



**Technical Service  
Information Bulletin**

August 25, 2006

Title:

**M.I.L. "ON" DTC P0300, P0301, P0302,  
P0303, P0304, P0305, OR P0306**

Models:

**'06 IS 250**

**ENGINE  
EG019-06**

**Introduction** After a cold soak startup, some 2006 model year IS 250 vehicles may exhibit a M.I.L. "ON" condition with one or more of the following DTCs stored within 60 seconds of initial engine run time.

- P0300 (Random/Multiple Cylinder Misfire Detected)
- P0301 (Cylinder 1 Misfire Detected)
- P0302 (Cylinder 2 Misfire Detected)
- P0303 (Cylinder 3 Misfire Detected)
- P0304 (Cylinder 4 Misfire Detected)
- P0305 (Cylinder 5 Misfire Detected)
- P0306 (Cylinder 6 Misfire Detected)

The valve lash adjuster and valve spring have been improved to prevent any of the above DTCs from setting.

- Applicable Vehicles**
- **2006** model year **IS 250** vehicles equipped with the **4GR-FSE engine** and produced **BEFORE** the Production Change Effective VINs shown below.

**Production  
Change  
Information**

MODEL	PLANT	DRIVETRAIN	PRODUCTION CHANGE EFFECTIVE VIN
IS 250	Kyushu	2WD	JTHBK262#62017120
		AWD	JTHCK262#62007184
	Tahara	2WD	JTHBK262#65020537
		AWD	JTHCK262#65006155

**Warranty  
Information**

OP CODE	DESCRIPTION	TIME	OPF	T1	T2
EG5037	R & R All Valve Lash Adjusters, Valve Springs, and Valve Spring Retainers	8.0	13750-75020 13741-20021	8A	99

**Applicable Warranty\*:**

**This repair is covered under the Lexus Powertrain Warranty. This warranty is in effect for 72 months or 70,000 miles, whichever occurs first, from the vehicle's in-service date.**




\* Warranty application is limited to correction of a problem based upon a customer's specific complaint.



Parts  
Information

PREVIOUS PART NUMBER	CURRENT PART NUMBER	PART NAME	QTY
13750-75020	13750-31020	Adjuster Assembly, Valve Lash	24
90501-33019	90501-30030	Spring, Compression (for inner)	24
13741-20021	13741-31020	Retainer, Valve Spring	24
90430-16012	Same	Gasket, Oil Pipe	4
90430-16016	Same		2
11328-31030	Same	Gasket, Timing Gear Cover	1
11159-31010	11159-0P010	Gasket, Camshaft Bearing Cap	4
90430-10024	90430-A0001		2
23915-46011	Same	Insulator, Fuel Pump	1
11214-31020	Same	Gasket, Cylinder Head Cover No. 2	1
11213-31040	Same	Gasket Cylinder Head Cover	1
17176-31050	Same	Gasket, Air Surge Tank to Intake Manifold	3

Required  
SSTs

ITEM NO.	SPECIAL SERVICE TOOLS (SSTs)	PART NUMBER	QTY	DRW**
1	<b>Lexus Diagnostic Tester Kit*</b> NOTE: <ul style="list-style-type: none"> <li>All components from this kit/set are required.</li> <li>12 Megabyte Diagnostic Tester Program Card (P/N 01002593-005) with version 13.4a Software (or later) is required.</li> </ul> 	LEX220036	1	8
2	<b>CAN Interface Module Kit*</b> NOTE: <ul style="list-style-type: none"> <li>All components from this kit/set are required.</li> </ul> 	01002744	1	8
3	<b>Hydraulic Lash Adjuster</b> 	09276-75010-01	1	1

\* Essential SSTs.

\*\* Refers to drawer number in SST Storage System.

**NOTE:**

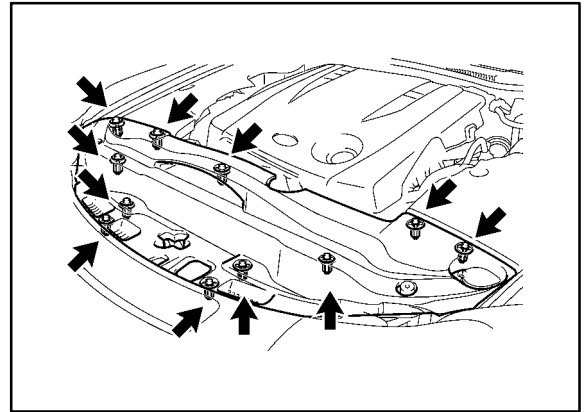
**Additional Diagnostic Tester Kits, CAN Interface Modules, Program Cards, or other SSTs may be ordered by calling SPX/OTC at 1-800-933-8335.**

**Required  
Tools &  
Material**

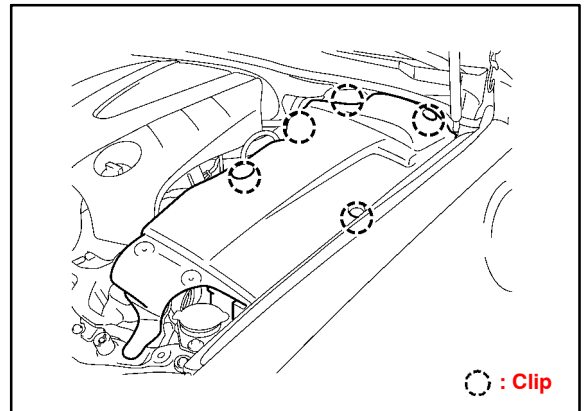
TOOLS & MATERIAL	QUANTITY
Toyota Genuine Adhesive 1344, Three Bond 1344, or Equivalent	As Needed
FIPG Sealant: P/N 08826-00080, or Equivalent	As Needed
ILSAC GF-4 Multi-grade SAE 5W-30	1 qt (As Needed for Installation of Valve Lifters and Fuel Pump)
Anti-rotation Tool, or Equivalent	1
Air Lead Pipe, or Equivalent	1
Valve Spring Removal Tool, or Equivalent	1

**Repair  
Procedure**

1. Disconnect the cable from the negative (-) battery terminal.
2. Remove the cool air intake duct seal by removing the 11 clips.

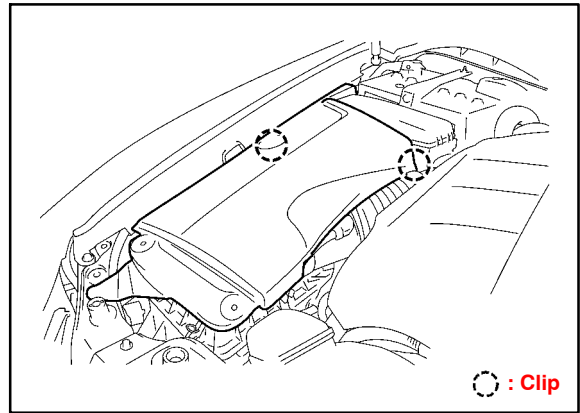


3. Remove the engine compartment side cover LH by removing the 5 clips.



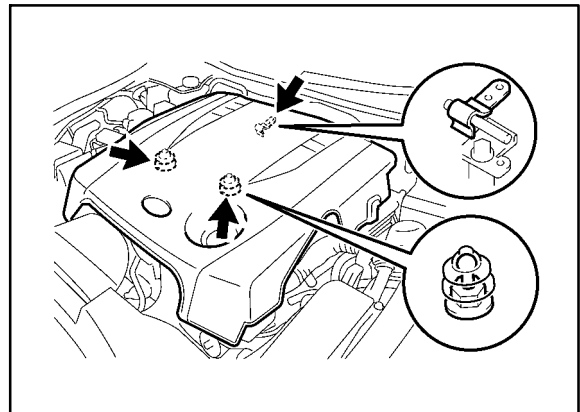
**Repair  
Procedure**  
(Continued)

4. Remove the engine compartment side cover RH by removing the 2 clips.



5. Remove the V-bank cover sub-assembly.

Raise the V-bank cover to disengage the clip on the rear of the cover. Raise the cover again to disengage the 2 clips on the front of the cover and remove the cover.



**NOTE:**

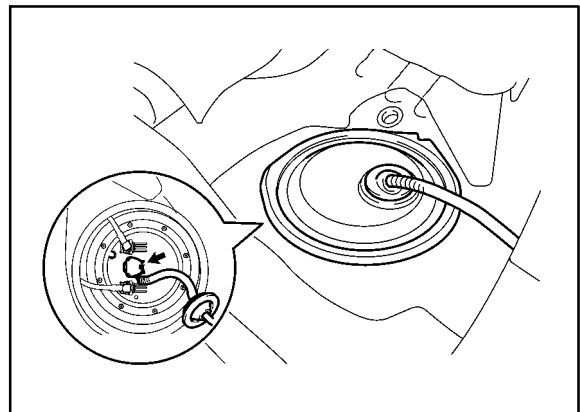
Attempting to disengage both front and rear clips at the same time may cause the cover to break.

6. Discharge the fuel system pressure.

**FUEL SYSTEM CAUTIONS:**

- Do NOT smoke or work near an open flame when working on the fuel system.
- Keep gasoline away from rubber or leather parts.
- Do NOT allow fuel to spray when removing the pipe between the high pressure side fuel pump and the fuel injector. The fuel in the pipe is highly pressurized.
- Wear safety goggles while working with fuel system under pressure.
- Do NOT disconnect any part of the fuel system until you have discharged the fuel system pressure.
- Even after discharging the fuel pressure, place a shop rag over fittings as you separate them to reduce risk of fuel spray on yourself or in the engine compartment.

- A. Disconnect the fuel pump connector.
- B. Connect the cable to the negative (-) battery terminal.
- C. Start the engine. After the engine has stopped on its own, turn the engine switch OFF.

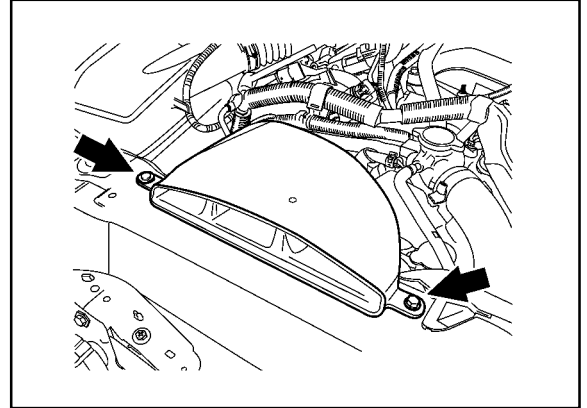


**HINT:**

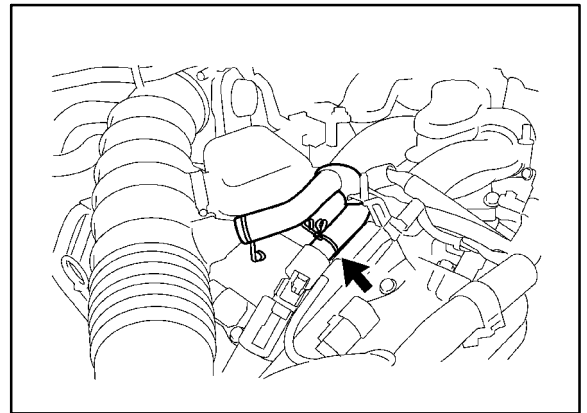
DTC P0171/P0172 (System Too Lean) may be set.

**Repair  
Procedure**  
(Continued)

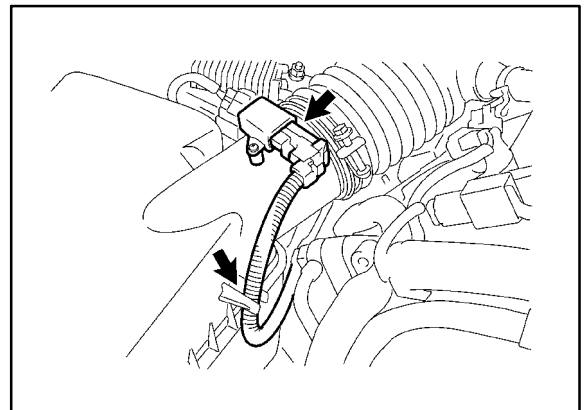
- D. Crank the engine again, and then check that the engine does NOT start.
  - E. Loosen the fuel tank cap to discharge the pressure in the fuel tank completely.
  - F. Reconnect the fuel pump connector.
  - G. Disconnect the cable from the negative (-) battery terminal.
7. Remove the No. 1 inlet air cleaner.  
Remove the bolt, clip, and then the inlet air cleaner.



8. Disconnect the No. 2 ventilation hose from the cylinder head.

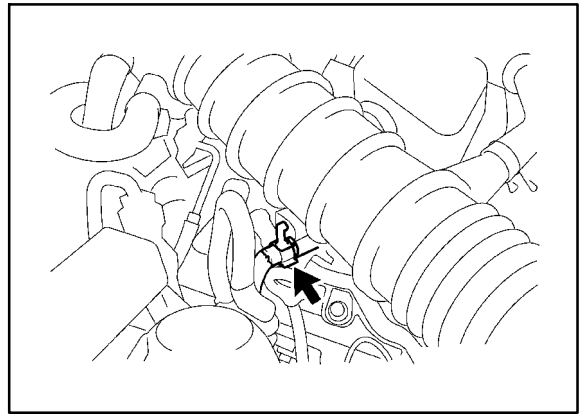


9. Remove the air cleaner cap with air cleaner hose.
- A. Disconnect the MAF connector.
  - B. Disconnect the clamp from the air cleaner.

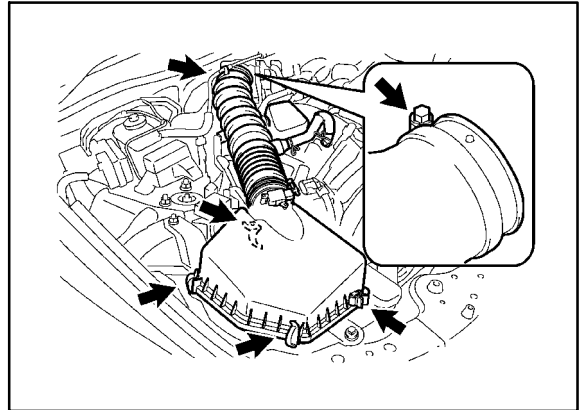


**Repair  
Procedure**  
(Continued)

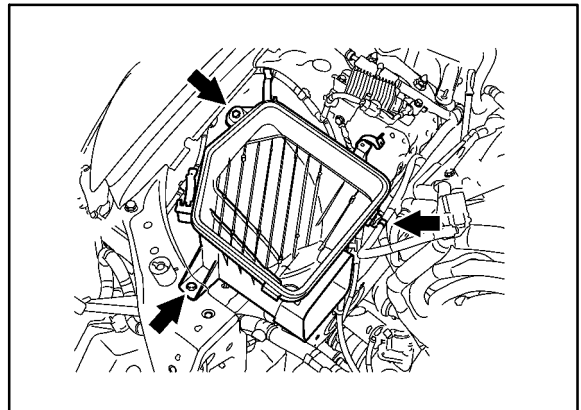
- C. Disconnect the VSV hose.



- D. Disconnect the 4 clamps.  
E. Remove the hose clamp and air cleaner cap with air cleaner hose.



