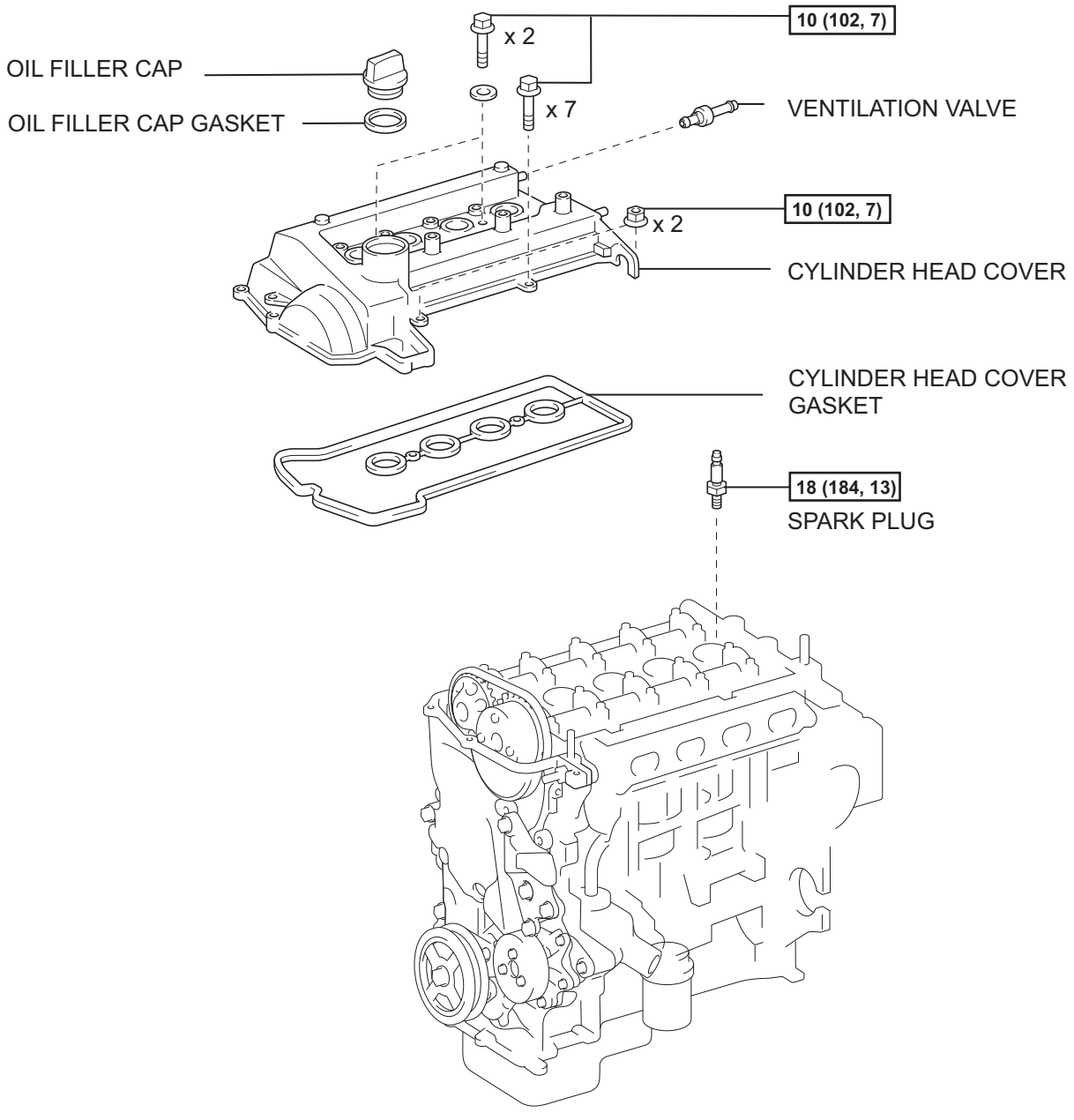
ENGINE UNIT

COMPONENTS

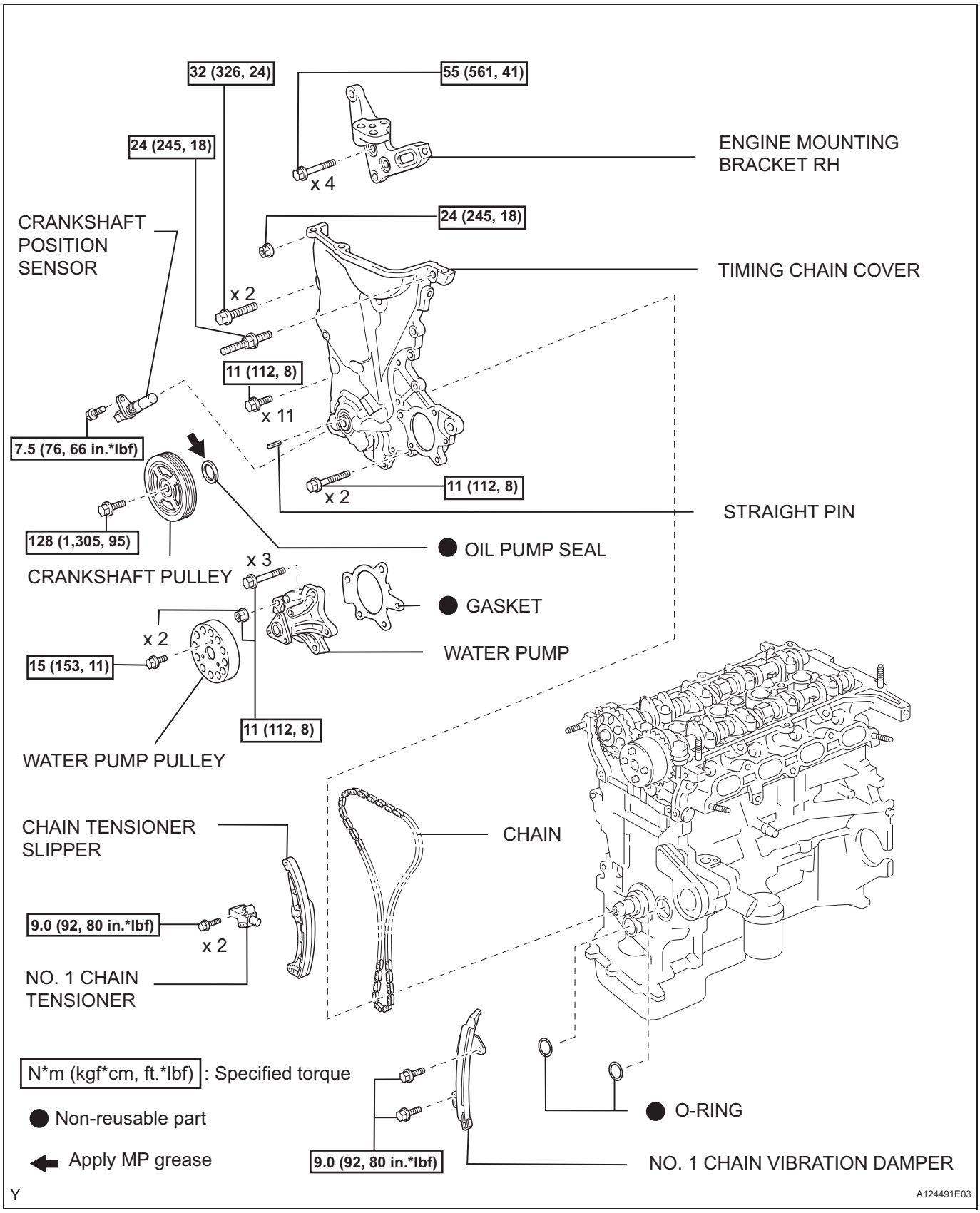


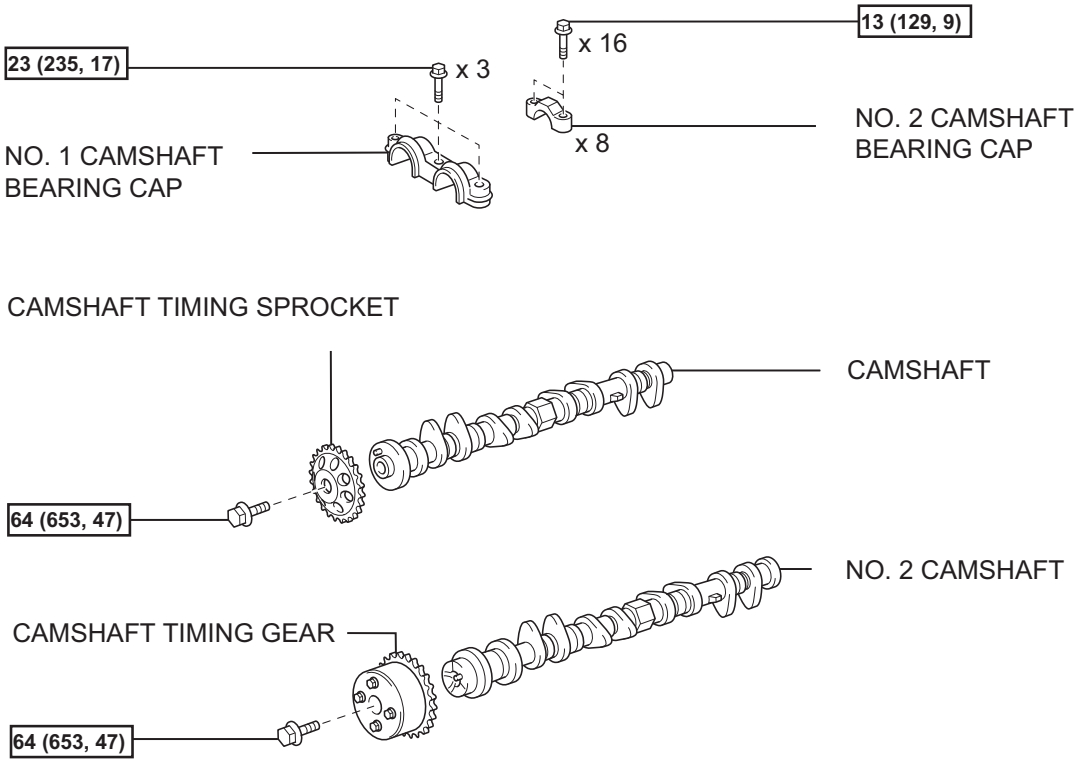
N*m (kgf*cm, ft.*lbf) : Specified torque

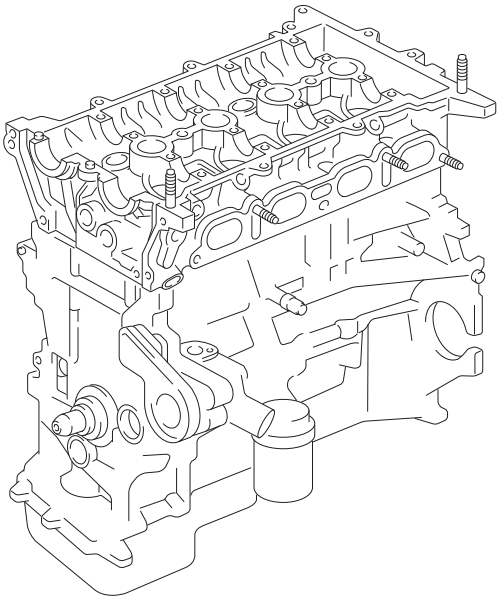
Y

A116718E02

EM


32 (326, 24)
55 (561, 41)
24 (245, 18)
ENGINE MOUNTING BRACKET RH
x 4
CRANKSHAFT POSITION SENSOR
24 (245, 18)
TIMING CHAIN COVER
x 2
11 (112, 8)
x 11
7.5 (76, 66 in.*lbf)
11 (112, 8)
x 2
STRAIGHT PIN
128 (1,305, 95)
OIL PUMP SEAL
CRANKSHAFT PULLEY
x 3
GASKET
x 2
15 (153, 11)
WATER PUMP
11 (112, 8)
WATER PUMP PULLEY
CHAIN TENSIONER SLIPPER
CHAIN
9.0 (92, 80 in.*lbf)
x 2
NO. 1 CHAIN TENSIONER
N*m (kgf*cm, ft.*lbf) : Specified torque
O-RING
Non-reusable part
Apply MP grease
9.0 (92, 80 in.*lbf)
NO. 1 CHAIN VIBRATION DAMPER
Y
A124491E03

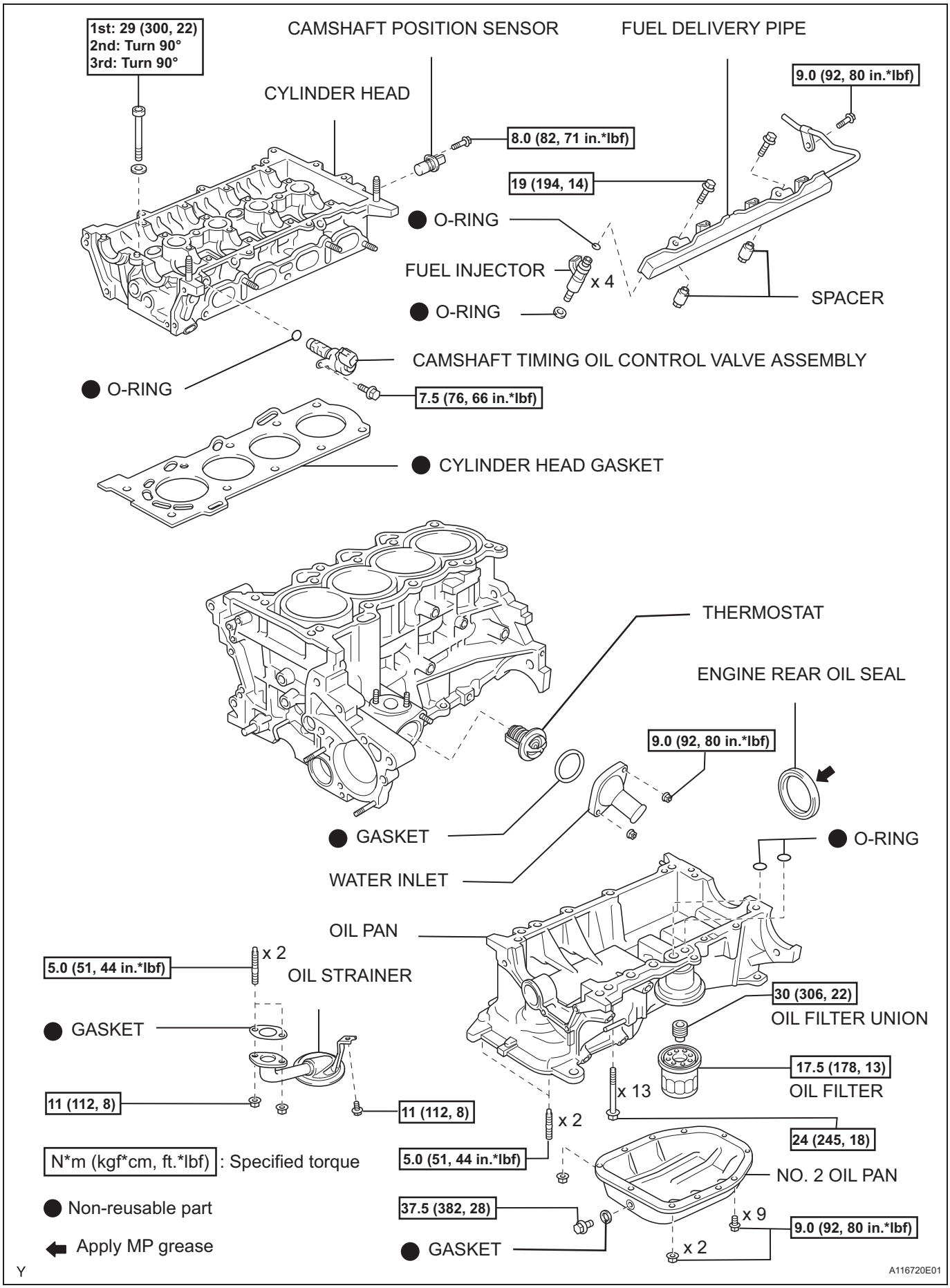


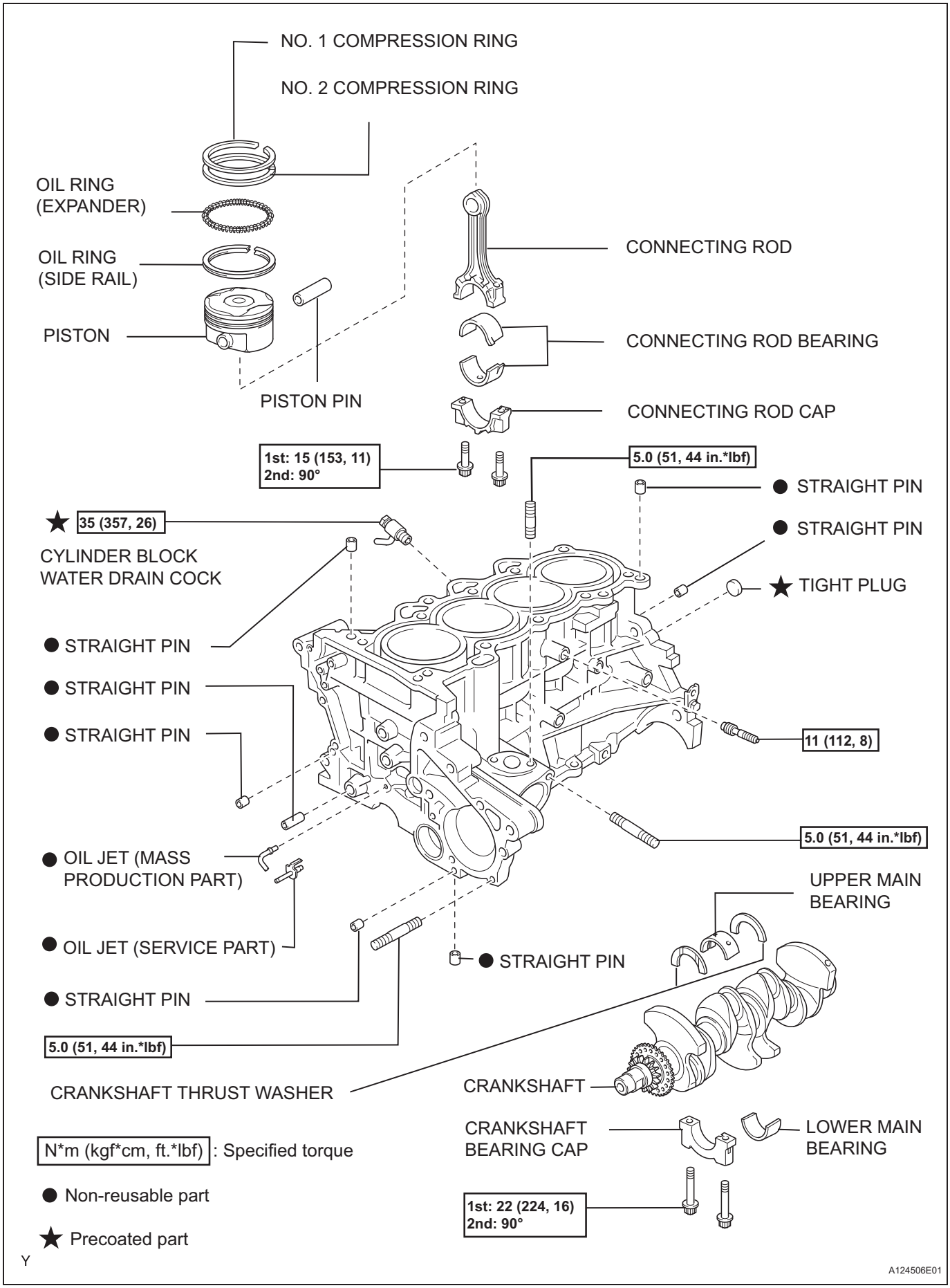


N*m (kgf*cm, ft.*lbf) : Specified torque

Y

A116719E01


1st: 29 (300, 22)
2nd: Turn 90°
3rd: Turn 90°
CAMSHAFT POSITION SENSOR
FUEL DELIVERY PIPE
CYLINDER HEAD
9.0 (92, 80 in.*lbf)
8.0 (82, 71 in.*lbf)
19 (194, 14)
O-RING
FUEL INJECTOR
x 4
O-RING
SPACER
CAMSHAFT TIMING OIL CONTROL VALVE ASSEMBLY
O-RING
7.5 (76, 66 in.*lbf)
CYLINDER HEAD GASKET
THERMOSTAT
ENGINE REAR OIL SEAL
9.0 (92, 80 in.*lbf)
GASKET
O-RING
WATER INLET
OIL PAN
5.0 (51, 44 in.*lbf)
x 2
OIL STRAINER
30 (306, 22)
OIL FILTER UNION
GASKET
17.5 (178, 13)
OIL FILTER
x 13
11 (112, 8)
11 (112, 8)
x 2
24 (245, 18)
N*m (kgf*cm, ft.*lbf) : Specified torque
5.0 (51, 44 in.*lbf)
NO. 2 OIL PAN
Non-reusable part
37.5 (382, 28)
x 9
9.0 (92, 80 in.*lbf)
Apply MP grease
GASKET
x 2
Y
A116720E01


NO. 1 COMPRESSION RING
NO. 2 COMPRESSION RING
OIL RING (EXPANDER)
OIL RING (SIDE RAIL)
PISTON
PISTON PIN
CONNECTING ROD
CONNECTING ROD BEARING
CONNECTING ROD CAP
1st: 15 (153, 11)
2nd: 90°
5.0 (51, 44 in.*lbf)
● STRAIGHT PIN
● STRAIGHT PIN
★ TIGHT PLUG
★ 35 (357, 26)
CYLINDER BLOCK WATER DRAIN COCK
● STRAIGHT PIN
● STRAIGHT PIN
● STRAIGHT PIN
11 (112, 8)
5.0 (51, 44 in.*lbf)
● OIL JET (MASS PRODUCTION PART)
● OIL JET (SERVICE PART)
● STRAIGHT PIN
● STRAIGHT PIN
5.0 (51, 44 in.*lbf)
UPPER MAIN BEARING
CRANKSHAFT THRUST WASHER
CRANKSHAFT
CRANKSHAFT BEARING CAP
LOWER MAIN BEARING
1st: 22 (224, 16)
2nd: 90°
N*m (kgf*cm, ft.*lbf) : Specified torque
● Non-reusable part
★ Precoated part
Y
A124506E01

DISASSEMBLY

1. REMOVE SPARK PLUG

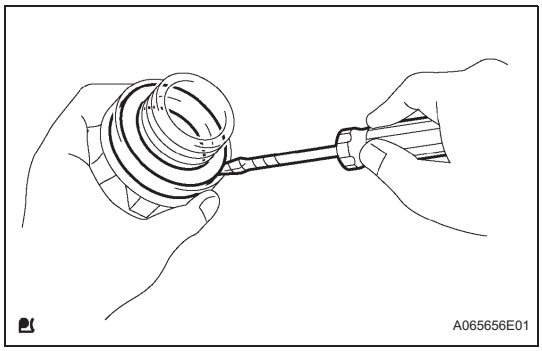
(a) Using a 16 mm plug wrench, remove the 4 spark plugs.

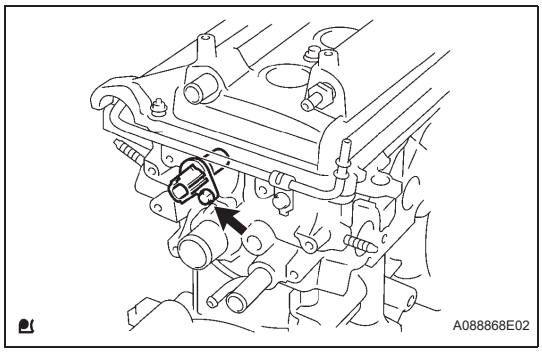
2. REMOVE OIL FILLER CAP

(a) Remove the oil filler cap from the cylinder head cover.

