remove the nut and bracket.

11. REMOVE CRANKSHAFT PULLEY



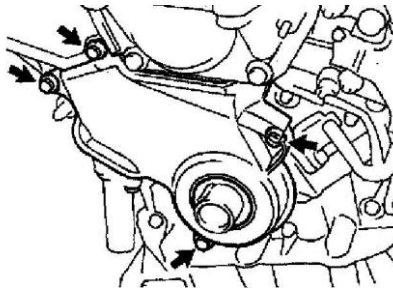
a. Using SST, remove the pulley bolt.

SST 09213-54015 (91651-60855), 09330-00021



b. Using SST, remove the pulley.

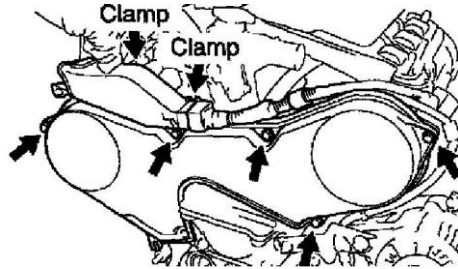
SST 09950-50013 (09951-05010, 09952-05010, 09953-05010, 09953-05020, 09954-05021)



12. REMOVE NO. 1 TIMING BELT COVER

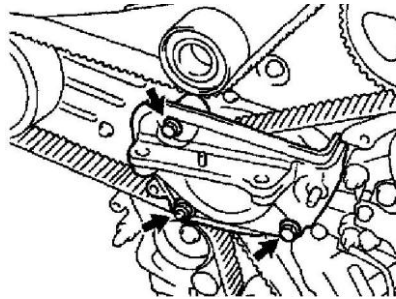
Remove the 4 bolts and timing belt cover.

13. REMOVE TIMING BELT GUIDE



14. REMOVE NO. 2 TIMING BELT COVER

- a. Disconnect the engine wire protector clamps from the NO. 2 timing belt cover.
- b. Remove the 5 bolts and timing belt cover.

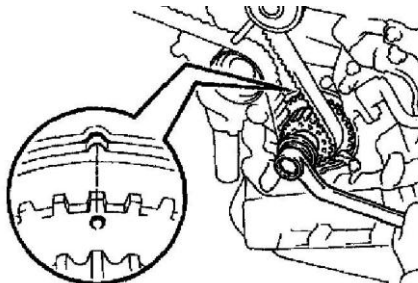


15. REMOVE RH ENGINE MOUNTING BRACKET

Remove the 2 bolts, nut and mounting bracket.

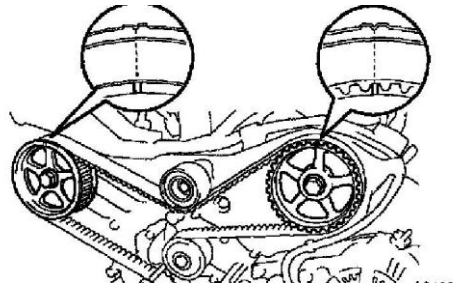
16. SET NO. 1 CYLINDER TO TDC/COMPRESSION

- a. Temporarily install the crankshaft pulley bolt to the crankshaft.

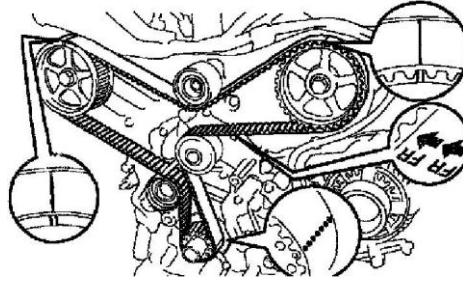


- b. Turn the crankshaft, and align the timing marks of the crankshaft timing pulley and oil pump body.

NOTICE: Always turn the crankshaft clockwise.



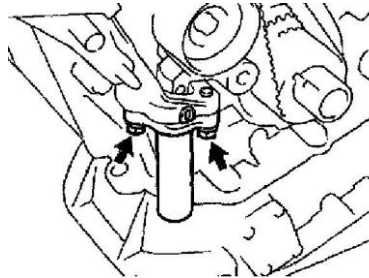
- c. Check that timing marks of the camshaft timing pulleys and NO. 3 timing belt cover are aligned.  
If not, turn the crankshaft 1 revolution (360°).
- d. Remove the crankshaft pulley bolt.



#### 17. IF REUSING TIMING BELT, CHECK INSTALLATION MARKS ON TIMING BELT

Check that there are 3 installation marks and front mark on the timing belt.

