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| <b>Last Modified:</b> 4-17-2018                                                               | 6.8:8.0.48           | <b>Doc ID:</b> RM0000030XO00HX       |
| <b>Model Year Start:</b> 2010                                                                 | <b>Model:</b> Tundra | <b>Prod Date Range:</b> [04/2009 - ] |
| <b>Title:</b> 3UR-FE ENGINE MECHANICAL: ENGINE UNIT: DISASSEMBLY; 2010 MY Tundra [04/2009 - ] |                      |                                      |

## DISASSEMBLY

### 1. REMOVE OIL FILTER ELEMENT [INFO](#)

### 2. REMOVE NO. 1 OIL COOLER BRACKET (w/ Oil Cooler) [INFO](#)

### 3. REMOVE OIL FILTER BRACKET (w/ Oil Cooler) [INFO](#)

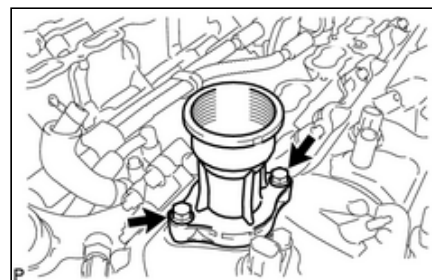
### 4. REMOVE OIL FILTER BRACKET (w/o Oil Cooler) [INFO](#)

### 5. REMOVE CRANKSHAFT PULLEY [INFO](#)

### 6. REMOVE OIL FILLER CAP SUB-ASSEMBLY

### 7. REMOVE OIL FILLER CAP HOUSING

(a) Remove the 2 bolts, filler cap housing and gasket.

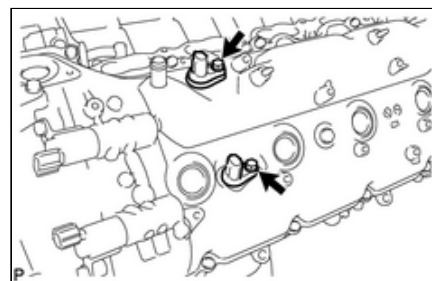


### 8. REMOVE SPARK PLUG

### 9. REMOVE VVT SENSOR

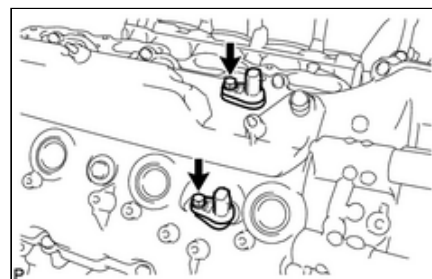
(a) LH:

Remove the 2 bolts and 2 VVT sensors.



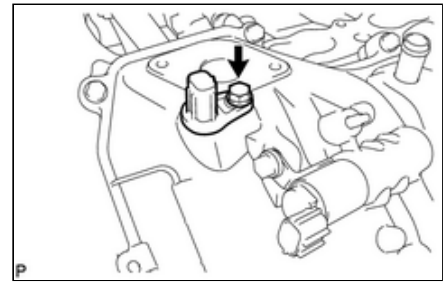
(b) RH:

Remove the 2 bolts and 2 VVT sensors.



### 10. REMOVE CAMSHAFT POSITION SENSOR

(a) Remove the bolt and camshaft position sensor.



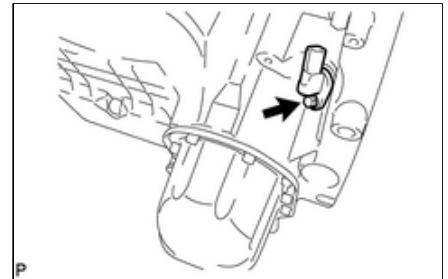
## 11. REMOVE CRANK POSITION SENSOR PROTECTOR

- (a) Remove the 2 bolts and sensor protector.



## 12. REMOVE CRANKSHAFT POSITION SENSOR

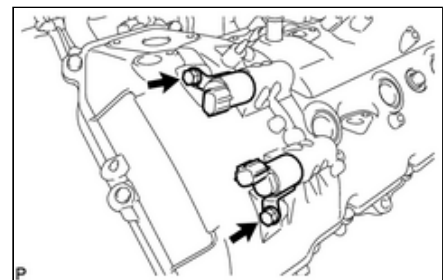
- (a) Remove the bolt and crankshaft position sensor.



## 13. REMOVE CAMSHAFT OIL CONTROL VALVE ASSEMBLY

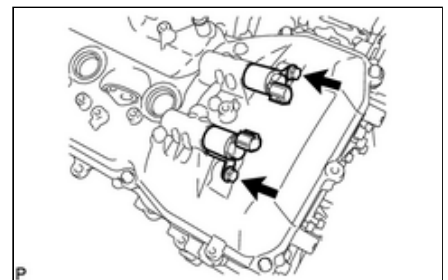
- (a) LH:

Remove the 2 bolts and 2 oil control valves.