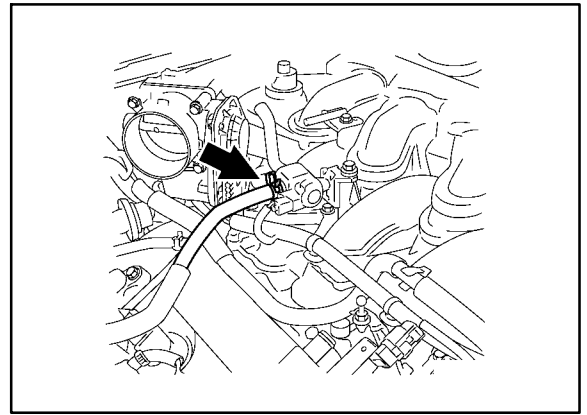
10. Remove the air cleaner case sub-assembly.  
Remove the 2 bolts, clamp, and the air cleaner case.



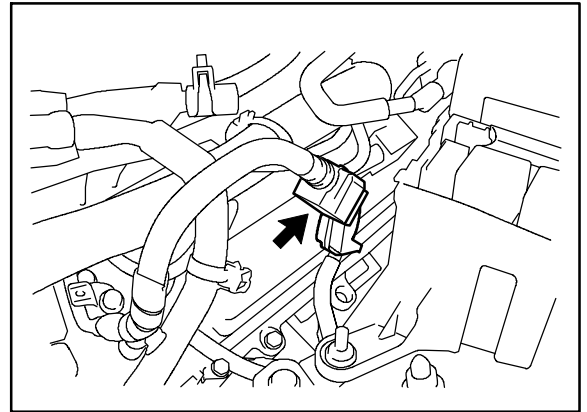
11. Disconnect the union to check valve hose by removing the clamp.

**Repair  
Procedure**  
(Continued)

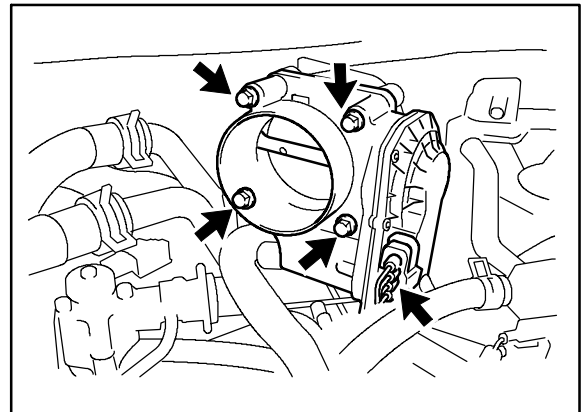
12. Disconnect the No. 2 fuel vapor feed hose by removing the clamp.



13. Disconnect the fuel main tube.



14. Remove the throttle body assembly (with motor).
- A. Disconnect the throttle motor connector.
  - B. Remove the 4 bolts and disconnect the throttle body from the intake surge tank.



**HINT:**  
Do NOT disconnect the water bypass hose.

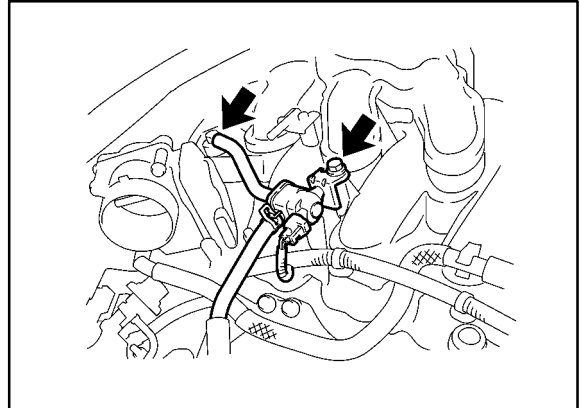
**Repair  
Procedure**  
(Continued)

15. Remove the intake air surge tank assembly.

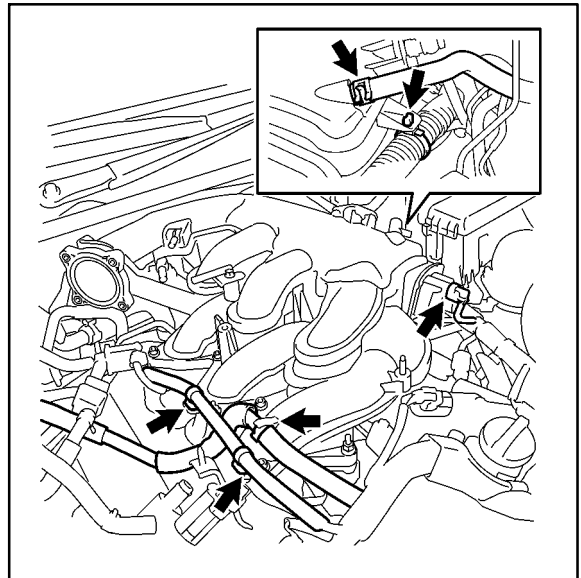
**NOTE:**

**Cover the top surface of the intake manifold with duct tape (or equivalent) to prevent foreign material from falling into the engine.**

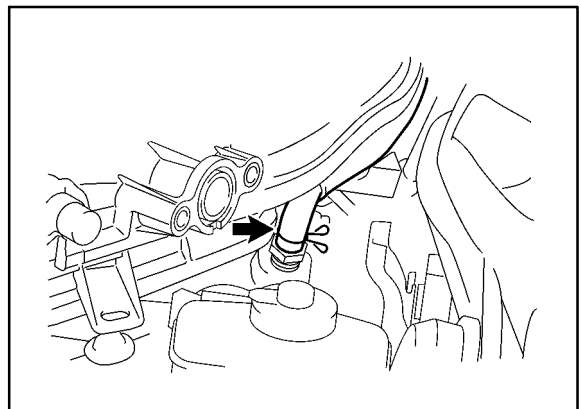
- A. Disconnect the vacuum hose from the intake air surge tank.
- B. Remove the bolt and disconnect the No. 1 vacuum switching valve assembly from the intake air surge tank.



- C. Disconnect the wire harness and hose from the surge tank.



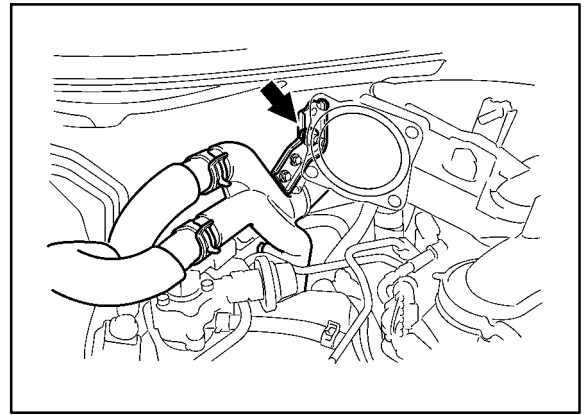
- D. Disconnect the ventilation hose from the intake air surge tank.



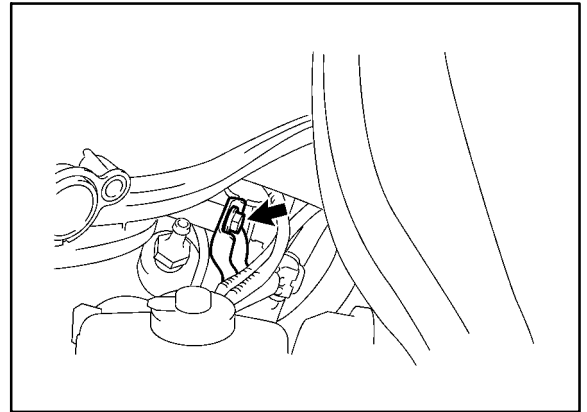


**Repair  
Procedure**  
(Continued)

- E. Remove the bolt and water hose joint from the intake air surge tank.



- F. Remove the bolt and disconnect the surge tank stay.
- G. Using a 5-mm hexagon socket wrench, remove the 7 bolts, 2 nuts, and gasket.

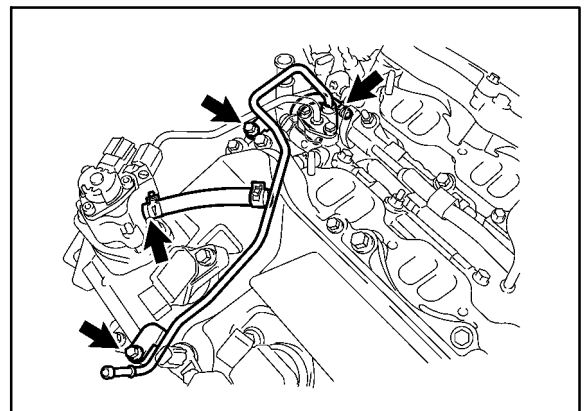


16. Remove fuel pipe No. 1.

- A. Disconnect the No. 3 fuel hose from the No. 1 fuel pipe.



- B. Disconnect the 2 fuel hoses.
- C. Remove the 2 bolts and No. 1 fuel pipe.

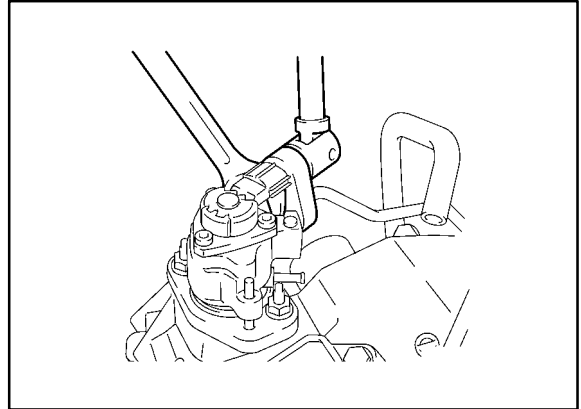


**Repair  
Procedure**  
(Continued)

17. Disconnect fuel pipe No. 2.
- A. Disconnect the fuel high pressure side fuel pump connector.
  - B. Secure the union bolt in place on the fuel pump side with a 21-mm wrench. Using a 19-mm union nut wrench, loosen the union and remove the fuel pipe.

**NOTE:**

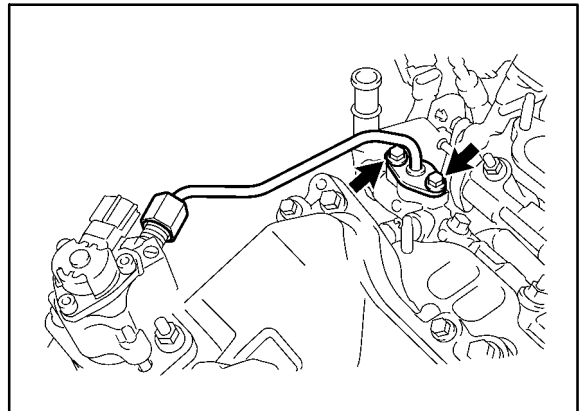
- There must be absolutely **NO** free play in the union on the fuel pump side.
- If the union on the fuel pump side has free play, replace the fuel pump.



- C. Remove the 2 bolts on the delivery pipe side.

**NOTE:**

- Do **NOT** remove the fuel pipe from the delivery pipe. Only remove the 2 bolts.
- If the No. 2 fuel pipe **IS** accidentally removed, replace its O-ring, No. 1 backup ring, and No. 2 backup ring.



18. Remove the fuel pump assembly.
- A. Remove the 2 nuts, 2 stud bolts, and fuel pump.
  - B. Remove the fuel insulator from the cylinder head cover.

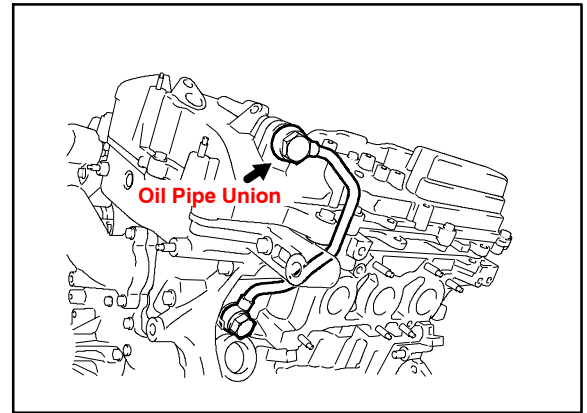
**NOTE:**

- To keep the nipple joint for the fuel pipe free of foreign matter, cover with a plastic bag.
- Remove the engine oil out of the oil pool from the cylinder head cover's fuel pump attachment hole.

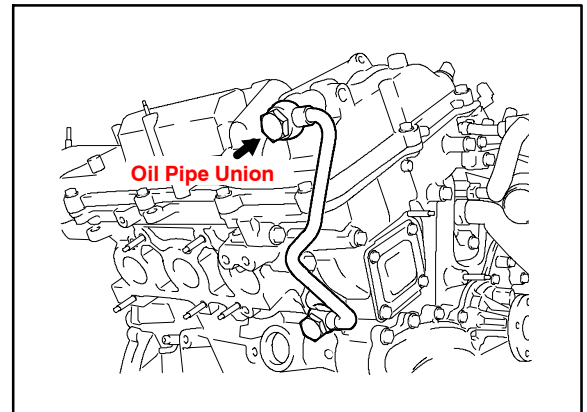
19. Remove the ignition coil assemblies.

**Repair  
Procedure**  
(Continued)

20. Remove the No. 1 oil pipe union bolt from the oil pipe.



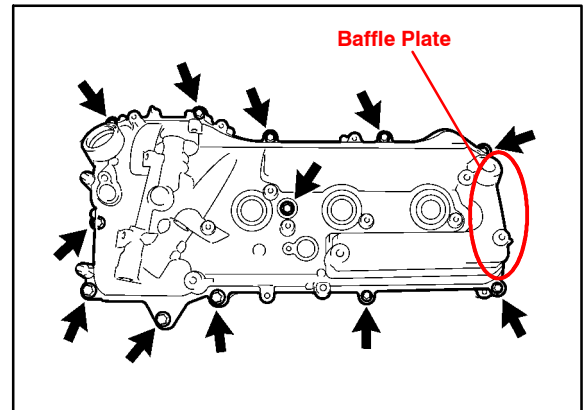
21. Remove No. 2 oil pipe union bolt from the oil pipe.



22. Remove the cylinder head cover LH.  
A. Remove the 12 bolts, oil seal washer, and cylinder head cover.

**NOTE:**

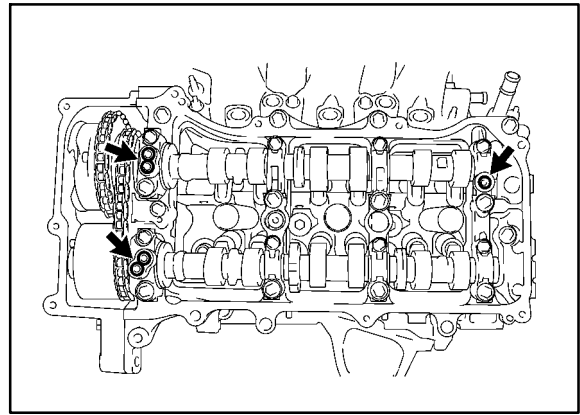
- Cover the hole around the timing chain with shop rags to prevent foreign material from falling into the engine.
- The baffle plate is located on the back of the portion shown in the illustration.
- Do NOT damage the baffle plate when removing the cylinder head cover.