If the installation and front marks have disappeared, before removing the timing belt, place 3 new installation marks on the timing belt to match the timing marks of the timing pulleys, and place a new front mark on the timing belt.

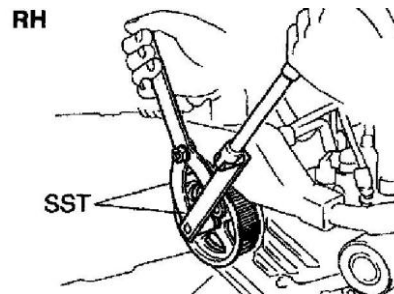


#### 18. REMOVE TIMING BELT TENSIONER

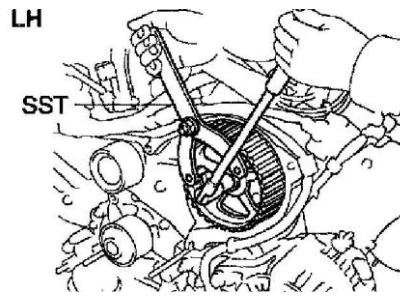
Alternately loosen the 2 bolts, and remove them, the tensioner and dust boot.

#### 19. REMOVE TIMING BELT

#### 20. REMOVE CAMSHAFT TIMING PULLEYS

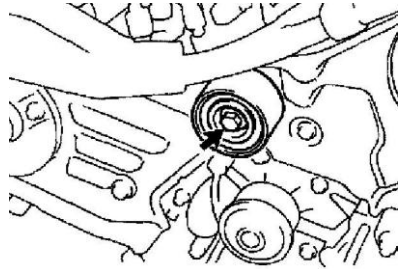


- a. Using SST, remove the bolt and RH timing pulley.  
SST 09249-63010, 09960-10010 (09962-01000, 09963-01000)

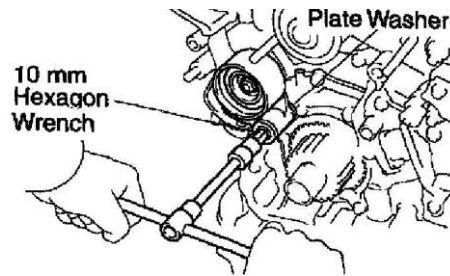


- b. Using SST, remove the LH timing pulley.  
SST 09960-10010 (09962-01000, 09963-01000)

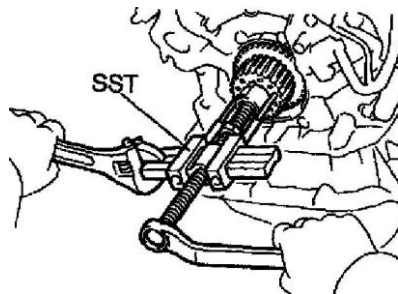
HINT: Arrange the camshaft timing pulleys (RH and LH sides).



- 21. REMOVE NO. 2 IDLER PULLEY  
Remove the bolt and idler pulley.



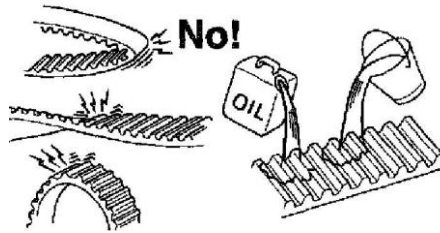
- 22. REMOVE NO. 1 IDLER PULLEY  
Using a 10 mm hexagon wrench, remove the bolt, idler pulley and plate washer.
- 23. REMOVE CRANKSHAFT TIMING PULLEY
  - a. Remove the bolt and timing belt plate.



- b. Using SST, remove the crankshaft timing pulley.  
SST 09950-50013 (09951-05010, 09952-05010, 09953-05010, 09954-05020, 09954-05011)

NOTICE: Do not scratch the sensor part of the crankshaft timing pulley.

## INSPECTION



## 1. INSPECT TIMING BELT

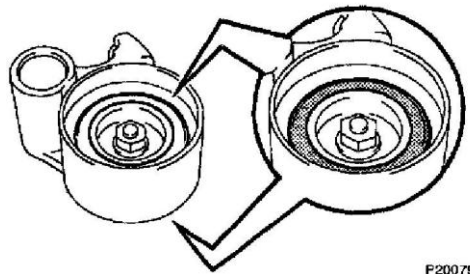
### NOTICE:

- 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 mount bolt of the camshaft timing pulley.

