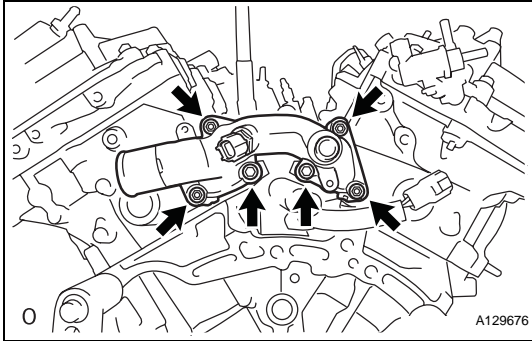
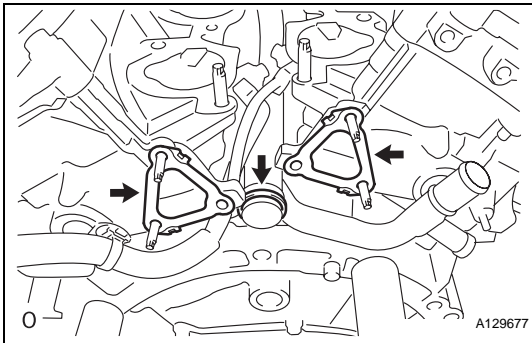


DISASSEMBLY

1. REMOVE OIL FILLER CAP SUB-ASSEMBLY
2. REMOVE SPARK PLUG
3. REMOVE CAMSHAFT TIMING CONTROL VALVE ASSEMBLY (See page [ES-440](#))
4. REMOVE VVT SENSOR (See page [ES-443](#))
5. REMOVE WATER OUTLET
 - (a) Remove the 2 bolts, 4 nuts and water outlet.

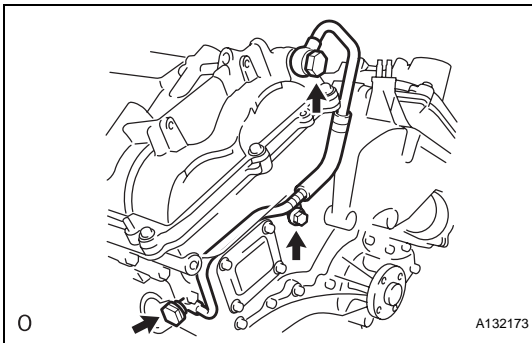


- (b) Remove the 2 gaskets and O-ring.



6. REMOVE OIL PIPE

- (a) Remove the bolt, 2 union bolts and oil pipe.
- (b) Remove the oil control valve filter RH and gaskets.

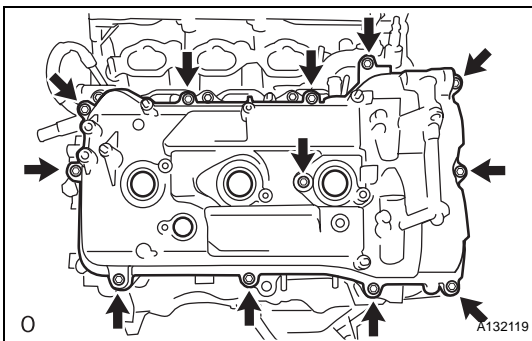


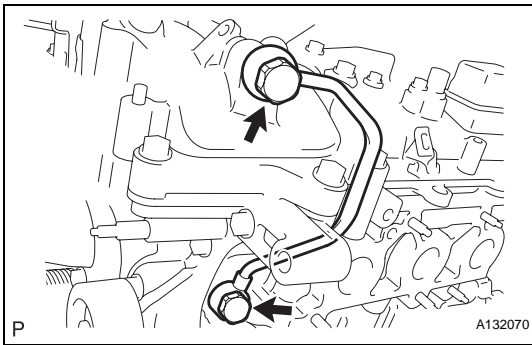
7. REMOVE CYLINDER HEAD COVER SUB-ASSEMBLY (for Bank 1)

- (a) Remove the 12 bolts, cylinder head cover and gasket.

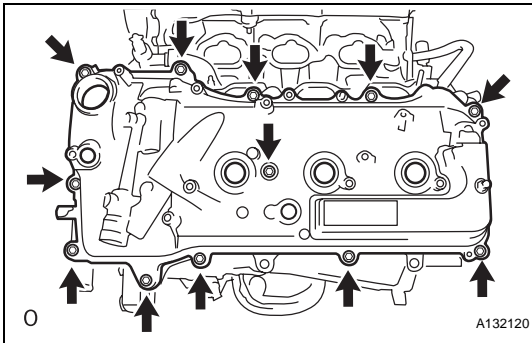
HINT:

Make sure the removed parts are returned to the same places they were removed from.



**8. REMOVE NO. 1 OIL PIPE**

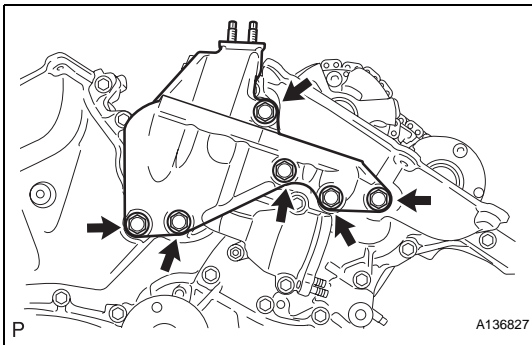
- (a) Remove the 2 union bolts and oil pipe.
- (b) Remove the oil control valve filter LH and gaskets.

**9. REMOVE CYLINDER HEAD COVER SUB-ASSEMBLY (for Bank 2)**

- (a) Remove the 12 bolts, cylinder head cover and gasket.

HINT:

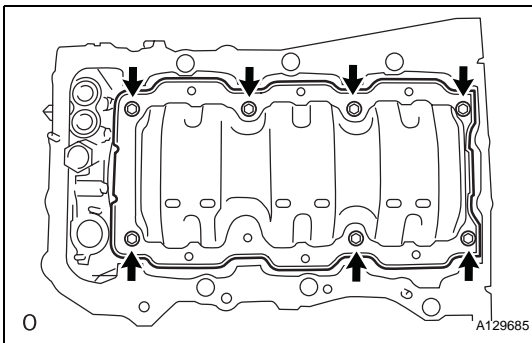
Make sure the removed parts are returned to the same places they were removed from.

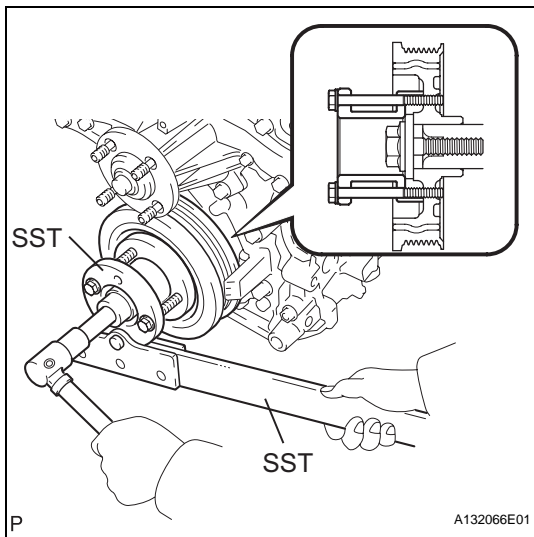
**10. REMOVE FRONT NO. 1 ENGINE MOUNTING BRACKET**

- (a) Remove the 6 bolts and mounting bracket.

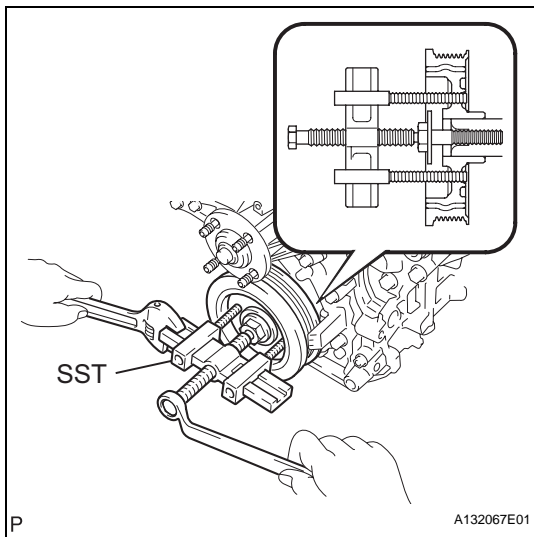
11. REMOVE WATER INLET HOUSING (See page CO-12)**12. REMOVE OIL FILTER CAP ASSEMBLY (See page LU-4)****13. REMOVE OIL FILTER ELEMENT (See page LU-5)****14. REMOVE NO. 2 OIL PAN SUB-ASSEMBLY (See page LU-12)****15. REMOVE OIL STRAINER SUB-ASSEMBLY (See page LU-13)****16. REMOVE OIL PAN SUB-ASSEMBLY (See page LU-13)****17. REMOVE OIL PAN BAFFLE PLATE**

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



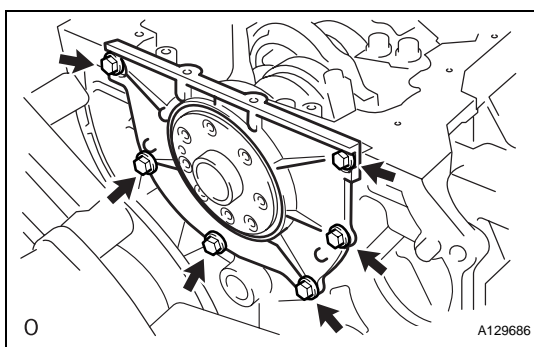
**18. REMOVE CRANKSHAFT PULLEY**

- (a) Using SST, loosen the crankshaft pulley set bolt.
SST 09213-70011 (09213-70020), 09330-00021

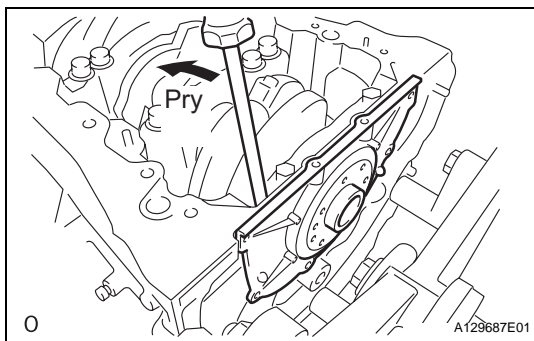


- (b) Using the pulley set bolt and SST, remove the crankshaft pulley.

