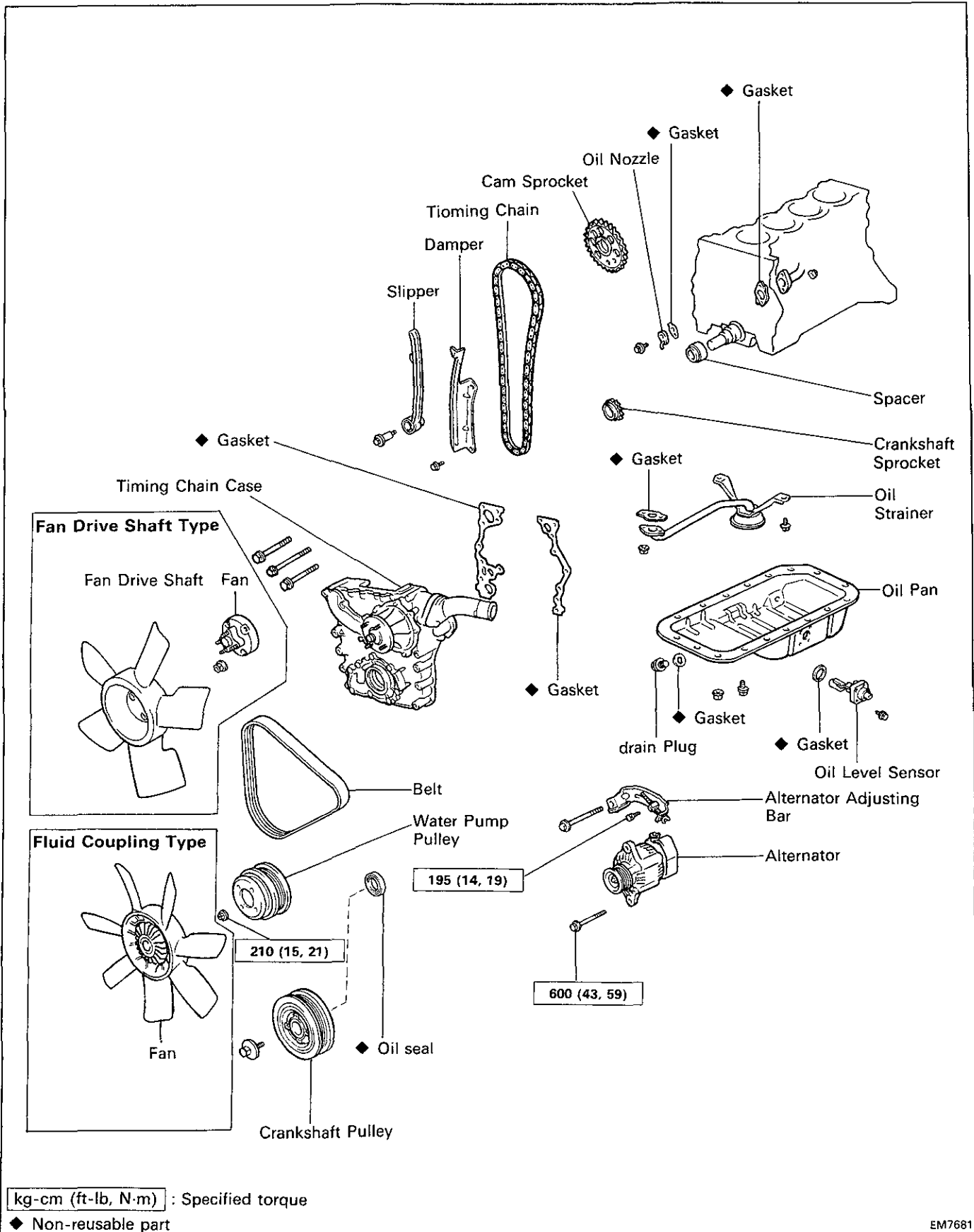
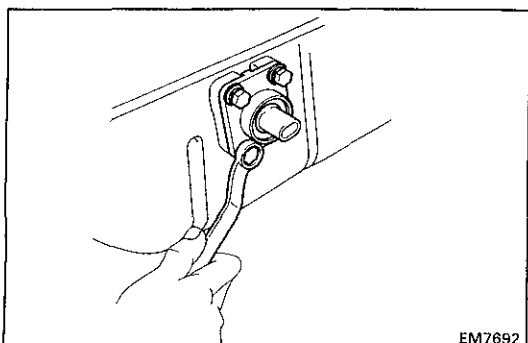
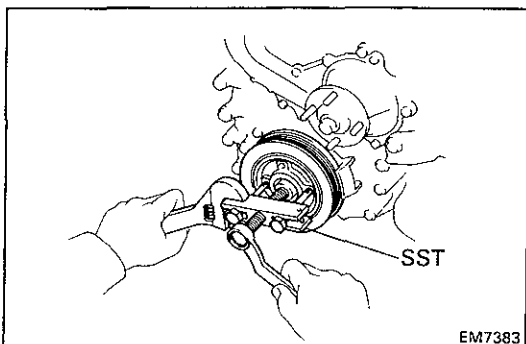
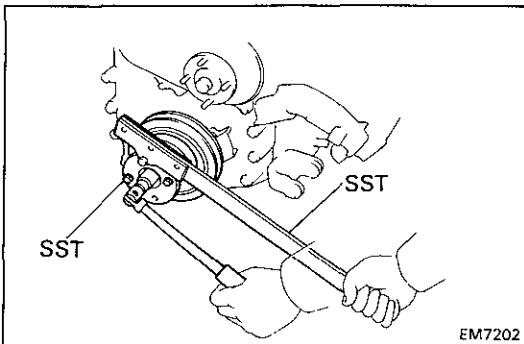
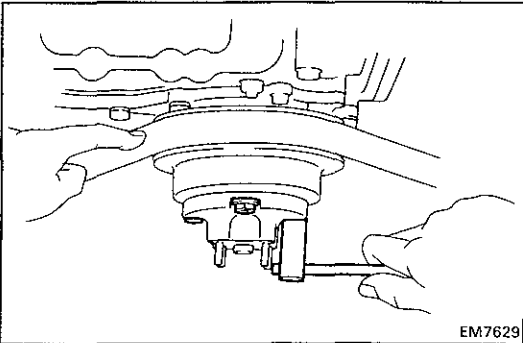
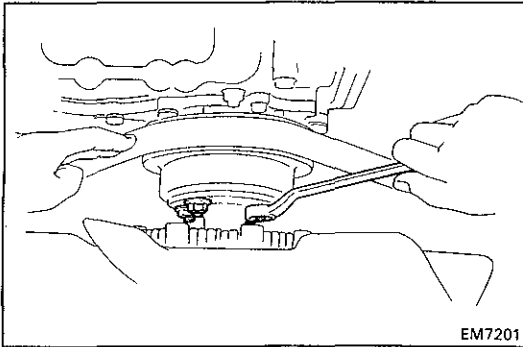