- (b) RH:

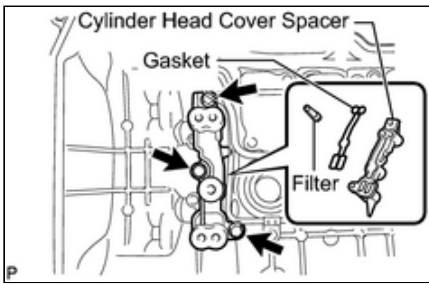
Remove the 2 bolts and 2 oil control valves.



## 14. REMOVE CYLINDER HEAD COVER SUB-ASSEMBLY LH INFO

## 15. REMOVE CYLINDER HEAD COVER SUB-ASSEMBLY RH INFO

## 16. REMOVE OIL CONTROL VALVE FILTER

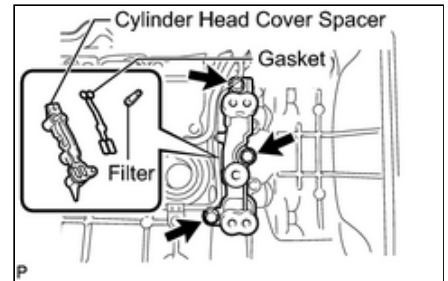


(a) LH:

Remove the 3 bolts, cylinder head cover spacer, gasket and valve filter.

(b) RH:

Remove the 3 bolts, cylinder head cover spacer, gasket and valve filter.



## 17. REMOVE SPARK PLUG TUBE GASKET

(a) Bend the 4 ventilation baffle plate claws on the cylinder head cover to an angle of 90° or more.

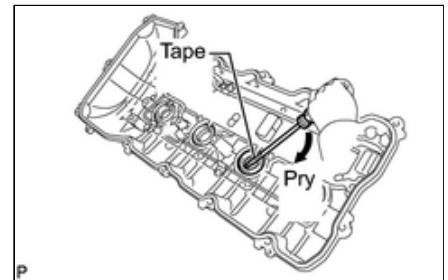
(b) Using a screwdriver, pry out the gaskets.

### NOTICE:

Be careful not to damage the cylinder head cover.

### HINT:

- Be careful not to damage the gasket when removing it, as the removed gasket needs to be used when installing a new one.
- Tape the screwdriver tip before use.



## 18. REMOVE WATER PUMP ASSEMBLY INFO

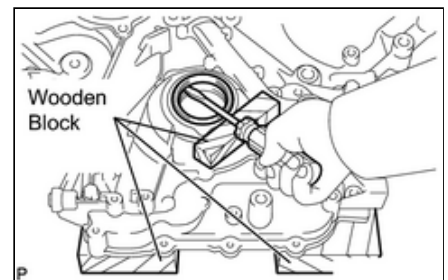
## 19. REMOVE TIMING CHAIN COVER SUB-ASSEMBLY INFO

## 20. REMOVE WATER INLET PIPE INFO

## 21. REMOVE FRONT CRANKSHAFT OIL SEAL

(a) Place the timing chain cover on wooden blocks.

(b) Place the oil pump on a wooden block.



(c) Using a screwdriver and wooden block, pry out the oil seal.

### NOTICE:

Do not damage the surface of the oil seal press fit hole.