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

19. REMOVE WATER PUMP ASSEMBLY (See page CO-13)**20. REMOVE ENGINE REAR OIL SEAL RETAINER**

- (a) Remove the 6 bolts.

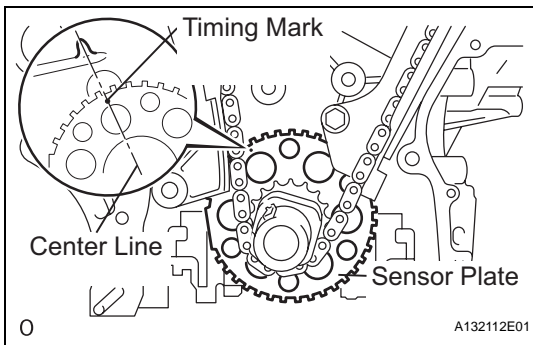


- (b) Using a screwdriver, pry out the oil seal retainer.
HINT:

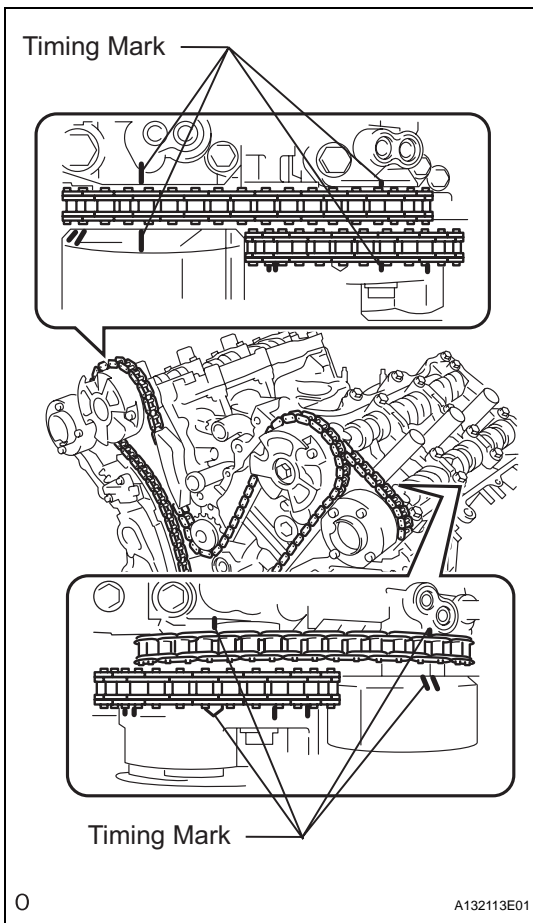
Tape the screwdriver tip before use.

21. REMOVE TIMING CHAIN COVER SUB-ASSEMBLY (w/ Oil Pump) (See page LU-14)**22. SET NO. 1 CYLINDER TO TDC / COMPRESSION**

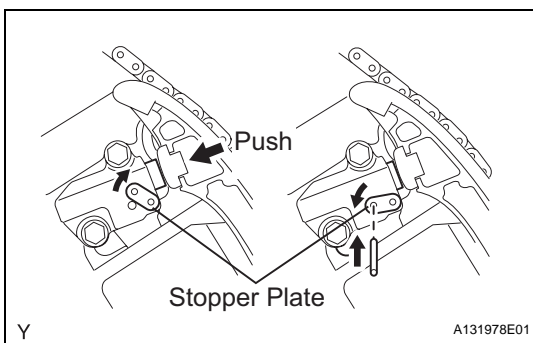
- (a) Temporarily tighten the pulley set bolt.



- (b) Set the timing mark on the crank angle sensor plate to the RH block bore center line (TDC / compression).



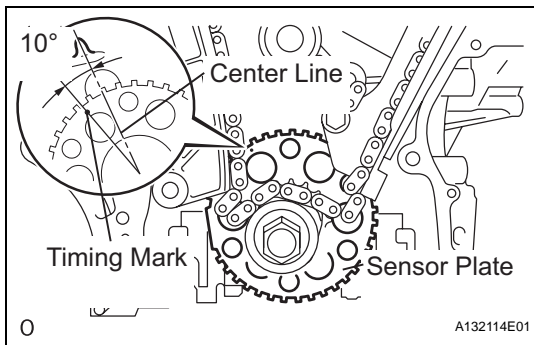
- (c) Check that the timing marks of the camshaft timing gears are aligned with the timing marks of the bearing cap as shown in the illustration. If not, turn the crankshaft 1 revolution (360°) and align the timing marks as above.



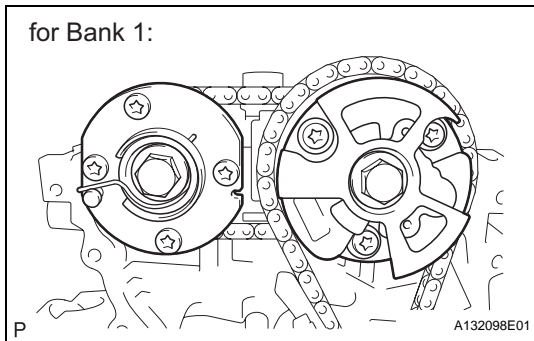
23. REMOVE NO. 1 CHAIN TENSIONER ASSEMBLY

- 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 and chain tensioner.

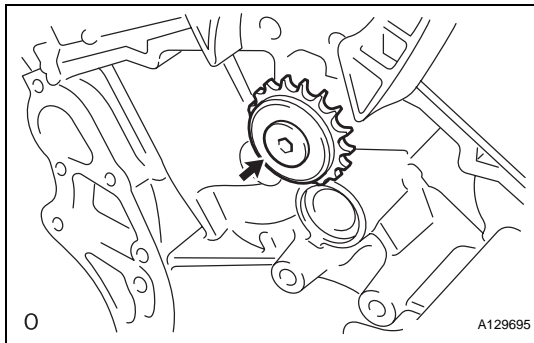
24. REMOVE CHAIN TENSIONER SLIPPER

**25. REMOVE NO. 1 CHAIN SUB-ASSEMBLY**

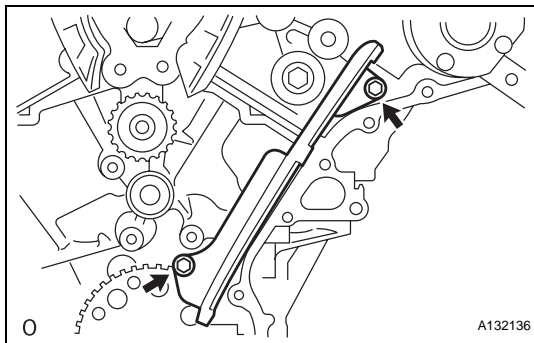
- (a) Turn the crankshaft counterclockwise 10° to loosen the chain of the crankshaft timing gear.
- (b) Remove the chain from the crankshaft timing gear and place it on the crankshaft.



- (c) Turn the camshaft timing gear on the RH bank clockwise (approximately 60°) and set it as shown in the illustration. Be sure to loosen the chain between the center banks.
- (d) Remove the chain.

**26. REMOVE IDLE SPROCKET ASSEMBLY**

- (a) Using a 10 mm hexagon wrench, remove the No. 2 idle gear shaft, idle sprocket and No. 1 idle gear shaft.

**27. REMOVE NO. 1 CHAIN VIBRATION DAMPER**

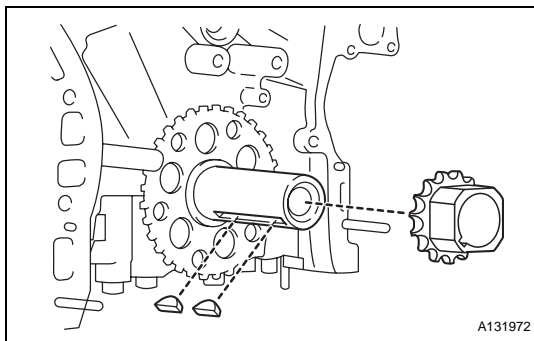
- (a) Remove the 2 bolts and vibration damper.

28. REMOVE NO. 2 CHAIN VIBRATION DAMPER

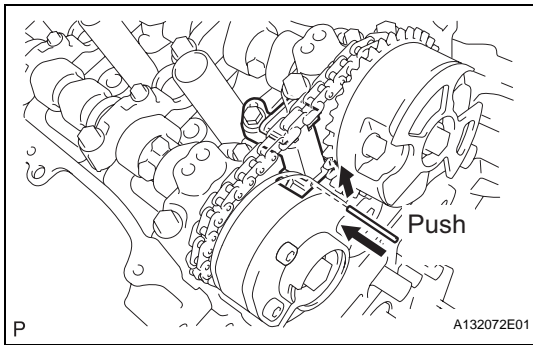
- (a) Remove the 2 chain vibration dampers.

29. REMOVE CRANKSHAFT TIMING GEAR OR SPROCKET

- (a) Remove the pulley set bolt.

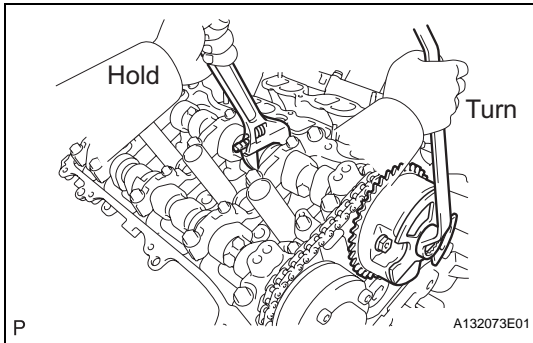


- (b) Remove the crankshaft timing gear from the crankshaft.
- (c) Remove the 2 pulley set keys from the crankshaft.



30. REMOVE CAMSHAFT TIMING GEAR ASSEMBLY (for Bank 1)

- (a) While raising up the No. 2 chain tensioner, insert a pin of $\phi 1.0$ mm (0.039 in.) into the hole to fix it in place.

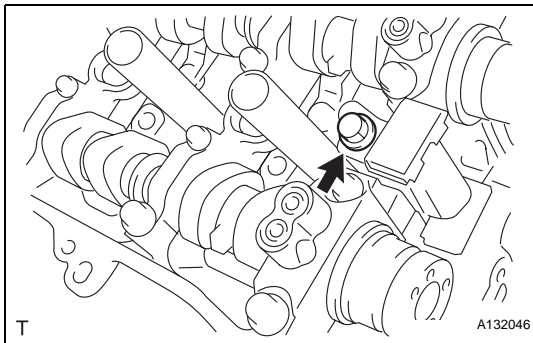


- (b) Hold the hexagonal portion of the camshaft with a wrench, and remove the 2 bolts and 2 camshaft timing gears.