3. REMOVE OIL FILLER CAP GASKET

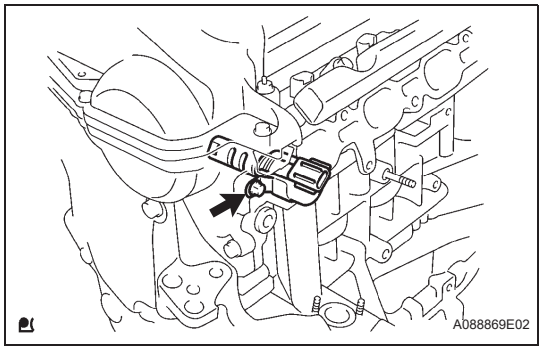
(a) Using a screwdriver, remove the gasket from the oil filler cap.
HINT:
Tape the screwdriver tip before use.





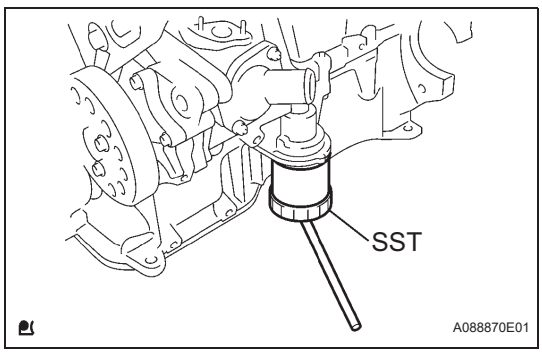
4. REMOVE CAMSHAFT POSITION SENSOR

(a) Remove the bolt and sensor.



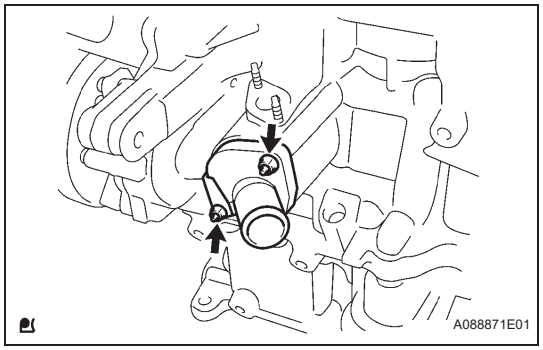
5. REMOVE CAMSHAFT TIMING OIL CONTROL VALVE ASSEMBLY

(a) Remove the bolt and oil control valve.



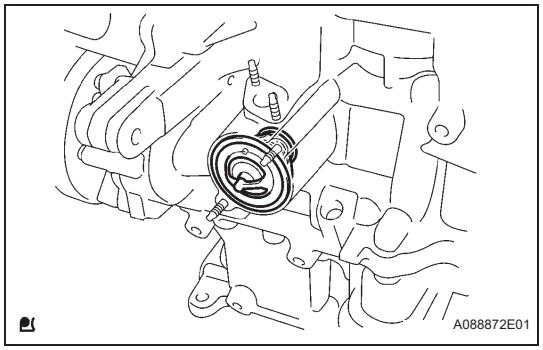
6. REMOVE OIL FILTER

(a) Using SST, remove the oil filter.
SST 09228-06501



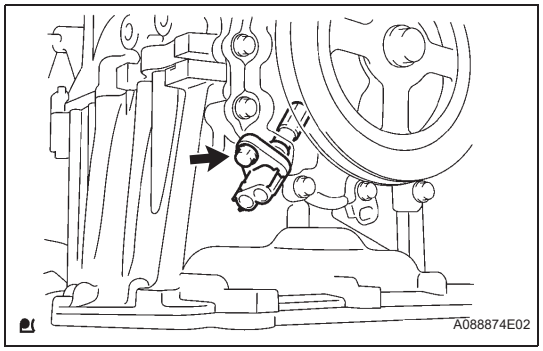
7. REMOVE THERMOSTAT

(a) Remove the 2 nuts and water inlet.



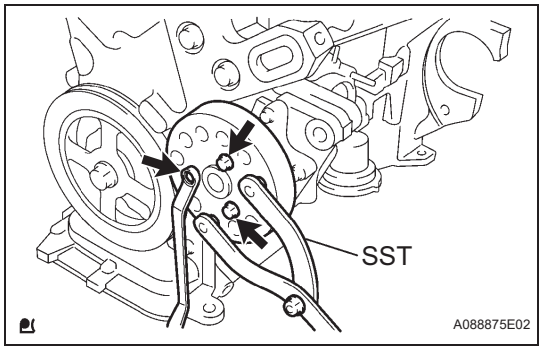
(b) Remove the thermostat.

(c) Remove the gasket from the thermostat.



8. REMOVE CRANKSHAFT POSITION SENSOR

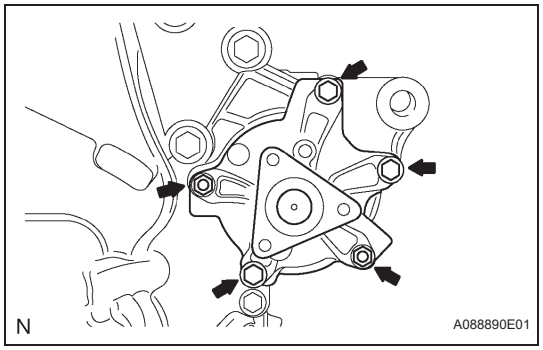
(a) Remove the bolt and sensor.



9. REMOVE WATER PUMP PULLEY

(a) Using SST, hold the pump pulley and remove the 3 bolts and pump pulley.

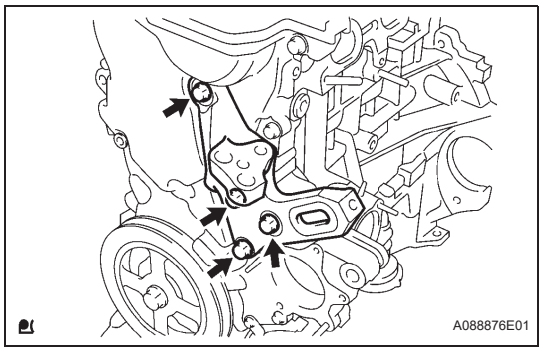
SST 09960-10010 (09962-01000, 09963-00600)



10. REMOVE WATER PUMP

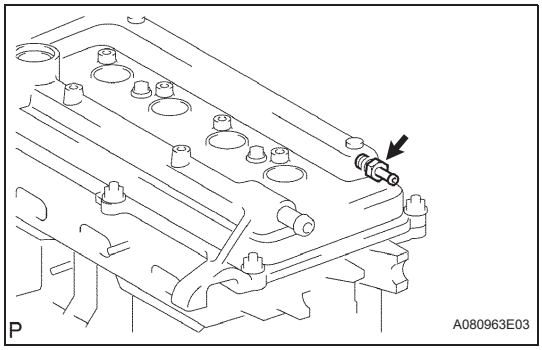
(a) Remove the 3 bolts and 2 nuts.

(b) Remove the water pump and gasket.



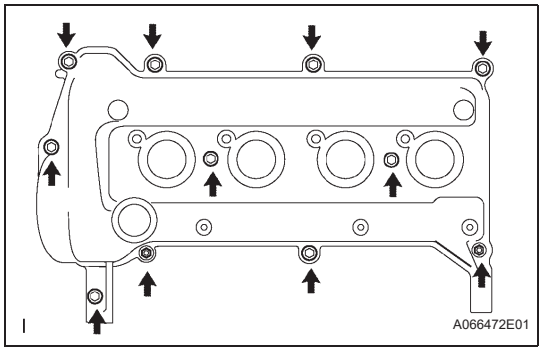
11. REMOVE ENGINE MOUNTING BRACKET RH

(a) Remove the 4 bolts and engine mounting bracket RH.



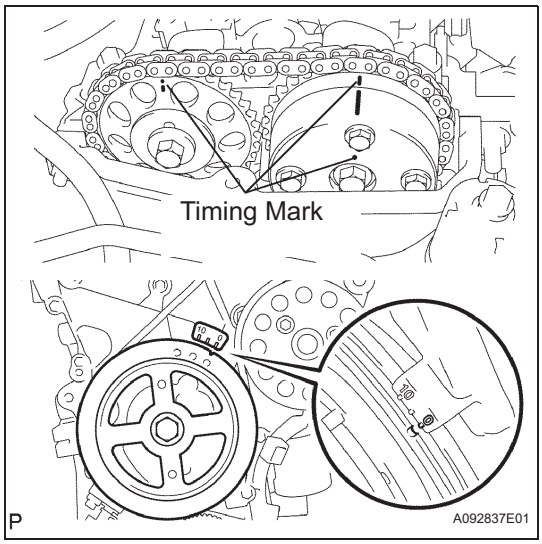
12. REMOVE VENTILATION VALVE

(a) Remove the ventilation valve from the cylinder head cover.



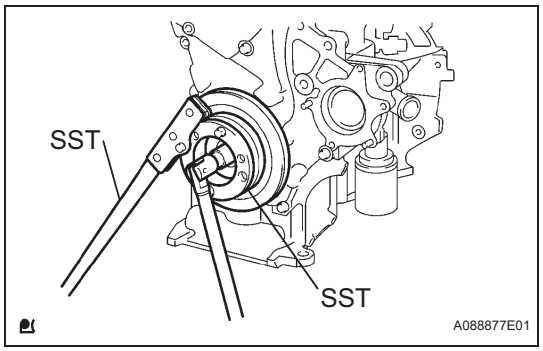
13. REMOVE CYLINDER HEAD COVER

(a) Remove the 9 bolts, 2 nuts and cylinder head cover.
(b) Remove the gasket from the cylinder head cover.

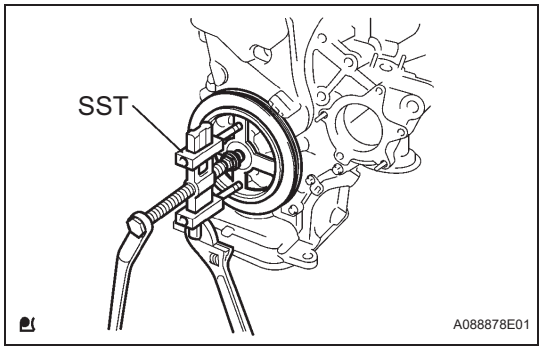


14. REMOVE CRANKSHAFT PULLEY

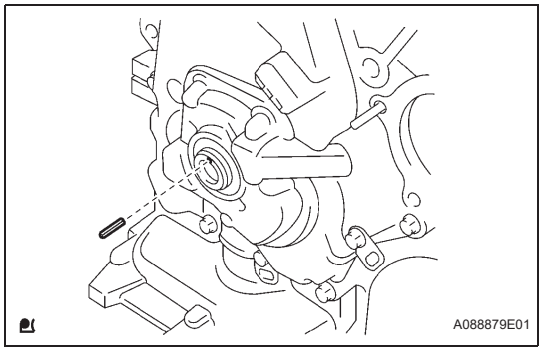
(a) Set the No. 1 cylinder to TDC/compression.
  (1) Turn the crankshaft pulley until its timing notch and timing mark 0 of the chain cover are aligned.
  (2) Check that both timing marks on the camshaft timing sprocket and the camshaft timing gear are facing upward as shown in the illustration. If not, turn the crankshaft 1 complete revolution (360°) and align the marks as above.



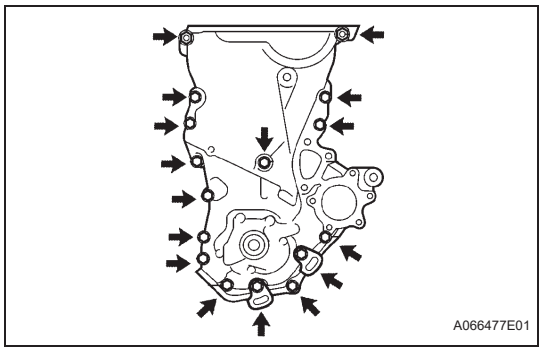
(b) Using SST, hold the crankshaft pulley and loosen the crankshaft pulley set bolt.
SST 09213-58012 (91111-50845), 09330-00021
NOTICE:
When installing SST, be careful that the bolt which holds SST does not interfere with the chain cover.



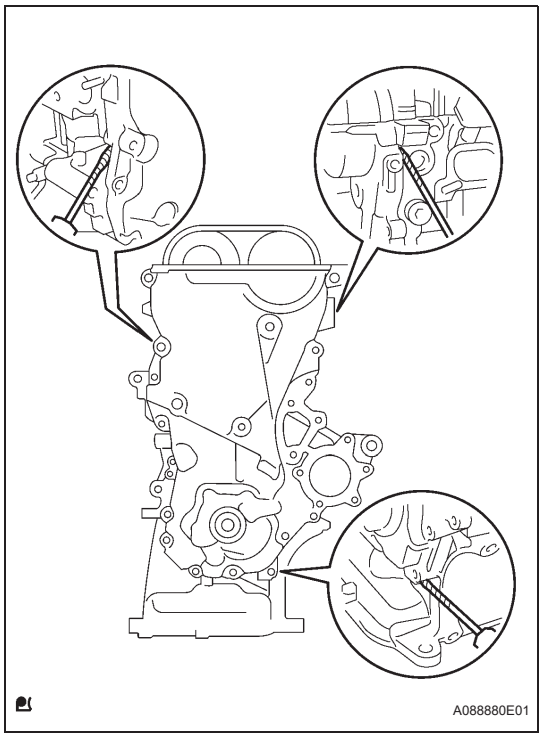
(c) Loosen the crankshaft pulley set bolts until 2 to 3 threads of the bolt is tightened to the crankshaft.
(d) Using SST, remove the crankshaft pulley and crankshaft pulley set bolt.
SST 09950-50013 (09951-05010, 09952-05010, 09953-05020, 09954-05021)



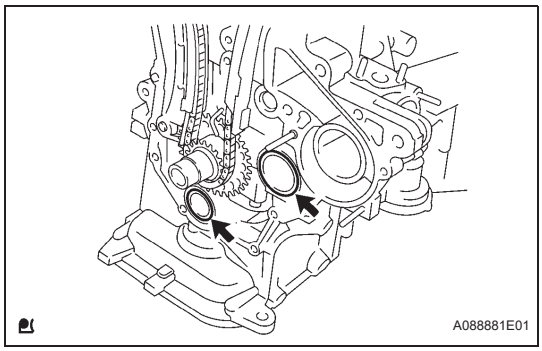
(e) Remove the crankshaft straight pin.



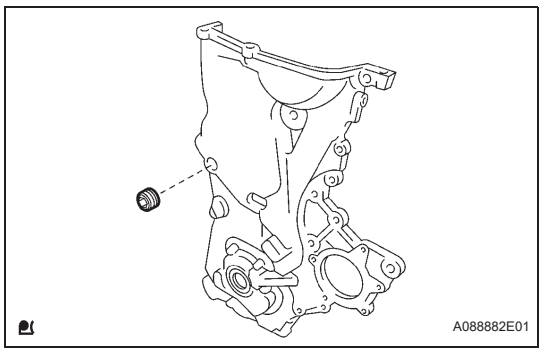
15. REMOVE TIMING CHAIN COVER
(a) Remove the 15 bolts and nut.



(b) Using a screwdriver with the tip wrapped in tape, remove the chain cover by prying between the cylinder head and cylinder block.
NOTICE:
Be careful not to damage the contact surfaces of the chain cover, the cylinder head and the cylinder block.

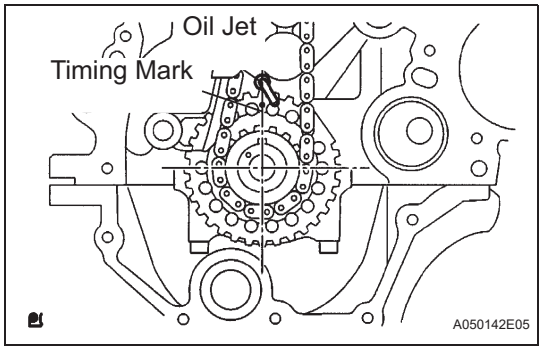


(c) Remove the 2 O-rings from the cylinder block and No. 1 oil pan.

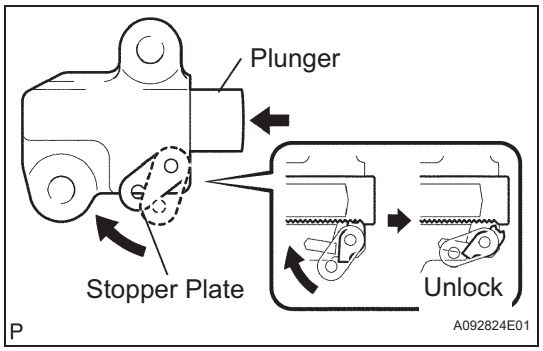


(d) Using an 8 mm hexagon wrench, remove the screw plug from the oil pump.

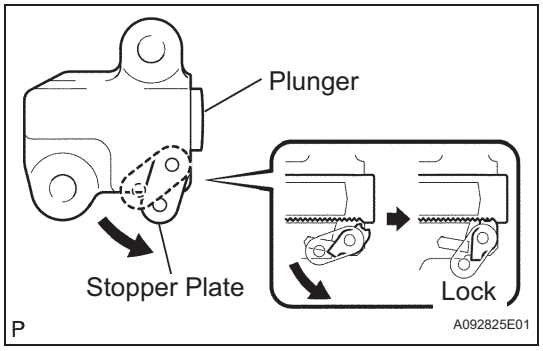
16. REMOVE OIL PUMP SEAL (See page EM-138)



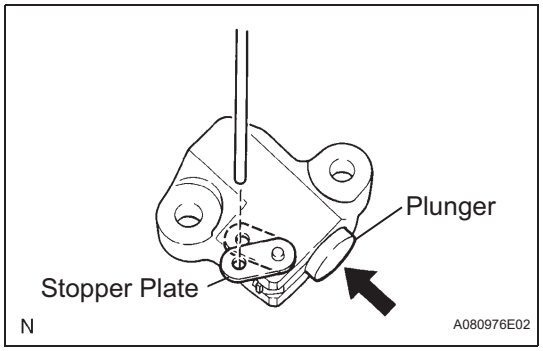
17. REMOVE NO. 1 CHAIN TENSIONER
NOTICE:
- **When rotating the camshaft with the timing chain removed, rotate the crankshaft counterclockwise 40° from TDC and align the oil jet hole with the paint mark to prevent the pistons from coming into contact with the valves.**
- **Do not rotate the crankshaft with the chain tensioner removed.**



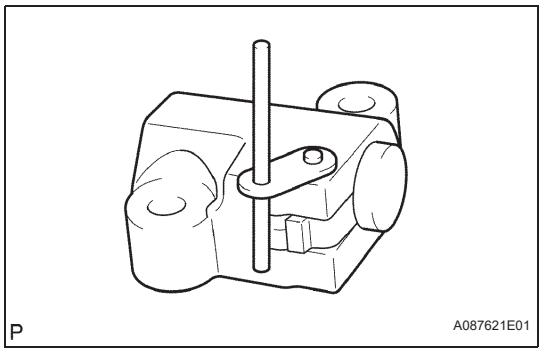
(a) Lift up the stopper plate, then unlock the plunger.
(b) Push in the plunger to the end with the plunger unlocked.



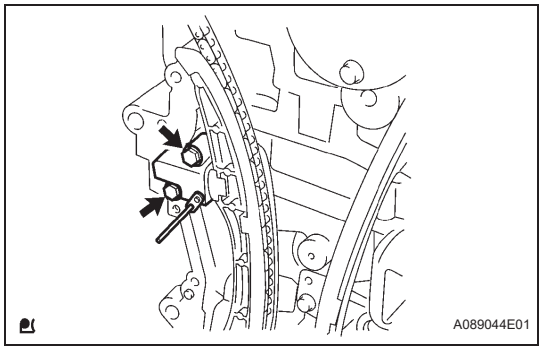
(c) Lower the stopper plate with the plunger pushed to the end, then lock the plunger.



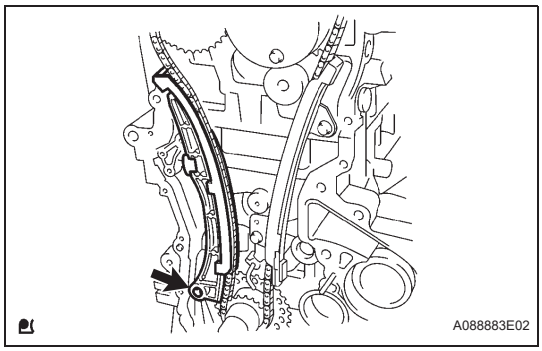
(d) Insert a 3.0 mm (0.118 in.) diameter bar into the hole of the stopper plate with the plunger locked.



HINT:
If the stopper plate is not completely lowered and a 3.0 mm (0.118 in.) diameter bar cannot be inserted, unlock and pull out the plunger slightly. Then the stopper plate will be completely lowered and a 3.0 mm (0.118 in.) diameter bar can be inserted easily.

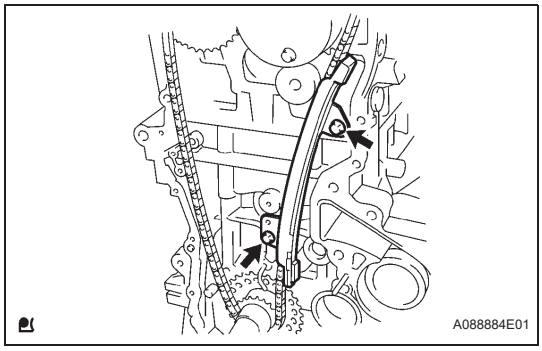


(e) Remove the 2 bolts and chain tensioner.



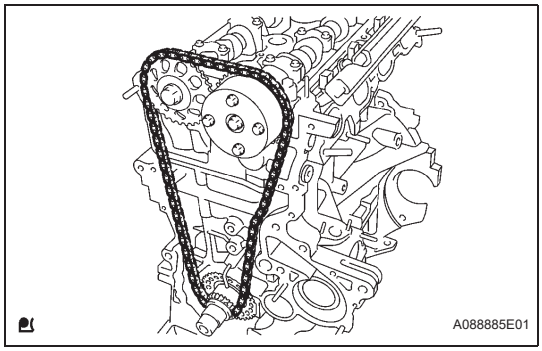
18. REMOVE CHAIN TENSIONER SLIPPER

(a) Remove the bolt and chain tensioner slipper.



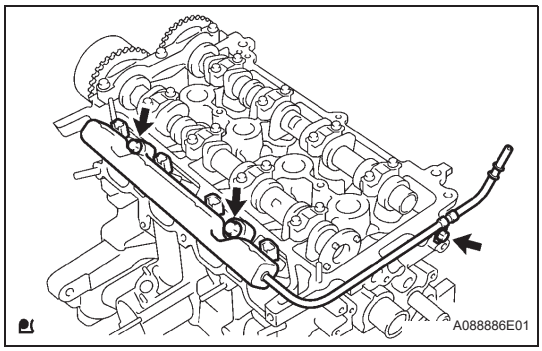
19. REMOVE NO. 1 CHAIN VIBRATION DAMPER

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



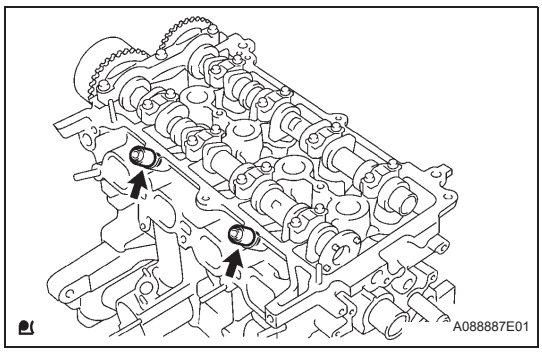
20. REMOVE CHAIN

(a) Remove the chain from the engine.

