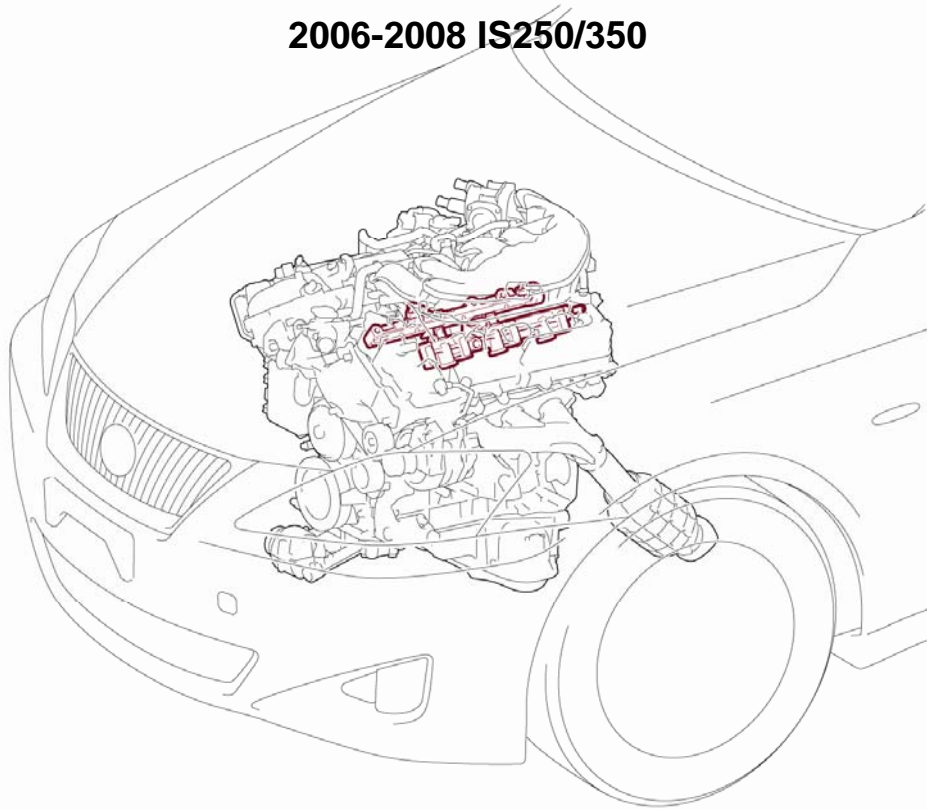


TECHNICAL INSTRUCTIONS
FOR
SPECIAL SERVICE CAMPAIGN 9LA
FUEL DELIVERY PIPE REPLACEMENT
2006-2008 IS250/350



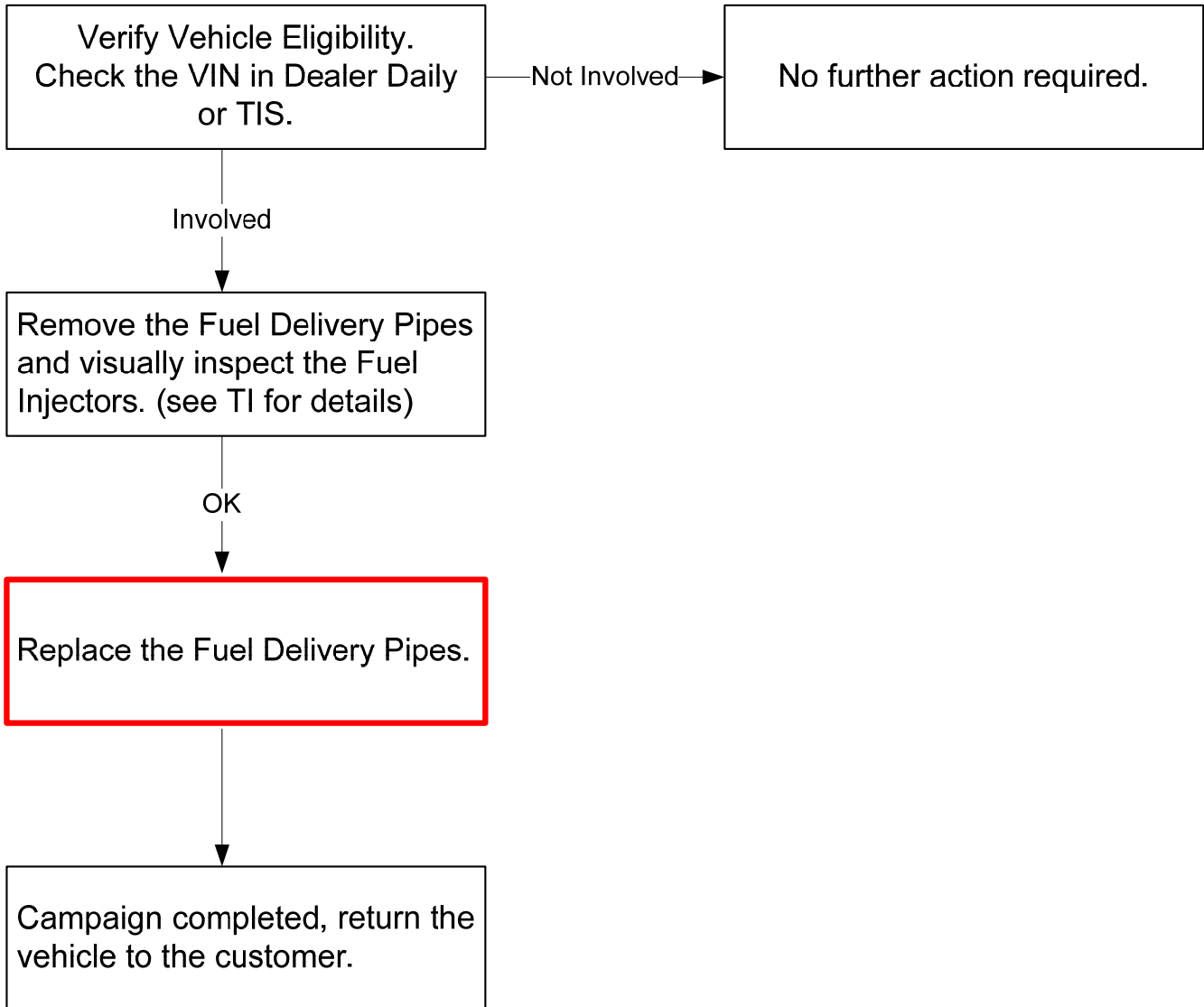
R0806120003

Revised January 26, 2011

TECHNICAL INSTRUCTION REVISION NOTICE:

- **January 26, 2011:**
 - **The Fuel Pressure Sensor torque value on page 31 has been modified.**

OPERATION FLOW CHART



I. IDENTIFICATION OF AFFECTED VEHICLES

A. AFFECTED VIN RANGE

Vehicle Model	Year	WMI	VIN Range	
			VDS	Range
IS250	2006	JTH	BK262	2000010 - 2021611
				5000018 - 5025772
				2021159 - 2058542
	5025773 - 5050845			
	2057792 - 2061389			
	5050849 - 5053158			
IS250 AWD	2006		CK262	2000003 - 2008675
				5000013 - 5007908
				2008542 - 2019897
	5007909 - 5015612			
	2019898 - 2020648			
	5015613 - 5016546			
IS350	2006		BE262	2000000 - 2007084
				5000018 - 5011869
				2006942 - 2013016
	5011870 - 5017246			
	2011547 - 2013594			
	5017247 - 5017817			
2007	BE262	2000000 - 2007084		
		5000018 - 5011869		
		2006942 - 2013016		
2008	BE262	5011870 - 5017246		
		2011547 - 2013594		
		5017247 - 5017817		

II. PREPARATION

A. Tools

- Standard hand tools
- Torque wrench
- 22 mm union nut wrench
- SST: (non-essential) 09612-24014 (09617-24011)
- SST: Stud Bolt - 04007-32331 (2 stud bolts have been included in each Service Manager's Package.)
- SST: 09260-39015 Injector seal tool set. (02968-03020, 09268-03010) Lexus drawer 1

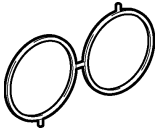
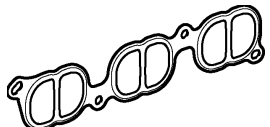
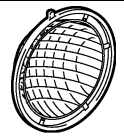
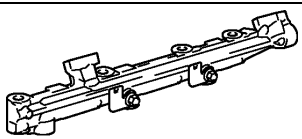
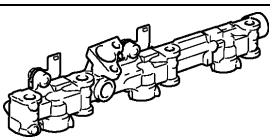
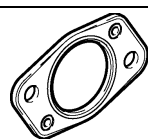
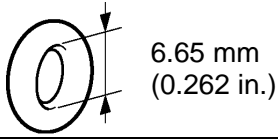
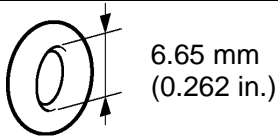

B. Equipment

- Techstream


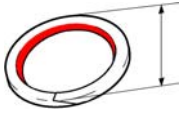

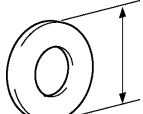
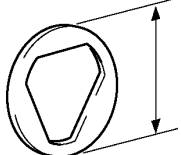
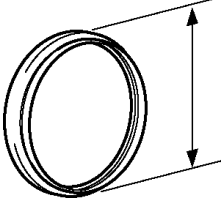
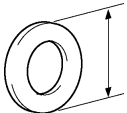
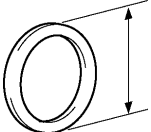
C. Material

- Protective Tape
- Wooden boards (for clamping purposes)

D. IS 250 Parts

Model	Part Number	Part Description		Qty
IS 250	04008-18431	Pipe Kit, Fuel Delivery, No. 4		1
<p>The kit listed above includes the following parts:</p> <p>An illustration of the parts replaced and their installation location(s) have been provided. Please reference the tables below and on the next page.</p>				
Part Number	Part Description	Qty	Illustration	Installation Location(s)
17176-31050	Gasket (Air Surge Tank to Intake Manifold)	3		See Page 8
17177-31020	Gasket (No. 1 Intake Manifold to Head)	2		See Page 8
22271-31030	Gasket (Throttle Body)	1		See Page 8
23807-31020	Fuel Delivery Pipe	1		See Pages 10 & 11
23808-31010	No 2 Fuel Delivery Pipe	1		See Pages 10 & 11
<p>The parts listed below are packages together in a clear plastic bag.</p>				
Part Number	Part Description	Qty	Illustration	Installation Location(s)
23915-46011	Fuel Pump Insulator	1		See Page 10
90301-06016	O-Ring	3		See Page 10
90301-06018	O-Ring	6		See Page 11
90523-05007	E-Ring	9		See Page 11

IS 250 PARTS CONTINUED...

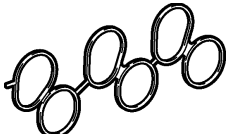
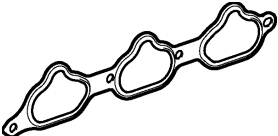

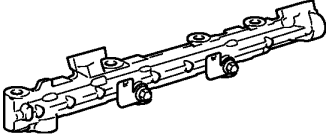
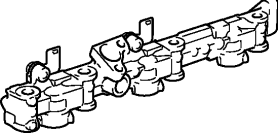

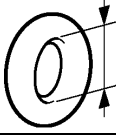
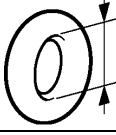
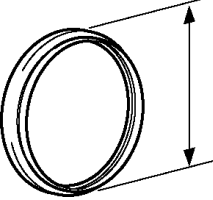
The parts listed below are packages together in a clear plastic bag.				
Part Number	Part Description	Qty	Illustration	Installation Location(s)
23255-31010	Fuel Injector Seal	12	 8.73 mm (0.344 in.)	See Page 11
23256-74010	No.1 Fuel Injector Backup Ring	9	 14.5 mm (0.571 in.) Tapered surface shown in red	See Pages 10 & 11
23257-74010	No.2 Fuel Injector Backup Ring	9	 14.5 mm (0.571 in.) Tapered surface shown in red	See Pages 10 & 11
23258-28011	No.3 Fuel Injector Backup Ring (Flat)	9	 14.4 mm (0.567 in.)	See Pages 10 & 11
23279-74010	Gasket (Fuel Pressure Pulsation Damper)	2	 19.5 mm (0.768 in.)	See Page 10
23291-31011	Injector Vibration Insulator	6	 25.6 mm (1.008 in.)	See Page 11
90430-08014	Gasket (Cold Start Injector)	2	 13 mm (0.512 in.)	See Page 8
90430-12026	Gasket	2	 16 mm (0.630 in.)	See Page 11

Based upon the inspection results you may need to replace the fuel injectors. Please keep all fuel injectors for possible parts recovery and inspections. If requested you will need a fuel injector shipping kit for dealers.


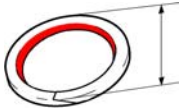

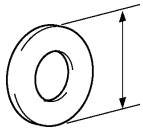
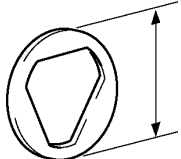
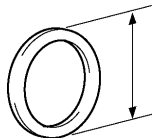

Model	Part No.	Insulator Color	Part Name	Qty/Unit
IS 250	23209-39057-A0* or	Black	Injector Assy, Fuel	6 (if needed)
	23209-39057-B0*	Reddish Brown		

* Either injector listed for the vehicle type may be installed; however, make sure that all injectors installed on the vehicle are the same type. The injector may be identified by the injector insulator color. Please see page 30 for addition information.

E. IS 350 Parts

Model	Part Number	Part Description		Qty
IS 350	04008-18231	Pipe Kit, Fuel Delivery, No. 2		1
<p>The kit listed above includes the following parts:</p> <p>An illustration of the parts replaced and their installation location(s) have been provided. Please reference the tables below and on the next page.</p>				
Part Number	Part Description	Qty	Illustration	Installation Location(s)
17176-31060	Gasket (Air Surge Tank to Intake Manifold)	1		See Page 9
17177-31060	Gasket (No. 1 Intake Manifold to Head)	2		See Page 9
22271-31020	Gasket (Throttle Body)	1		See Page 9
23807-31070	Fuel Delivery Pipe	1		See Pages 10 & 11
23808-31020	No 2 Fuel Delivery Pipe	1		See Pages 10 & 11
<p>The parts listed below are packages together in a clear plastic bag.</p>				
Part Number	Part Description	Qty	Illustration	Installation Location(s)
23915-46011	Fuel Pump Insulator	1		See Page 10
90301-06016	O-Ring	3		See Page 10
90301-06018	O-Ring	6		See Page 11
23291-31011	Injector Vibration Insulator	6		See Page 11

IS 350 PARTS CONTINUED...

The parts listed below are packages together in a clear plastic bag.				
Part Number	Part Description	Qty	Illustration	Installation Location(s)
23255-31010	Fuel Injector Seal	12	 8.73 mm (0.344 in.)	See Page 11
23256-74010	No.1 Fuel Injector Backup Ring	9	 14.5 mm (0.571 in.) Tapered surface shown in red	See Pages 10 & 11
23257-74010	No.2 Fuel Injector Backup Ring	9	 14.5 mm (0.571 in.) Tapered surface shown in red	See Pages 10 & 11
23258-28011	No.3 Fuel Injector Backup Ring (Flat)	9	 14.4 mm (0.567 in.)	See Pages 10 & 11
23279-74010	Gasket (Fuel Pressure Pulsation Damper)	2	 19.5 mm (0.768 in.)	See Page 10
90430-12026	Gasket	2	 16 mm (0.630 in.)	See Page 11
90523-05007	E-Ring	9	 10 mm (0.393 in.)	See Page 11

Based upon the inspection results you may need to replace the fuel injectors. Please keep all fuel injectors for possible parts recovery and inspections. If requested you will need a fuel injector shipping kit for dealers.

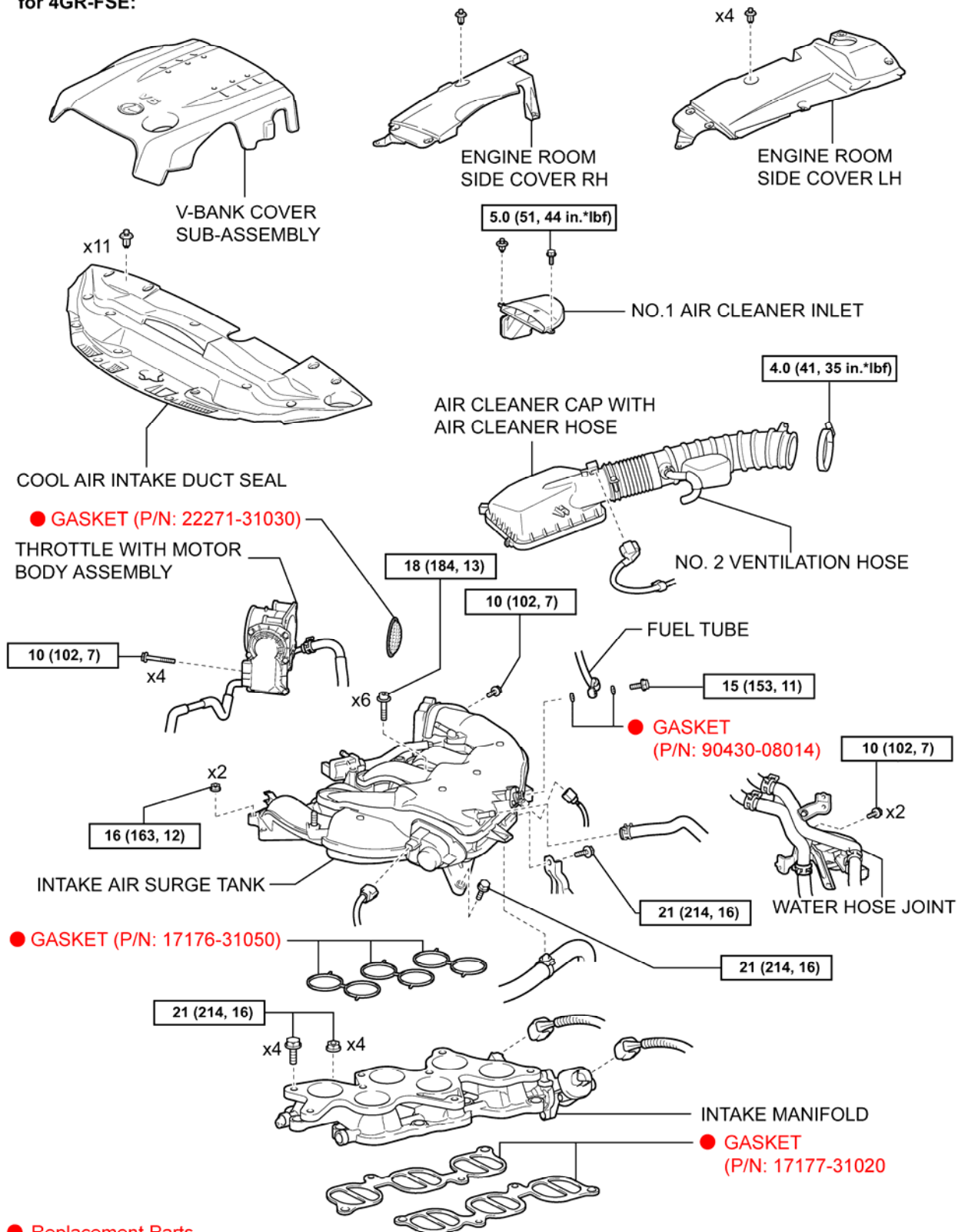
Model	Part No.	Insulator Color	Part Name	Qty/Unit
IS350	23209-39155-B0* or	Black	Injector Assy, Fuel	6 (if needed)
	23209-39155-C0* or	Reddish Brown		
	23209-39155-D0*	Green		

* Either injector listed for the vehicle type may be installed; however, make sure that all injectors installed on the vehicle are the same type. The injector may be identified by the injector insulator color. Please see page 30 for addition information.

F. PARTS INSTALLATION LOCATION(S)

IS 250 ONLY

for 4GR-FSE:



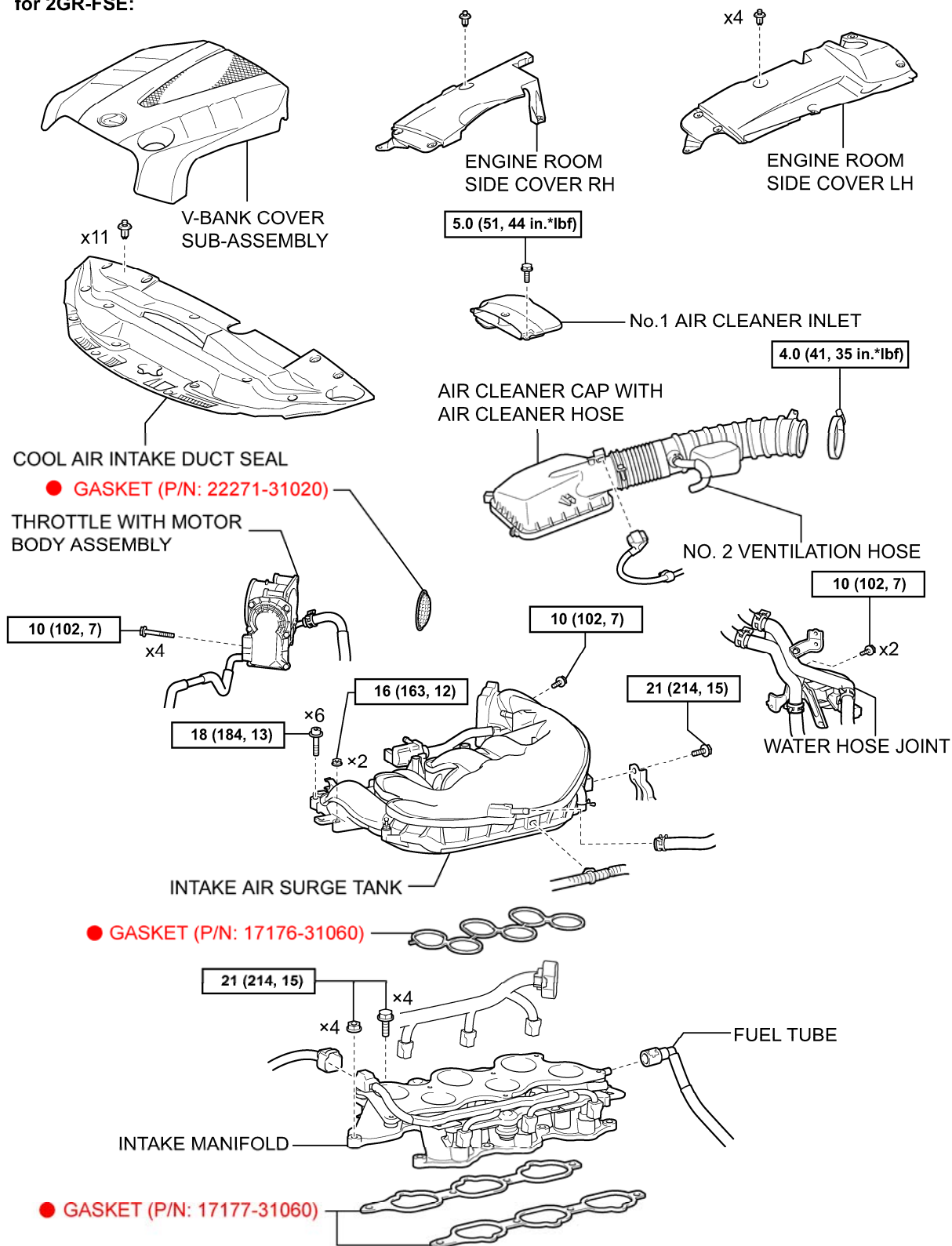
● Replacement Parts

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

PARTS INSTALLATION LOCATION(S) ...

IS 350 ONLY

for 2GR-FSE:

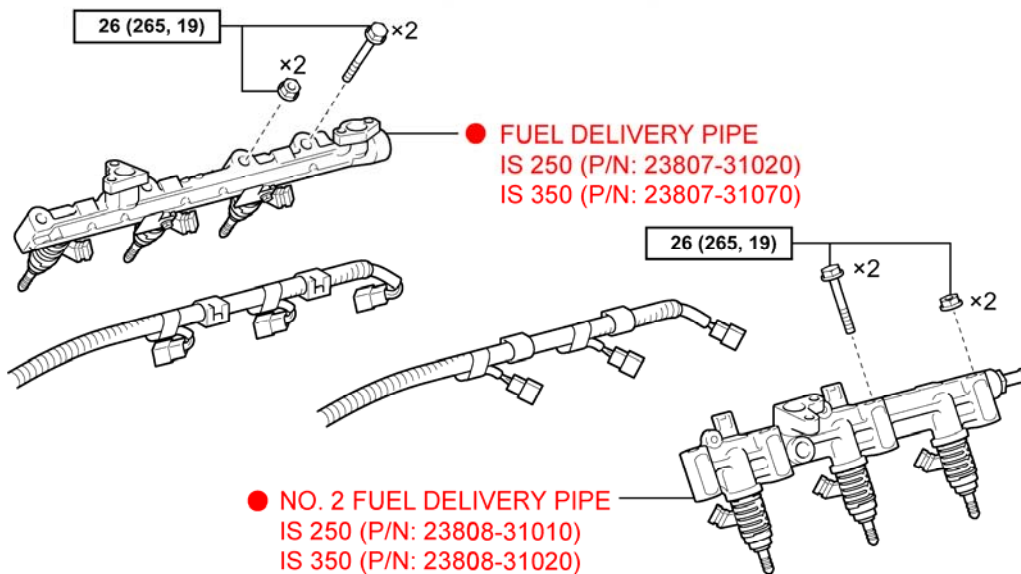
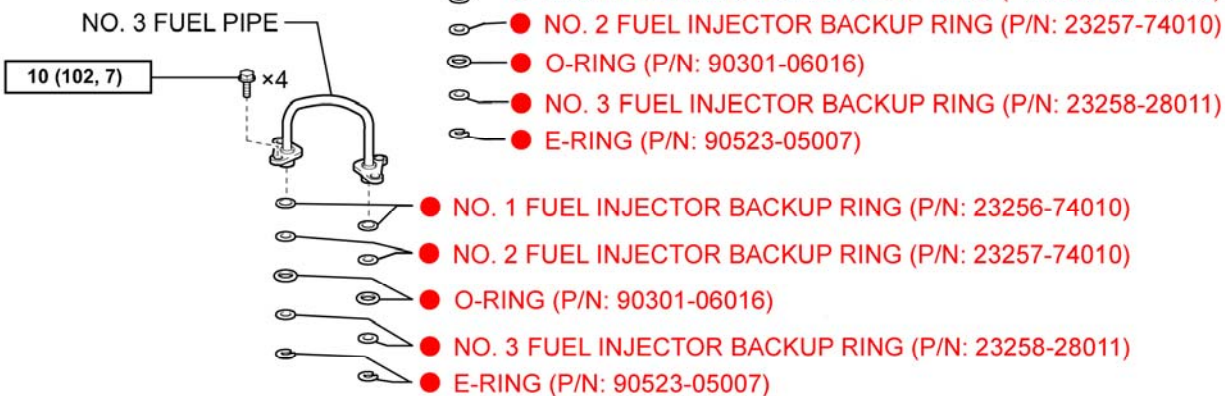
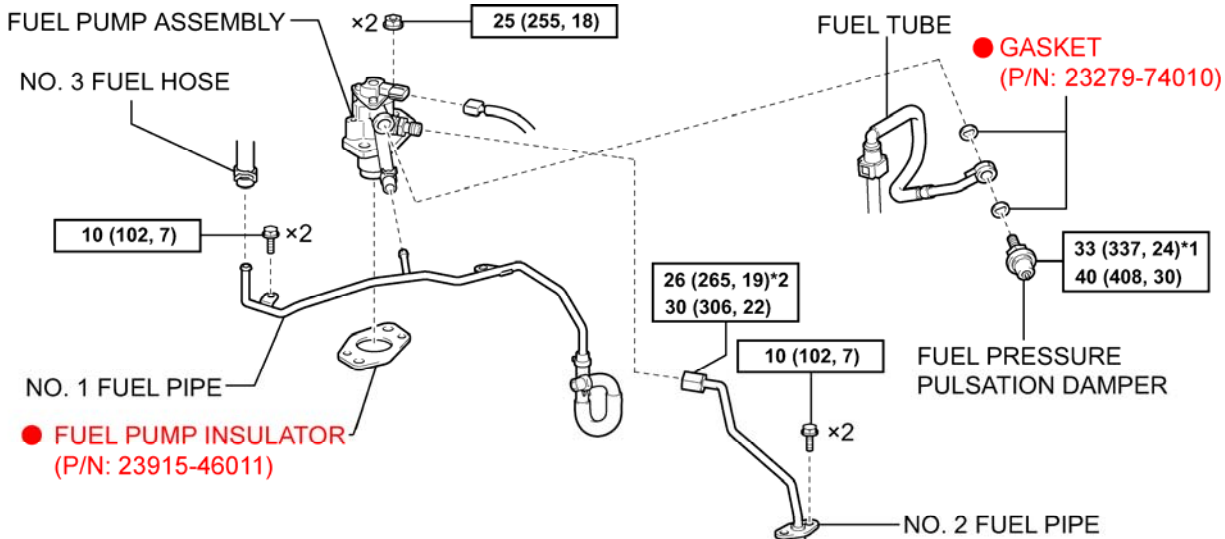


● Replacement Parts

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

*1 For use with union nut wrench 10mm

PARTS INSTALLATION LOCATION(S) ...



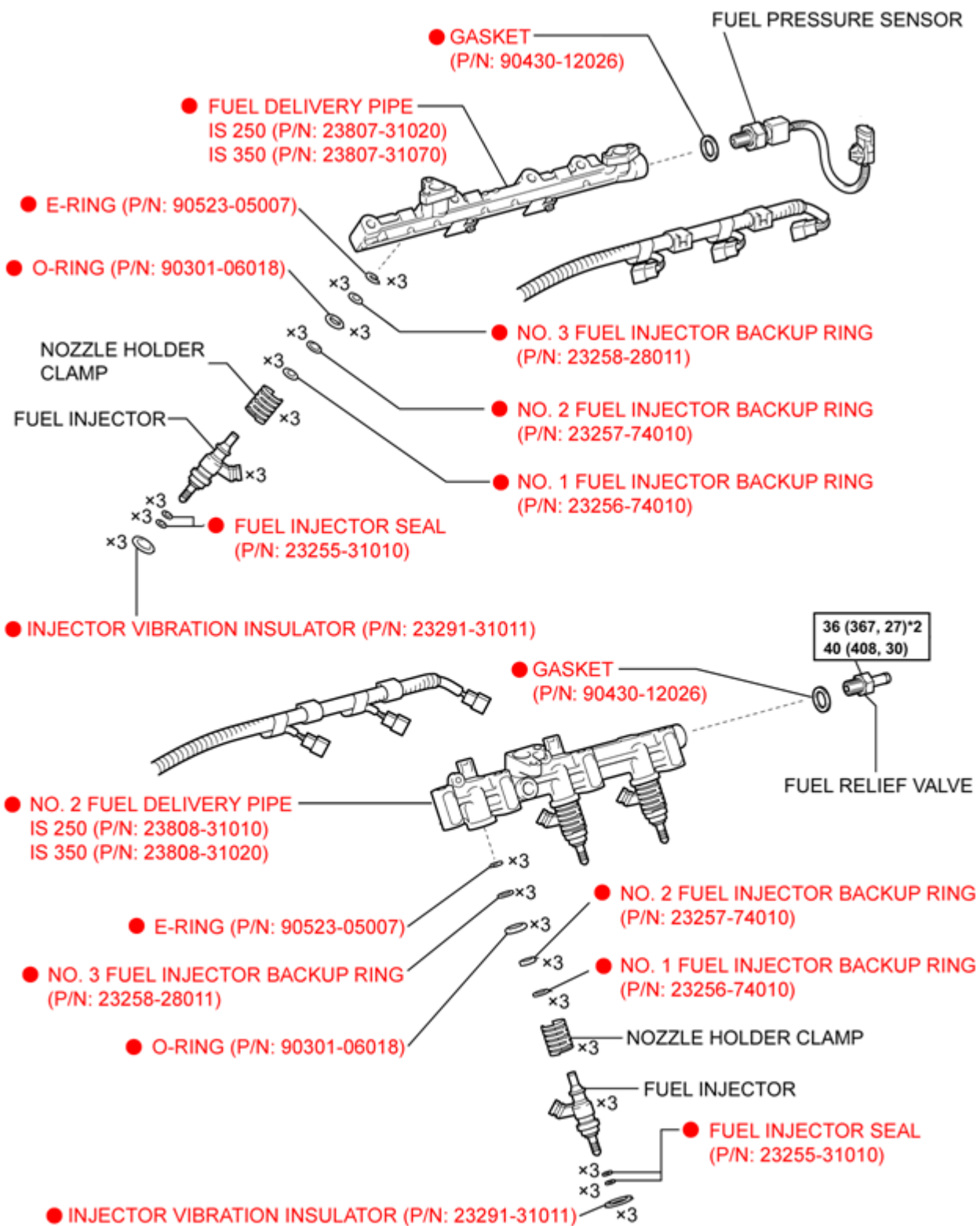
● Replacement Parts

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

*1 For use with SST

*2 For use with union nut wrench 19mm

PARTS INSTALLATION LOCATION(S) ...



● Replacement Parts

N*m (kg*cm, ft.*lb): Specified torque

*1 For use with SST

*2 For use with union nut wrench 17mm

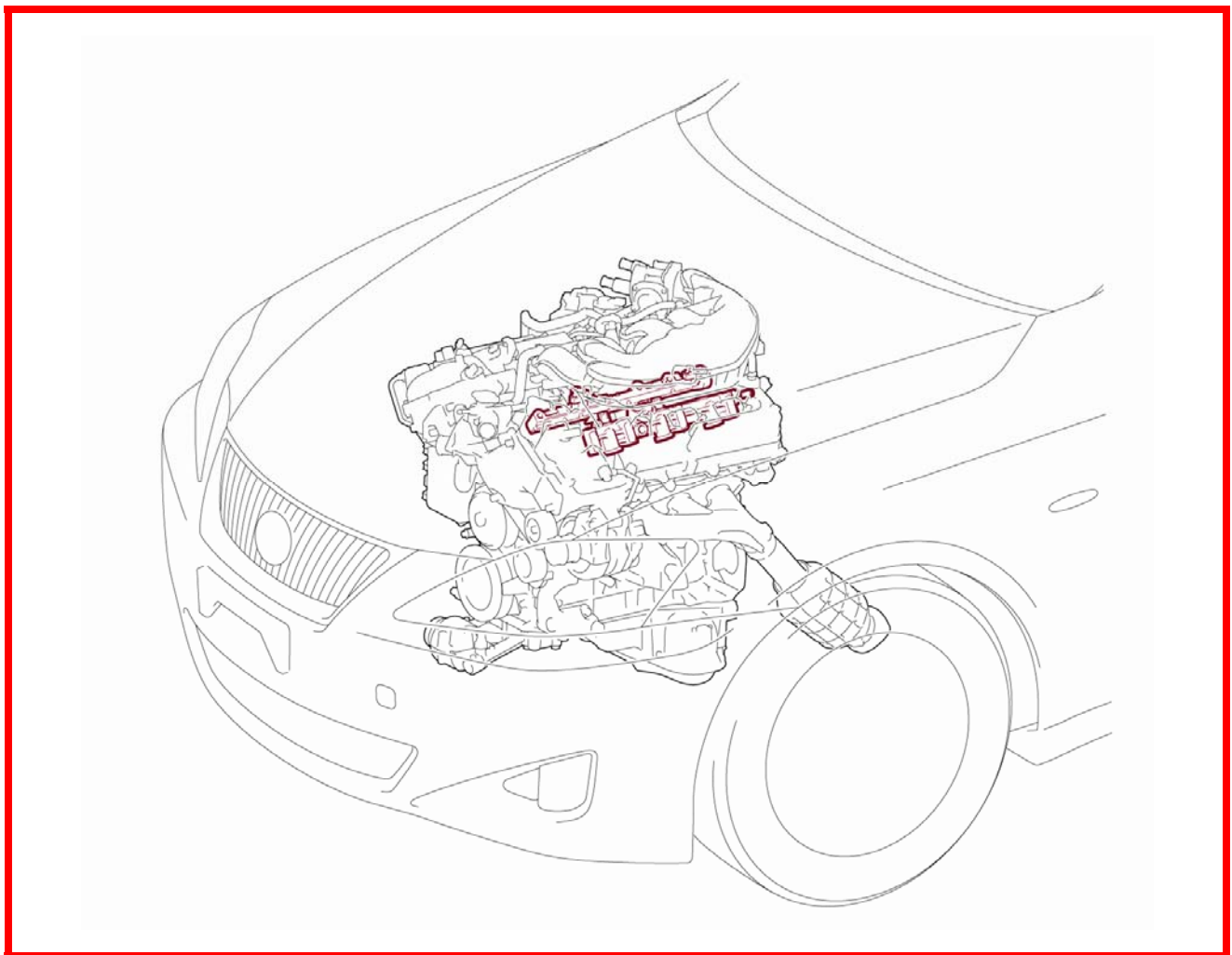
III. WORK PROCEDURE TABLE OF CONTENTS

Background.....	page 12
Safety Precautions.....	page 13
Fuel Delivery Pipe Replacement.....	page 15
Fuel Injector Inspection.....	page 30
Appendix	page 47

IMPORTANT: Only partial reinstallation steps are included in these Technical Instructions; please reference TIS for additional assistance if needed.

IV. BACKGROUND


The involved vehicles are equipped with aluminum Fuel Delivery Pipes (Fuel Rails). Lexus has determined that ethanol fuels with a low moisture content will corrode the internal surface of the fuel rails. As this condition progresses, the engine Malfunction Indicator Light (MIL) may illuminate. Over time, the corrosion will create a pinhole resulting in fuel leakage.



WORK PROCEDURE

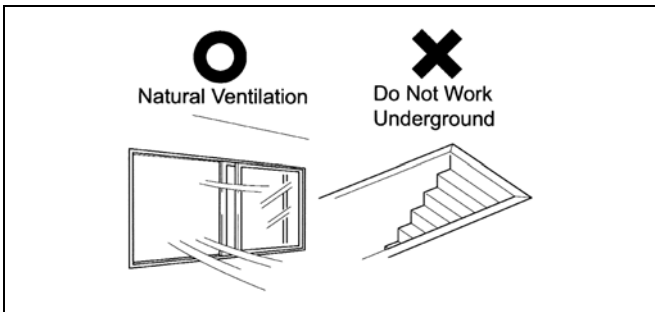
V. SAFETY PRECAUTIONS

A. PRECAUTIONS WHEN WORKING ON THE FUEL SYSTEM



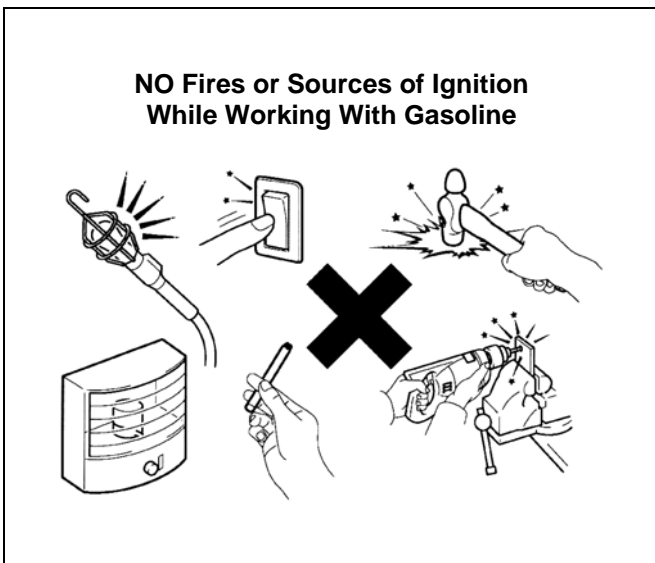
- ALWAYS REMEMBER **“SAFETY FIRST”**.
- IMMEDIATELY WIPE UP ANY SPILLED FUEL.
- BE EXTREMELY CAREFUL WHEN HANDLING FUEL TO PREVENT FIRES FROM OCCURRING.
- BEFORE REMOVING ANY FUEL SYSTEM PART, DRAIN ALL FUEL TO PREVENT SPILLING.
- BEFORE WORKING ON THE FUEL SYSTEM, PERFORM THE FOLLOWING SAFETY CHECK LIST.

B. SAFETY CHECKLIST



A. AIR VENTILATION

- Perform work in a well ventilated area.
- DO NOT** work underground or in an area where fuel vapors may fill the room due to poor ventilation.
- Quickly clean up any spilled fuel with a dry cloth and dissipate the fuel vapors.
- Dry all cloths that have come in contact with fuel in a well ventilated area and dispose of them properly (according to applicable local regulations).



B. FIRES AND IGNITION SOURCES ARE STRICTLY PROHIBITED

- Fires and ignition sources are prohibited while working on the fuel system.
- Clearly display the sign found on the next page stating **“WORKING WITH GASOLINE, NO FIRES OR IGNITION SOURCES”**.
- Smoking is prohibited near the work area.
- DO NOT** work in areas where there are welders, grinders, drills, electric motors, heaters, etc.
- DO NOT** use work lamps or any other electrical appliance due to the risk of sparks flying from the power switch or a rise in temperature.
- DO NOT** use metal hammers while working, due to the risk of flying sparks.
- DO NOT** start any engine or perform any of the above in neighboring work bays.

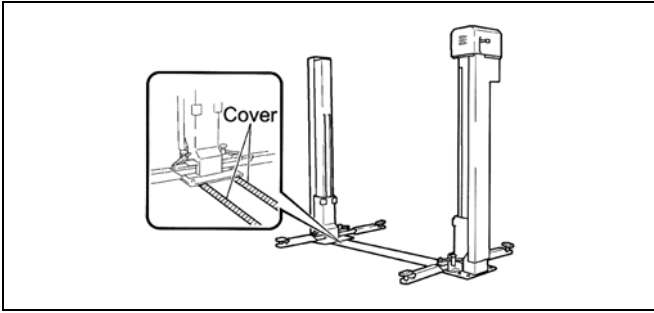
C. FIRE EXTINGUISHER

- Have a fire extinguisher ready and available before beginning work.



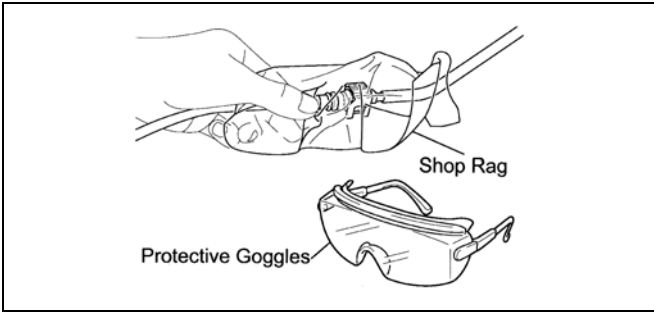
D. PREVENT STATIC ELECTRICITY

- To help prevent static electricity, lightly wet the floor with water, but not to the point where it creates a hazardous working condition.
- Place appropriate warning cones or stand signs around the area as a caution.