NOTICE:

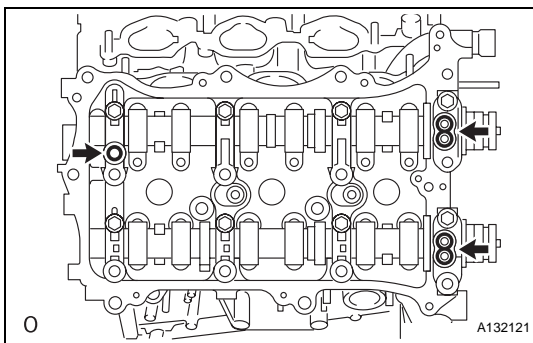
- Be careful not to damage the cylinder head with the wrench.
- Do not disassemble the camshaft timing gear.

- (c) Remove the No. 2 chain.



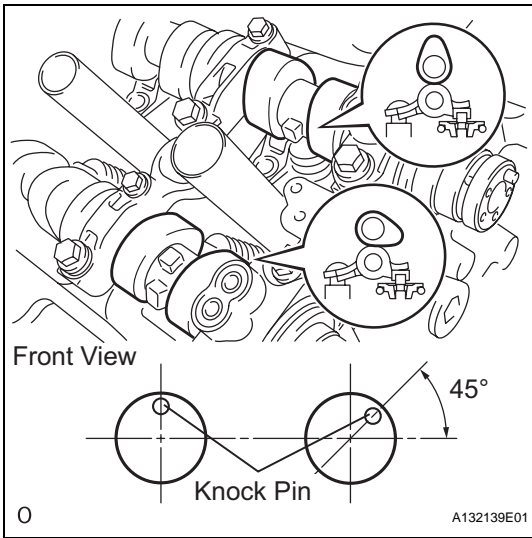
31. REMOVE NO. 2 CHAIN TENSIONER ASSEMBLY

- (a) Remove the bolt and chain tensioner.

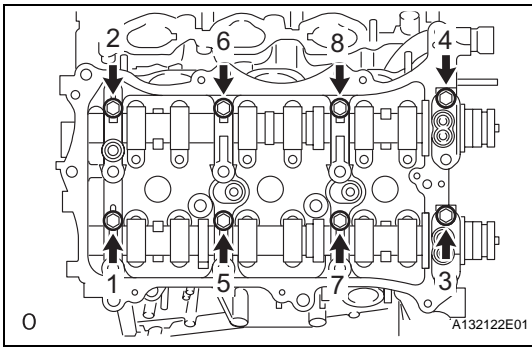


32. REMOVE CAMSHAFT (for Bank 1)

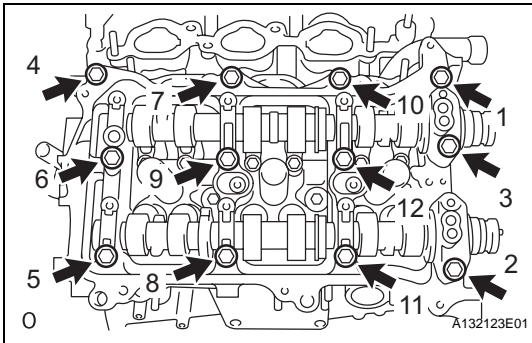
- (a) Remove the 3 gaskets.



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



- (c) Uniformly loosen and remove the 8 bearing cap bolts in the sequence shown in the illustration.



- (d) Uniformly loosen and remove the 12 bearing cap bolts in the sequence shown in the illustration.

NOTICE:

Uniformly loosen the bolts while keeping the camshaft level.

- (e) Remove the 5 bearing caps.
 (f) Remove the No. 1 and No. 2 camshafts.

33. REMOVE CAMSHAFT HOUSING SUB-ASSEMBLY (for Bank 1)

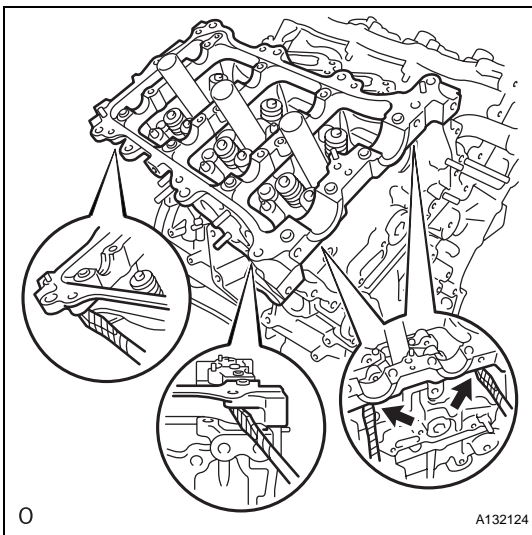
- (a) Remove the camshaft housing by prying between the cylinder head and camshaft housing with a screwdriver.

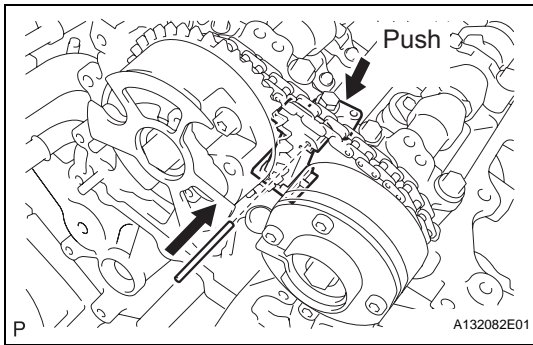
NOTICE:

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

HINT:

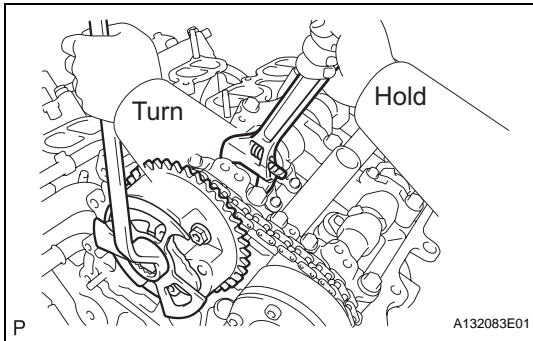
Tape the screwdriver tip before use.





34. REMOVE CAMSHAFT TIMING GEAR ASSEMBLY (for Bank 2)

- (a) While pushing down the chain tensioner, insert a pin of $\phi 1.0$ mm (0.039 in.) into the hole to fix it in place.

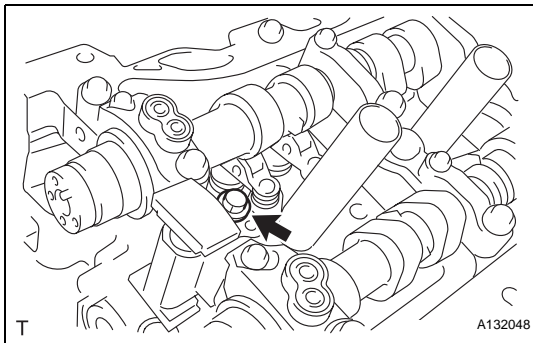


- (b) Hold the hexagonal portion of the camshaft with a wrench and remove the 2 bolts and 2 camshaft timing gears.

NOTICE:

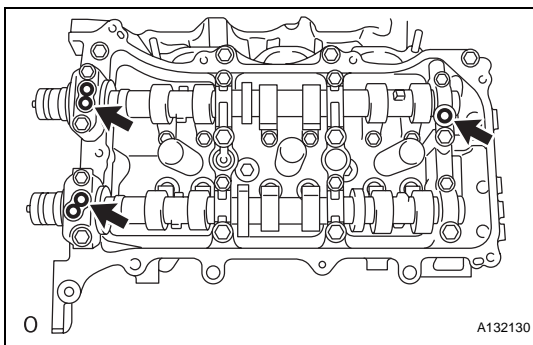
- Be careful not to damage the cylinder head with the wrench.
- Do not disassemble the camshaft timing gear.

- (c) Remove the No. 2 chain.



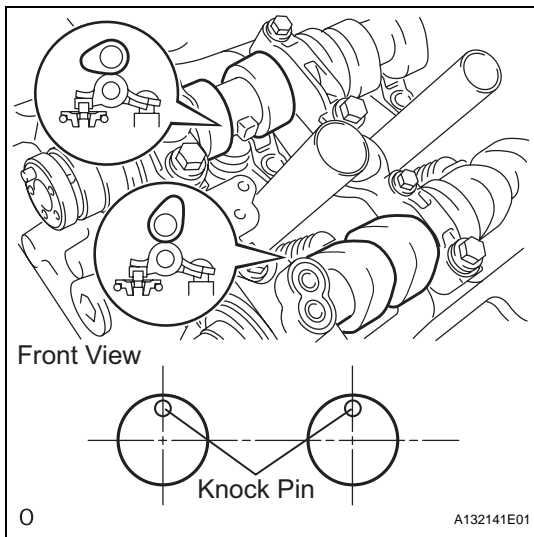
35. REMOVE NO. 3 CHAIN TENSIONER ASSEMBLY

- (a) Remove the bolt and chain tensioner.

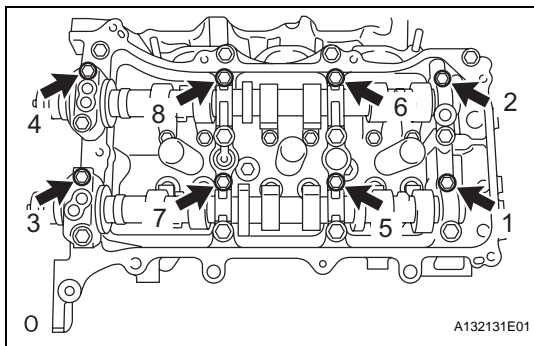


36. REMOVE CAMSHAFT SUB-ASSEMBLY (for Bank 2)

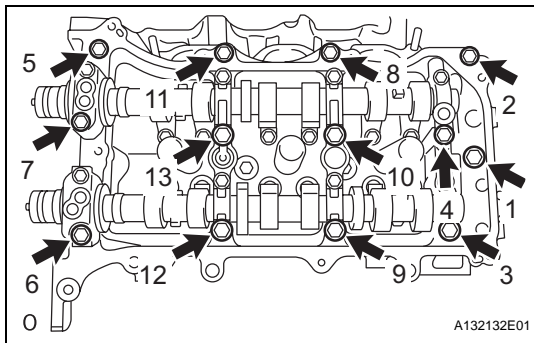
- (a) Remove the 3 gaskets.