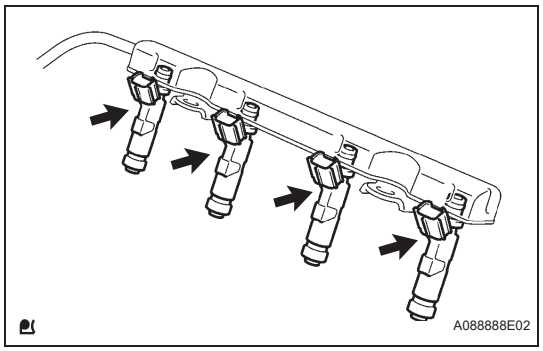


21. REMOVE FUEL DELIVERY PIPE

(a) Remove the 3 bolts and fuel delivery pipe together with the 4 fuel injectors.

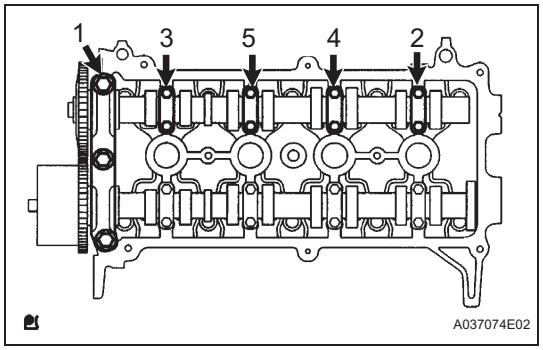


(b) Remove the delivery pipe spacer from the cylinder head.



22. REMOVE FUEL INJECTOR

(a) Pull out the 4 injectors from the delivery pipe.

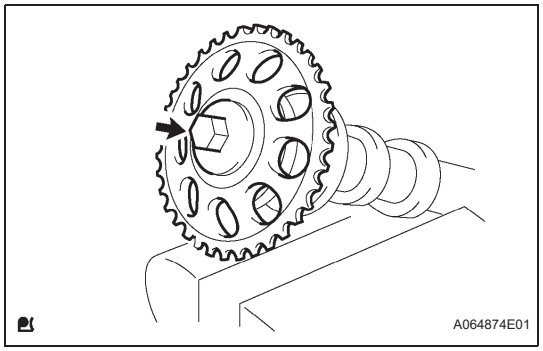


23. REMOVE NO. 2 CAMSHAFT

(a) Using several steps, uniformly loosen and remove the 11 bearing cap bolts in the sequence shown in the illustration, and then remove the 5 bearing caps and No. 2 camshaft.

NOTICE:

Loosen each bolt uniformly, keeping the camshaft level.



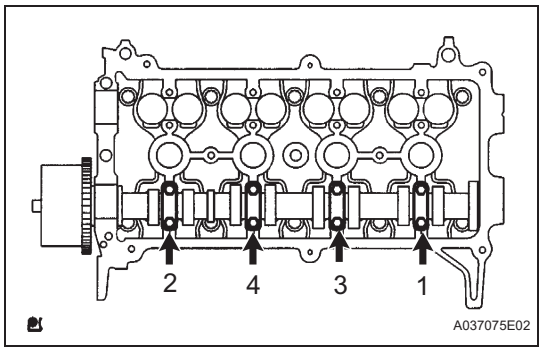
24. REMOVE CAMSHAFT TIMING SPROCKET

(a) Clamp the camshaft in a vise.

(b) Remove the flange bolt and camshaft timing sprocket.

NOTICE:

Be careful not to damage the camshaft.

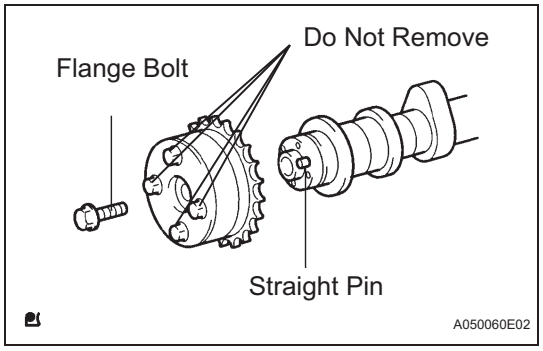


25. REMOVE CAMSHAFT

(a) Using several steps, uniformly loosen and remove the 8 bearing cap bolts in the sequence shown in the illustration, and then remove the 4 bearing caps and camshaft.

NOTICE:

Loosen each bolt uniformly, keeping the camshaft level.



26. REMOVE CAMSHAFT TIMING GEAR

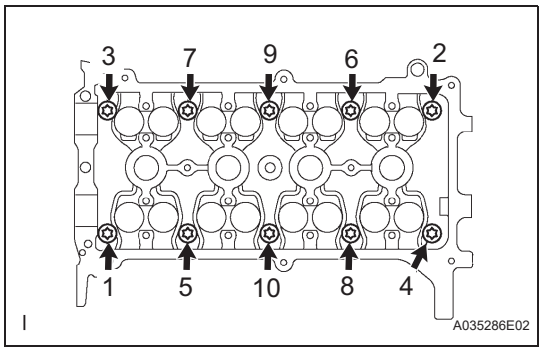
(a) Turn the valve timing controller assembly at the most advanced angle (see page EM-65).

(b) Remove the flange bolt and camshaft timing gear.

NOTICE:

- **Be careful not to remove the other 4 bolts.**
- **If reusing the camshaft timing gear, unlock the lock pin inside the camshaft timing gear first.**

EM



27. REMOVE CYLINDER HEAD

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

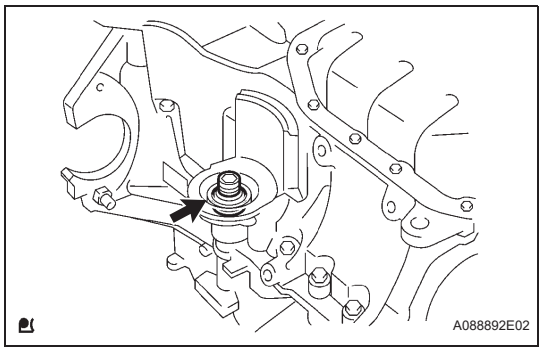
NOTICE:

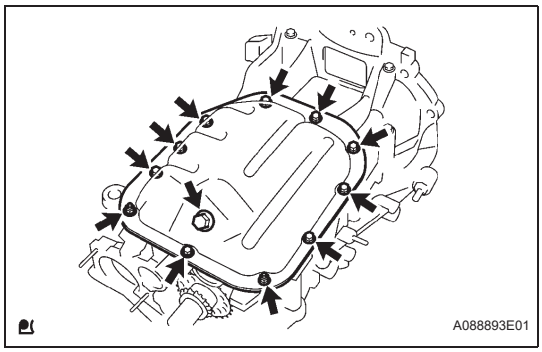
- **Be careful not to drop washers into the cylinder head.**
- **Head warpage or cracking could result from removing bolts in the incorrect order.**

28. REMOVE CYLINDER HEAD GASKET

29. REMOVE OIL FILTER UNION

(a) Using a 12 mm hexagon wrench, remove the oil filter union.

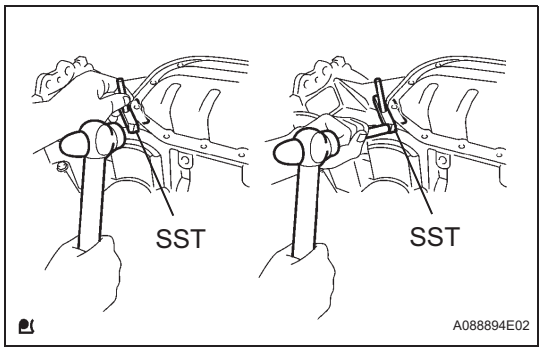




30. REMOVE NO. 2 OIL PAN

(a) Remove the oil pan drain plug and gasket.

(b) Remove the 9 bolts and 2 nuts.

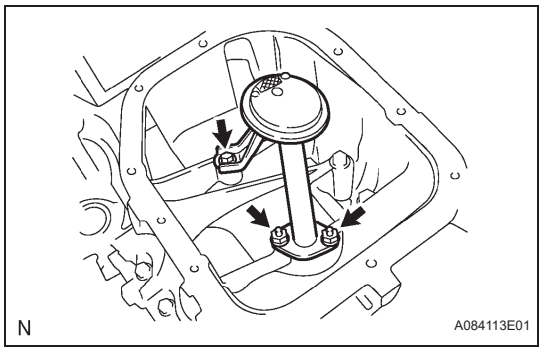


(c) Insert the blade of SST between the oil pan and No. 2 oil pan, cut off the applied sealer and remove the No. 2 oil pan.

SST 09032-00100

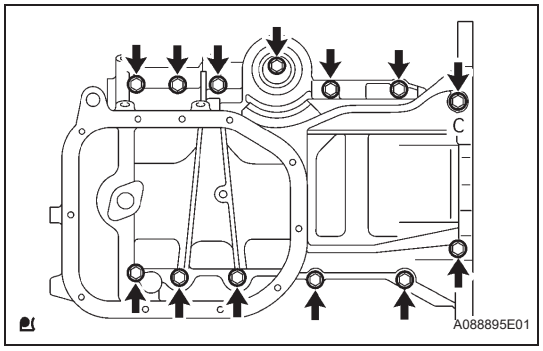
NOTICE:

Be careful not to damage the oil pan and No. 2 oil pan.



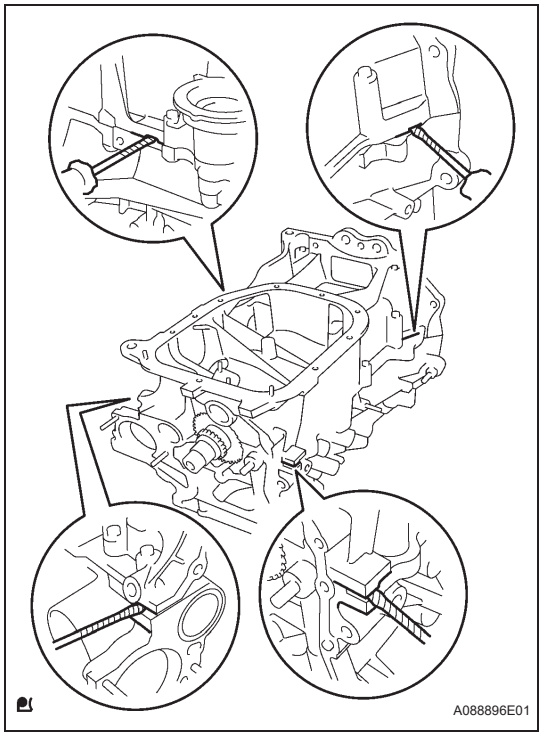
31. REMOVE OIL STRAINER

(a) Remove the bolt, 2 nuts, oil strainer and gasket.



32. REMOVE OIL PAN

(a) Loosen and remove the 13 bolts uniformly in several steps.



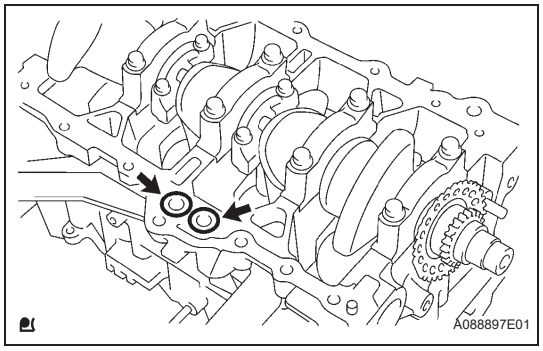
(b) Using a screwdriver, remove the oil pan by prying between the cylinder block and oil pan.

NOTICE:

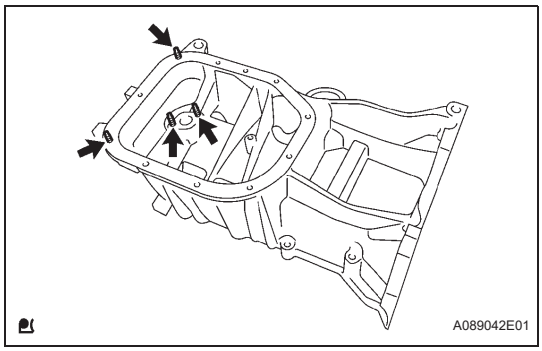
Be careful not to damage the contact surfaces of the oil pan and cylinder block.

HINT:

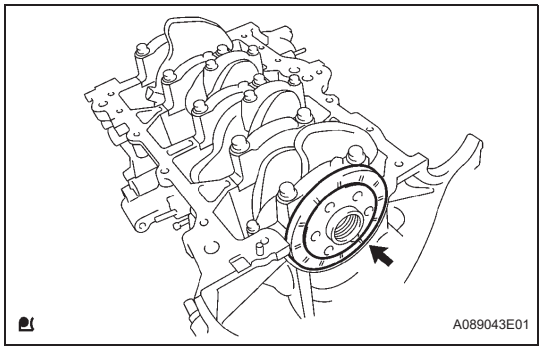
Tape the screwdriver tip before use.



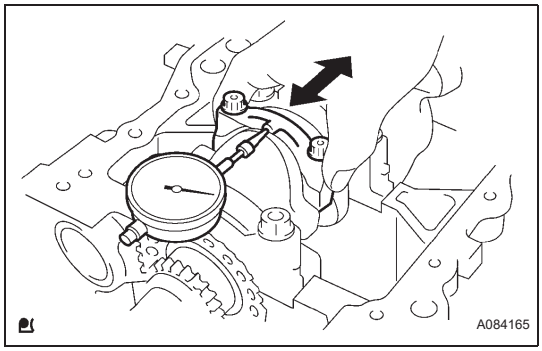
(c) Remove the 2 O-rings from the cylinder block.



(d) Using an E5 "torx" socket, remove the 4 stud bolts.



33. REMOVE ENGINE REAR OIL SEAL

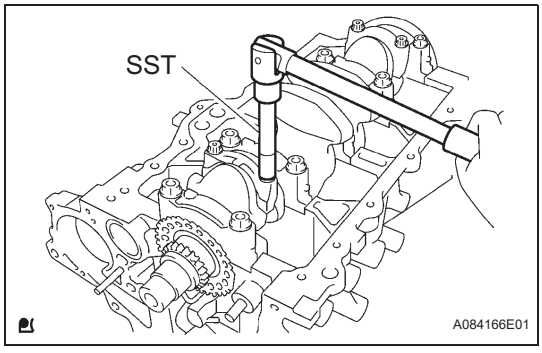


34. INSPECT CONNECTING ROD THRUST CLEARANCE

(a) Using a dial indicator, measure the thrust clearance while moving the connecting rod back and forth.
Standard thrust clearance:
0.16 to 0.36 mm (0.0063 to 0.0142 in.)
Maximum thrust clearance:
0.36 mm (0.0142 in.)
If the thrust clearance is greater than the maximum, replace the connecting rod.

35. INSPECT CONNECTING ROD OIL CLEARANCE

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

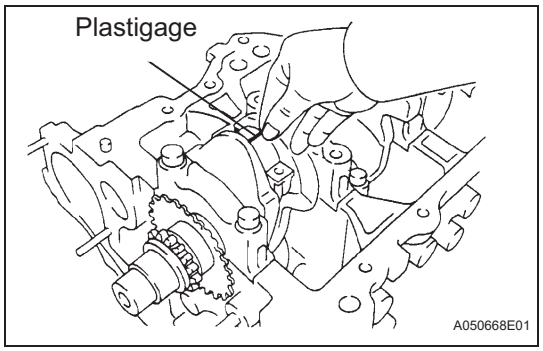


(b) Using SST, remove the 2 connecting rod cap bolts.
SST 09205-16010

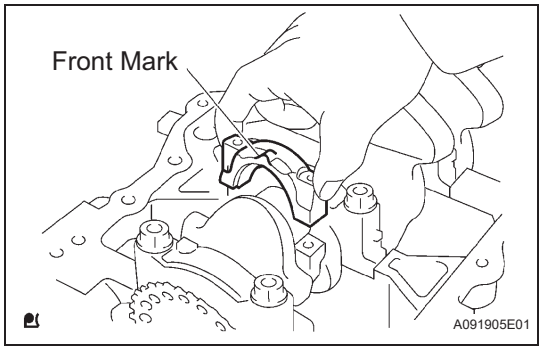
(c) Using the 2 removed connecting rod cap bolts, remove the connecting rod cap and lower bearing by wiggling the connecting rod cap right and left.

(d) Clean the crank pin and bearing.

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

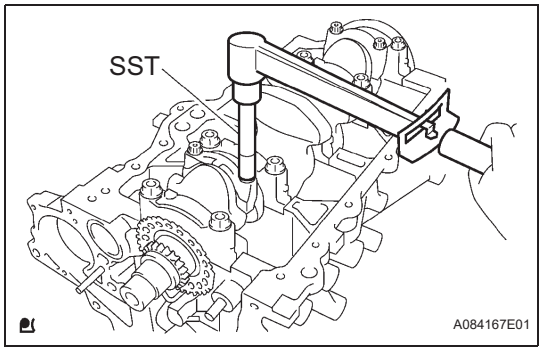


(f) Lay a strip of Plastigage across the crank pin.

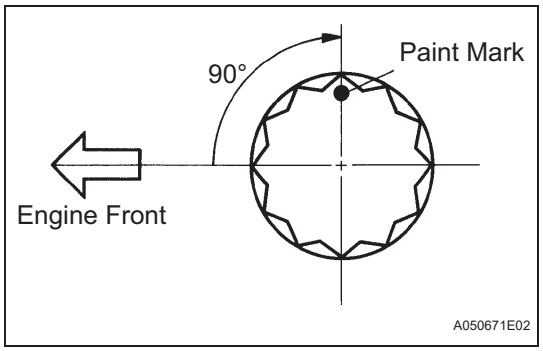


(g) Match together the connecting rod and cap in the correct combination. Then install the cap onto the connecting rod, making sure that the front mark on the cap is correctly oriented.

(h) Apply a light coat of engine oil to the threads of the connecting rod cap bolts.



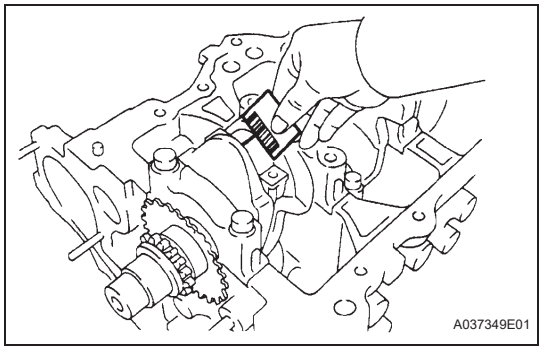
(i) Using SST, tighten the bolts in several steps by the specified torque.
SST 09205-16010
Torque: 15 N*m (153 kgf*cm, 11 ft.*lbf)
NOTICE:
Do not turn the crankshaft.



(j) Mark the front of the connecting cap bolts with paint.

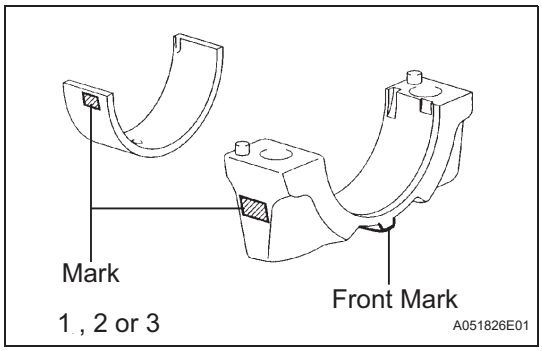
(k) Retighten the cap bolts by 90° as shown in the illustration.
NOTICE:
Do not turn the crankshaft.

(l) Remove the 2 bolts, connecting rod cap and lower bearing.



(m) Measure the Plastigage at its widest point.
Standard oil clearance:
0.016 to 0.040 mm (0.0006 to 0.0016 in.)
Maximum oil clearance:
0.06 mm (0.0024 in.)
NOTICE:
Completely remove the Plastigage.

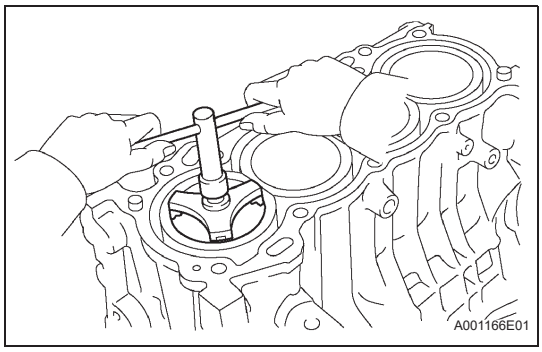
EM



(n) If the oil clearance is greater than the maximum, select and replace the bearing. If necessary, use an undersized bearing.

Reference

Number Mark	Connecting Rod External Diameter	Center Bearing Thickness	Oil Clearance
1	43.000 to 43.008 mm (1.6929 to 1.6932 in.)	1.491 to 1.492 mm (0.0587 to 0.0588 in.)	0.016 to 0.040 mm (0.0006 to 0.0016 in.)
2	43.008 to 43.016 mm (1.6932 to 1.6935 in.)	1.492 to 1.496 mm (0.0588 to 0.0589 in.)	0.016 to 0.040 mm (0.0006 to 0.0016 in.)
3	43.016 to 43.024 mm (1.6935 to 1.6939 in.)	1.496 to 1.500 mm (0.0589 to 0.0591 in.)	0.016 to 0.040 mm (0.0006 to 0.0016 in.)
U/S 0.25	43.000 to 43.024 mm (1.6929 to 1.6939 in.)	1.608 to 1.614 mm (0.0633 to 0.0635 in.)	0.016 to 0.040 mm (0.0006 to 0.0016 in.)

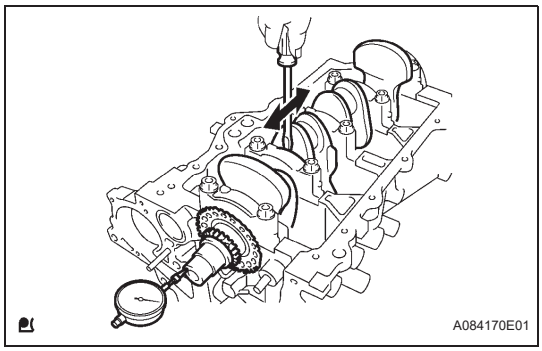


36. REMOVE PISTON WITH CONNECTING ROD

(a) Using a ridge reamer, remove all carbon from the top of the cylinder.

(b) Push the piston, connecting rod assembly and upper bearing through the top of the cylinder block.
HINT:
- Keep the bearing, connecting rod and cap together.
- Keep the piston and the connecting rod assemblies in the correct order so that they can be returned to their original locations when re-assembling.

37. REMOVE CONNECTING ROD BEARING

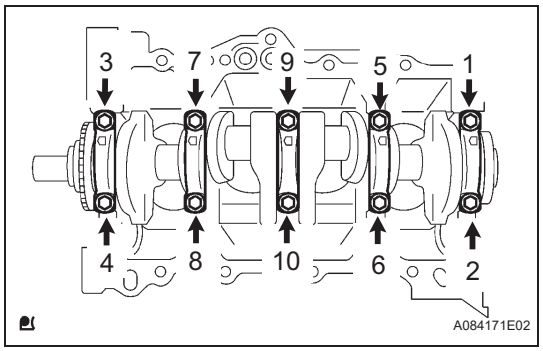


38. INSPECT CRANKSHAFT THRUST CLEARANCE

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

Standard thrust clearance:
0.09 to 0.19 mm (0.0035 to 0.0075 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. Check the crankshaft and block for wear. Repair or replace if necessary.
HINT:
Thrust washer thickness: 2.43 to 2.48 mm (0.0957 to 0.0976 in.)

