

## REASSEMBLY

### 1. INSTALL CAMSHAFT BEARING CAP SETTING RING PIN

- (a) Using a plastic-faced hammer, tap in a new ring pin to the specified protrusion height.

**Standard protrusion height:**

**8.5 to 9.5 mm (0.335 to 0.374 in.)**

### 2. INSTALL STUD BOLT

- (a) Using E5 and E7 "torx" sockets, install the 7 stud bolts.

**Torque: 10 N\*m (102 kgf\*cm, 7.4 ft.\*lbf) for bolt A**

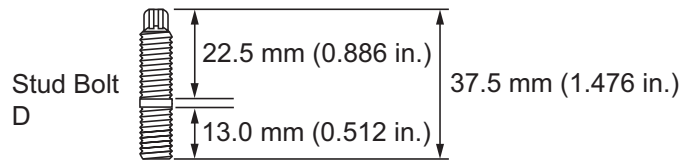
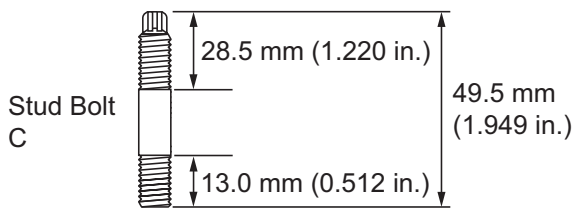
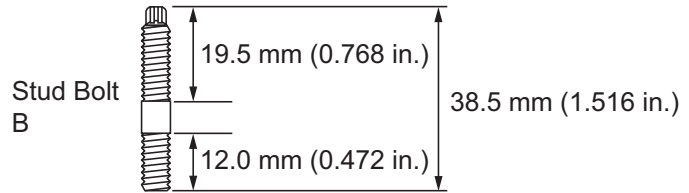
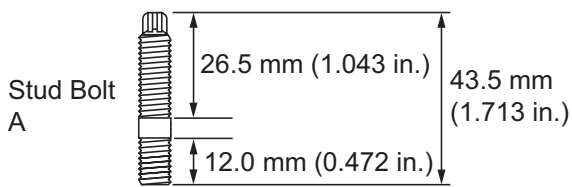
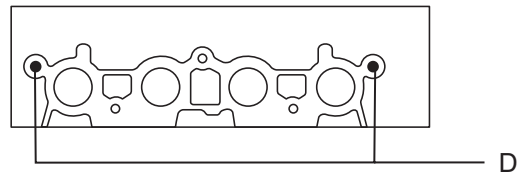
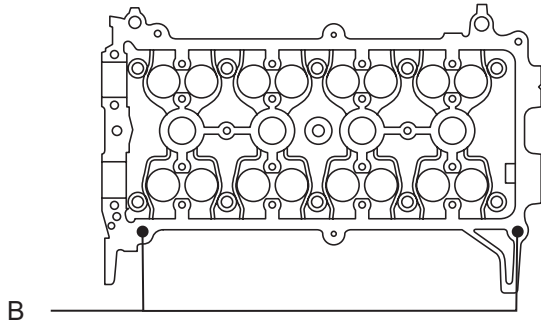
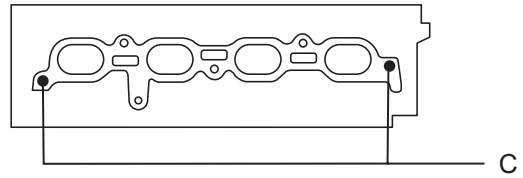
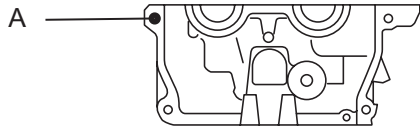
**4.0 N\*m (41 kgf\*cm, 35 in.\*lbf) for bolt B**