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



- (c) Uniformly loosen and remove the 8 bearing cap bolts in the sequence shown in the illustration.

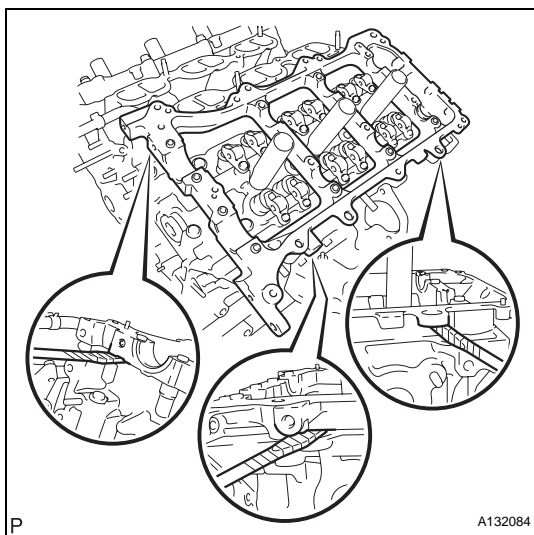


- (d) Uniformly loosen and remove the 13 bearing cap bolts in the sequence shown in the illustration.

NOTICE:

Uniformly loosen the bolts while keeping the camshaft level.

- (e) Remove the 5 bearing caps.
 (f) Remove the No. 3 and No. 4 camshafts.



37. REMOVE CAMSHAFT HOUSING SUB-ASSEMBLY (for Bank 2)

- (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 NO. 1 VALVE ROCKER ARM SUB-ASSEMBLY

- (a) Remove the 24 valve rocker arms.

HINT:

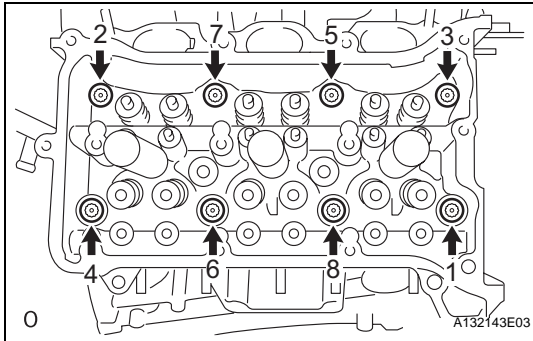
Arrange the removed parts in the correct order.

39. REMOVE VALVE LASH ADJUSTER ASSEMBLY

- (a) Remove the 24 valve lash adjusters from the cylinder head.

HINT:

Arrange the removed parts in the correct order.

**40. REMOVE CYLINDER HEAD SUB-ASSEMBLY (for Bank 1)**

- (a) Using a 10 mm bi-hexagon wrench, uniformly loosen the 8 bolts in the sequence shown in the illustration. Remove the 8 cylinder head bolts and plate washers.

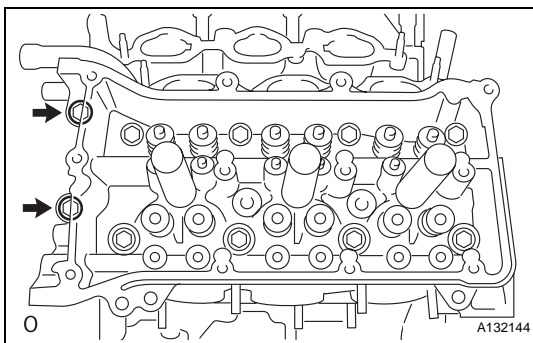
NOTICE:

- Be careful not to drop washers into the cylinder head.
- Head warpage or cracking could result from removing bolts in an incorrect order.

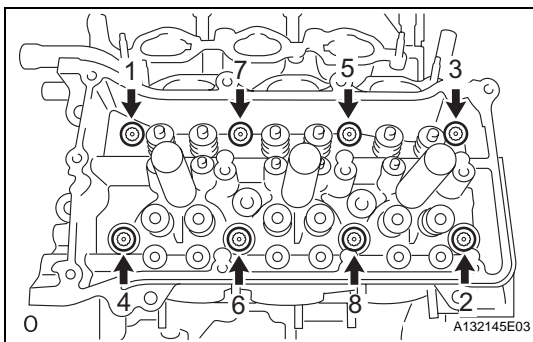
HINT:

Be sure to keep the removed parts separate for each installation position.

- (b) Remove the cylinder head and gasket.

**41. REMOVE CYLINDER HEAD SUB-ASSEMBLY (for Bank 2)**

- (a) Uniformly loosen and remove the 2 bolts in the sequence shown in the illustration.



- (b) Using a 10 mm bi-hexagon wrench, uniformly loosen the 8 bolts in the sequence shown in the illustration. Remove the 8 cylinder head bolts and plate washers.

NOTICE:

- Be careful not to drop washers into the cylinder head.
- Head warpage or cracking could result from removing bolts in an incorrect order.

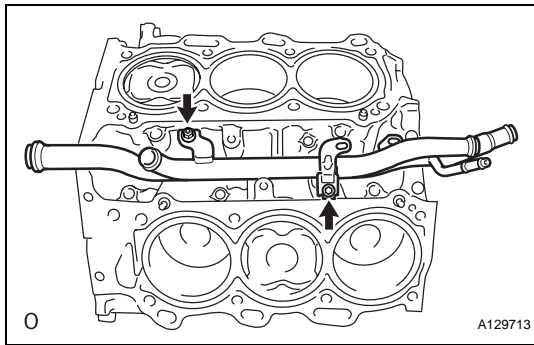
HINT:

Be sure to keep the removed parts separate for each installation position.

- (c) Remove the cylinder head and gasket.

42. REMOVE WATER INLET PIPE

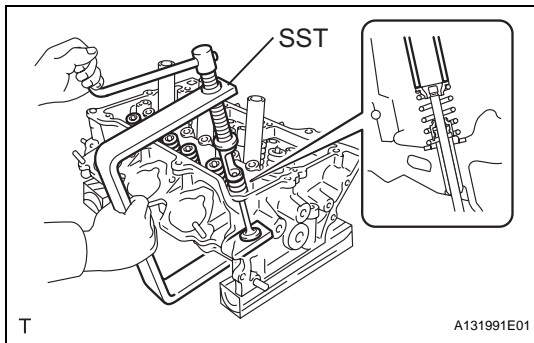
- (a) Disconnect the knock sensor wire.



- (b) Remove the 2 bolts and water outlet pipe.
- (c) Disconnect the water by-pass hose.

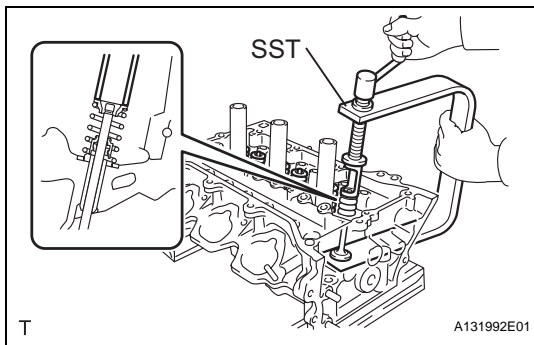
43. REMOVE VALVE STEM CAP

- (a) Remove the valve stem caps from the cylinder head.
- HINT:**
Arrange the removed parts in the correct order.



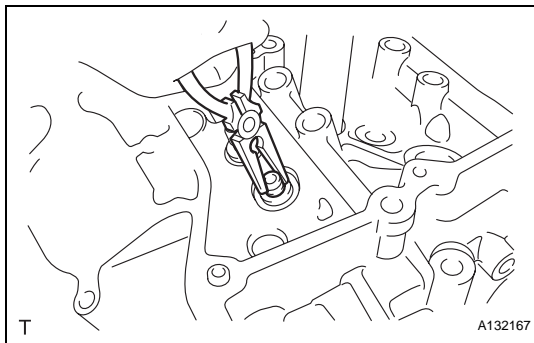
44. REMOVE INTAKE VALVE

- (a) Using SST and wooden blocks, compress the compression spring and remove the valve retainer lock.
- SST 09202-70020 (09202-00010)**
- (b) Remove the retainer, compression spring and valve.
- HINT:**
Arrange the removed parts in the correct order.



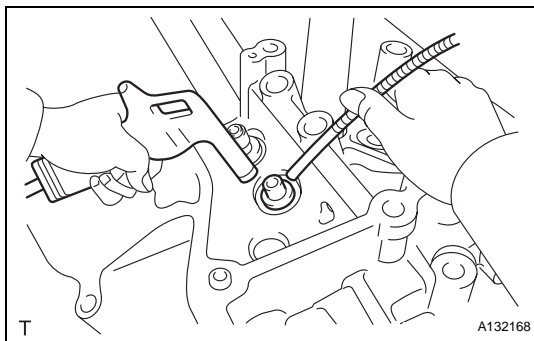
45. REMOVE EXHAUST VALVE

- (a) Using SST and wooden blocks, compress the compression spring and remove the valve retainer lock.
- SST 09202-70020 (09202-00010)**
- (b) Remove the retainer, compression spring and valve.
- HINT:**
Arrange the removed parts in the correct order.



46. REMOVE VALVE STEM OIL SEAL

- (a) Using needle-nose pliers, remove the oil seals.



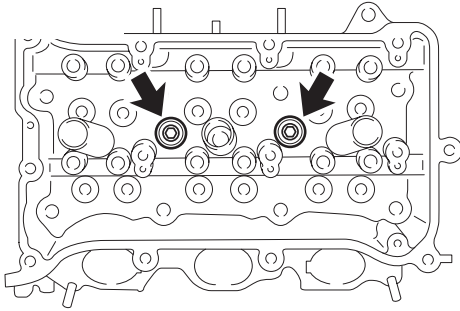
47. REMOVE VALVE SPRING SEAT

- (a) Using compressed air and a magnetic finger, remove the valve spring seat by blowing air onto it.