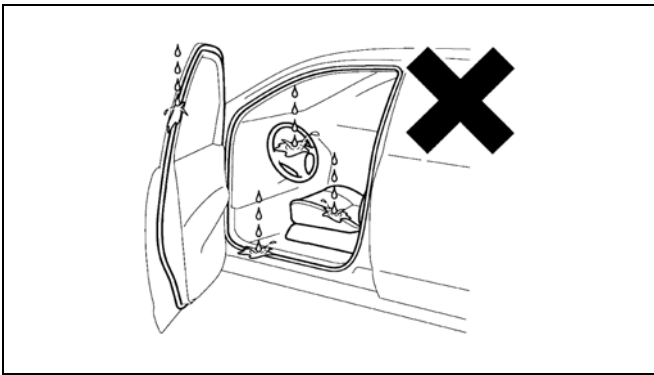
E. PRECAUTIONS WHEN USING A LIFT

- For bays equipped with auto lifts, cover all access cover joints with duct tape.
- In the event that fuel has leaked inside the auto lift, remove the access cover and clean up any spilled fuel. Dissipate fuel vapors until the smell is gone.



F. PREVENT THE FUEL FROM SPRAYING

- When disconnecting any fuel pipes or connectors there may still be some pressure remaining, even after discharging the system. To prevent the fuel from spraying, cover the pipe with a shop rag before disconnecting.
- Remember to always wear protective goggles especially when disconnecting fuel pipes.

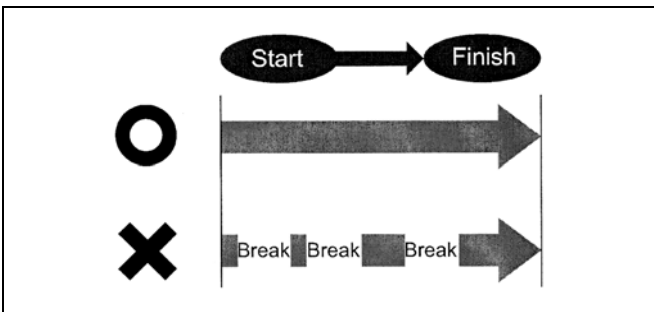


G. PREVENT THE FUEL FROM CONTACTING OTHER PARTS

- Do not allow the fuel to come in contact with any parts made of rubber or leather.

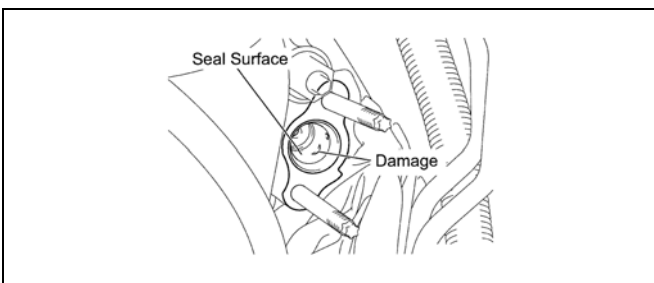
H. ASSIGN A SAFETY SUPERVISOR

- Assign a safety supervisor to be in charge of all safety precautions and fire hazards around the work area.



I. WORK SCHEDULING

- Work must be completed the same day.
- As a general rule, do not stop work midway. If work must stop midway, inform your safety supervisor.

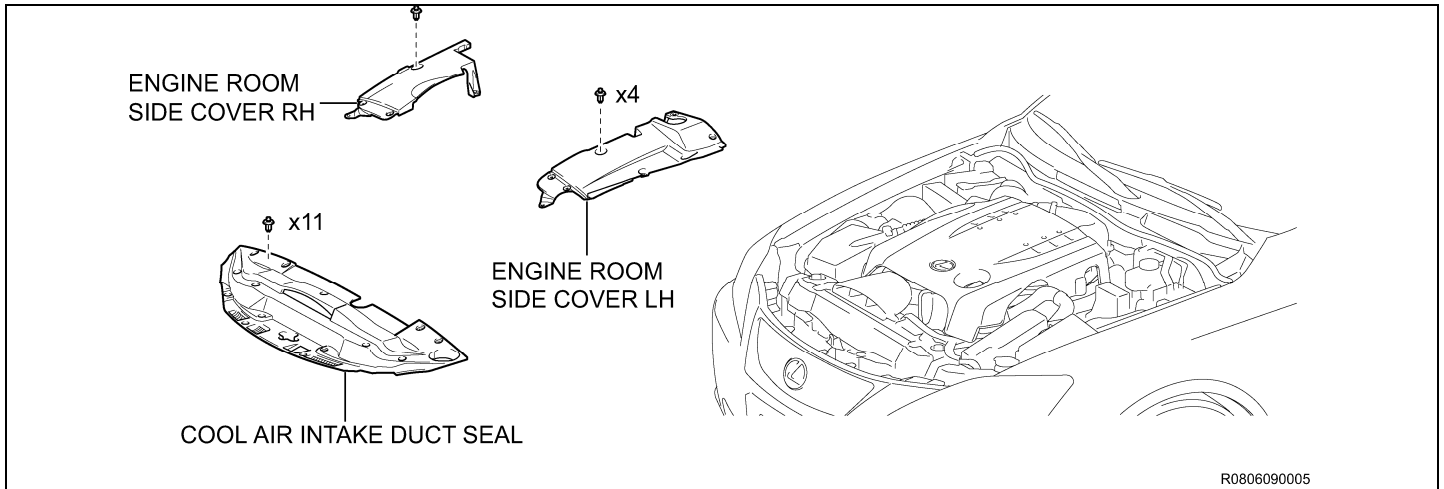


J. WHEN CONNECTING THE FUEL PIPE

- Any amount of damage or small foreign object (dust, a piece of thread, rust, etc.) may cause a fuel leak. Be thorough when inspecting and cleaning the fuel pipes and seal surface areas.

VI. FUEL DELIVERY PIPE REPLACEMENT

A. REMOVE THE ENGINE COVERS AND DISCHARGE THE FUEL SYSTEM

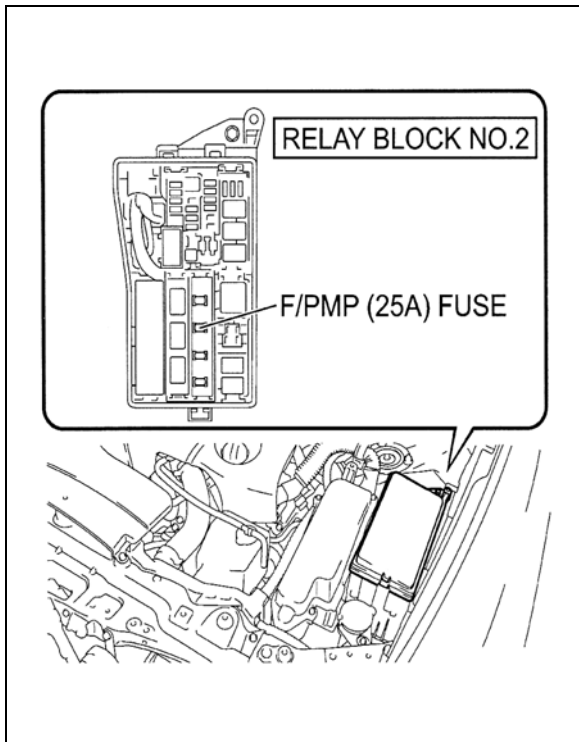


1. CHECK FOR DTCs

- If DTC(s) are present, verify them, view and record the freeze frame data, and perform the necessary repairs.

2. REMOVE THE ENGINE ROOM COVER & V-BANK COVER SUB-ASSEMBLY

- DO NOT DISCONNECT ANY PART OF THE FUEL SYSTEM UNTIL YOU HAVE DISCHARGED THE FUEL SYSTEM PRESSURE.**
- EVEN AFTER DISCHARGING THE FUEL SYSTEM PRESSURE, PLACE A PIECE OF CLOTH AROUND THE FITTINGS AS YOU SEPARATE THEM TO REDUCE THE RISK OF FUEL SPRAYING ON YOURSELF, IN THE ENGINE COMPARTMENT, AND ONTO OTHER PARTS.**



3. DISCHARGE THE FUEL SYSTEM PRESSURE

- Remove the relay block upper cover No. 2.
- Remove the fuel pump (F/PMP) 25 amp fuse.
- Start the engine.
- After the engine has stopped, turn the ignition switch OFF.
- Crank the engine again to relieve any existing fuel pressure.

NOTE:

DTC P0171/25 and/or P0191/49 may be set.

- Remove the fuel cap to discharge the fuel tank pressure.
- Record the radio station presets.

NOTE:

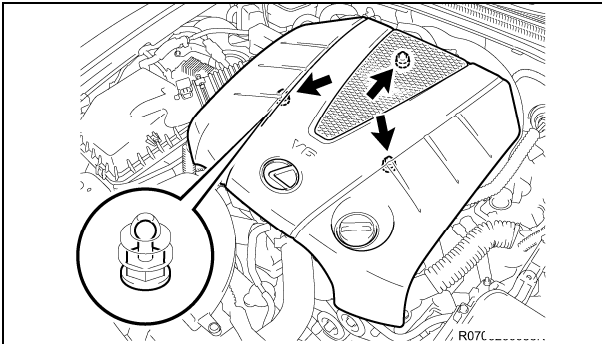
DO NOT disconnect the negative (-) battery cable until 6 minutes have elapsed after turning the ignition OFF.

- Disconnect the negative (-) battery cable.
- Reinstall the fuel pump (F/PMP) 25 amp fuse.
- Reinstall the relay block upper cover No. 2.
- Reinstall the fuel cap.

B. REMOVE THE INTAKE MANIFOLD

IS250 (4GR-FSE) – Skip to page 20

IS350 (2GR-FSE) – INTAKE MANIFOLD REMOVAL

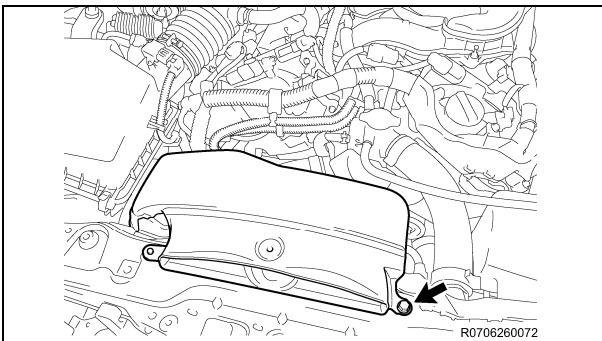


1. REMOVE V-BANK COVER SUB-ASSEMBLY

- a) Hold the front of the V-bank cover and raise it to disengage the 2 clips on the front of the cover. Continue to raise the cover to disengage the clip on the rear of the cover and remove the cover.

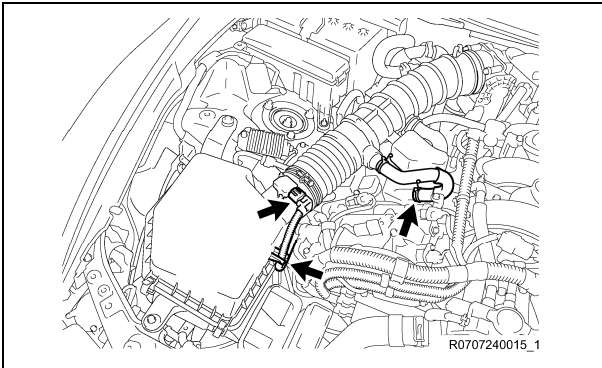
NOTE:

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



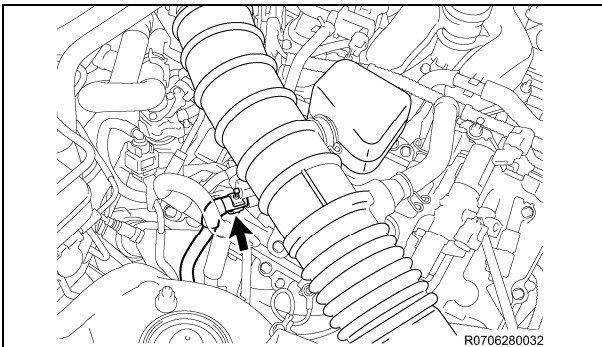
2. REMOVE NO. 1 AIR CLEANER INLET

- a) Remove the bolt, clip and inlet air cleaner.

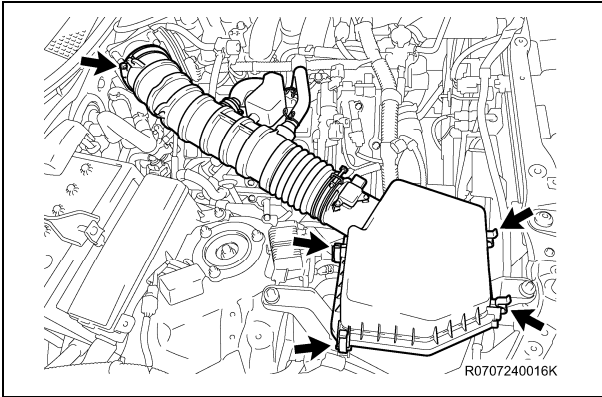


3. REMOVE AIR CLEANER CAP WITH AIR CLEANER HOSE

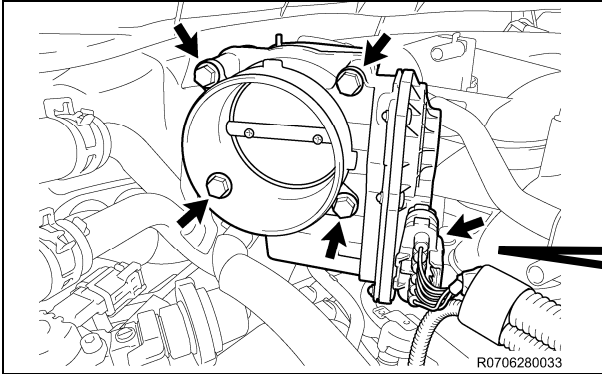
- a) Disconnect the MAF connector and remove the wiring from the clamp.
- b) Disconnect the NO.2 ventilation hose.



- c) Disconnect the vacuum hose clamp.



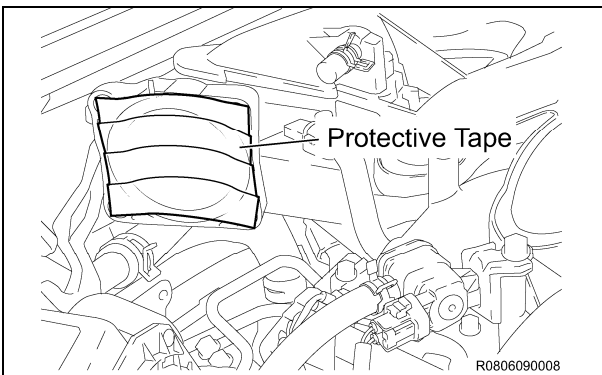
- d) Loosen the hose clamp bolt.
- e) Remove the 4 clips and air cleaner cap with air cleaner hose.



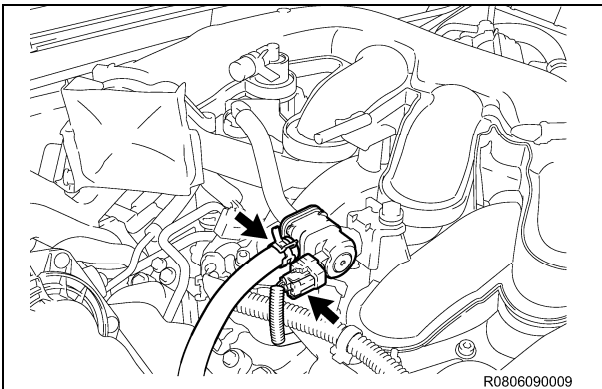
4. REMOVE THROTTLE BODY ASSEMBLY

- a) Disconnect the throttle body connector.
- b) Remove the 4 bolts and throttle body assembly and gasket.

NOTE:
Do not disconnect the 2 water by-pass hoses.

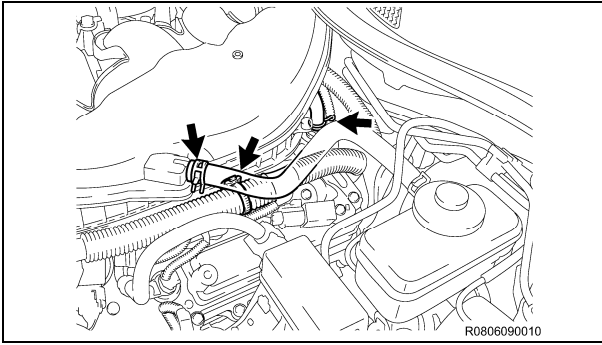


- c) Place protective tape over the surge tank opening to prevent foreign objects from entering from the old gasket above.

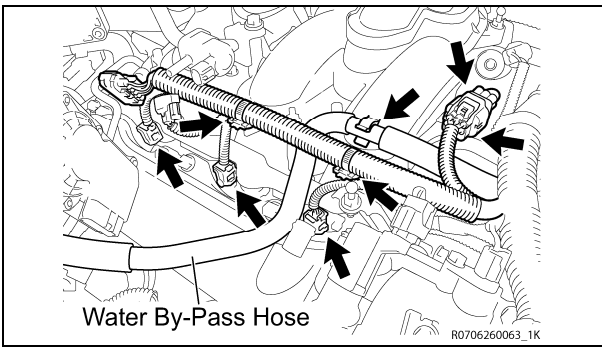


5. REMOVE INTAKE AIR SURGE TANK

- a) Disconnect the purge VSV connector.
- b) Disconnect the vacuum hose from the purge VSV.

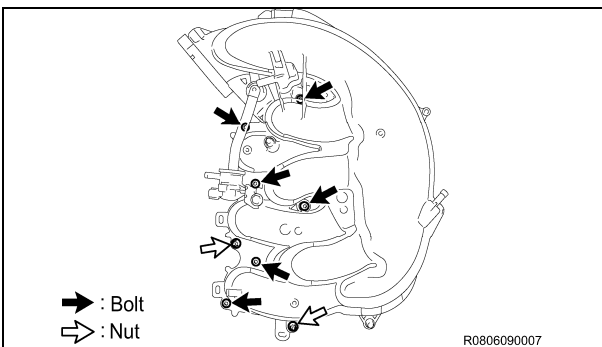
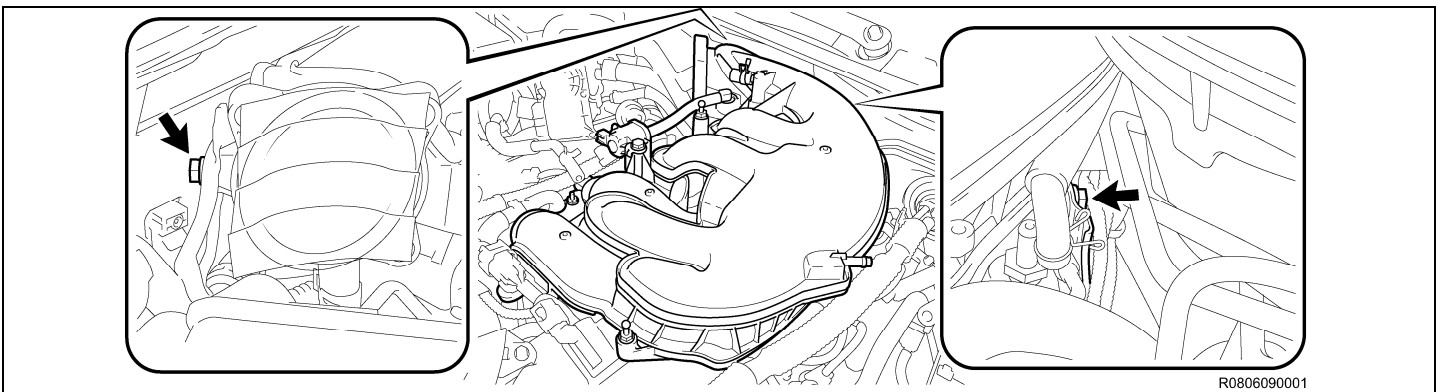


- c) Disconnect the ventilation hose from the intake manifold.
- d) Disconnect the union to check valve hose from the intake air surge tank.
- e) Disconnect the wire harness clamp from the intake air surge tank.

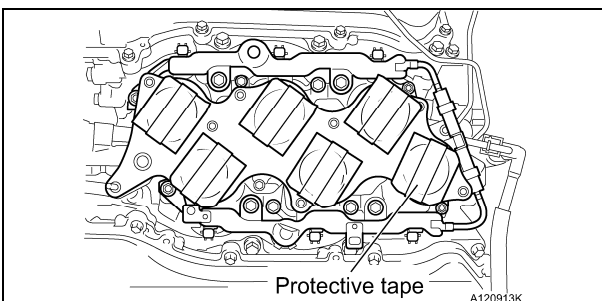


- f) Disconnect the 4 injector connectors.
- g) Disconnect the 3 wire harness clamps from the intake air surge tank.
- h) Disconnect the water by-pass hose from the intake air surge tank.

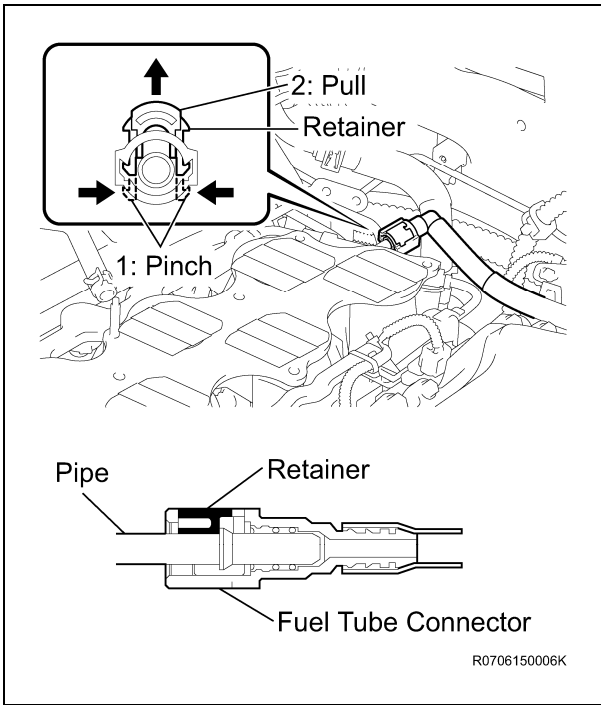
- i) Remove the 2 bolts from the intake air surge tank, see illustration below.



- j) Using a long hexagon 5 mm, remove the 6 bolts and using a 10mm socket remove the 2 nuts.
- k) Remove the intake surge tank and gasket.



- l) Place protective tape over the intake manifold openings to prevent foreign objects from entering.

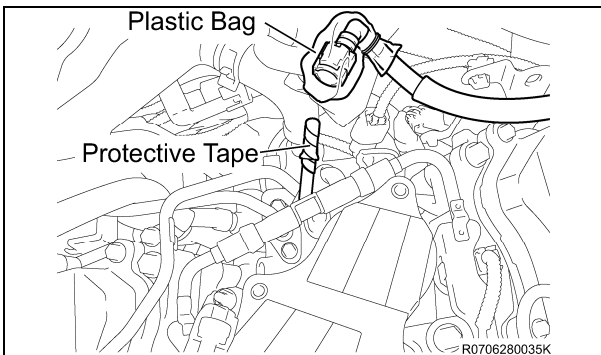


6. REMOVE INTAKE MANIFOLD

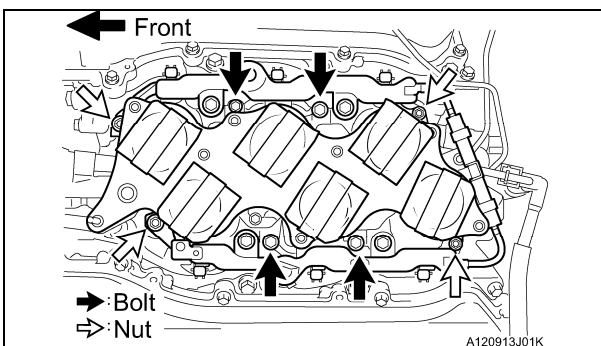
- a) Pinch and pull the fuel tube connector to disconnect the connector from the delivery pipe.

NOTE:

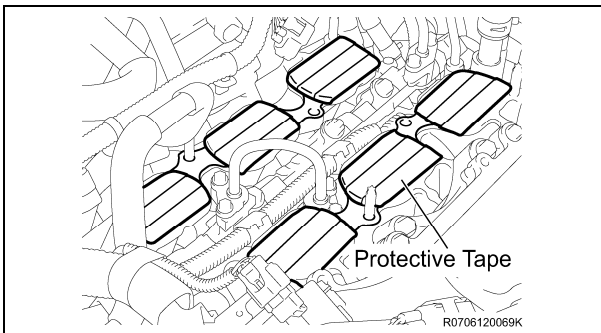
- Check for any dirt and foreign matter contamination in the pipe and around the connector. Clean if necessary. Foreign matter may damage the O-rings or cause leaks in the seal between the pipe and connector.
- Do not use any tools to separate the pipe and connector.
- Do not forcefully bend or twist the nylon tube.
- Check for any dirt and foreign matter on the pipe seal surface. Clean if necessary.
- If the pipe and connector are stuck together, pinch the tube between your fingers and turn it carefully to free it. Then disconnect the tube.



- b) Place a plastic bag over the fuel tube, seal bag to prevent damage or foreign objects from entering.
- c) Place protective tape around the sides of the pipe to prevent damage.



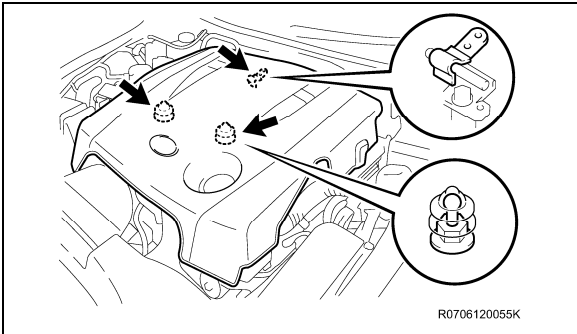
- d) Remove the 4 bolts, 4 nuts, intake manifold and gasket.



- e) Place protective tape on the old gasket and place it over the cylinder head opening to prevent foreign objects from entering.

7. SKIP TO PAGE 24 REPLACE FUEL DELIVERY PIPE

IS250 (4GR-FSE) – INTAKE MANIFOLD REMOVAL

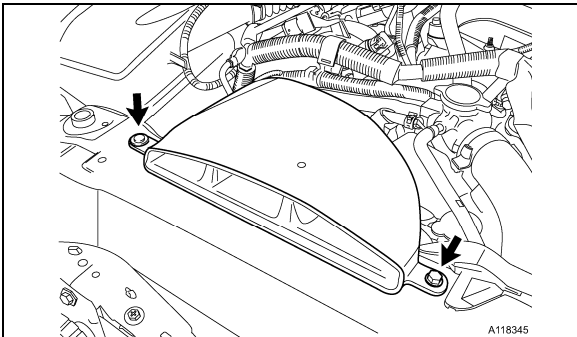


1. REMOVE V-BANK COVER SUB-ASSEMBLY

- a) Hold the front of the V-bank cover and raise it to disengage the 2 clips on the front of the cover. Continue to raise the cover to disengage the clip on the rear of the cover and remove the cover.

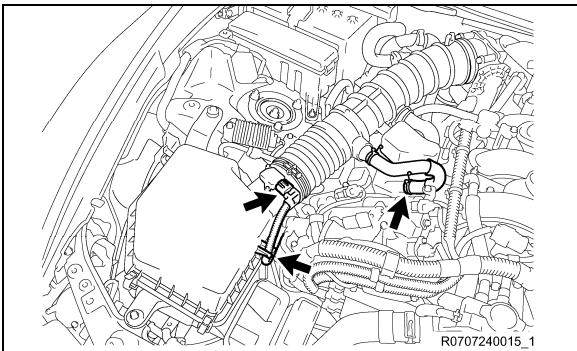
NOTE:

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



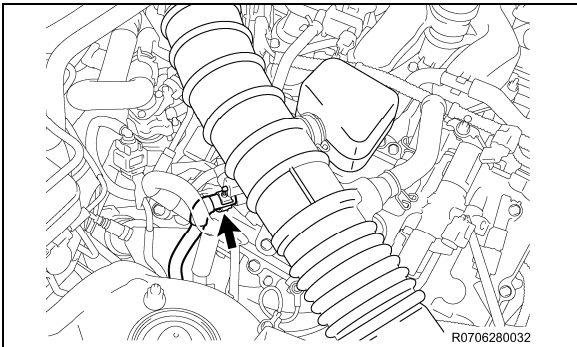
2. REMOVE NO. 1 AIR CLEANER INLET

- a) Remove the bolt, clip and air cleaner inlet.

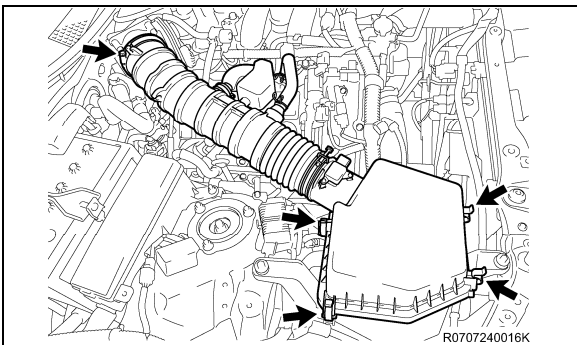


3. REMOVE AIR CLEANER CAP WITH AIR CLEANER HOSE

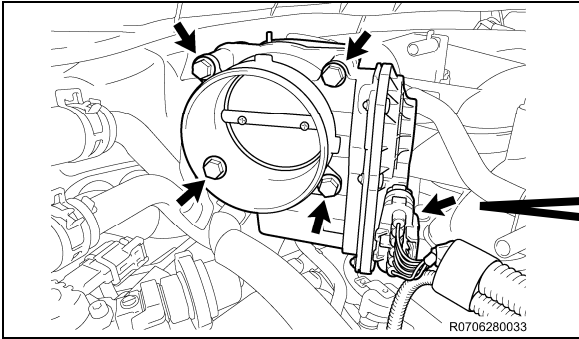
- a) Disconnect the MAF connector and remove the wiring from the clamp.
- b) Disconnect the No. 2 Ventilation hose.



- c) Disconnect the vacuum hose clamps.



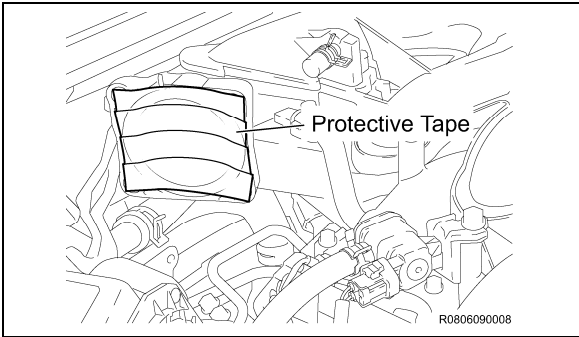
- d) Loosen the hose clamp bolt.
- e) Remove the 4 clips and air cleaner cap with air cleaner hose.



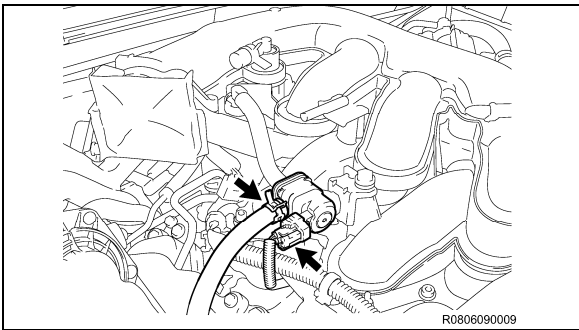
4. REMOVE THROTTLE BODY ASSEMBLY

- a) Disconnect the throttle body connector.
- b) Remove the 4 bolts and throttle body assembly and gasket.

NOTE:
Do not disconnect the 2 water by-pass hoses.

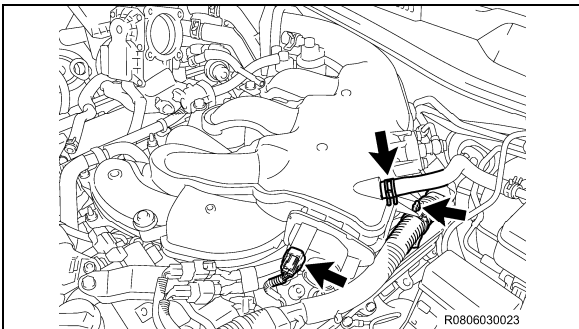


- c) Place protective tape over the surge tank opening to prevent foreign objects from entering from the old gasket above.

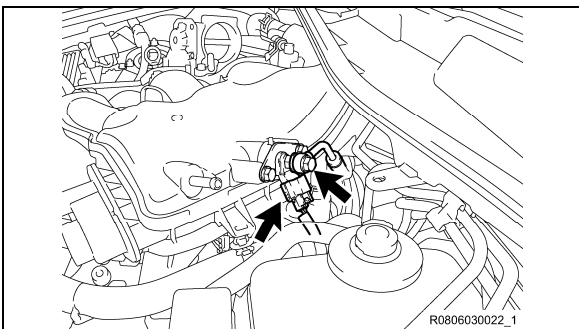


5. REMOVE INTAKE AIR SURGE TANK

- a) Disconnect the purge VSV connector.
- b) Disconnect the vacuum hose from the purge VSV.

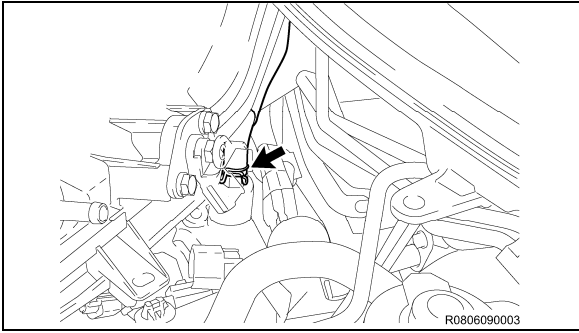


- c) Disconnect the connector.
- d) Disconnect the wire harness clamp.
- e) Disconnect the union to check valve hose from the intake air surge tank.

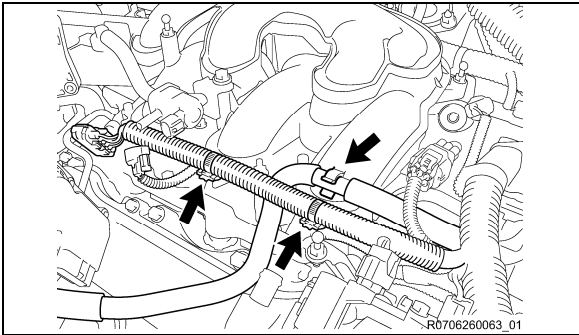


- f) Disconnect the cold start injector connector.
- g) Remove the bolt and 2 gaskets, and disconnect the fuel tube from the cold start injector.

NOTE:
Do not fold or bend the hose.

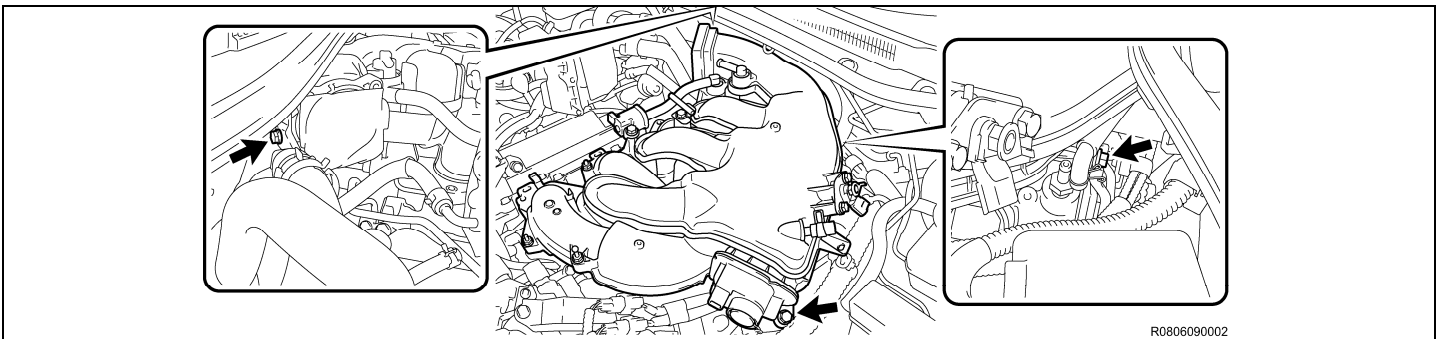


h) Disconnect the ventilation hose from the intake manifold.

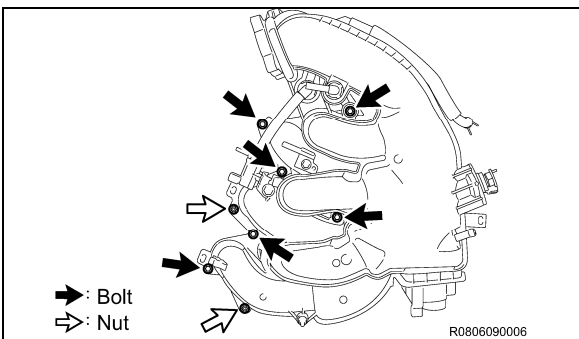


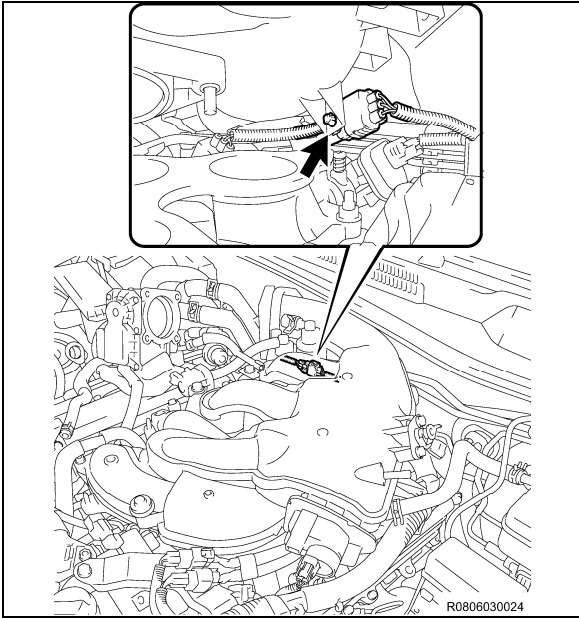
- i) Disconnect the 2 wire harness clamps from the intake air surge tank.
- j) Disconnect the water by-pass hose from the intake air surge tank.

k) Remove the 3 bolts from the intake air surge tank, see illustration below.

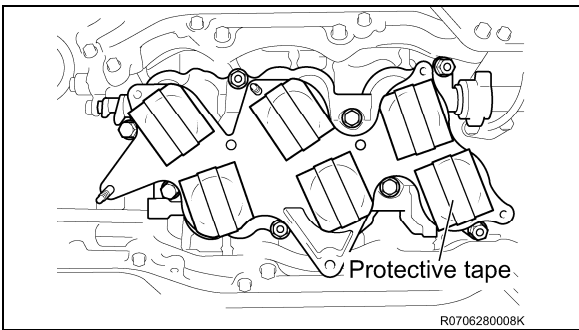


l) Using a hexagon 5 mm, remove the 6 bolts, then using a 10mm socket remove the 2 nuts.

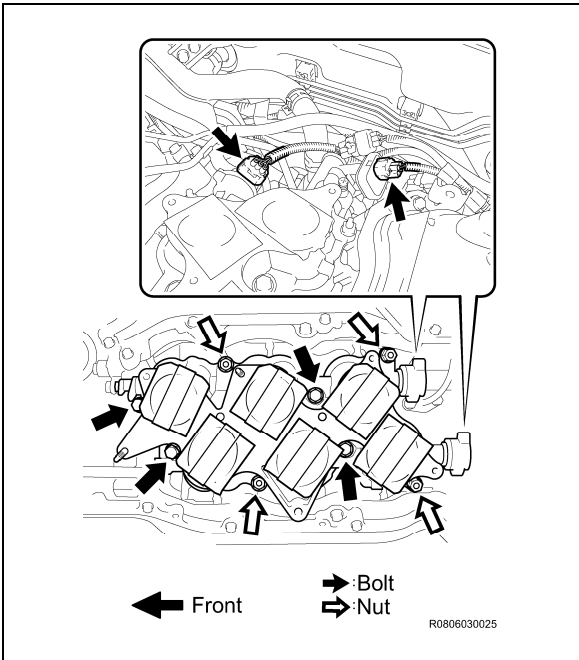




- m) Disconnect the connector clamp from the intake air surge tank.
- n) Remove the intake air surge tank and gasket.



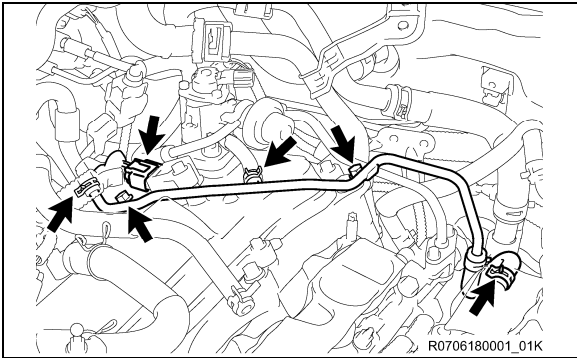
- o) Place protective tape over the intake manifold openings to prevent foreign objects from entering.



6. REMOVE INTAKE MANIFOLD

- a) Disconnect the connector for the SCV.
- b) Disconnect the SCV position sensor connector.
- c) Remove the 4 bolts, 4 nuts, intake manifold and gasket.
- d) Place protective tape on the old gasket and place it over the cylinder head opening to prevent foreign objects from entering.

C. REMOVE FUEL DELIVERY PIPE

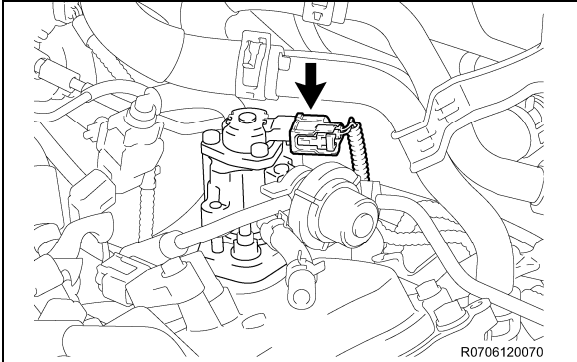


1. REMOVE NO. 1 FUEL PIPE

- Disconnect the ignition coil connector illustrated.
- Disconnect the 3 fuel hoses.
- Remove the 2 bolts and No. 1 fuel pipe.

NOTE:

- Insert a hose plug into the hose.
- Wipe away any spilt fuel with a shop rag.