# TIMING CHAIN COMPONENTS





## REMOVAL OF TIMING CHAIN

1. **REMOVE CYLINDER HEAD**  
(1RZ, 2RZ: See steps 1 to 9 on pages EM-39 to 41)  
(2RZ-E: See steps 1 to 9 on pages EM-65, 66)
2. **(FLUID COUPLING TYPE)**  
**REMOVE FLUID COUPLING WITH FAN AND WATER PUMP PULLEY**
  - (a) Loosen the four water pump pulley set nuts.
  - (b) Loosen the belt adjusting bolt and pivot bolt of the alternator, and remove the drive belt.
  - (c) Remove the four set nuts, fluid coupling with fan and water pump pulley.

### (FAN DRIVE SHAFT TYPE)

- (a) Remove the four nuts and fan.
- (b) Loosen the belt adjusting bolt and pivot bolt of the alternator, and remove the drive belt.
- (c) Remove the four nuts, fan drive shaft and water pump pulley.

## 3. REMOVE ALTERNATOR

## 4. REMOVE CRANKSHAFT PULLEY

- (a) Using SSTs to hold the crankshaft pulley, loosen the pulley bolt.

SST 09213-70010 and 09330-00021

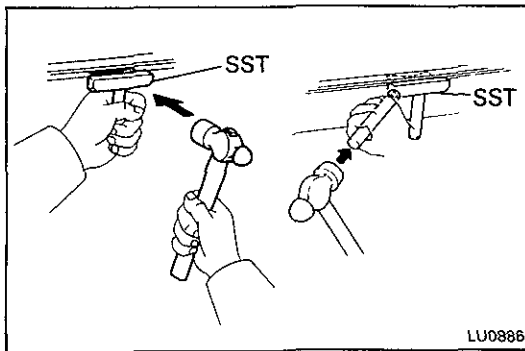
- (b) Remove SSTs and pulley bolt.