**10 N\*m (102 kgf\*cm, 7.4 ft.\*lbf) for bolt C**

**9.0 N\*m (92 kgf\*cm, 80 in.\*lbf) for bolt D**

EM

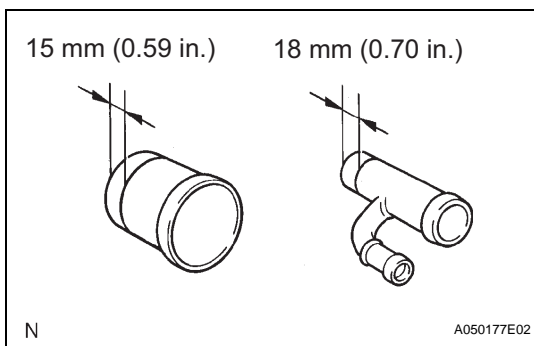
EM

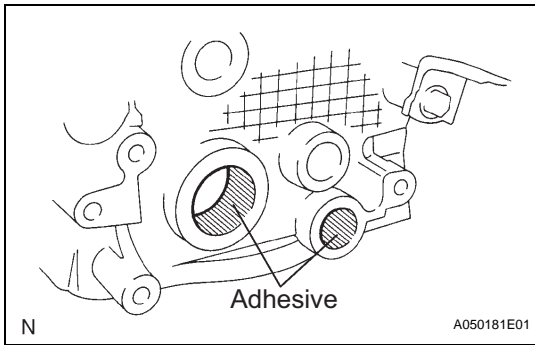


A117402E01

**3. INSTALL UNION**

- (a) Mark the standard position away from the edge onto 2 new water hose unions as shown in the illustration.

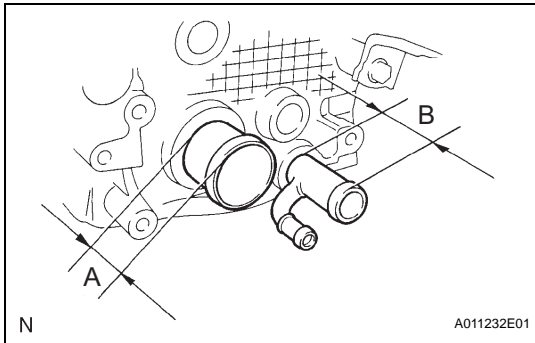




- (b) Apply adhesive to the water hose union hole of the cylinder head.

**Adhesive:**

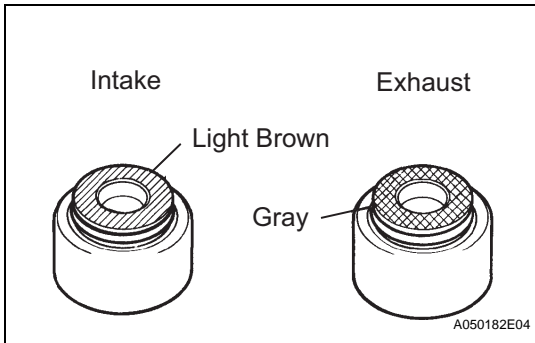
**Part No. 08833-00070, THREE BOND 1324 or equivalent**



- (c) Using a press, press in the water hose union until the marks come to the same level as the cylinder head surface.

**Standard protrusion**

Union	Specified Condition
A	29 mm (1.14 in.)
B	44 mm (1.73 in.)



**4. INSTALL VALVE STEM OIL SEAL**

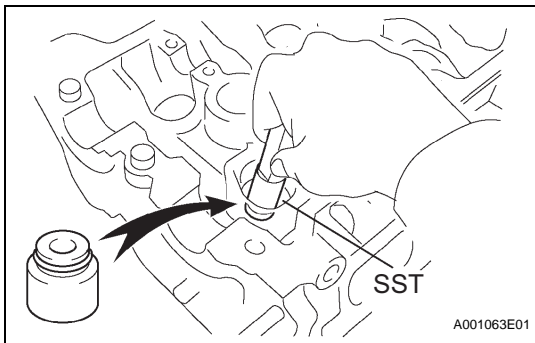
- (a) Apply a light coat of engine oil to the valve stem.