**HINT:**

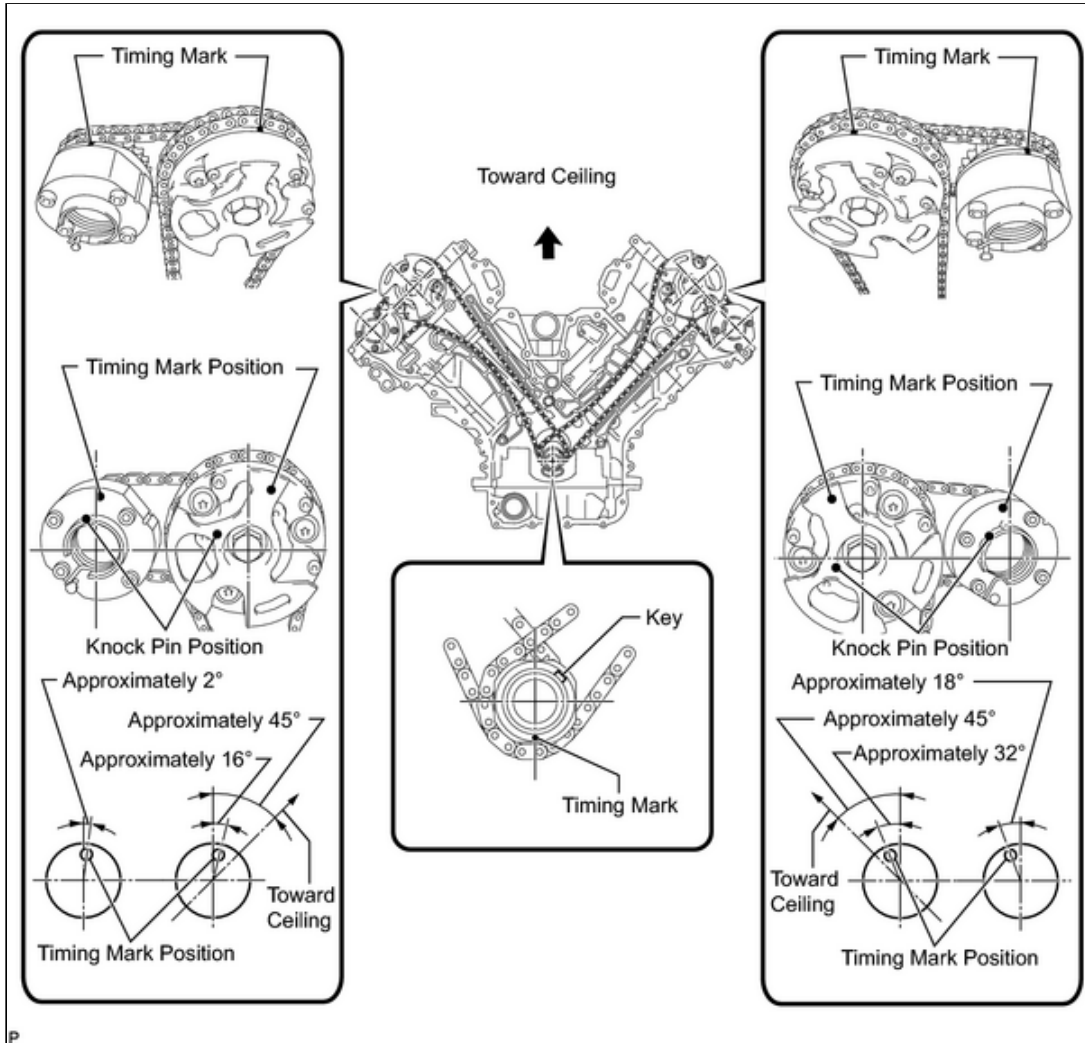
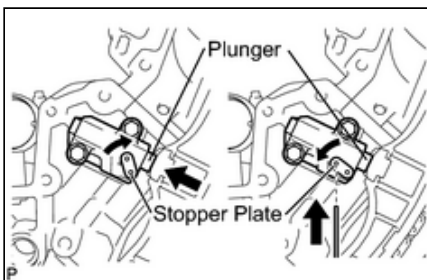
Tape the screwdriver tip before use.

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

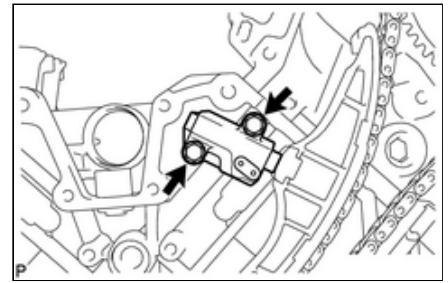
- Temporarily tighten the pulley set bolt.
- Rotate the crankshaft clockwise so that the timing marks on the crankshaft timing gear and camshaft timing gears are as shown in the illustration.

**HINT:**

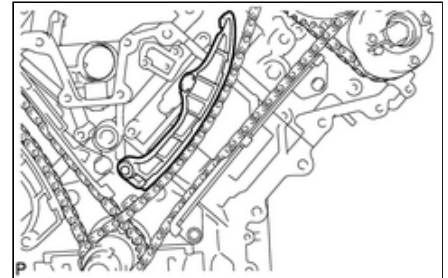
If the timing marks do not align, rotate the crankshaft clockwise again and align the timing marks.

**23. REMOVE NO. 1 CHAIN TENSIONER ASSEMBLY LH**

- Move the stopper plate upward to release the lock, and push the plunger deep into the tensioner.
- Move the stopper plate downward to set the lock, and insert a hexagon wrench into the stopper plate hole.
- Remove the 2 bolts, chain tensioner and gasket.

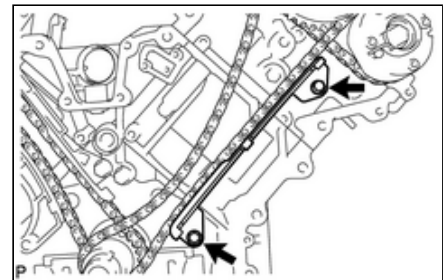


#### 24. REMOVE NO. 1 CHAIN TENSIONER SLIPPER LH

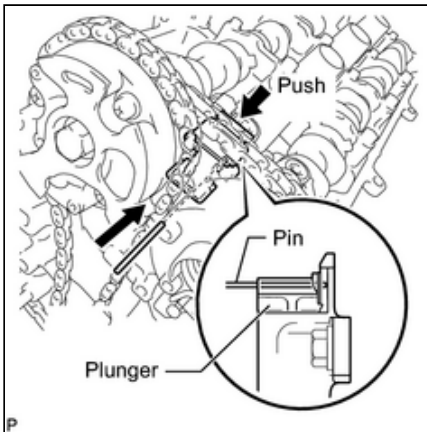


#### 25. REMOVE NO. 1 CHAIN VIBRATION DAMPER LH

(a) Remove the 2 bolts and chain vibration damper.