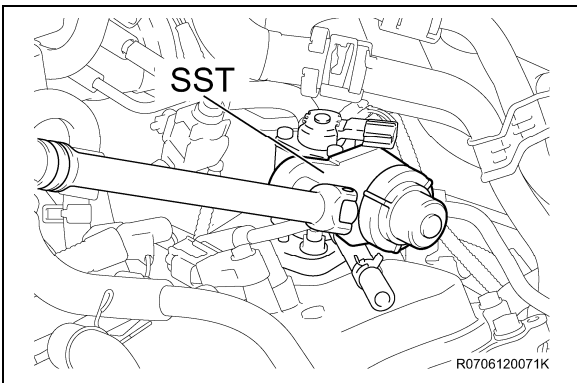


2. REMOVE FUEL PRESSURE PULSATION DAMPER

- Disconnect the pulsation damper connector.

NOTE:

When the fuel pressure pulsation damper is removed, be certain to disconnect the connector to prevent it from being damaged by tools.

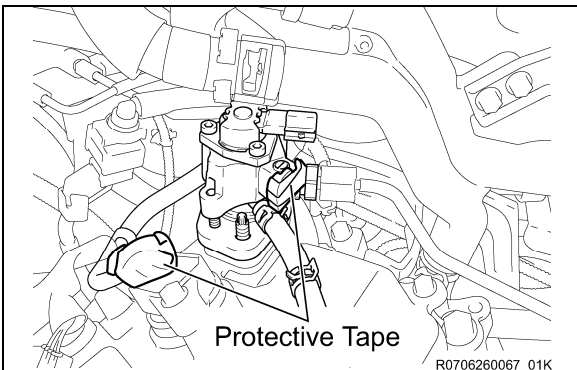


- Using SST or a 22 mm wrench, remove the fuel pressure pulsation damper and 2 gaskets from the fuel pump.

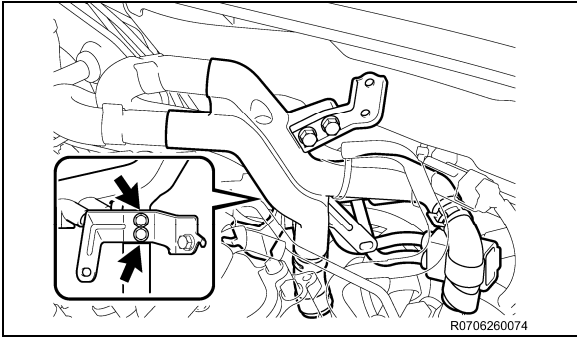
SST 09617-24011

NOTE:

- Do not blow pressurized air into the pulsation damper. The air pressure may damage the internal diaphragm.



- Place protective tape over the fuel pump and fuel tube to prevent damage.

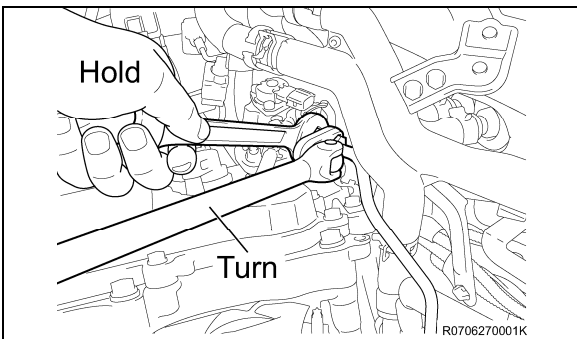


**3. REMOVE WATER HOSE JOINT
(for IS350 2GR-FSE only)**

- a) Remove the 2 bolts and disconnect the water hose joint.

4. REMOVE FUEL PUMP ASSEMBLY AND NO. 2 FUEL PIPE

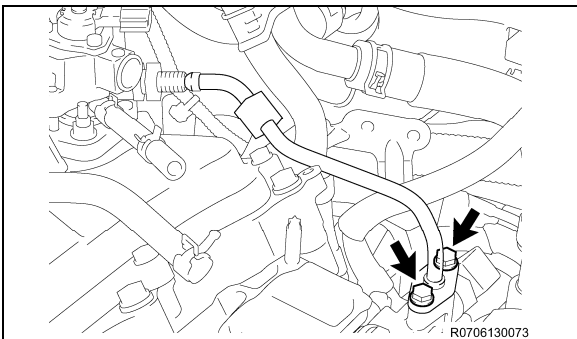
STOP WHEN REPLACING FUEL PIPE NO. 2, ***THE FUEL PUMP MUST BE REMOVED. THIS MUST BE DONE TO PREVENT SEAL DAMAGE AND THE TWISTING OF THE FUEL PIPE, FAILURE TO DO SO MAY RESULT IN A FUEL LEAK!***



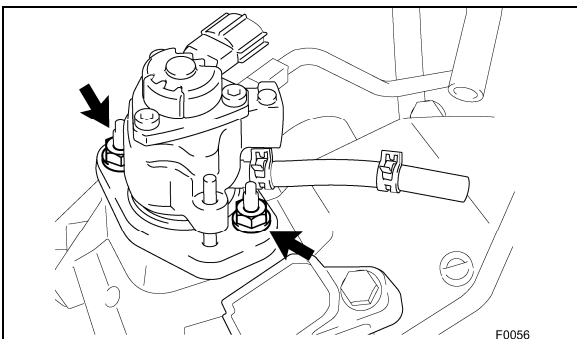
- a) Fix the union bolt on the fuel pump side in place with a 21 mm wrench. Using a 19 mm union nut wrench, loosen the union.

NOTE:

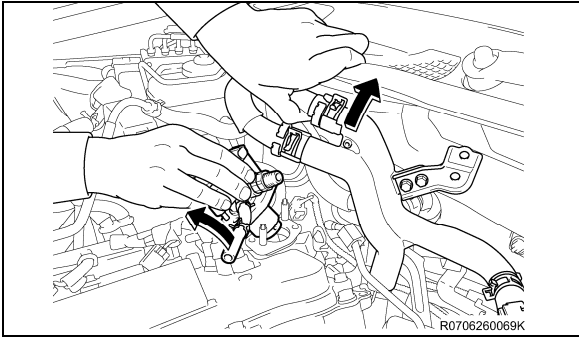
- **Must be absolutely no free play in the union on the fuel pump side.**
- **If the union on the fuel pump side has free play, replace the fuel pump.**



- b) Remove the 2 bolts on the delivery pipe side.



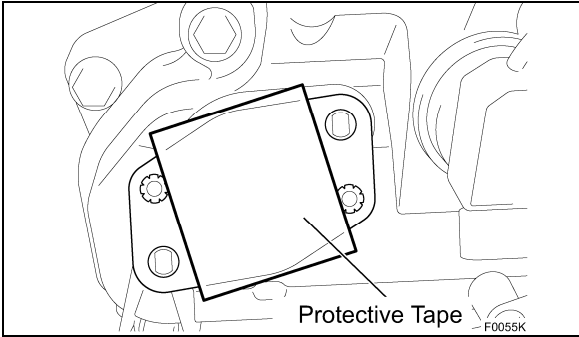
- c) Remove the 2 nuts from the fuel pump.



d) Remove the fuel pump and fuel pump insulator.

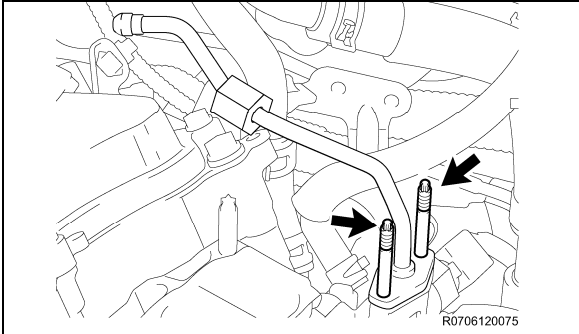
NOTE:

- Wipe away any spilt fuel with a shop rag.
- Do not apply excessive force to the heater hose and coolant pipe.



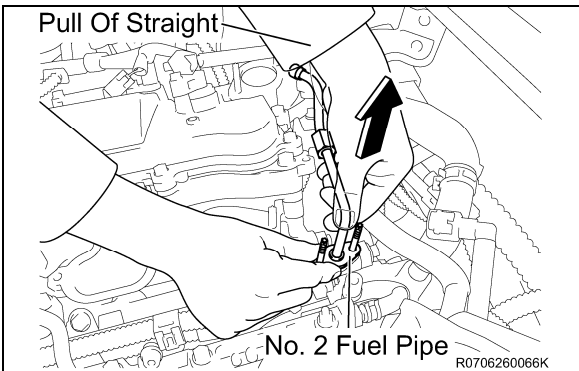
e) Place protective tape on the old insulator and place it over the head cover opening to prevent foreign objects from entering.

5. REMOVE NO. 2 FUEL PIPE



a) Hand tighten the 2 SST stud bolts in the delivery pipe's bolt attachment holes. (torx® side up)

SST 04007-32331

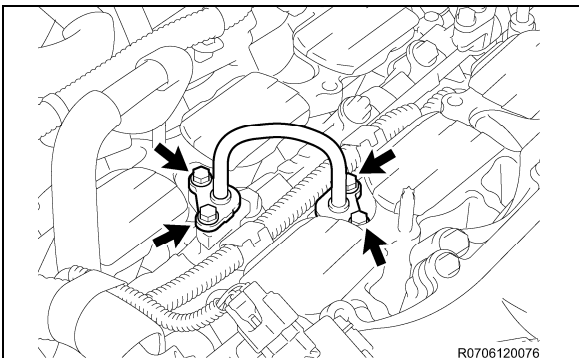


b) Remove the fuel pipe from the fuel delivery pipe.
c) Remove the 2 stud bolts.

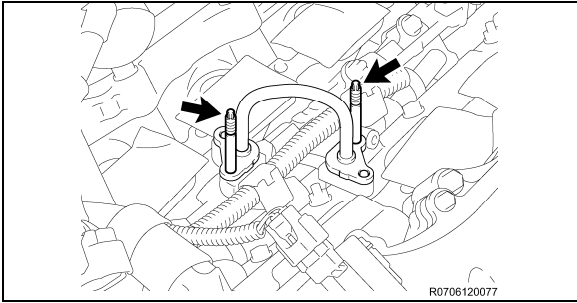
NOTE:

- Shifting the pipe too widely to the left and right may damage the part which may lead to a fuel leak.
- Fuel Pipes may be extremely tight, use caution while removing as to not cause damage.

6. REMOVE NO. 3 FUEL PIPE



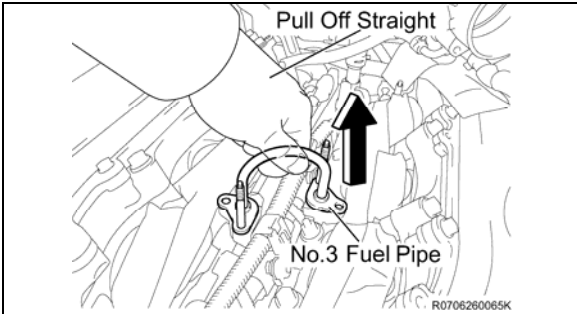
a) Remove the 4 bolts.



- b) Hand tighten the 2 stud bolts to the delivery pipe. (torx® side up)

NOTE:

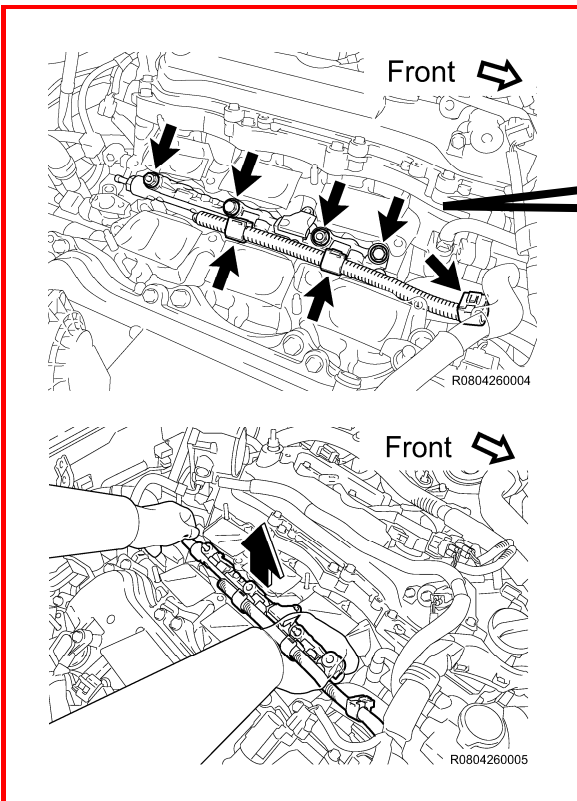
Attach the stud bolts diagonal from each as shown in the illustration.



- c) Remove the fuel pipe from the fuel delivery pipe.
d) Remove the 2 stud bolts.

NOTE:

Shifting the pipe too widely to the left and right may damage the part which may lead to a fuel leak.



7. REMOVE NO. 2 FUEL DELIVERY PIPE

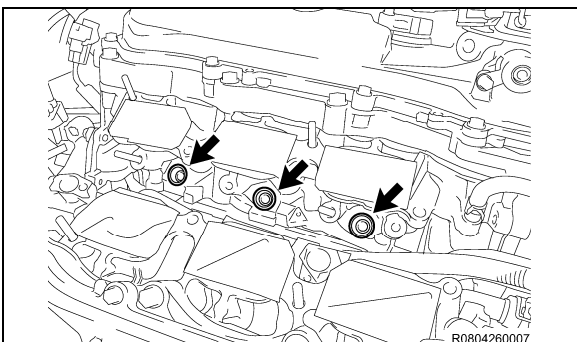
To prevent possible injector damage, please proceed with the following steps in the order indicated.

Do not disconnect the fuel injector electrical connectors until after removing the delivery pipe.

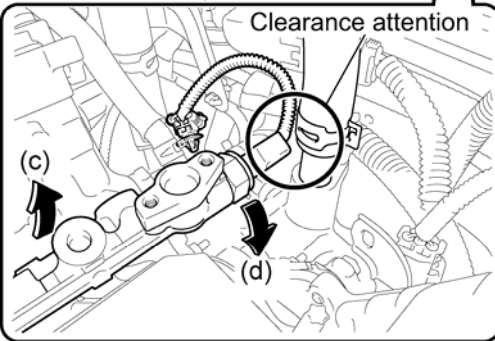
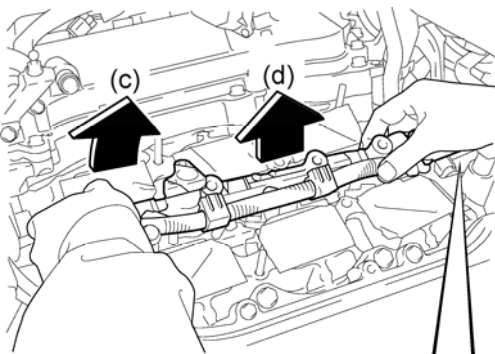
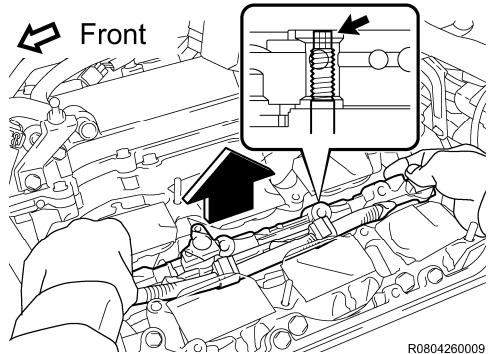
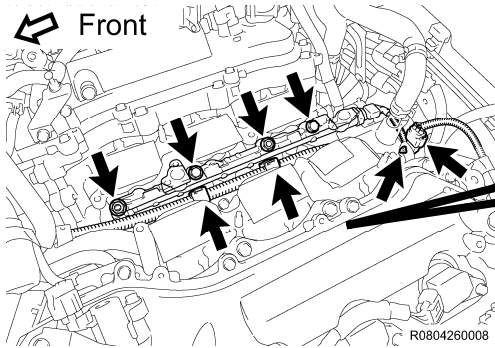
- a) Disconnect the 3 wire harness clamps and remove the 2 bolts and 2 nuts.
b) Remove the fuel delivery pipe.
c) Disconnect the 3 electrical connectors by hand.

NOTE:

- Do not exert extreme force while removing the fuel pipe, this may lead to injector damage.
- Carefully move the fuel pipe back and forth from end to end while firmly pulling up will assist with removal.
- Injectors may remain in the cylinder head during fuel pipe removal; if this occurs, carefully disconnect the electrical connector to prevent injector damage.
- Be extremely careful not to touch or strike the tips of the injectors.



- d) Remove the 3 injector vibration insulators from the cylinder head.



8. REMOVE NO. 1 FUEL DELIVERY PIPE

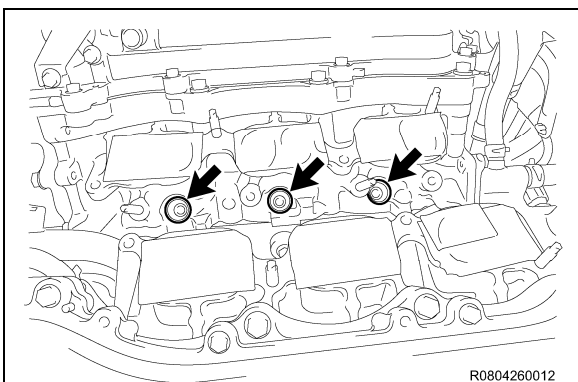
To prevent possible injector damage, please proceed with the following steps in the order indicated.

Do not disconnect the fuel injector electrical connectors until after removing the delivery pipe.

- Disconnect the fuel pressure sensor connector, wire harness clamps and remove the 2 bolts and 2 nuts.
- Lift the fuel delivery pipe up until it is horizontally level with the stud bolts.
- Carefully pull up on the front side of the fuel delivery pipe.
- Carefully pull the fuel delivery pipe up so that the fuel pressure sensor and the heater hose do not touch.
- Disconnect the 3 electrical connectors by hand.

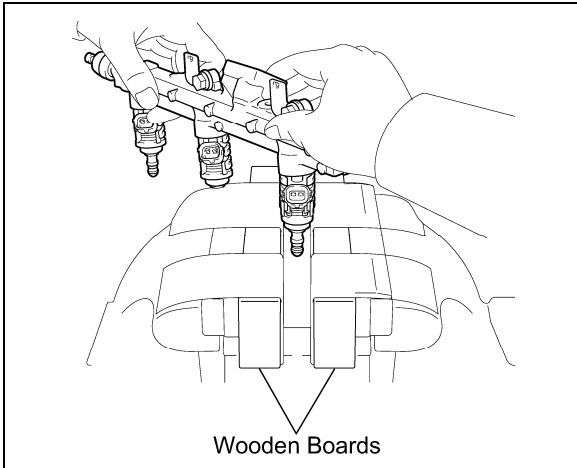
NOTE:

- Do not exert extreme force while removing the fuel pipe, this may lead to injector damage.
- Carefully move the fuel pipe back and forth from end to end while firmly pulling up will assist with removal.
- Injectors may remain in the cylinder head during fuel pipe removal; if this occurs, carefully disconnect the electrical connector to prevent injector damage.
- Be extremely careful not to touch or strike the tips of the injectors.
- To avoid damage to both components, do not allow the fuel pressure sensor to come in contact with the heater hose.



- Remove the 3 injector vibration insulators from the cylinder head.

D. REMOVE AND INSPECT FUEL INJECTORS

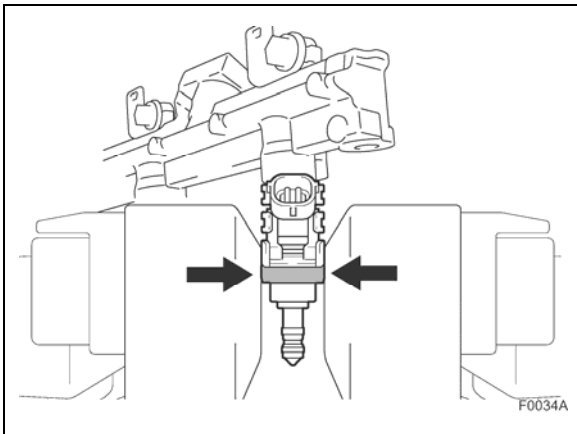


1. REMOVE FUEL INJECTORS

- a) Clamp the fuel injector assembly in a vise with wooden boards placed in between the vise and assembly.

NOTE:

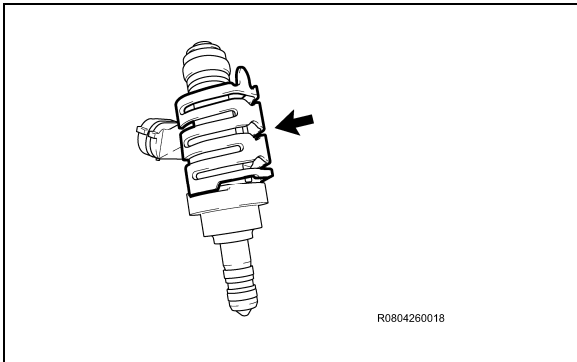
- Be extremely careful not to touch or strike the tips of the injectors.
- Use both hands when clamping the fuel injector assembly to the vise.



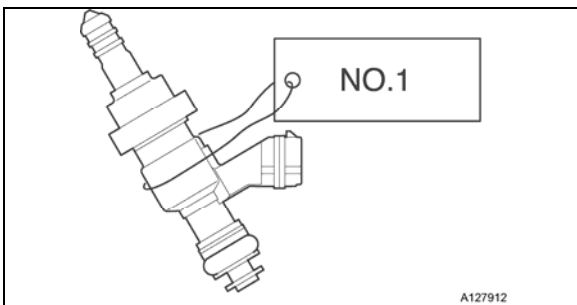
- b) With the fuel injector assembly clamped in the vise, remove the fuel delivery pipe by pulling straight back from the assembly as shown in the illustration.

NOTE:

- Clamp the vise to the areas illustrated on the fuel injector assembly. Do not clamp areas which are not indicated in the left illustration.
- Do not over tighten. Also, do not allow the connector to come in contact with the vise.



- c) Remove the nozzle holder clamp from the injectors.



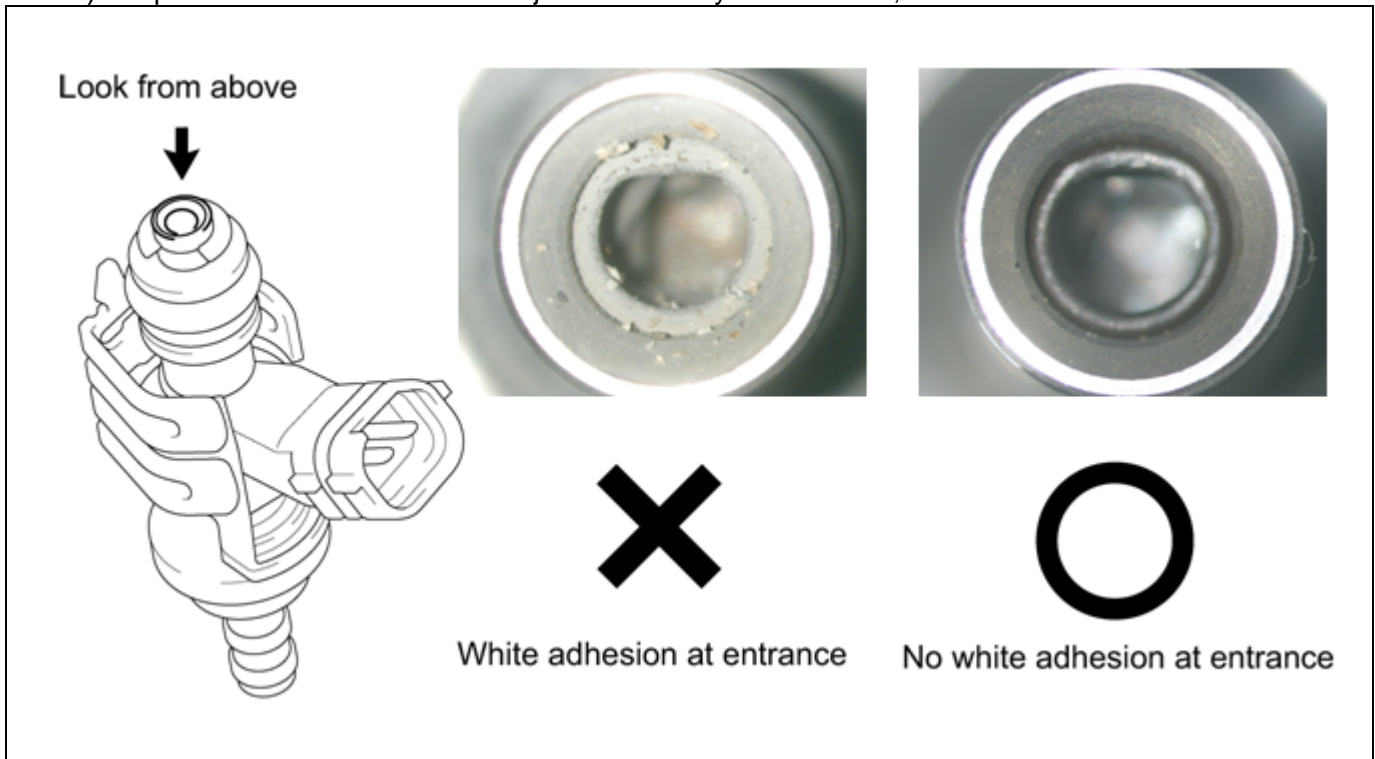
NOTE:

For reinstallation, attach a tag or label to the injector shaft.

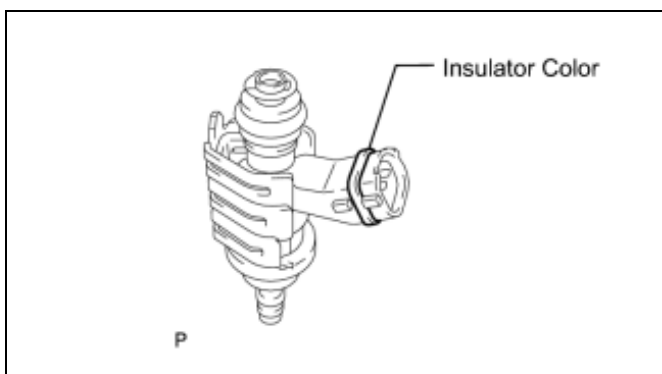
- d) Repeat steps a) ~ c) for the remaining injectors.

2. FUEL INJECTOR INSPECTION

a) Inspect the condition of the fuel injector assembly as illustrated, and assess with the chart below.

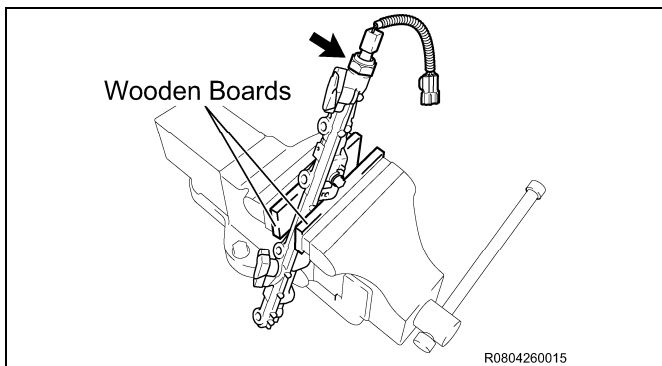


Condition of fuel injector assembly	Results
No white adhesion at entrance	Reuse the fuel injector.
White adhesion at entrance	Replace ALL fuel injectors with new ones. Keep used injectors for possible parts recovery and inspection.



NOTE:

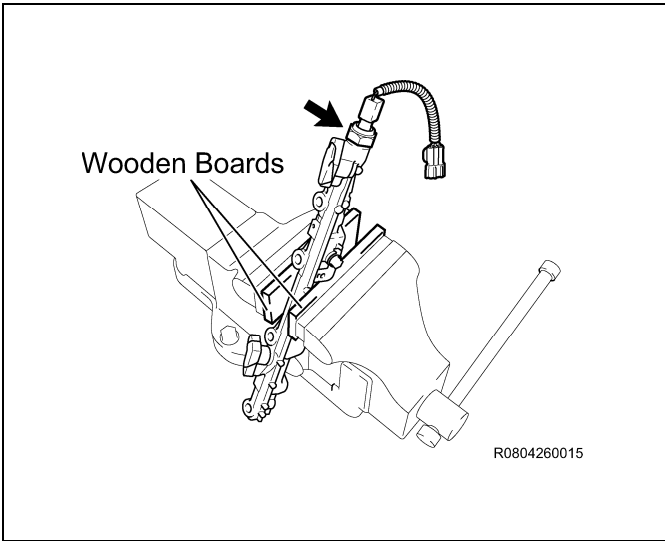
- Either injector listed in the parts table for a particular vehicle type may be installed; however, make sure that all injectors installed on the vehicle are the same color.
- IS250 23209-39057-A0 = Black
- IS250 23209-39057-B0 = Reddish Brown
- IS350 23209-39155-B0 = Black
- IS350 23209-39155-C0 = Reddish Brown
- IS350 23209-39155-D0 = Green



3. REMOVE FUEL PRESSURE SENSOR

- Clamp the No. 1 fuel delivery pipe in a vise with wooden boards placed in between the pipe and vise as illustrated.
- Using a 24 mm wrench, remove the fuel pressure sensor and gasket.

Remove and Inspect Fuel Injectors IS350 & IS250



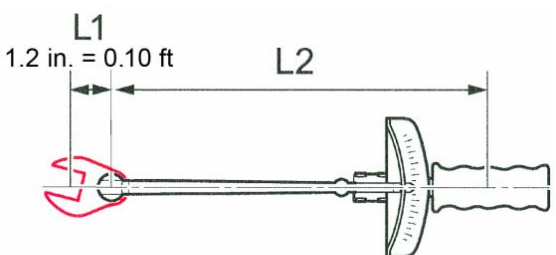
4. INSTALL FUEL PRESSURE SENSOR

- a) Clamp a **NEW** No. 1 fuel delivery pipe in a vise with wooden boards placed in between the pipe and vise as illustrated.
- b) Install a **NEW** gasket to the fuel pressure sensor.
- c) Using SST, install the fuel pressure sensor to the No. 1 delivery pipe.

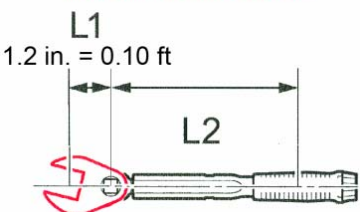
5. CALCULATE THE FUEL PRESSURE SENSOR TORQUE VALUE



- The calculated torque (C) is the value at which the torque wrench **MUST** be set.
- To determine the calculated torque, **READ**, and **CLOSELY** follow the steps below.
- If using the formula L1 and L2 **MUST** be measured in feet.



Torque wrench adapter and union nut wrench



Connect the torque wrench to the union nut so that they form a straight line when tightening.

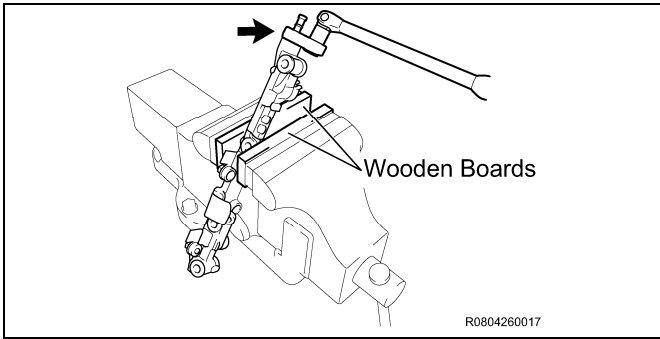
- a) Measure the length of the torque wrench from the center of the drive to the middle of the handle as shown in the illustration (L2)
- b) Determine the calculated torque (C) value to set the wrench to by referencing the table below.

Torque Wrench Length – L2 (inches)	Calculated Torque (ft lbs)
10"	27.6
12"	28.1
14"	28.5
16"	28.8
18"	29
20"	29.2

NOTE:
The torque wrench union nut **MUST** be used when using the values in this table.

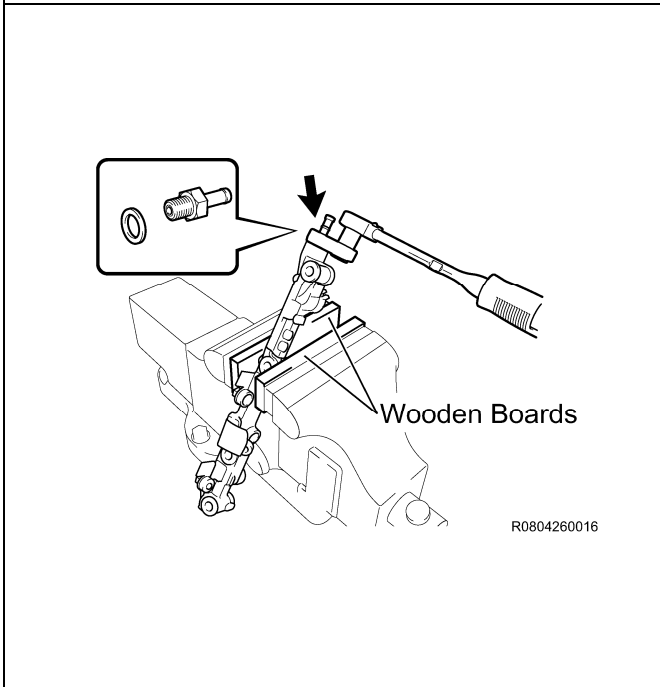
Calculated Torque Formula:
 $C = (T) \times L2 / (L1 + L2)$

C	Calculated Torque (ft-lbf)
T	Specified torque (ft-lbf) (31 ft-lbf)
L1	Torque wrench adapter length or length of tool (ft.)
L2	Length of torque wrench (ft.)



6. REMOVE FUEL RELIEF VALVE ASSY

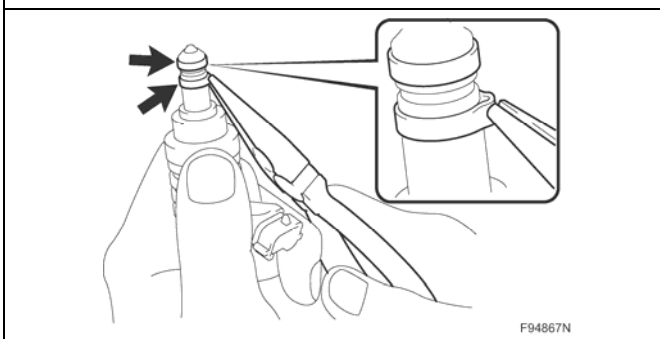
- Clamp the No. 2 fuel delivery pipe in a vise with wooden boards placed in between the pipe and vise as illustrated.
- Using a 17 mm union nut wrench, remove the fuel relief valve and gasket.



7. INSTALL FUEL RELIEF VALVE ASSY

- Clamp a **NEW** No. 2 fuel delivery pipe in a vise with wooden boards placed in between the pipe and vise as illustrated.
- Install a **NEW** gasket to the fuel relief valve.
- Using union nut wrench 17 mm, install the fuel relief valve to the No. 2 delivery pipe.

Torque Specification:
36 N·m (367 kgf·cm, 27 ft·lbf)

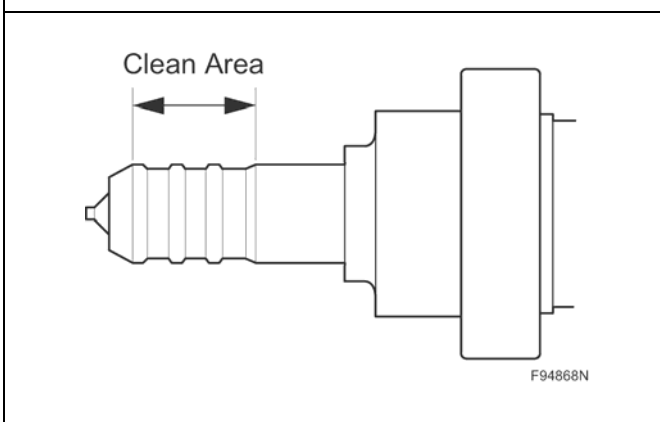


8. REMOVE FUEL INJECTOR SEAL

- Using the tips of a pair of needle nose pliers, pinch and pull one of the 2 injector seals at several points to stretch it. Repeat this for the other injector seal.
- Repeat step a) for the remaining injectors.

NOTE:

If an injector is dropped or the tips of the injectors are struck, replace it with a **NEW one.**

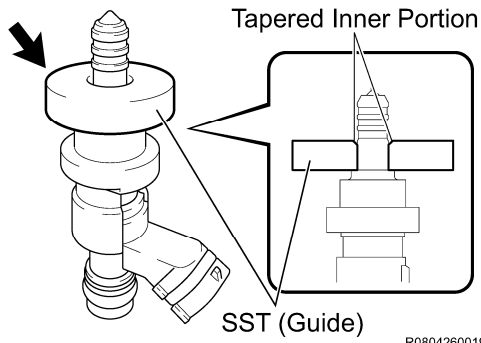


9. INSTALL FUEL INJECTOR SEAL

- Apply engine conditioner to the injector area shown in the illustration. Using a piece of cloth, clean carbon deposits from the injector and its grooves.

NOTE:

- Do not clean the tip of the injector.
- Do not use a wire brush to clean the injector.
- If an injector is dropped or the tips of the injectors are struck, replace it.

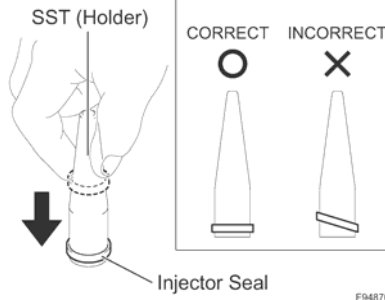


- b) Apply engine oil to the injector contact surface of SST (guide). Then attach SST (guide) to the injector with the tapered inner portion facing the tip of the injector, as shown in the illustration.

SST 09260-39015 (09268-03020)

NOTE:

Due to the specific tolerances needed to seat the seals it will be difficult to slide the SST. Slowly wiggle it from side to side while sliding it up the injector little by little.

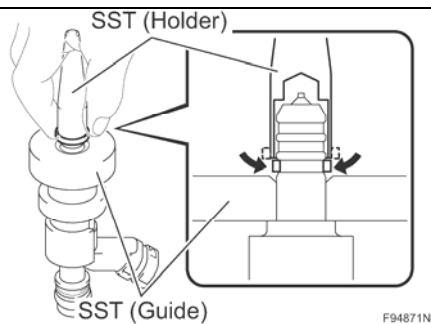


- c) Install a **NEW** injector seal to SST (holder).

SST 09260-39015 (09268-03010)

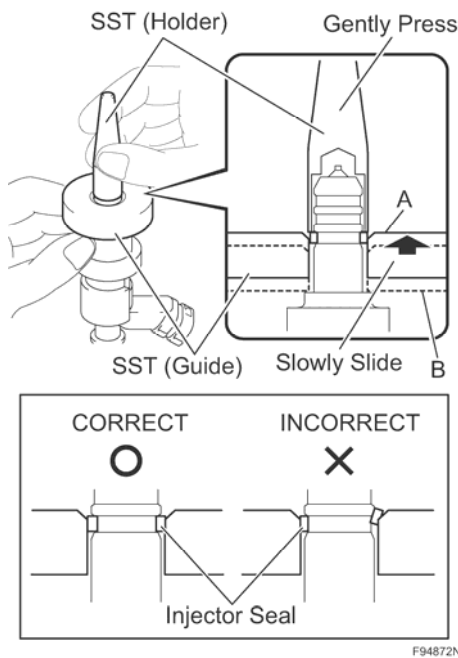
NOTE:

Be careful not to install the injector seal to the SST (holder) at an angle. Doing so will stretch the seal.



- d) Install SST (holder with injector seal) to the tip of the injector. Slide the seal downward into the injector groove (injector connector side) with your fingers, as shown in the illustration.

SST 09260-39015 (09268-03010, 09268-03020)

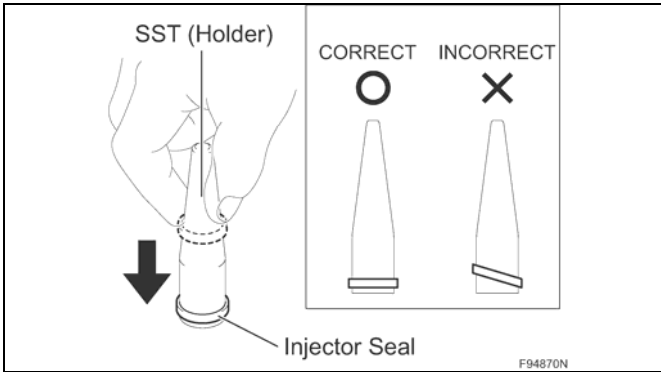


- e) Using SST (holder), gently press downward on the injector seal (injector connector side). Then slowly slide SST (guide) towards the injector tip to settle the seal into the injector groove.

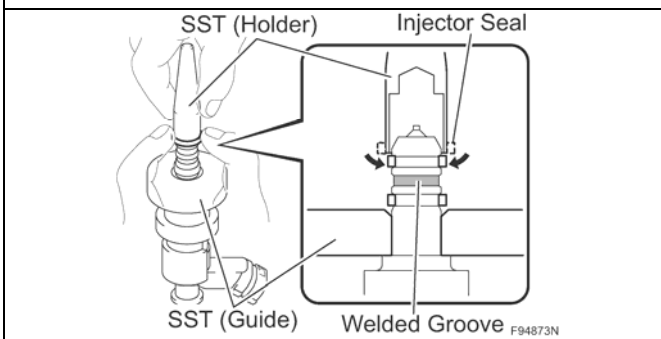
SST 09260-39015 (09268-03010, 09268-03020)

NOTE:

- Be careful that the seal is not pinched between SST (guide) and the injector groove. Replace the seal if it becomes damaged.
- When using SST (guide) to settle the seal into the groove, SST (guide) only needs to be slid upward to the position labeled A in the illustration.
- After using SST (guide) to settle the seal into the groove, return SST (guide) to its position labeled B in the illustration.



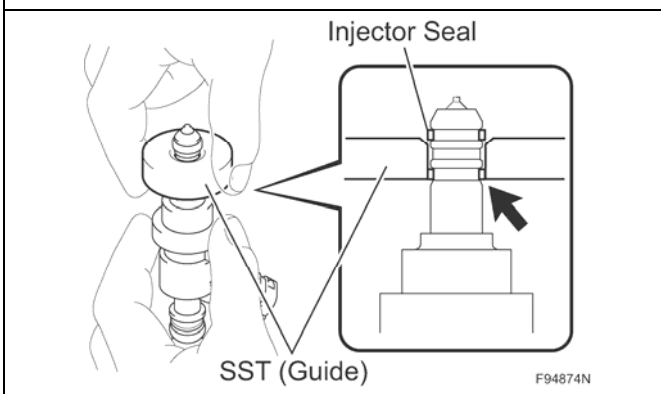
f) Install a **NEW** injector seal to SST (holder).