If there are any defects, as shown in the illustrations, check these points: a. Premature parting

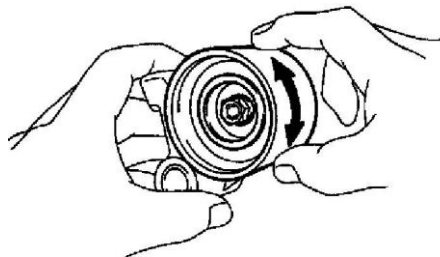
- Check for proper installation.
  - Check the timing cover gasket for damage and proper installation.
  - b. If the belt teeth are cracked or damaged, check to see if either camshaft is locked.
  - c. If there is noticeable wear or cracks on the belt face, check to see if there are nicks on the side 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 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



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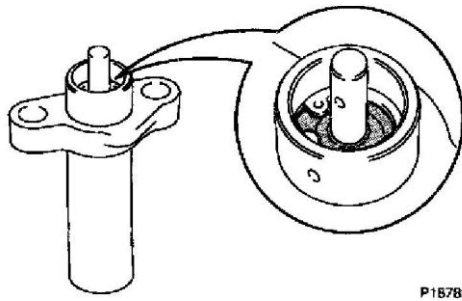
- a. Visually check the seal portion of the idler pulley for oil leakage. If leakage is found, replace the idler pulley.



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

## 3. INSPECT TIMING BELT TENSIONER



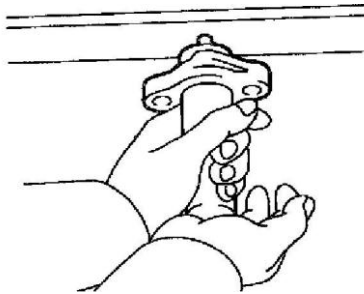


P18782

- a. Visually check the seal portion of the tensioner for oil leakage.

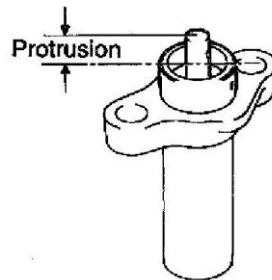
HINT: If there is only the faintest trace of oil on the seal on the push rod side, the tensioner is all right.

If leakage is found, replace the tensioner.



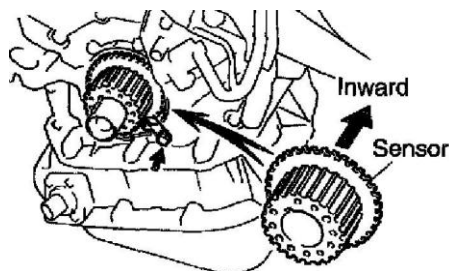
- b. Hold the tensioner with both hands and push the push rod strongly as shown to check that it doesn't move. If the push rod moves, replace the tensioner.

NOTICE: Never hold the tensioner push rod facing downward.



- c. Measure the protrusion of the push rod from the housing end.  
Protrusion: 10.0 - 10.8 mm (0.394 - 0.425 inch)  
If the protrusion is not as specified, replace the tensioner.

## INSTALLATION

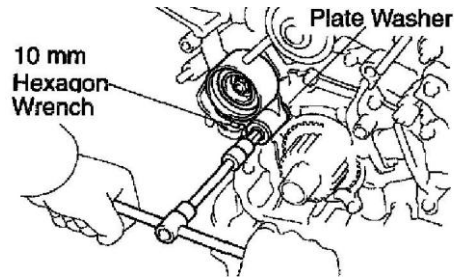


1. INSTALL CRANKSHAFT TIMING PULLEY
  - a. Align the pulley set key with the key groove of the timing pulley, and slide on the timing pulley.
  - b. Install the timing pulley, facing the sensor side inward.

NOTICE: Do not scratch the sensor part of the crankshaft timing pulley.

- c. Install the timing belt plate with the bolt.

Torque: 8.0 Nm (80 kgf-cm, 69 inch lbs.)



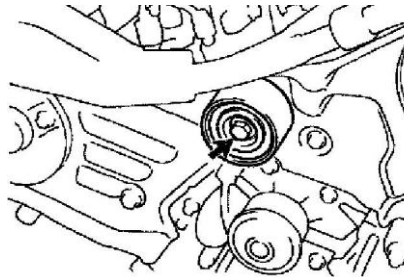
## 2. INSTALL NO. 1 IDLER PULLEY

Adhesive: Part No.08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent

- a. Using a 10 mm hexagon wrench, install the plate washer and idler pulley with the pivot bolt.