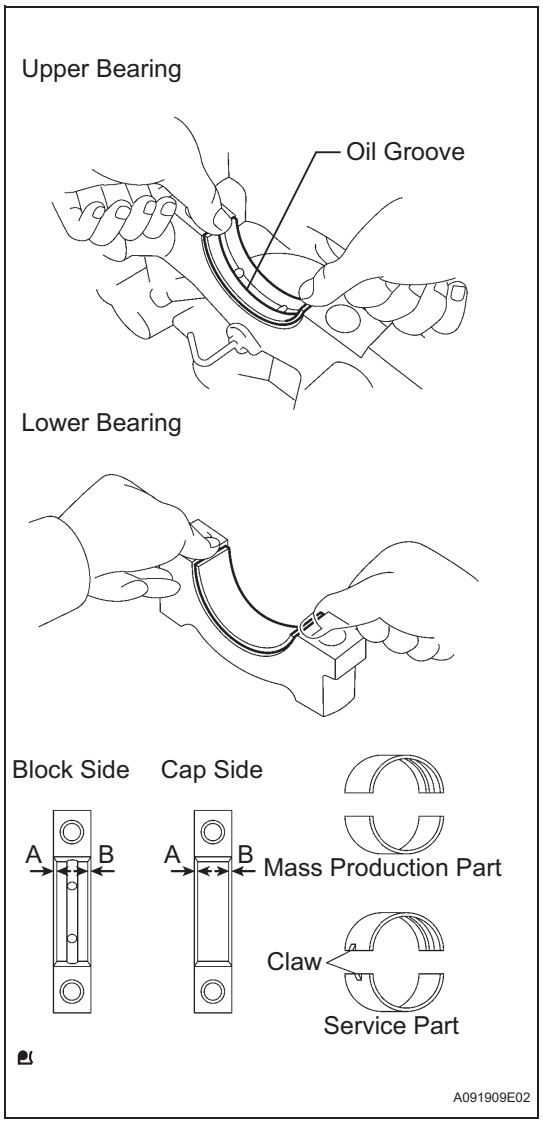


39. REMOVE CRANKSHAFT AND INSPECT OIL CLEARANCE

(a) Using several steps, uniformly loosen and remove the 10 bearing cap bolts with SST in the sequence shown in the illustration.
SST 09011-38121

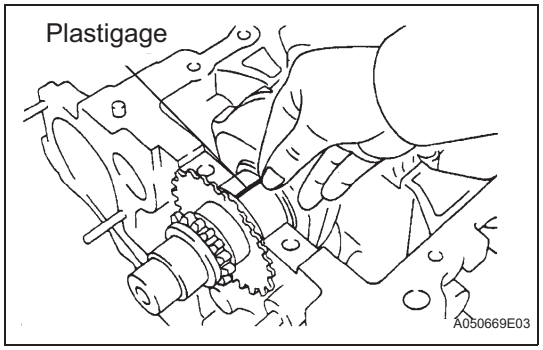
(b) Remove the 5 bearing caps and crankshaft.

(c) Clean each main journal and bearing.



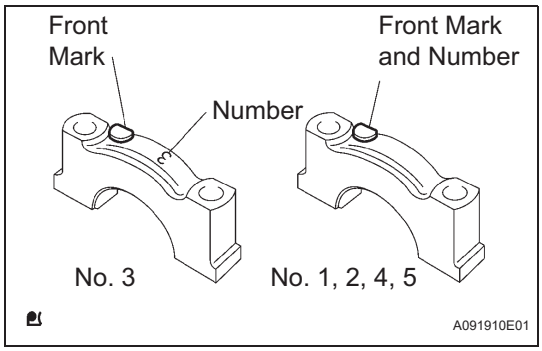
(d) Install the upper bearing with the oil groove onto the cylinder block, and the lower bearing onto the bearing cap.
NOTICE:
Do not apply engine oil to the contact surfaces of the cylinder block or the backside of the bearing.
HINT:
The mass production parts do not have claws as marks. If reusing the mass production parts, measure the clearance of both sides with the bearing in the center of the bearing cap.
Standard clearance:
A - B = within 0.8 mm (0.032 in.)

(e) Install the crankshaft onto the cylinder block.

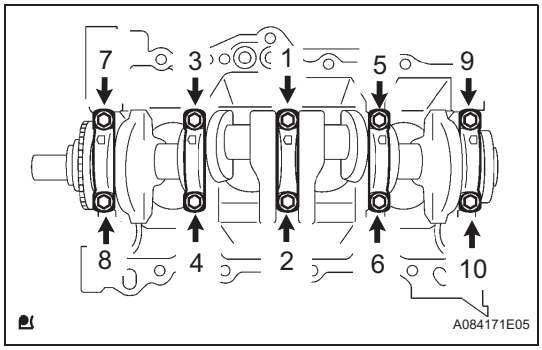


(f) Lay a strip of Plastigage across each journal.

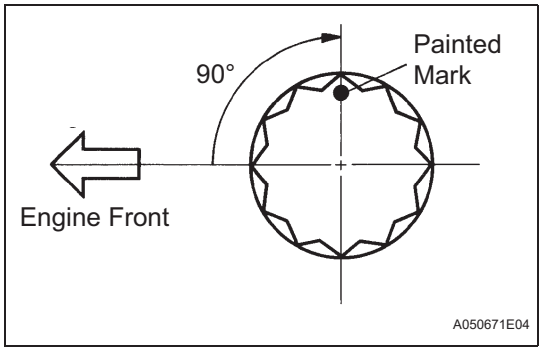
EM



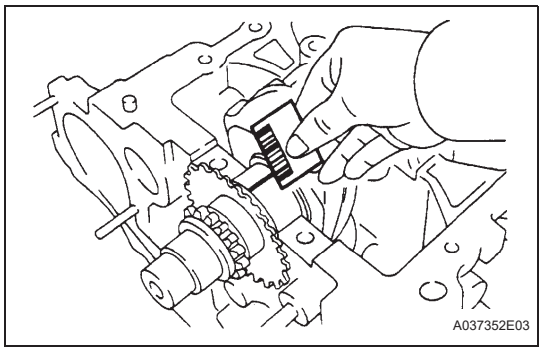
(g) Check the front marks and numbers and install the bearing caps onto the cylinder block.
(h) Apply a light coat of engine oil to the threads of the bearing cap bolts.



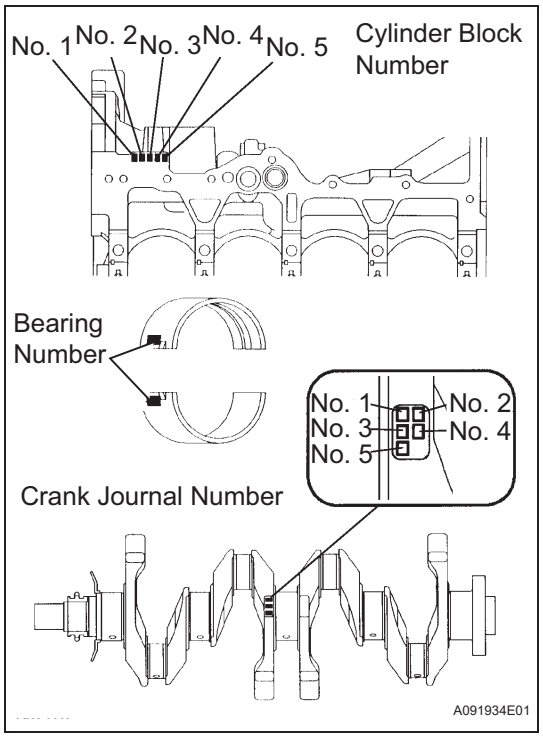
(i) Using SST, tighten the bolts in several steps by the specified torque in the sequence shown in the illustration.
SST 09011-38121
Torque: 22 N*m (224 kgf*cm, 16 ft.*lbf)
NOTICE:
Do not turn the crankshaft.



(j) Mark the front of the bearing cap bolts with paint.
(k) Retighten the bearing cap bolts by 90° in the same sequence.
(l) Check that the painted mark is now at a 90° angle to the front.
NOTICE:
Do not turn the crankshaft.
(m) Remove the bearing cap.



(n) Measure the Plastigage at its widest point.
Standard oil clearance:
0.010 to 0.023 mm (0.0004 to 0.0009 in.)
Maximum oil clearance:
0.07 mm (0.0028 in.)
NOTICE:
Completely remove the Plastigage.



HINT:

- If the oil clearance is greater than the maximum, select and replace the bearing. If necessary, use an undersized bearing.
- To select the correct bearing size, calculate the bearing number by adding together the numbers imprinted on the cylinder block and crank journal. Example:
  Imprinted number on the cylinder block is 3.
  Imprinted number on the crank journal is 5. 3 + 5 = 8 Select the bearing with the bearing number 3.

Standard cylinder block diameter

Number	Specified Condition
0	50.000 to 50.003 mm (1.9685 to 1.9686 in.)
1	50.003 to 50.005 mm (1.9686 to 1.9687 in.)
2	50.005 to 50.007 mm (1.9687 to 1.9688 in.)
3	50.007 to 50.010 mm (1.9688 to 1.9689 in.)
4	50.010 to 50.012 mm (1.9689 to 1.9690 in.)
5	50.012 to 50.014 mm (1.9690 to 1.9691 in.)
6	50.014 to 50.016 mm (1.96905 to 1.96913 in.)

Standard crankshaft journal diameter

Number	Specified Condition
0	45.998 to 46.000 mm (1.8109 to 1.8110 in.)
1	45.996 to 45.998 mm (1.81086 to 1.81094 in.)
2	45.994 to 45.996 mm (1.8108 to 1.8109 in.)
3	45.992 to 45.994 mm (1.81071 to 1.81079 in.)
4	45.990 to 45.992 mm (1.8106 to 1.8107 in.)
5	45.988 to 45.990 mm (1.81055 to 1.81063 in.)

Reference

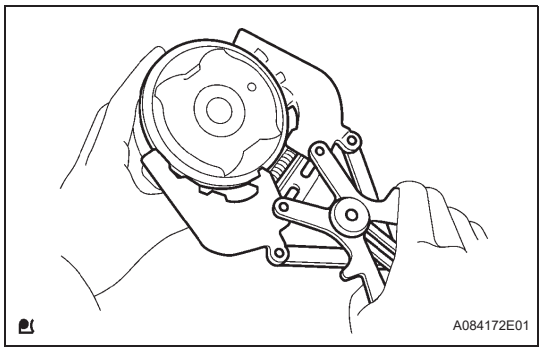
Cylinder Block Number + Crank Journal Number	Bearing Number	Center Bearing Thickness	Oil Clearance
0 to 2	1	1.992 to 1.995 mm (0.0784 to 0.0785 in.)	0.010 to 0.023 mm (0.0004 to 0.0009 in.)
3 to 5	2	1.995 to 1.998 mm (0.0785 to 0.0787 in.)	Same as above
6 to 8	3	1.998 to 2.001 mm (0.0787 to 0.0788 in.)	Same as above
9 to 11	4	2.001 to 2.004 mm (0.0788 to 0.0789 in.)	Same as above
-	U/S 0.25	2.111 to 2.117 mm (0.0831 to 0.0834 in.)	Same as above

40. REMOVE CRANKSHAFT BEARING

41. REMOVE CRANKSHAFT THRUST WASHER

42. REMOVE PISTON RING SET

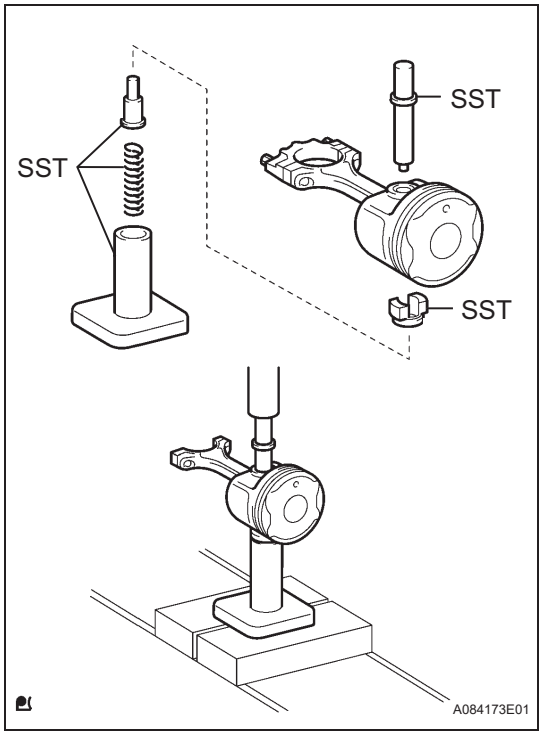
HINT:
Keep the piston rings in the correct combination and correct order so that they can be returned to their original locations when reassembling.



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

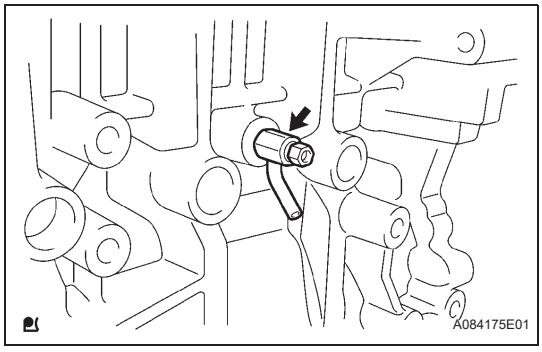
43. REMOVE PISTON PIN

(a) Using SST, press out the piston pin from the piston.
SST 09221-25026 (09221-00021, 09221-00030, 09221-00190, 09221-00141, 09221-00150)
NOTICE:
Keep the pistons, pins, rings, connecting rods and bearings in the correct order so that they can be returned to their original locations when reassembling.



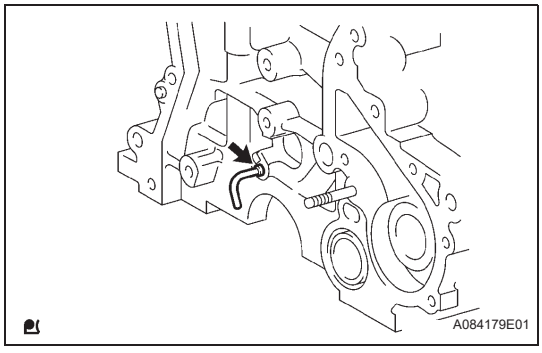
44. REMOVE CYLINDER BLOCK WATER DRAIN COCK

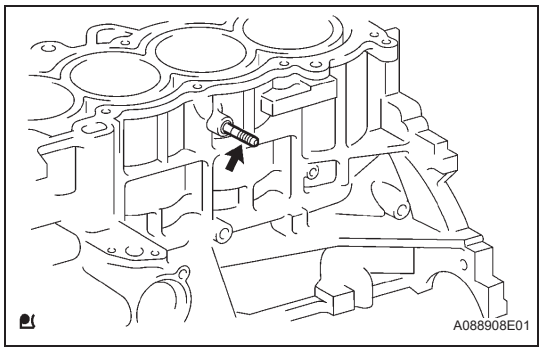
(a) Remove the cylinder block water drain cock from the cylinder block.



45. REMOVE OIL JET

(a) Remove the oil jet from the cylinder block.

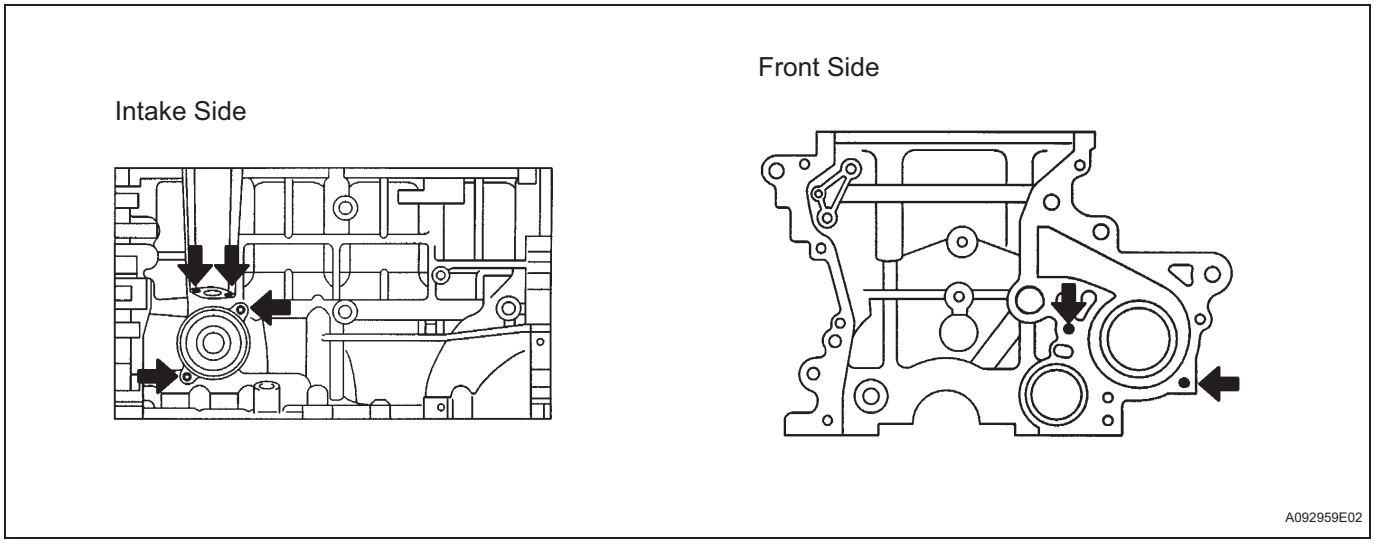


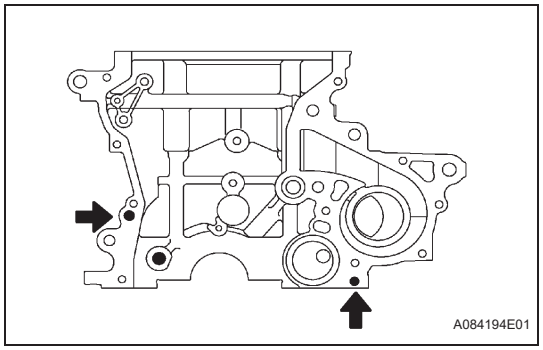


46. REMOVE STUD BOLT

(a) Remove the stud bolt for the knock control sensor from the cylinder block.

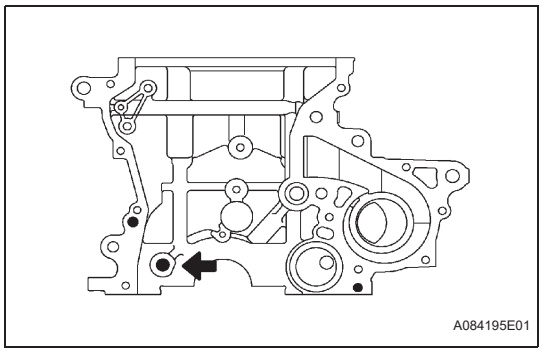
(b) Using an E5 "torx" socket, remove the 6 stud bolts from the cylinder block.





47. REMOVE RING PIN

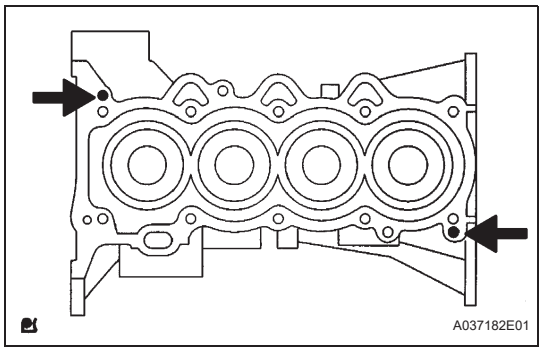
(a) Remove the 2 oil pump ring pins from the cylinder block.



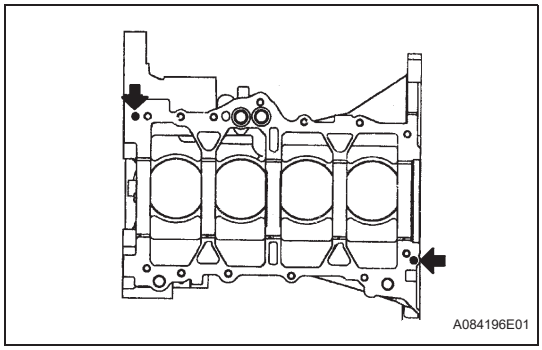
48. REMOVE STRAIGHT PIN

(a) Remove the chain tensioner straight pin from the cylinder block.

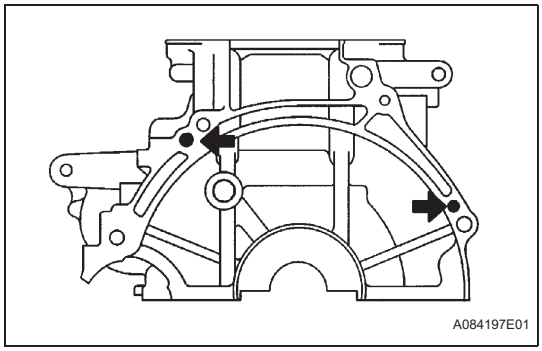
EM



(b) Remove the 2 cylinder head straight pins from the cylinder block.



(c) Remove the 2 oil pan straight pins from the cylinder block.



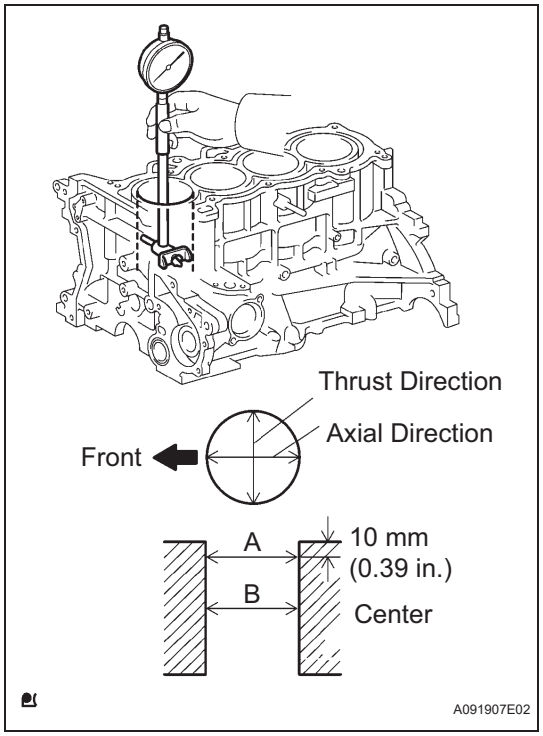
(d) Remove the 2 end plate straight pins from the cylinder block.

49. REMOVE TIGHT PLUG

INSPECTION

1. **INSPECT CYLINDER BLOCK FOR FLATNESS (See page EM-61)**

2. **INSPECT CYLINDER BORE**



(a) Using a cylinder gauge, measure the cylinder bore diameter at positions A and B in the thrust and axial directions.

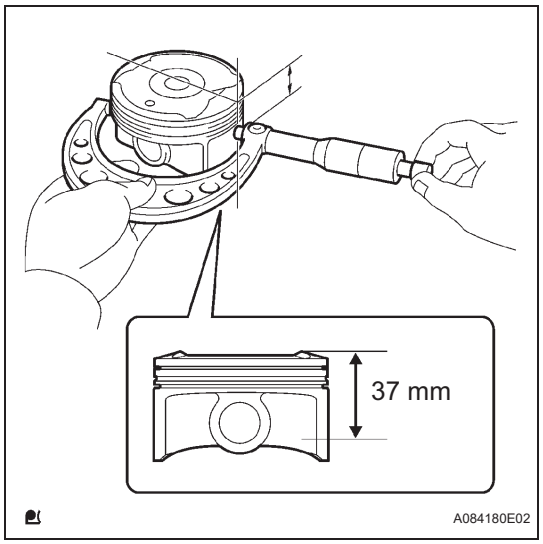
(b) Calculate the average of the thrust diameter and axial diameter at position A in the illustration.

(c) Calculate the average of thrust diameter and axial diameter at position B in the illustration.

Standard diameter:
75.000 to 75.013 mm (2.9528 to 2.9533 in.)

Maximum diameter:
75.133 mm (2.9580 in.)