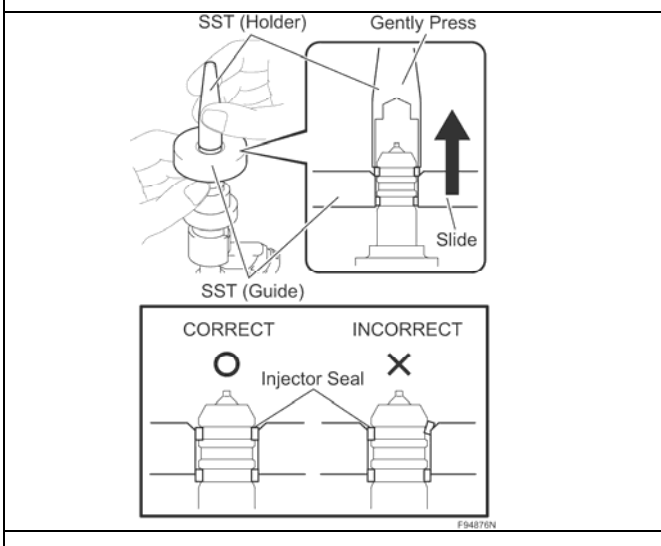
- g) Install a **NEW** injector seal to the injector groove (injector tip side) as shown in the illustration.
- h) Check that the seal covers the circumference of the injector groove as shown in the illustration.

NOTE:

Make sure that the seal does not slip into the welded groove of the injector shown in the illustration. If it does, replace it with a **NEW one.**



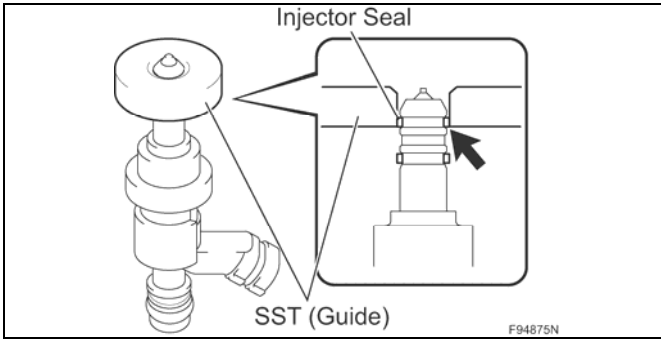
i) Slowly slide SST (guide) towards the tip of the injector. When the injector contact surface of SST (guide) aligns with the seal (injector connector side) as shown in the illustration, hold the position for 5 seconds or more to fully align the seal into the injector groove.



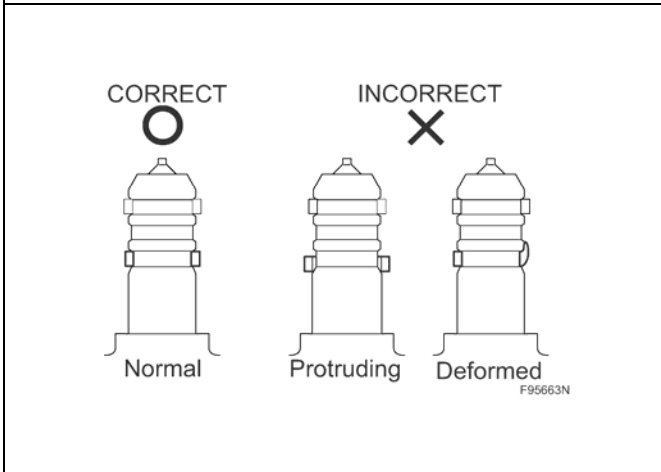
j) Using SST (holder), gently press downward on the injector seal (injector tip side). Then slowly slide SST (guide) towards the injector tip to settle the seal into the injector groove.

NOTE:

Be careful that the seal is not pinched between SST (guide) and the injector groove. Replace the seal if it becomes damaged.



- k) Slowly slide SST (guide) towards the tip of the injector. When the injector contact surface of SST (guide) aligns with the seal (injector tip side) as shown in the illustration, hold the position for 5 seconds or more to fully align the seal into the injector groove.



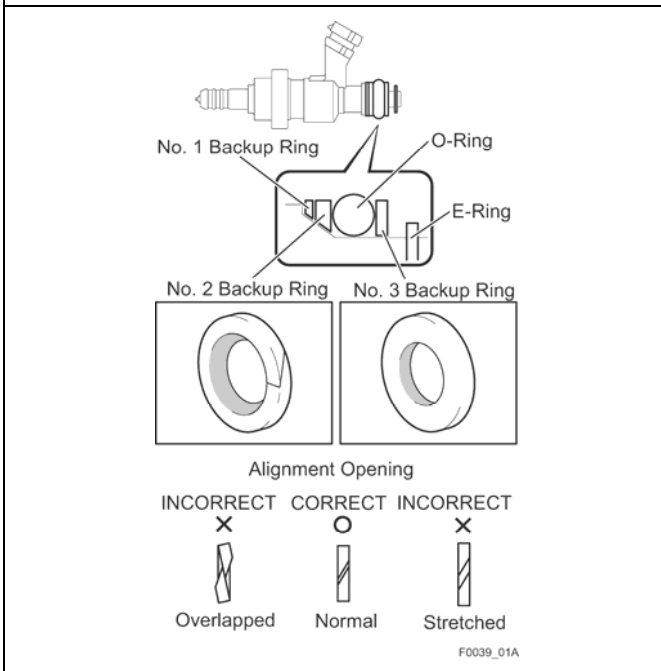
- l) After installing the seals, check that the seal is not scratched, deformed or protruding from the injector groove.

NOTE:

- If the seal is scratched, deformed or protruding from the groove, replace it with a **NEW** one.
- The 2nd seal from the injector tip is partially on a tapered surface so after installation it may slide up to 0.5 mm.

- m) Repeat steps a) ~ k), for the remaining injectors.

10. REPLACE FUEL INJECTOR O-RING, BACKUP RINGS AND E-RING



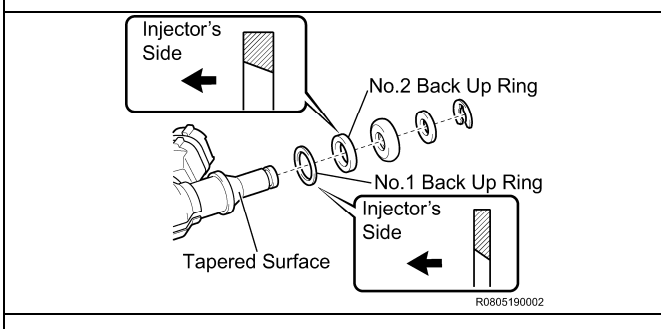
- a) Remove the O-ring, backup rings and E-ring from the fuel injector.
 b) Install a **NEW** O-ring, **NEW** backup rings (No. 1, No. 2, No. 3) and **NEW** E-ring to the fuel injector as shown in the illustration.

NOTE:

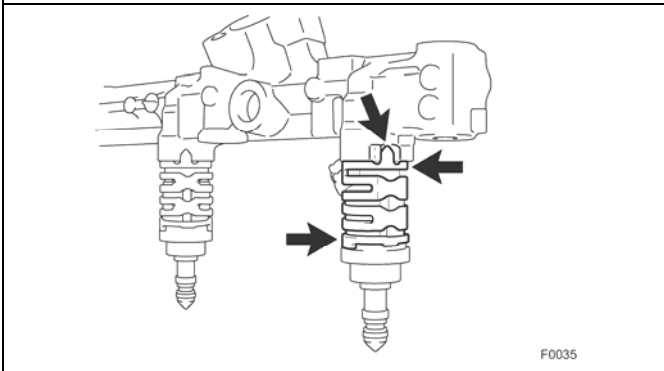
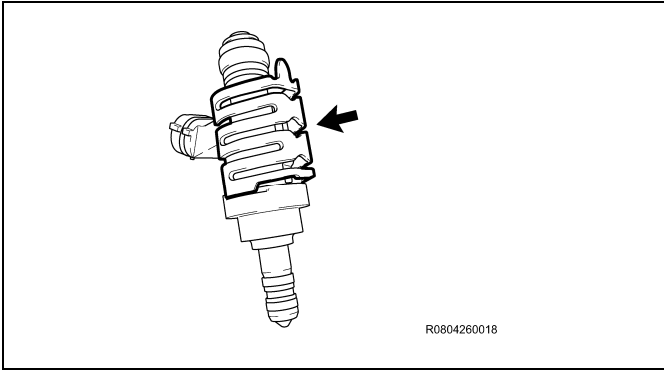
- Check that there is no foreign matter or damaged areas in the injector's O-ring groove.
- Check that the No. 1 and No. 2 backup rings are installed in the correct direction.
- Make sure that the backup rings and O-ring are installed in the correct order.
- Check that the alignment openings of the backup rings are not overlapped or stretched as shown in the illustration.

NOTE:

Align and install the No.1 and No.2 back up rings to the fuel injector's tapered surface.



- c) Repeat steps a) ~ b), and install the 6 O-ring, **NEW** backup rings (No. 1 No. 2, and No. 3) and **NEW** E-ring.



11. INSTALL FUEL INJECTOR ASSEMBLY

- a) Install the injector nozzle holder clamp.
- b) Apply gasoline to the fuel injector's O-ring and into the attachment hole of the fuel delivery pipe.

NOTE:

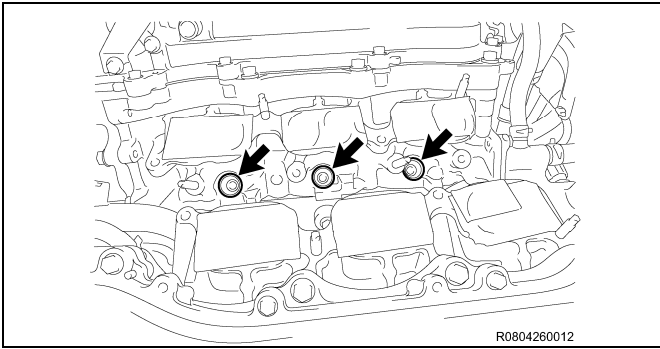
Apply gasoline on both the O-ring and into the attachment hole. Lubricant will run out immediately after insertion if only applied to the O-ring side.

- c) Install the nozzle holder clamp by aligning the protruding part of the clamp to the notch of the delivery pipe.
- d) Repeat steps a) ~ c) for the remaining injectors.

NOTE:

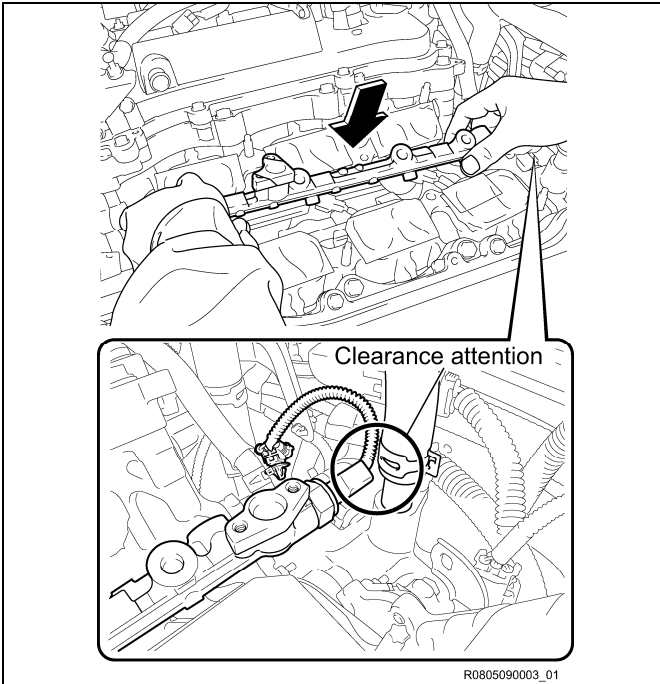
- **Make sure that there is no gap between the delivery pipe and clamp.**
- Check that there is no foreign matter or damage to the injector insertion hole of the delivery pipe.

E. FUEL PIPE INSTALLATION



1. INSTALL NO. 1 FUEL DELIVERY PIPE

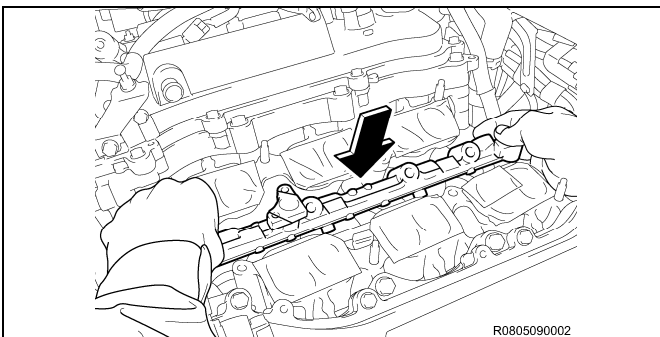
- a) Install 3 **NEW** injector vibration insulators to the cylinder head.
- b) Apply lubricant to the installation hole of the injector.



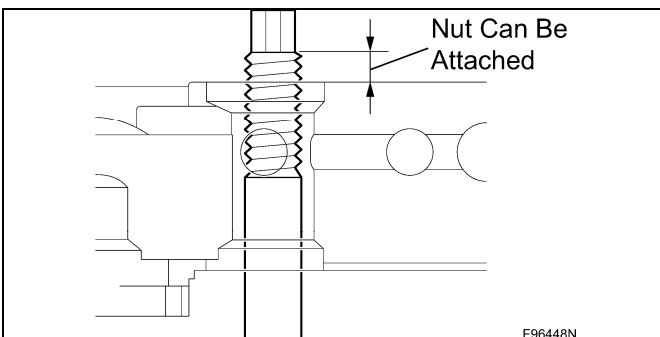
- c) While gently raising the front of the delivery pipe, carefully insert the fuel delivery pipe on to the cylinder head's stud bolts. Do not allow the fuel pressure sensor and heater hose come in contact.

NOTE:

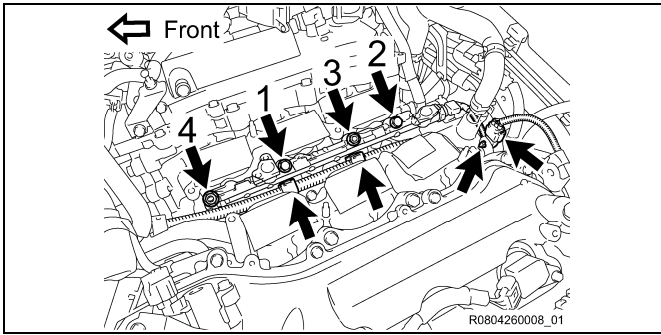
- If an injector is dropped or the tips of the injectors are struck, replace it with a **NEW** one.
- Check that there is no foreign matter or damage to the injector insertion hole of the delivery pipe.
- When inserting the fuel delivery pipe, push it in evenly without tilting it.



- d) Align the delivery pipe's attachment holes with the stud bolts and install the delivery pipe without letting the fuel pressure sensor and heater hose come in contact.
- e) Connect the 3 electrical fuel injector connectors.



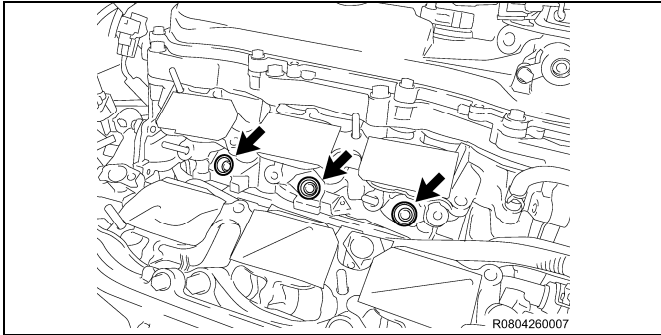
- f) Install the fuel delivery pipe until the screw threads protrude enough so that a nut can be attached.



- g) Install the fuel delivery pipe by uniformly tightening the 2 bolts and 2 nuts in several passes in the order shown in the illustration.

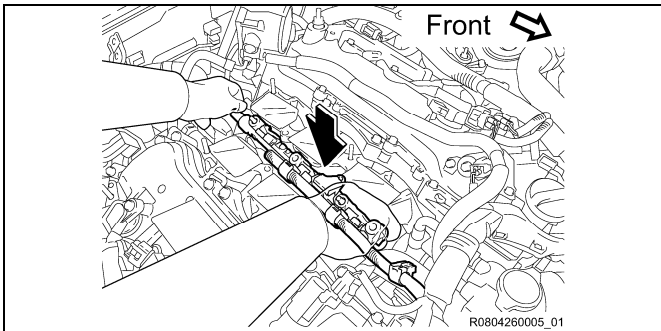
Torque Specification:
26 N·m (265 kgf·cm, 19 ft·lbf)

- h) Connect the fuel pressure sensor connector and wire harness clamps.



2. INSTALL NO. 2 FUEL DELIVERY PIPE

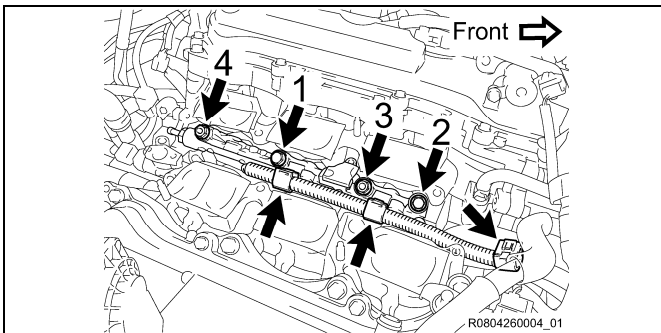
- a) Install 3 **NEW** injector vibration insulators to the cylinder head.
 b) Apply lubricant to the installation holes of the injectors.
 c) Connect the 3 electrical fuel injector connectors.



- d) Install the fuel delivery pipe until the screw threads protrude enough so that a nut can be attached.

NOTE:

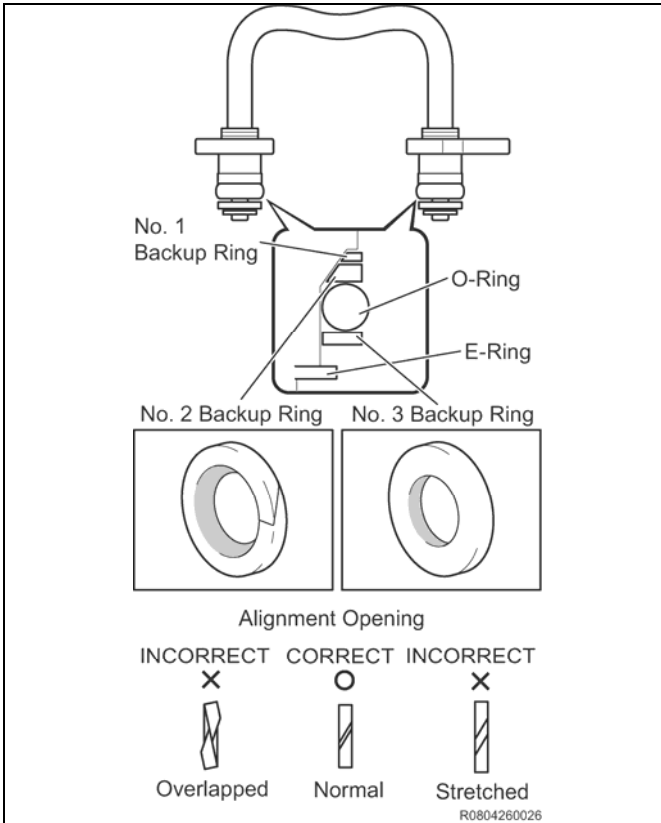
- If an injector is dropped or the tips of the injectors are struck, replace it with a **NEW** one.
- When inserting the fuel delivery pipe, push it in evenly without tilting it.



- e) Reinstall the fuel delivery pipe by uniformly tightening the 2 bolts and 2 nuts in several passes in the order shown in the illustration.

Torque Specification:
26 N·m (265 kgf·cm, 19 ft·lbf)

- f) Connect the 3 wire harness clamps to the fuel delivery pipe.

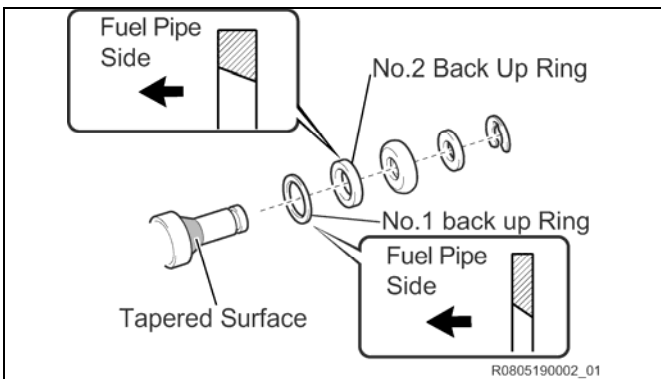


3. REINSTALL NO. 3 FUEL PIPE

- Remove the O-ring, backup rings and E-ring from the No. 3 fuel pipe.
- Install a **NEW** O-ring, **NEW** backup rings (No. 1 No. 2, and No. 3) and **NEW** E-ring to the fuel injector as shown in the illustration.

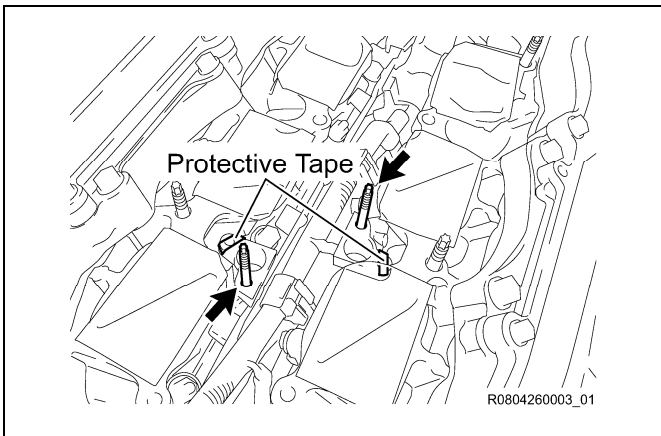
NOTE:

- Check that there is no foreign matter or damaged areas in the injector's O-ring groove.
- Check that the No. 1 and No. 2 backup rings are installed in the correct direction.
- Make sure that the backup rings and O-ring are installed in the correct order.
- Check that the alignment openings of the backup rings are not overlapped or stretched as shown in the illustration.
- After installing the O-ring, check that it is not contaminated with foreign matter and is not damaged.



NOTE:

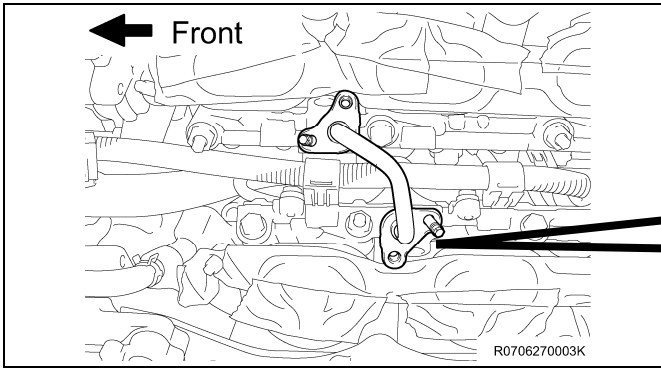
Align and install the No.1 and No.2 back up rings to the No. 3 fuel pipe's tapered surface.



- Hand tighten the 2 stud bolts to the delivery pipe bolt attachment holes diagonally as illustrated. (torx® side up)
- Place protective tape over screw holes without stud bolts to prevent lubricant from entering.
- Apply gasoline to the No. 3 fuel pipe's O-ring and into the attachment hole of the delivery pipe's No. 3 fuel pipe.

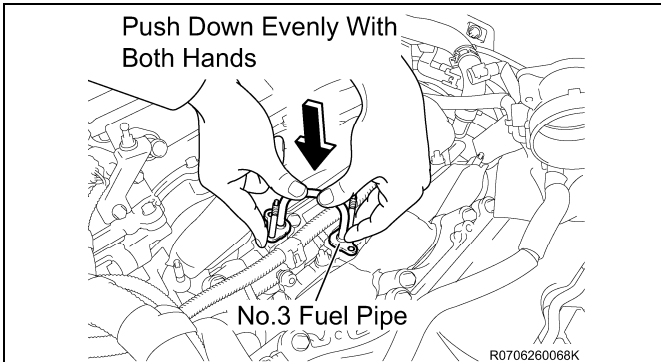
NOTE:

- Failure to lubricate both o-ring and attachment hole, may damage the seal.



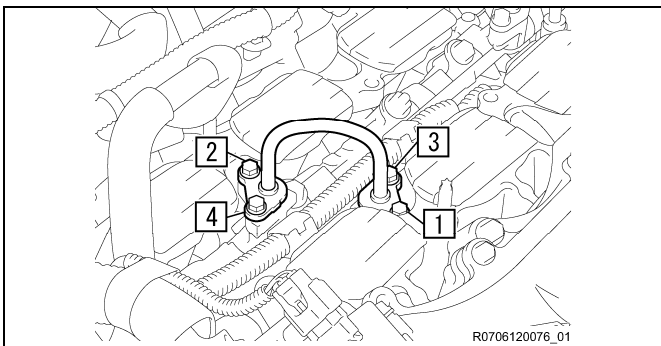
- f) Remove the protective tape and clean the delivery pipe attachment surface.
- g) Insert the 2 stud bolts through the No. 3 fuel pipe.

NOTE:
Be Careful of the Direction for Pipe No. 3.
(Attaching the pipe backwards will interfere with the intake manifold.)



- h) Press the fuel pipe and delivery pipe together by hand until there is no gap between them.
- i) Remove the 2 stud bolts once the pipes are together.

NOTE:
 Shifting the pipe too widely to the left and right may damage the part which may lead to a fuel leak.



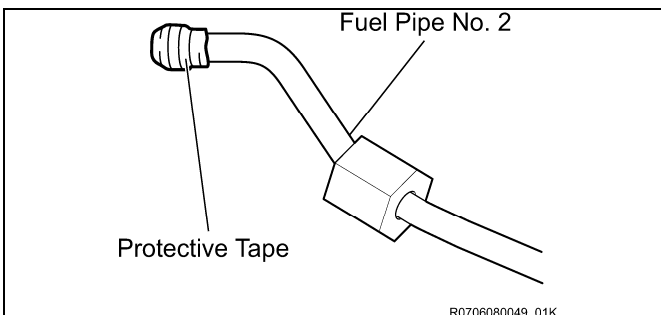
- j) Clean the screw holes of dirt and gasoline, and then insert and tighten the 4 bolts in the order shown in the illustration.

Torque Specification:
10 N·m (102 kgf·cm, 7 ft·lbf)

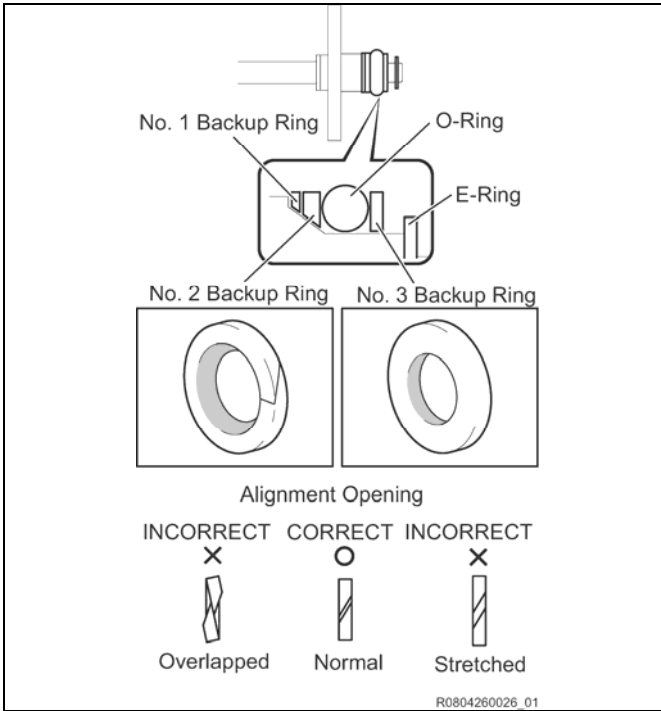
4. INSTALL NO. 2 FUEL PIPE



WHEN REINSTALLING FUEL PIPE NO. 2 AND THE FUEL PUMP, FOLLOW THE TEMPORARY INSTALLATION, TIGHTENING AND OTHER PROCEDURES SHOWN TO PREVENT DAMAGE TO ALL SEALING SURFACES.



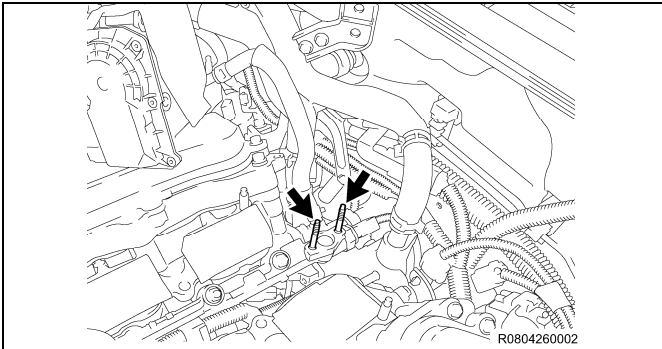
- a) Place protective tape over the taper section of the No.2 fuel pipe's fuel pump to prevent damage.



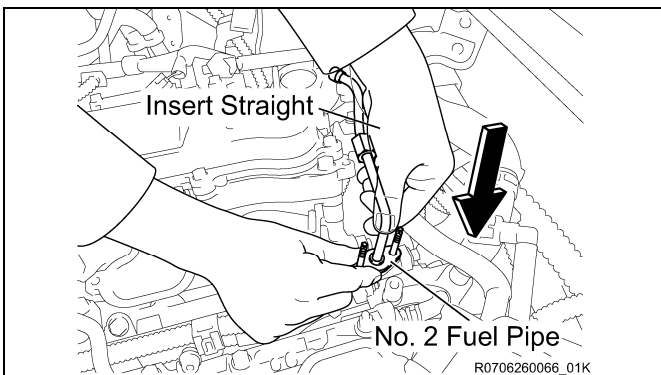
- b) Remove the O-ring, backup rings and E-ring from the No. 2 fuel pipe.
- c) Install a **NEW** O-ring, **NEW** backup rings (No. 1 No. 2, and No. 3) and **NEW** E-ring to the fuel injector as shown in the illustration.

NOTE:

- Check that the No. 1 and No. 2 backup rings are installed in the correct direction.
- Make sure that the backup rings and O-ring are installed in the correct order.
- Check that the alignment openings of the backup rings are not overlapped or stretched as shown in the illustration.
- After installing the O-ring, check that it is not contaminated with foreign matter and is not damaged.
- Check that the No. 3 fuel pipe installation end is not contaminated with foreign matter and is not damaged.



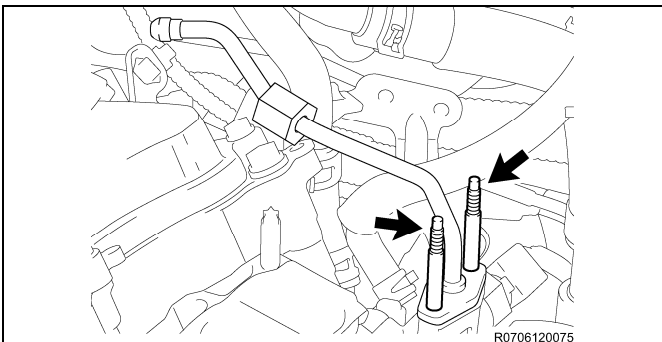
- d) Hand tighten the 2 stud bolts in the delivery pipe's bolt attachment holes. (torx® side up)



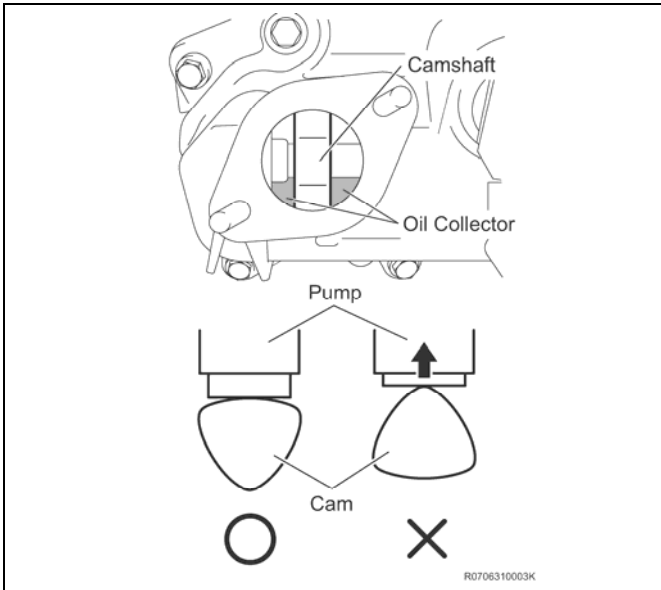
- e) Apply gasoline to the No. 2 fuel pipe's O-ring and into the attachment hole of the delivery pipe's No. 3 fuel pipe.
- f) Press the fuel pipe and delivery pipe together by hand until there is no gap between them.

NOTE:

- Apply gasoline on both the O-ring and into the attachment hole. Lubricant will run out immediately after insertion if only applied to the O-ring side.



- g) Remove the 2 stud bolts.
- h) Reinstall the 2 bolts but do not torque yet.

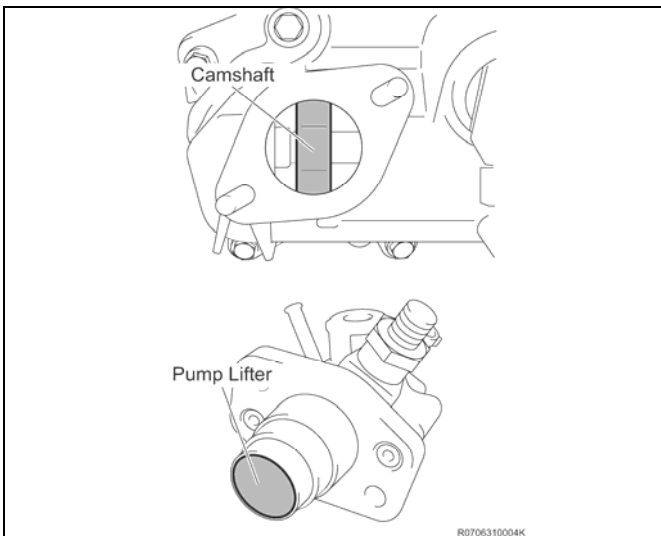


- i) Turn the crankshaft until the flat of the cam is facing the cylinder head cover's fuel pump attachment hole, as shown in the illustration.

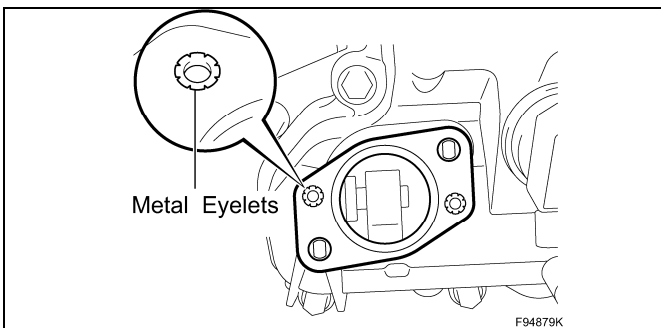
NOTE:

When installing the fuel pump by following the procedure described above: By not using the camshaft pointed side to push up the pump activation surface, it is easier to install the fuel pump and No. 2 fuel pipe later.

- j) Pour 30 cc of engine oil through the cylinder head cover's fuel pump attachment hole into the cylinder head oil collector.



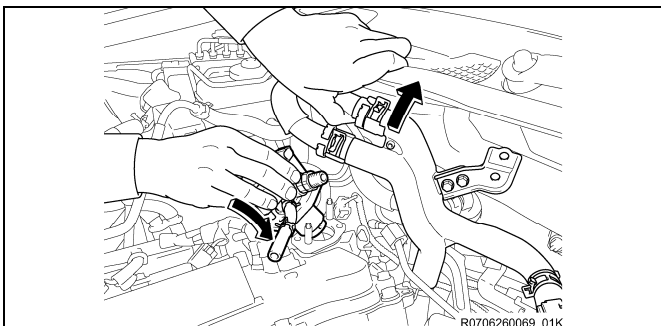
- k) Apply a coat of engine oil to the pump activation cam and pump lifter part.



- l) Install a **NEW** fuel pump insulator to the cylinder head cover.

NOTE:

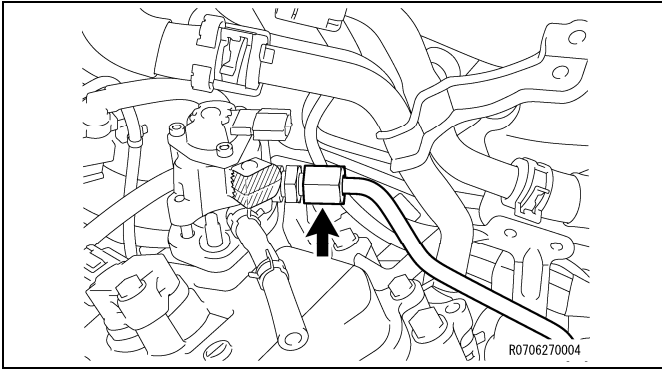
• **Install the insulator so that the open sides of the metal eyelets are facing outward, as shown in the illustration.**



- m) Reinstall the fuel pump.

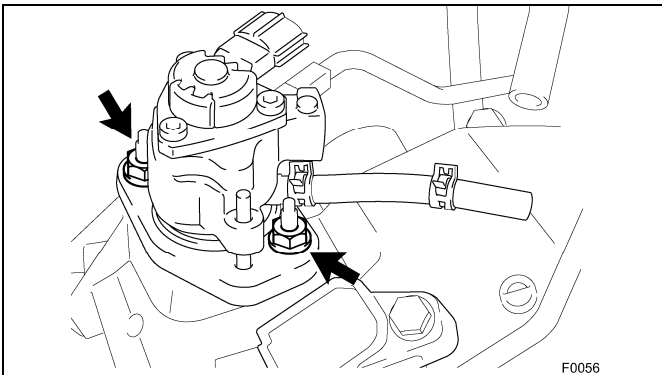
NOTE:

Do not apply excessive force to the heater hose and coolant pipe.



- n) Remove the Protective tape.
- o) Loosely install the No. 2 fuel pipe sub-assembly to the fuel pump assembly.

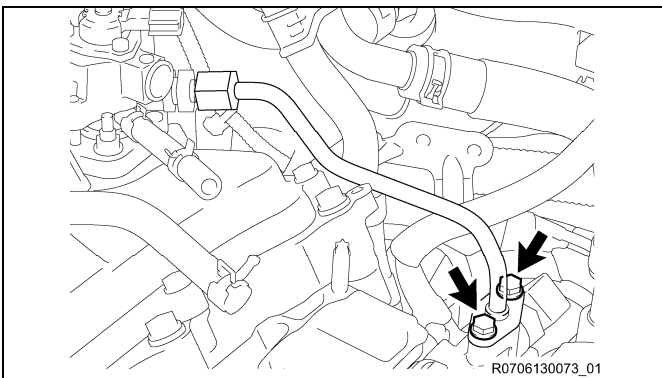
NOTE:
 Be careful not to damage the sealing surface of the fuel pipe when temporarily installing the fuel pipe.



- p) Install the 2 nuts and tighten them in several passes.

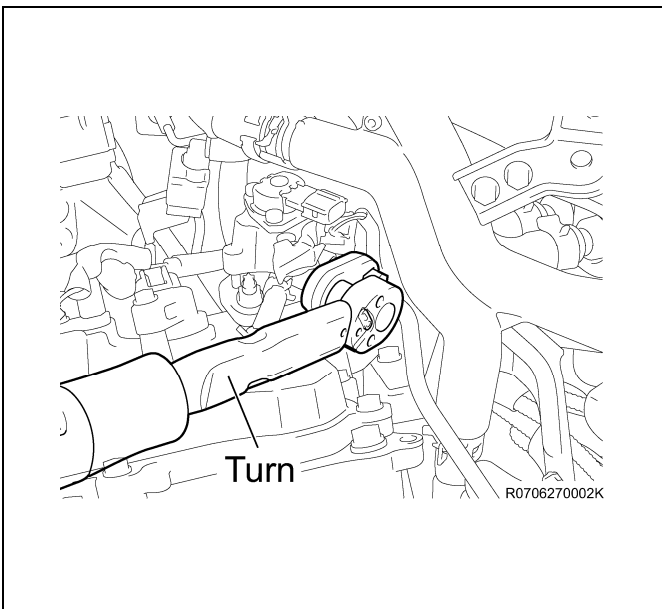
Torque Specification:
 25 N·m (255 kgf·cm, 18 ft·lbf)

5. RECONNECT NO. 2 FUEL PIPE



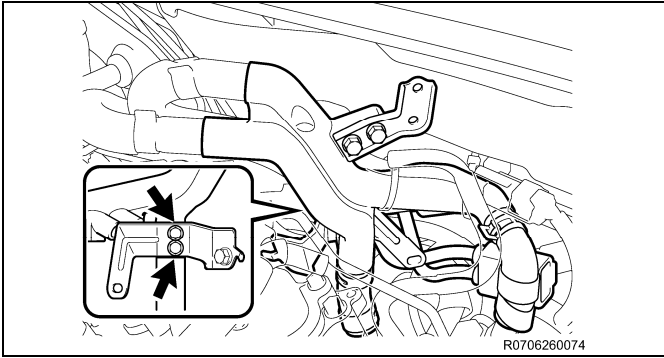
- a) Torque the 2 fuel pipe bolts.

Torque Specification:
 10 N·m (102 kgf·cm, 7 ft·lbf)



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

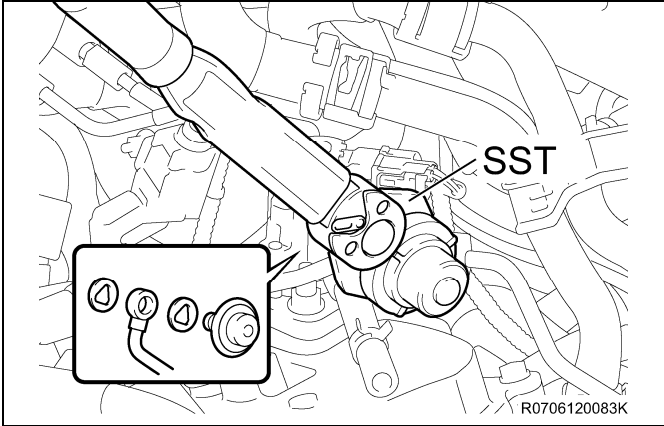
Torque Specification:
 26 N·m (265 kgf·cm, 19 ft·lbf)



**6. REINSTALL WATER HOSE JOINT
(for IS350 2GR-FSE)**

- a) Reinstall the water hose joint with the 2 bolts.