**NOTICE:**

**Installing the oil seals for the intake and exhaust onto the opposite valve guide bush may cause failures.**

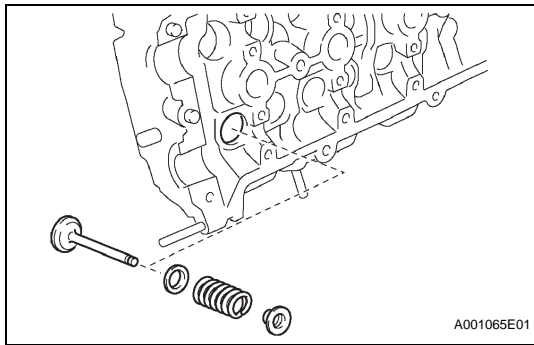
**HINT:**

The intake valve oil seal is light brown and the exhaust valve oil seal is gray.



- (b) Using SST, push in a new oil seal.

**SST 09201-41020**

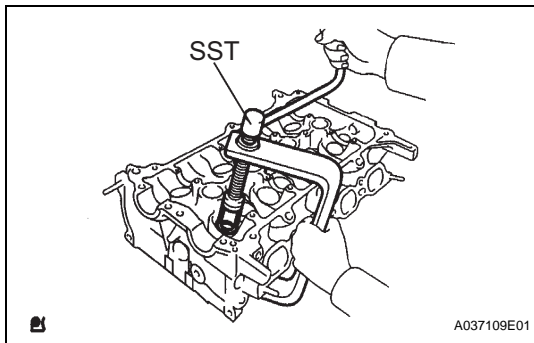


## 5. INSTALL INTAKE VALVE

- (a) Install the valve, spring seat, valve spring and spring retainer.

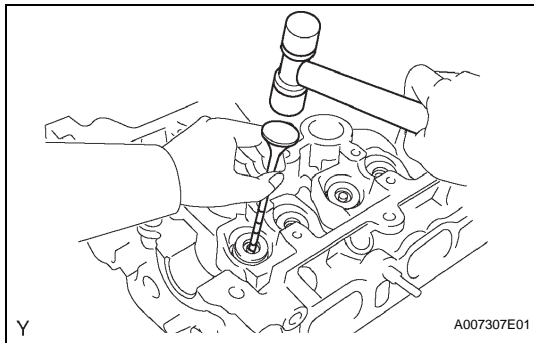
### NOTICE:

**Install the same parts in the same combination to the original locations.**



- (b) Using SST, compress the valve spring and place the 2 retainer locks around the valve stem.

**SST 09202-70020 (09202-00010)**



- (c) Using a plastic-faced hammer and the valve stem (not in use) with the tip wrapped in tape, lightly tap the valve stem tip to ensure a proper fit.

### NOTICE:

**Be careful not to damage the valve stem tip.**

## 6. INSTALL EXHAUST VALVE

- (a) Install the valve, spring seat, valve spring, and spring retainer.

- (b) Using SST, compress the valve spring and place the 2 retainer locks around the valve stem.

**SST 09202-70020 (09202-00010)**

- (c) Using a plastic-faced hammer and the valve stem (not in use) with the tip wrapped in tape, lightly tap the valve stem tip to ensure a proper fit.

### NOTICE:

**Be careful not to damage the valve stem tip.**

## 7. INSTALL OIL CONTROL VALVE FILTER

- (a) Using an 8 mm hexagon wrench, install the filter with a new gasket and the plug.

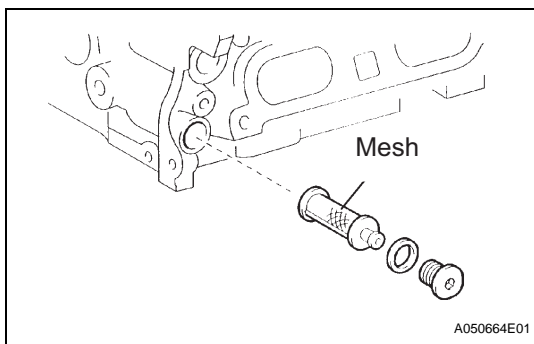
**Torque: 30 N\*m (306 kgf\*cm, 22 ft.\*lbf)**