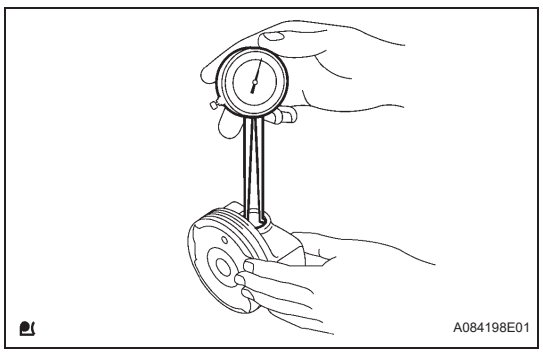
If either of the 2 average values is greater than the maximum, replace the cylinder block.



3. **INSPECT PISTON WITH PIN**

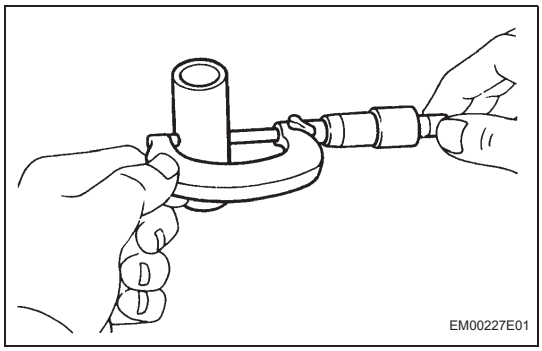
(a) Using a micrometer, measure the diameter of the piston. Align the micrometer so it is 37 mm (1.46 in.) from the top of the piston and at a right angle (90°) to the piston pin holes.

Standard piston diameter:
74.941 to 74.979 mm (2.9504 to 2.9519 in.)



(b) Using a caliper gauge, measure the piston pin hole diameter of the piston.

Standard piston pin hole diameter:
18.013 to 18.016 mm (0.7092 to 0.7093 in.) at 20°C (68°F)


EM00227E01

(c) Using a micrometer, measure the piston pin diameter.
Standard piston pin diameter:
18.001 to 18.004 mm (0.7087 to 0.7088 in.)
NOTICE:
Do not change the combination of the piston and piston pin so that they can be returned to their original locations when reassembling.

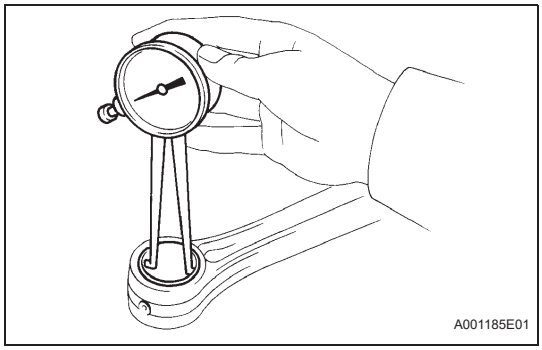
(d) Subtract the piston pin diameter measurement from the piston pin hole diameter measurement.
Standard oil clearance:
0.009 to 0.015 mm (0.0004 to 0.0006 in.)
Maximum oil clearance:
0.050 mm (0.0020 in.)
If the clearance is greater than the maximum, replace the bush. If necessary, replace both the piston and piston pin together.

EM

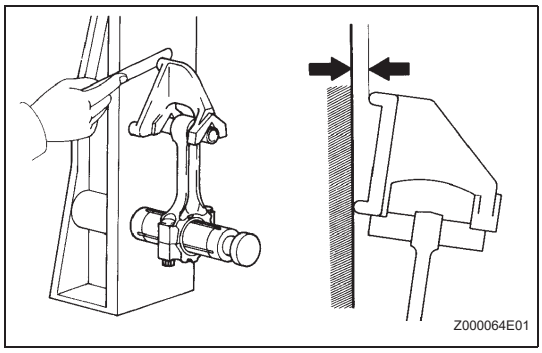
4. INSPECT PISTON CLEARANCE

(a) Subtract the piston diameter measurement from the cylinder bore diameter measurement.
Standard oil clearance:
0.045 to 0.068 mm (0.0018 to 0.0027 in.)
Maximum oil clearance:
0.08 mm (0.0032 in.)
If the oil clearance is greater than the maximum, replace all 4 pistons. If necessary, replace the cylinder block.

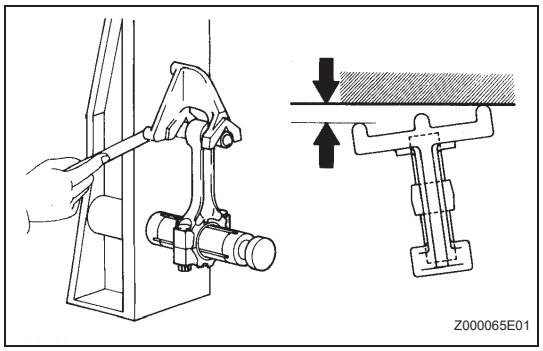
5. INSPECT CONNECTING ROD


A001185E01

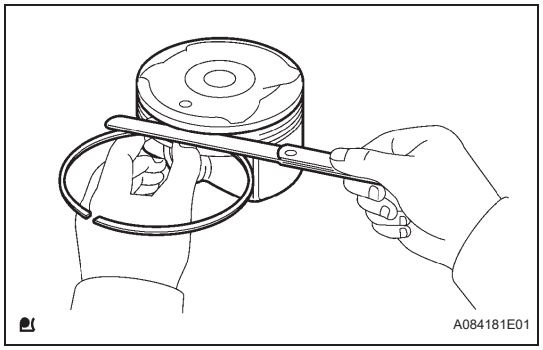
(a) Using a caliper gauge, measure the internal diameter of the connecting rod.
Standard connecting rod inside diameter:
17.965 to 17.985 mm (0.7073 to 0.7081 in.)
If the diameter is not within the range of the standard inside diameter, replace the connecting rod.


Z000064E01

(b) Using a rod aligner and feeler gauge, check the connecting rod alignment.
(1) Check for misalignment.
Maximum misalignment:
0.05 mm (0.0020 in.) per 100 mm (3.94 in.)
If the misalignment is greater than the maximum, replace the connecting rod assembly.



(2) Check for twist.
Maximum twist:
0.05 mm (0.0020 in.) per 100 mm (3.94 in.)
If the twist is greater than the maximum, replace the connecting rod assembly.

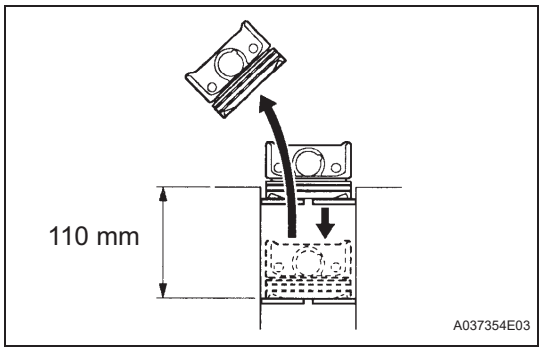


6. INSPECT RING GROOVE CLEARANCE

(a) Using a feeler gauge, measure the clearance between the new piston ring and the wall of the ring groove.
Standard ring groove clearance

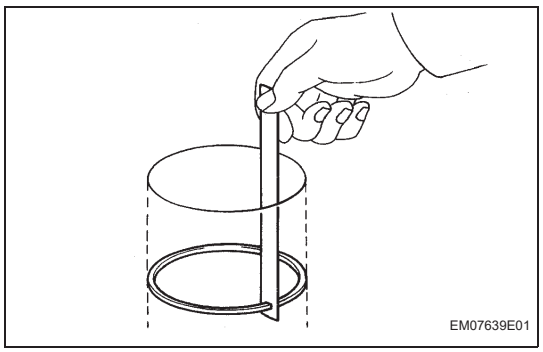
Item	Specified Condition
No. 1 ring	0.02 to 0.04 mm (0.0008 to 0.0016 in.)
No. 2 ring	0.02 to 0.06 mm (0.0008 to 0.0024 in.)
Oil ring	0.02 to 0.06 mm (0.0008 to 0.0024 in.)

If the clearance is not as specified, replace the piston.



7. INSPECT PISTON RING END GAP

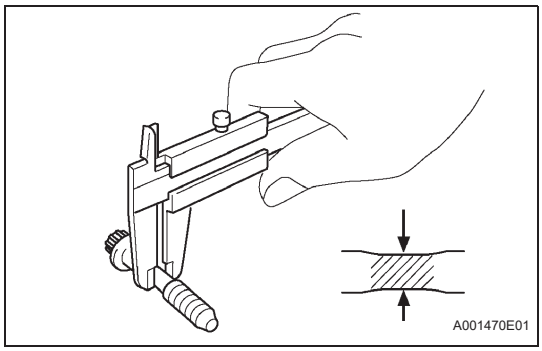
(a) Using a piston, push the piston ring a little beyond the bottom of the ring travel, 110 mm (4.33 in.) from the top of the cylinder block.



(b) Using a feeler gauge, measure the end gap.
Standard end gap

Item	Standard	Maximum
No. 1 ring	0.20 to 0.30 mm (0.0079 to 0.0118 in.)	0.61 mm (0.0240 in.)
No. 2 ring	0.30 to 0.45 mm (0.0118 to 0.0177 in.)	1.20 mm (0.0472 in.)
Oil ring	0.10 to 0.40 mm (0.0039 to 0.0158 in.)	1.15 mm (0.0453 in.)

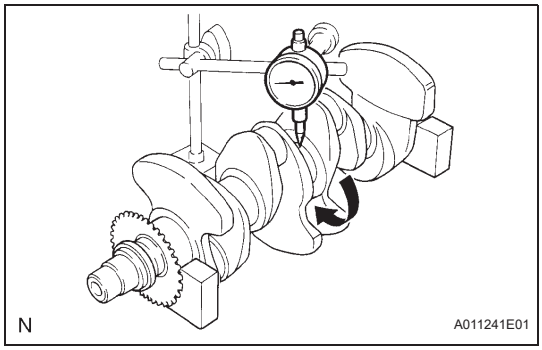
If the end gap is greater than the maximum, replace the piston ring and oil ring.



8. INSPECT CONNECTING ROD BOLT

(a) Using a vernier caliper, measure the tension portion diameter of the bolt.

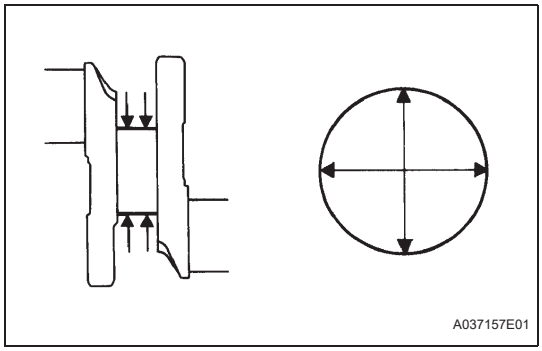
Standard diameter:
6.6 to 6.7 mm (0.260 to 0.264 in.)
Minimum diameter:
6.4 mm (0.252 in.)
If the diameter is less than the minimum, replace the bolt.



9. INSPECT CRANKSHAFT

(a) Using a dial indicator and V-blocks, measure the circle runout as shown in the illustration.

Maximum circle runout:
0.03 mm (0.0012 in.)
If the circle runout is greater than the maximum, replace the crankshaft.



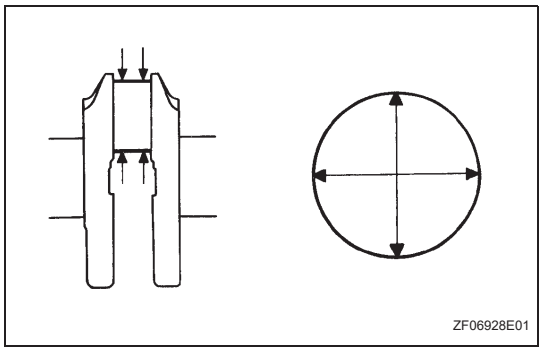
(b) Inspect the diameter.

(1) Using a micrometer, measure the diameter of each main journal as illustrated.

Standard diameter:
45.988 to 46.000 mm (1.8106 to 1.8110 in.)
If the diameter is not as specified, replace the crankshaft.

(2) Calculate the taper and distortion of the main journal.

Maximum taper and distortion:
0.02 mm (0.0008 in.)
If the taper and distortion are greater than the maximum, replace the crankshaft.

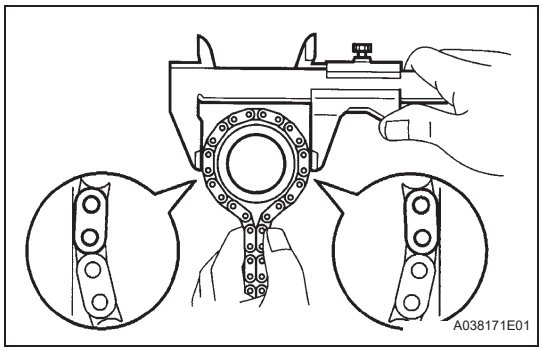


(3) Using a micrometer, measure the diameter of each crank pin as illustrated.

Standard diameter:
39.992 to 40.000 mm (1.5745 to 1.5748 in.)
If the diameter is not as specified, replace the crankshaft.

(4) Calculate the taper and distortion of the crank pin.

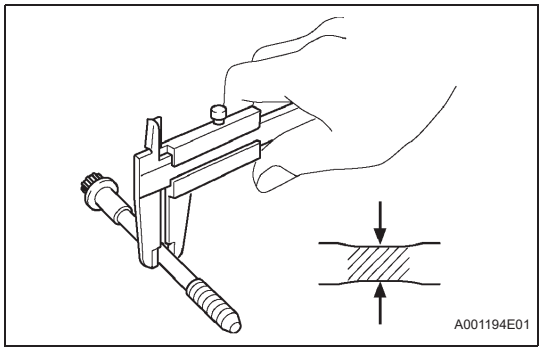
Maximum taper and distortion:
0.02 mm (0.0008 in.)
If the taper and distortion are greater than the maximum, replace the crankshaft.



(c) Wrap the chain around the timing sprocket as shown in the illustration.

(d) Using a vernier caliper, measure the timing sprocket diameter with the chain wrapped.

Standard sprocket diameter (w/ chain):
51.72 mm (2.0362 in.)
Minimum sprocket diameter (w/ chain):
50.5 mm (1.988 in.)
NOTICE:
When measuring the diameter, the vernier caliper must be in contact with the chain roller.
If the diameter is less than the minimum, replace the chain and crankshaft.



10. INSPECT CRANKSHAFT BEARING CAP SET BOLT

(a) Using a vernier caliper, measure the tension portion diameter of the bolt.

Standard diameter:
7.3 to 7.5 mm (0.287 to 0.295 in.)
Minimum diameter:
7.2 mm (0.283 in.)
If the diameter is less than the minimum, replace the bolt.

EM

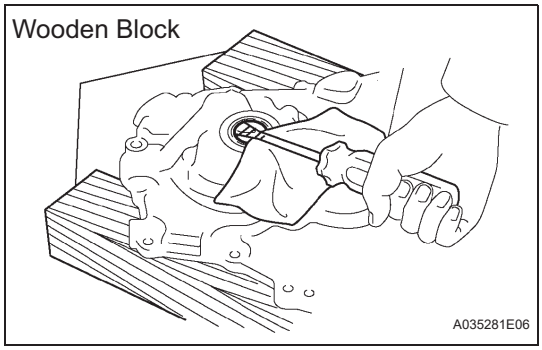
REPLACEMENT

1. REPLACE OIL PUMP SEAL

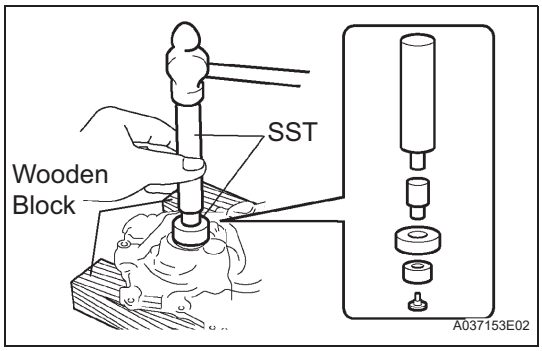
HINT:
There are 2 ways to replace the oil seal: remove it with the timing chain cover removed, or remove it with the timing chain cover installed.

(a) If the timing chain cover is removed:

(1) Using a screwdriver, remove the oil seal.
HINT:
Tape the screwdriver tip before use.



(2) Using SST and a hammer, tap in a new oil seal until its surface is flush with the timing chain cover edge.
SST 09950-60010 (09951-00250, 09951-00380, 09952-06010), 09950-70010 (09951-07100)
NOTICE:
- **Be careful not to tap the oil seal at an angle.**
- **Keep the lip free of foreign objects.**

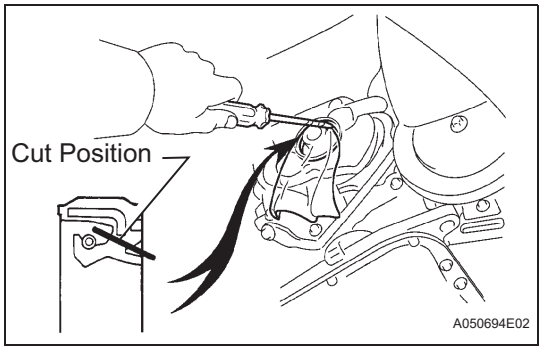


(3) Apply multi-purpose grease to the lip of the oil seal.

(b) If the timing chain cover is installed:

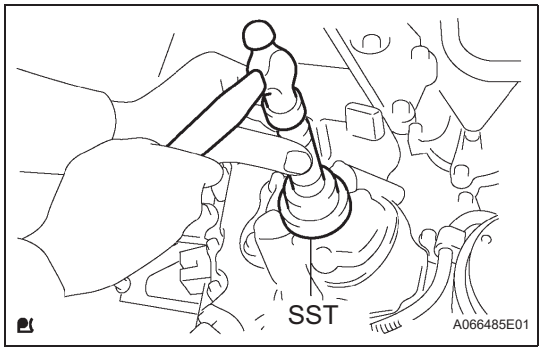
(1) Using a knife, cut off the lip of the oil seal.

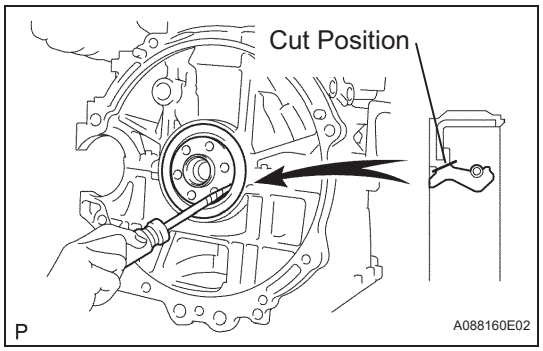
(2) Using a screwdriver with the tip wrapped in tape, pry out the oil seal.
NOTICE:
After removal, check if the crankshaft is not damaged. If it is damaged, smooth the surface with 400-grit sandpaper.



(3) Apply multi-purpose grease to the lip of a new oil seal.
NOTICE:
Keep the lip free of foreign objects.

(4) Using SST and a hammer, tap in the oil seal until its surface is flush with the timing chain cover edge.
SST 09223-22010
NOTICE:
- **Be careful not to tap the oil seal at an angle.**
- **Wipe any extra grease off the crankshaft.**





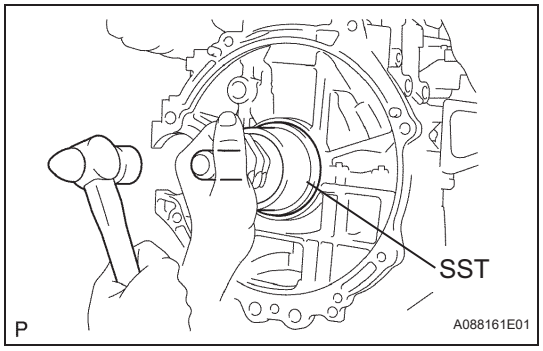
2. REPLACE ENGINE REAR OIL SEAL

(a) Using a knife, cut off the lip of the oil seal.

(b) Using a screwdriver with the tip wrapped in tape, pry out the oil seal.

NOTICE:

After removal, check if the crankshaft is damaged. If it is damaged, smooth the surface with 400-grit sandpaper.



(c) Apply multi-purpose grease to the lip of a new oil seal.

NOTICE:

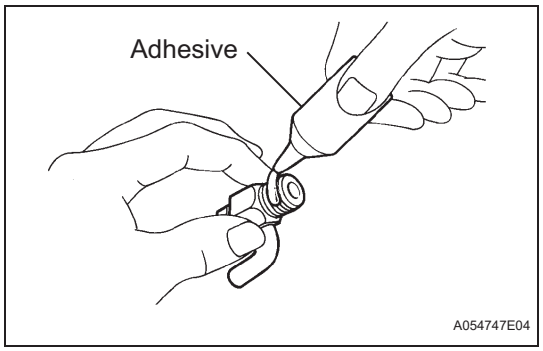
Keep the lip free of foreign materials.

(d) Using SST and a hammer, tap in the oil seal until its surface is flush with the rear oil seal retainer edge.

SST 09223-56010

NOTICE:

- **Be careful not to tap the oil seal at an angle.**
- **Wipe any extra grease off the crankshaft.**



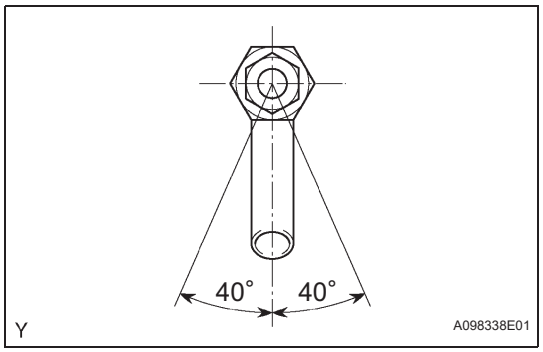
REASSEMBLY

1. INSTALL CYLINDER BLOCK WATER DRAIN COCK

(a) Apply adhesive to 2 or 3 threads of the drain cock, and install it within 3 minutes.

Adhesive:

Toyota Genuine Adhesive 1344, Three Bond 1344 or Equivalent



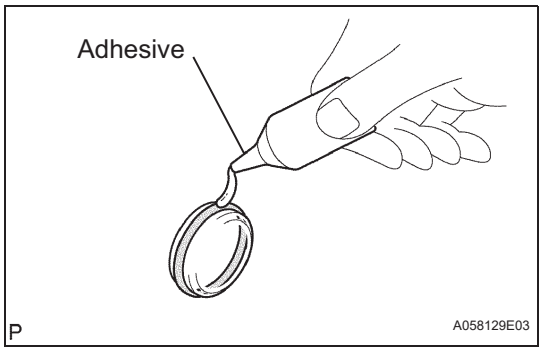
(b) Tighten the drain cock to the specified torque. Then rotate the drain cock clockwise until its drain port faces downward.

Torque: 35 N*m (357 kgf*cm, 26 ft.*lbf)

NOTICE:

- **Install the water drain cock within 3 minutes of applying adhesive.**
- **Do not add coolant for at least 1 hour after installation.**
- **Do not rotate the drain cock more than 360° in this step, and never loosen it after setting the drain cock correctly.**
- **The pipe of the drain cock should be within 40° of the vertical position.**

EM

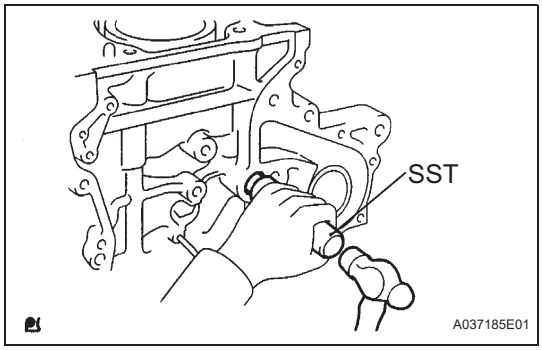


2. INSTALL TIGHT PLUG

(a) Apply adhesive to new tight plugs.