#### 26. REMOVE NO. 1 CHAIN SUB-ASSEMBLY LH

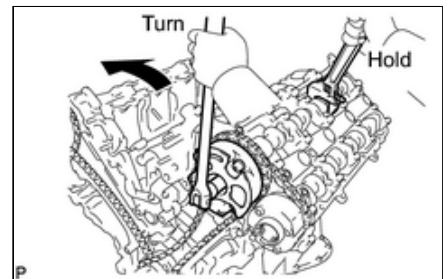


(a) While pushing down the No. 3 chain tensioner, insert a pin of  $\phi 1.0$  mm (0.0394 in.) into the hole to fix it in place.

(b) Hold the hexagonal portion of the camshaft with a wrench and loosen the bolt.

#### NOTICE:

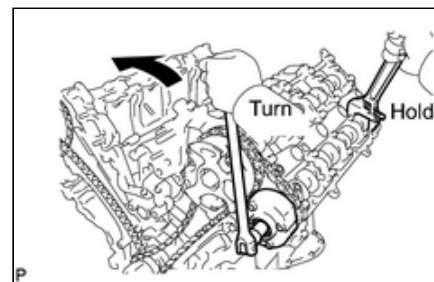
- Be careful not to damage the cylinder head with the wrench.
- Do not disassemble the camshaft timing gear.



(c) Hold the hexagonal portion of the camshaft with a wrench and loosen the bolt.

**NOTICE:**

Be careful not to damage the cylinder head with the wrench.

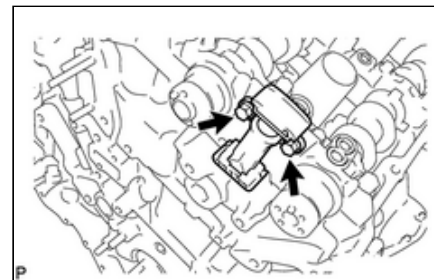
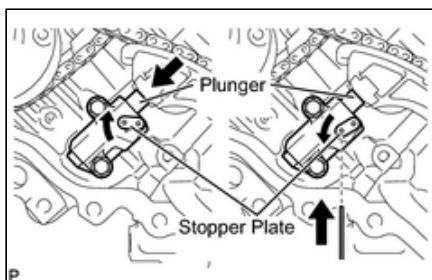


(d) Remove the 2 bolts. Then with the No. 1 and No. 2 chains still connected to the gears, remove the camshaft timing gear, camshaft timing exhaust gear and crankshaft timing sprocket LH.

(e) Remove the No. 1 and No. 2 chains from the gears.

**27. REMOVE NO. 3 CHAIN TENSIONER ASSEMBLY**

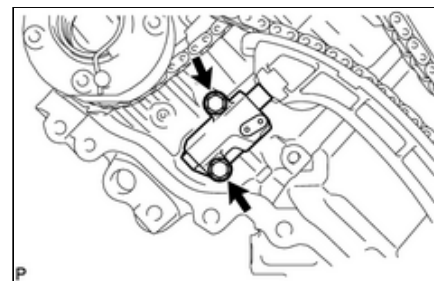
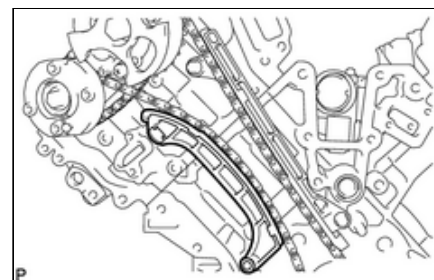
(a) Remove the 2 bolts and chain tensioner.

**28. REMOVE NO. 1 CHAIN TENSIONER ASSEMBLY RH**

(a) Move the stopper plate upward to release the lock, and push the plunger deep into the tensioner.

(b) Move the stopper plate downward to set the lock, and insert a hexagon wrench into the stopper plate hole.

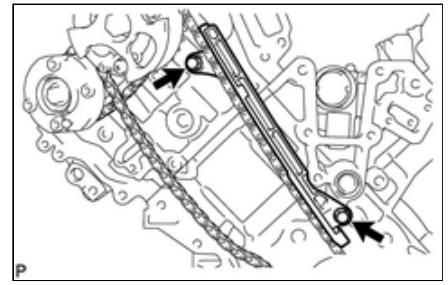
(c) Remove the 2 bolts and chain tensioner.

**29. REMOVE NO. 1 CHAIN TENSIONER SLIPPER RH**

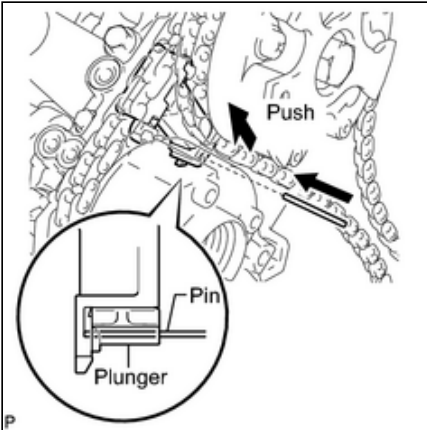


### 30. REMOVE NO. 1 CHAIN VIBRATION DAMPER RH

- (a) Remove the 2 bolts and vibration damper.