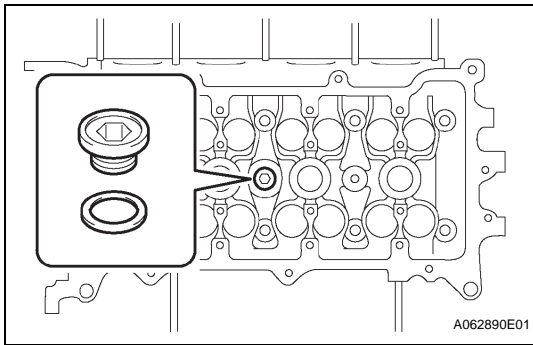
## 8. INSTALL VALVE LIFTER

- (a) Apply a light coat of engine oil to the valve lifter.

- (b) Install the valve lifter.

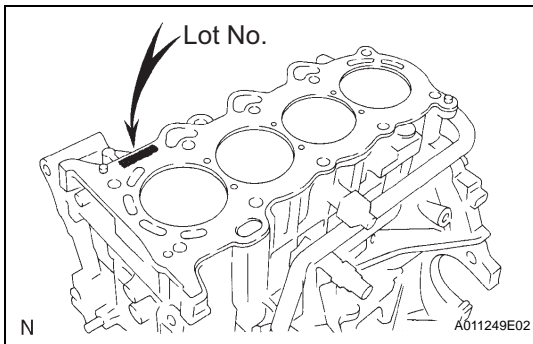
- (c) Check that the valve lifter rotates smoothly by hand.



**9. INSTALL NO. 1 TAPER SCREW PLUG**

- (a) Using a 10 mm hexagon wrench, install the taper screw plug with a new gasket.

**Torque: 44 N\*m (449 kgf\*cm, 33 ft.\*lbf)**

**INSTALLATION****1. 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.
- Be careful of the mounting orientation.
- Place the cylinder head on the gasket gently so as not to damage the gasket at the bottom part of the head.

**2. 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:**

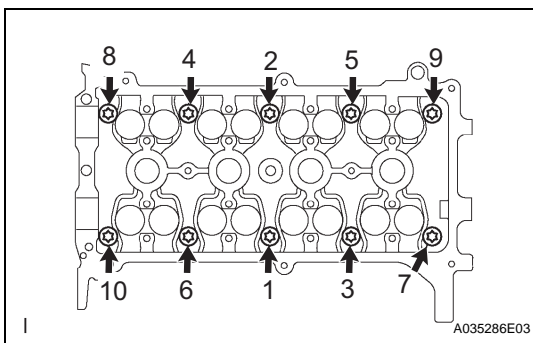
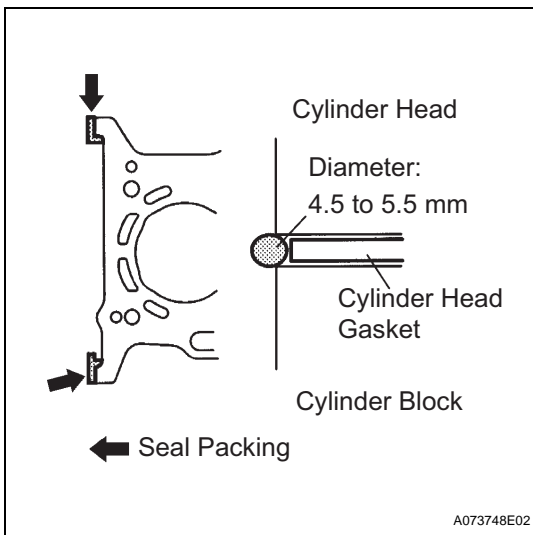
**Part No. 08826-00100**