Torque: 34 Nm (350 kgf-cm, 25 ft. lbs.)

- b. Check that the pulley bracket moves smoothly.



## 3. INSTALL NO. 2 IDLER PULLEY

- a. Install the idler pulley with the bolt.

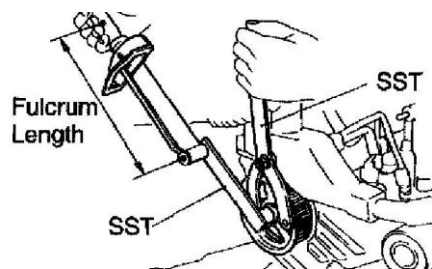
Torque: 43 Nm (440 kgf-cm, 32 ft. lbs.)

- b. Check that the idler pulley moves smoothly.

## 4. INSTALL RH CAMSHAFT TIMING PULLEY

- a. Face the flange side of the timing pulley outward.

- b. Align the knock pin on the camshaft with the knock pin groove of the timing pulley, and slide on the timing pulley.



- c. Using SST, install the pulley bolt.

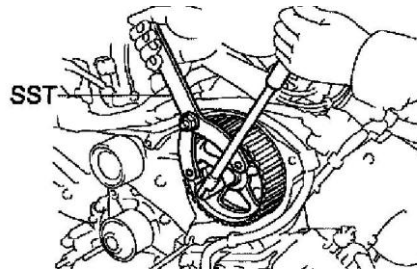
SST 09249-63010, 09960-10010 (09962-01000, 09963-01000) Torque: 88 Nm (900 kgf-cm, 65 ft. lbs.)

HINT: Use a torque wrench with a fulcrum length of 340 mm (13.39 inch).

## 5. INSTALL LH CAMSHAFT TIMING PULLEY

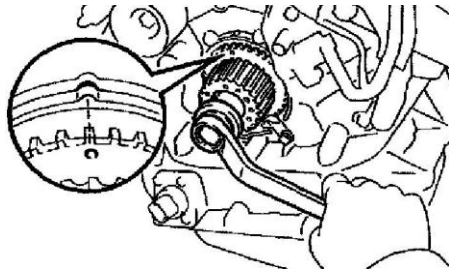
- a. Face the flange side of the timing pulley inward.

- b. Align the knock pin on the camshaft with the knock pin groove of the timing pulley, and slide on the timing pulley.

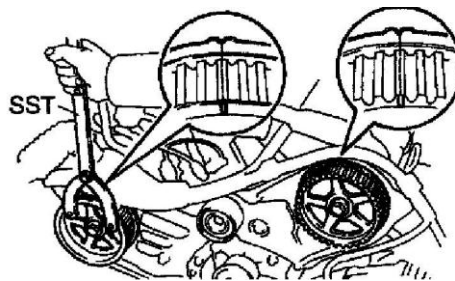


- c. Using SST, install the pulley bolt.  
 SST 09960-10010 (09962-01000, 09963-01000)  
 Torque: 125 Nm (1,300 kgf-cm, 94 ft. lbs.)

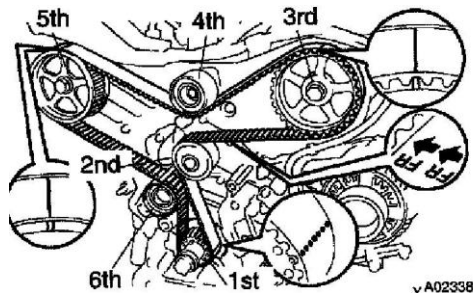
6. SET NO. 1 CYLINDER TO TDC/COMPRESSION



- a. Crankshaft Timing Pulley Position:
  - Temporarily install the crankshaft pulley bolt to the crankshaft.
  - Turn the crankshaft, and align the timing marks of the crankshaft timing pulley and oil pump body.



- b. Camshaft Timing Pulley Positions: Using SST, turn the camshaft pulley, align the timing marks of the timing pulley and NO. 3 timing belt cover.  
 SST 09960-10010 (09962-01000, 0996-01000)



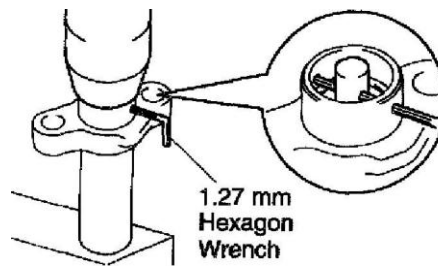
7. INSTALL TIMING BELT

NOTICE: The engine should be cold.