- (c) Using SST, remove the crankshaft pulley.

SST 09213-31021

## 5. REMOVE OIL PAN

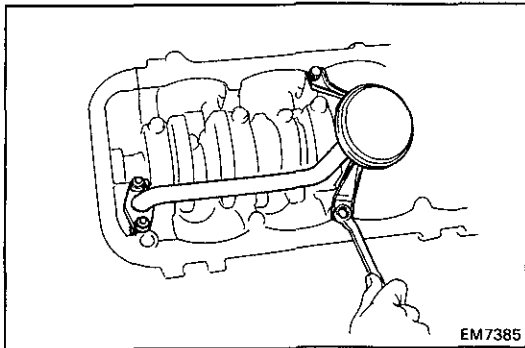
- (a) Remove the four bolts, oil level sensor and gasket.  
**CAUTION:** Be careful not to drop the oil level sensor when removing it.



- (a) Remove the sixteen bolts and two nuts.
- (b) Using SST and a brass bar, separate the oil pan from the cylinder block.

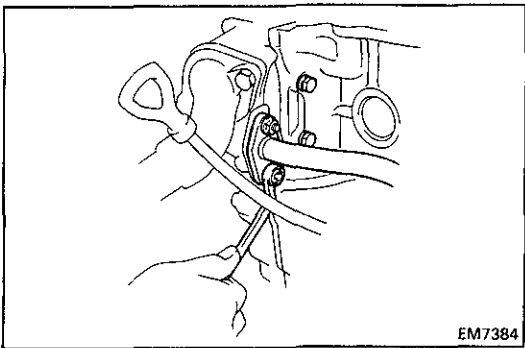
SST 09032-00100

HINT: When removing the oil pan, be careful not to damage the oil pan flange.



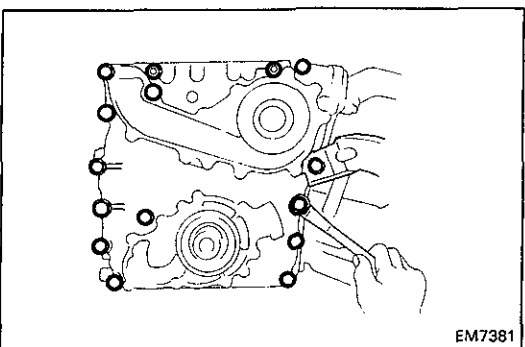
#### 6. REMOVE OIL STRAINER

Remove the two bolts and two nuts, and remove the oil strainer and gasket.



#### 7. REMOVE TIMING CHAIN CASE

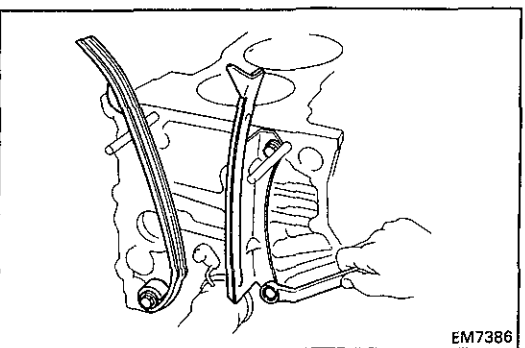
- (a) Remove the two water by-pass pipe mounting nuts.
- (b) Remove the two bolts.



- (c) Remove the two nuts, thirteen bolts and alternator adjusting bar.
- (d) Using a plastic-faced hammer, loosen the chain cover and remove the timing chain case and three gasket.

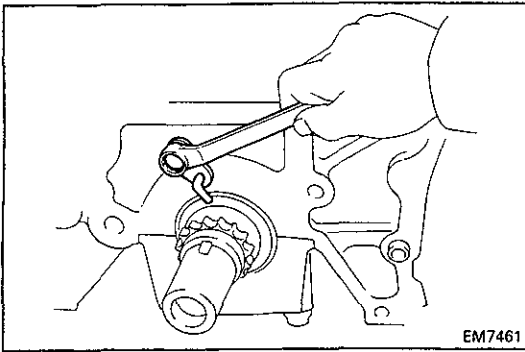
#### 8. REMOVE TIMING CHAIN AND CAMSHAFT SPROCKET

Remove the cam sprocket and chain together.