### 31. REMOVE NO. 1 CHAIN SUB-ASSEMBLY RH

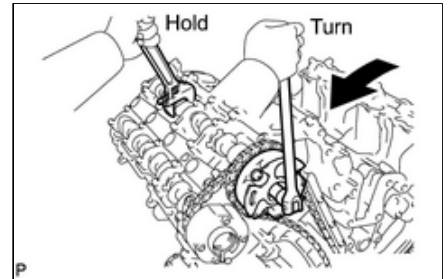


- (a) While raising up the No. 2 chain tensioner, insert a pin of  $\phi 1.0$  mm (0.0394 in.) into the hole to fix it in place.

- (b) Hold the hexagonal portion of the camshaft with a wrench and loosen the bolt.

#### NOTICE:

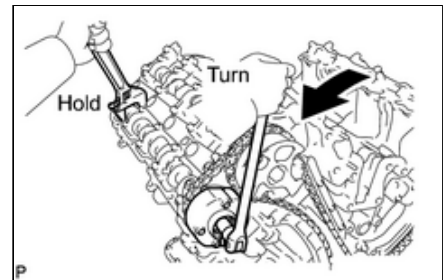
- Be careful not to damage the cylinder head with the wrench.
- Do not disassemble the camshaft timing gear.



- (c) Hold the hexagonal portion of the camshaft with a wrench and loosen the bolt.

#### NOTICE:

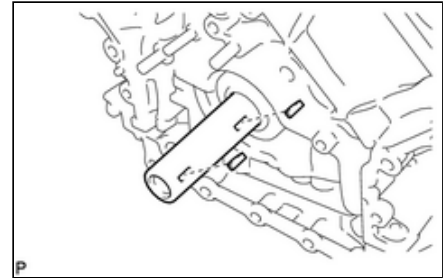
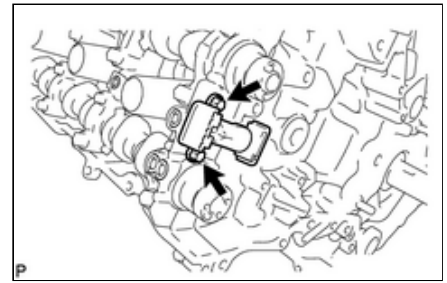
- Be careful not to damage the cylinder head with the wrench.



- (d) Remove the 2 bolts. Then with the No. 1 and No. 2 chains still connected to the gears, remove the camshaft timing gear, camshaft timing exhaust gear and crankshaft timing sprocket RH.
- (e) Remove the No. 1 and No. 2 chains from the gears.

### 32. REMOVE NO. 2 CHAIN TENSIONER ASSEMBLY

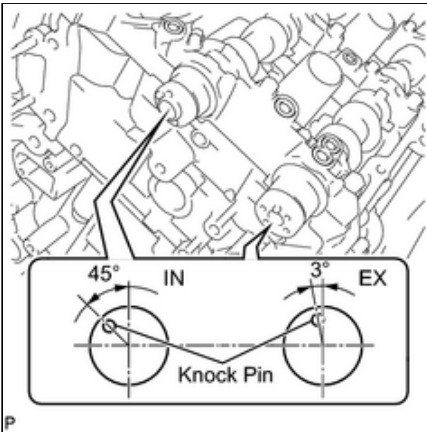
- (a) Remove the 2 bolts and chain tensioner.



### 33. REMOVE CRANKSHAFT TIMING GEAR KEY

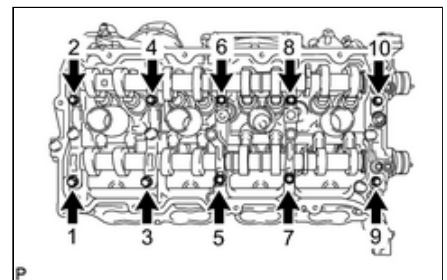
- (a) Using a screwdriver, remove the 2 timing gear keys from the crankshaft.

### 34. REMOVE CAMSHAFT BEARING CAP LH

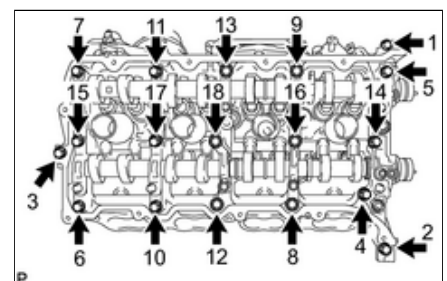


- (a) Make sure that the knock pin of the camshaft is positioned as shown in the illustration.

- (b) Uniformly loosen and remove the 10 bearing cap bolts in the sequence shown in the illustration.