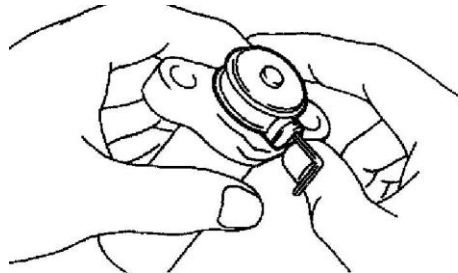
- a. Remove any oil or water on the pulleys, and keep them clean.

NOTICE: Only wipe the pulleys; do not use any cleansing agent.

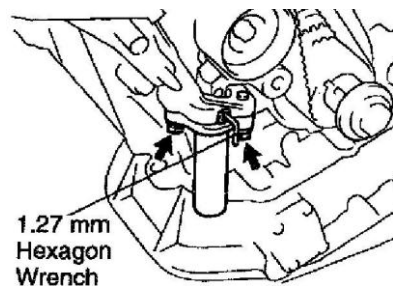
- b. Face the front mark on the timing belt forward.
  - c. Align the installation mark on the timing belt with the timing mark of the crankshaft timing pulley.
  - d. Align the installation marks on the timing belt with the timing marks of the camshaft timing pulleys. e. Install the timing belt in this order:
    - 1st: Crankshaft timing pulley
    - 2nd: Water pump pulley
    - 3rd: LH camshaft timing pulley
    - 4th: NO. 2 idler pulley
    - 5th: RH camshaft timing pulley
    - 6th: NO. 1 idler pulley
8. SET TIMING BELT TENSIONER



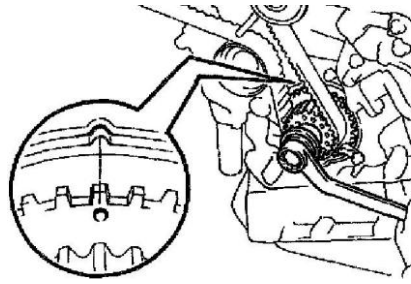
- a. Using a press, slowly press in the push rod using 981 - 9,807 N (100 - 1,000 kgf, 200 - 2,205 lbs) of pressure.
- b. Align the holes of the push rod and housing, pass a 1.27 mm hexagon wrench through the holes to keep the setting position of the push rod. c. Release the press.



- d. install the dust boot to the tensioner.

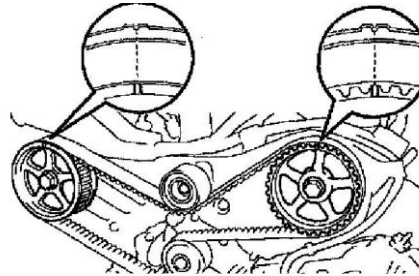


9. INSTALL TIMING BELT TENSIONER
- a. Temporarily install the tensioner with the 2 bolts.
  - b. Alternately tighten the 2 bolts.  
Torque: 27 Nm (280 kgf-cm, 20 ft. lbs.)
  - c. Remove the 1.27 mm hexagon wrench from the tensioner.
10. CHECK VALVE TIMING



- a. Slowly turn the crankshaft 2 revolutions, and align the timing marks of the crankshaft timing pulley and oil pump body.

NOTICE: Always turn the crankshaft clockwise.



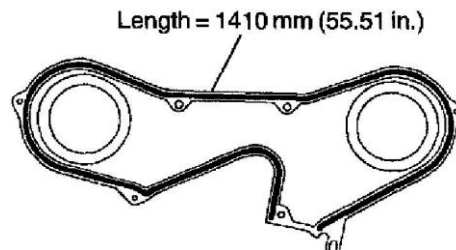
- b. Check that the timing marks of the RH and LH timing pulleys with the timing marks of the NO. 3 timing belt cover as shown in the illustration.

If the marks do not align, remove the timing belt and reinstall it.

- c. Remove the crankshaft pulley bolt.

#### 11. INSTALL RH ENGINE MOUNTING BRACKET

Torque: 28 Nm (290 kgf-cm, 21 ft. lbs.)