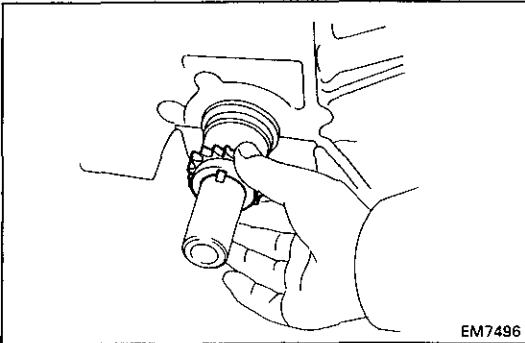
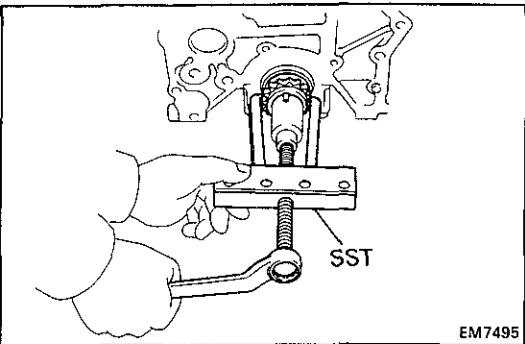


#### 9. REMOVE CHAIN SLIPER AND DAMPER

- (a) Remove the bolt and chain sliper.
- (b) Remove the two bolts and chain damper.

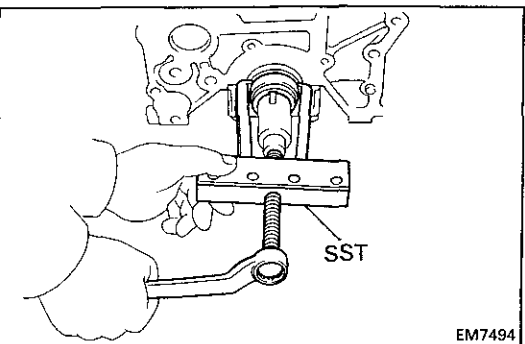
**10. REMOVE OIL NOZZLE**

Remove the bolt, oil nozzle and gasket.

**11. REMOVE CRANKSHAFT SPROCKET**

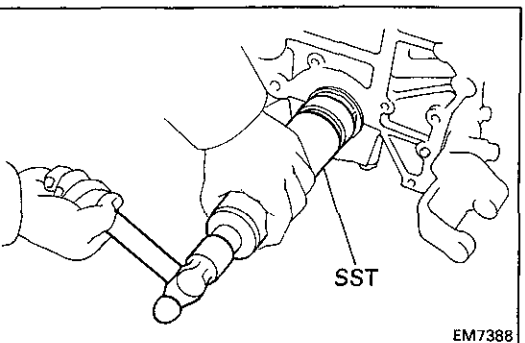
HINT: If the sprocket cannot be removed by hand, use SST to remove them together.

SST 09213-36020

**12. IF NECESSARY, REPLACE SPACER**

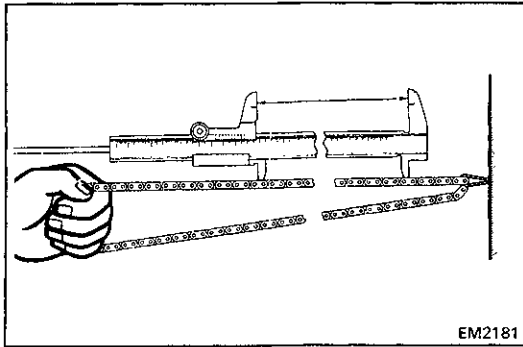
(a) Using SST, remove the spacer.

SST 09213-36020



(b) Using SST, install the spacer.

SST 09608-35014 (09608-06040)



## INSPECTION OF COMPONENTS

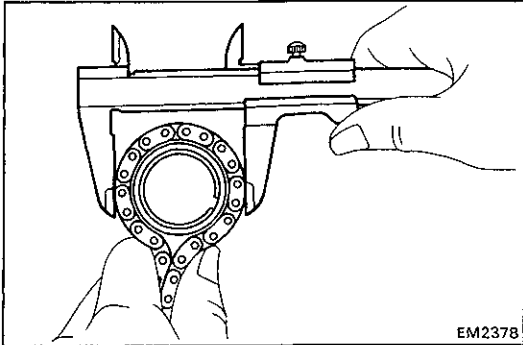
### 1. MEASURE CHAIN AND SPROCKET WEAR

- (a) Measure the length of 16 links with the chain fully stretched.
- (b) Make the same measurements at least three other places selected at random.