- (c) Uniformly loosen and remove the 18 bearing cap bolts in the sequence shown in the illustration.



#### NOTICE:

Uniformly loosen the bolts while keeping the camshaft level.

- (d) Remove the 6 bearing caps.



**HINT:**

Arrange the removed parts in the correct order.

- (e) Remove the No. 3 and No. 4 camshafts.

**HINT:**

Arrange the removed parts in the correct order.

**35. REMOVE CAMSHAFT HOUSING SUB-ASSEMBLY LH**

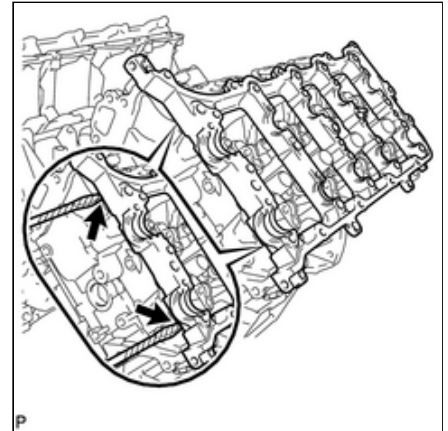
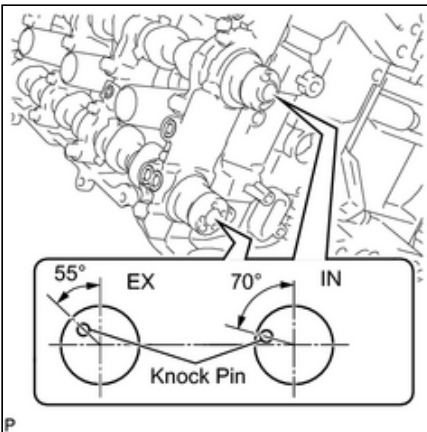
- (a) Remove the camshaft housing by prying between the cylinder head and camshaft housing with a screwdriver.

**NOTICE:**

Be careful not to damage the contact surfaces of the cylinder head and camshaft housing.

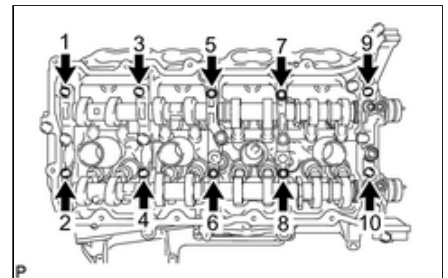
**HINT:**

Tape the screwdriver tip before use.

**36. REMOVE CAMSHAFT BEARING CAP RH**

- (a) Make sure that the knock pin of the camshaft is positioned as shown in the illustration.

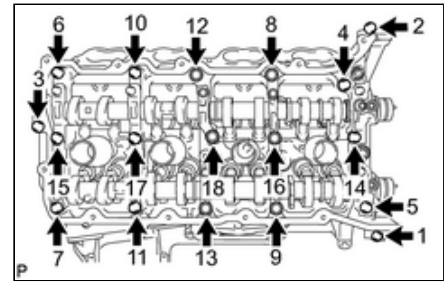
- (b) Uniformly loosen and remove the 10 bearing cap bolts in the sequence shown in the illustration.



- (c) Uniformly loosen and remove the 18 bearing cap bolts in the sequence shown in the illustration.

**NOTICE:**

Uniformly loosen the bolts while keeping the camshaft level.



(d) Remove the 6 bearing caps.

**HINT:**

Arrange the removed parts in the correct order.

(e) Remove the No. 1 and No. 2 camshafts.

**HINT:**

Arrange the removed parts in the correct order.

### 37. REMOVE CAMSHAFT HOUSING SUB-ASSEMBLY RH

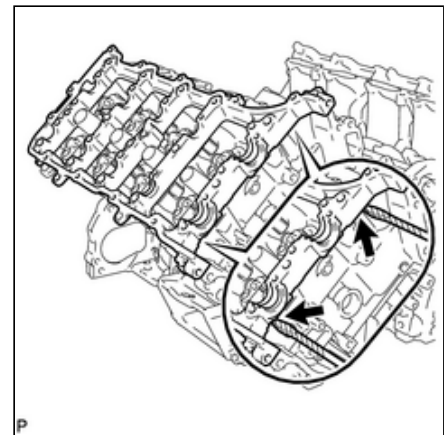
(a) Remove the camshaft housing by prying between the cylinder head and camshaft housing with a screwdriver.

**NOTICE:**

Be careful not to damage the contact surfaces of the cylinder head and camshaft housing.

**HINT:**

Tape the screwdriver tip before use.



### 38. REMOVE VALVE ROCKER ARM SUB-ASSEMBLY

(a) Remove the 32 valve rocker arms from the cylinder head.

**HINT:**

Arrange the removed parts in the correct order.

### 39. REMOVE VALVE LASH ADJUSTER ASSEMBLY

(a) Remove the 32 valve lash adjusters from the cylinder head.