- B. Remove the cylinder head cover gasket from the cylinder head cover.

**Repair  
Procedure**  
(Continued)

- C. Remove the 3 gaskets.

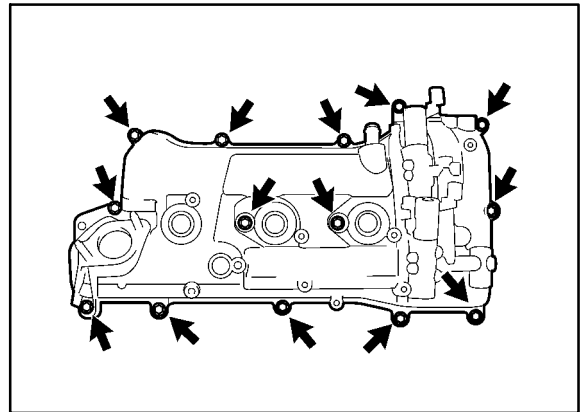


23. Remove the cylinder head cover RH.

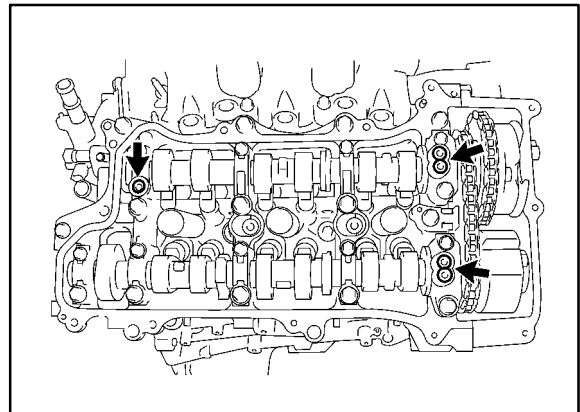
- A. Remove the 12 bolts, 2 oil seal washers, and cylinder head cover.

**NOTE:**

- Cover the hole around the timing chain with shop rags to prevent foreign material from falling into the engine.
- The baffle plate is located on the back of the portion shown in the illustration.
- Do NOT damage the baffle plate when removing the cylinder head cover.

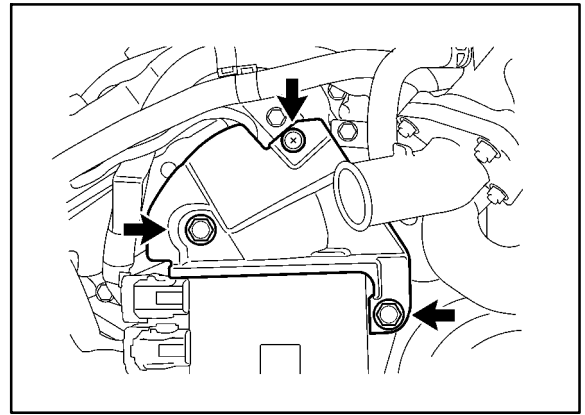


- B. Remove the cylinder head cover gasket from the cylinder head cover.
- C. Remove the 3 gaskets.

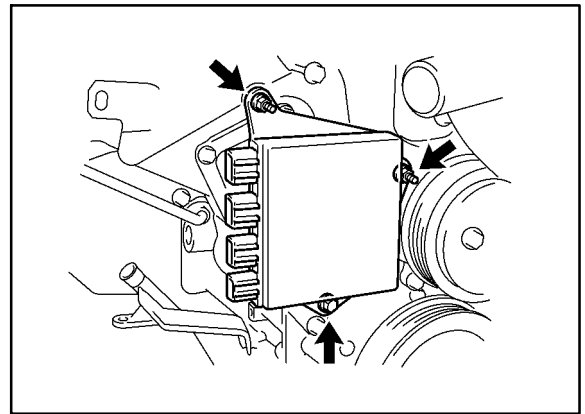


**Repair  
Procedure**  
(Continued)

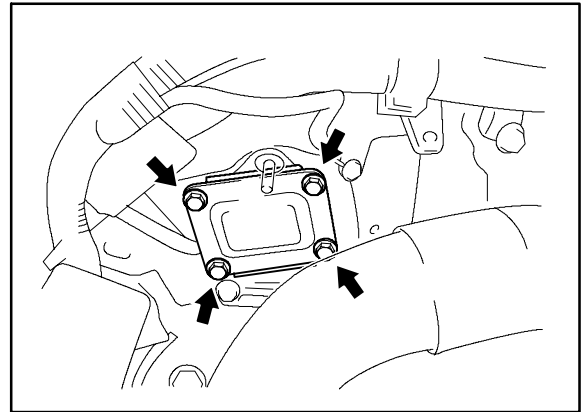
24. Remove engine cover No. 1 by removing the 3 clips.



25. Remove the injector driver by removing the bolt and 2 nuts.



26. Remove the timing chain cover plate.  
Remove the 4 bolts, timing chain cover plate, and timing chain cover plate gasket.



27. Set the No. 1 cylinder to TDC/compression.
- A. Set the timing mark to 0° on the timing chain cover by rotating the crankshaft clockwise.
  - B. Check that the timing marks of the camshaft timing gear assembly are aligned with the timing marks of the camshaft bearing cap.

**HINT:**

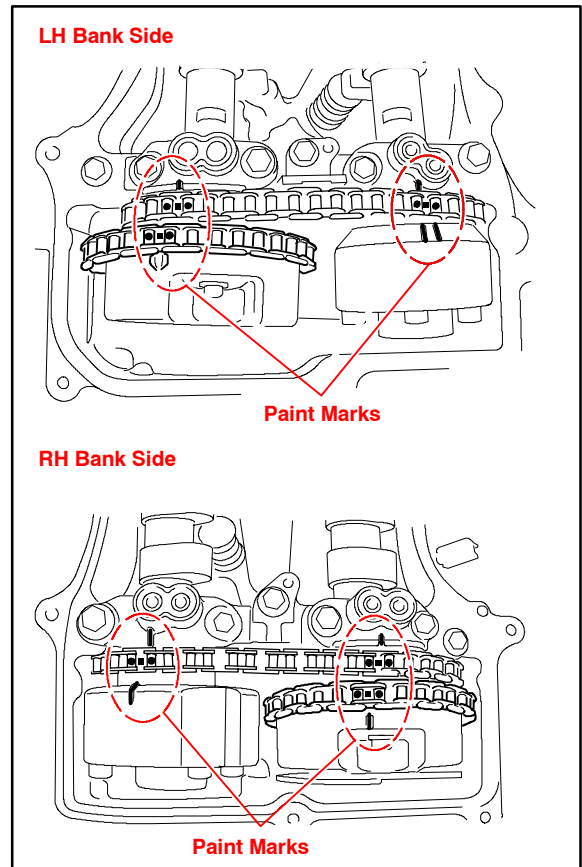
**If the timing marks are NOT aligned, turn the crankshaft one revolution (360°) clockwise and align the timing marks.**

**Repair Procedure**  
(Continued)

- C. Using a paint marker, mark the sprocket wheel, timing mark of the camshaft timing gear assembly, and the timing chain itself.

**HINT:**

Wipe any oil off before marking.



28. Remove the chain tensioner assembly No. 1.
- A. Loosen tension from the timing chain by rotating the crankshaft 30° counterclockwise.

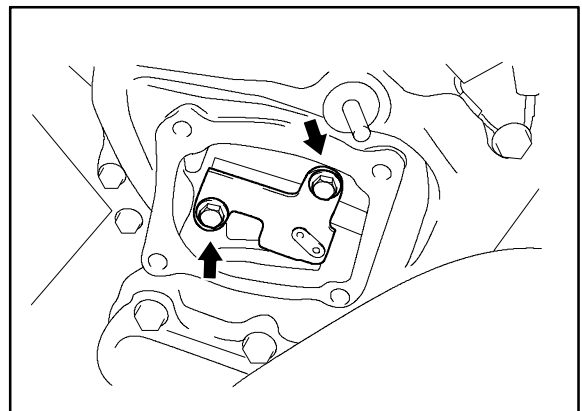
**HINT:**

The procedure above is to prevent the valve and piston from hitting each other when turning the crankshaft.

- B. Remove the 2 bolts and No. 1 chain tensioner assembly.

**NOTE:**

Do NOT drop the No. 1 chain tensioner assembly and bolts inside the timing chain cover.



**Repair  
Procedure**  
(Continued)

29. Remove the timing chain.

A. LH bank:

a. Loosen tension from the timing chain by rotating the crankshaft.

**HINT:**

**Oil may spray out of the holes on top of the No. 3 camshaft bearing cap when rotating the crankshaft. Use shop rags to prevent any spray.**

b. Remove the timing chain from the timing gear and rest it on the camshaft timing gear assembly temporarily.

B. RH bank:

a. Loosen tension from the timing chain by rotating the crankshaft.

**NOTE:**

**Oil may spray out of the holes on top of the No. 1 camshaft bearing cap when rotating the crankshaft. Use shop rags to prevent any spray.**

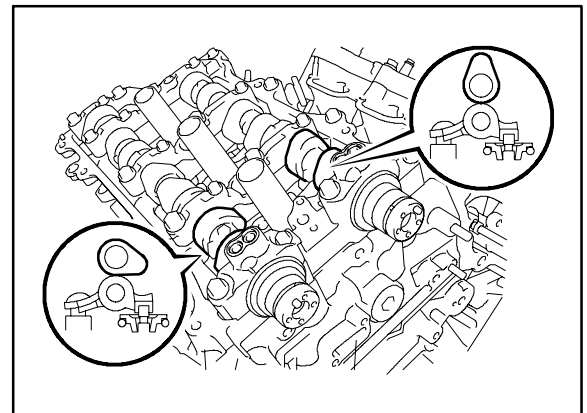
b. Rotate the crankshaft clockwise until the flat surface of the timing exhaust gear assembly faces to the vertical position.

c. Remove the timing chain from the timing gear and rest it on the camshaft timing gear assembly temporarily.

30. Remove the camshaft bearing cap.

A. RH bank:

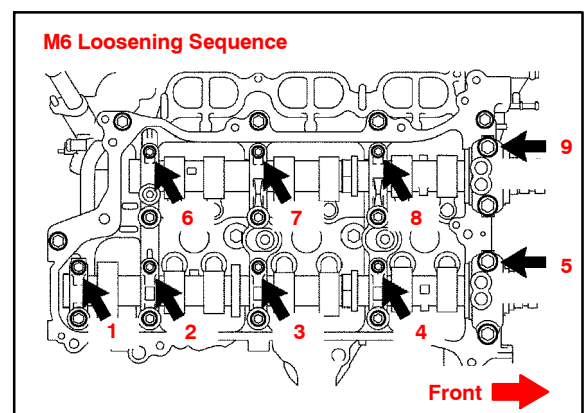
a. Check that the camshafts are in the neutral position shown in the illustration.



b. Uniformly loosen and remove the 9 camshaft bearing cap M6 bolts in the sequence shown in the illustration.

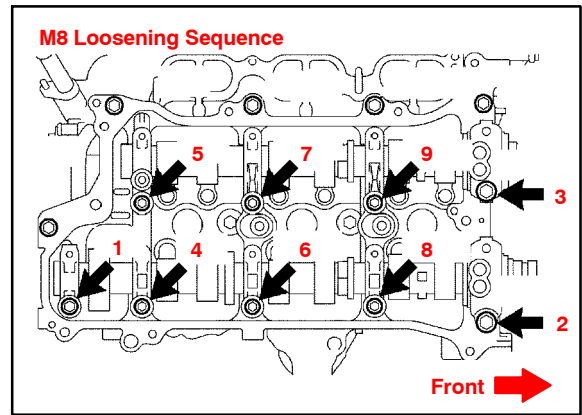
**HINT:**

**Keep the camshaft horizontal while loosening the bearing cap bolts.**



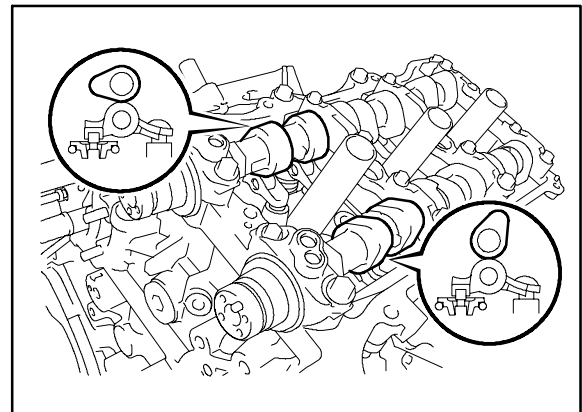
**Repair Procedure**  
(Continued)

- c. Uniformly loosen and remove the 9 camshaft bearing cap M8 bolts in the sequence shown in the illustration.
- d. Remove the 6 camshaft bearing caps.



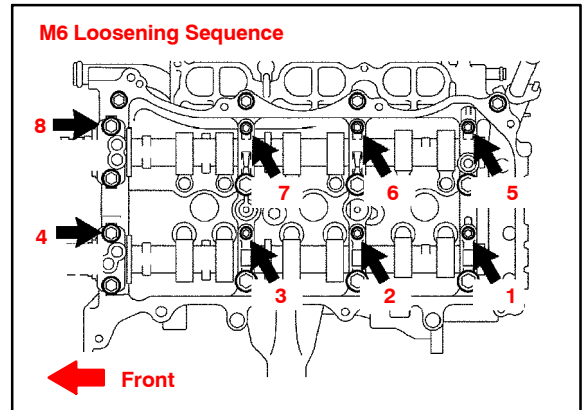
B. LH bank:

- a. Check that the camshafts are in the neutral position shown in the illustration.

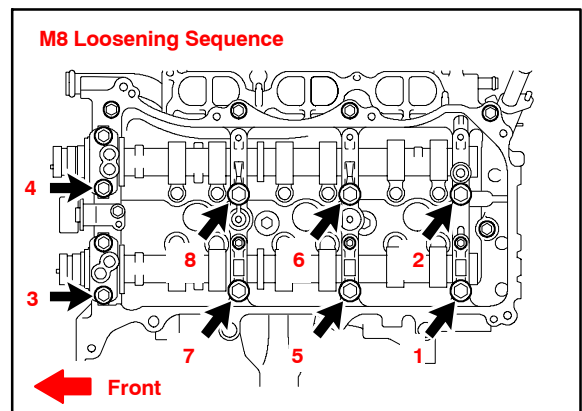


- b. Uniformly loosen and remove the 8 camshaft bearing cap M6 bolts in the sequence shown in the illustration.

**HINT:**  
Keep the camshaft horizontal while loosening the bearing cap bolts.



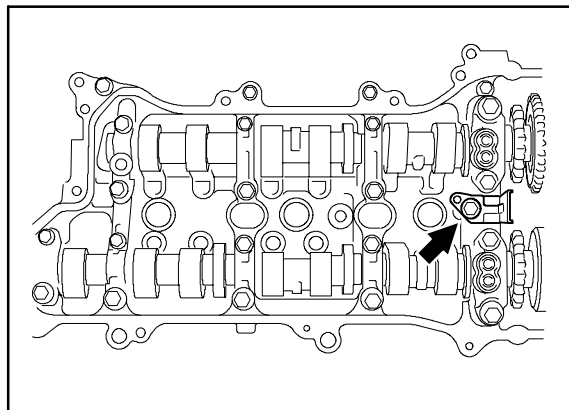
- c. Uniformly loosen and remove the 8 camshaft bearing cap M8 bolts in the sequence shown in the illustration.
- d. Remove the 5 camshaft bearing caps.