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



**7. REINSTALL FUEL PRESSURE PULSATION
DAMPER**

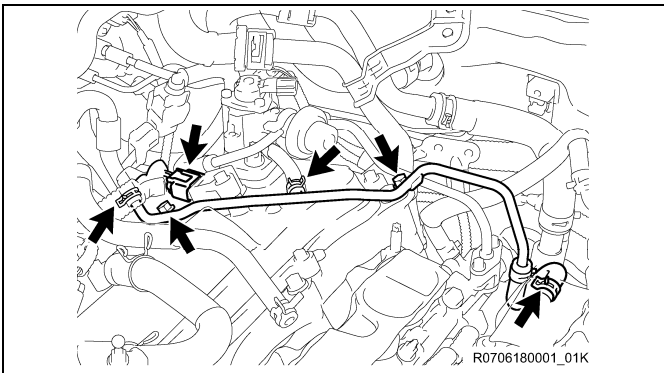
- a) Remove the protective tape and clean the attachment's surface.
- b) Once the 2 **NEW** gaskets and fuel tube have been installed, attach the fuel pressure pulsation damper and tighten by hand.
- c) Use SST to securely tighten the pulsation damper.
- d) Connect the electrical connector to the fuel pump.

SST 09617-24011

NOTE:

Do not use pulsation dampers which have been dropped. Dropped dampers may not work properly.

**Torque Specification:
For Use With SST :
33 N-m (337 kgf-cm, 24 ft-lbf)
For Use Without SST :
40 N-m (408 kgf-cm, 30 ft-lbf)**



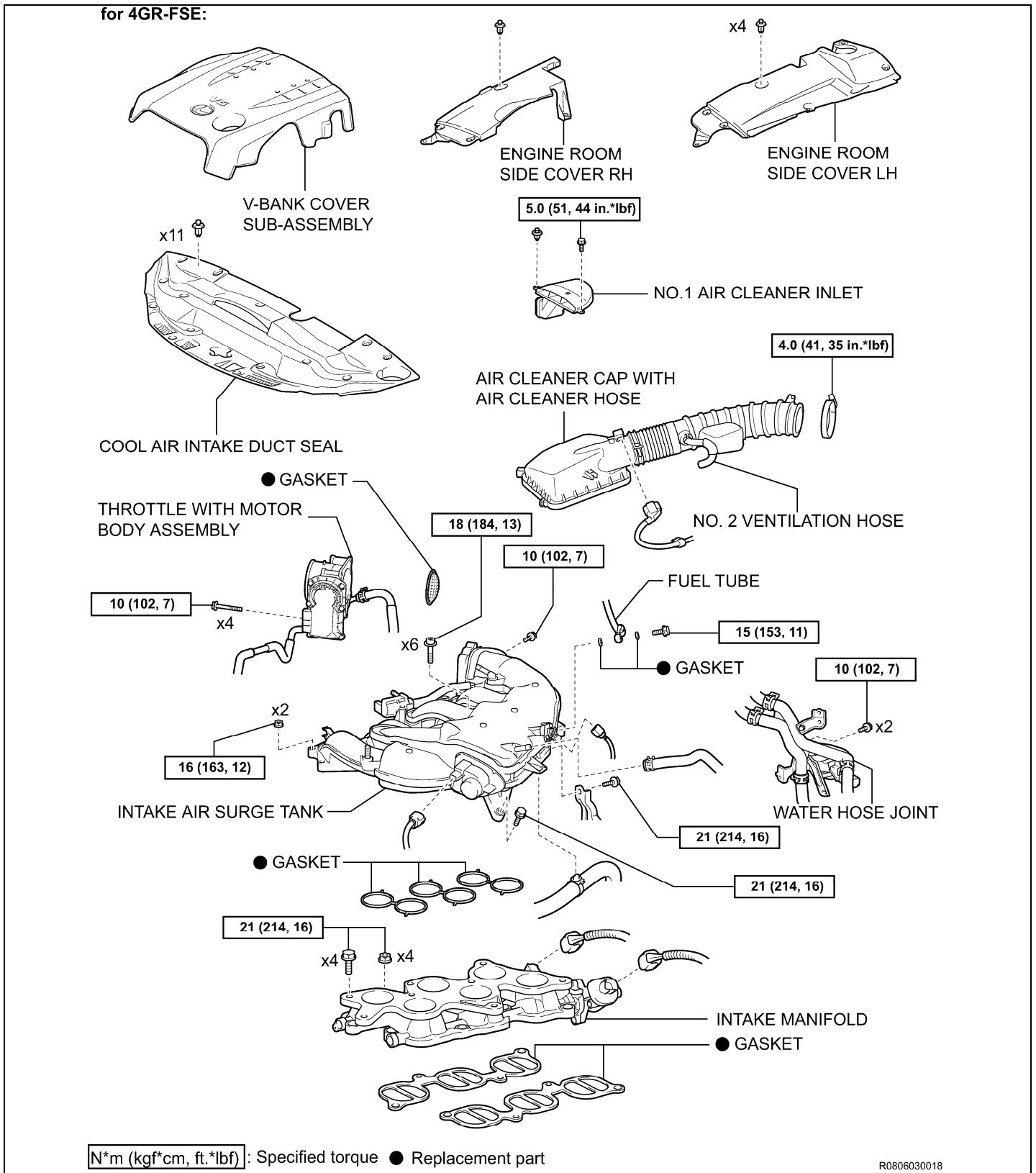
8. REINSTALL NO. 1 FUEL PIPE

- a) Reinstall the fuel pipe with the 2 bolts.

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

- b) Connect the 3 fuel hoses.
- c) Connect the ignition coil connector.

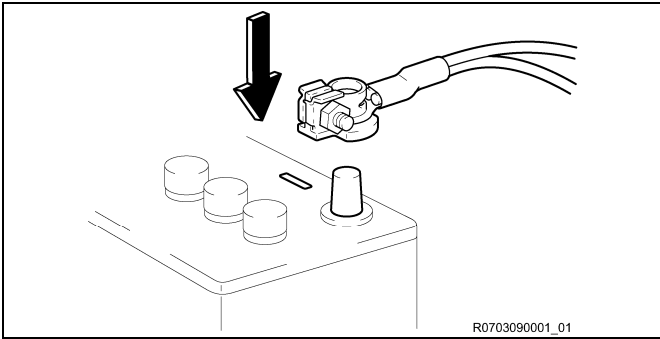
G. IS250 4GR-FSE INTAKE MANIFOLD REINSTALLATION



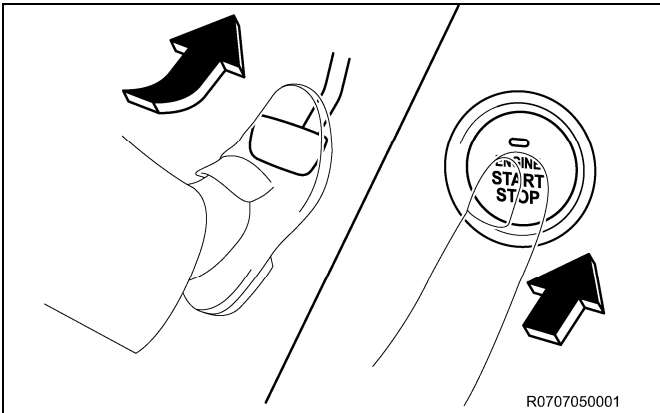
REINSTALL THE COMPONENTS SHOWN IN THE ILLUSTRATION ABOVE. Click link if additional assistance is required:

- [IS250 4GR-FSE FUEL: FUEL INJECTOR: INSTALLATION \(2007 IS250\)](#)

F. CHECK FOR FUEL LEAKS & REASSEMBLY



1. CONNECT THE NEGATIVE (-) BATTERY TERMINAL CABLE



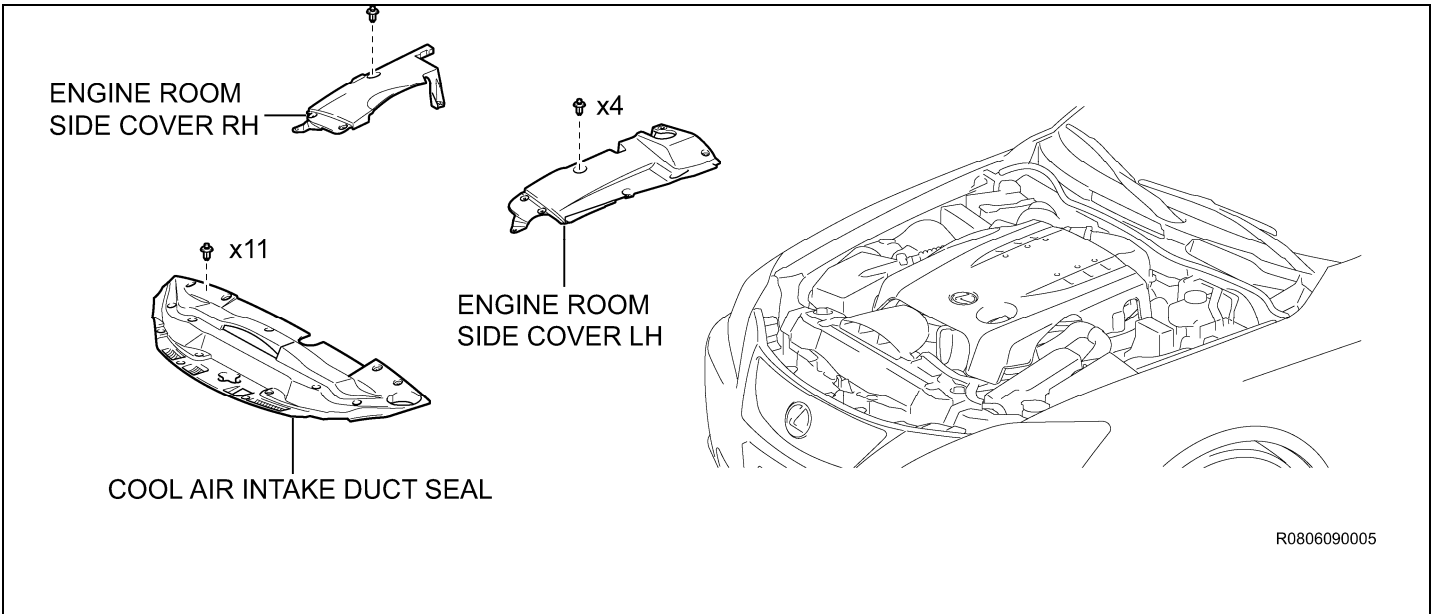
2. CHECK FOR FUEL LEAKS

- Start and then stop the engine after approximately 5 seconds.
- Inspect each part for fuel leakage.
- If there is no fuel leakage found in step (b), restart the engine and re-inspect.

NOTE:

- Cranking alone may not start the high pressure fuel pump solenoid valves used to produce fuel pressure (high pressure).

3. INSTALL ENGINE ROOM COVERS



4. CHECK THROTTLE BODY

- a) Check the throttle control motor operating sounds.
 - 1) Push the engine switch on.
 - 2) 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.

- b) Check the throttle position sensor.
 - 1) Connect the techstream to the DLC3.
 - 2) Push the engine switch on.
 - 3) Depress the accelerator pedal. When the value is fully opened, check that the value of the "Throttle Sensor Position" is within the specification.

Standard throttle valve opening percentage: 60% or more.

NOTE:

- **When checking the standard throttle valve opening percentage, the shift should be in the N position.**
- **If the percentage is less than 60%, replace the throttle body.**

5. CHECK FOR DTC

- a) If an error code displays, repair as necessary.

6. TEST DRIVE

- a) Test drive the vehicle and inspect for any abnormalities. (warning lamps, drivability, etc.)

7. PERFORM INITIALIZATIONS

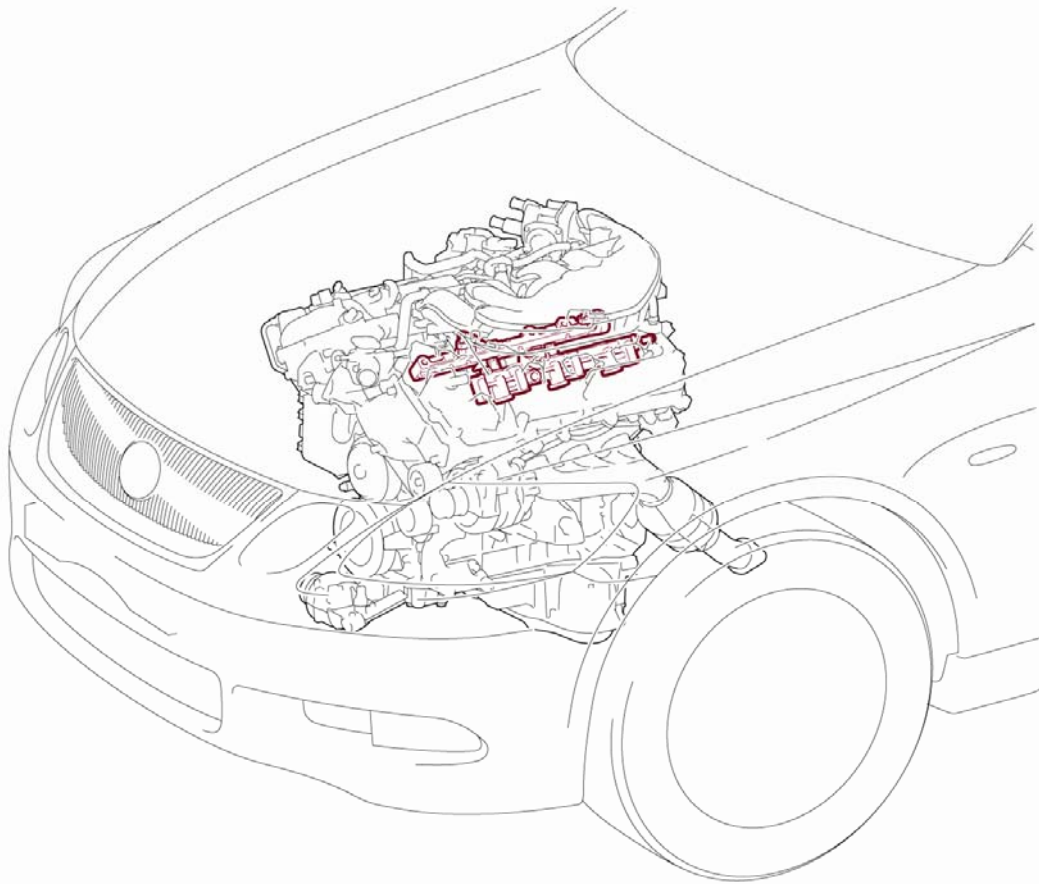
INITIALIZATION FUNCTION	IS250	IS350
Enter Recorded Presets	Required	Required
Power Window Control System	Required	Required

VII. APPENDIX

A. CAMPAIGN PARTS DISPOSAL

As required by Federal Regulations, please make sure all campaign parts (original parts) removed from the vehicle are disposed of in a manner in which they will not be reused.

TECHNICAL INSTRUCTIONS
FOR
SPECIAL SERVICE CAMPAIGN 9LA
FUEL DELIVERY PIPE REPLACEMENT
2006-2007 GS300/350

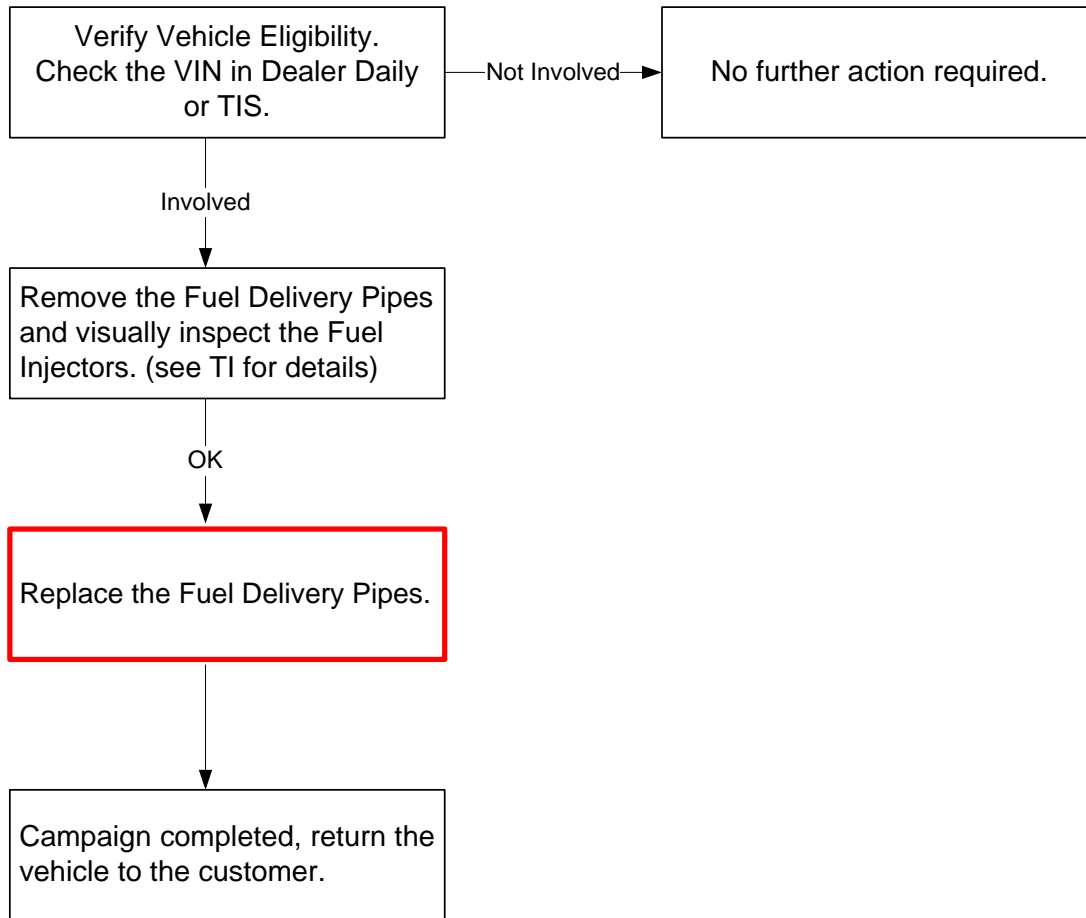


Revised January 26, 2011

TECHNICAL INSTRUCTION REVISION NOTICE:

- **January 26, 2011:**
 - **The Fuel Pressure Sensor torque value on page 32 has been modified.**

I. OPERATION FLOW CHART



II. IDENTIFICATION OF AFFECTED VEHICLES

A. AFFECTED VIN RANGE

Vehicle Model	Year	WMI	VIN Range	
			VDS	Range
GS300	2006	JTH	BH96S	5000028 - 5045859
GS300 AWD	2006		CH96S	0001017 - 0021080
GS350	2007	JTH	BE96S	0007608 - 0028362
GS350 AWD	2007		CE96S	0001838 - 0012689

III. PREPARATION

A. TOOLS

- Standard hand tools
- Torque wrench
- 22 mm union nut wrench
- SST: (non-essential) 09612-24014 (09617-24011)
- SST: Stud Bolt - 04007-32331 (2 stud bolts have been included in each Service Manager's Package.)
- SST: 09260-39015 Injector seal tool set. (02968-03020, 09268-03010) Lexus drawer 1
-

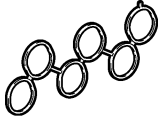
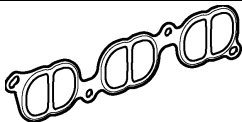

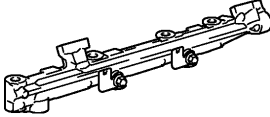
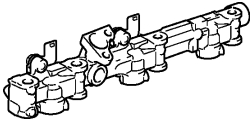
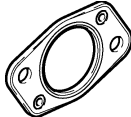
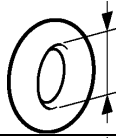
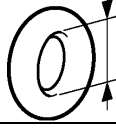

B. EQUIPMENT

- Techstream


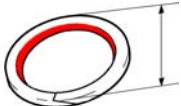

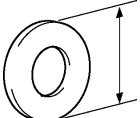
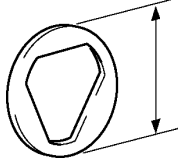
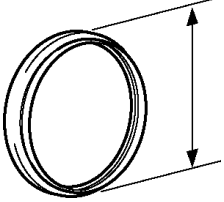
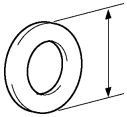
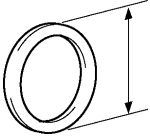
C. MATERIALS

- Protective Tape
- Wooden boards (for clamping purposes)

D. GS 300 PARTS

Model	Part Number	Part Description		Qty
GS 300	04008-18331	Pipe Kit, Fuel Delivery, No. 3		1
<p>The kit listed above includes the following parts:</p> <p>An illustration of the parts replaced and their installation location(s) have been provided. Please reference the tables below and on the next page.</p>				
Part Number	Part Description	Qty	Illustration	Installation Location(s)
17176-31020	Gasket (Air Surge Tank to Intake Manifold)	1		See Page 7
17177-31020	Gasket (No. 1 Intake Manifold to Head)	2		See Page 7
22271-31030	Gasket (Throttle Body)	1		See Page 7
23807-31020	Fuel Delivery Pipe	1		See Pages 9 & 10
23808-31010	No 2 Fuel Delivery Pipe	1		See Pages 9 & 10
<p>The parts listed below are packaged together in a clear plastic bag.</p>				
Part Number	Part Description	Qty	Illustration	Installation Location(s)
23915-46011	Fuel Pump Insulator	1		See Page 9
90301-06016	O-Ring	3		See Page 9
90301-06018	O-Ring	6		See Page 10
90523-05007	E-Ring	9		See Pages 9 & 10

GS 300 PARTS CONTINUED...

The parts listed below are packaged together in a clear plastic bag.				
Part Number	Part Description	Qty	Illustration	Installation Location(s)
23255-31010	Fuel Injector Seal	12	 8.73 mm (0.344 in.)	See Page 10
23256-74010	No.1 Fuel Injector Backup Ring	9	 14.5 mm (0.571 in.) Tapered surface shown in red	See Pages 9 & 10
23257-74010	No.2 Fuel Injector Backup Ring	9	 14.5 mm (0.571 in.) Tapered surface shown in red	See Pages 9 & 10
23258-28011	No.3 Fuel Injector Backup Ring (Flat)	9	 14.4 mm (0.567 in.)	See Pages 9 & 10
23279-74010	Gasket (Fuel Pressure Pulsation Damper)	2	 19.5 mm (0.768 in.)	See Page 9
23291-31011	Injector Vibration Insulator	6	 25.6 mm (1.008 in.)	See Page 10
90430-08014	Gasket (Cold Start Injector)	2	 13 mm (0.512 in.)	See Page 7
90430-12026	Gasket	2	 16 mm (0.630 in.)	See Page 10

Based upon the inspection results you may need to replace the fuel injectors. Please keep all fuel injectors for possible parts recovery and inspections. If requested you will need a fuel injector shipping kit for dealers.

Model	Part No.	Insulator Color	Part Name	Qty/Unit
GS 300	23209-39057-A0* or	Black	Injector Assy, Fuel	6 (if needed)
	23209-39057-B0*	Reddish Brown		

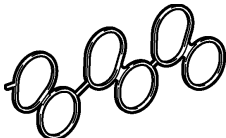
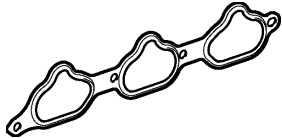

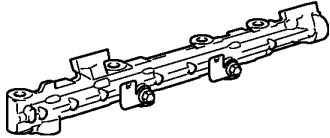
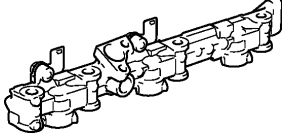
* Either injector listed for the vehicle type may be installed; however, make sure that all injectors installed on the vehicle are the same type. The injector may be identified by the injector insulator color. Please see page 31 for additional information.

E. GS 350 PARTS

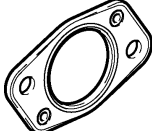
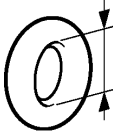
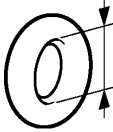
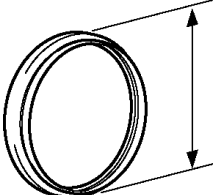
Model	Part Number	Part Description	Qty
GS 350	04008-18231	Pipe Kit, Fuel Delivery, No. 2	1

The kit listed above includes the following parts:


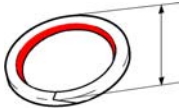

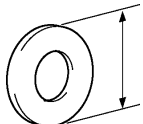
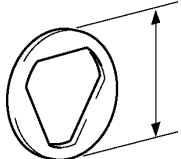
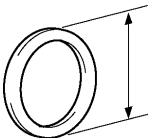

An illustration of the parts replaced and their installation location(s) have been provided. Please reference the tables below and on the next page.

Part Number	Part Description	Qty	Illustration	Installation Location(s)
17176-31060	Gasket (Air Surge Tank to Intake Manifold)	1		See Page 8
17177-31060	Gasket (No. 1 Intake Manifold to Head)	2		See Page 8
22271-31020	Gasket (Throttle Body)	1		See Page 8
23807-31070	Fuel Delivery Pipe	1		See Pages 9 & 10
23808-31020	No 2 Fuel Delivery Pipe	1		See Pages 9 & 10

The parts listed below are packaged together in a clear plastic bag.

Part Number	Part Description	Qty	Illustration	Installation Location(s)
23915-46011	Fuel Pump Insulator	1		See Page 9
90301-06016	O-Ring	3		See Page 9
90301-06018	O-Ring	6		See Page 10
23291-31011	Injector Vibration Insulator	6		See Page 10

GS 350 PARTS CONTINUED...

The parts listed below are packaged together in a clear plastic bag.				
Part Number	Part Description	Qty	Illustration	Installation Location(s)
23255-31010	Fuel Injector Seal	12	 8.73 mm (0.344 in.)	See Page 10
23256-74010	No.1 Fuel Injector Backup Ring	9	 14.5 mm (0.571 in.) Tapered surface shown in red	See Pages 9 & 10
23257-74010	No.2 Fuel Injector Backup Ring	9	 14.5 mm (0.571 in.) Tapered surface shown in red	See Pages 9 & 10
23258-28011	No.3 Fuel Injector Backup Ring (Flat)	9	 14.4 mm (0.567 in.)	See Pages 9 & 10
23279-74010	Gasket (Fuel Pressure Pulsation Damper)	2	 19.5 mm (0.768 in.)	See Page 9
90430-12026	Gasket	2	 16 mm (0.630 in.)	See Page 10
90523-05007	E-Ring	9	 10 mm (0.393 in.)	See Pages 9 & 10

Based upon the inspection results you may need to replace the fuel injectors. Please keep all fuel injectors for possible parts recovery and inspections. If requested you will need a fuel injector shipping kit for dealers.

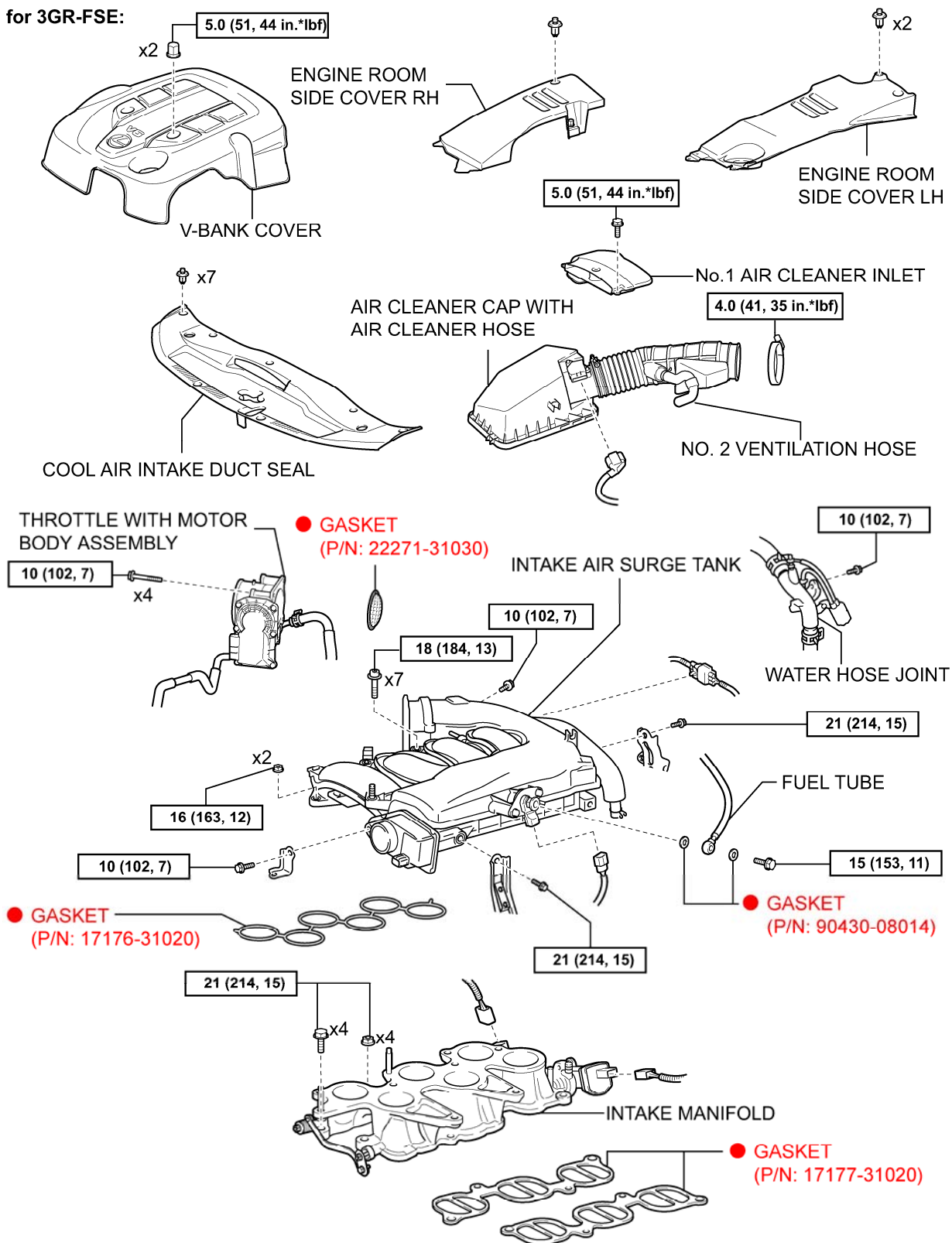
Model	Part No.	Insulator Color	Part Name	Qty/Unit
GS 350	23209-39155-B0* or	Black	Injector Assy, Fuel	6 (if needed)
	23209-39155-C0* or	Reddish Brown		
	23209-39155-D0*	Green		

* Either injector listed for the vehicle type may be installed; however, make sure that all injectors installed on the vehicle are the same type. The injector may be identified by the injector insulator color. Please see page 31 for additional information.

F. PARTS INSTALLATION LOCATION(S)

GS 300 ONLY

for 3GR-FSE:



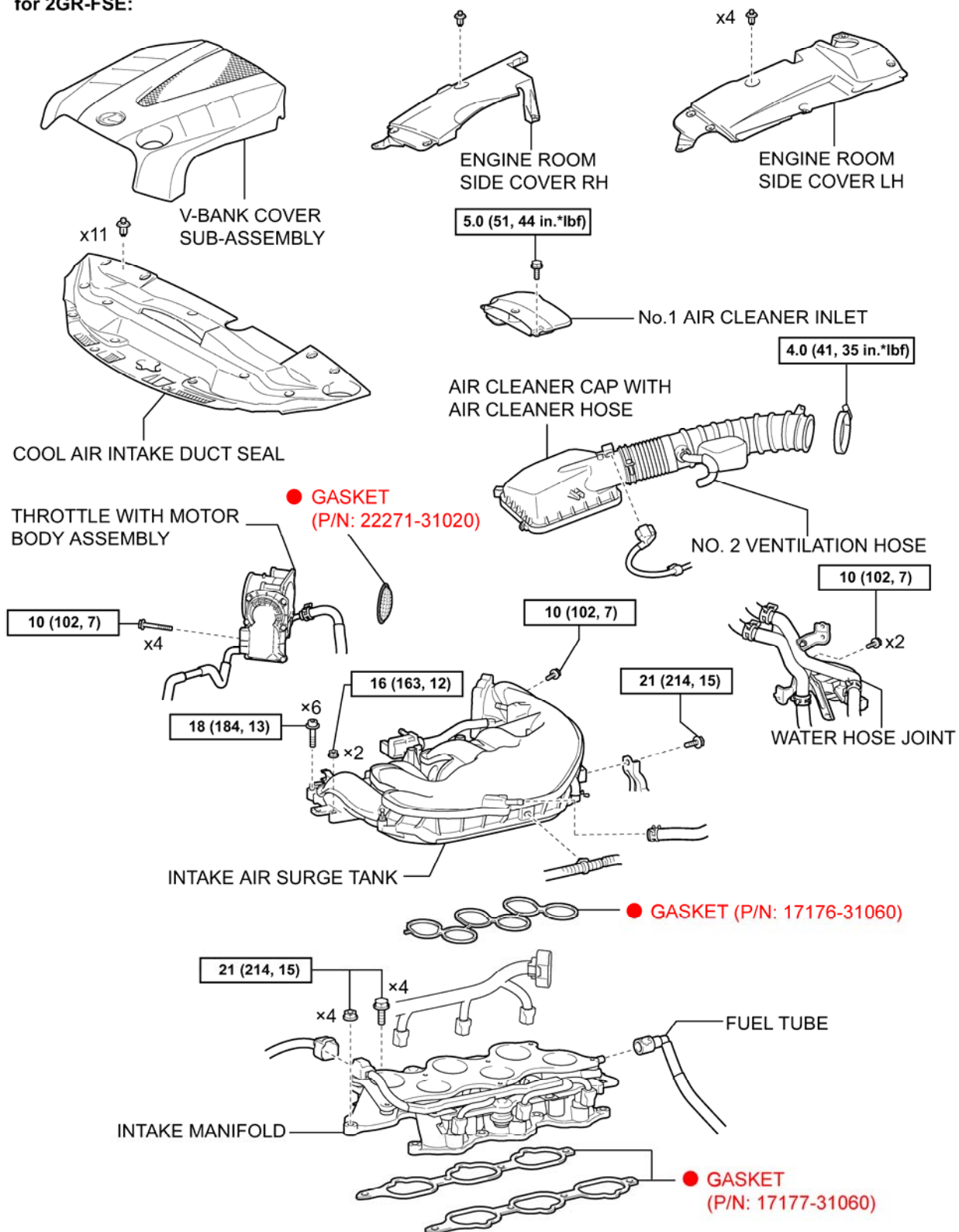
● Replacement Parts

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

PARTS INSTALLATION LOCATION(S) ...

GS 350 ONLY

for 2GR-FSE:

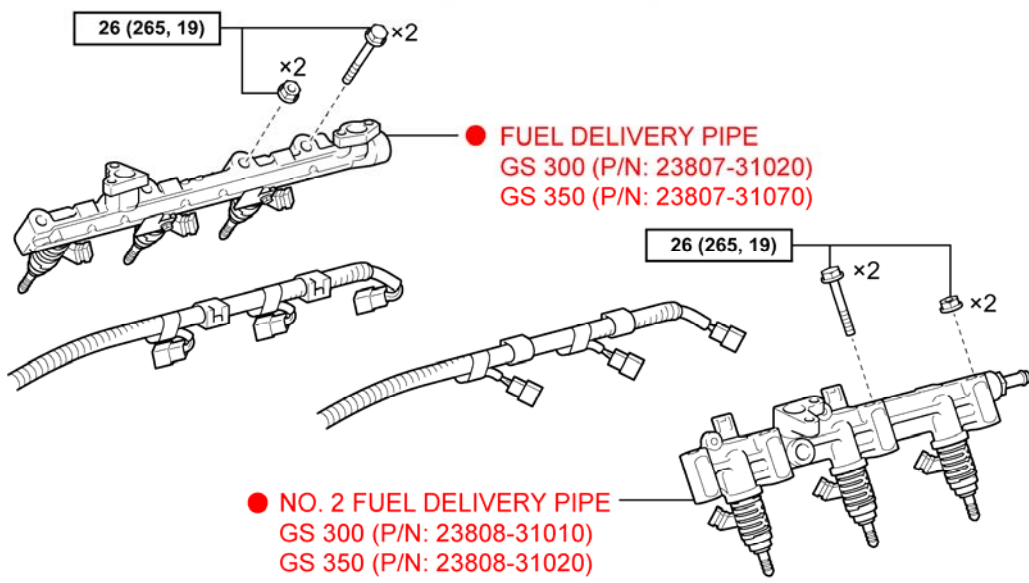
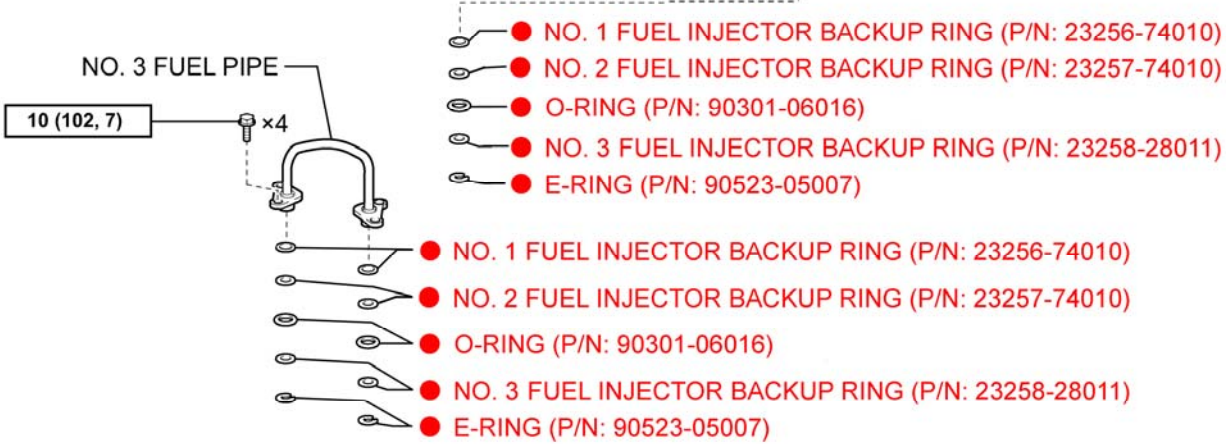
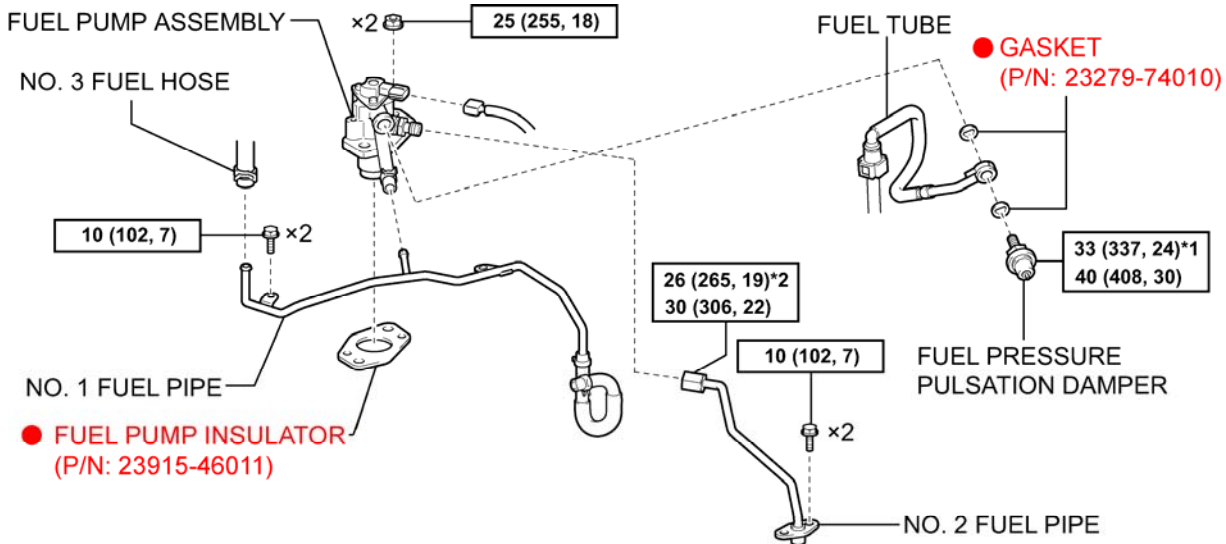


● Replacement Parts

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

*1 For use with union nut wrench 10mm

PARTS INSTALLATION LOCATION(S) ...



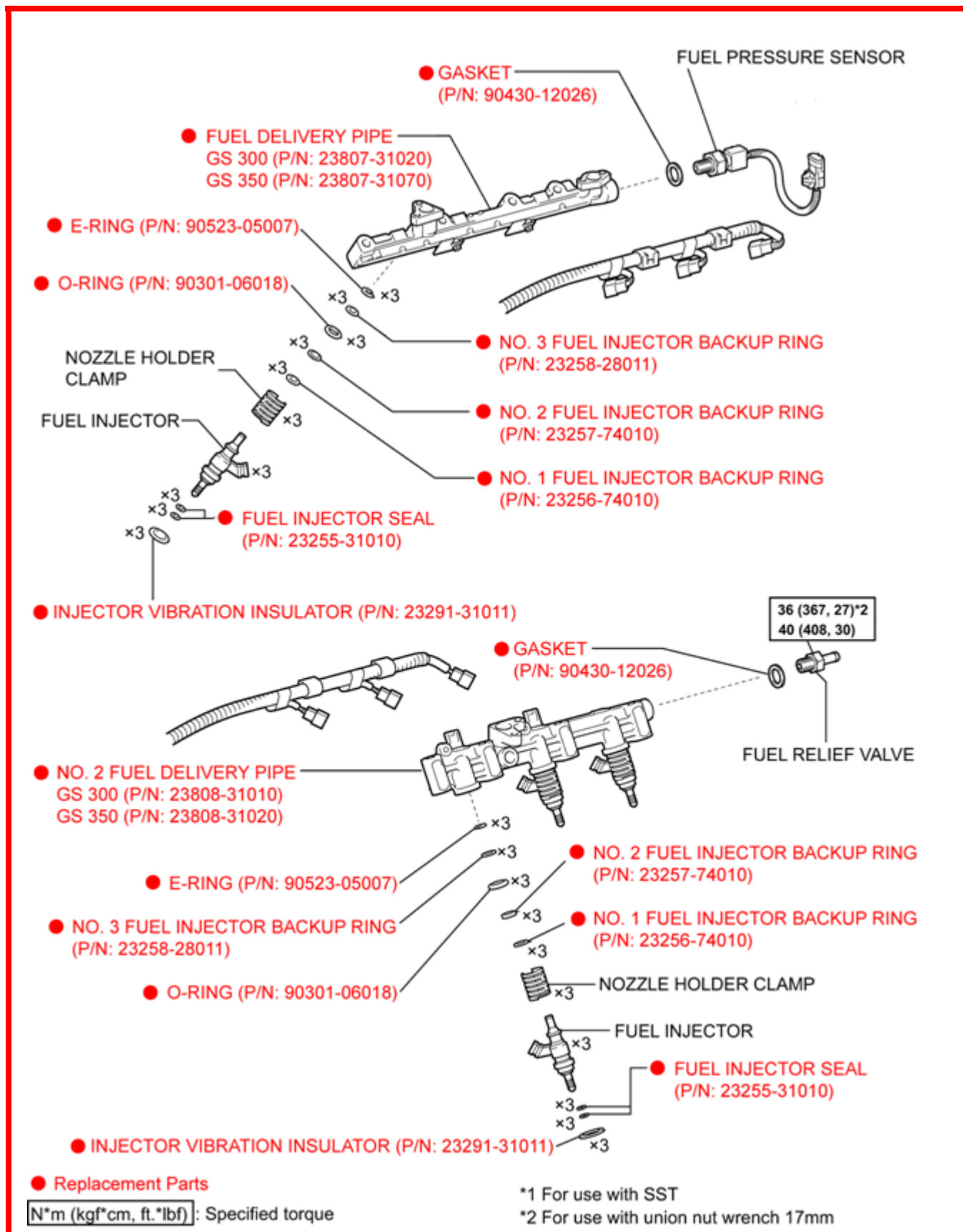
● Replacement Parts

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

*1 For use with SST

*2 For use with union nut wrench 19mm

PARTS INSTALLATION LOCATION(S) ...