**HINT:**

Arrange the removed parts in the correct order.

### 40. REMOVE VALVE STEM CAP

(a) Remove the 32 valve stem caps from the cylinder head.

**HINT:**

Arrange the removed parts in the correct order.

### 41. REMOVE CYLINDER HEAD SUB-ASSEMBLY LH INFO

### 42. REMOVE CYLINDER HEAD SUB-ASSEMBLY RH INFO

### 43. REMOVE CYLINDER HEAD GASKET LH

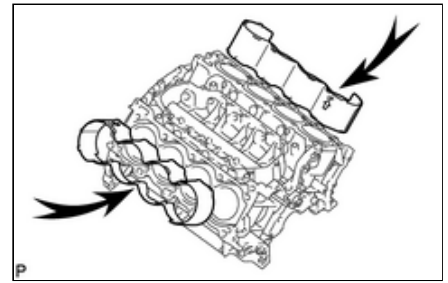
### 44. REMOVE CYLINDER HEAD GASKET RH

### 45. REMOVE CYLINDER BLOCK WATER JACKET SPACER

- (a) Remove the 2 water jacket spacers from the cylinder head.

**NOTICE:**

Be sure to remove the water jacket spacers. If not, they may fall and become damaged when the cylinder block is inverted.

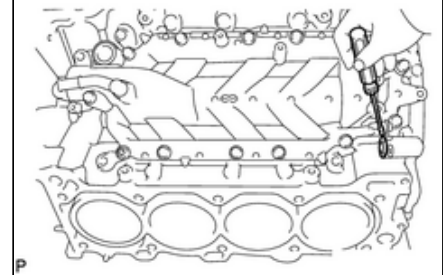


**46. REMOVE OIL RETURN PIPE GASKET**

- (a) Using a screwdriver, pry out the oil return pipe gasket.

**HINT:**

Tape the screwdriver tip before use.

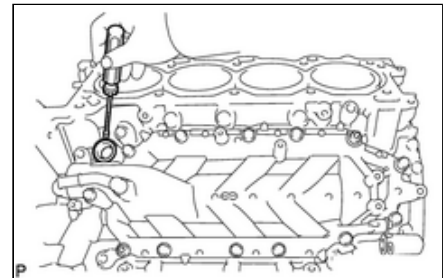


**47. REMOVE VENTILATION PIPE GASKET**

- (a) Using a screwdriver, pry out the ventilation pipe gasket.

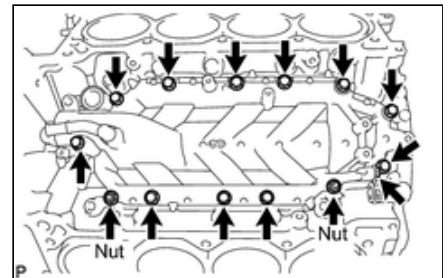
**HINT:**

Tape the screwdriver tip before use.



**48. REMOVE NO. 1 HEAT EXCHANGER COVER**

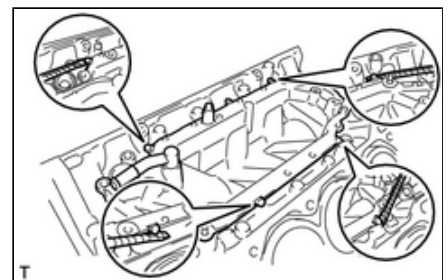
- (a) Remove the 12 bolts and 2 nuts.



- (b) Remove the heat exchanger by prying between the heat exchanger and cylinder block with a screwdriver.

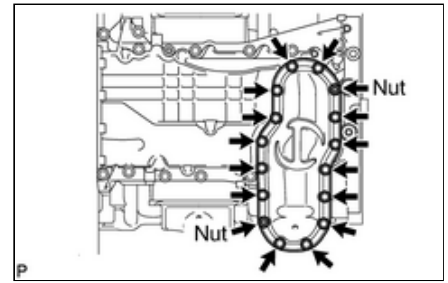
**HINT:**

Tape the screwdriver tip before use.



**49. REMOVE NO. 2 OIL PAN SUB-ASSEMBLY**

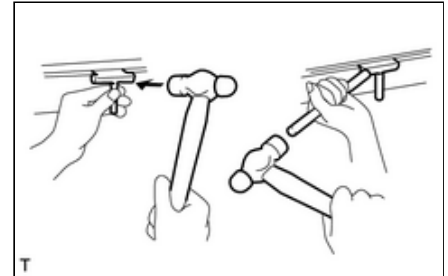
- (a) Remove the 14 bolts and 2 nuts.



- (b) Insert the blade of oil pan seal cutter between the oil pans. Cut through the applied sealer and remove the No. 2 oil pan.

**NOTICE:**

Be careful not to damage the contact surfaces of the oil pans.