Chain elongation limit at 16 links:

**146.6 mm (5.772 in.)**

If over the limit at any place, replace the chain.

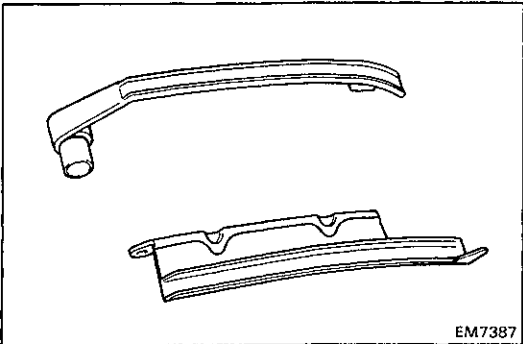


- (c) Wrap the chain around the sprocket.
- (d) Using calipers, measure the outer sides of the chain rollers as shown. Measure both sprockets.

Minimum crankshaft sprocket: **59.4 mm (2.339 in.)**

Minimum camshaft sprocket: **113.8 mm (4.480 in.)**

If the measurement is less than minimum, replace the chain and two sprockets.

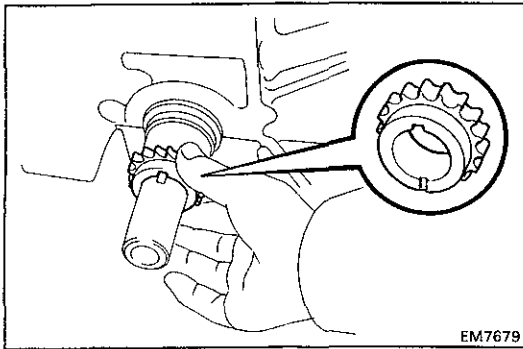


### 2. MEASURE CHAIN DAMPER AND SLIPPER

Using a micrometer, measure the damper and slipper.

Maximum wear: **1.0 mm (0.039 in.)**

If damper and slipper is worn or greater than maximum, replace the damper and/or slipper.



## INSTALLATION OF TIMING CHAIN

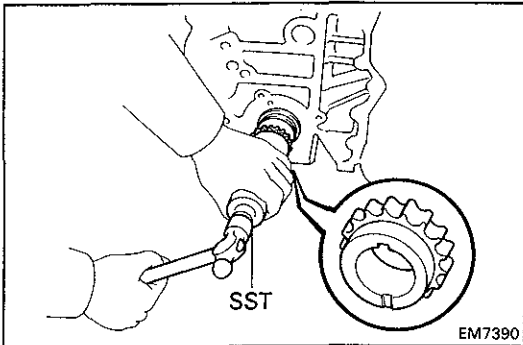
(See page EM-72)

### 1. INSTALL CRANKSHAFT SPROCKET AND CHAIN

- (a) Turn the crankshaft until the shaft key is on top.
- (b) Slide the sprocket over the key on the crankshaft.

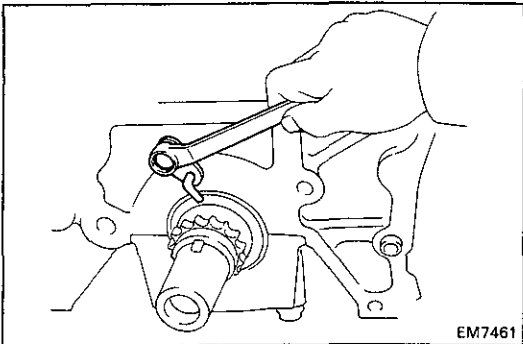
**HINT:** If the crankshaft sprocket is difficult to install by hand, install using SST.

SST 09608-35014 (09608-06040)



### 2. INSTALL OIL NOZZLE

Install the oil nozzle and a new gasket with the bolt.



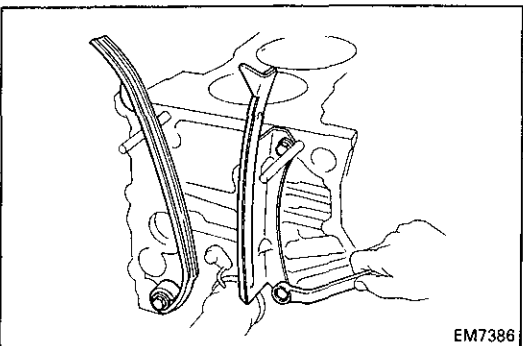
### 3. INSTALL CHAIN DAMPER AND SLIPER

- (a) Install the chain damper with the two bolts.