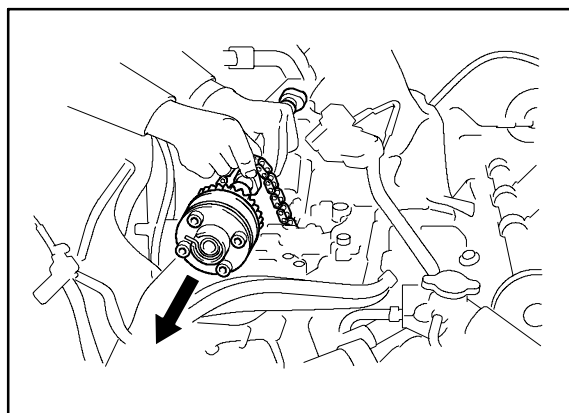


**Repair  
Procedure**  
(Continued)

31. Remove the No. 2 camshaft.
- A. Remove the bolt for the No. 2 chain tensioner assembly.
  - B. While holding No. 2 camshaft, remove the No. 2 chain tensioner assembly.



- C. While holding the No. 2 chain, slide the No. 2 camshaft out toward the front of the vehicle.



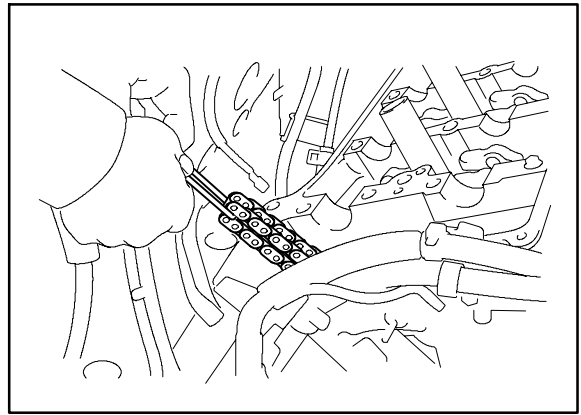
32. Remove the No. 1 camshaft.
- A. Hold the rear portion of the No. 1 camshaft (with tilt position).
  - B. Hold the timing chain from the timing gear, and slide the No. 1 camshaft (with No. 2 chain) out toward the rear of the vehicle.

**NOTE:**

Keep tension on the timing chain to avoid separation from the crankshaft timing gear.

**Repair  
Procedure**  
(Continued)

- C. Tie the timing chain to the oil pipe with a strap.



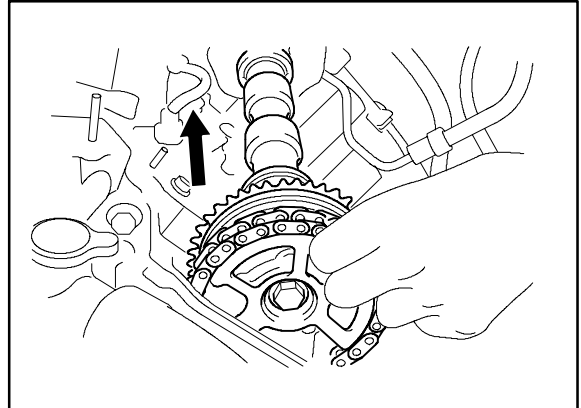
33. Remove camshaft No. 4.
- Remove the bolt for the No. 3 chain tensioner assembly.
  - While holding the No. 4 camshaft, remove the No. 3 chain tensioner assembly.
  - Hold the No. 2 chain, and slide the No. 4 camshaft out toward the front of the vehicle.

34. Remove camshaft No. 3.
- Hold the rear portion of the No. 3 camshaft (with tilt position).
  - Remove the timing chain from the timing gear, and slide the No. 3 camshaft (with the No. 2 chain) out toward the rear of the vehicle.

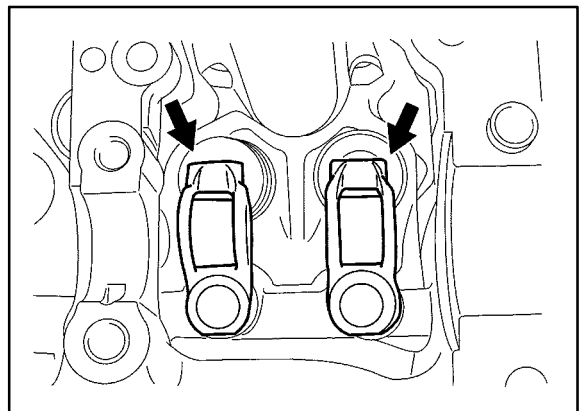
**NOTE:**

Keep tension on the timing chain to avoid separation from the crankshaft timing gear.

- C. Tie the timing chain to the oil pipe with a strap.



35. Remove the valve rocker arms for all cylinders.

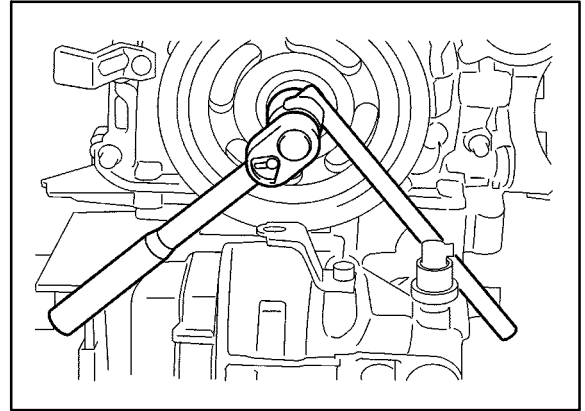


**Repair  
Procedure**  
(Continued)

36. Remove the valve stem cap.
37. Attach the anti-rotation tool to the crankshaft.

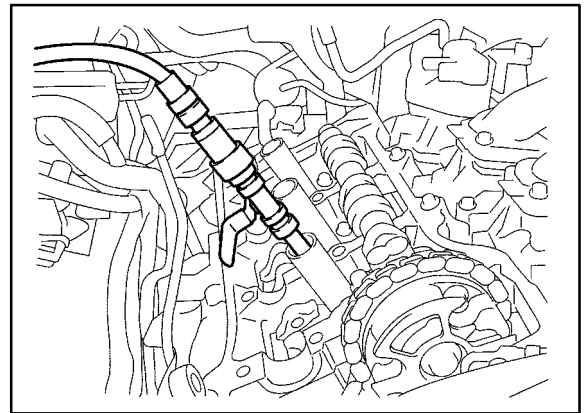
**NOTE:**

Make sure that the anti-rotation tool is secured to prevent the crankshaft from turning either clockwise or counterclockwise.



38. Remove the spark plugs.
39. Attach the air lead pipe, or equivalent tool, to allow compressed air to be applied to the combustion chamber.

**Torque: 10 N•m (102 kgf•cm, 7 ft•lbf)**



40. Pressurize the combustion chamber.  
Slowly apply air pressure into the combustion chamber.

**Recommended air pressure: 58 - 116 psi  
(4.1 - 8.2 kgf/cm<sup>2</sup>, 400 - 700 kPa)**

**NOTE:**

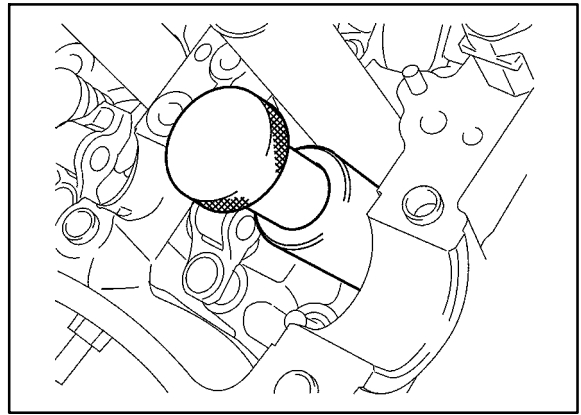
- Pressurize the combustion chamber slowly to prevent unexpected crankshaft rotation.
- Make sure that the anti-rotation tool is attached properly before putting air into the combustion chamber.

**Repair  
Procedure**  
(Continued)

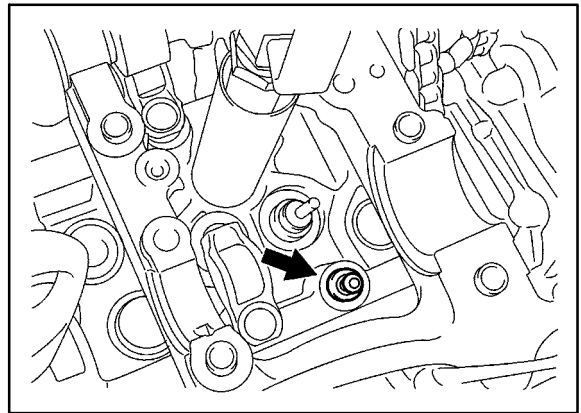
41. Remove the valve spring retainer lock using a valve spring removal tool or equivalent tool.

**NOTE:**

- Be careful as the valve spring may pop out when the valve spring retainer lock is disassembled.
- Cover the oil holes on the cylinder head with shop rags to prevent the valve spring retainer lock from falling into the engine.



42. Remove the valve spring retainer.
43. Remove the valve spring.
44. Remove the lash adjuster.



**Repair Procedure**  
(Continued)

45. Install the NEW lash adjuster.

**NOTE:**

- Keep the lash adjuster free of dirt and foreign matter.
- Only use clean engine oil.

- Place the lash adjuster into a container filled with engine oil.
- Insert the SST's tip into the lash adjuster's plunger and use the tip to press down on the check ball inside the plunger.
  - **SST P/N 09276-75010-01**
- Squeeze the SST and lash adjuster together to move the plunger up and down 5 to 6 times.
- Check the movement of the plunger and bleed the air.

**OK: Plunger moves up and down.**

**NOTE:**

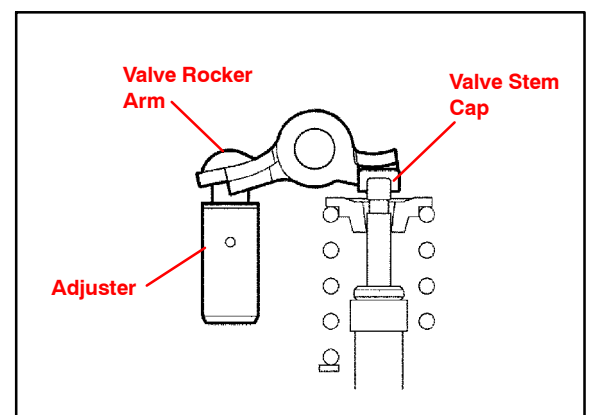
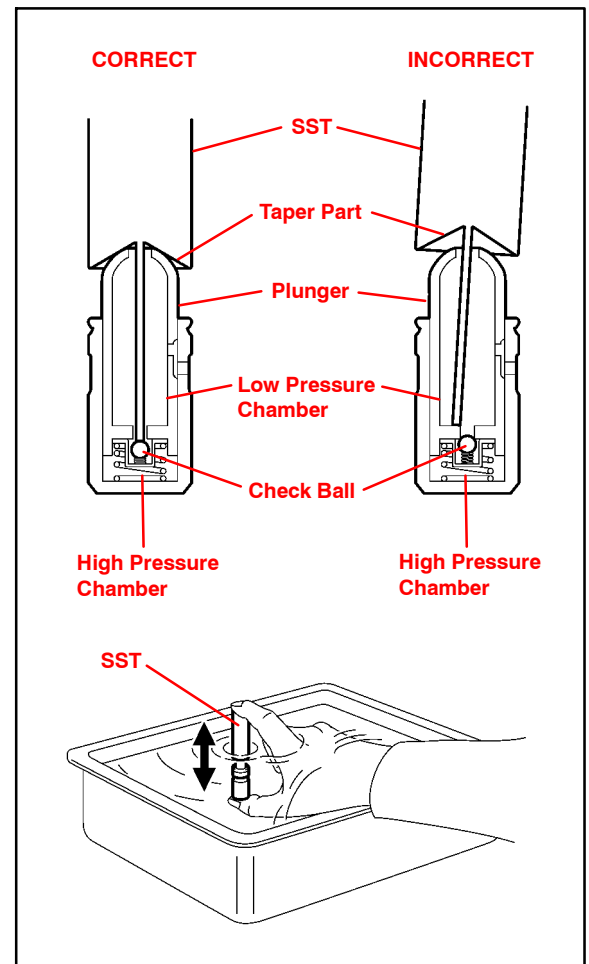
When bleeding the lash adjuster high-pressure chamber, make sure that the SST is actually pressing the check ball as shown in the illustration. If the check ball is NOT pressed, air will NOT bleed.

- After bleeding the air, remove the SST. Then try to quickly and firmly press the plunger with your fingers.

**OK: Plunger is very difficult to move.**

If the result is NOT as specified, repeat the bleeding procedure.

- Install the NEW lash adjusters.



**Repair  
Procedure**  
(Continued)

46. Install the NEW valve spring.
47. Install the NEW valve spring retainer.
48. Install the valve spring retainer locks.
  - A. Using the valve spring installation tool or equivalent tool, install the valve spring retainer lock.

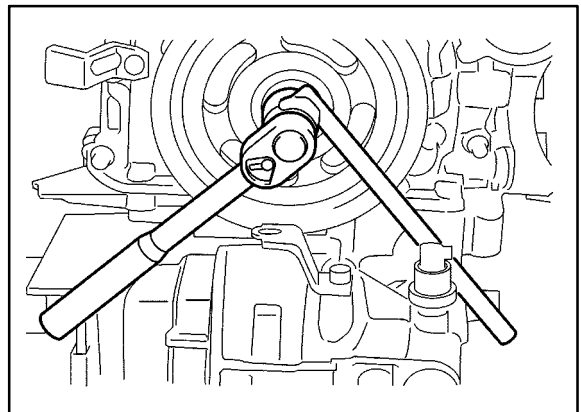
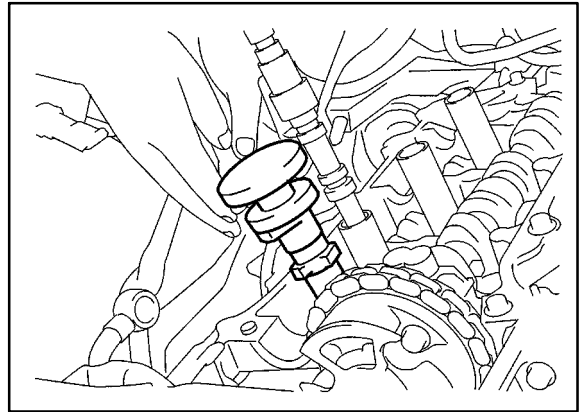
**NOTE:**

- The valve spring may pop out if the valve spring retainer locks are NOT installed properly.
- Cover the oil holes on the cylinder head with shop rags to prevent the valve spring retainer locks from falling into the engine.