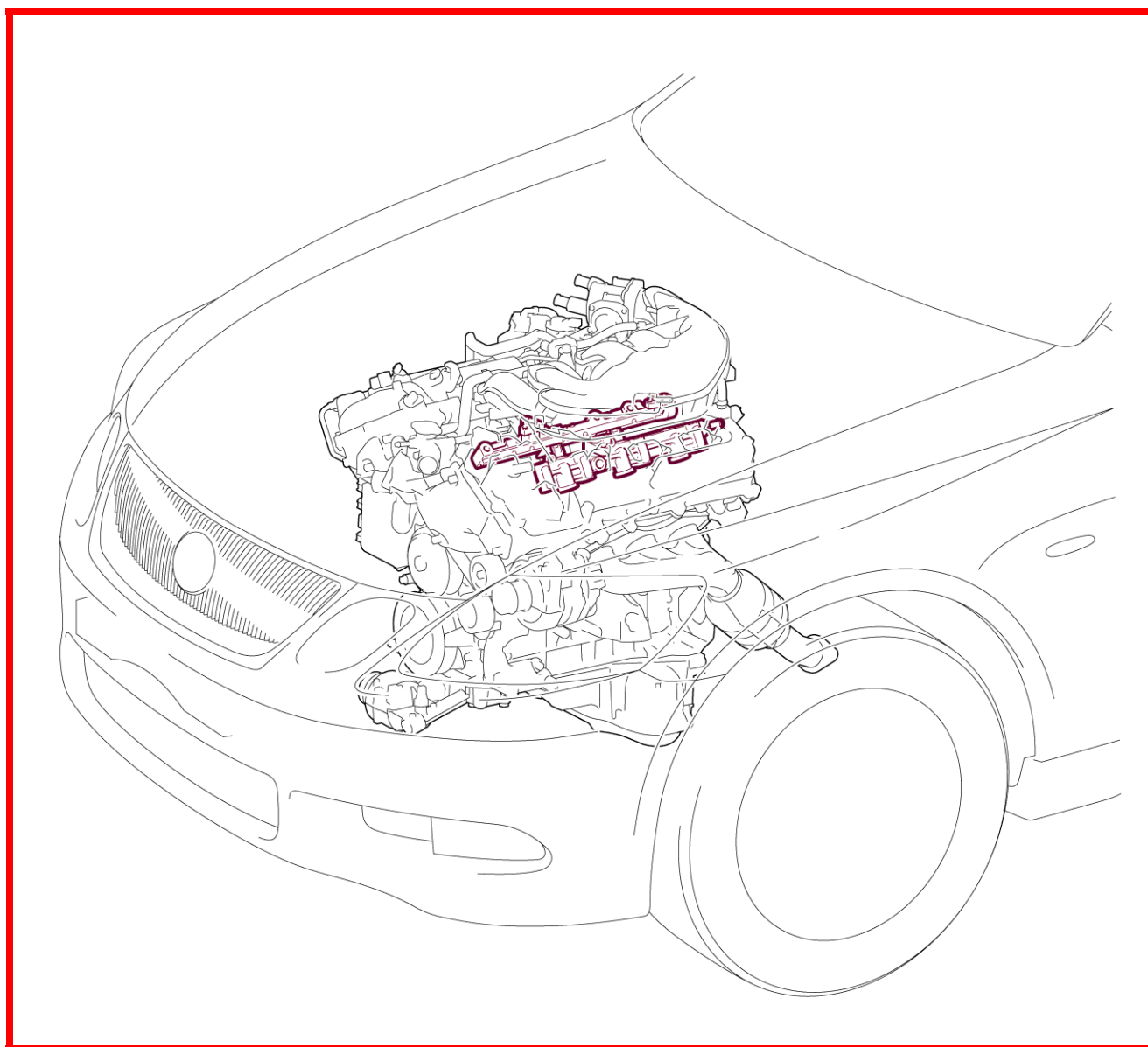
IV. WORK PROCEDURE TABLE OF CONTENTS

Background.....	page 11
Safety Precautions.....	page 12
Fuel Delivery Pipe Replacement.....	page 16
Fuel Injector Inspection.....	page 31
Appendix	page 48

IMPORTANT: Only partial reinstallation steps are included in these Technical Instructions; please reference TIS for additional assistance if needed.

V. BACKGROUND

The involved vehicles are equipped with aluminum Fuel Delivery Pipes (Fuel Rails). Lexus has determined that ethanol fuels with a low moisture content will corrode the internal surface of the fuel rails. As this condition progresses, the engine Malfunction Indicator Light (MIL) may illuminate. Over time, the corrosion will create a pinhole resulting in fuel leakage.



WORK PROCEDURE

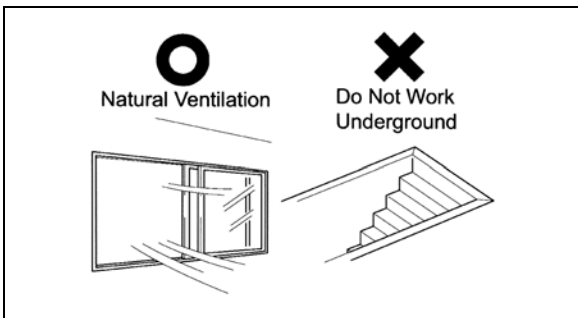
VI. SAFETY PRECAUTIONS

A. PRECAUTIONS WHEN WORKING ON THE FUEL SYSTEM



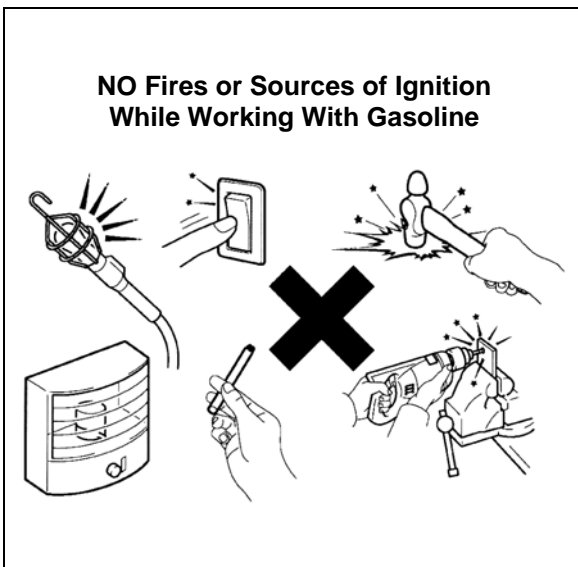
- ALWAYS REMEMBER “**SAFETY FIRST**”.
- IMMEDIATELY WIPE UP ANY SPILLED FUEL.
- BE EXTREMELY CAREFUL WHEN HANDLING FUEL TO PREVENT FIRES FROM OCCURRING.
- BEFORE REMOVING ANY FUEL SYSTEM PART, DRAIN ALL FUEL TO PREVENT SPILLING.
- BEFORE WORKING ON THE FUEL SYSTEM, PERFORM THE FOLLOWING SAFETY CHECK LIST.

B. SAFETY CHECKLIST



B. AIR VENTILATION

- Perform work in a well ventilated area.
- DO NOT** work underground or in an area where fuel vapors may fill the room due to poor ventilation.
- Quickly clean up any spilled fuel with a dry cloth and dissipate the fuel vapors.
- Dry all cloths that have come in contact with fuel in a well ventilated area and dispose of them properly (according to applicable local regulations).



C. FIRES AND IGNITION SOURCES ARE STRICTLY PROHIBITED

- Fires and ignition sources are prohibited while working on the fuel system.
- Clearly display the sign found on the next page stating “**WORKING WITH GASOLINE, NO FIRES OR IGNITION SOURCES**”.
- Smoking is prohibited near the work area.
- DO NOT** work in areas where there are welders, grinders, drills, electric motors, heaters, etc.
- DO NOT** use work lamps or any other electrical appliance due to the risk of sparks flying from the power switch or a rise in temperature.
- DO NOT** use metal hammers while working, due to the risk of flying sparks.
- DO NOT** start any engine or perform any of the above in neighboring work bays.

D. FIRE EXTINGUISHER

- Have a fire extinguisher ready and available before beginning work.



E. PREVENT STATIC ELECTRICITY

- To help prevent static electricity, lightly wet the floor with water, but not to the point where it creates a hazardous working condition.
- Place appropriate warning cones or stand signs around the area as a caution.

■ Copy And Display When Working

**WORKING WITH
GASOLINE**

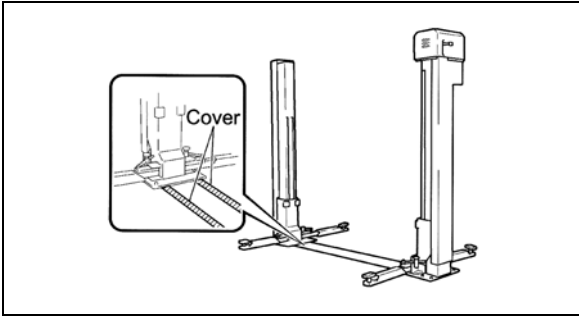
**NO FIRES
NO IGNITION
SOURCES**

Supervisor

- Copiar y exhibir al trabajar

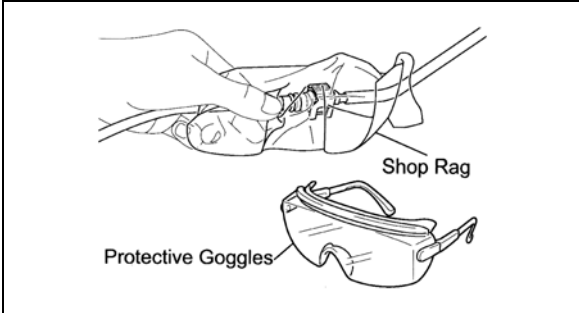
**TRABAJANDO CON
GASOLINA
NINGÚN INCENDIOS
NINGUNA FUENTE
DE IGNICIÓN**

Supervisor



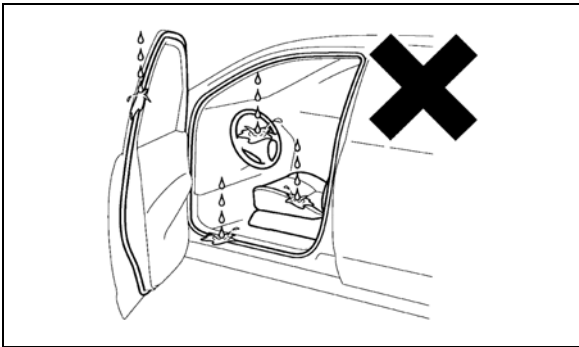
F. PRECAUTIONS WHEN USING A LIFT

- For bays equipped with auto lifts, cover all access cover joints with duct tape.
- In the event that fuel has leaked inside the auto lift, remove the access cover and clean up any spilled fuel. Dissipate fuel vapors until the smell is gone.



G. PREVENT THE FUEL FROM SPRAYING

- When disconnecting any fuel pipes or connectors there may still be some pressure remaining, even after discharging the system. To prevent the fuel from spraying, cover the pipe with a shop rag before disconnecting.
- Remember to always wear protective goggles especially when disconnecting fuel pipes.

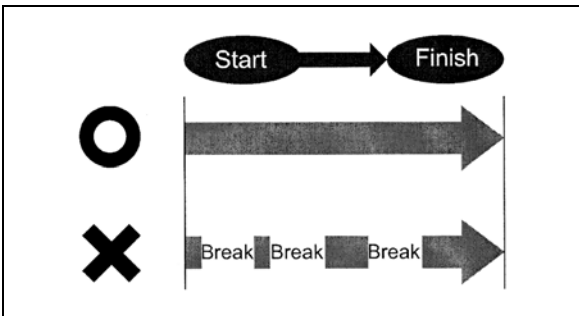


H. PREVENT THE FUEL FROM CONTACTING OTHER PARTS

- Do not allow the fuel to come in contact with any parts made of rubber or leather.

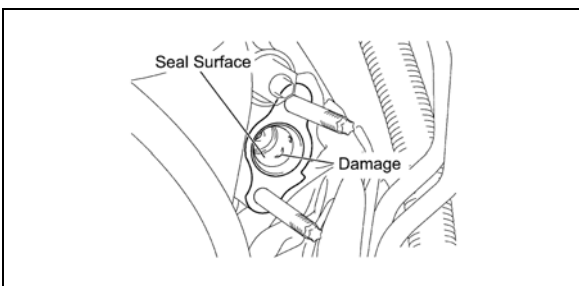
I. ASSIGN A SAFETY SUPERVISOR

- Assign a safety supervisor to be in charge of all safety precautions and fire hazards around the work area.



J. WORK SCHEDULING

- Work must be completed the same day.
- As a general rule, do not stop work midway. If work must stop midway, inform your safety supervisor.

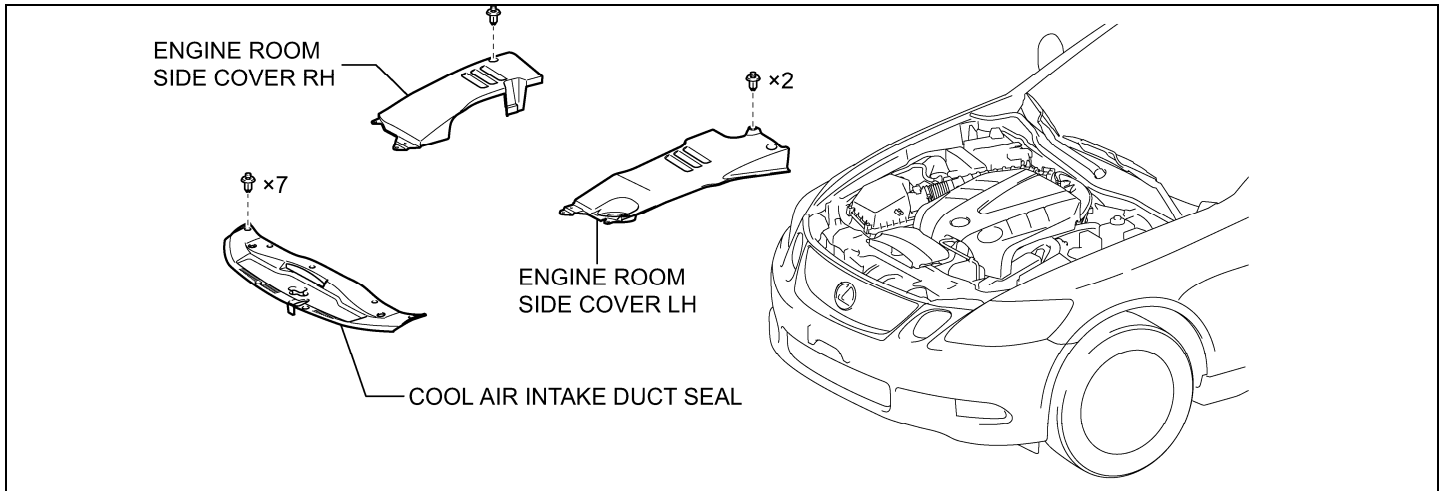


K. WHEN CONNECTING THE FUEL PIPE

- Any amount of damage or small foreign object (dust, a piece of thread, rust, etc.) may cause a fuel leak. Be thorough when inspecting and cleaning the fuel pipes and seal surface areas.

VII. FUEL DELIVERY PIPE REPLACEMENT

A. REMOVE THE ENGINE COVERS AND DISCHARGE THE FUEL SYSTEM

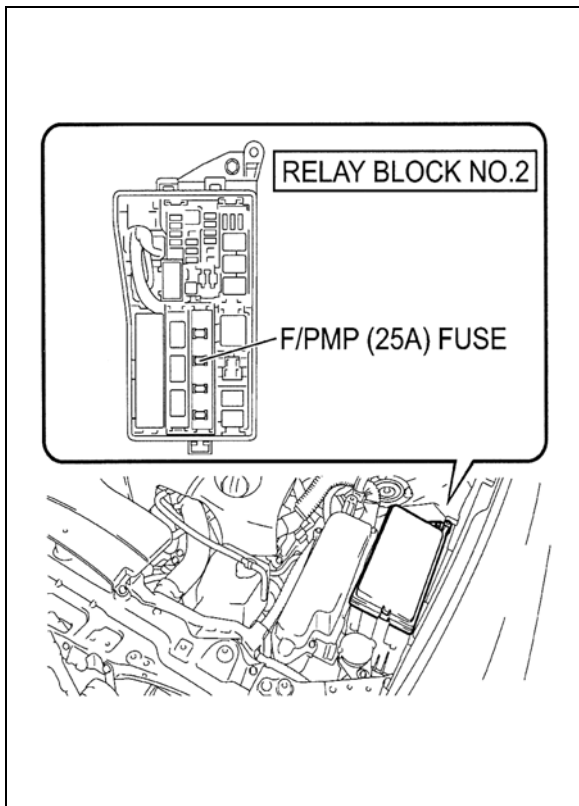


1. CHECK FOR DTCs

- a) If DTC(s) are present, verify them, view and record the freeze frame data, and perform the necessary repairs.

2. REMOVE THE ENGINE ROOM COVERS

- **DO NOT DISCONNECT ANY PART OF THE FUEL SYSTEM UNTIL YOU HAVE DISCHARGED THE FUEL SYSTEM PRESSURE.**
- **EVEN AFTER DISCHARGING THE FUEL SYSTEM PRESSURE, PLACE A PIECE OF CLOTH AROUND THE FITTINGS AS YOU SEPARATE THEM TO REDUCE THE RISK OF FUEL SPRAYING ON YOURSELF, IN THE ENGINE COMPARTMENT, AND ONTO OTHER PARTS.**



3. DISCHARGE THE FUEL SYSTEM PRESSURE

- a) Remove the relay block upper cover No. 2.
- b) Remove the fuel pump (F/PMP) 25 amp fuse.
- c) Start the engine.
- d) After the engine has stopped, turn the ignition switch OFF.
- e) Crank the engine again to relieve any existing fuel pressure.

NOTE:

DTC P0171/25 and/or P0191/49 may be set.

- f) Remove the fuel cap to discharge the fuel tank pressure.
- g) Record the radio station presets.

NOTE:

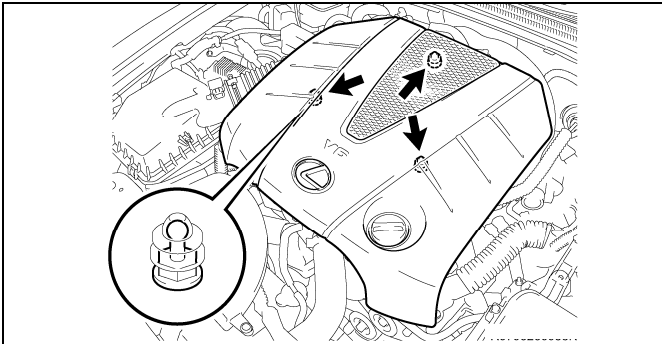
DO NOT disconnect the negative (-) battery cable until 6 minutes have elapsed after turning the ignition OFF.

- h) Disconnect the negative (-) battery cable.
- i) Reinstall the fuel pump (F/PMP) 25 amp fuse.
- j) Reinstall the relay block upper cover No. 2.
- k) Reinstall the fuel cap.

B. REMOVE THE INTAKE MANIFOLD

GS300 (3GR-FSE) – Skip to page 21

GS350 (2GR-FSE) – INTAKE MANIFOLD REMOVAL

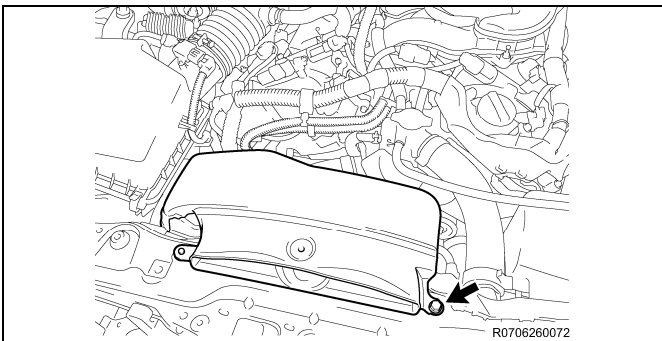


1. REMOVE V-BANK COVER SUB-ASSEMBLY

- a) Hold the front of the V-bank cover and raise it to disengage the 2 clips on the front of the cover. Continue to raise the cover to disengage the clip on the rear of the cover and remove the cover.

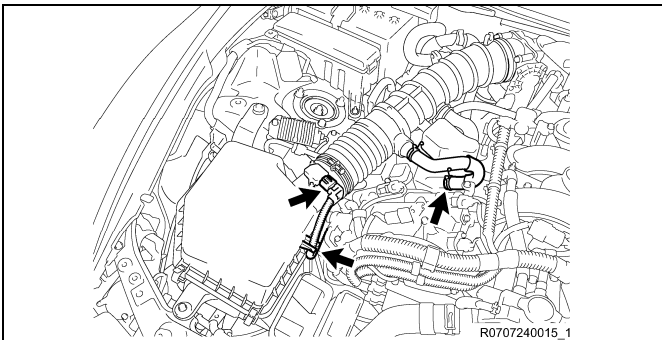
NOTE:

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



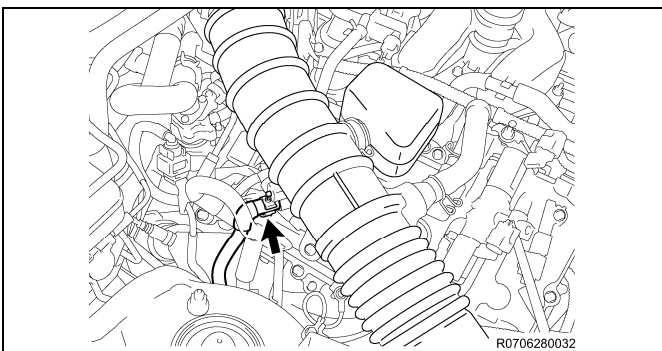
2. REMOVE NO. 1 AIR CLEANER INLET

- a) Remove the bolt, clip and inlet air cleaner.

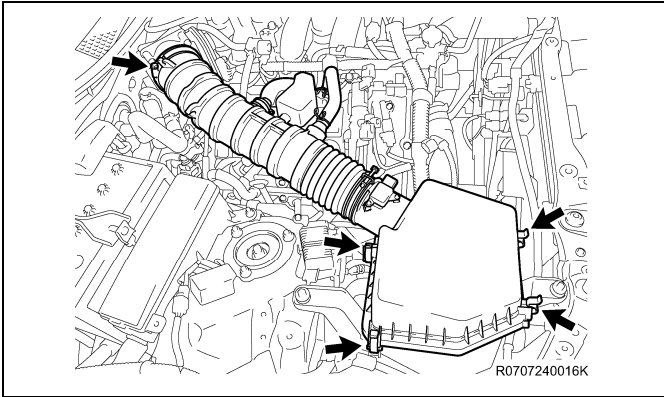


3. REMOVE AIR CLEANER CAP WITH AIR CLEANER HOSE

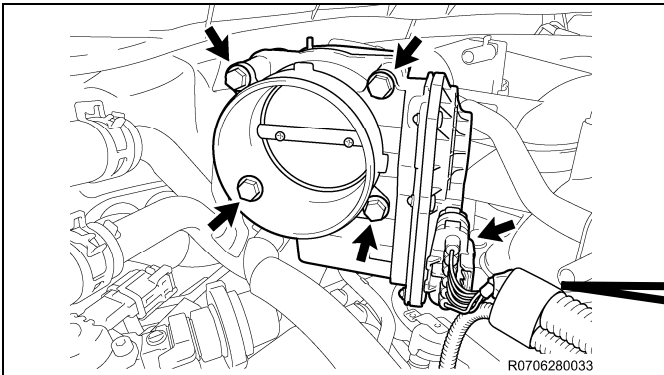
- a) Disconnect the connector.
- b) Disconnect the No.2 ventilation hose.



- c) Disconnect the vacuum hose clamp.



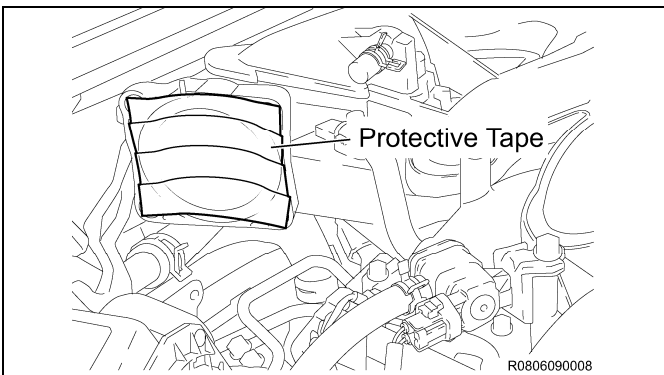
- d) Loosen the hose clamp bolt.
- e) Remove the 4 clips and air cleaner cap with air cleaner hose.



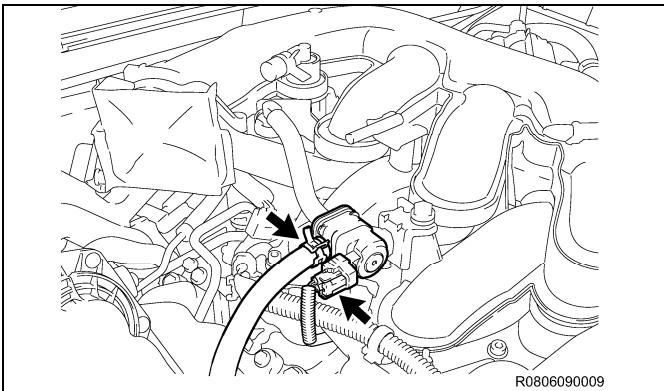
4. REMOVE THROTTLE WITH MOTOR BODY ASSEMBLY

- a) Disconnect the connector.
- b) Remove the 4 bolts and throttle with motor body assembly and gasket.

NOTE:
Do not disconnect the 2 water by-pass hoses.

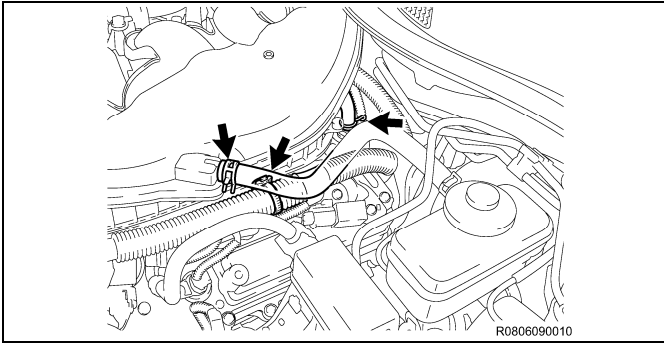


- c) Place protective tape over the surge tank opening to prevent foreign objects from entering from the old gasket above.

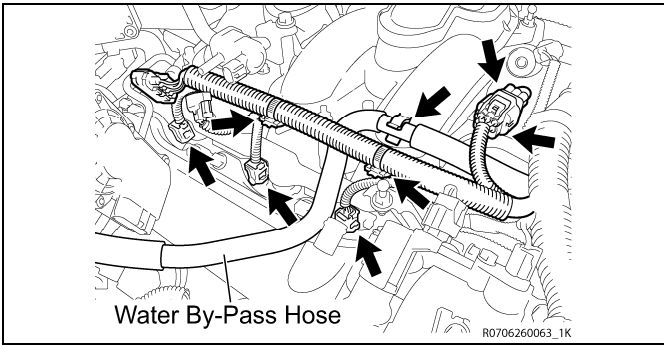


5. REMOVE INTAKE AIR SURGE TANK

- a) Disconnect the connector.
- b) Disconnect the vacuum hose from the purge VSV.

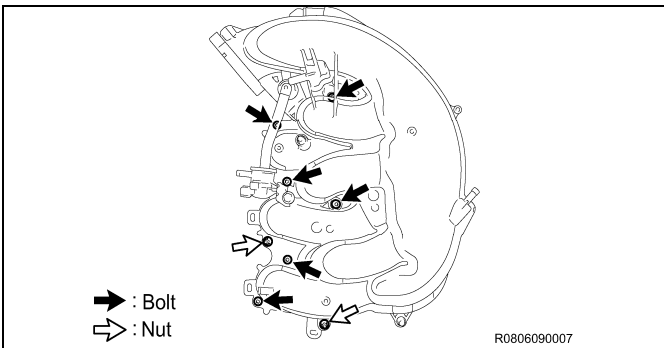
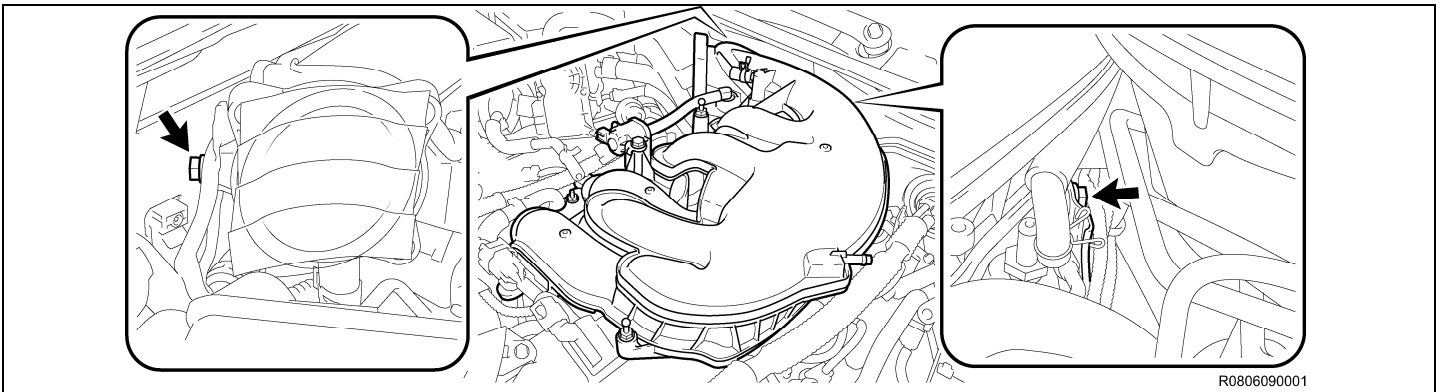


- c) Disconnect the ventilation hose.
- d) Disconnect the union to check valve hose from the intake air surge tank.
- e) Disconnect the wire harness clamps from the intake air surge tank.

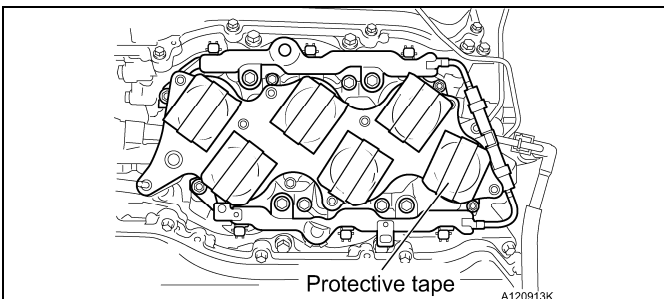


- f) Disconnect the 4 injector connectors.
- g) Disconnect the 3 wire harness clamps from the intake air surge tank.
- h) Disconnect the water by-pass hose from the intake air surge tank.

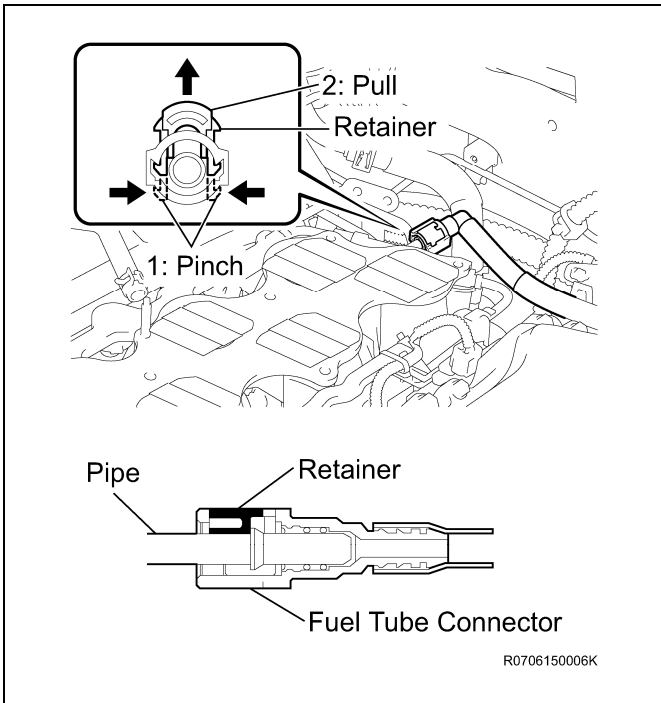
- i) Remove the 2 bolts from the intake air surge tank, see illustration below.



- j) Using a long hexagon 5 mm, remove the 6 bolts and using a 10mm remove the 2 nuts.
- k) Remove the intake surge tank and gasket.



- l) Place protective tape over the intake manifold openings to prevent foreign objects from entering.

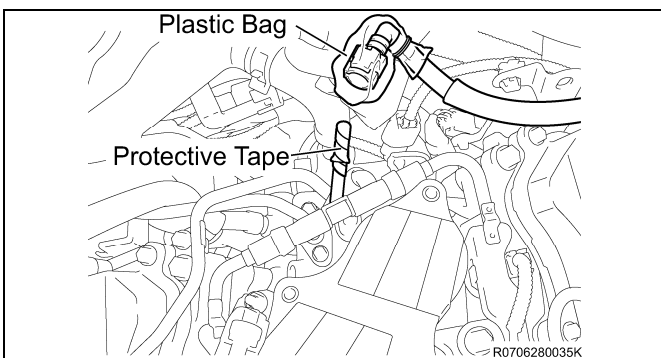


6. REMOVE INTAKE MANIFOLD

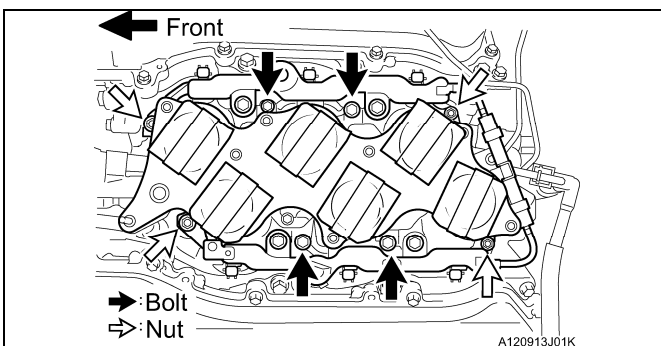
- a) Pinch and pull the fuel tube connector to disconnect the connector from the delivery pipe.

NOTE:

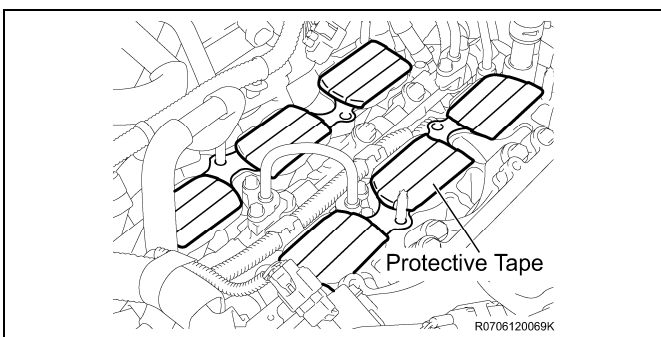
- Check for any dirt and foreign matter contamination in the pipe and around the connector. Clean if necessary. Foreign matter may damage the O-rings or cause leaks in the seal between the pipe and connector.
- Do not use any tools to separate the pipe and connector.
- Do not forcefully bend or twist the nylon tube.
- Check for any dirt and foreign matter on the pipe seal surface. Clean if necessary.
- If the pipe and connector are stuck together, pinch the tube between your fingers and turn it carefully to free it. Then disconnect the tube.



- b) Place and seal a plastic bag over the fuel tube to prevent damage or foreign objects from entering.
- c) Place protective tape around the sides of the pipe to prevent damage.



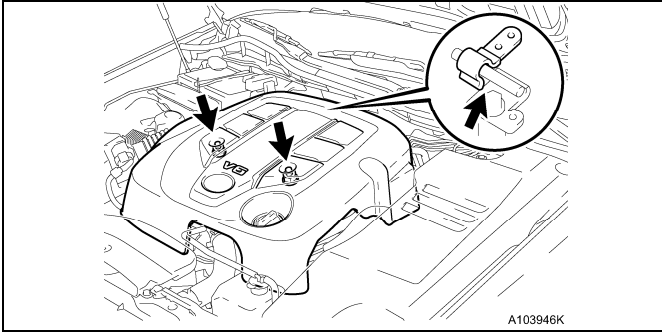
- d) Remove the 4 bolts, 4 nuts, intake manifold and gasket.



- e) Place protective tape on the old gasket and place it over the cylinder head opening to prevent foreign objects from entering.

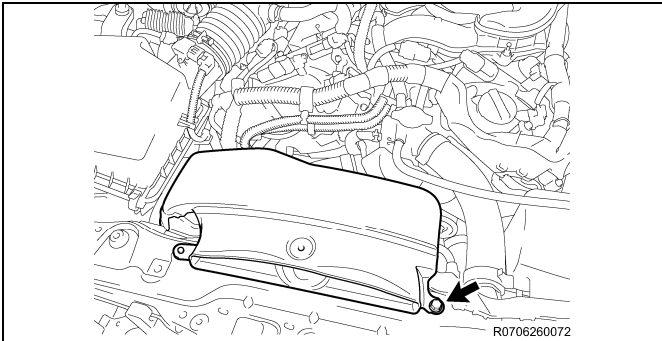
7. SKIP TO PAGE 25, REPLACE FUEL DELIVERY PIPE

GS300 (3GR-FSE) – INTAKE MANIFOLD REMOVAL



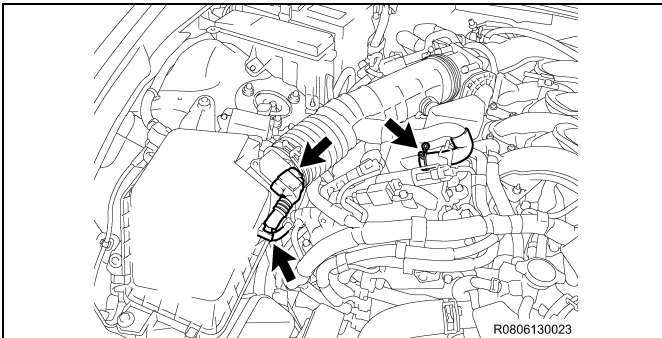
1. REMOVE V-BANK COVER SUB-ASSEMBLY

- a) Remove the two nuts and V-bank cover.



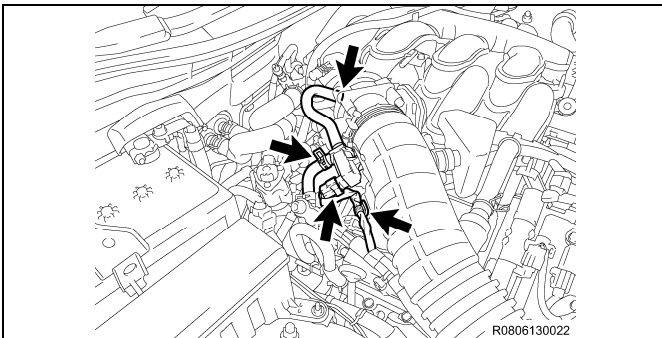
2. REMOVE NO. 1 AIR CLEANER INLET

- a) Remove the bolt and air cleaner inlet.

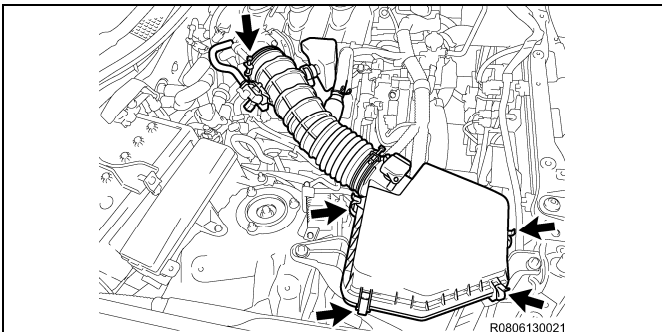


3. REMOVE AIR CLEANER CAP WITH AIR CLEANER HOSE

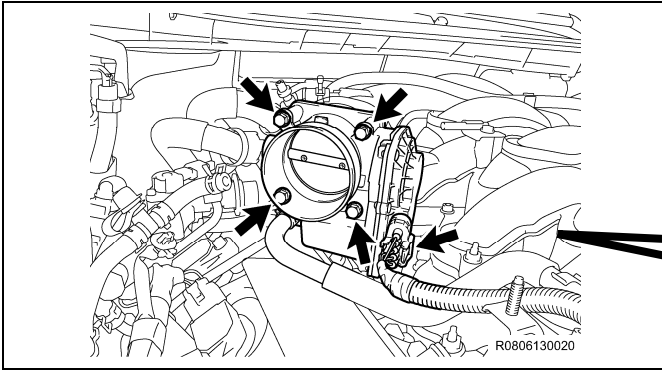
- a) Disconnect the MAF connector.
- b) Disconnect the No. 2 Ventilation hose.



- c) Disconnect the connector.
- d) Disconnect the clamp.
- e) Disconnect the 2 fuel vapor feed hoses.