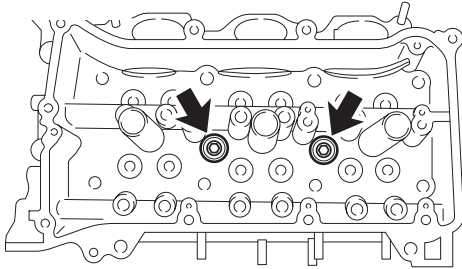
48. REMOVE NO. 1 STRAIGHT SCREW PLUG

- NOTICE:**
If water leaks from the No. 1 screw plug or the plug is corroded, replace it.

for Bank 1:



for Bank 2:

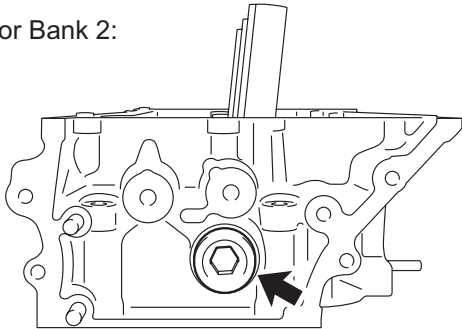


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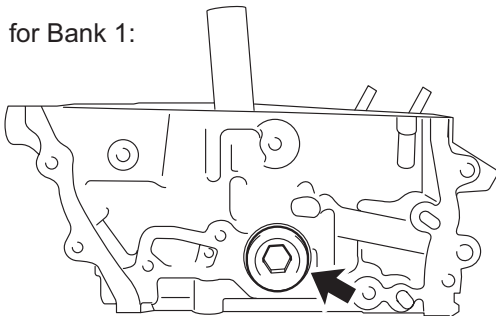
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- (a) Using a 10 mm hexagon wrench, remove the 4 screw plugs and 4 gaskets.

for Bank 2:



for Bank 1:



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49. REMOVE NO. 2 STRAIGHT SCREW PLUG

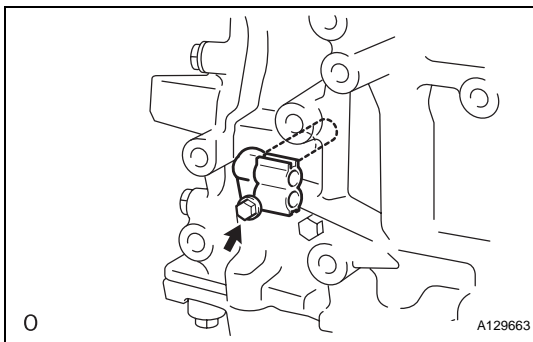
- (a) Using a 14 mm hexagon wrench, remove the 2 screw plugs and 2 gaskets.

NOTICE:

If water leaks from the No. 2 screw plug or the plug is corroded, replace it.

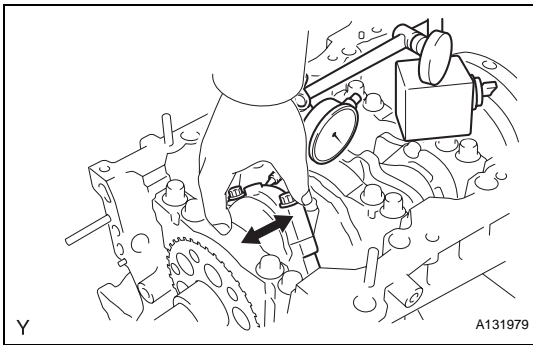
50. REMOVE CRANKSHAFT POSITION SENSOR

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



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**51. INSPECT CONNECTING ROD THRUST CLEARANCE**

- (a) Using a dial indicator, measure the thrust clearance while moving the connecting rod back and forth.

Standard thrust clearance:

0.15 to 0.40 mm (0.0059 to 0.0157 in.)

Maximum thrust clearance:

0.50 mm (0.0197 in.)

If the thrust clearance is greater than the maximum, replace one or more connecting rods as necessary. If necessary, replace the crankshaft.

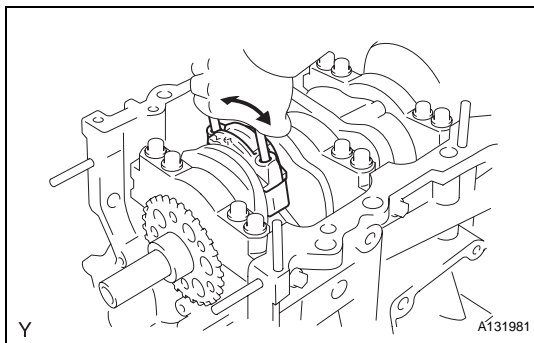
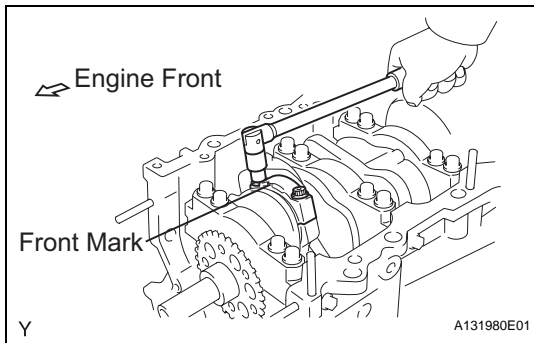
52. INSPECT CONNECTING ROD OIL CLEARANCE

- (a) Check that the front mark on the connecting rod and cap are aligned to ensure the correct reassembly.

NOTICE:

The front mark on the connecting rods and caps are for ensuring the correct reassembly.

- (b) Remove the 2 connecting rod cap bolts.

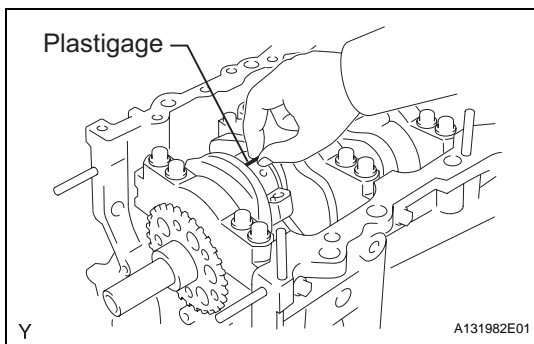


- (c) Using the 2 removed connecting rod cap bolts, remove the connecting rod cap and lower bearing by wiggling the connecting rod cap right and left.

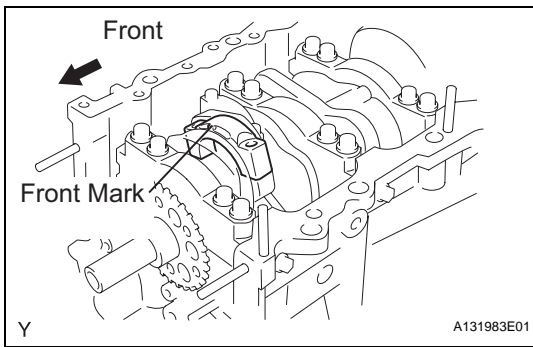
HINT:

Keep the lower bearing inserted to the connecting rod cap.

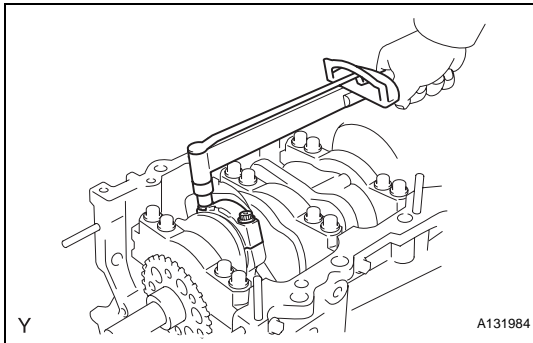
- (d) Clean the crank pin and bearing.
 (e) Check the crank pin and bearing for pitting and scratches.



- (f) Lay a strip of Plastigage on the crank pin.



- (g) Check that the front mark of the connecting rod cap is facing forward.

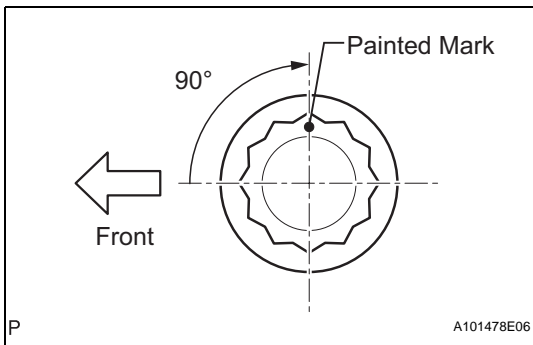


- (h) Install and alternately tighten the bolts of the connecting rod cap in several steps.

NOTICE:

Do not turn the crankshaft.

Torque: 25 N*m (255 kgf*cm, 18 ft.*lbf)

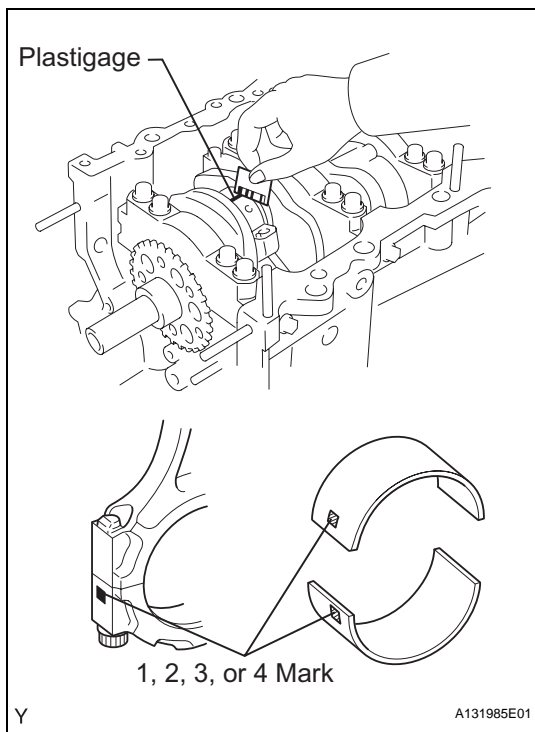


- (i) Mark the front side of each connecting cap bolt with paint.
 (j) Retighten the cap bolts by 90° as shown.
 (k) Check that the painted mark is now at a 90° angle to the front.

NOTICE:

Do not turn the crankshaft.

- (l) Remove the 2 connecting rod cap bolts.
 (m) Using the 2 removed connecting rod cap bolts, remove the connecting rod cap and lower bearing by wiggling the connecting rod cap right and left.
HINT:
 Keep the lower bearing inserted to the connecting rod cap.



- (n) Measure the Plastigage at its widest point.

Standard oil clearance:

0.045 to 0.067 mm (0.0018 to 0.0026 in.)

Maximum oil clearance:

0.070 mm (0.0028 in.)

If the oil clearance is greater than the maximum, replace the bearings. If necessary, replace the crankshaft.