**HINT:**

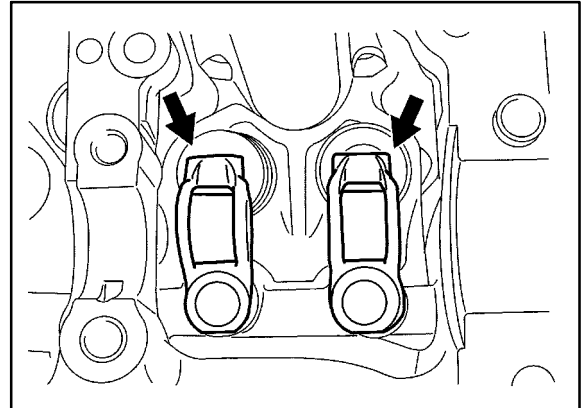
Applying grease to the valve spring retainer locks may assist in holding them together.

- B. Using a plastic hammer, tap the valve spring retainer to check that the valve spring retainer lock fits properly.
49. Release the air inside the combustion chamber.
50. Remove the air lead pipe or equivalent tool.
51. Proceed to replace the remaining 23 valve lash adjusters, valve springs, and valve spring retainers following steps 40 - 50 in this TSIB.
52. Remove the anti-rotation tool from the crankshaft.

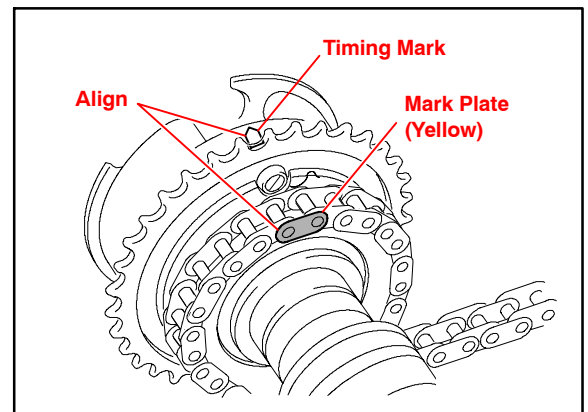


**Repair  
Procedure**  
(Continued)

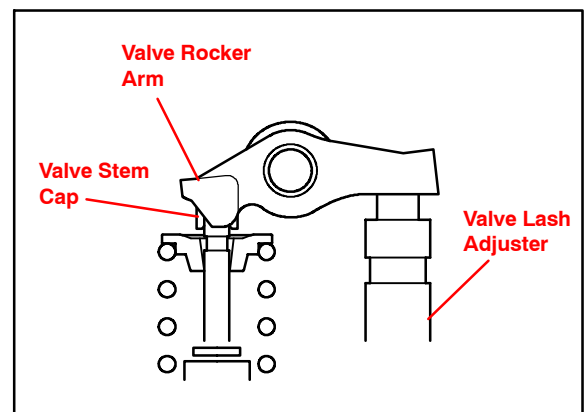
53. Install the spark plugs.  
**Torque: 25 N•m (255 kgf•cm, 18 ft•lbf)**
54. Install the valve stem caps.
55. Install the valve rocker arms.



56. Install the No. 3 camshaft.
- A. Align the mark plate (yellow) of the No. 2 chain with the timing marks of the camshaft timing gear assembly shown in the illustration.
- B. Clean the camshaft journals and apply engine oil.



- C. Make sure that the valve rocker arms are installed with the lash adjuster and valve stem cap properly as shown in the illustration.

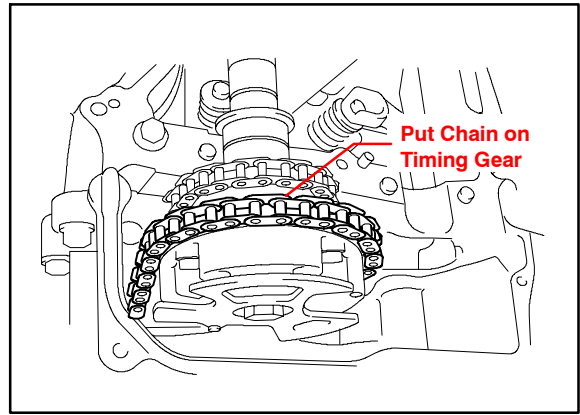


**Repair  
Procedure**  
(Continued)

- D. Temporarily put the timing chain to the No. 3 camshaft on the camshaft timing gear assembly and place the No. 3 camshaft on the camshaft housing LH.

**NOTE:**

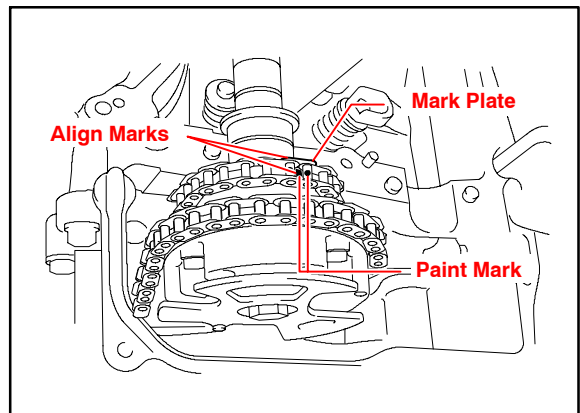
- Temporarily put the timing chain on the camshaft timing gear assembly without installing to the sprocket.
- Place the camshaft as the timing mark faces on the top.



57. Install the No. 1 camshaft using the same procedure as step 56.

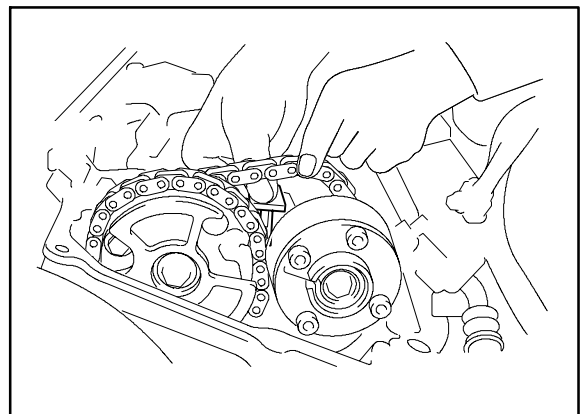
58. Install the No. 4 camshaft.

- A. Clean the camshaft journals and apply engine oil to them.
- B. Hold the No. 2 chain and slide the No. 4 camshaft in from the front of the vehicle.
- C. Align the mark plate (yellow) with the timing marks of the camshaft timing exhaust gear LH.



- D. Hold the No. 2 chain and install the No. 3 chain tensioner assembly.

**Torque: 21 N•m**  
**(214 kgf•cm, 15 ft•lbf)**



59. Install the No. 2 camshaft using the same procedure as step 58.

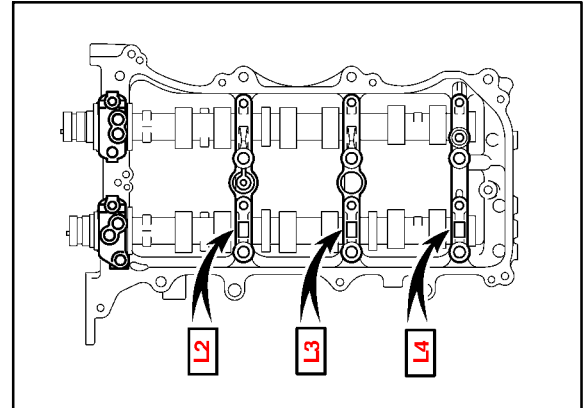


**Repair  
Procedure**  
(Continued)

60. Install the camshaft bearing cap.

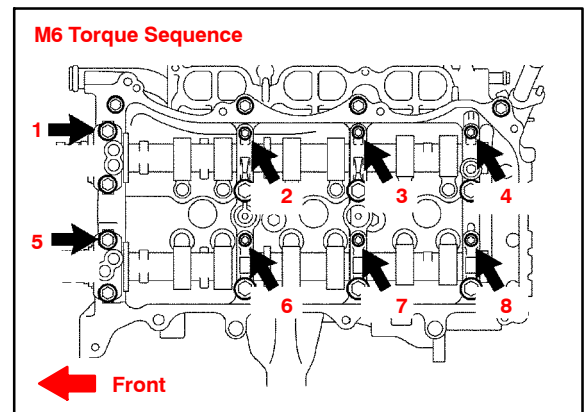
A. LH bank:

- a. Clean the camshaft bearing caps and apply engine oil.
- b. Make sure that the valve rocker arms are installed with the lash adjuster and valve stem cap properly.
- c. Make sure of the marks and numbers on the camshaft bearing caps and temporarily tighten the 16 bolts.



- d. Tighten the 8 M6 bolts in the sequence shown in the illustration.

**Torque: 10 N•m**  
(102 kgf•cm, 7 ft•lbf)

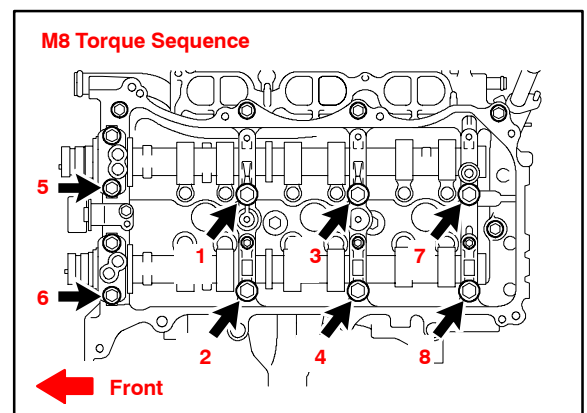


- e. Tighten the 8 M8 bolts in the sequence shown in the illustration.

**Torque: 28 N•m**  
(286 kgf•cm, 21 ft•lbf)

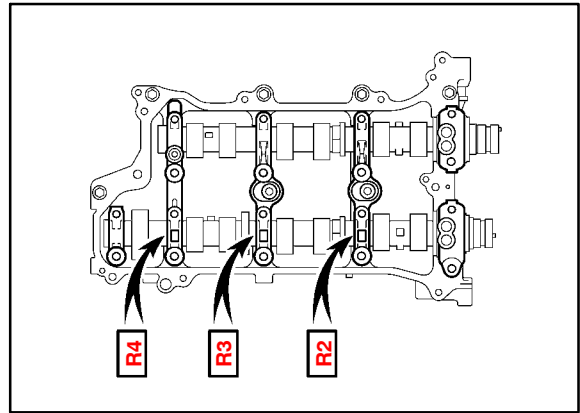
- f. Tighten the 8 M6 bolts to their final torque value in the sequence shown in the illustration.

**Torque: 16 N•m**  
(163 kgf•cm, 12 ft•lbf)



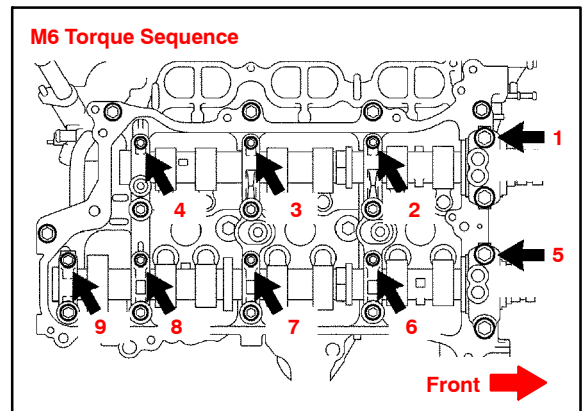
**Repair  
Procedure**  
(Continued)

- B. RH bank:
- Clean the camshaft bearing caps and apply engine oil.
  - Make sure that the valve rocker arms are installed with the lash adjuster and valve stem cap properly.
  - Make sure of the marks and numbers on the camshaft bearing caps and temporarily tighten the 16 bolts.



- Tighten the 9 M6 bolts in the sequence shown in the illustration.

**Torque: 10 N•m**  
(102 kgf•cm, 7 ft•lbf)

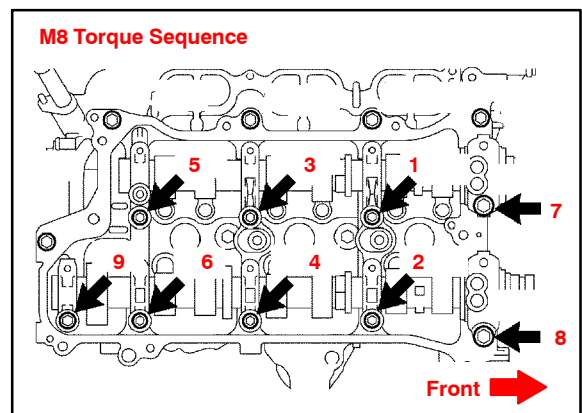


- Tighten the 9 M8 bolts in the sequence shown in the illustration.

**Torque: 28 N•m**  
(286 kgf•cm, 21 ft•lbf)

- Tighten the 9 M6 bolts to their final torque value in the sequence shown in the illustration.

**Torque: 16 N•m**  
(163 kgf•cm, 12 ft•lbf)



**Repair  
Procedure**  
(Continued)

61. Install the timing chain.

A. LH bank:

Align the mark plate (yellow) of the timing chain with the timing marks of the camshaft timing gear assembly and install to the sprocket.

**NOTE:**

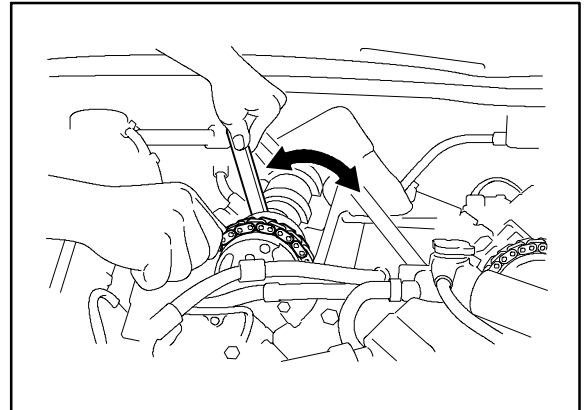
If the paint mark is NOT aligned, turn the crankshaft slightly to adjust the position.

B. RH bank:

- a. Align the mark plate (yellow) of the timing chain with the timing marks of the camshaft timing gear assembly and install to the sprocket.

**NOTE:**

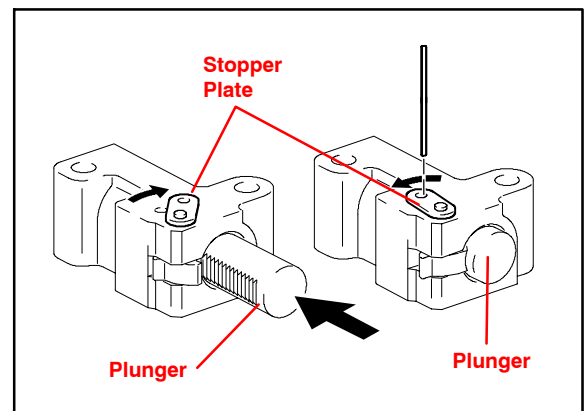
If the paint mark is NOT aligned, turn the crankshaft and adjust one notch each as shown in the illustration.



- b. Set the No. 1 cylinder to TDC/compression, by aligning the timing mark to 0° on the timing chain cover by rotating the crankshaft counterclockwise.
- c. Slightly turn the crankshaft and loosen tension for the timing chain where the No. 1 chain tensioner is attached.