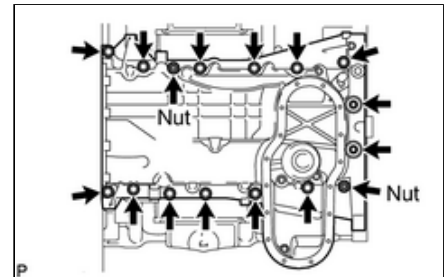


## 50. REMOVE NO. 1 OIL PAN SUB-ASSEMBLY

- (a) Remove the 14 bolts and 2 nuts.

**HINT:**

Be sure to clean the bolts and stud bolts, and check the threads for cracks or other damage.



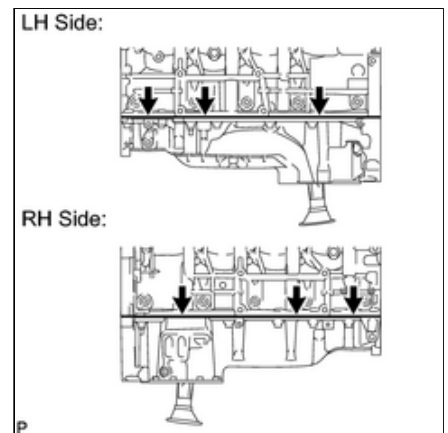
- (b) Remove the oil pan by prying between the oil pan and cylinder block with a screwdriver.

**NOTICE:**

Be careful not to damage the contact surfaces of the cylinder block and oil pan.

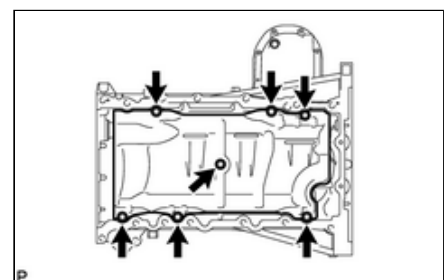
**HINT:**

Tape the screwdriver tip before use.



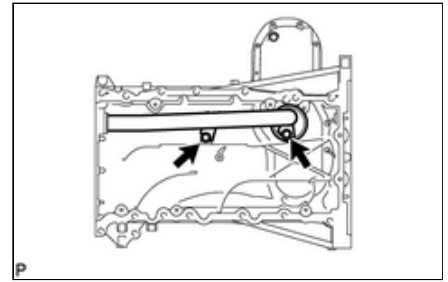
## 51. REMOVE NO. 1 OIL PAN BAFFLE PLATE

- (a) Remove the 7 bolts and baffle plate.



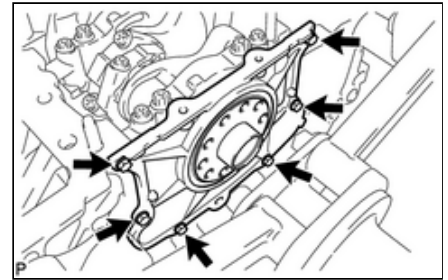
## 52. REMOVE OIL STRAINER SUB-ASSEMBLY

- (a) Remove the 2 bolts, oil strainer and O-ring.



## 53. REMOVE ENGINE REAR OIL SEAL RETAINER

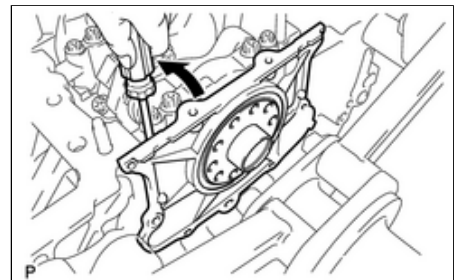
- (a) Remove the 6 bolts and oil seal retainer.



- (b) Using a screwdriver, pry out the oil seal retainer.

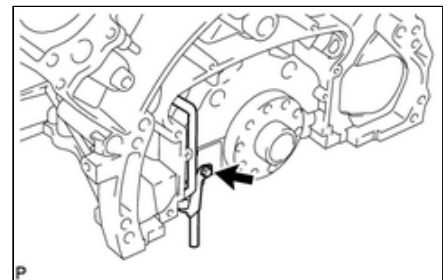
### HINT:

Tape the screwdriver tip before use.



## 54. REMOVE OIL DRAIN PIPE SUB-ASSEMBLY

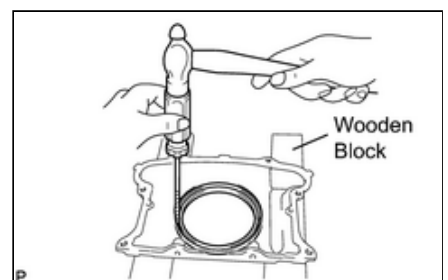
- (a) Remove the bolt and oil drain pipe.



- (b) Remove the O-ring.

## 55. REMOVE REAR CRANKSHAFT OIL SEAL

- (a) Place the oil seal retainer on wooden blocks.



(b) Using a screwdriver and hammer, tap out the oil seal.

## **56. REMOVE RING PIN**

### **NOTICE:**

It is not necessary to remove the ring pin unless it is being replaced.

## **57. REMOVE STUD BOLT**

### **NOTICE:**

If the stud bolt is deformed or its threads are damaged, replace it.