Adhesive:

Toyota Genuine Adhesive 1324, Three Bond 1324 or Equivalent

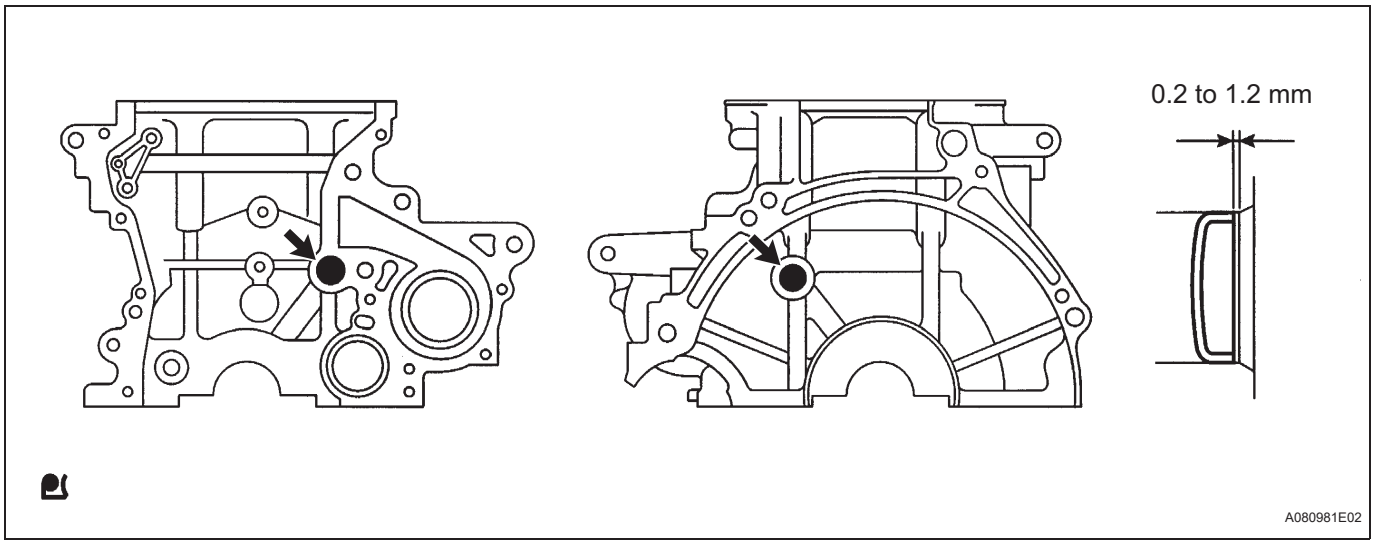


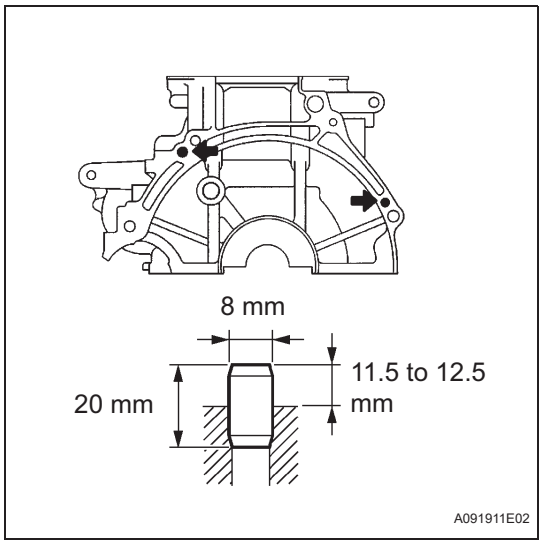
(b) Using SST, tap in the tight plugs as shown in the illustration.

SST 09950-60010 (09951-00180), 09950-70010 (09951-07100)

Standard depth:

0.2 to 1.2 mm (0.008 to 0.047 in.)





3. INSTALL STRAIGHT PIN

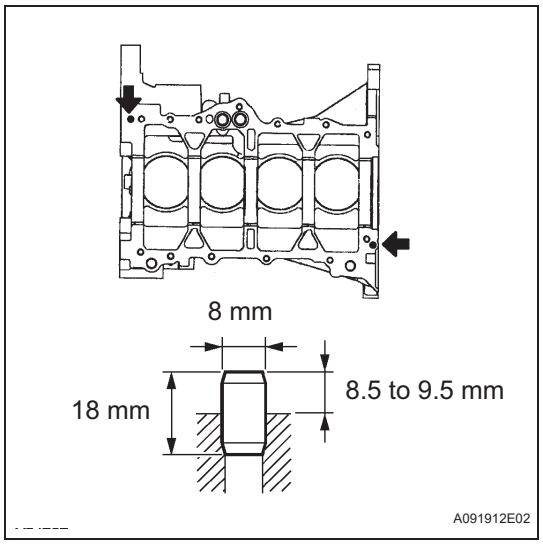
(a) Using a plastic-faced hammer, tap in a new end plate straight pin.

Standard protrusion:

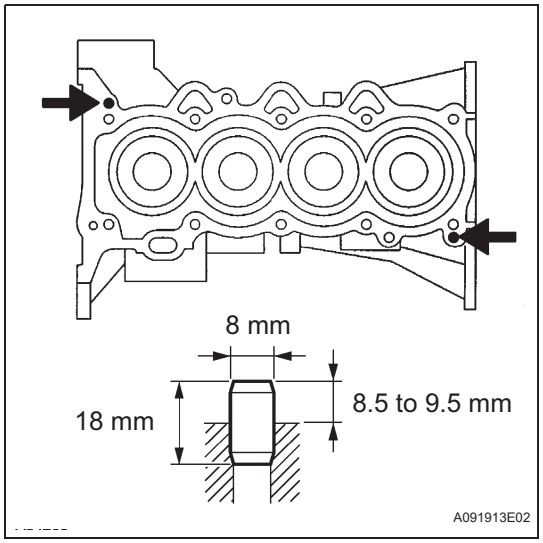
11.5 to 12.5 mm (0.453 to 0.492 in.)

HINT:

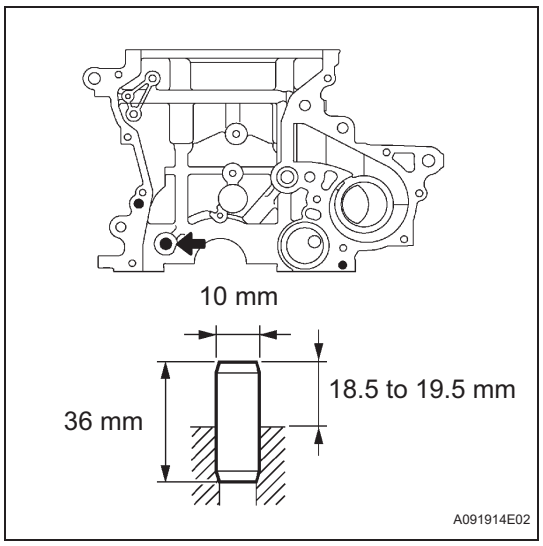
- Pin height: 20 mm (0.787 in.)
- Pin diameter: 8 mm (0.315 in.)



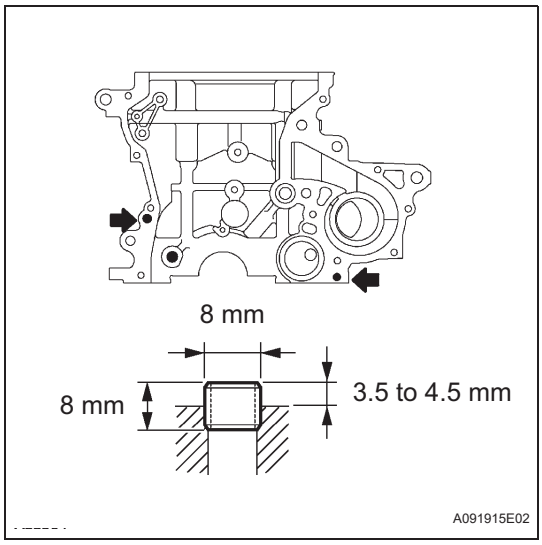
(b) Using a plastic-faced hammer, tap in a new oil pan straight pin.
Standard protrusion:
8.5 to 9.5 mm (0.335 to 0.374 in.)
HINT:
- Pin height: 18 mm (0.709 in.)
- Pin diameter: 8 mm (0.315 in.)



(c) Using a plastic-faced hemmer, tap in a new cylinder head straight pin.
Standard protrusion:
8.5 to 9.5 mm (0.335 to 0.374 in.)
HINT:
- Pin height: 18 mm (0.709 in.)
- Pin diameter: 8 mm (0.315 in.)



(d) Using a plastic-faced hammer, tap in a new chain tensioner straight pin.
Standard protrusion:
18.5 to 19.5 mm (0.728 to 0.768 in.)
HINT:
- Pin height: 36 mm (1.417 in.)
- Pin diameter: 10 mm (0.394 in.)



4. INSTALL RING PIN

(a) Using a plastic-faced hammer, tap in a new oil pump ring pin.

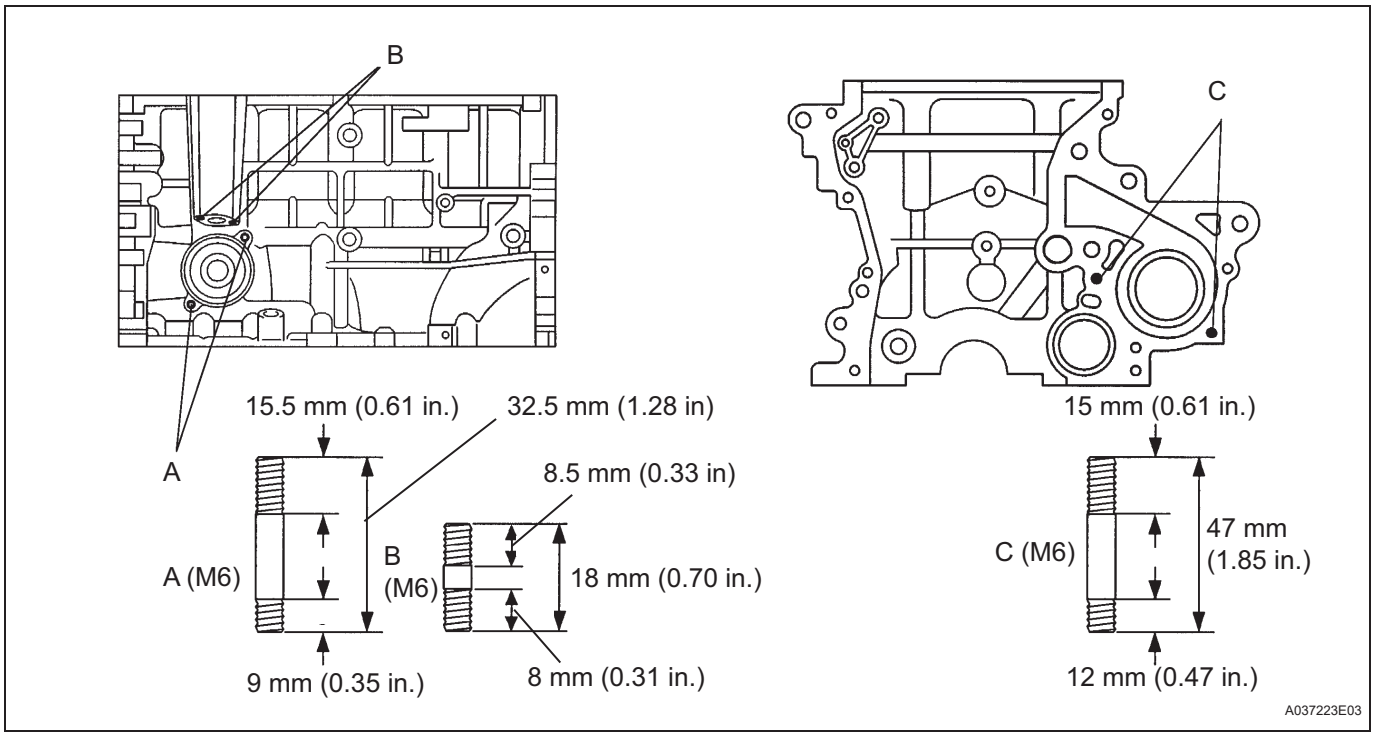
Standard protrusion:
3.5 to 4.5 mm (0.134 to 0.177 in.)

HINT:
- Pin height: 8 mm (0.315 in.)
- Pin diameter: 8 mm (0.315 in.)

5. INSTALL STUD BOLT

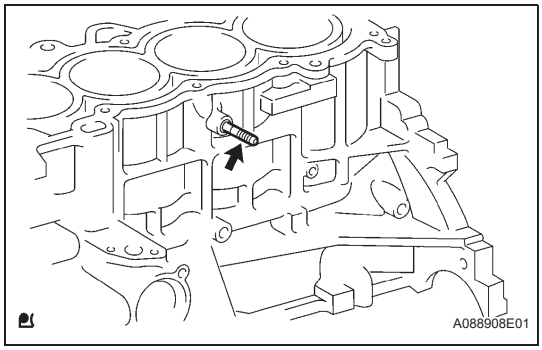
(a) Using an E5 "torx" socket, install the 6 stud bolts.
Torque: 5.0 N*m (51 kgf*cm, 44 in.*lbf)

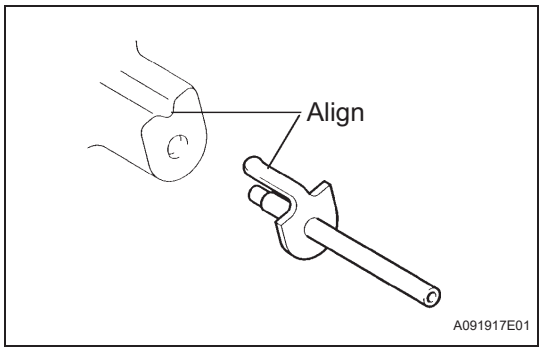
EM



NOTICE:
Make sure that the bottom of the stud bolt contacts the cylinder block, as shown in the illustration.

(b) Install the stud bolt for the knock sensor to the cylinder block.
Torque: 11 N*m (112 kgf*cm, 8 ft.*lbf)



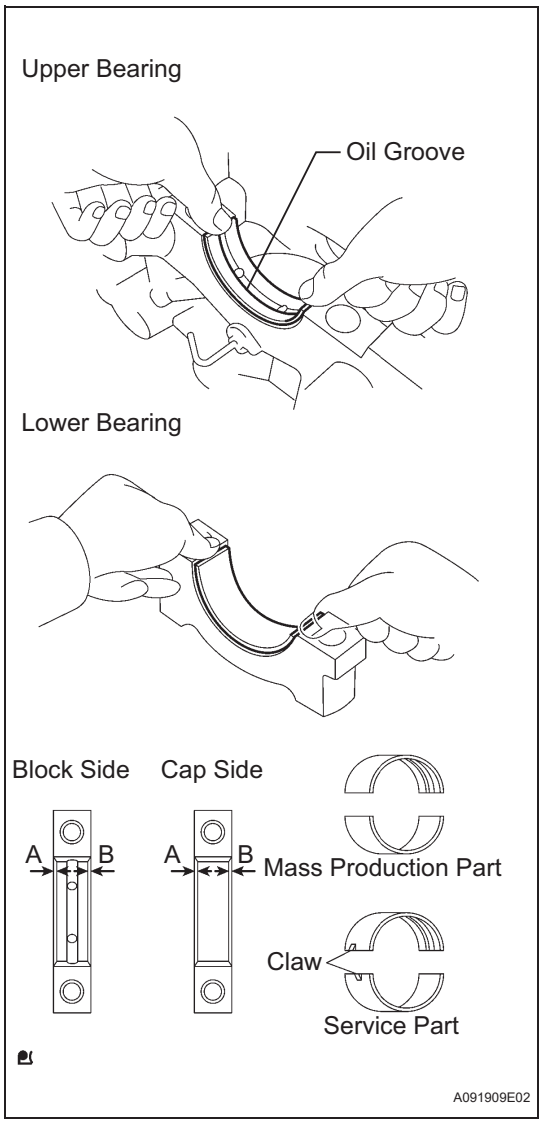


6. INSTALL OIL JET

(a) Align the concave of the cylinder block with the bracket of the oil jet, then tap in the oil jet (the service part).

NOTICE:

Do not tap the tip of the oil jet.



7. INSTALL CRANKSHAFT

(a) Install the upper bearing with the oil groove onto the cylinder block, and the lower bearing onto the bearing cap.

NOTICE:

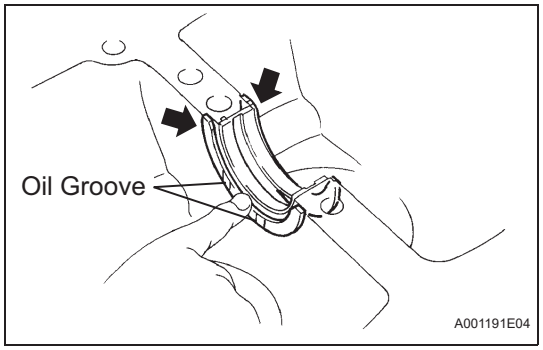
Do not apply engine oil to the contact surface of the cylinder block or the backside of the bearing.

HINT:

Mass production parts do not have claws as marks. If reusing the mass production parts, measure the clearance of both sides with the bearing in the center of the bearing cap.

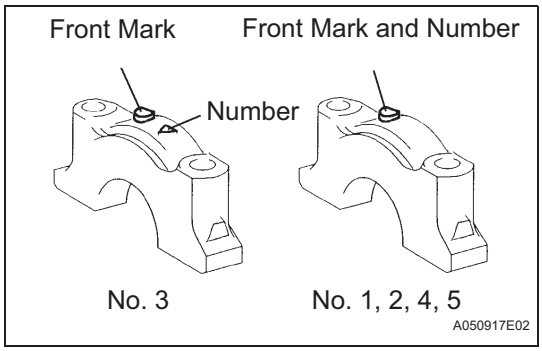
Standard clearance:

A - B = within 0.8 mm (0.032 in.)

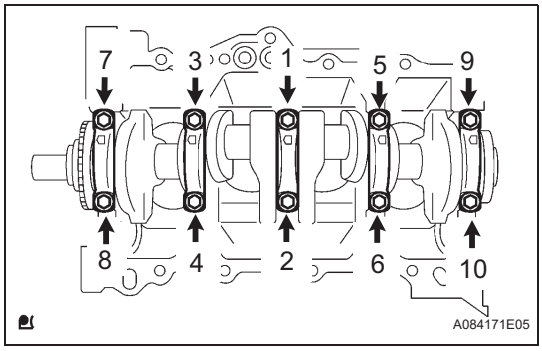


(b) Install the 2 thrust washers onto the No. 3 journal position of the cylinder block with the oil grooves facing outward.

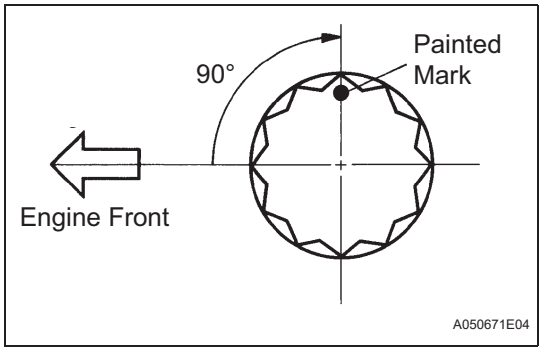
(c) Apply engine oil to the upper bearing and install the crankshaft onto the cylinder block.



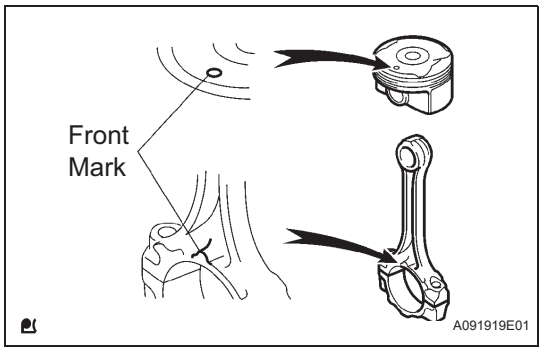
(d) Check the front marks and numbers and install the bearing caps onto the cylinder block.
(e) Apply a light coat of engine oil to the threads of the bearing cap bolts.



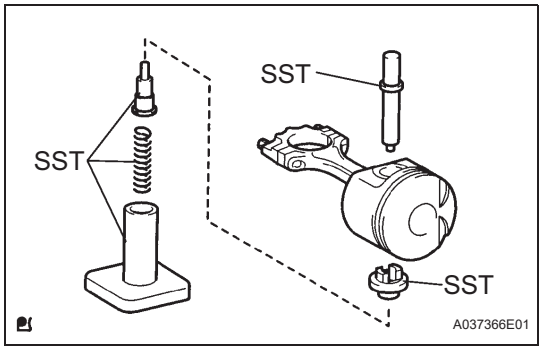
(f) Using SST, tighten the bolts in several steps by the specified torque in the sequence shown in the illustration.
SST 09011-38121
Torque: 22 N*m (224 kgf*cm, 16 ft.*lbf)
NOTICE:
Check that the crankshaft turns smoothly.



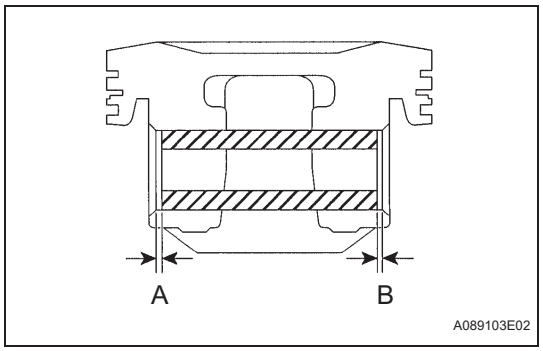
(g) Mark the front of the bearing cap bolts with paint.
(h) Retighten the bearing cap bolts by 90° in the same sequence.
(i) Check that the painted mark is now at a 90° angle to the front.



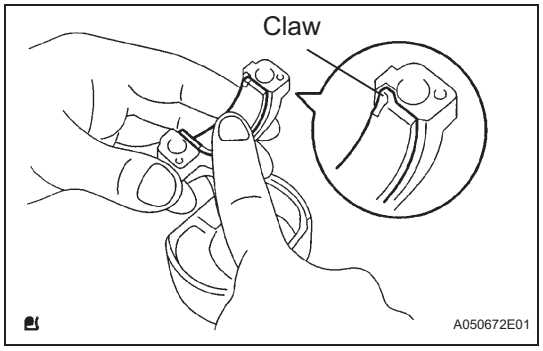
8. INSTALL PISTON PIN
(a) Apply engine oil to the piston pin and the inside surface of the connecting rod.
(b) Align the front marks of the piston and connecting rod.



(c) Using SST, push in the piston pin.
SST 09221-25026 (09221-00021, 09221-00030, 09221-00190, 09221-00141, 09221-00150)
NOTICE:
Keep the pistons, pins, rings, connecting rods and bearings in the correct order so that they can be returned to their original locations when reassembling.

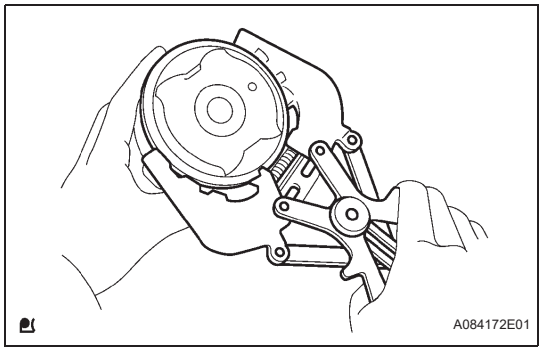


(d) Check the piston pin position.
Specified clearance:
A - B = -0.5 to 0.5 mm (-0.0197 to 0.0197 in.)