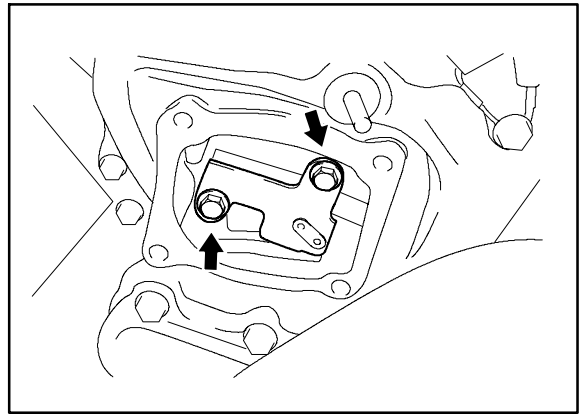
62. Install the No. 1 chain tensioner assembly.

- A. Move the stopper plate upward to release the lock, and push the plunger deep into the tensioner.
- B. Move the stopper plate downward to set the lock, and insert a hexagon wrench into the hole of the stopper plate.

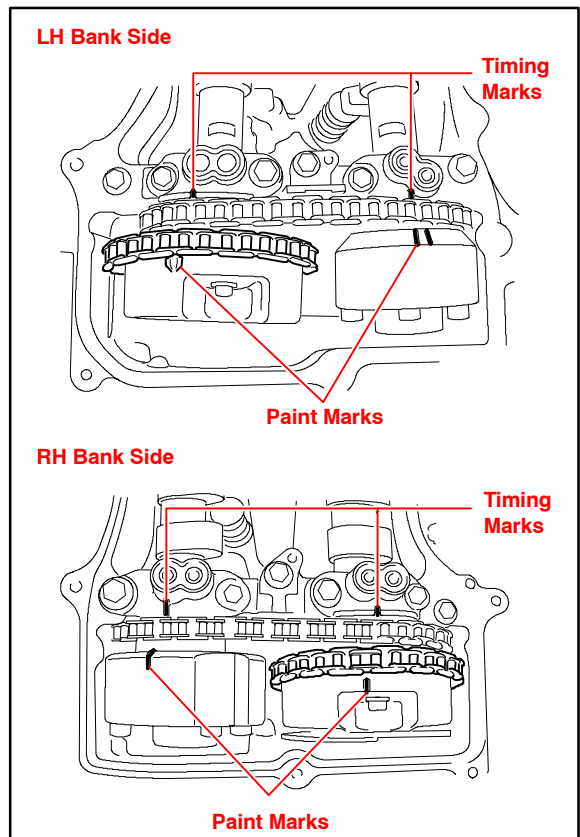


**Repair  
Procedure**  
(Continued)

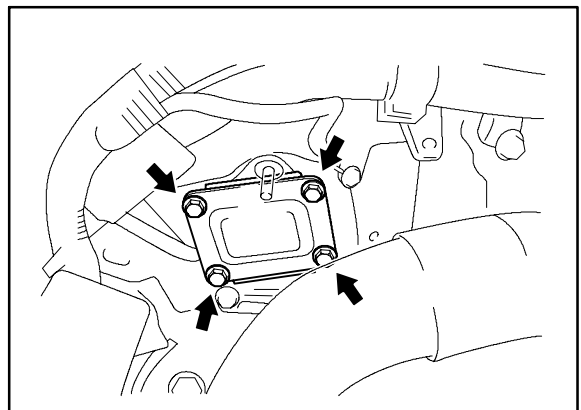
- C. Install the No. 1 chain tensioner assembly with the 2 bolts.  
**Torque: 10 N•m (102 kgf•cm, 7 ft•lbf)**



- D. Remove the lock pin of the No. 1 chain tensioner assembly. Check that each timing mark is aligned with the crankshaft at the TDC/compression.
- E. Turn the crankshaft 2 rotations and double-check that each timing mark is positioned properly.



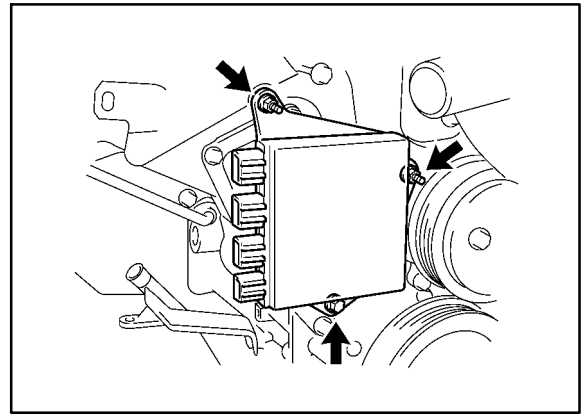
63. Install the NEW gasket and the timing chain cover plate with the 4 bolts.  
**Torque: 9 N•m (93 kgf•cm, 7 ft•lbf)**



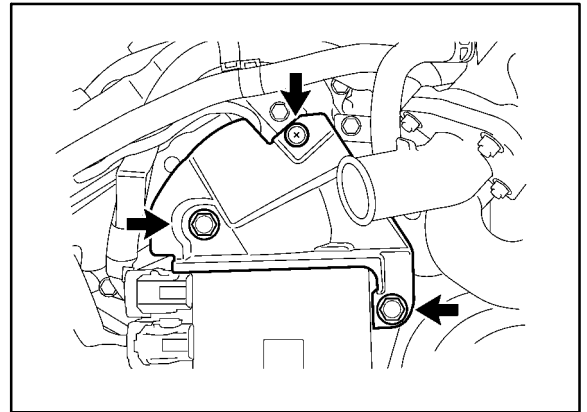
**Repair  
Procedure**  
(Continued)

64. Install the injector driver with the bolt and 2 nuts.

**Torque: 10 N•m (102 kgf•cm, 7 ft•lbf)**



65. Install the No. 1 engine cover with the 3 clips.



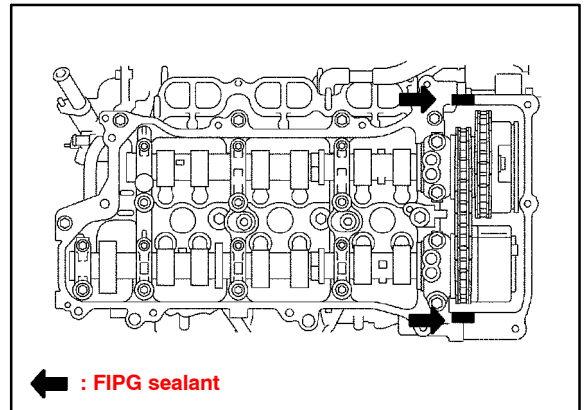
66. Install the cylinder head cover RH.

- A. Apply FIPG sealant as shown in the illustration.

**FIPG sealant: P/N 08826-00080  
(or equivalent)**

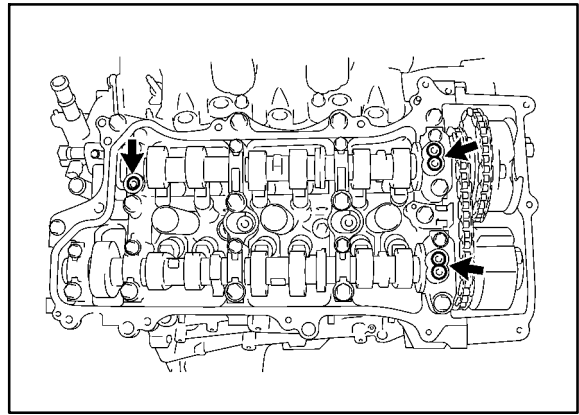
**NOTE:**

- Remove any oil from the contact surface.
- Install the head cover within 3 minutes after applying the FIPG sealant.
- Do NOT start the engine for at LEAST 2 hours after installing.



**Repair  
Procedure**  
(Continued)

- B. Install 3 NEW gaskets as shown in the illustration.
- C. Install a NEW gasket to the head cover.



- D. Install the head cover with the 14 bolts.

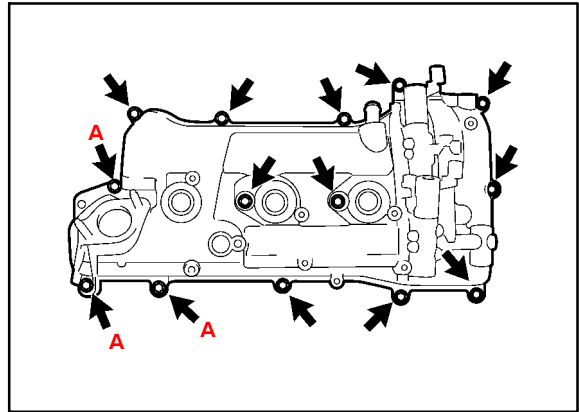
**Torque:**

**Bolts A:**

21 N•m (214 kgf•cm, 15 ft•lbf)

**Bolts except A:**

10 N•m(102 kgf•cm, 7 ft•lbf)



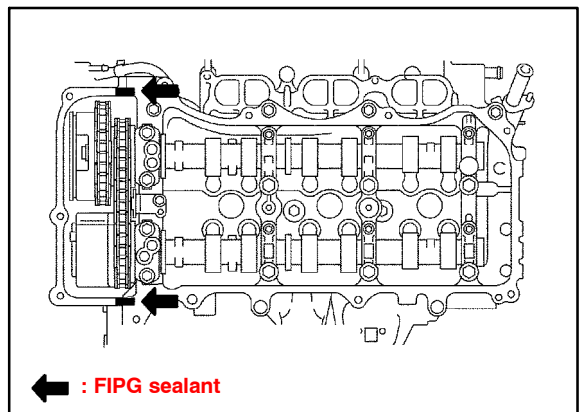
67. Install the cylinder head cover LH.

- A. Apply FIPG sealant as shown in the illustration.

**FIPG sealant: P/N 08826-00080  
(or equivalent)**

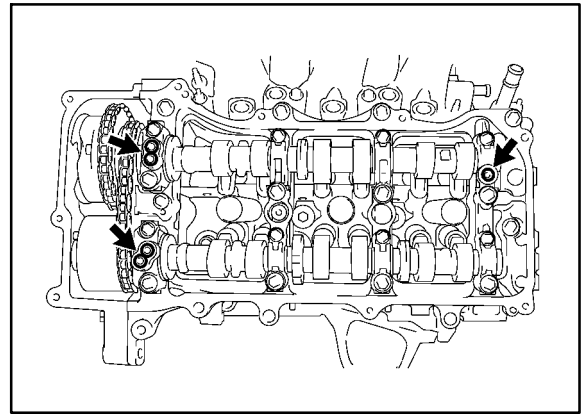
**NOTE:**

- Remove any oil from the contact surface.
- Install the head cover within 3 minutes after applying FIPG sealant.
- Do NOT start the engine for at LEAST 2 hours after installing.



**Repair  
Procedure**  
(Continued)

- B. Install 3 NEW gaskets as shown in the illustration.
- C. Install a NEW gasket to the head cover.



- D. Install the head cover with the 12 bolts.

**Torque:**

**Bolts A:**

21 N•m (214 kgf•cm, 15 ft•lbf)

**Bolts except A:**

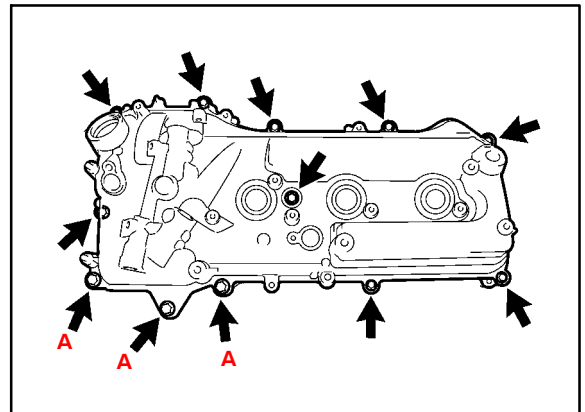
10 N•m (102 kgf•cm, 7 ft•lbf)

- E. For 4WD:

Install the engine hanger with the 2 bolts.

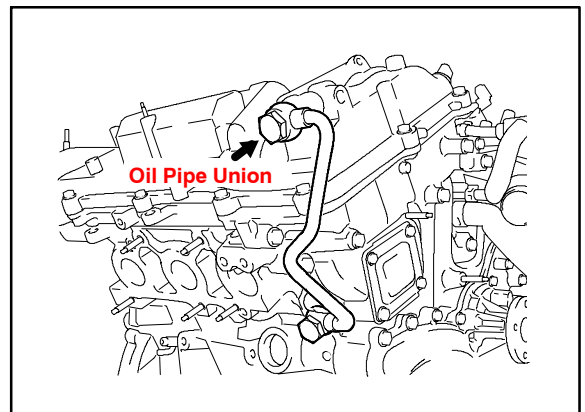
**Torque: 33 N•m**

(337 kgf•cm, 24 ft•lbf)



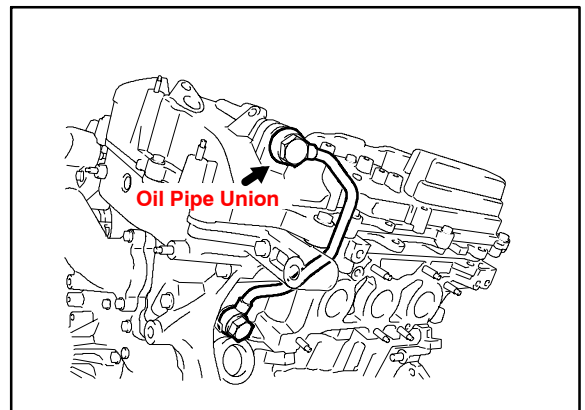
68. Install the oil pipe union bolt to the No. 2 oil pipe.

**Torque: 60 N•m (612 kgf•cm, 44 ft•lbf)**



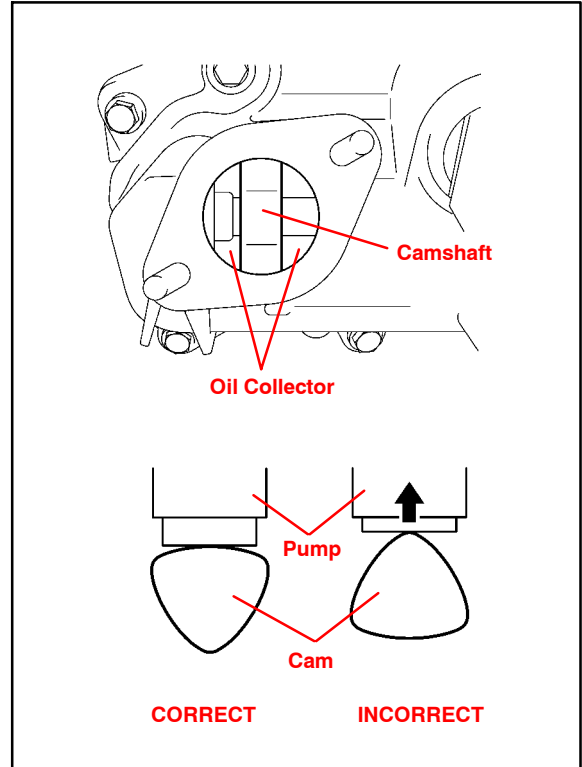
69. Install the oil pipe union bolt to the No. 1 oil pipe.