**Torque:** 185 kg-cm (13 ft-lb, 18 N·m)

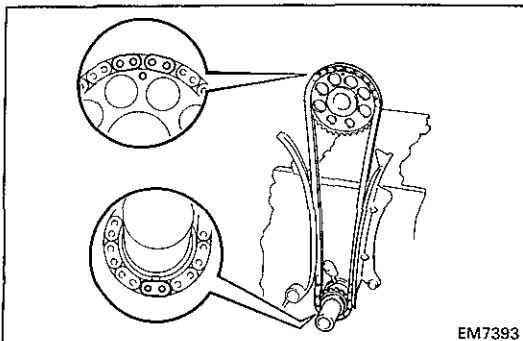
- (b) Install the chain sliper with the bolt.

**Torque:** 270 kg-cm (20 ft-lb, 26 N·m)

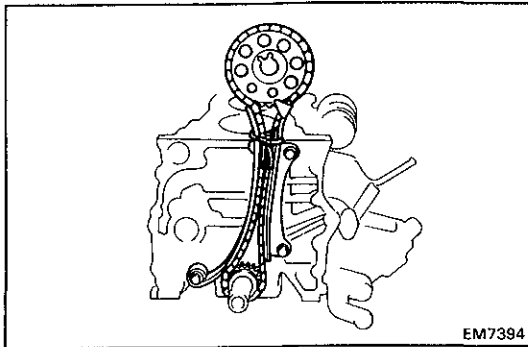


### 4. PLACE CHAIN AND CRANKSHAFT SPROCKET

- (a) Place the timing chain on the camshaft sprocket so that the timing mark is bright chain links.

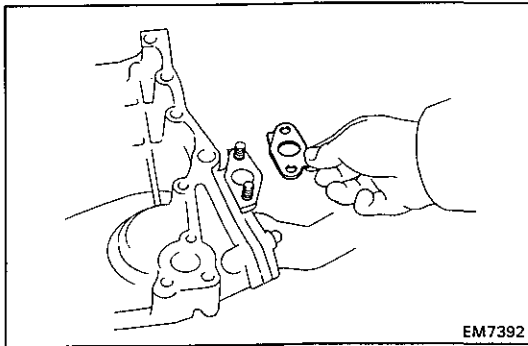


- (b) Place the timing chain on the crankshaft sprocket with the single bright link aligned with the timing mark on the crankshaft sprocket.
- (c) Make sure the chain is positioned damper and sliper.
- (d) Turn the camshaft sprocket counterclockwise to take the slack out of the chain.



EM7394

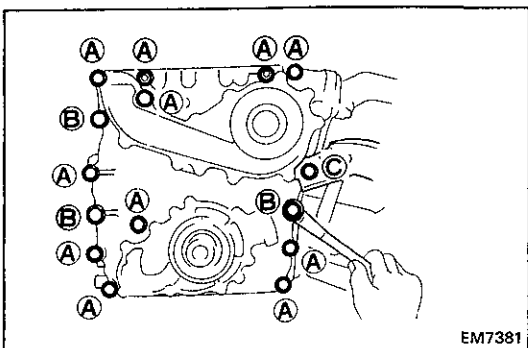
- (e) Tie the timing chain with a cord as shown in the illustration and make sure it doesn't come loose.



EM7392

#### 5. INSTALL TIMING CHAIN CASE

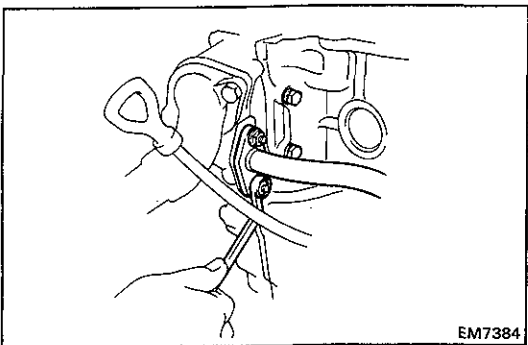
- (a) Clean the gasket surface.
- (b) Install two new gaskets over the dowels.
- (c) Install a new gasket for water by-pass pipe to the timing chain case.