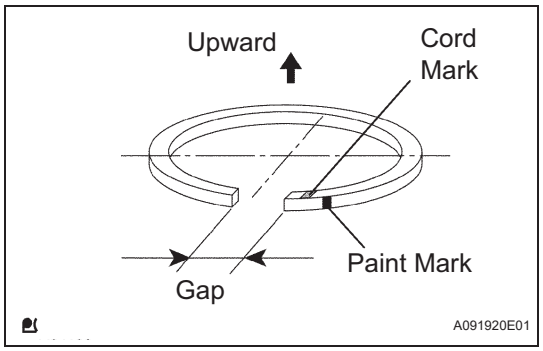
9. INSTALL CONNECTING ROD BEARING

(a) Align the bearing claw with the grooves of the connecting rod and connecting rod cap.
NOTICE:
Do not apply engine oil to the contact surface of the connecting rod and connecting rod cap and the backside of the bearing.



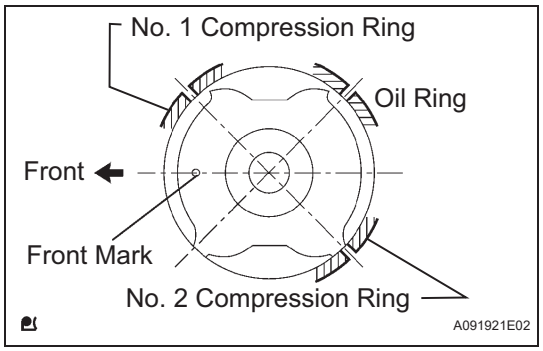
10. INSTALL PISTON RING SET

HINT:
If reusing the piston rings, install them onto the matched pistons with the surfaces facing correctly.



(a) Install the 2 compression rings and oil ring.
Code mark

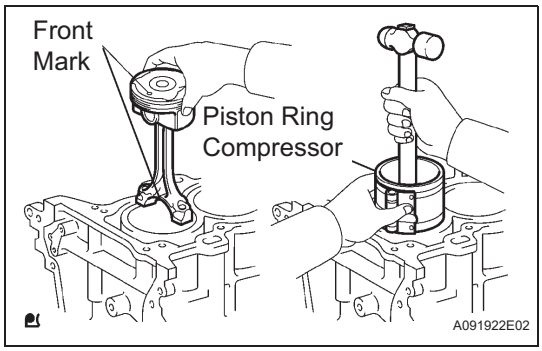
Part	Paint Color	Code Mark
No. 1 compression ring	Red	1R
No. 2 compression ring	Blue	2R
Oil ring	-	-



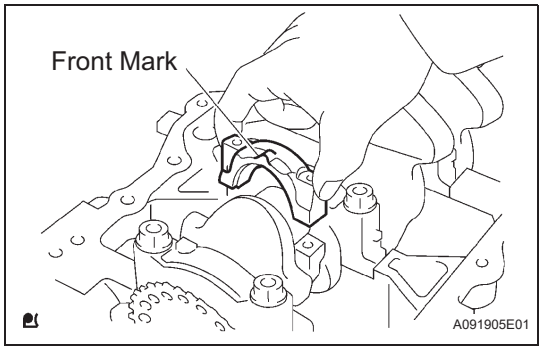
(b) Position the piston rings so that the ring ends are as shown in the illustration.

11. INSTALL PISTON WITH CONNECTING ROD

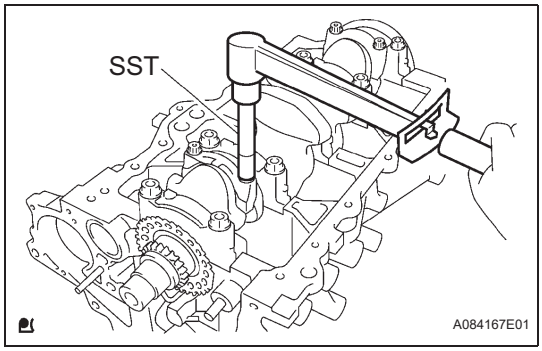
(a) Apply engine oil to the cylinder walls, pistons, and the surfaces of the connecting rod bearings.
(b) Check the position of the piston ring ends.



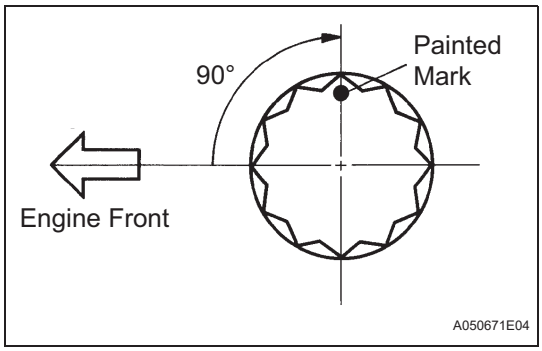
(c) Using a piston ring compressor, push the correctly numbered piston and connecting rod assemblies into each cylinder with the front mark on the piston facing forward.
NOTICE:
- **Do not apply engine oil to the contact surface of the connecting rod cap and the backside of the bearing.**
- **Match the numbered connecting rod cap with the correct connecting rod.**



(d) Match the connecting rod and cap together in the correct combination. Then install the cap onto the connecting rod, making sure that the front mark on the cap is correctly oriented.
(e) Apply a light coat of engine oil to the threads of the connecting rod cap bolts.



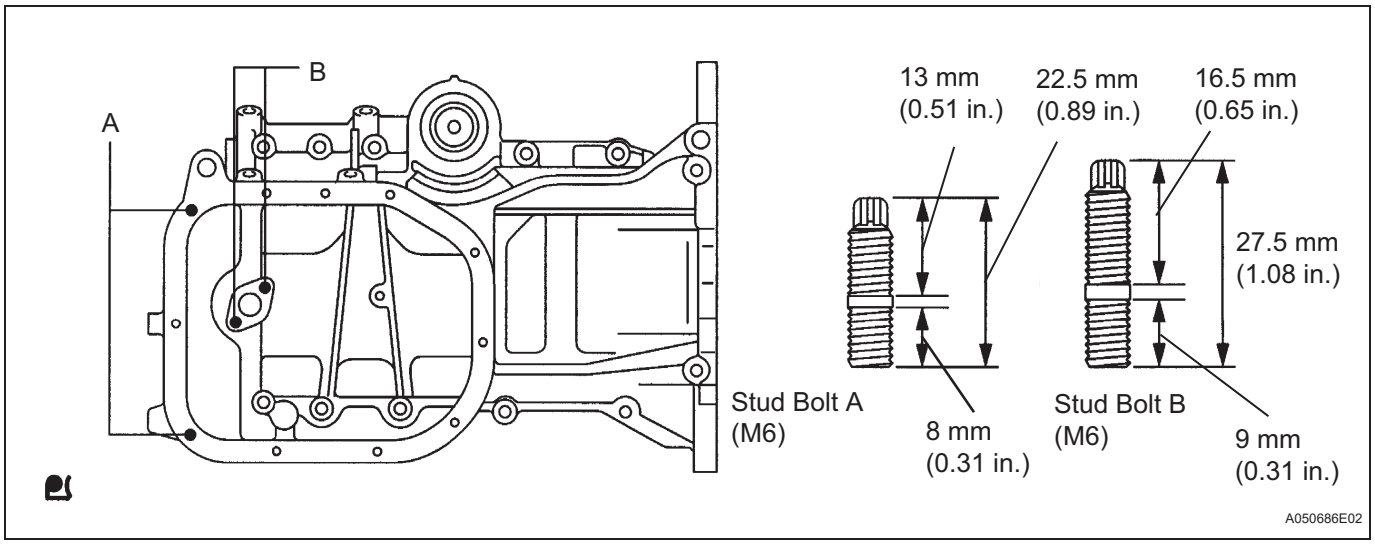
(f) Using SST, tighten the bolts in several steps by the specified torque.
SST 09205-16010
Torque: 15 N*m (153 kgf*cm, 11 ft.*lbf)



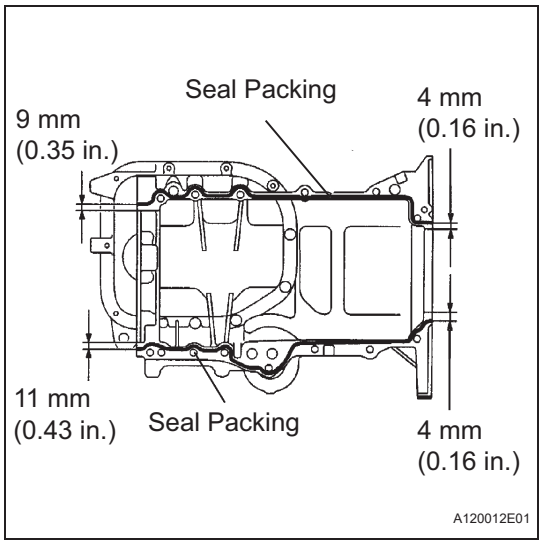
(g) Mark the front of the connecting cap bolts with paint.
(h) Retighten the cap bolts by 90° as shown.
(i) Check that the crankshaft turns smoothly.

12. INSTALL OIL PAN

(a) Using an E5 "torx" socket, install the 4 stud bolts.



Torque: 5.0 N*m (51 kgf*cm, 44 in.*lbf)



(b) Apply a continuous line of seal packing to the oil pan mating surface as shown in the illustration.

Seal packing:

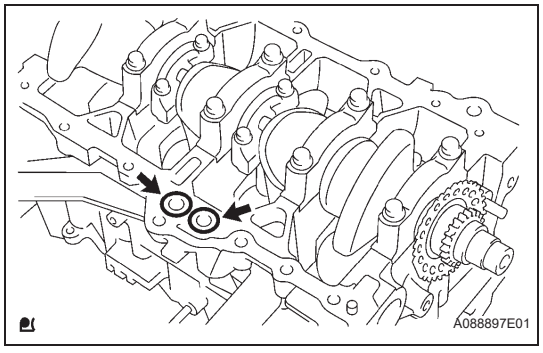
Toyota Genuine Seal Packing Black, Three Bond 1207B or Equivalent

Standard seal diameter:

2.0 to 3.0 mm (0.079 to 0.118 in.)

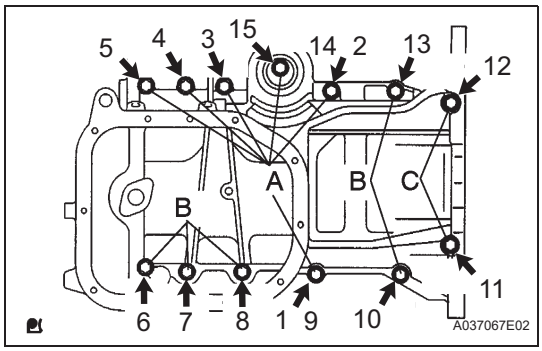
NOTICE:

- **Remove any oil from the contact surface.**
- **Install the oil pan within 3 minutes of applying seal packing.**
- **Do not expose the seal to engine oil for at least 2 hours after installation.**



(c) Install 2 new O-rings onto the cylinder block.

EM

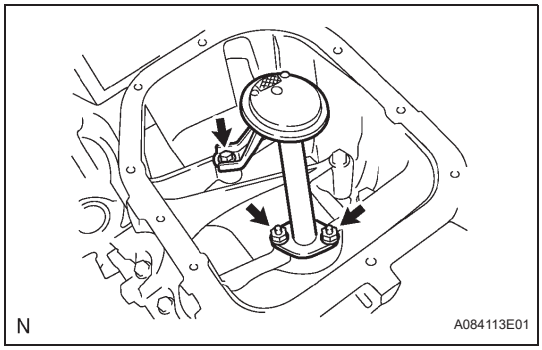


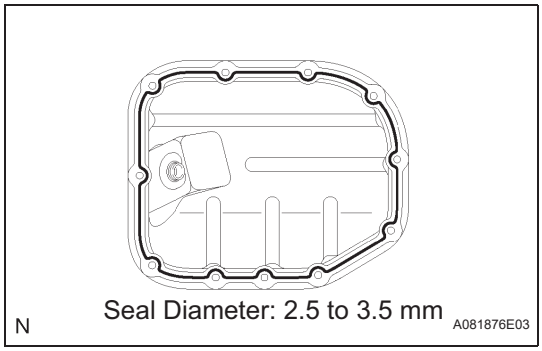
(d) Using several steps, install and uniformly tighten the 13 bolts in the sequence shown in the illustration.
Torque: 24 N*m (245 kgf*cm, 18 ft.*lbf)
HINT:
Each bolt length is as follows:
49 mm (1.93 in.) for bolt A
88 mm (3.47 in.) for bolt B
144 mm (5.67 in.) for bolt C

13. INSTALL ENGINE REAR OIL SEAL (See page EM-140)

14. INSTALL OIL STRAINER

(a) Install a new gasket and the oil strainer with the 2 nuts and bolt.
Torque: 11 N*m (112 kgf*cm, 8.1 ft.*lbf)



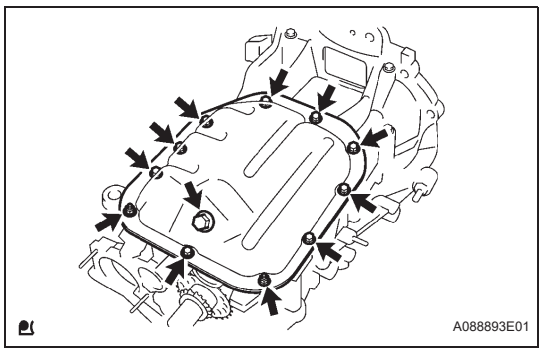


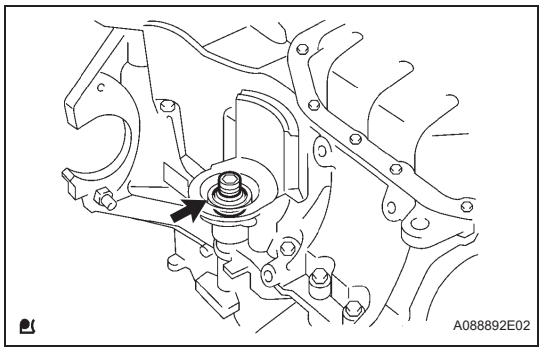
15. INSTALL NO. 2 OIL PAN

(a) Apply a continuous line of seal packing to the oil pan mating surface as shown in the illustration.
Seal packing:
Toyota Genuine Seal Packing Black, Three Bond 1207B or Equivalent
Standard seal diameter:
2.5 to 3.5 mm (0.098 to 0.14 in.)
NOTICE:
- **Remove any oil from the contact surface.**
- **Install the oil pan within 3 minutes of applying seal packing.**
- **Do not expose the seal to engine oil for at least 2 hours after installation.**
- **Do not start the engine within 2 hours of installation.**

(b) Install the No. 2 oil pan with the 9 bolts and 2 nuts.
Torque: 9.0 N*m (92 kgf*cm, 80 in.*lbf)

(c) Install the drain plug with a new gasket.
Torque: 37.5 N*m (382 kgf*cm, 28 ft.*lbf)



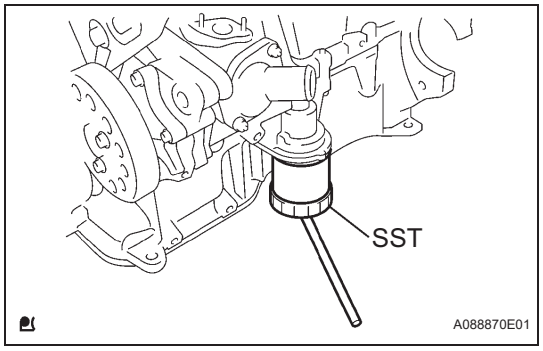


16. INSTALL OIL FILTER UNION

(a) Using a 12 mm hexagon wrench, install the oil filter union.
Torque: 30 N*m (306 kgf*cm, 22 ft.*lbf)

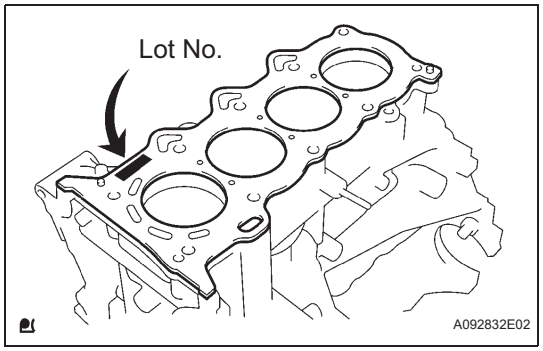
17. INSTALL OIL FILTER

(a) Check and clean the oil filter installation surface.
(b) Apply clean engine oil to the gasket of a new oil filter.
(c) Lightly screw the oil filter into place, and tighten it until the gasket comes into contact with the seat.



(d) Using SST, tighten it an additional 3/4 turn.
SST 09228-06501
If using a torque wrench, tighten to the specified torque.
Torque: 17.5 N*m (178 kgf*cm, 13 ft.*lbf)

EM



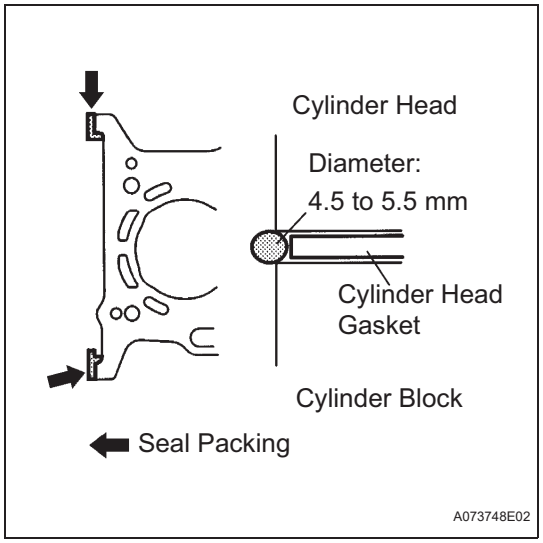
18. INSTALL CYLINDER HEAD GASKET

(a) Place a new cylinder head gasket on the cylinder block with the Lot No. stamp facing upward.
NOTICE:
- **Remove any oil from the contact surface.**
- **Pay attention to the mounting orientation of the cylinder head gasket.**
- **Place the cylinder head on the cylinder block gently in order not to damage the gasket at the bottom part of the head.**

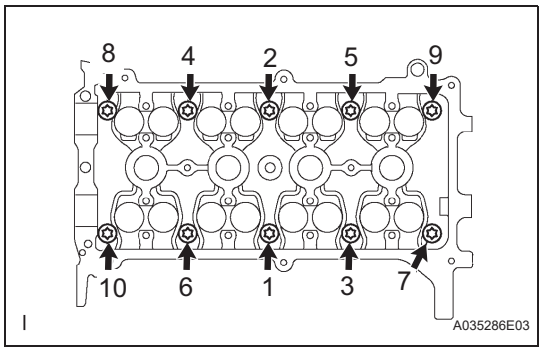
19. INSTALL CYLINDER HEAD

HINT:
The cylinder head bolts are tightened in 2 successive steps.

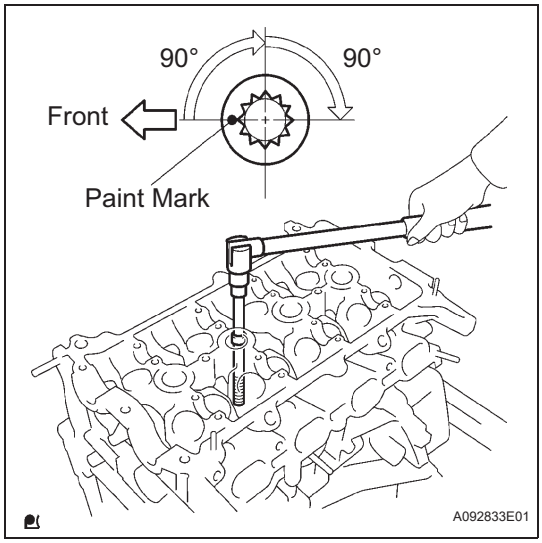
(a) Apply seal packing as shown in the illustration.
Seal packing:
Toyota Genuine Seal Packing Black, Three Bond 1207B or Equivalent
Standard seal diameter:
3.5 to 4.5 mm (0.177 to 0.217 in.)
NOTICE:
- **Remove any oil from the contact surface.**
- **Install the oil pan within 3 minutes of applying seal packing.**



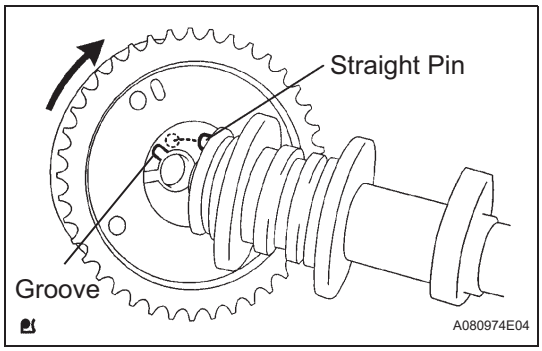
(b) Apply a light coat of engine oil to the threads of the cylinder head bolts.



(c) Using several steps, install and uniformly tighten the 10 cylinder head bolts and plate washers with an 8 mm bi-hexagon wrench in the sequence shown in the illustration.
Torque: 29 N*m (300 kgf*cm, 22 ft.*lbf)

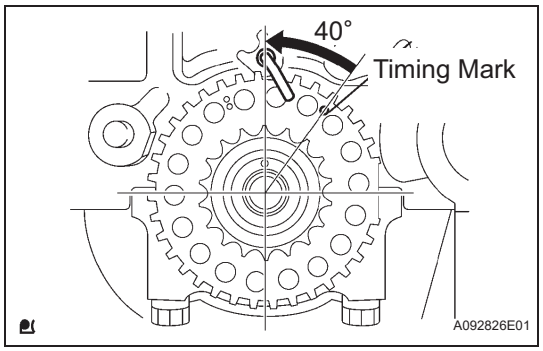


(d) Mark the front of the cylinder head bolt with paint.
(e) Retighten the cylinder head bolts by an additional 90° and then another 90°, as shown in the illustration.
(f) Check that the painted mark is now at a 180° angle to the front.



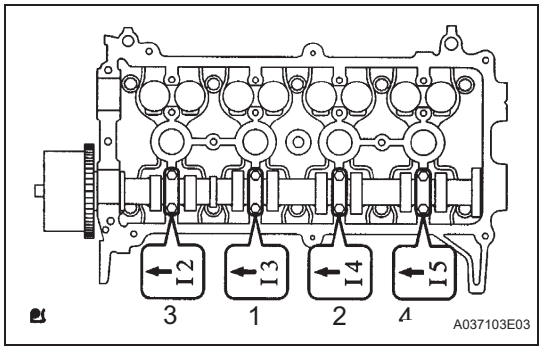
20. INSTALL CAMSHAFT TIMING GEAR

(a) Put the camshaft timing gear and camshaft together so that the straight pin and key groove are offset, as shown in the illustration.
(b) Turn the camshaft timing gear assembly clockwise while pushing it lightly towards the camshaft. Push further at the position where the pin fits into the groove.
NOTICE:
Be careful not to turn the camshaft timing gear to the retard angle (to the right).
(c) Check that there is no clearance between the gear fringe and the camshaft.
(d) Tighten the flange bolt with the camshaft timing gear fixed in place.
Torque: 64 N*m (653 kgf*cm, 47 ft.*lbf)
(e) Check that the camshaft timing gear can move to the retard angle (to the right) and is locked in the most retarded position.



21. INSTALL CAMSHAFT

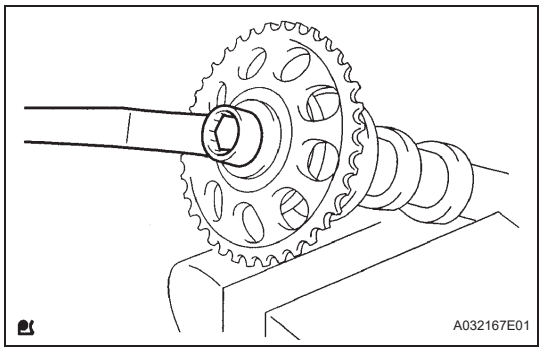
(a) Turn the crankshaft by 40° counterclockwise from TDC/compression.



(b) Apply a light coat of engine oil to the camshaft journals.

(c) Place the camshaft on the cylinder head with the timing mark on the camshaft timing gear facing upward.