**Torque: 60 N•m (612 kgf•cm, 44 ft•lbf)**

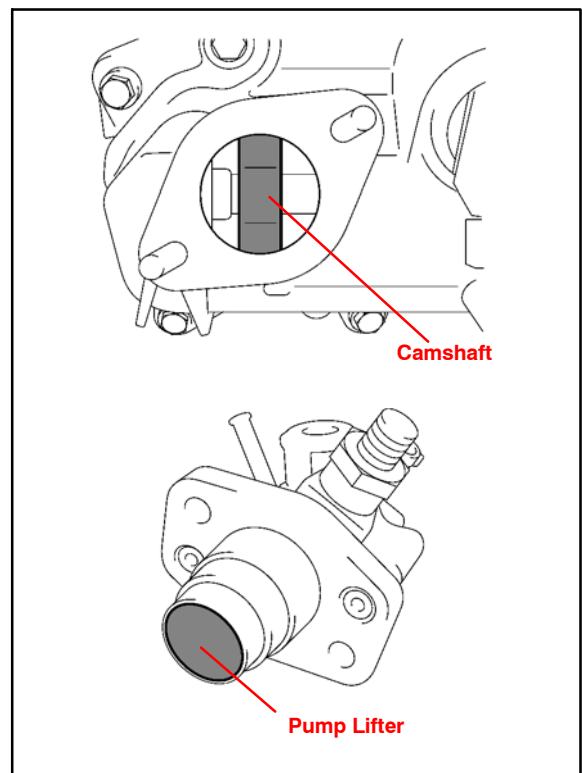


**Repair Procedure**  
(Continued)

- 70. Install the ignition coil assemblies.
- 71. Install the fuel pump assembly.
  - A. Turn the crankshaft until the flat of the cam is facing the cylinder head cover's fuel pump attachment hole as shown in the illustration.
  - B. Pour 30 cc of engine oil into the cylinder head oil collector through the cylinder head cover's fuel pump attachment hole.



- C. Apply a coat of engine oil to the pump activation cam and pump lifter part.



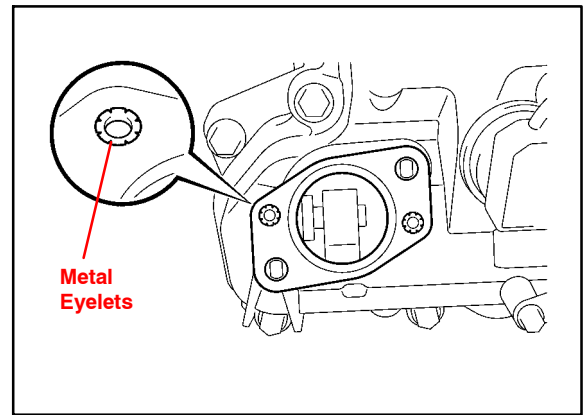


**Repair  
Procedure**  
(Continued)

- D. Install the NEW fuel insulator to the cylinder head cover.

**NOTE:**

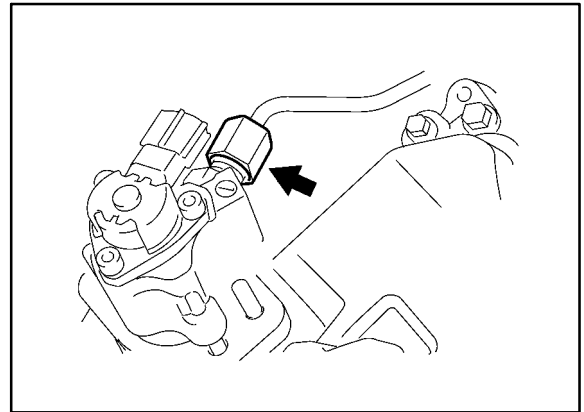
The open sides of the metal eyelets must be facing upward as shown in the illustration.



- E. Temporarily install the No. 2 fuel pipe sub-assembly to the fuel pump assembly.

**NOTE:**

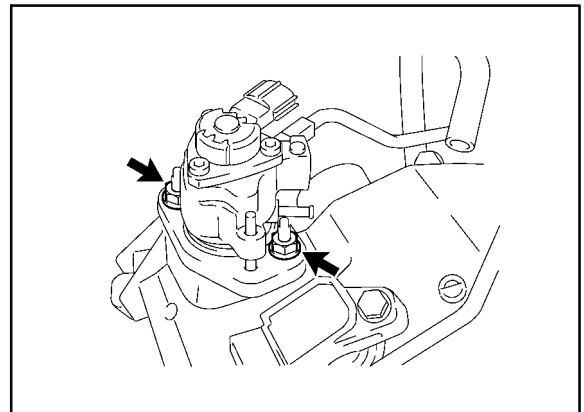
Be careful NOT to damage the sealing surface of the fuel pipe when temporarily installing the fuel pipe.



- F. Install the 2 studs.  
**Torque: 10 N•m (102 kgf•cm, 7 ft•lbf)**

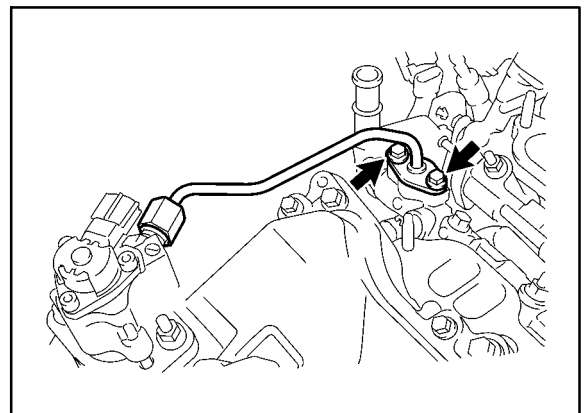
- G. Install the 2 nuts and tighten them in several passes.  
**Torque: 25 N•m (255 kgf•cm, 18 ft•lbf)**

- H. Connect the fuel hose.



72. Connect the No. 2 fuel pipe.

- A. Install the No. 2 fuel pipe to the delivery pipe with the 2 bolts.  
**Torque: 10 N•m (102 kgf•cm, 7 ft•lbf)**

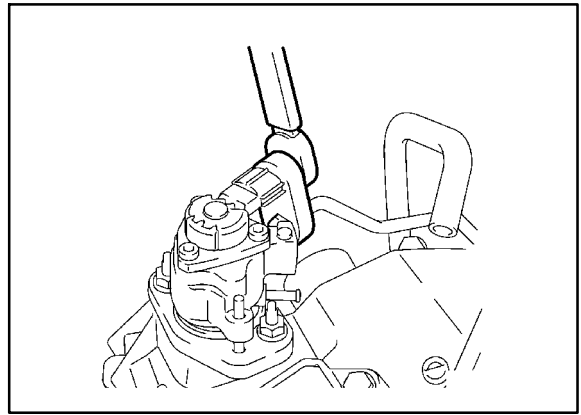


**Repair  
Procedure**  
(Continued)

- B. Using a 19-mm union nut wrench, connect the fuel pipe.

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

- C. Connect the connector to the fuel pump.

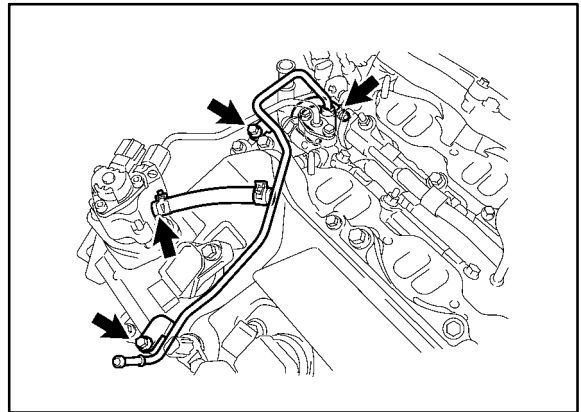


73. Install the No. 1 fuel pipe.

- A. Install the No. 1 fuel pipe with the 2 bolts.

**Torque: 10 N•m (102 kgf•cm, 7 ft•lbf)**

- B. Connect the 2 fuel hoses.



74. Connect the fuel main tube.

75. Install the air surge tank assembly.

- A. Install a NEW gasket to the intake air surge tank.

- B. Using a 5-mm hexagon socket wrench, install the 6 bolts.

**Torque:**

**Bolts except A:**

**18 N•m (184 kgf•cm, 13 ft•lbf)**

- C. Install the bolt and 2 nuts to the intake air surge tank.

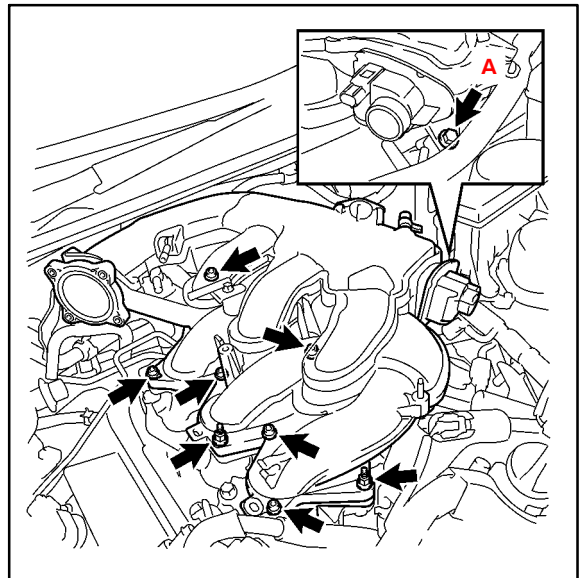
**Torque:**

**Bolt A:**

**21 N•m (214 kgf•cm, 15 ft•lbf)**

**Nut:**

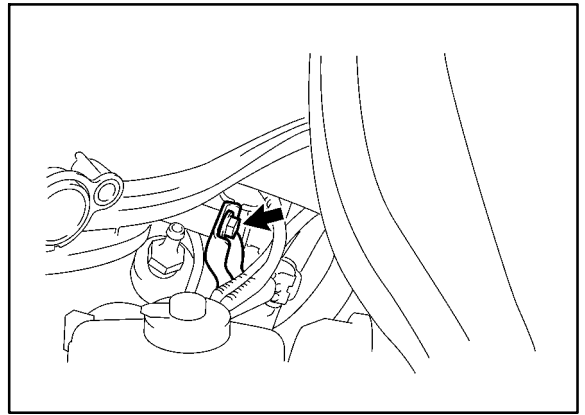
**16 N•m (163 kgf•cm, 12 ft•lbf)**



**Repair  
Procedure**  
(Continued)

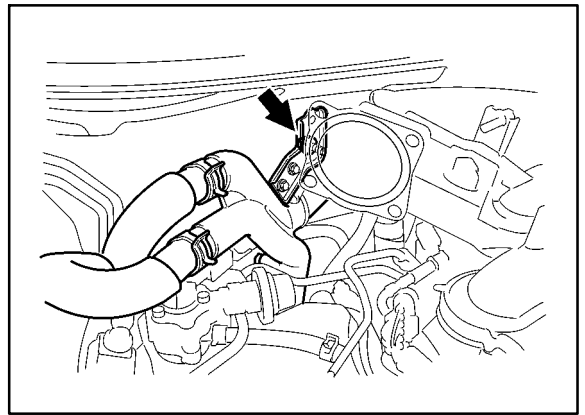
- D. Install the surge tank stay to the intake air surge tank.

**Torque: 21 Nm (214 kgf•cm, 15 ft•lbf)**

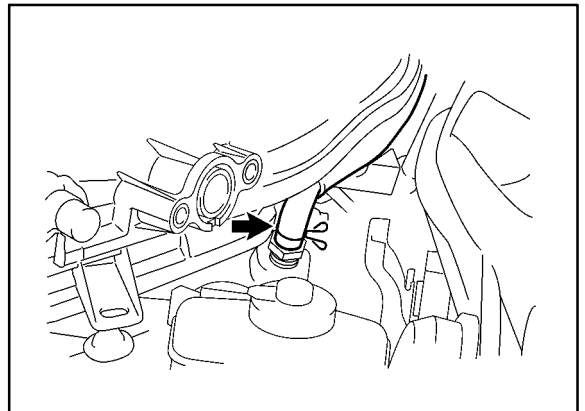


- E. Connect the water hose joint with the bolt.

**Torque: 10 N•m (102 kgf•cm, 7 ft•lbf)**

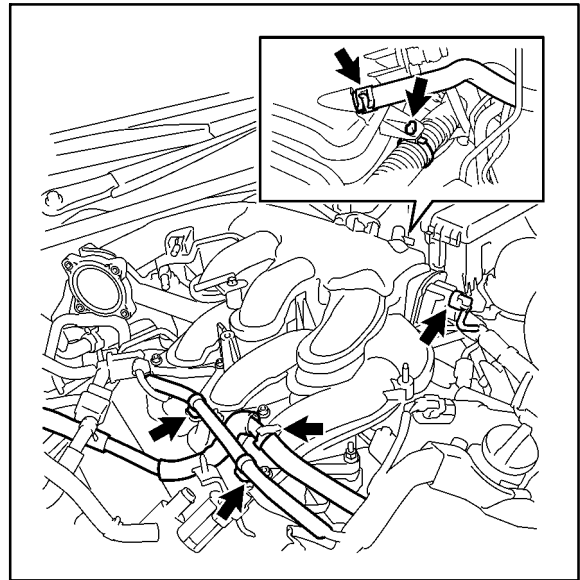


- F. Connect the ventilation hose to the intake air surge tank.

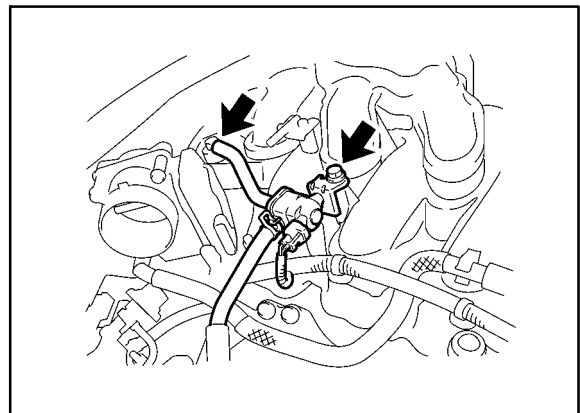


**Repair  
Procedure**  
(Continued)

- G. Connect the wire harness and hose to the intake air surge tank.



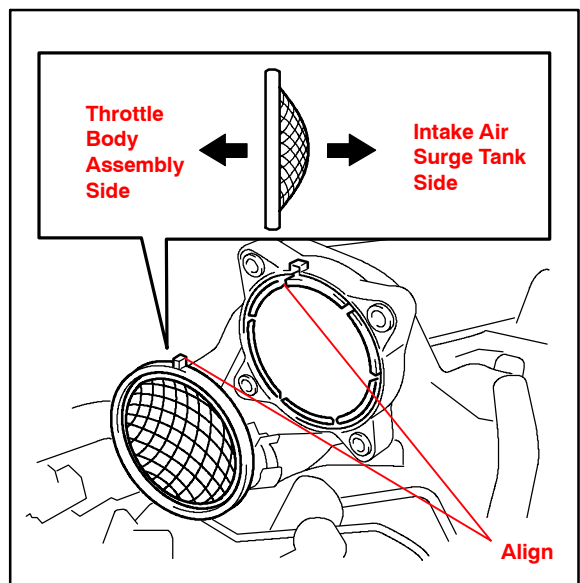
- H. Connect the No. 1 vacuum switching valve assembly to the intake air surge tank.  
**Torque: 18 N•m (184 kgf•cm, 13 ft•lbf)**
- I. Connect the vacuum hose to the intake air surge tank.