**Standard seal diameter:**

**4.5 to 5.5 mm (0.177 to 0.217 in.)**

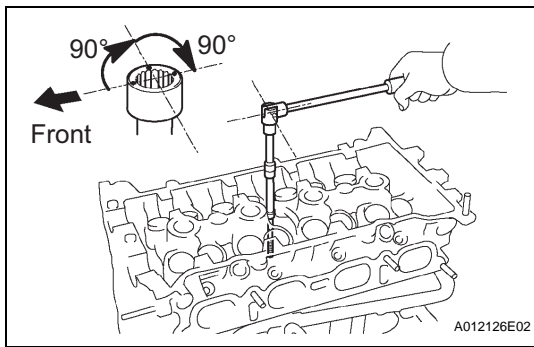
**NOTICE:**

- Remove any oil from the contact surface.
  - Install the cylinder head within 3 minutes of applying seal packing.
- (b) Apply a light coat of engine oil to the threads of the cylinder head bolts.

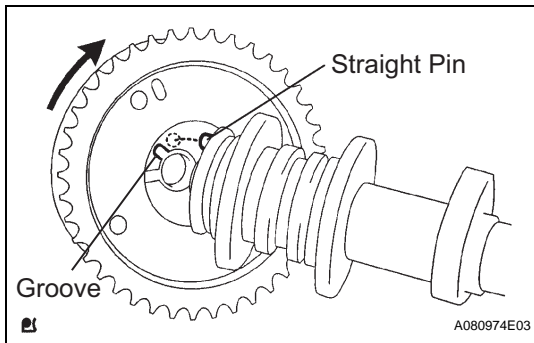


- (c) Using several steps, install and tighten the 10 cylinder head bolts and plate washers uniformly with an 8 mm bi-hexagon wrench in the sequence shown in the illustration.

**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 additional 90°, as shown in the illustration.
- (f) Check that the paint mark is now 180° opposite to the front.



### 3. INSTALL CAMSHAFT TIMING GEAR

- (a) Put the camshaft timing gear assembly and the camshaft together with the straight pin off the groove, 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.

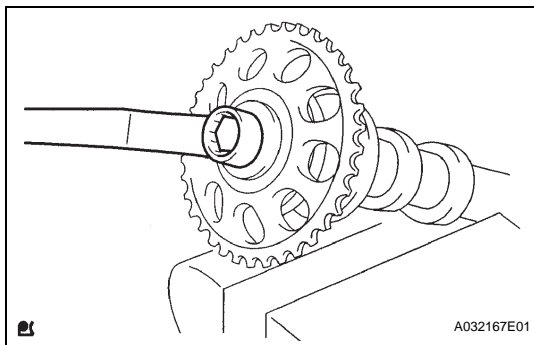
**NOTICE:**

**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 camshaft.
- (d) Tighten the flange bolt with the camshaft timing gear fixed.

**Torque: 64 N\*m (653 kgf\*cm, 47 ft.\*lbf)**

- (e) Check that the camshaft timing gear assembly can move to the retard angle (to the right) and is locked in the most retarded position.



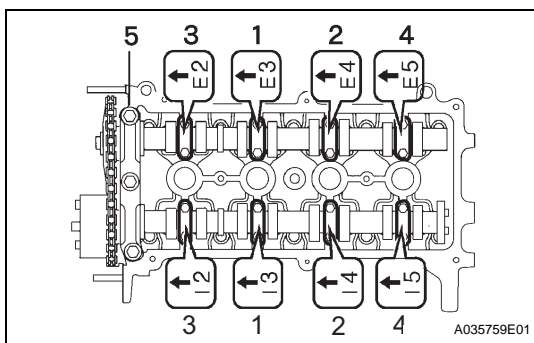
### 4. INSTALL CAMSHAFT TIMING SPROCKET

- (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.**



### 5. INSTALL 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 (129 kgf\*cm, 9 ft.\*lbf)**

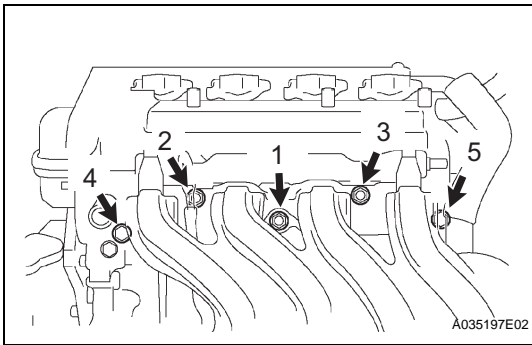
**NOTICE:**

**Tighten each bolt uniformly, keeping the camshaft level.**

(d) Install the No. 1 bearing cap.