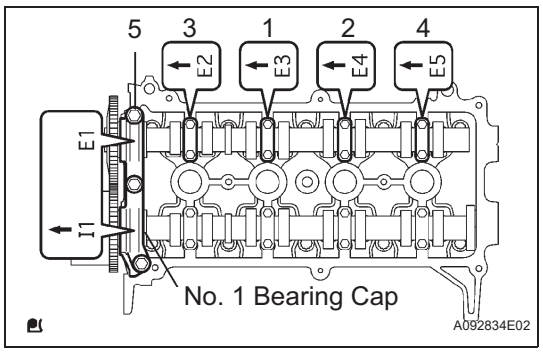
(d) Examine the front marks and numbers, and tighten the bolts in the sequence shown in the illustration.
Torque: 13 N*m (129 kgf*cm, 9 ft.*lbf)
NOTICE:
Tighten each bolt uniformly, keeping the camshaft level.



22. INSTALL CAMSHAFT TIMING SPROCKET

(a) Clamp the camshaft in a vise.

(b) Align the knock pin hole of the camshaft timing sprocket with the knock pin of the camshaft, and install the camshaft timing sprocket.
Torque: 64 N*m (653 kgf*cm, 47 ft.*lbf)
NOTICE:
Be careful not to damage the camshaft.



23. INSTALL NO. 2 CAMSHAFT

(a) Apply a light coat of engine oil to the camshaft journals.

(b) Place the camshaft on the cylinder head with the timing mark on the camshaft timing gear facing upward.

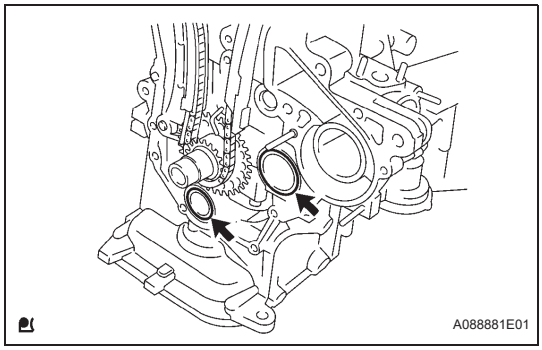
(c) Examine the front marks and numbers, and tighten the bolts in the sequence shown in the illustration.
Torque: 13 N*m (133 kgf*cm, 9 ft.*lbf)
NOTICE:
Tighten each bolt uniformly, keeping the camshaft level.

(d) Install the No. 1 bearing cap.
Torque: 23 N*m (235 kgf*cm, 17 ft.*lbf)

24. INSTALL CHAIN (See page EM-35)

25. INSTALL OIL PUMP SEAL (See page EM-138)

EM

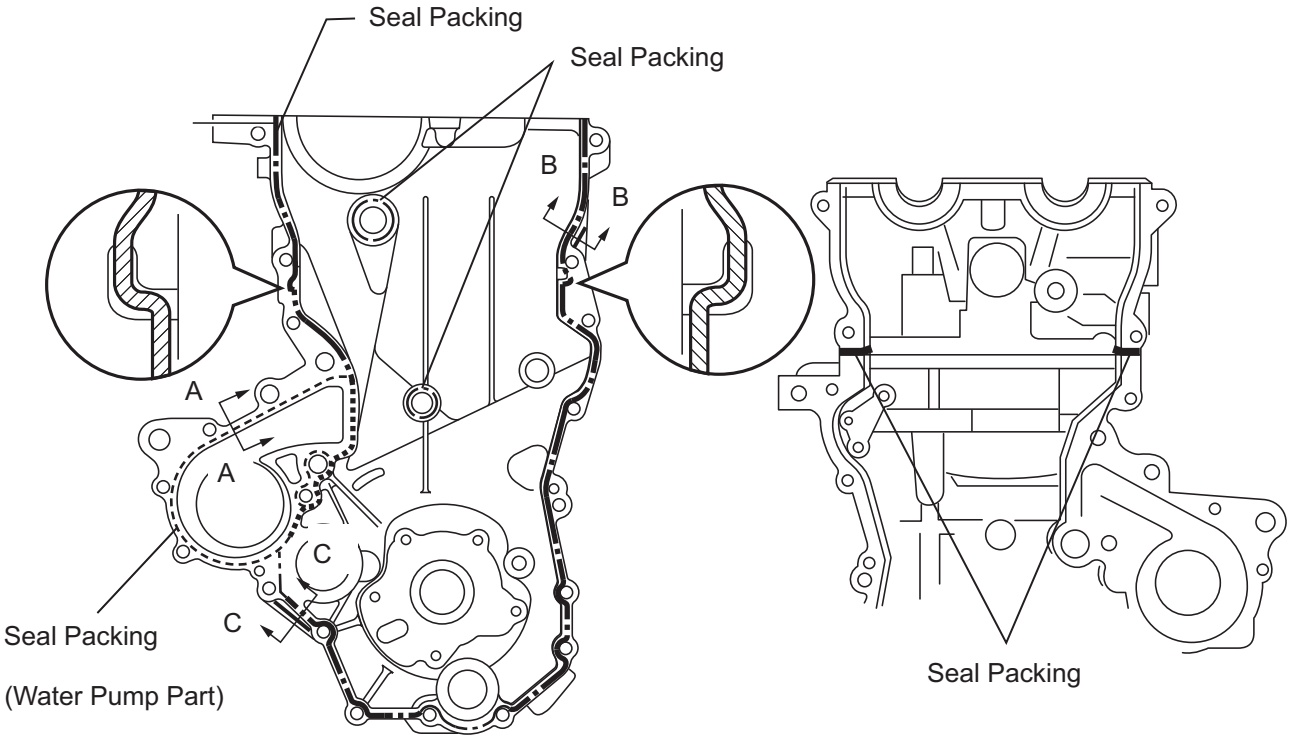


26. INSTALL TIMING CHAIN COVER

(a) Remove any old packing material from the contact surface.

(b) Install 2 new O-rings onto the 2 locations as shown in the illustration.

(c) Apply seal packing to the oil pump assembly, cylinder head and cylinder block as shown in the illustration below.



A - A

Diameter:

1.5 to 2.0 mm (0.059 to 0.078 in.)

2.5 mm (0.098 in.)

5.0 mm (0.197 in.)

1.5 mm (0.059 in.)

B - B, C - C (After Assembling)

2.5 mm (0.098 in.) or more

B - B, C - C

2.5 mm (0.098 in.)

Diameter:

3.5 to 4.5 mm (0.138 to 0.177 in.)

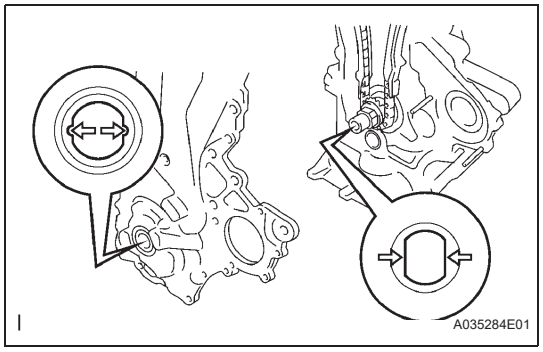
1.0 mm (0.039 in.)

1.0 mm (0.039 in.)

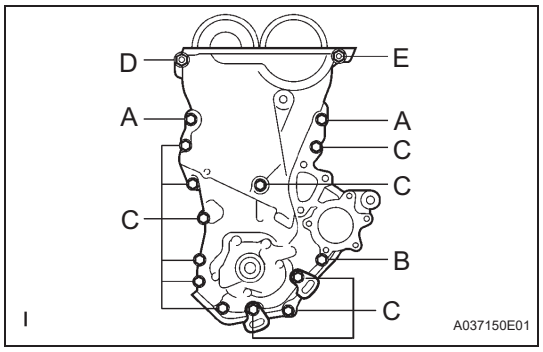
Other Part	Seal Diameter:
——·——·—	3.5 to 4.5 mm (0.138 to 0.177 in.)
——·——·—	1.5 to 2.0 mm (0.059 to 0.078 in.)
Water Pump Part	**Seal Diameter:**
·····	3.5 to 4.5 mm (0.138 to 0.177 in.)
- - - - - - - - - -	1.5 to 2.0 mm (0.059 to 0.078 in.)

A117400E03

Seal packing:
Water pump part: Toyota Genuine Adhesive 1324, Three Bond 1324 or Equivalent
Other part: Toyota Genuine Seal Packing Black, Three Bond 1207B or Equivalent
NOTICE:
- **Remove any oil from the contact surface.**
- **Install the oil pump within 3 minutes of applying seal packing.**
- **Do not expose the seal to engine oil for at least 2 hours after installation.**
- **Do not start the engine for at least 2 hours after installation.**

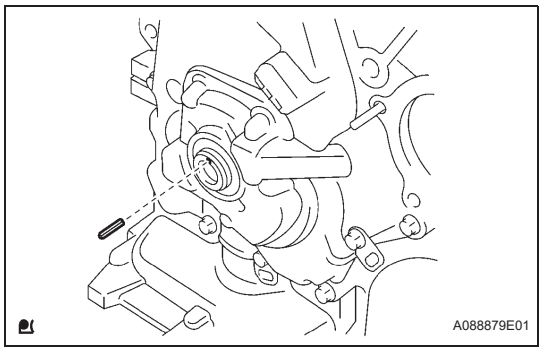


(d) Align the keyway of the oil pump drive rotor with the rectangular portion of the crankshaft, and slide the oil pump into place.



(e) Install the oil pump assembly with the 15 bolts and nut. Uniformly tighten the bolts and nut in several steps.
Torque: 32 N*m (326 kgf*cm, 24 ft.*lbf) for bolt A
11 N*m (112 kgf*cm, 8.1 ft.*lbf) for bolt B
11 N*m (112 kgf*cm, 8.1 ft.*lbf) for bolt C
24 N*m (245 kgf*cm, 18 ft.*lbf) for nut D
24 N*m (245 kgf*cm, 18 ft.*lbf) for bolt E
NOTICE:
- **Be careful not to disturb the seal packing.**
- **After installing the timing chain case, install the mounting bracket and water pump within 15 minutes.**

HINT:
Each bolt length is as follows:
30 mm (1.18 in.) for bolt A
35 mm (1.38 in.) for bolt B
20 mm (0.79 in.) for bolt C
20 to 14 mm (0.79 to 0.55 in.) for bolt E



27. INSTALL CRANKSHAFT PULLEY

(a) Install the crankshaft straight pin to the crankshaft.

(b) Align the hole of the crankshaft pulley with the straight pin, then install the crankshaft pulley.

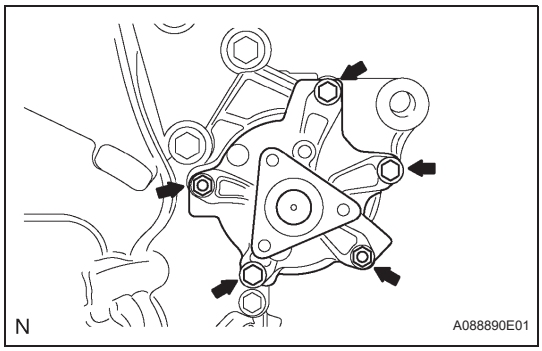
(c) Using SST, hold the crankshaft pulley and tighten the crankshaft bolt.

SST 09213-58013 (91111-50845), 09330-00021

Torque: 128 N*m (1,305 kgf*cm, 95 ft.*lbf)

NOTICE:

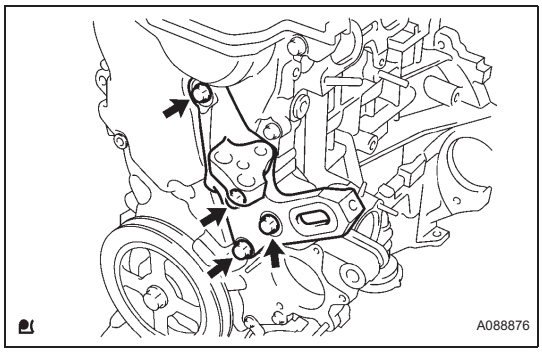
When installing SST, be careful that the bolt which holds SST does not interfere with the chain cover.



28. INSTALL WATER PUMP

(a) Install a new gasket and the water pump with the 3 bolts and 2 nuts.

Torque: 11 N*m (112 kgf*cm, 8 ft.*lbf)



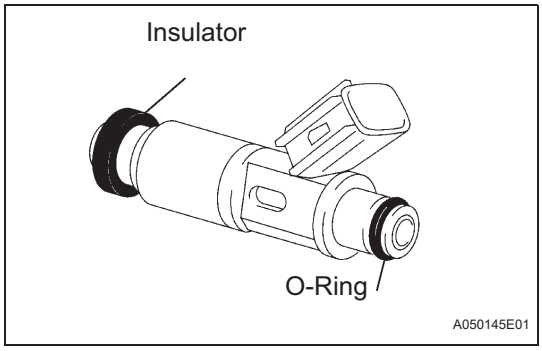
29. INSTALL ENGINE MOUNTING BRACKET RH

(a) Install the engine mounting bracket RH with the 4 bolts.

Torque: 55 N*m (561 kgf*cm, 41 ft.*lbf)

30. INSPECT VALVE CLEARANCE (See page EM-7)

31. ADJUST VALVE CLEARANCE (See page EM-9)

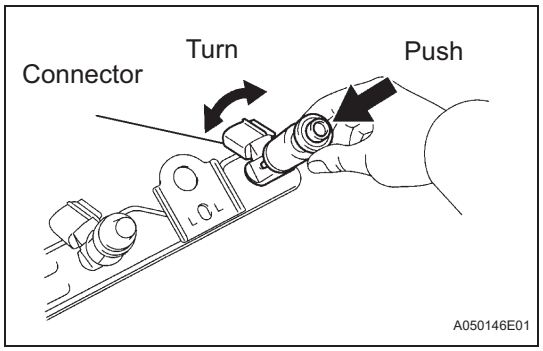


32. INSTALL FUEL INJECTOR

(a) Install new insulators onto each fuel injector.

(b) Apply a light coat of spindle oil or gasoline to new O-rings and install them onto each fuel injector.

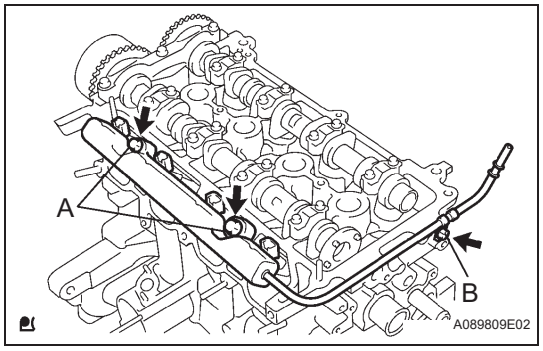
(c) Apply a light coat of spindle oil or gasoline to the place where a delivery pipe comes into contact with the O-ring.



(d) While turning the injector clockwise and counterclockwise, install it to the delivery pipe.
NOTICE:
- **Be careful not to twist the O-ring.**
- **After installing the fuel injectors, check that they turn smoothly. If not, reinstall it with a new O-ring.**

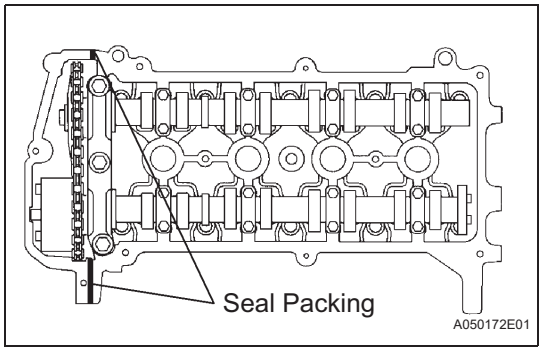
33. INSTALL FUEL DELIVERY PIPE

(a) Install the 2 spacers onto the cylinder head.



(b) Install the fuel delivery pipe and 4 fuel injectors together.
Torque: 19 N*m (194 kgf*cm, 14 ft.*lbf) for bolt A
9.0 N*m (92 kgf*cm, 80 in.*lbf) for bolt B
NOTICE:
- **Be careful not to drop the fuel injectors when installing the fuel delivery pipe.**
- **Check that the fuel injectors rotate smoothly after installing the fuel delivery pipe.**

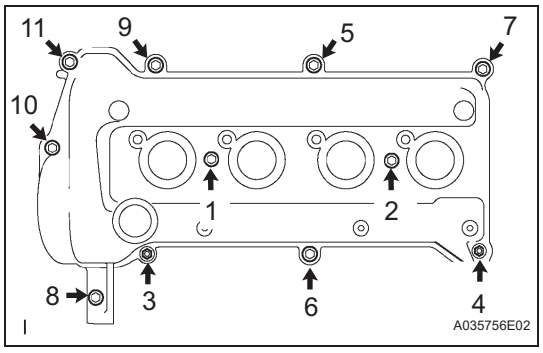
EM



34. INSTALL CYLINDER HEAD COVER

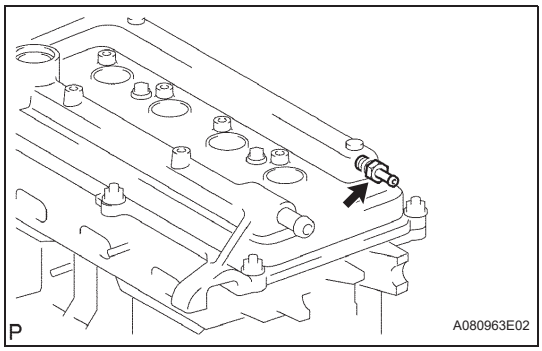
(a) Install the gasket onto the cylinder head cover.

(b) Apply seal packing to the 2 locations shown in the illustration.
Seal packing:
Toyota Genuine Seal Packing Black, Three Bond 1207B or Equivalent
NOTICE:
- **Remove any oil from the contact surface.**
- **Install the cylinder head cover within 3 minutes of applying seal packing.**
- **Do not start the engine for at least 2 hours after installation.**



(c) Install the cylinder head cover with the 9 bolts, 2 seal washers and 2 nuts.

(d) Using several steps, uniformly tighten the bolts and nuts in the sequence shown in the illustration.
Torque: 10 N*m (102 kgf*cm, 7 ft.*lbf)

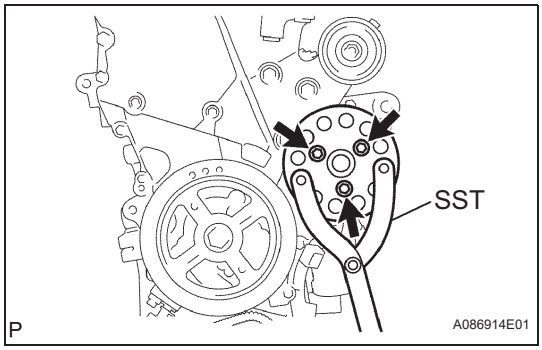


35. INSTALL VENTILATION VALVE

(a) Install the ventilation valve onto the cylinder head cover.
Torque: 27 N*m (275 kgf*cm, 20 ft.*lbf)

36. INSTALL OIL FILLER CAP

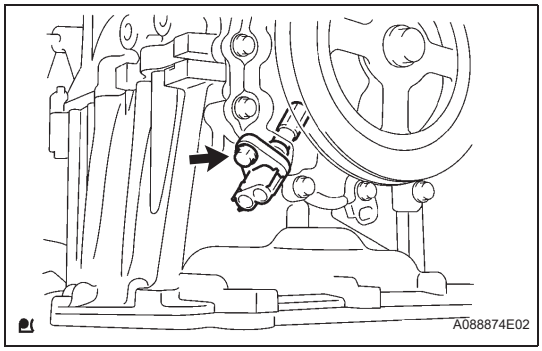
(a) Install a new gasket and the oil filler cap.



37. INSTALL WATER PUMP PULLEY

(a) Temporarily install the water pump pulley with the 3 bolts.

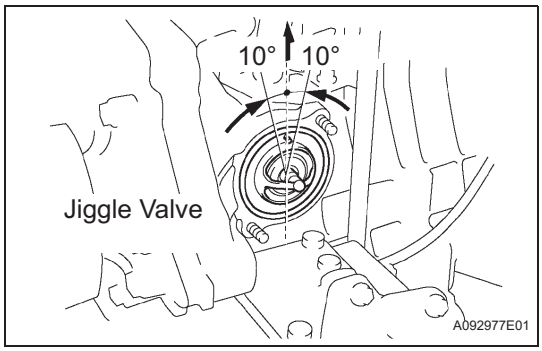
(b) Using SST, tighten the 3 bolts.
SST 09960-10010 (09962-01000, 09963-00600)
Torque: 15 N*m (153 kgf*cm, 11 ft.*lbf)



38. INSTALL CRANKSHAFT POSITION SENSOR

(a) Apply a light coat of engine oil to the O-ring on the sensor.
NOTICE:
If the O-ring is damaged, replace the sensor.

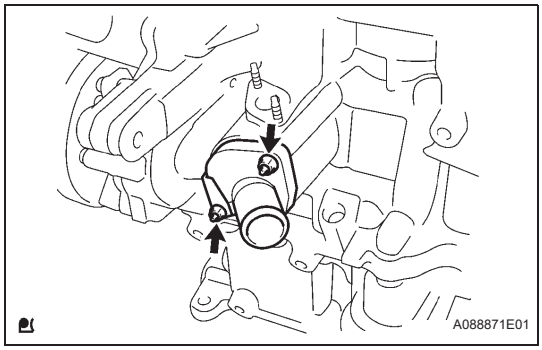
(b) Install the sensor with the bolt.
Torque: 7.5 N*m (76 kgf*cm, 66 in.*lbf)



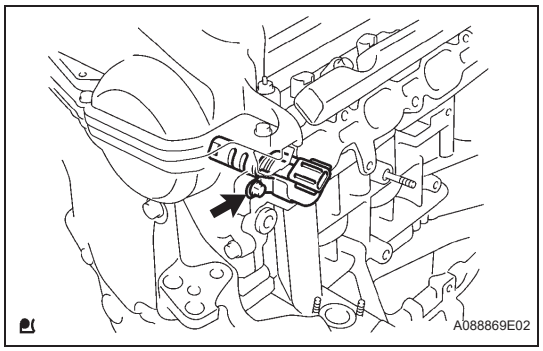
39. INSTALL THERMOSTAT

(a) Install a new gasket onto the thermostat.

(b) Install the thermostat with the jiggle valve facing upward.
HINT:
The jiggle valve may be set within 10° on either side as shown in the illustration.



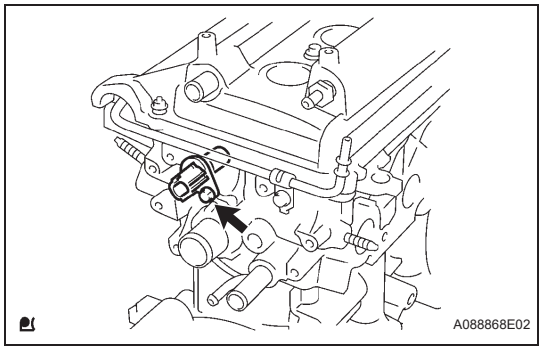
(c) Install the water inlet with the 2 nuts.
Torque: 9.0 N*m (92 kgf*cm, 80 in.*lbf)



40. INSTALL CAMSHAFT TIMING OIL CONTROL VALVE ASSEMBLY

(a) Apply a light coat of engine oil to a new O-ring, and install it onto the oil control valve.

(b) Install the oil control valve with the bolt.
Torque: 7.5 N*m (76 kgf*cm, 66 in.*lbf)
NOTICE:
Be careful not to twist the O-ring.



41. INSTALL CAMSHAFT POSITION SENSOR

(a) Apply engine oil to the O-ring.
NOTICE:
If the O-ring is damaged, replace the sensor.

(b) Install the sensor with the bolt.
Torque: 8.0 N*m (82 kgf*cm, 71 in.*lbf)

42. INSTALL SPARK PLUG

(a) Using a 16 mm plug wrench, install the 4 spark plugs.
Torque: 18 N*m (184 kgf*cm, 13 ft.*lbf)

EM