EM7381

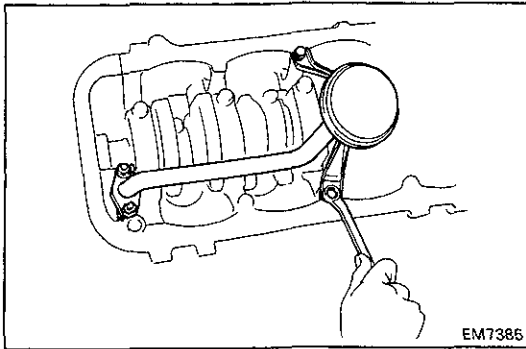
- (d) Slide the timing case over the dowels.
- (e) Install the alternator adjusting bar and bolts and nuts as shown and torque them.

Torque: **A** 200 kg-cm (14 ft-lb, 20 N·m)  
**B** 420 kg-cm (30 ft-lb, 41 N·m)  
**C** 440 kg-cm (32 ft-lb, 43 N·m)



EM7384

- (f) Install and torque the two bolts.  
 Torque: 185 kg-cm (13 ft-lb, 18 N·m)
- (g) Connect the water by-pass pipe, and install and torque the two nuts.  
 Torque: 200 kg-cm (14 ft-lb, 20 N·m)



## 6. INSTALL OIL STRAINER

Install the oil strainer and a new gasket with the two bolts and two nuts.

**Torque:** Bolt 185 kg-cm (13 ft-lb, 18 N·m)  
Nut 200 kg-cm (14 ft-lb, 20 N·m)

## 7. INSTALL OIL PAN

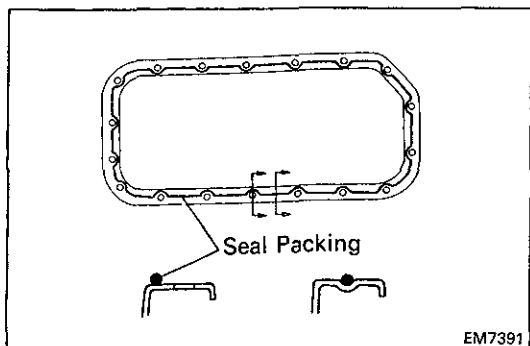
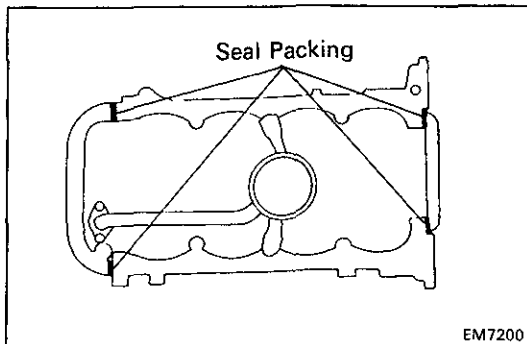
(a) Remove any old packing material and be careful not to drop any oil on the contacting surfaces of the oil pan and cylinder block.

- Using a razor blade and gasket scraper, remove all the packing (FIPG) material from the gasket surfaces.
- Thoroughly clean all components to remove all the loose material.
- Clean both sealing surfaces with a non-residue solvent.

**NOTICE:** Do not use a solvent which will affect the painted surfaces.

(b) Apply seal packing to the joint part of the cylinder block and rear oil seal retainer.

**Seal packing:** Part No.08826-00080 or equivalent



(c) Apply seal packing to the oil pan as shown in the figure.

**Seal packing:** Part No.08826-00080 or equivalent

- Install a nozzle that has been cut to a 5-mm (0.20 in.) opening.

**HINT:** Avoid applying an excess amount to the surface. Be especially careful near oil passages.

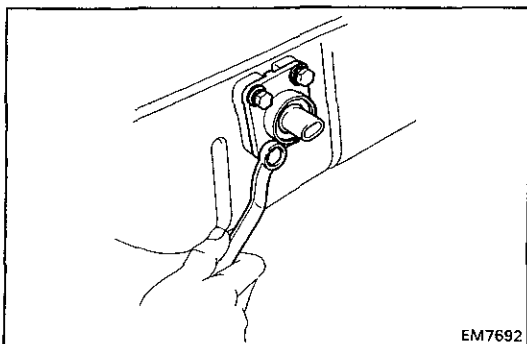
- Parts must be assembled within 5 minutes of application. Otherwise, the material must be removed and re-applied.
- Immediately remove nozzle from tube and reinstall cap.