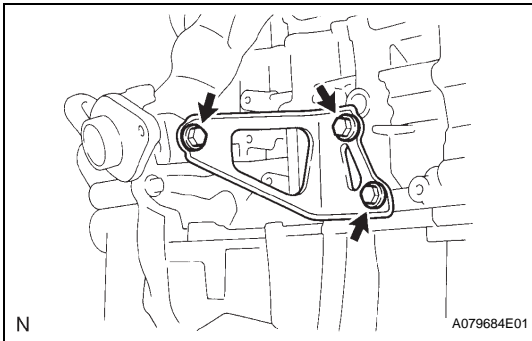
Torque: 23 N\*m (235 kgf\*cm, 17 ft.\*lbf)

6. INSTALL FUEL INJECTOR (See page [EM-122](#))
7. INSTALL FUEL DELIVERY PIPE (See page [EM-122](#))
8. INSTALL CHAIN (See page [EM-28](#))
9. INSTALL OIL PUMP SEAL (See page [EM-107](#))
10. INSTALL TIMING CHAIN COVER (See page [EM-119](#))
11. INSTALL WATER PUMP (See page [EM-121](#))
12. INSTALL ENGINE MOUNTING BRACKET RH (See page [EM-29](#))
13. INSTALL ENGINE MOUNTING INSULATOR RH (See page [EM-30](#))
14. INSTALL CAMSHAFT TIMING OIL CONTROL VALVE ASSEMBLY (See page [EM-30](#))
15. INSTALL CRANKSHAFT POSITION SENSOR (See page [ES-339](#))
16. INSTALL WATER PUMP PULLEY (See page [EM-122](#))
17. INSTALL CRANKSHAFT PULLEY (See page [EM-30](#))
18. INSTALL CYLINDER HEAD COVER (See page [EM-30](#))
19. INSTALL IGNITION COIL (See page [EM-31](#))
20. INSTALL NO. 2 CYLINDER HEAD COVER (See page [EM-31](#))
21. INSTALL GENERATOR (See page [CH-15](#))
22. INSTALL VANE PUMP V BELT (See page [EM-7](#))
23. INSTALL GENERATOR V BELT (See page [EM-7](#))
24. ADJUST GENERATOR V BELT (See page [EM-7](#))
25. ADJUST VANE PUMP V BELT (See page [EM-7](#))
26. INSPECT DRIVE BELT DEFLECTION AND TENSION (See page [EM-6](#))
27. INSTALL CAMSHAFT TIMING CONTROL VALVE ASSEMBLY (See page [EM-123](#))
28. CONNECT NO. 2 VENTILATION HOSE (See page [EM-31](#))
29. CONNECT VENTILATION HOSE (See page [EM-31](#))
30. INSTALL IGNITION COIL (See page [EM-31](#))
31. INSTALL OIL DIPSTICK GUIDE
  - (a) Apply engine oil to a new O-ring and install it to the dipstick guide.
  - (b) Install the dipstick guide with the bolt.  
Torque: 9.0 N\*m (92 kgf\*cm, 80 in.\*lbf)

**32. INSTALL INTAKE MANIFOLD**

- (a) Install a new gasket onto the intake manifold.
- (b) Install the intake manifold with the 3 bolts and 2 nuts. Using several steps, uniformly tighten the bolts and nuts in the sequence shown in the illustration.