HINT:

If replacing a bearing, replace it with one that has the same number as its respective connecting rod cap. Each bearing's standard thickness is indicated by a 1, 2, 3 and 4 mark on its surface.

Reference:

Connecting rod big end inside diameter

Mark	Thickness
1	56.000 to 56.006 mm (2.2047 to 2.2050 in.)
2	56.007 to 56.012 mm (2.2050 to 2.2052 in.)
3	56.013 to 56.018 mm (2.2052 to 2.2054 in.)
4	56.019 to 56.024 mm (2.2055 to 2.2057 in.)

Standard sized bearing center wall thickness

Mark	Thickness
1	1.481 to 1.484 mm (0.0583 to 0.0584 in.)
2	1.484 to 1.497 mm (0.0584 to 0.0585 in.)
3	1.487 to 1.490 mm (0.0585 to 0.0587 in.)
4	1.490 to 1.493 mm (0.0587 to 0.0588 in.)

Crankshaft pin diameter:

52.992 to 53.000 mm (2.0863 to 2.0866 in.)

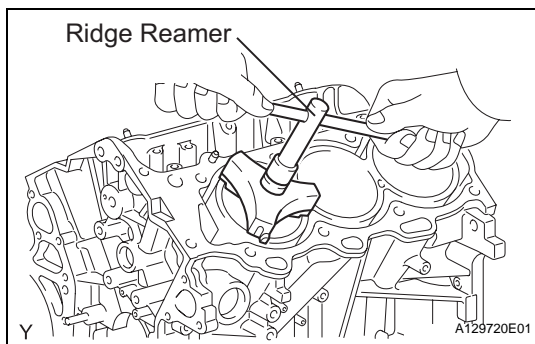
- (o) Completely remove the Plastigage.

53. REMOVE PISTON SUB-ASSEMBLY WITH CONNECTING ROD

- (a) Using a ridge reamer, remove all the carbon from the top of the cylinder.
- (b) Push the piston, connecting rod and upper bearing through the top of the cylinder block.

HINT:

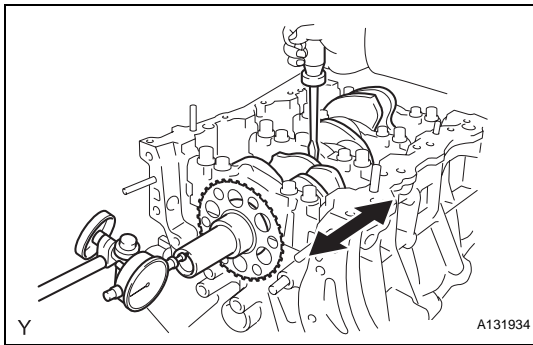
- Keep the bearing, connecting rod and cap together.
- Arrange the piston and connecting rod in the correct order.



54. REMOVE CONNECTING ROD BEARING

HINT:

Arrange the removed parts in the correct order.



55. INSPECT CRANKSHAFT THRUST CLEARANCE

- (a) Using a dial indicator, measure the thrust clearance while prying the crankshaft back and forth with a screwdriver.

Standard thrust clearance:

0.04 to 0.24 mm (0.0016 to 0.0094 in.)

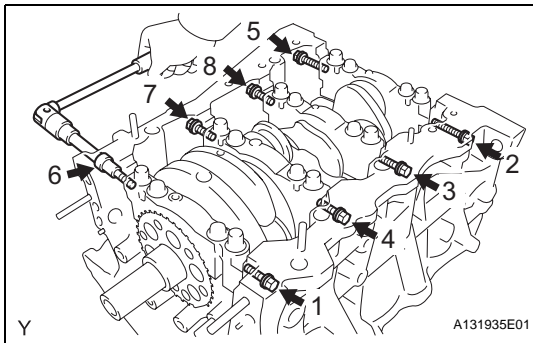
Maximum thrust clearance:

0.30 mm (0.0118 in.)

If the thrust clearance is greater than the maximum, replace the thrust washers as a set. If necessary, replace the crankshaft.

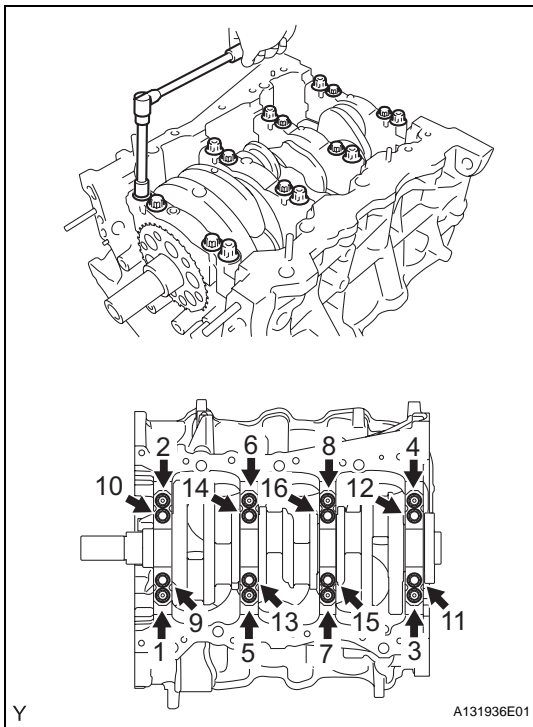
Standard thrust washer thickness:

2.43 to 2.48 mm (0.0957 to 0.0976 in.)

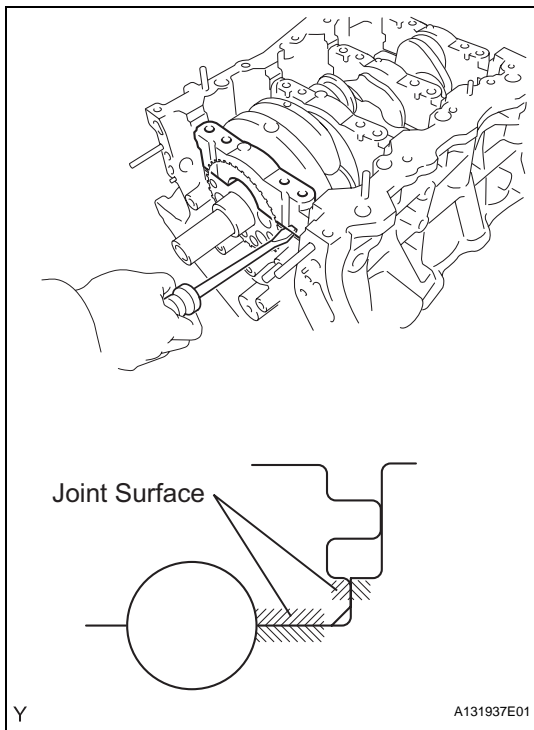


56. REMOVE CRANKSHAFT AND CRANKSHAFT OIL CLEARANCE

- (a) Uniformly loosen and remove the 8 main bearing cap bolts and seal washers in several steps, in the sequence shown in the illustration.



- (b) Uniformly loosen the 16 bearing cap bolts in several steps, in the sequence shown in the illustration.



- (c) Using a screwdriver, pry out the main bearing caps. Remove the 4 main bearing caps and lower bearings.

NOTICE:

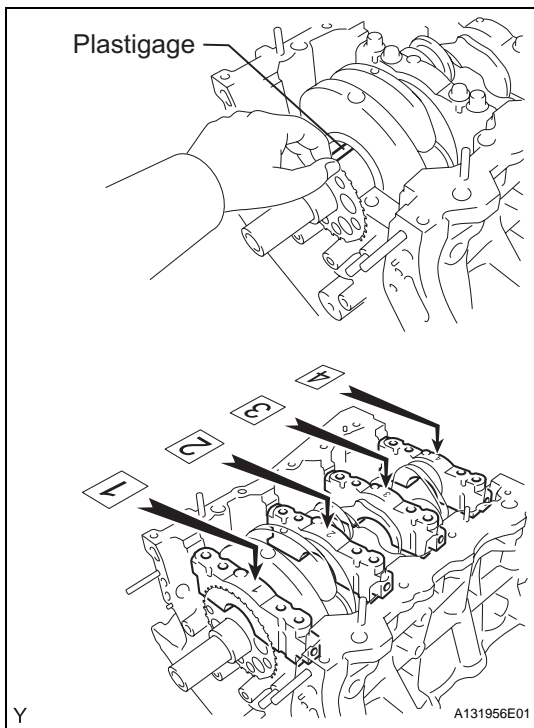
- Pry up the main cap little by little to the right and left in turns.
- Be careful not to damage the joint surface of the cylinder block and main bearing caps.

- (d) Clean each main journal and bearing.
 (e) Check each main journal and bearing for pitting and scratches.

HINT:

If the journal or bearing is damaged, replace the bearing.

- (f) Place the crankshaft on the cylinder block.



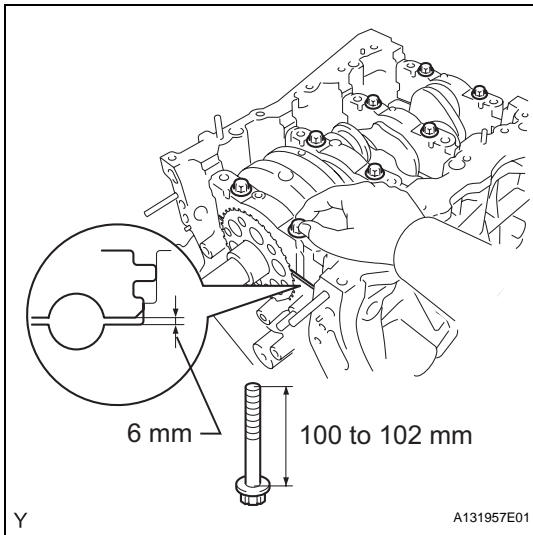
- (g) Lay a strip of Plastigage across each journal.

- (h) Examine the front marks and numbers and install the bearing caps on the cylinder block.

HINT:

A number is marked on each main bearing cap to indicate the installation position.

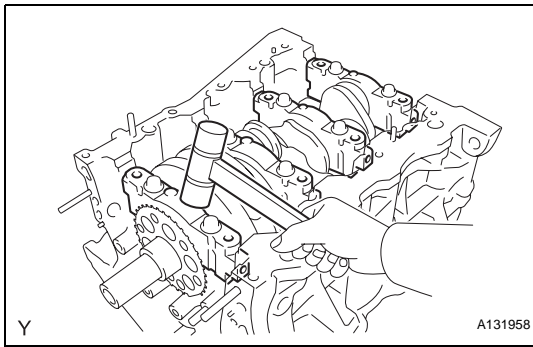
- (i) Apply a light coat of engine oil on the threads and under the heads of the bearing cap bolts.
 (j) Place the crankshaft bearing cap on the cylinder block.