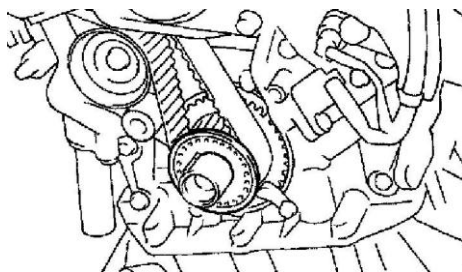
#### 12. INSTALL NO. 2 TIMING BELT COVER

- a. Check that the timing belt cover gasket has no cracks or peeling, etc. If the gasket has cracks or peeling, etc., replace it using these steps:

- Using a screwdriver and gasket scraper, remove all the old gasket material.
- Thoroughly clean all components to remove all the loose material.
- Remove the backing paper from a new gasket and install the gasket evenly to the part of the timing belt cover shaded black in the illustration.
- After installing the gasket, press down on it so that the adhesive firmly sticks to the timing belt cover.

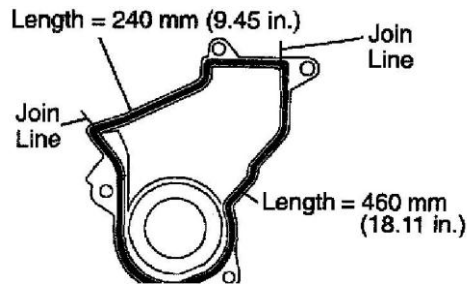
Torque: 8.5 Nm (85 kgf-cm, 74 inch lbs.)

- c. Install the engine wire protector clamps to the NO. 3 timing belt cover.



### 13. INSTALL TIMING BELT GUIDE

Install the timing belt guide, facing the cup side outward.



### 14. INSTALL NO. 1 TIMING BELT COVER

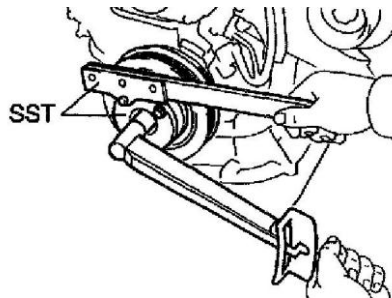
- a. Check that the timing belt cover gaskets have cracks or peeling, etc.

If the gasket has cracks or peeling, etc., replace it using these steps:

- Using a screwdriver and gasket scraper, remove all the old gasket material.
- Thoroughly clean all components to remove all the loose material.
- Remove the backing paper from a new gasket and install the gasket evenly to the part of the timing belt cover shaded black in the illustration.

NOTICE: When joining 2 gaskets, do not leave a gap between them. Cut off any excess gasket.

- After installing the gasket, press down on it so that the adhesive firmly sticks to the timing belt cover. b. Install the timing belt cover with the 4 bolts. Torque: 8.5 Nm (85 kgf-cm, 74 inch lbs.)

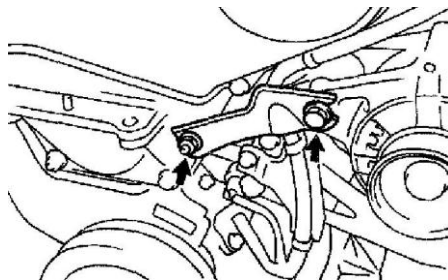


### 15. INSTALL CRANKSHAFT PULLEY

- a. Align the pulley set key with the key groove of the pulley, and slide on the pulley. b. Using SST, install the pulley bolt.

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Torque: 215 Nm (2,200 kgf-cm, 159 ft. lbs.)



### 16. INSTALL NO. 2 GENERATOR BRACKET

Install the generator bracket with the pivot bolt and nut. Do not tighten the bolt yet. Torque: (Nut): 28 Nm (290 kgf-cm, 21 ft. lbs.)

17. INSTALL NO. 2 RH ENGINE MOUNTING BRACKET, ENGINE MOVING CONTROL ROD AND RH ENGINE MOUNTING STAY 18. CONNECT DLC1 TO NO. 2 RH ENGINE MOUNTING BRACKET

### 19. CONNECT GROUND STRAP CONNECTORS

### 20. CONNECT ENGINE COOLANT RESERVOIR HOSE TO WATER OUTLET

### 21. INSTALL PS PUMP DRIVE BELT

### 22. INSTALL GENERATOR DRIVE BELT

23. INSTALL RH FENDER APRON SEAL
24. INSTALL RH FRONT WHEEL
25. INSTALL OUTER FR COWL TOP PANEL ASSEMBLY
26. VEHICLE ROAD TEST

Check for abnormal noise, shock, slippage, correct shift points and smoothly operation.