**Torque: 30 N\*m (306 kgf\*cm, 22 ft.\*lbf)**

**33. INSTALL EXHAUST MANIFOLD (See page [EM-80](#))****34. INSTALL MANIFOLD SUPPORT BRACKET**

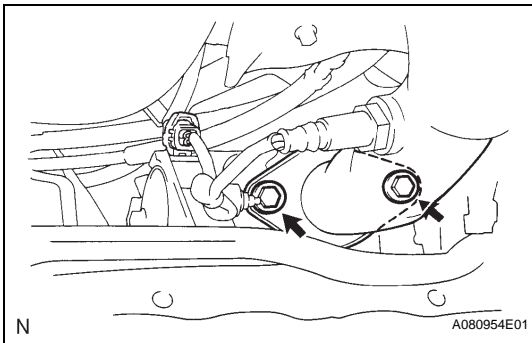
- (a) Install the manifold support bracket with the 3 bolts.

**Torque: 44 N\*m (449 kgf\*cm, 32 ft.\*lbf)**

**35. INSTALL NO. 1 EXHAUST MANIFOLD HEAT INSULATOR**

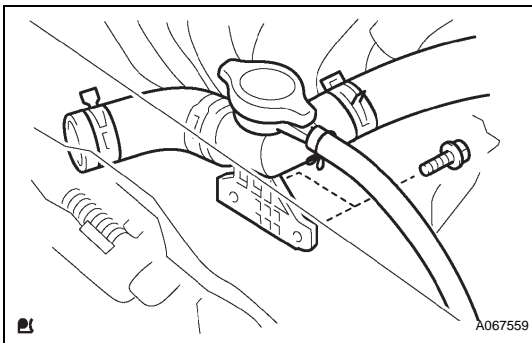
- (a) Install the No. 1 exhaust manifold heat insulator with the 4 bolts.

**Torque: 8.0 N\*m (82 kgf\*cm, 71 in.\*lbf)**

**36. INSTALL FRONT EXHAUST PIPE**

- (a) Place a new gasket on the exhaust manifold.
- (b) Install the 2 compression springs and 2 bolts.

**Torque: 43 N\*m (438 kgf\*cm, 32 ft.\*lbf)**

**37. INSTALL WATER FILLER**

- (a) Install the water filler with the 2 bolts.  
**Torque: 7.5 N\*m (76 kgf\*cm, 66 in.\*lbf)**
- (b) Connect the radiator reservoir tank hose.
- (c) Connect the No. 3 radiator hose.
- (d) Connect the radiator inlet hose.

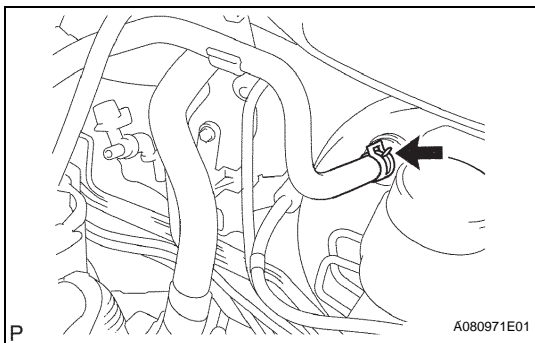
**38. INSTALL NO. 1 WATER BY-PASS PIPE**

- (a) Install the water by-pass pipe with the bolt.

**Torque: 9.0 N\*m (92 kgf\*cm, 80 in.\*lbf)**

**39. CONNECT RADIATOR HOSE INLET**

- (a) Connect the radiator hose inlet to the union.



40. **CONNECT UNION TO CHECK VALVE HOSE**
  - (a) Connect the union to check valve hose to the brake booster.
41. **CONNECT FUEL TUBE** (See page [FU-15](#))
42. **INSTALL ACCELERATOR CONTROL CABLE** (See page [ES-348](#))
43. **CONNECT ENGINE WIRE**
44. **INSTALL AIR CLEANER** (See page [ES-348](#))
45. **INSTALL OIL PAN DRAIN PLUG**
46. **ADD ENGINE OIL** (See page [LU-3](#))
47. **CHECK FOR ENGINE OIL LEAKS**
48. **ADD COOLANT** (See page [CO-5](#))
49. **CHECK FOR ENGINE COOLANT LEAKS** (See page [CO-1](#))
50. **CHECK FOR FUEL LEAKS** (See page [FU-8](#))
51. **CONNECT CABLE TO NEGATIVE BATTERY TERMINAL**