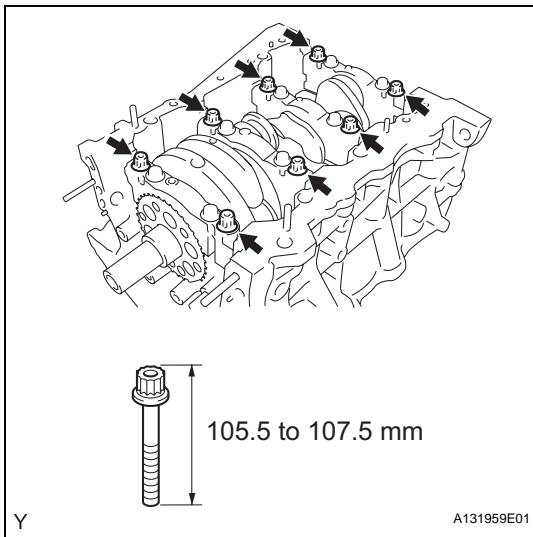
- (k) Install the main bearing cap with your hand until the clearance between the main bearing cap and the cylinder block is less than 6 mm (0.23 in.) by marking the 2 internal bearing cap bolts as a guide.

Bolt length:

100 to 102 mm (3.94 to 4.02 in.)



- (l) Using a plastic-faced hammer, lightly tap the bearing cap to ensure a proper fit.
- (m) Apply a light coat of engine oil on the threads and under the heads of the 8 main bearing cap bolts.



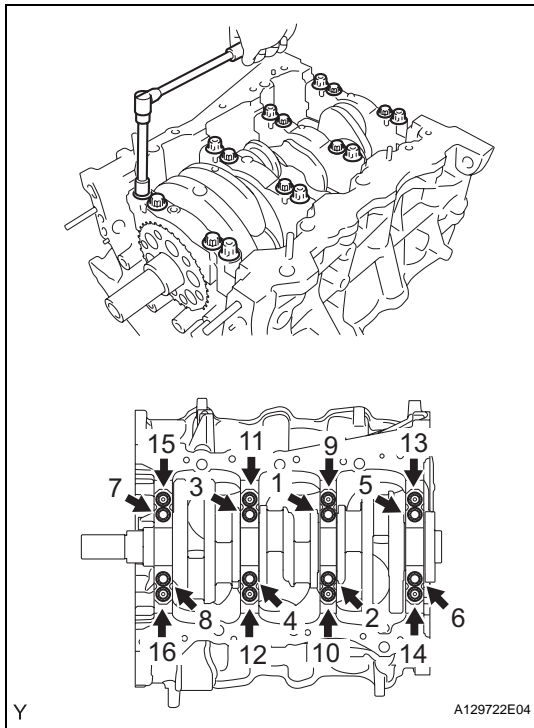
- (n) Install the 8 main bearing cap bolts to the outside positions.

Bolt length:

105.5 to 107.5 mm (4.15 to 4.23 in.)

HINT:

The main bearing cap bolts are tightened in 2 progressive steps.



(o) Step 1

- (1) Install and uniformly tighten the 16 main bearing cap bolts in the sequence shown in the illustration.

Torque: 61 N*m (622 kgf*cm, 45 ft.*lbf)

HINT:

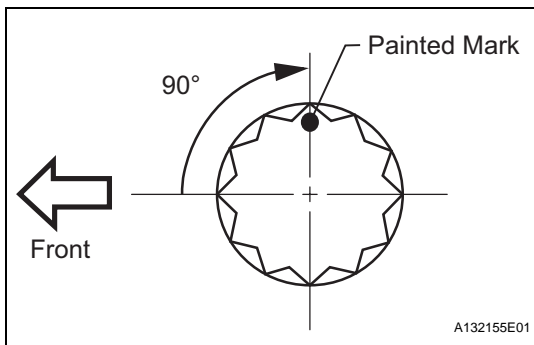
If any of the main bearing cap bolts does not meet the torque specification, replace the main bearing cap bolt.

NOTICE:

Do not turn the crankshaft.

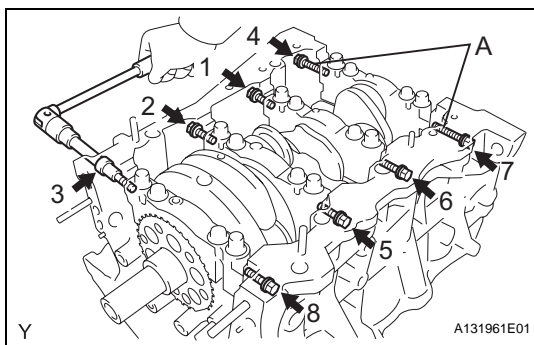
(p) Step 2

- (1) Mark the front of the bearing cap bolts with paint.



- (2) Retighten the bearing cap bolts by 90° as shown in the order shown in step 1.

- (3) Check that the painted mark is now at a 90° angle to the front.



- (q) Install and uniformly tighten the 8 main bearing cap bolts in several steps and in the sequence shown in the illustration.

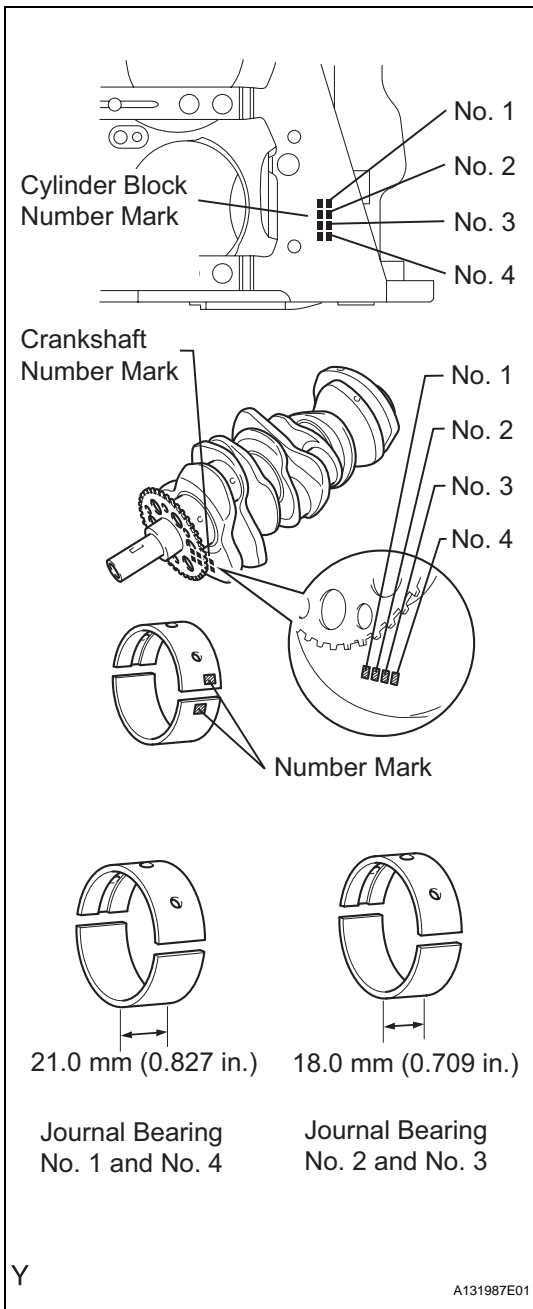
Torque: 52 N*m (530 kgf*cm, 38 ft.*lbf)

Bolt length:

45 mm (1.77 in.) for bolt A

30 mm (1.18 in.) for except bolt A

- (r) Remove the 24 bolts and bearing cap bolts.
- (s) Completely remove the Plastigage.



- (t) If replacing a bearing, replace it with one having the same number. If the number of the bearing cannot be determined, select the correct bearing by adding together the numbers imprinted on the cylinder block and crankshaft, then refer to the table below for the appropriate bearing number. There are 5 sizes of standard bearings, marked "1", "2", "3", "4" and "5" accordingly.

Journal bearing

Use Bearing	Cylinder Block Number Mark + Crankshaft Number Mark
1	0 - 5
2	6 - 11
3	12 - 17
4	18 - 23
5	24 - 28

EXAMPLE:

Cylinder block "11" + Crankshaft "06" = Total number 17 (Use bearing "3")

Standard crankshaft main journal diameter

Mark	Specified Condition
00	60.999 to 61.000 mm (2.4015 to 2.4016 in.)
01	60.998 to 60.999 mm (2.4015 to 2.4015 in.)
02	60.997 to 60.998 mm (2.4015 to 2.4015 in.)
03	60.996 to 60.997 mm (2.4014 to 2.4015 in.)
04	60.995 to 60.996 mm (2.4014 to 2.4014 in.)
05	60.994 to 60.995 mm (2.4013 to 2.4014 in.)
06	60.93 to 60.994 mm (2.4013 to 2.4013 in.)
07	60.992 to 60.993 mm (2.4013 to 2.4013 in.)
08	60.991 to 60.992 mm (2.4012 to 2.4013 in.)
09	60.990 to 60.991 mm (2.4012 to 2.4012 in.)
10	60.989 to 60.990 mm (2.4011 to 2.4012 in.)
11	60.988 to 60.989 mm (2.4.11 to 2.4011 in.)

**Standard upper bearing center wall thickness
No. 1 and No. 4 journal**

Mark	Specified Condition
1	2.500 to 2.503 mm (0.0984 to 0.0985 in.)
2	2.503 to 2.506 mm (0.0985 to 0.0987 in.)
3	2.506 to 2.509 mm (0.0987 to 0.0988 in.)



Mark	Specified Condition
4	2.509 to 2.512 mm (0.0988 to 0.0989 in.)
5	2.512 to 2.515 mm (0.0989 to 0.0990 in.)

No. 2 and No. 3 journal

Mark	Specified Condition
1	2.478 to 2.481 mm (0.0976 to 0.0977 in.)
2	2.481 to 2.484 mm (0.0977 to 0.0978 in.)
3	2.484 to 2.487 mm (0.0978 to 0.0979 in.)
4	2.487 to 2.490 mm (0.0979 to 0.0980 in.)
5	2.490 to 2.493 mm (0.0980 to 0.0981 in.)