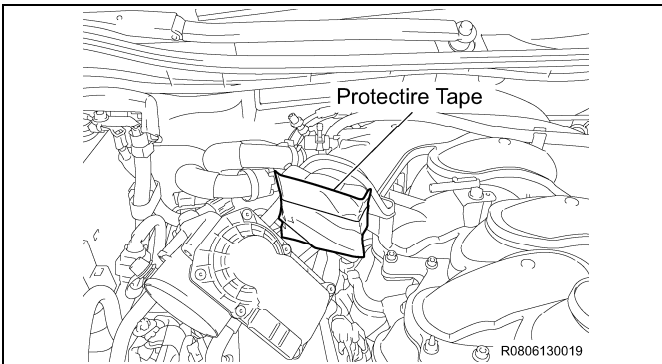
- f) Loosen the hose clamp bolt.
- g) Remove the 4 clips and air cleaner cap with air cleaner hose.



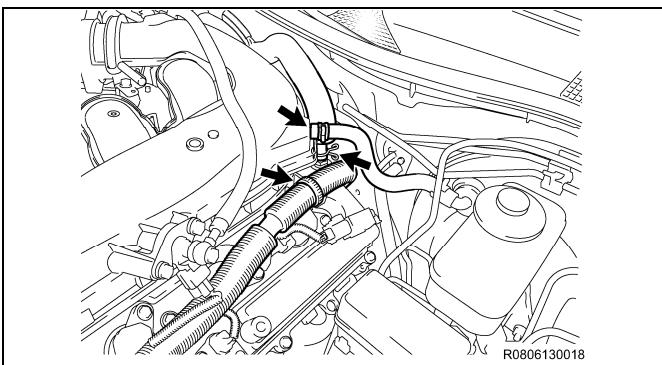
4. REMOVE THROTTLE WITH MOTOR BODY ASSEMBLY

- a) Disconnect the connector.
- b) Remove the 4 bolts and throttle with motor body assembly and gasket.

NOTE:
Do not disconnect the 2 water by-pass hoses.

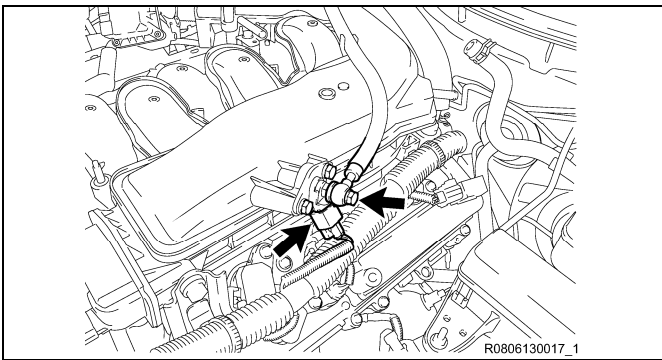


- c) Place protective tape over the surge tank opening to prevent foreign objects from entering from the old gasket above.



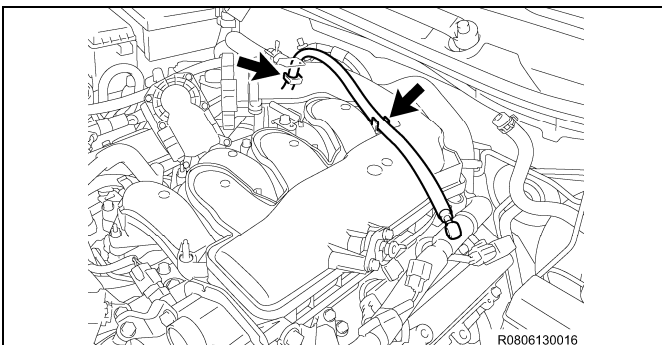
5. REMOVE INTAKE AIR SURGE TANK

- a) Disconnect the union to check valve hose from the intake air surge tank.
- b) Disconnect the wire harness and brake booster hose from the surge tank.

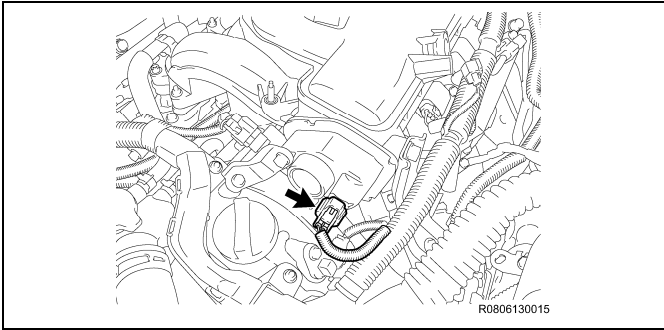


- c) Disconnect the connector.
- d) Remove the bolt and 2 gaskets, and disconnect the fuel tube from the cold start injector.

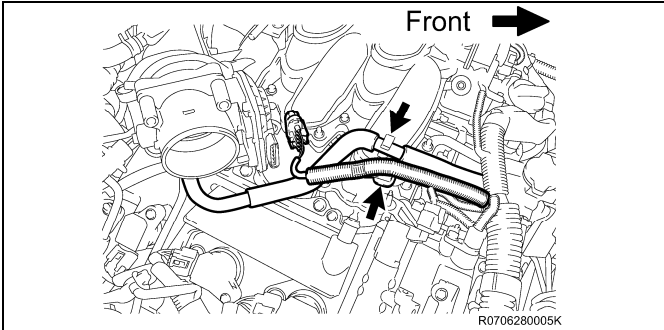
NOTE:
Do not fold or bend the hose.



- e) Disconnect the 2 clamps.



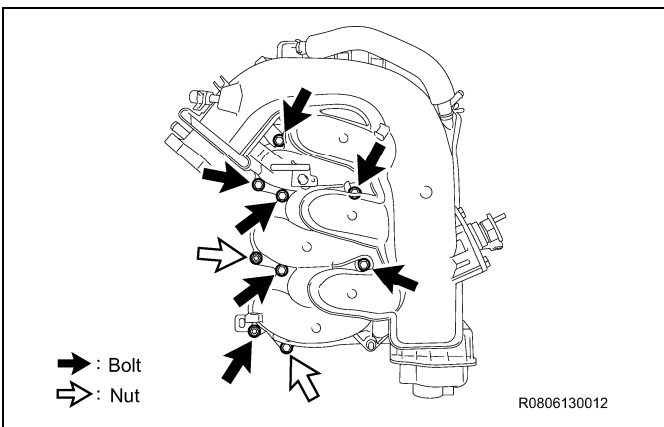
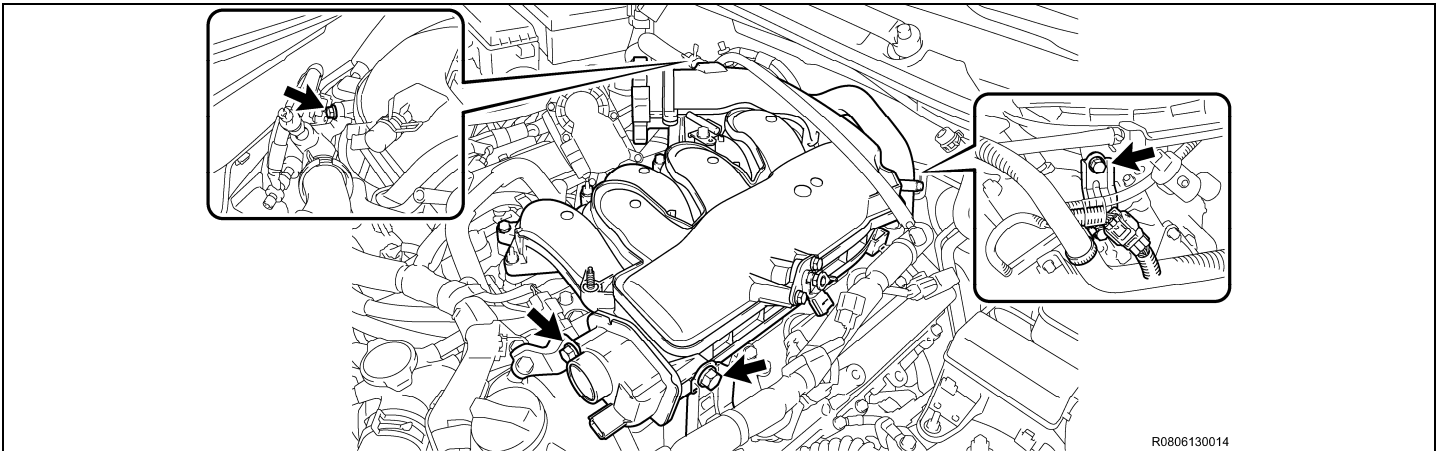
f) Disconnect the connector.



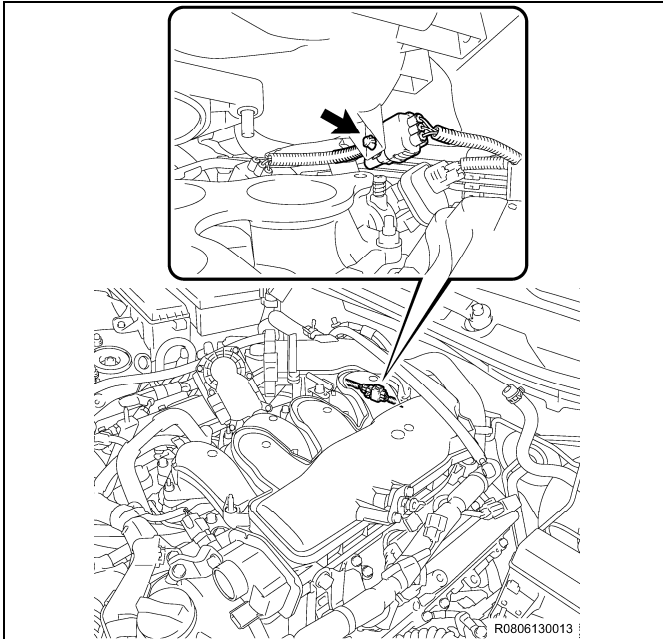
g) Disconnect the wire harness clamp from the intake air surge tank.

h) Disconnect the water by-pass hose from the intake air surge tank.

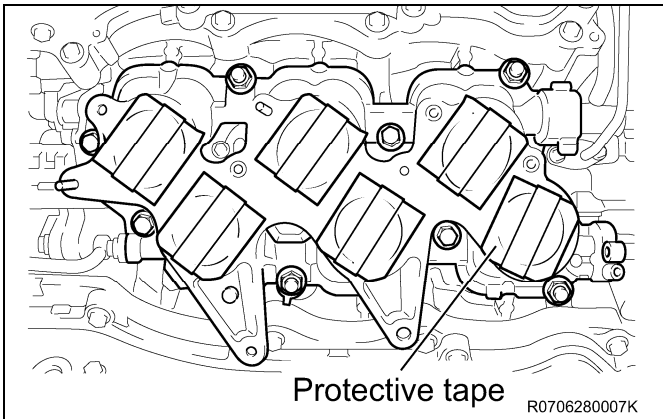
i) Remove the 4 bolts from the intake air surge tank, see illustration below.



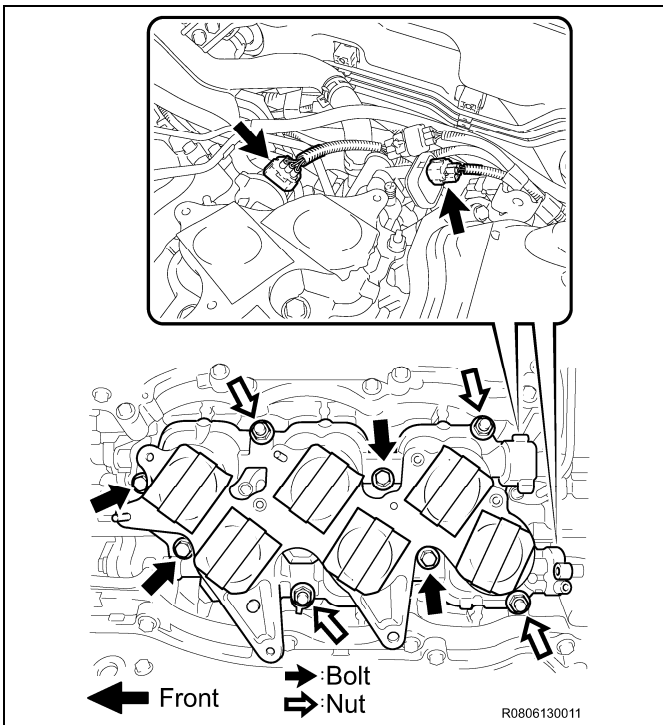
j) Using a socket wrench hexagon 5 mm, remove the 7 bolts, and using a 10 mm socket remove the 2 nuts.



- k) Disconnect the connector clamp from the intake air surge tank.
- l) Remove the bracket on the rear of the surge tank.
- m) Remove the intake air surge tank and gasket.



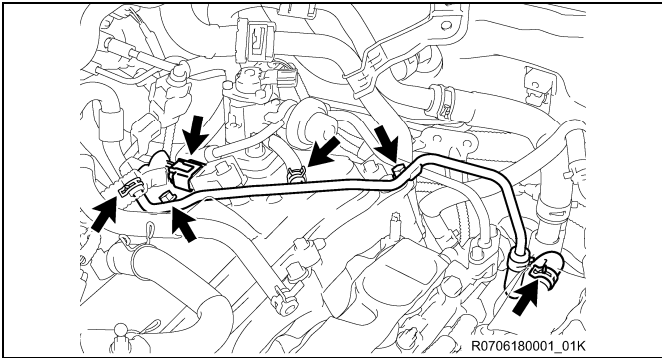
- n) Place protective tape over the intake manifold openings to prevent foreign objects from entering.



6. REMOVE INTAKE MANIFOLD

- a) Disconnect both SCV connectors.
- b) Remove the 4 bolts, 4 nuts, intake manifold and gasket.
- c) Place protective tape on the old gasket and place it over the cylinder head opening to prevent foreign objects from entering.

C. REMOVE FUEL DELIVERY PIPE

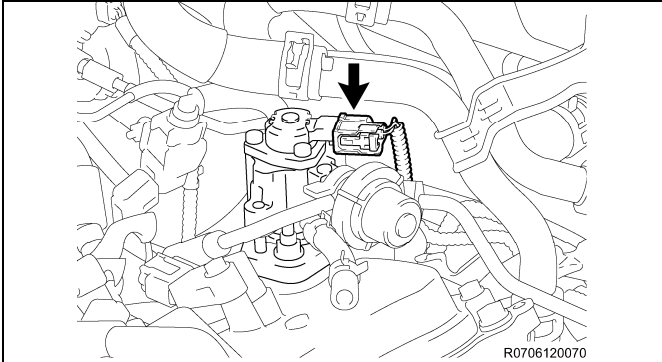


1. REMOVE NO. 1 FUEL PIPE

- Disconnect the ignition coil connector illustrated.
- Disconnect the 3 fuel hoses.
- Remove the 2 bolts and No. 1 fuel pipe.

NOTE:

- Insert a hose plug into the hose.
- Wipe away any spilt fuel with a shop rag.

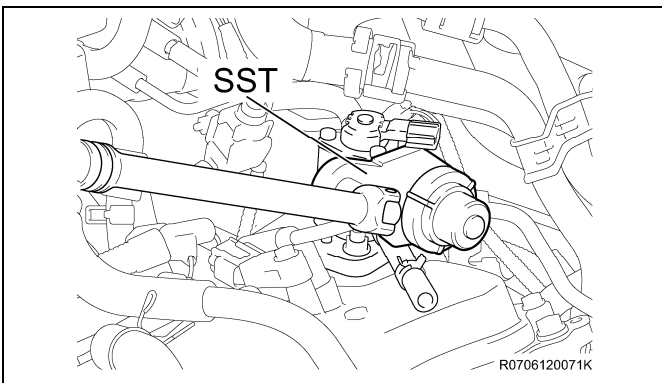


2. REMOVE FUEL PRESSURE PULSATION DAMPER

- Disconnect the connector.

NOTE:

When the fuel pressure pulsation damper is removed, be certain to disconnect the connector to prevent it from being damaged by tools.

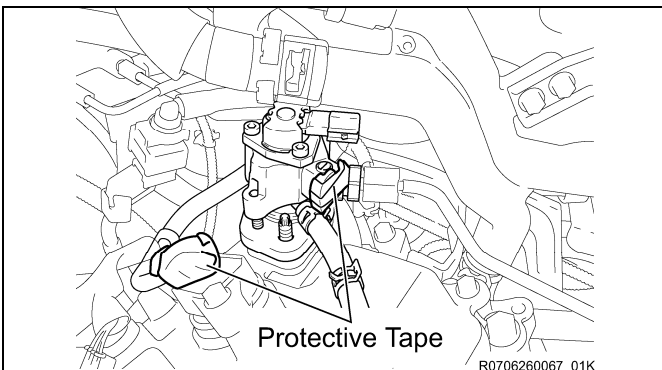


- Using SST or a 22 mm wrench, remove the fuel pressure pulsation damper and 2 gaskets from the fuel pump.

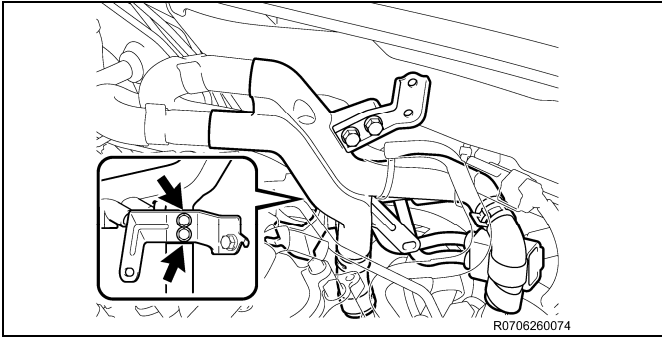
SST 09617-24011

NOTE:

- Do not blow pressurized air into the pulsation damper. The air pressure may damage the internal diaphragm.



- Place protective tape over the fuel pump and fuel tube to prevent damage.

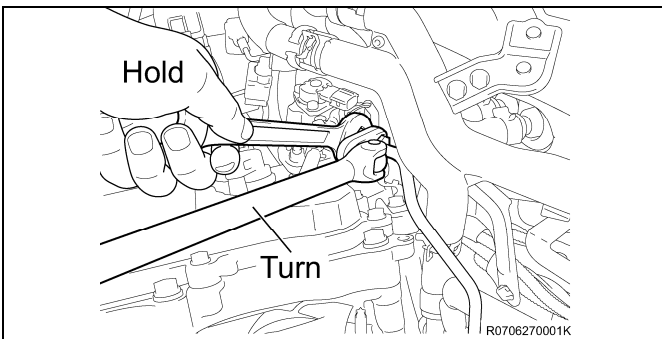


**3. REMOVE WATER HOSE JOINT
(for GS350 2GR-FSE only)**

- a) Remove the 2 bolts and disconnect the water hose joint.

4. REMOVE FUEL PUMP ASSEMBLY AND NO. 2 FUEL PIPE

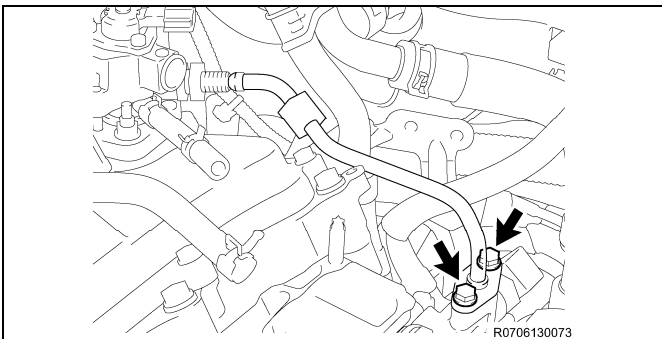
STOP WHEN REPLACING FUEL PIPE NO. 2, **THE FUEL PUMP MUST BE REMOVED. THIS MUST BE DONE TO PREVENT SEAL DAMAGE AND THE TWISTING OF THE FUEL PIPE, FAILURE TO DO SO MAY RESULT IN A FUEL LEAK!**



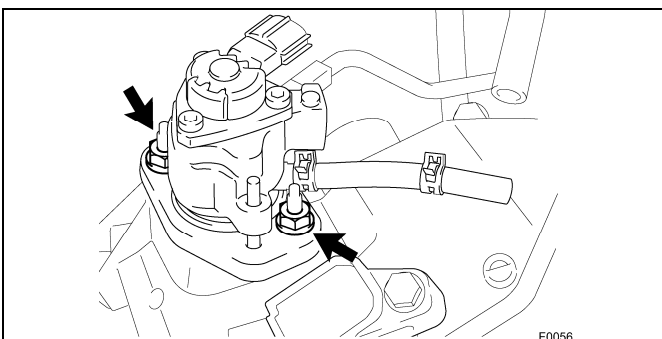
- a) Fix the union bolt on the fuel pump side in place with a 21 mm wrench. Using a 19 mm union nut wrench, loosen the union and remove the fuel pipe.

NOTE:

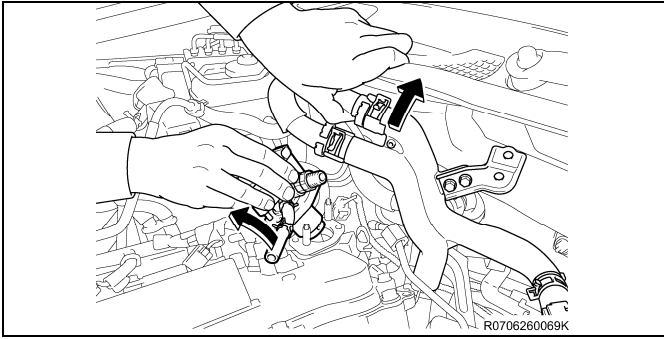
- **Must be absolutely no free play in the union on the fuel pump side.**
- **If the union on the fuel pump side has free play, replace the fuel pump.**



- b) Remove the 2 bolts on the delivery pipe side.



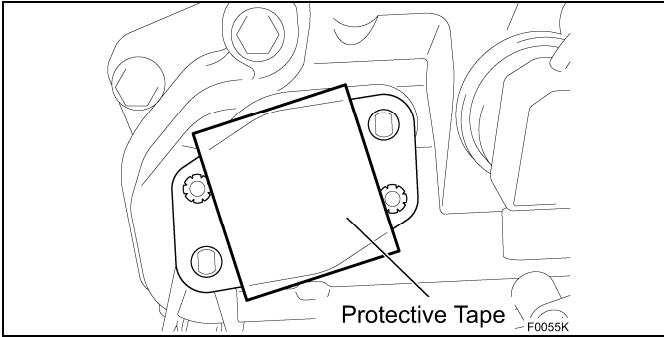
- c) Remove the 2 nuts from the fuel pump.



d) Remove the fuel pump and fuel pump insulator.

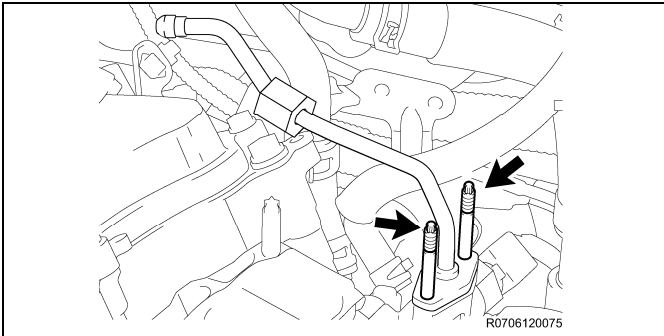
NOTE:

- Wipe away any spilt fuel with a shop rag.
- Do not apply excessive force to the heater hose and coolant pipe.



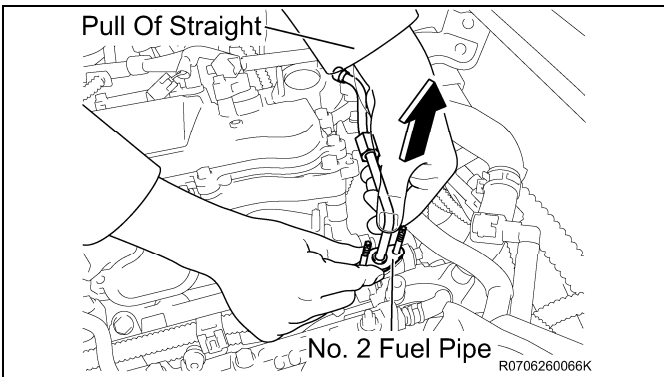
e) Place protective tape on the old insulator and place it over the head cover opening to prevent foreign objects from entering.

5. REMOVE NO. 2 FUEL PIPE



a) Hand tighten the 2 SST stud bolts in the delivery pipe's bolt attachment holes. (torx® side up)

SST 04007-32331

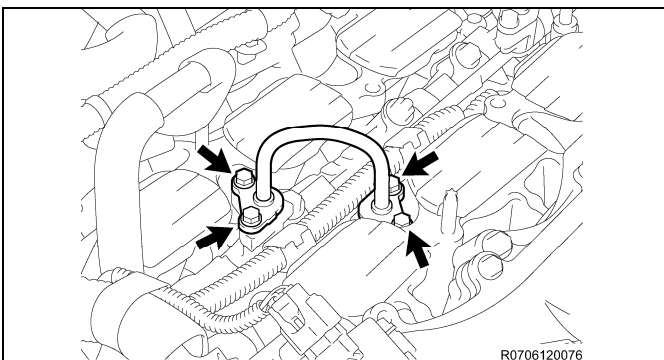


b) Remove the fuel pipe from the fuel delivery pipe.
c) Remove the 2 stud bolts.

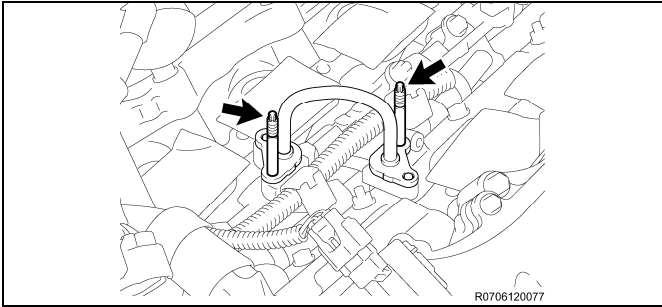
NOTE:

- Shifting the pipe too widely to the left and right may damage the part which may lead to a fuel leak.
- Fuel Pipes may be extremely tight, use caution while removing as to not cause damage.

6. REMOVE NO. 3 FUEL PIPE



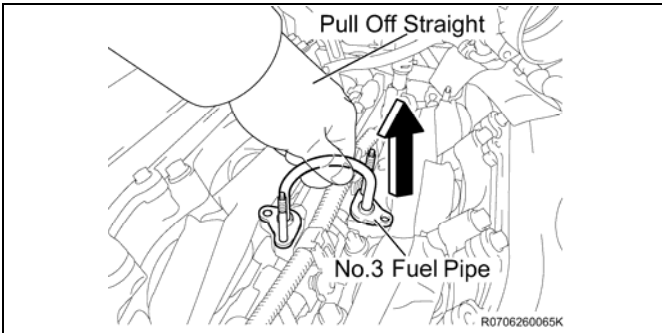
a) Remove the 4 bolts.



- b) Hand tighten the 2 stud bolts to the delivery pipe. (torx® side up)

NOTE:

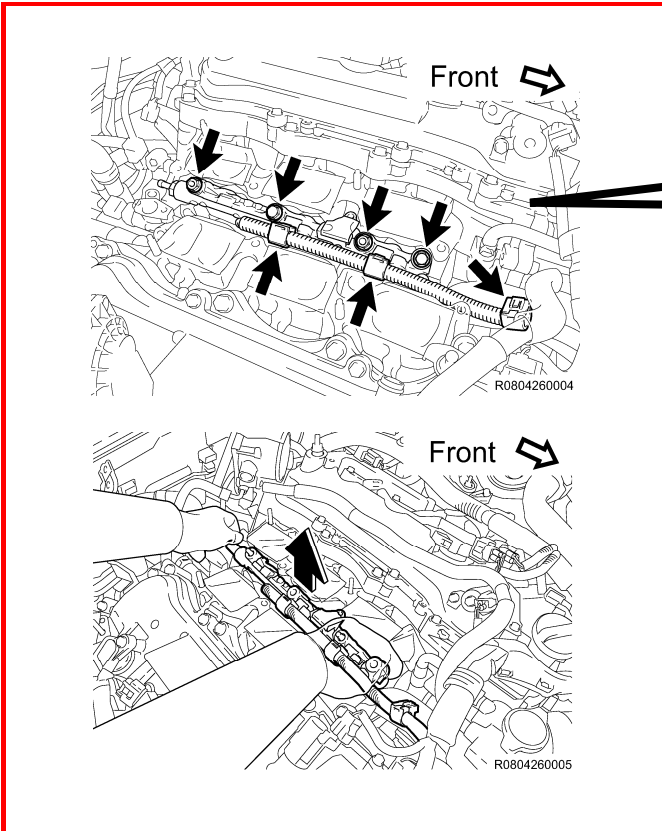
Attach the stud bolts diagonal from each other.



- c) Remove the fuel pipe from the fuel delivery pipe.
d) Remove the 2 stud bolts.

NOTE:

Shifting the pipe too widely to the left and right may damage the part which may lead to a fuel leak.



7. REMOVE NO. 2 FUEL DELIVERY PIPE

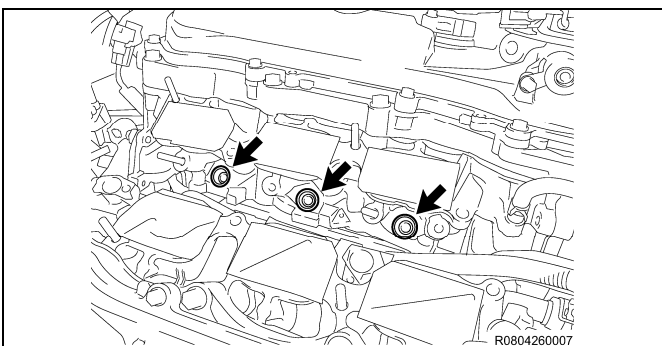
To prevent possible injector damage, please proceed with the following steps in the order indicated.

Do not disconnect the fuel injector electrical connectors until after removing the delivery pipe.

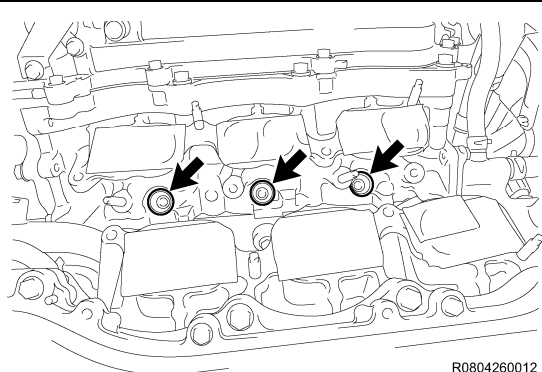
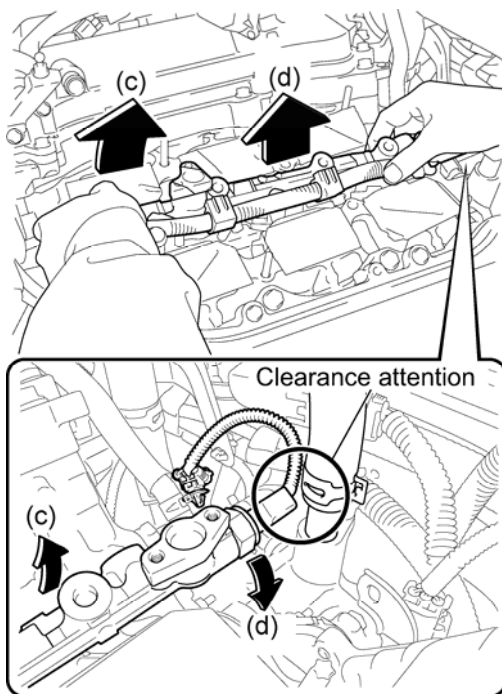
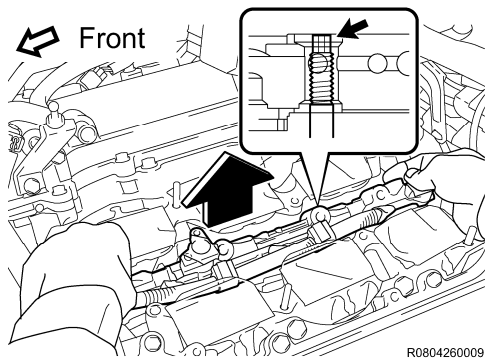
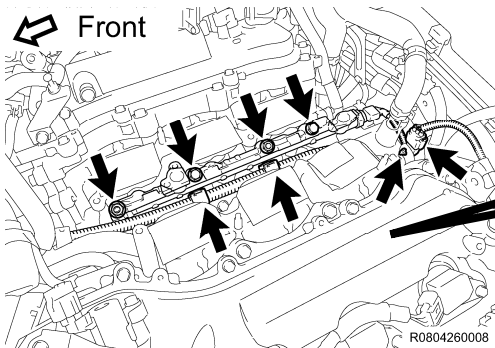
- a) Disconnect the 3 wire harness clamps and remove the 2 bolts and 2 nuts.
b) Remove the fuel delivery pipe.
c) Disconnect the 3 electrical connectors by hand.

NOTE:

- Do not exert extreme force while removing the fuel pipe, this may lead to injector damage.
- Carefully move the fuel pipe back and forth from end to end while firmly pulling up will assist with removal.
- Injectors may remain in the cylinder head during fuel pipe removal; if this occurs, carefully disconnect the electrical connector to prevent injector damage.
- Be extremely careful not to touch or strike the tips of the injectors.



- d) Remove the 3 injector vibration insulators from the cylinder head.



8. REMOVE NO. 1 FUEL DELIVERY PIPE

To prevent possible injector damage, please proceed with the following steps in the order indicated.

Do not disconnect the fuel injector electrical connectors until after removing the delivery pipe.

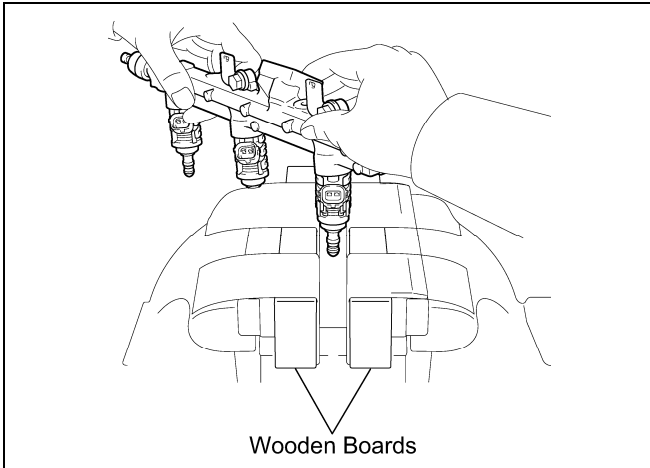
- Disconnect the fuel pressure sensor connector, wire harness clamps and remove the 2 bolts and 2 nuts.
- Lift the fuel delivery pipe up until it is horizontally level with the stud bolts.
- Carefully pull up on the front side of the fuel delivery pipe.
- Carefully pull the fuel delivery pipe up so that the fuel pressure sensor and the heater hose do not touch.
- Disconnect the 3 electrical connectors by hand.

NOTE:

- Do not exert extreme force while removing the fuel pipe, this may lead to injector damage.
- Carefully move the fuel pipe back and forth from end to end while firmly pulling up will assist with removal.
- Injectors may remain in the cylinder head during fuel pipe removal; if this occurs, carefully disconnect the electrical connector to prevent injector damage.
- Be extremely careful not to touch or strike the tips of the injectors.
- To avoid damage to both components, do not allow the fuel pressure sensor to come in contact with the heater hose.

- Remove the 3 injector vibration insulators from the cylinder head.

D. REMOVE AND INSPECT FUEL INJECTORS

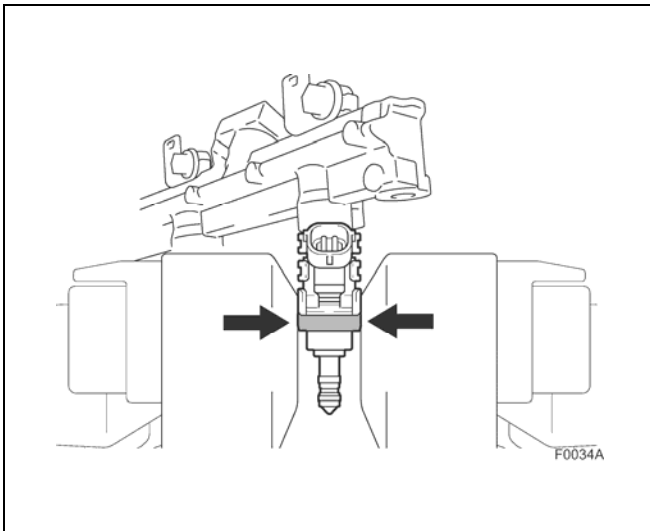


1. REMOVE FUEL INJECTORS

- a) Clamp the fuel injector assembly in a vise with wooden boards placed in between the vise and assembly.

NOTE:

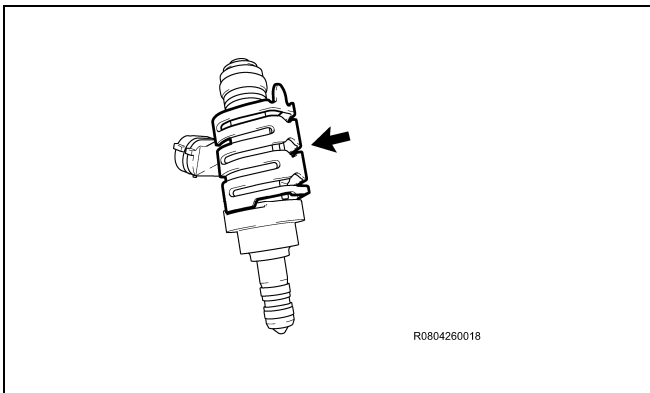
- Be extremely careful not to touch or strike the tips of the injectors.
- Use both hands when clamping the fuel injector assembly to the vise.



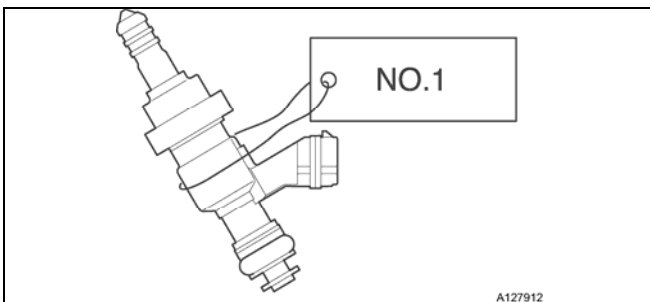
- b) With the fuel injector assembly clamped in the vise, remove the fuel delivery pipe by pulling straight back from the assembly as shown in the illustration.

NOTE:

- Clamp the vise to the areas illustrated on the fuel injector assembly. Do not clamp areas which are not indicated in the left illustration.
- Do not over tighten. Also, do not allow the connector to come in contact with the vise.



- c) Remove the nozzle holder clamp from the injectors.



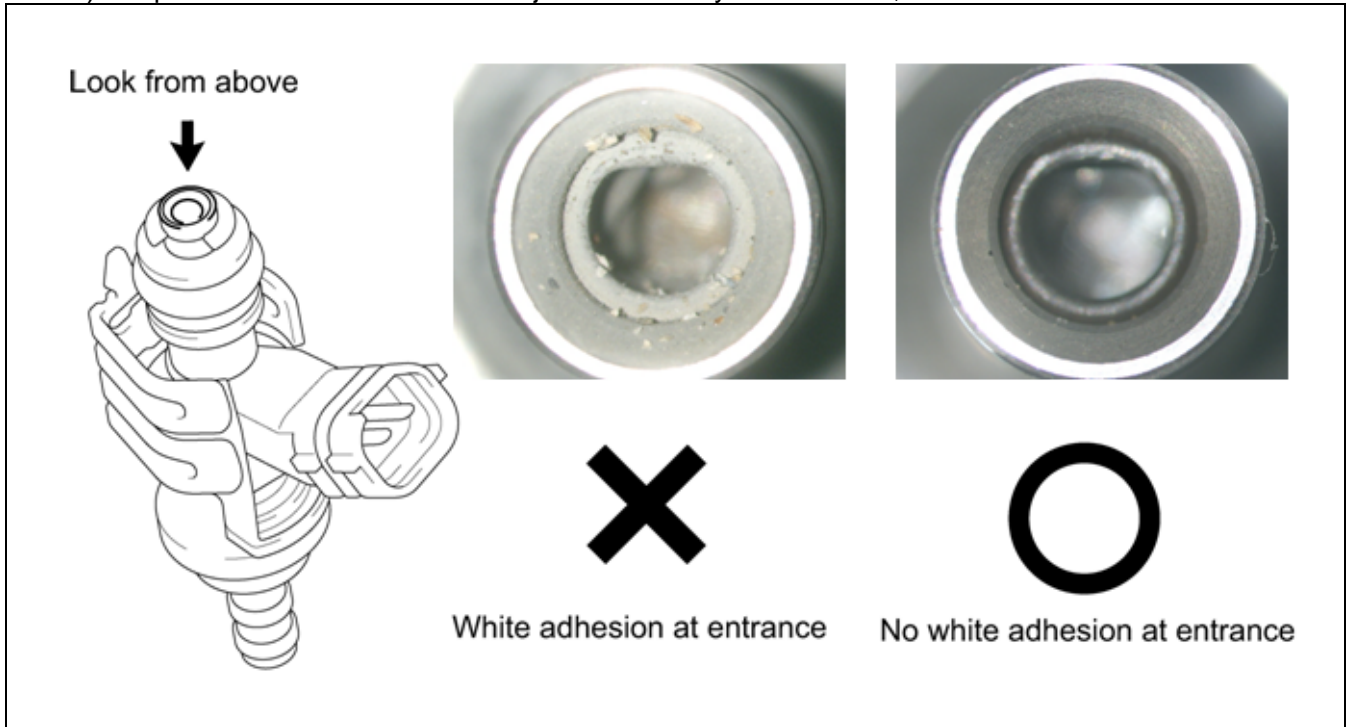
NOTE:

For reinstallation, attach a tag or label to the injector shaft.

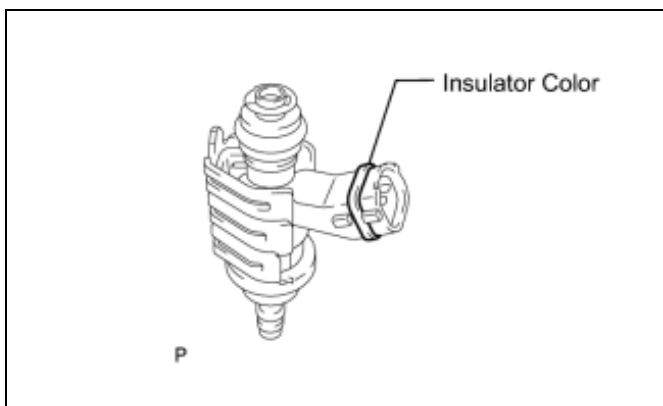
- d) Repeat steps a) ~ c) for the remaining injectors.

2. FUEL INJECTOR INSPECTION

a) Inspect the condition of the fuel injector assembly as illustrated, and assess with the chart below.