76. Install the throttle body assembly (with motor).
- A. Install a NEW gasket to the intake air surge tank.

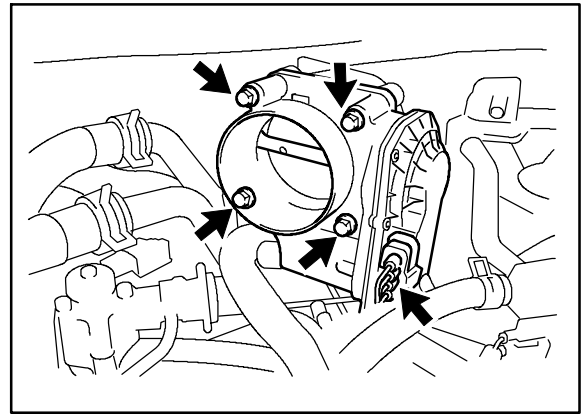
**NOTE:**

- Align the protrusion of the gasket on the intake air surge tank.
- Make sure the direction of the gasket is as shown in the illustration.

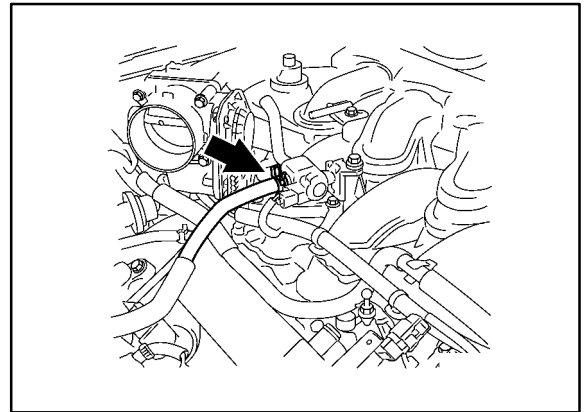


**Repair  
Procedure**  
(Continued)

- B. Install the throttle body with the 4 bolts.  
**Torque: 10 N•m (102 kgf•cm, 7 ft•lbf)**
- C. Connect the throttle body connector.

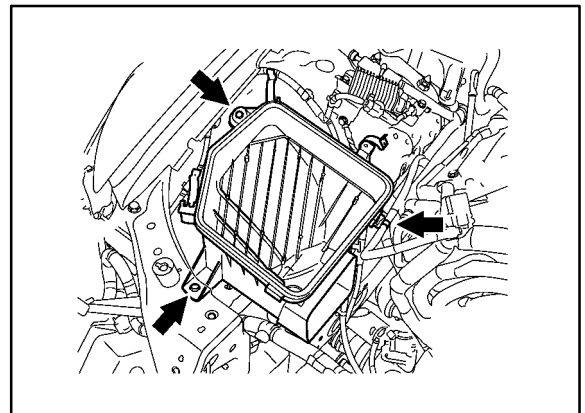


77. Connect the No. 2 fuel vapor hose.  
Install the clamp and connect the  
No. 2 fuel vapor feed hose.



78. Connect the union to check valve  
hose to the surge tank.

79. Install the air cleaner case  
sub-assembly, clamp, and 2 bolts.  
**Torque: 5.0 N•m (51 kgf•cm, 44 in.•lbf)**

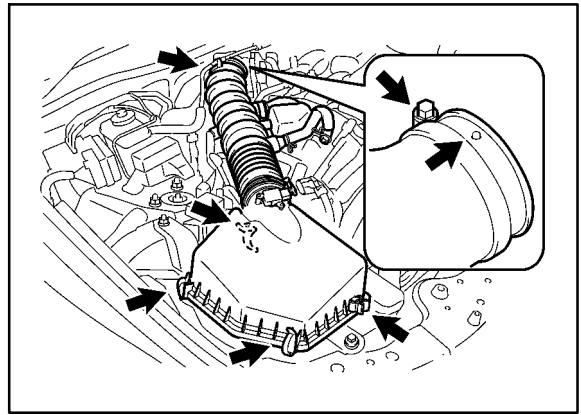


**Repair  
Procedure**  
(Continued)

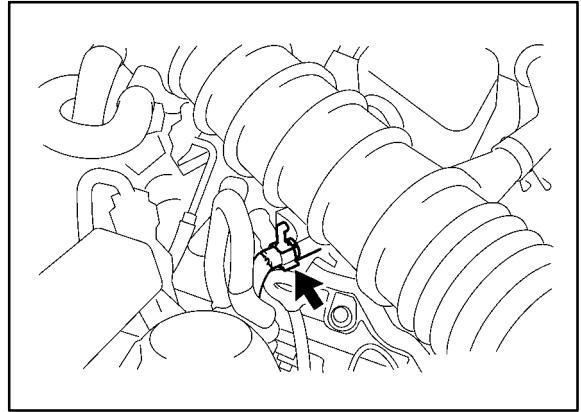
80. Install the air cleaner cap with air cleaner hose.
- A. Install the air cleaner cap with air cleaner hose assembly with the 4 clamps and hose clamp.

**HINT:**

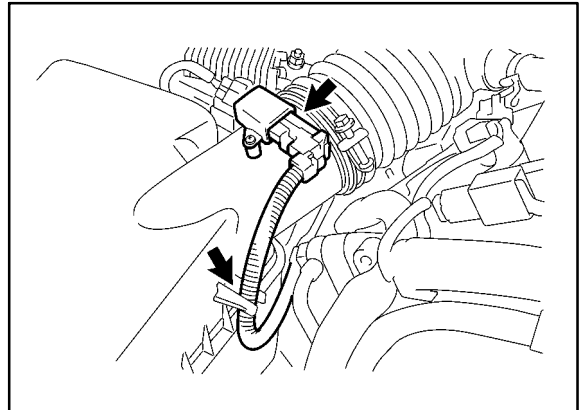
Be sure to install the air cleaner assembly so that the screw part of the hose clamp is as shown in the illustration.



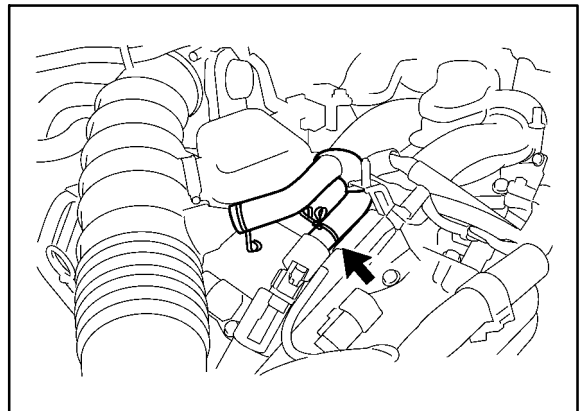
- B. Install the VSV hose to the air cleaner hose.



- C. Connect the MAF connector and clamp to the air cleaner.



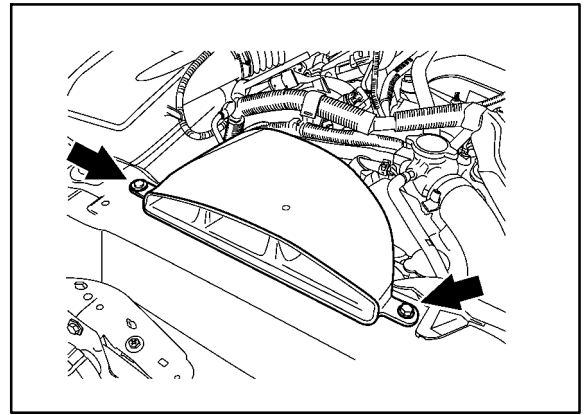
81. Connect the No. 2 ventilation hose to the cylinder head cover with the clamp.



**Repair  
Procedure**  
(Continued)

82. Install the No. 1 air cleaner inlet with the 2 bolts.

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



83. Connect the cable to the negative (-) battery terminal.

**Torque: 5.4 N•m (55 kgf•cm, 48 in.•lbf)**

84. Check for fuel leaks.

- A. Connect the Diagnostic Tester to DLC3.
- B. Turn the engine switch ON (IG). Do NOT start the engine.
- C. Select the following menus:  
DIAGNOSIS / ENHANCED OBD II / ACTIVE TEST / FUEL PUMP / SPD.
- D. Check for fuel leaks.

Check that there are NO fuel leaks anywhere in the system. If there is a fuel leak, repair or replace parts as necessary.

85. Check for engine oil leaks.

86. Check the ignition timing.

- A. Warm up the engine and then stop the engine.

**NOTE:**

**A warmed up engine should have an engine coolant temperature of over 176°F (80°C), have an engine oil temperature of 140°F (60°C), and the engine rpm should be stabilized.**

- B. Connect the Diagnostic Tester to DLC3.
- C. Start the engine and maintain engine rpm at idle speed.
- D. Select the following menus:  
POWERTRAIN / ENGINE AND ECT / DATA LIST / IGN ADVANCE.

**Ignition timing: 5 to 15° BTDC at idle**

**HINT:**

**Refer to the Diagnostic Tester Operator's Manual for further details.**

- E. Check that ignition timing advances as engine speed increases.

**Repair  
Procedure**  
(Continued)

87. Check engine idle speed.  
A. Warm up and then stop the engine.

**NOTE:**

- A warmed up engine should have an engine coolant temperature of over 176°F (80°C), have an engine oil temperature of 140°F (60°C), and the engine rpm should be stabilized.
- Switch OFF all accessories and A/C before connecting the Diagnostic Tester.

- B. Connect the Diagnostic Tester to DLC3.  
C. Raise the engine speed to 2,500 rpm for approximately 90 seconds, and then return to idle.  
D. Select the following menus:  
POWERTRAIN / ENGINE AND ECT / DATA LIST / ENGINE SPD.  
**Idle speed: 650 to 750 rpm**

**NOTE:**

When checking the idle speed, the transmission should be in Neutral or Park.

**HINT:**

Refer to the Diagnostic Tester Operator's Manual for further details. If the idle speed is NOT as specified, check the air intake system.

- E. Clear all DTCs.  
F. Disconnect the Diagnostic Tester from DLC3.

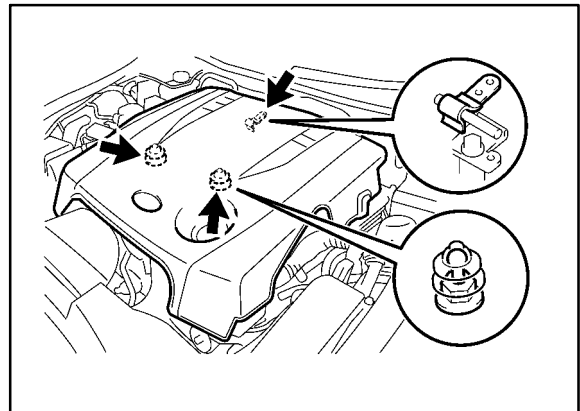
88. Check the engine oil level.

Stop the engine, and wait 5 minutes. The oil level should be between the dipstick's low level mark and full level mark. If low, check for leakage and add oil up to the full level mark.

89. Install the V-bank cover sub-assembly.  
Engage the 2 clips on the front of the cover, and then engage the clip on the rear to install the V-bank cover.

**NOTE:**

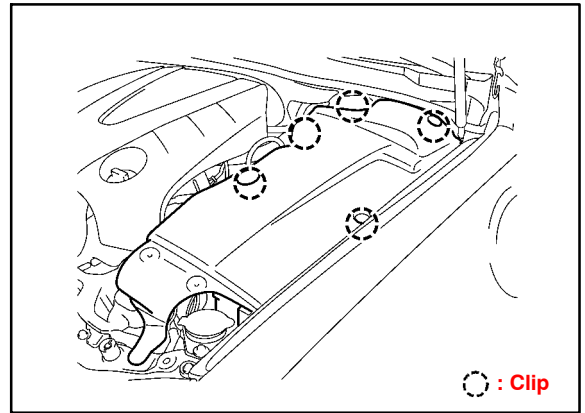
- Be sure to engage the clips securely.
- Do NOT apply excessive force or hit the cover to engage the clips. This may cause the cover to break.



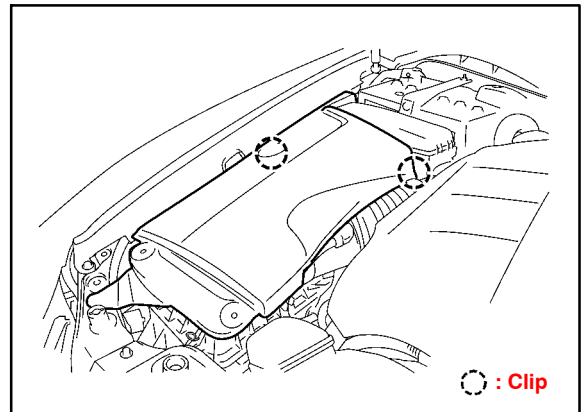


**Repair Procedure**  
(Continued)

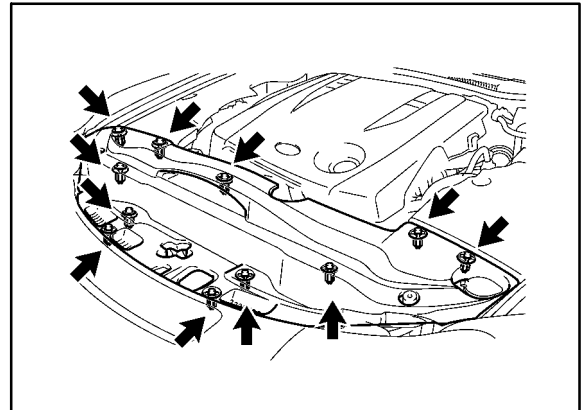
90. Install the engine compartment side cover LH with the 5 clips.



91. Install the engine compartment side cover RH with the 2 clips.

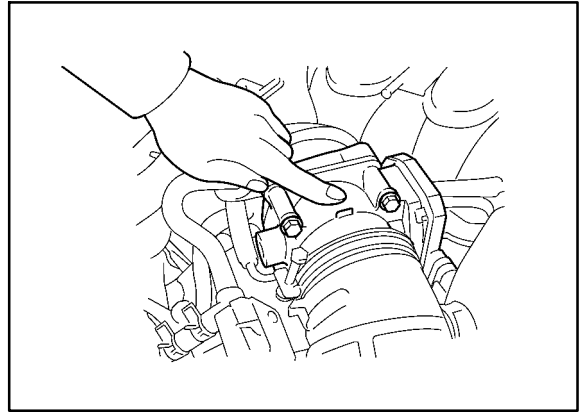


92. Install the cool air intake duct seal with the 11 clips.



**Repair  
Procedure**  
(Continued)

93. Check the function of the throttle body.
- Check the throttle control motor operating sounds.
- A. Turn the engine switch ON (IG).
  - B. When pressing the accelerator pedal, check the operating sound of the running motor. Make sure that NO friction noises emit from the motor. If friction noise exists, replace the throttle body.



94. Re-initialize the power windows on the vehicle.
- Refer to TSIB No. PD043-05, "Initialization of Power Window During PDS."