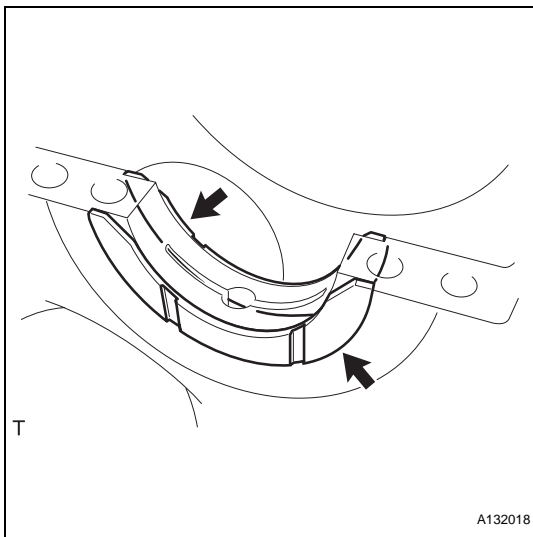
Standard lower bearing center wall thickness No. 1 and No. 4 journal

Mark	Specified Condition
1	2.478 to 2.481 mm (0.0976 to 0.0977 in.)
2	2.481 to 2.484 mm (0.0977 to 0.0780 in.)
3	2.484 to 2.487 mm (0.0978 to 0.0979 in.)
4	2.487 to 2.490 mm (0.0979 to 0.0980 in.)
5	2.490 to 2.493 mm (0.0980 to 0.0981 in.)

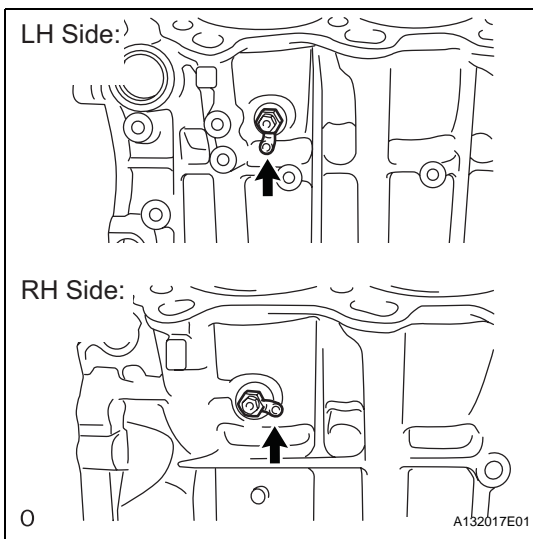
No. 2 and No. 3 journal

Mark	Specified Condition
1	2.500 to 2.503 mm (0.0984 to 0.0985 in.)
2	2.503 to 2.506 mm (0.0985 to 0.0987 in.)
3	2.506 to 2.509 mm (0.0987 to 0.0988 in.)
4	2.509 to 2.512 mm (0.0988 to 0.0989 in.)
5	2.512 to 2.515 mm (0.0989 to 0.0990 in.)

(u) Lift out the crankshaft.

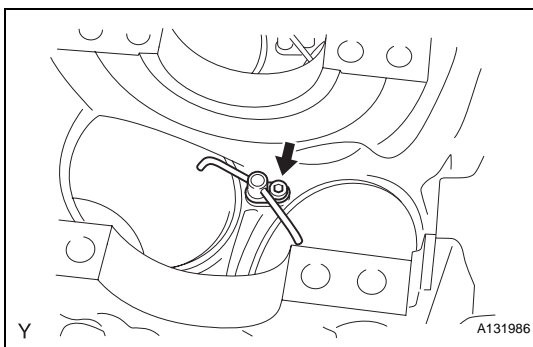


- (v) Remove the upper bearings and upper thrust washers from the cylinder block.
HINT:
 Arrange the bearings and thrust washers in the correct order.



57. REMOVE CYLINDER BLOCK WATER DRAIN COCK SUB-ASSEMBLY

- (a) Remove the 2 water drain cocks from the cylinder block.
 (b) Remove the water drain cock plugs from the water drain cocks.

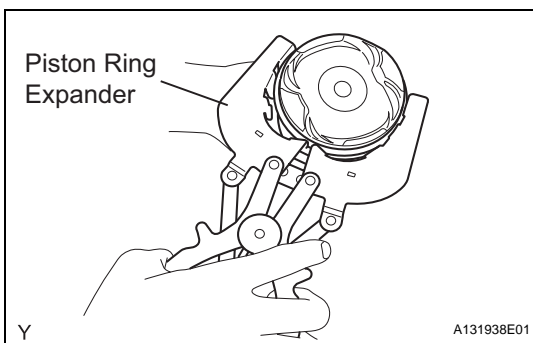


58. REMOVE NO. 1 OIL NOZZLE SUB-ASSEMBLY

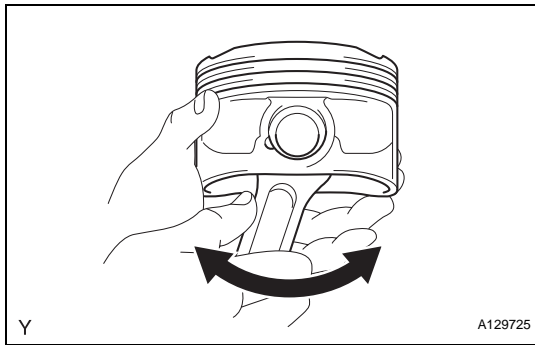
- (a) Using a 5 mm hexagon wrench, remove the 3 oil nozzles.
 (b) Check the oil nozzles for damage or clogging. If necessary, replace the oil nozzle.

59. REMOVE PISTON RING SET

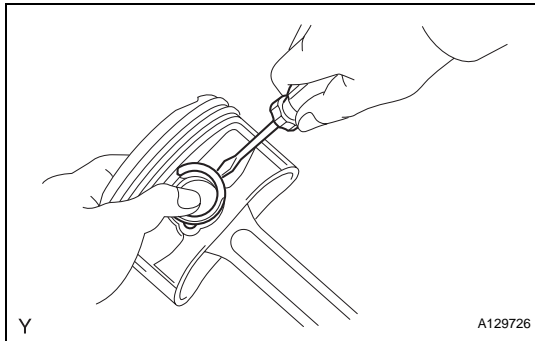
- HINT:**
 Arrange the piston rings in the correct order.



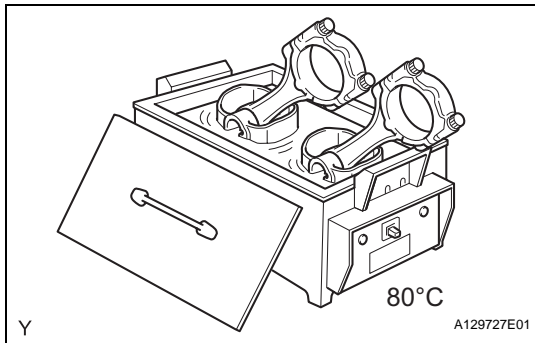
- (a) Using a piston ring expander, remove the 2 compression rings.
 (b) Using a piston ring expander, remove the 2 side rails.
 (c) Remove the oil ring expander by hand.

**60. REMOVE PISTON WITH PIN SUB-ASSEMBLY**

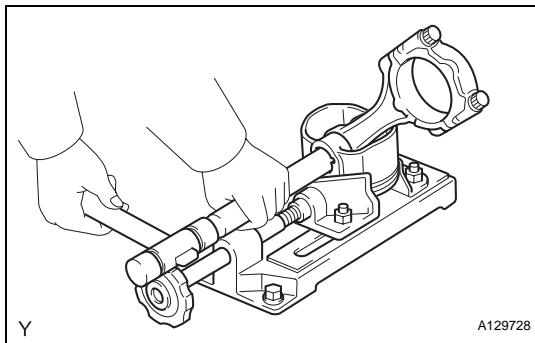
- (a) Check the fitting condition between the piston and piston pin.
- (1) Try to move the piston back and forth on the piston pin.
- HINT:
If any movement is felt, replace the piston and pin as a set.



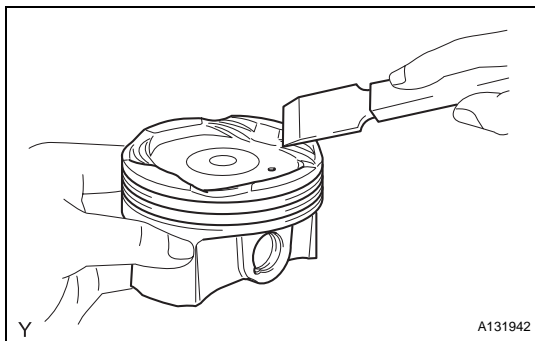
- (b) Disconnect the connecting rod from the piston.
- (1) Using a screwdriver, pry off the snap rings from the piston.



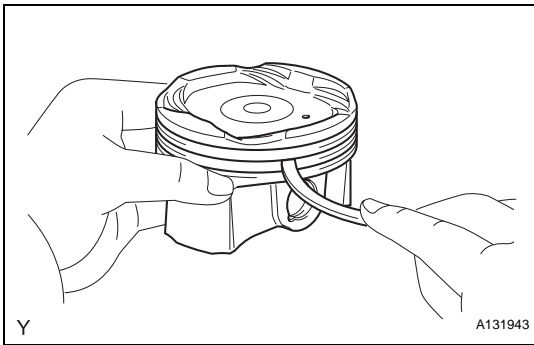
- (2) Gradually heat the piston to approximately 80°C (176°F).



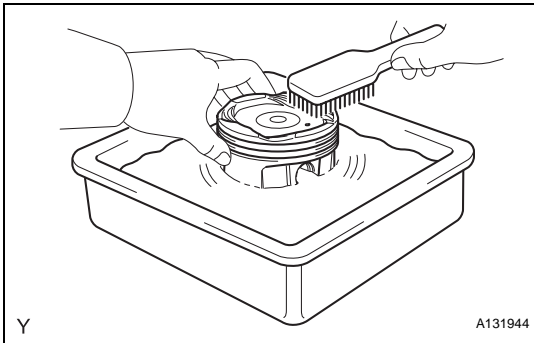
- (3) Using a brass bar and plastic-faced hammer, lightly tap out the piston pin and remove the connecting rod.
- HINT:
- The piston and pin are a matched set.
 - Arrange the pistons, pins, rings, connecting rods and bearings in the correct order.



- (c) Clean piston.
- (1) Using a gasket scraper, remove the carbon from the piston top.



- (2) Using a groove cleaning tool or broken ring, clean the piston ring grooves.



- (3) Using solvent and a brush, thoroughly clean the piston.

NOTICE:
Do not use a wire brush.