(d) Install the oil pan over the studs on the block with sixteen bolts and two nuts. Torque the bolts and nuts.

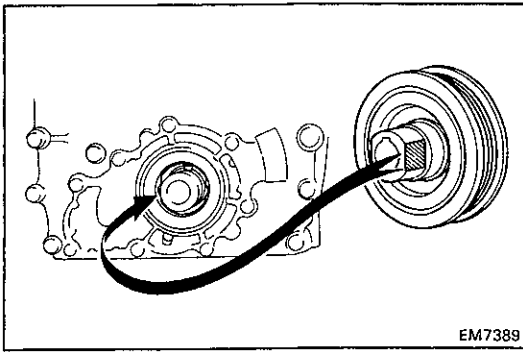
**Torque:** 130 kg-cm (9 ft-lb, 13 N·m)

(e) Install a new gasket and the oil level gauge with the four bolts.

**CAUTION:** Be careful not to drop the oil level sensor when installing it.







EM7389

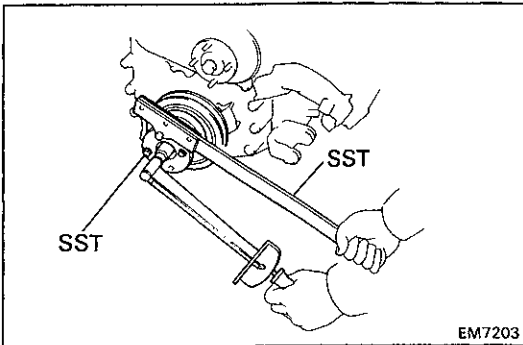
## 8. INSTALL CRANKSHAFT PULLEY

- (a) Install the crankshaft pulley to the crankshaft with the spline teeth of the crankshaft pulley engaged with the large teeth of the oil pump.
- (b) Rotate the crankshaft pulley to left and right and check that the key groove of the crankshaft pulley correctly fits the crankshaft key.
- (c) Install the crankshaft pulley bolt.

- (d) Using SSTs to hold the crankshaft pulley, torque the bolt.

SST 09213-70010 and 09330-00021

Torque: 2,500 kg-cm (181 ft-lb, 245 N·m)

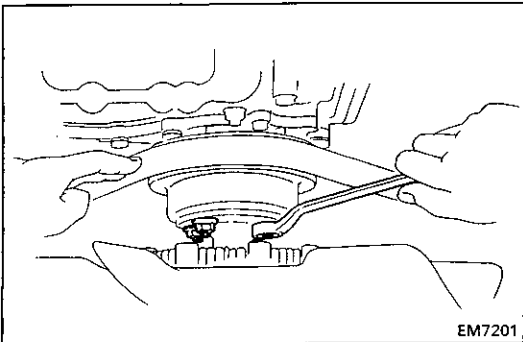


EM7203

## 9. INSTALL ALTERNATOR

### 10. (FLUID COUPLING TYPE) INSTALL WATER PUMP PULLEY AND FLUID COUPLING WITH FAN

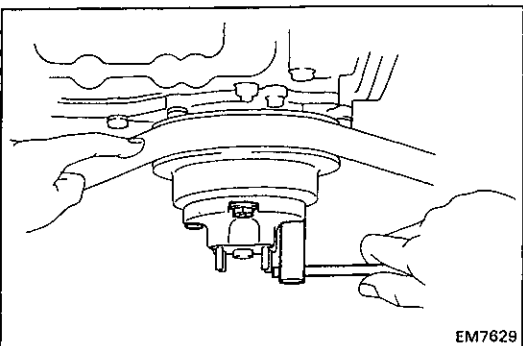
- (a) Temporarily install the water pump pulley and fluid coupling with fan with four nuts.
- (b) Place the drive belt on to each pulley.
- (c) Stretch the belt tight and tighten the four nuts.



EM7201

### (FAN DRIVE SHAFT TYPE)

- (a) Temporarily install the water pump pulley and fan drive shaft with four nuts.
- (b) Place the drive belt on to each pulley.
- (c) Stretch the belt tight and tighten the four nuts.
- (d) Install the fan with the four nuts.



EM7629

## 11. REMOVE CORD FROM TIMING CHAIN

## 12. INSTALL CYLINDER HEAD

(1RZ, 2RZ: See steps 1 to 11 on pages EM-59 to 63)  
(2RZ-E: See steps 1 to 11 on pages EM-70, 71)

## 13. ADJUST DRIVE BELTS