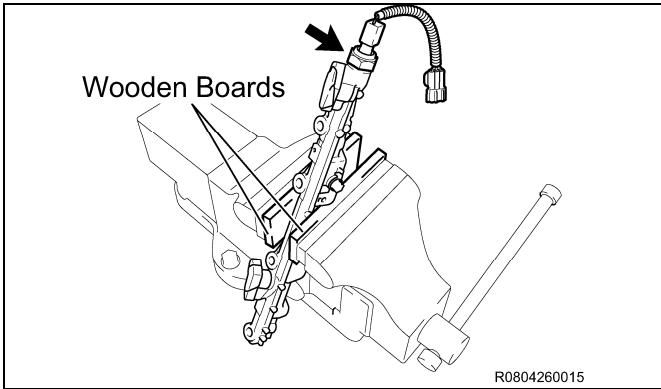


Condition of fuel injector assembly	Results
No white adhesion at entrance	Reuse the fuel injector.
White adhesion at entrance	Replace ALL fuel injectors with new ones. Keep used injectors for possible parts recovery and inspection.



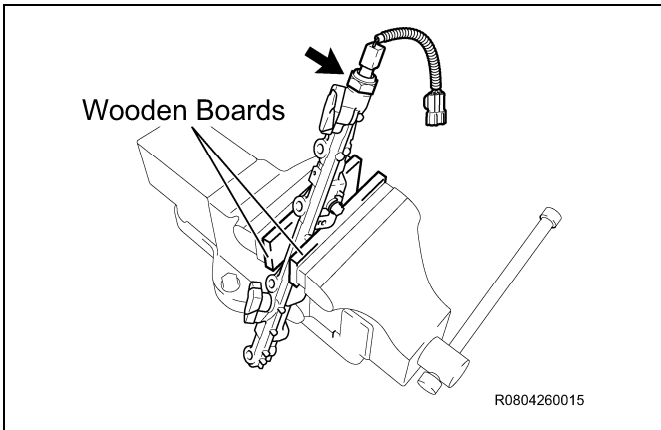
NOTE:

- Either injector listed in the parts table for a particular vehicle type may be installed; however, make sure that all injectors installed on the vehicle have the same color insulator.
- GS300 23209-39057-A0 = Black
- GS300 23209-39057-B0 = Reddish Brown
- GS350 23209-39155-B0 = Black
- GS350 23209-39155-C0 = Reddish Brown
- GS350 23209-39155-D0 = Green



3. REMOVE FUEL PRESSURE SENSOR

- Clamp the No. 1 fuel delivery pipe in a vise with wooden boards placed in between the pipe and vise as illustrated.
- Using a 24 mm wrench, remove the fuel pressure sensor and gasket.



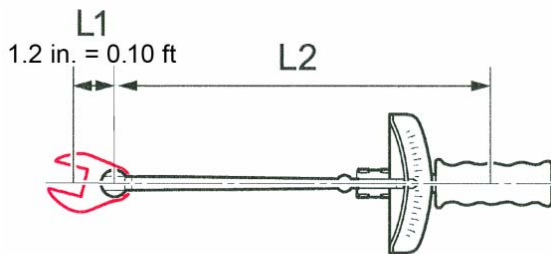
4. INSTALL FUEL PRESSURE SENSOR

- Clamp a **NEW** No. 1 fuel delivery pipe in a vise with wooden boards placed in between the pipe and vise as illustrated.
- Install a **NEW** gasket to the fuel pressure sensor.
- Install the fuel pressure sensor to the No. 1 delivery pipe.

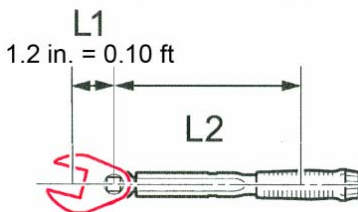
5. CALCULATE THE FUEL PRESSURE SENSOR TORQUE VALUE



- The calculated torque (C) is the value at which the torque wrench **MUST** be set.
- To determine the calculated torque, **READ**, and **CLOSELY** follow the steps below.
- If using the formula L1 and L2 **MUST** be measured in feet.



Torque wrench adapter and union nut wrench



Connect the torque wrench to the union nut so that they form a straight line when tightening.

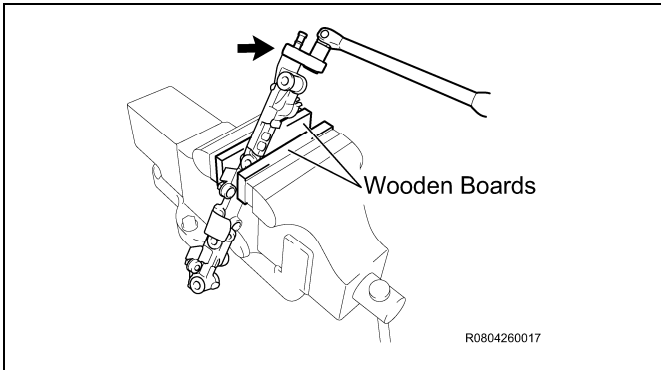
- Measure the length of the torque wrench from the center of the drive to the middle of the handle as shown in the illustration (L2)
- Determine the calculated torque (C) value to set the wrench to by referencing the table below.

Torque Wrench Length – L2 (inches)	Calculated Torque (ft lbs)
10"	27.6
12"	28.1
14"	28.5
16"	28.8
18"	29
20"	29.2

NOTE:
The torque wrench union nut **MUST** be used when using the values in this table.

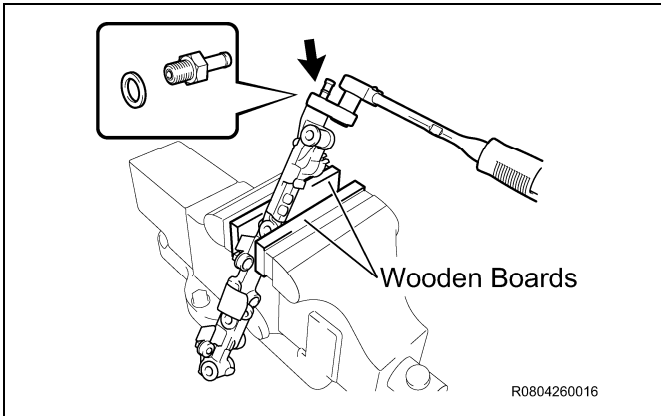
Calculated Torque Formula:
 $C = (T) \times L2 / (L1 + L2)$

C	Calculated Torque (ft·lbf)
T	Specified torque (ft·lbf) (31 ft·lbf)
L1	Torque wrench adapter length or length of tool (ft.)
L2	Length of torque wrench (ft.)



6. REMOVE FUEL RELIEF VALVE ASSY

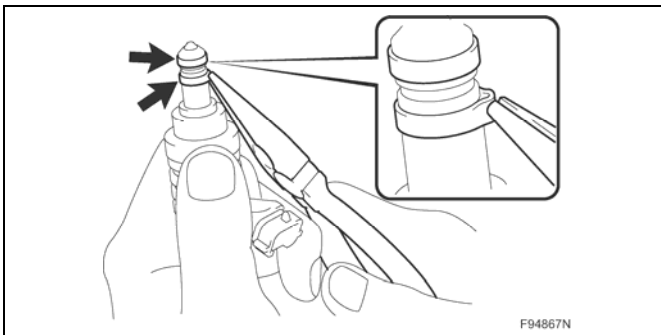
- a) Clamp the No. 2 fuel delivery pipe in a vise with wooden boards placed in between the pipe and vise as illustrated.
- b) Using a 17 mm union nut wrench, remove the fuel relief valve and gasket.



7. INSTALL FUEL RELIEF VALVE ASSY

- a) Clamp a **NEW** No. 2 fuel delivery pipe in a vise with wooden boards placed in between the pipe and vise as illustrated.
- b) Install a **NEW** gasket to the fuel relief valve.
- c) Using union nut wrench 17 mm, install the fuel relief valve to the No. 2 delivery pipe.

Torque Specification:
36 N·m (367 kgf·cm, 27 ft·lbf)



8. REMOVE FUEL INJECTOR SEAL

- a) Using the tips of a pair of needle nose pliers, pinch and pull one of the 2 injector seals at several points to stretch it. Repeat this for the other injector seal.
- b) Repeat step a) for the remaining injectors.

NOTE:

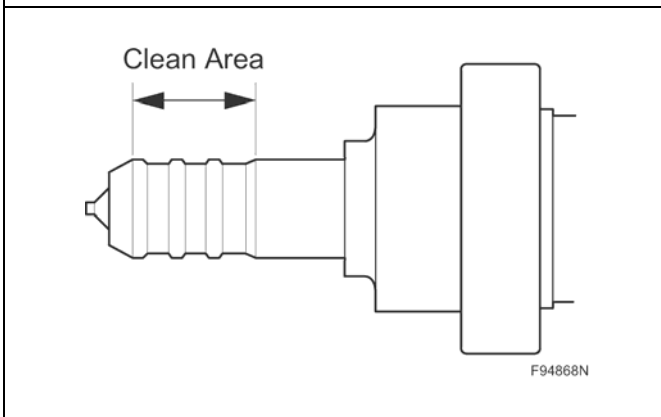
If an injector is dropped or the tips of the injectors are struck, replace it with a **NEW one.**

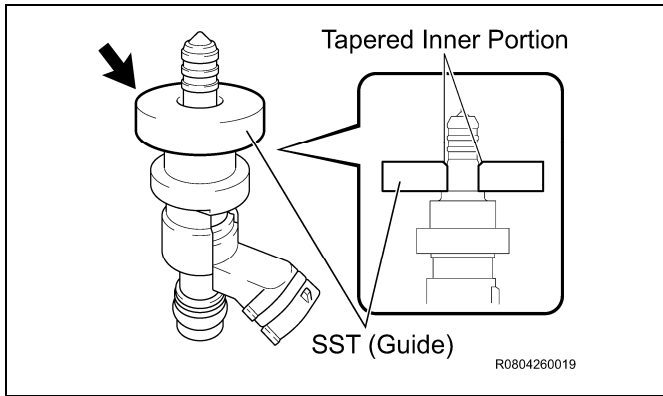
9. INSTALL FUEL INJECTOR SEAL

- a) Apply engine conditioner to the injector area shown in the illustration. Using a piece of cloth, clean carbon deposits from the injector and its grooves.

NOTE:

- Do not clean the tip of the injector.
- Do not use a wire brush to clean the injector.
- If an injector is dropped or the tips of the injectors are struck, replace it.



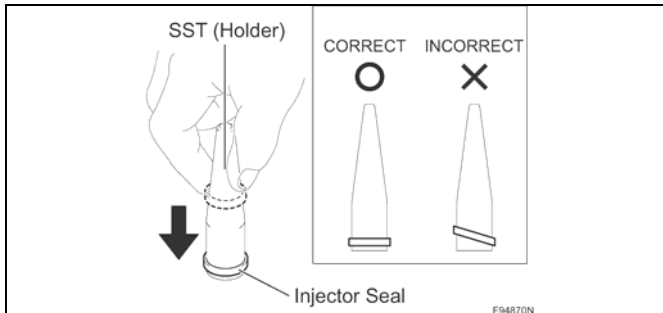


- b) Apply engine oil to the injector contact surface of SST (guide). Then attach SST (guide) to the injector with the tapered inner portion facing the tip of the injector, as shown in the illustration.

SST 09260-39015 (09268-03020, Guide)

NOTE:

Due to the specific tolerances needed to seat the seals it will be difficult to slide the SST. Slowly wiggle it from side to side while sliding it up the injector little by little.

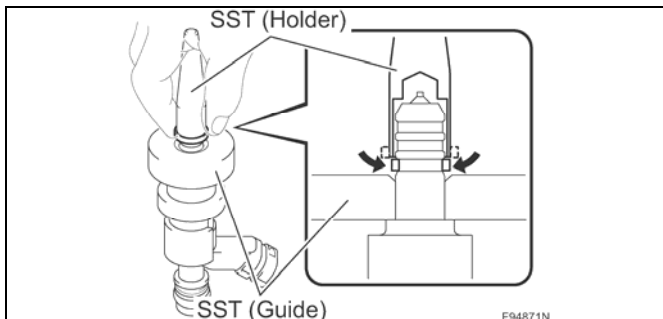


- c) Install a **NEW** injector seal to SST (holder).

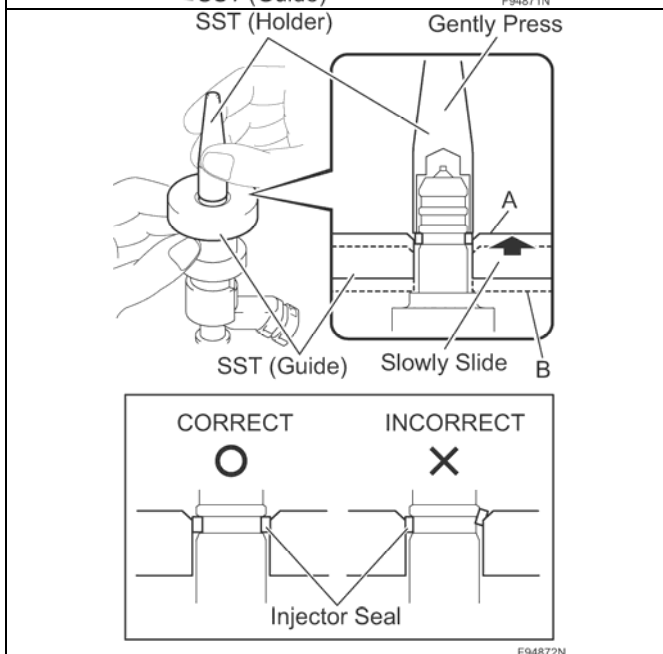
SST 09260-39015 (09268-03010, Holder)

NOTE:

Be careful not to install the injector seal onto the SST (holder) at an angle. Doing so will stretch the seal.



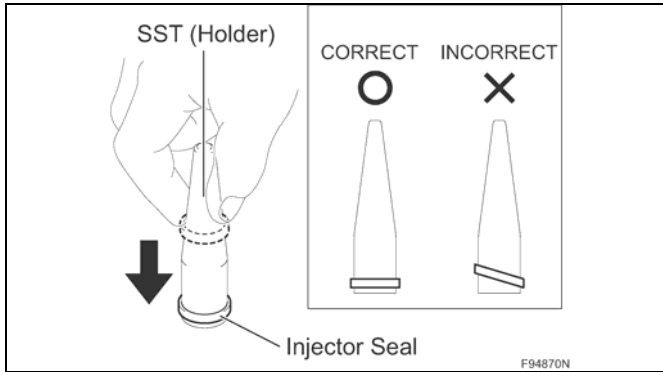
- d) Install SST (holder with injector seal) to the tip of the injector. Slide the seal downward into the injector groove (injector connector side) with your fingers, as shown in the illustration.



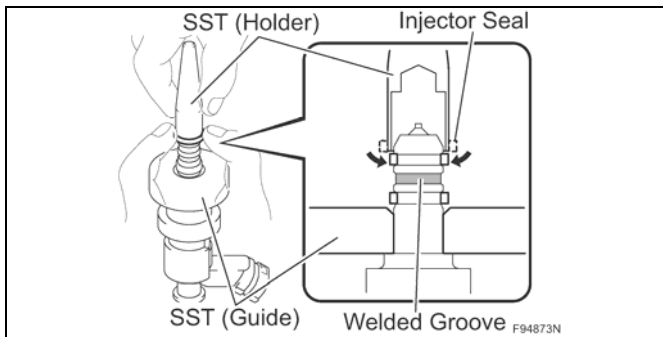
- e) Using SST (holder), gently press downward on the injector seal (injector connector side). Then slowly slide SST (guide) towards the injector tip to settle the seal into the injector groove.

NOTE:

- **Be careful that the seal is not pinched between SST (guide) and the injector groove. Replace the seal if it becomes damaged.**
- **When using SST (guide) to settle the seal into the groove, SST (guide) only needs to be slid upward to the position labeled A in the illustration.**
- **After using SST (guide) to settle the seal into the groove, return SST (guide) to its position labeled B in the illustration.**



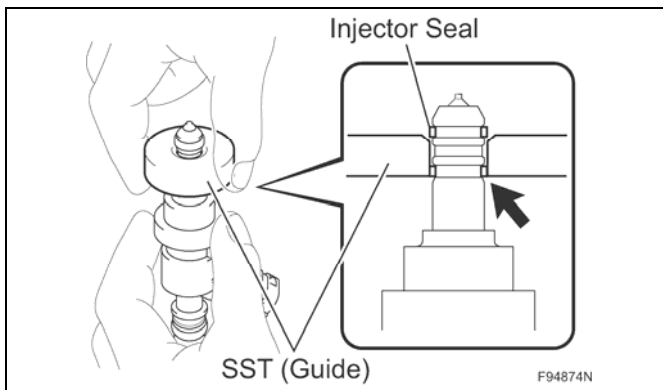
f) Install a **NEW** injector seal to SST (holder).



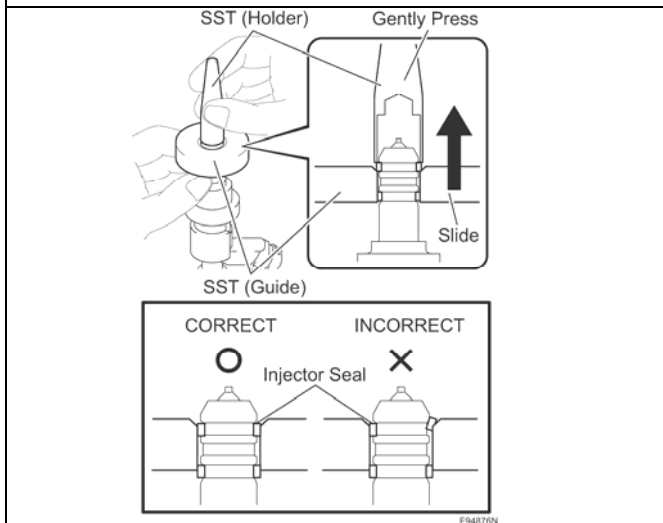
- g) Install a **NEW** injector seal to the injector groove (injector tip side) as shown in the illustration.
- h) Check that the seal covers the circumference of the injector groove as shown in the illustration.

NOTE:

Make sure that the seal does not slip into the welded groove of the injector shown in the illustration. If it does, replace it with a **NEW one.**



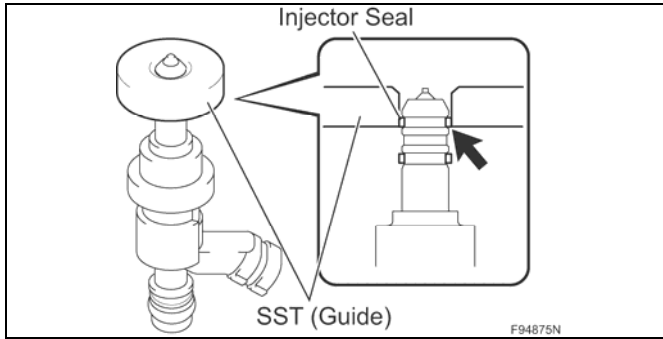
- i) Slowly slide SST (guide) towards the tip of the injector. When the injector contact surface of SST (guide) aligns with the seal (injector connector side) as shown in the illustration, hold the position for 5 seconds or more to fully align the seal into the injector groove.



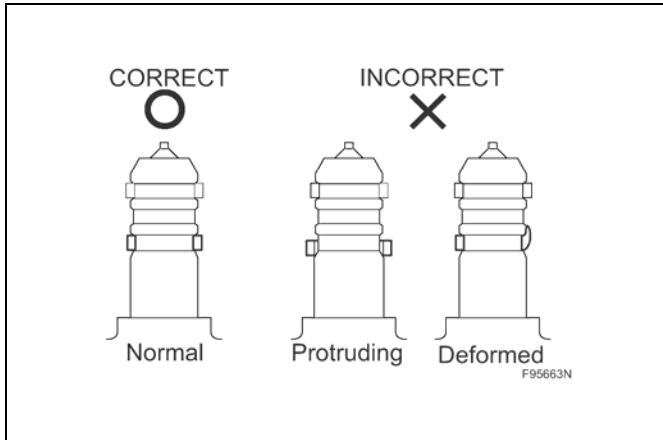
- j) Using SST (holder), gently press downward on the injector seal (injector tip side). Then slowly slide SST (guide) towards the injector tip to settle the seal into the injector groove.

NOTE:

Be careful that the seal is not pinched between SST (guide) and the injector groove. Replace the seal if it becomes damaged.



- k) Slowly slide SST (guide) towards the tip of the injector. When the injector contact surface of SST (guide) aligns with the seal (injector tip side) as shown in the illustration, hold the position for 5 seconds or more to fully align the seal into the injector groove.



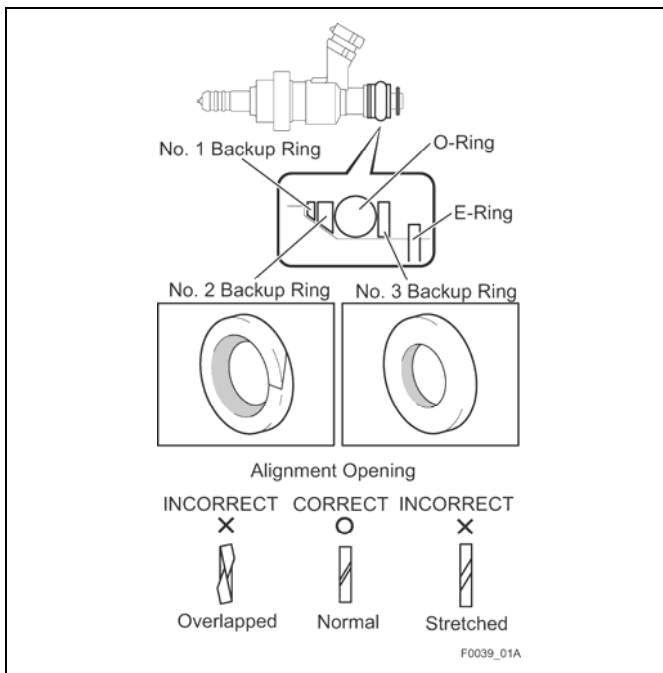
- l) After installing the seals, check that the seal is not scratched, deformed or protruding from the injector groove.

NOTE:

- If the seal is scratched, deformed or protruding from the groove, replace it with a **NEW** one.
- The 2nd seal from the injector tip is partially on a tapered surface so after installation it may slide up to 0.5 mm.

- m) Repeat steps a) ~ k), for the remaining injectors.

10. REPLACE FUEL INJECTOR O-RING, BACKUP RINGS AND E-RING



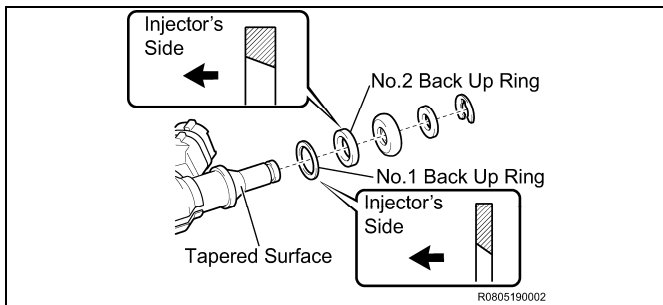
- a) Remove the O-ring, backup rings and E-ring from the fuel injector.
 b) Install a **NEW** O-ring, **NEW** backup rings (No. 1, No. 2, No. 3) and **NEW** E-ring to the fuel injector as shown in the illustration.

NOTE:

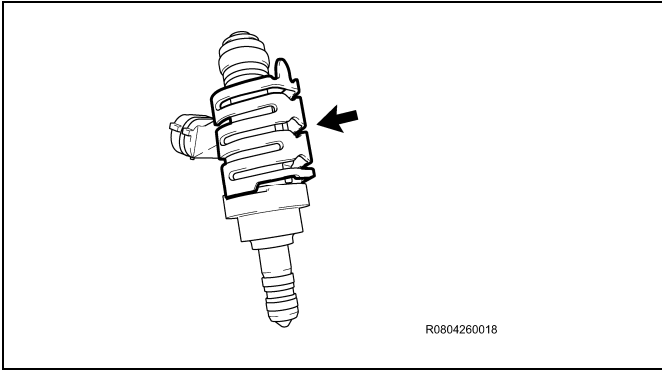
- Check that there is no foreign matter or damaged areas in the injector's O-ring groove.
- Check that the No. 1 and No. 2 backup rings are installed in the correct direction.
- Make sure that the backup rings and O-ring are installed in the correct order.
- Check that the alignment openings of the backup rings are not overlapped or stretched as shown in the illustration.

NOTE:

Align and install the No.1 and No.2 back up rings to the fuel injector's tapered surface.



- c) Repeat steps a) ~ b), and install the 6 O-ring, **NEW** backup rings (No. 1 No. 2, and No. 3) and **NEW** E-ring.

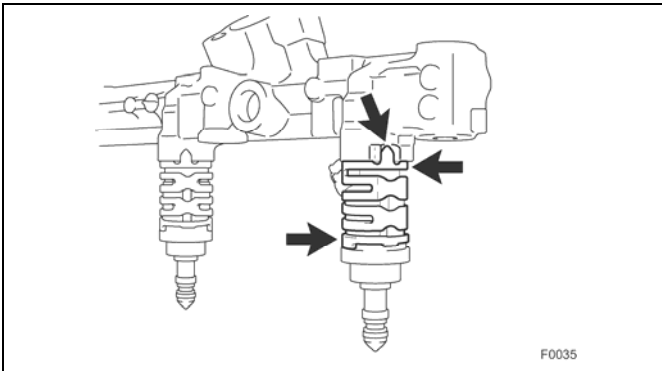


11. INSTALL FUEL INJECTOR ASSEMBLY

- a) Install the injector nozzle holder clamp.
- b) Apply gasoline to the fuel injector's O-ring and into the attachment hole of the fuel delivery pipe.

NOTE:

Apply gasoline on both the O-ring and into the attachment hole. Lubricant will run out immediately after insertion if only applied to the O-ring side.

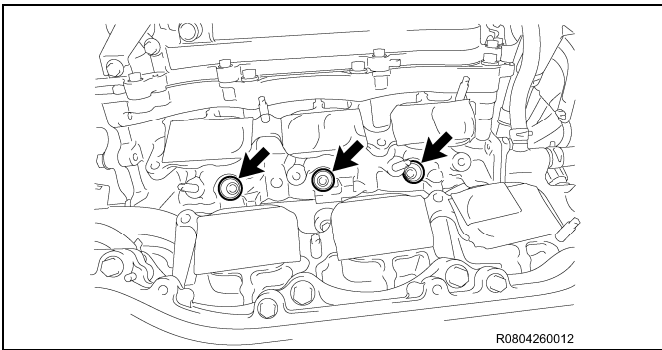


- c) Install the nozzle holder clamp by aligning the protruding part of the clamp to the notch of the delivery pipe.
- d) Repeat steps a) ~ c) for the remaining injectors.

NOTE:

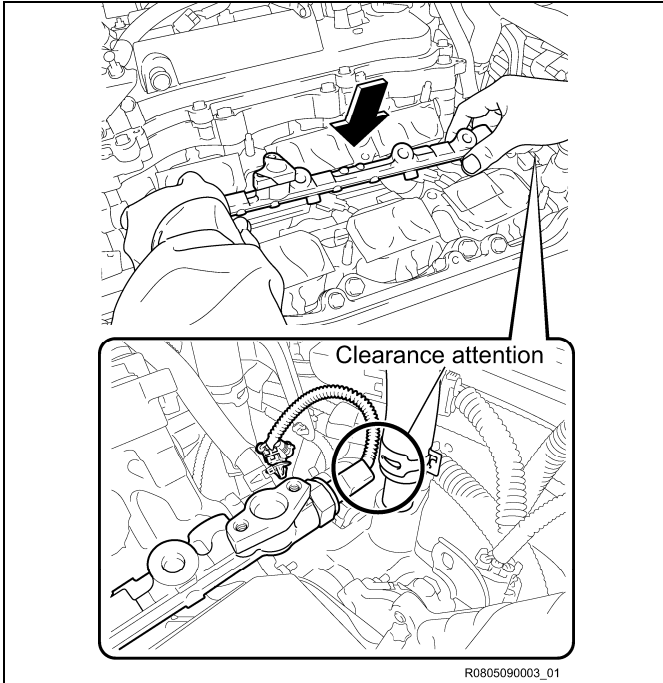
- **Make sure that there is no gap between the delivery pipe and clamp.**
- Check that there is no foreign matter or damage to the injector insertion hole of the delivery pipe.

E. FUEL PIPE INSTALLATION



1. INSTALL NO. 1 FUEL DELIVERY PIPE

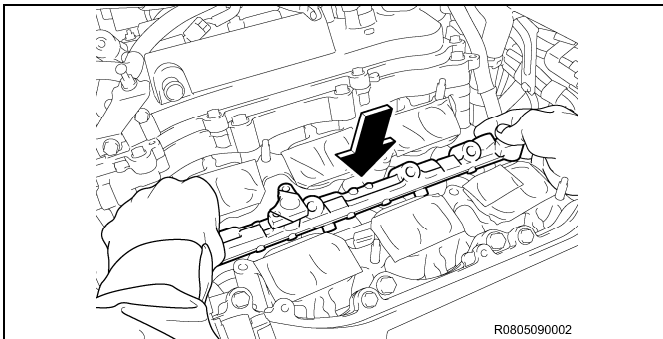
- a) Install 3 **NEW** injector vibration insulators to the cylinder head.
- b) Apply lubricant to the installation hole of the injector.



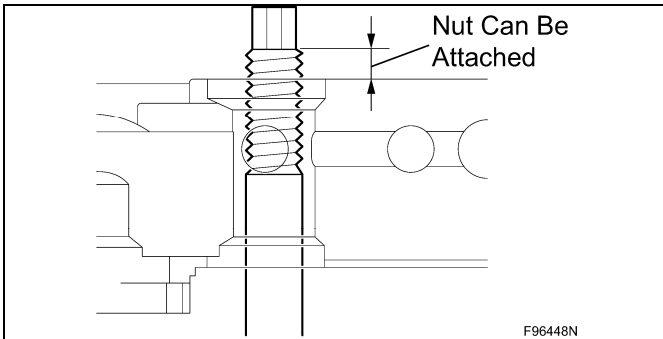
- c) While gently raising the front of the delivery pipe, carefully insert the fuel delivery pipe on to the cylinder head's stud bolts. Do not allow the fuel pressure sensor and heater hose come in contact.

NOTE:

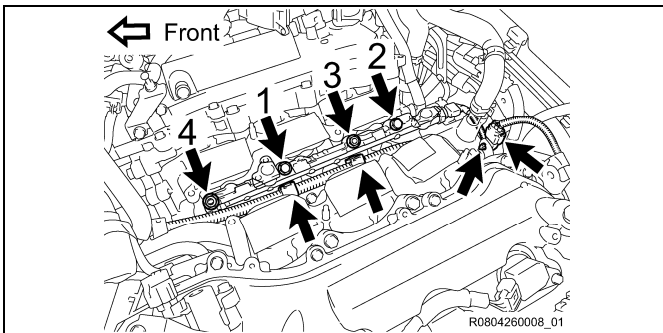
- If an injector is dropped or the tips of the injectors are struck, replace it with a **NEW** one.
- Check that there is no foreign matter or damage to the injector insertion hole of the delivery pipe.
- When inserting the fuel delivery pipe, push it in evenly without tilting it.



- d) Align the delivery pipe's attachment holes with the stud bolts and install the delivery pipe without letting the fuel pressure sensor and heater hose come in contact.
- e) Connect the 3 electrical fuel injector connectors.



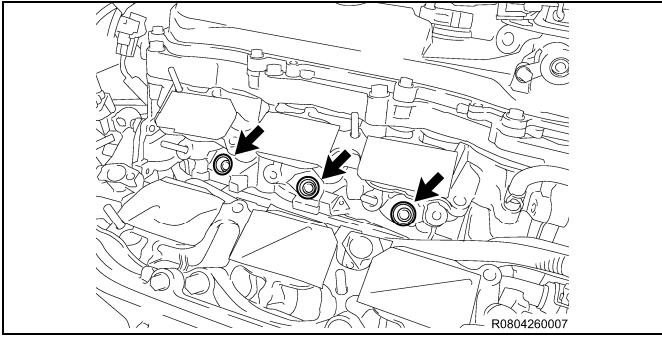
- f) Install the fuel delivery pipe until the screw threads protrude enough so that a nut can be attached.



- g) Install the fuel delivery pipe by uniformly tightening the 2 bolts and 2 nuts in several passes in the order shown in the illustration.

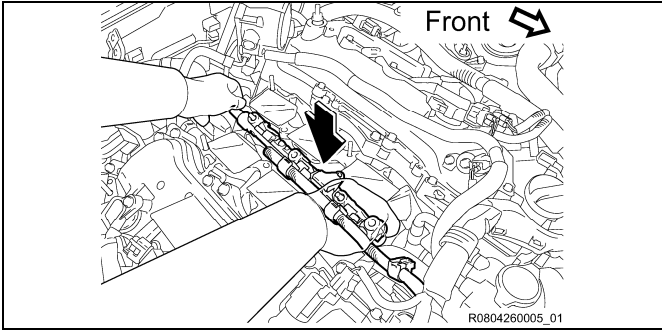
Torque Specification:
26 N·m (265 kgf·cm, 19 ft·lbf)

- h) Connect the fuel pressure sensor connector and wire harness clamps.



2. INSTALL NO. 2 FUEL DELIVERY PIPE

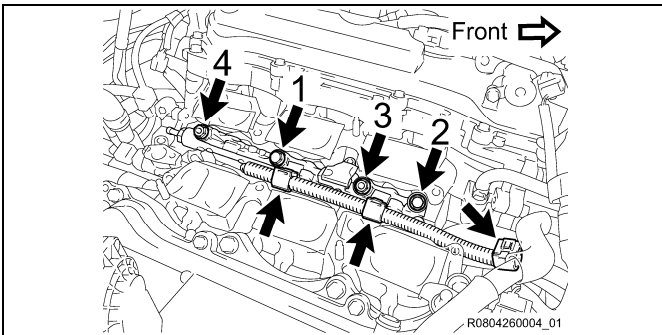
- a) Install 3 **NEW** injector vibration insulators to the cylinder head.
- b) Apply lubricant to the installation holes of the injectors.
- c) Connect the 3 electrical connectors.



- d) Install the fuel delivery pipe until the screw threads protrude enough so that a nut can be attached.

NOTE:

- If an injector is dropped or the tips of the injectors are struck, replace it with a **NEW** one.
- When inserting the fuel delivery pipe, push it in evenly without tilting it.

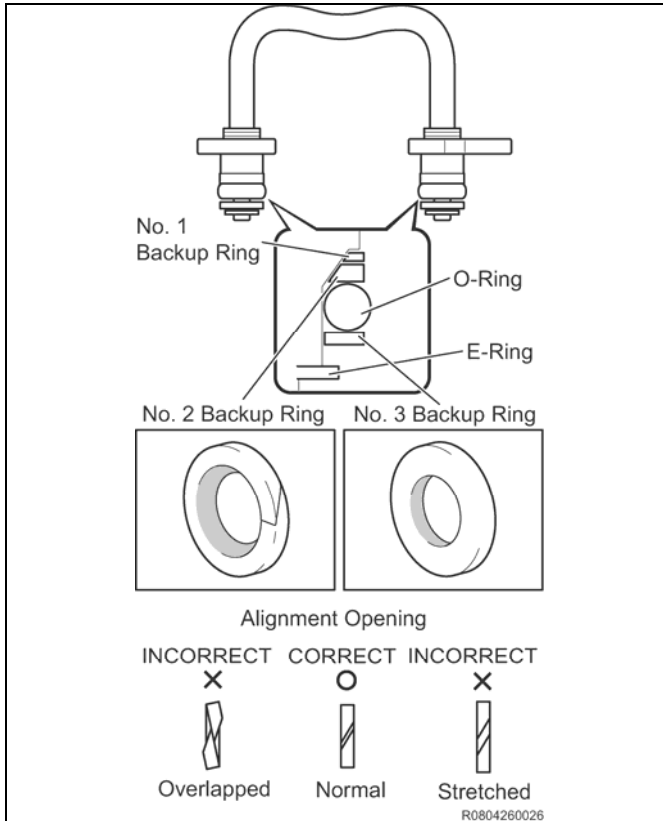


- e) Reinstall the fuel delivery pipe by uniformly tightening the 2 bolts and 2 nuts in several passes in the order shown in the illustration.

Torque Specification:

26 N·m (265 kgf·cm, 19 ft·lbf)

- f) Connect the 3 wire harness clamps.

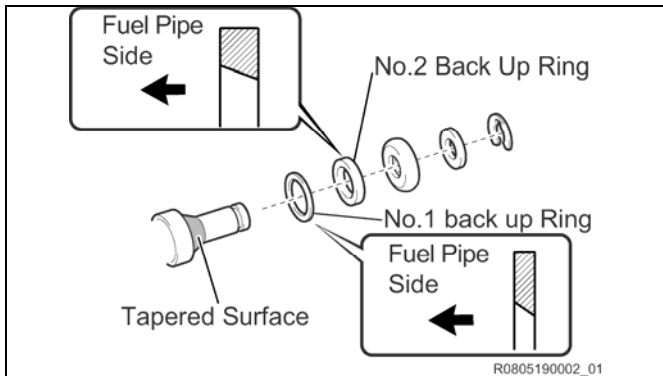


3. REINSTALL NO. 3 FUEL PIPE

- Remove the O-ring, backup rings and E-ring from the No. 3 fuel pipe.
- Install a **NEW** O-ring, **NEW** backup rings (No. 1 No. 2, and No. 3) and **NEW** E-ring to the fuel injector as shown in the illustration.

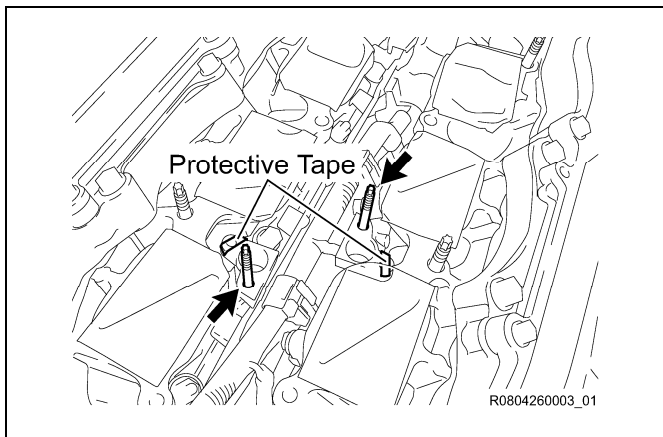
NOTE:

- Check that there is no foreign matter or damaged areas in the injector's O-ring groove.
- Check that the No. 1 and No. 2 backup rings are installed in the correct direction.
- Make sure that the backup rings and O-ring are installed in the correct order.
- Check that the alignment openings of the backup rings are not overlapped or stretched as shown in the illustration.
- After installing the O-ring, check that it is not contaminated with foreign matter and is not damaged.



NOTE:

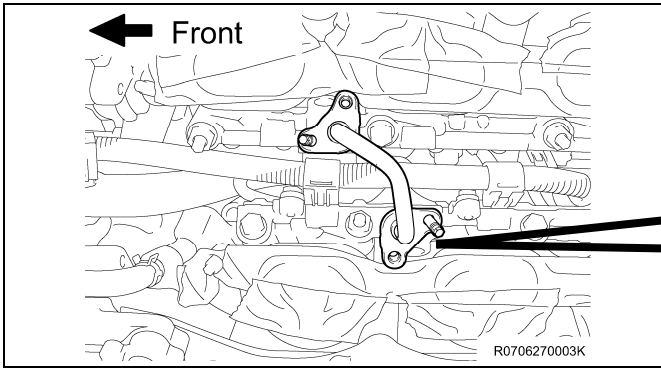
Align and install the No.1 and No.2 back up rings to the No. 3 fuel pipe's tapered surface.



- Hand tighten the 2 stud bolts to the delivery pipe bolt attachment holes diagonally as illustrated. (torx® side up)
- Place protective tape over screw holes without stud bolts to prevent lubricant from entering.
- Apply gasoline to the No. 3 fuel pipe's O-ring and into the attachment hole of the delivery pipe's No. 3 fuel pipe.

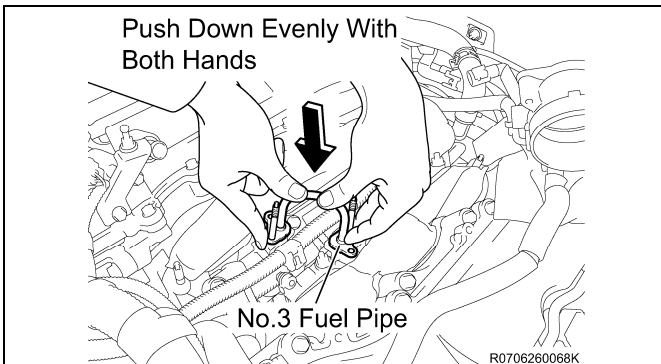
NOTE:

- Failure to lubricate both o-ring and attachment hole, may damage the seal.



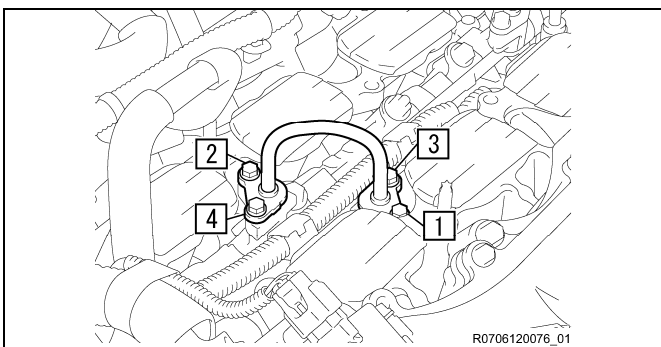
- f) Remove the protective tape and clean the delivery pipe attachment surface.
- g) Insert the 2 stud bolts through the No. 3 fuel pipe.

NOTE:
Be Careful of the Direction for Pipe No. 3.
(Attaching the pipe backwards will interfere with the intake manifold.)



- h) Press the fuel pipe and delivery pipe together by hand until there is no gap between them.
- i) Remove the 2 stud bolts once the pipes are together.

NOTE:
 Shifting the pipe too widely to the left and right may damage the part which may lead to a fuel leak.

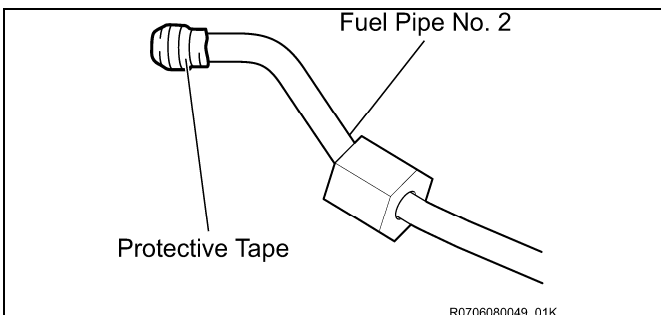


- j) Clean the screw holes of dirt and gasoline, and then insert and tighten the 4 bolts in the order shown in the illustration.

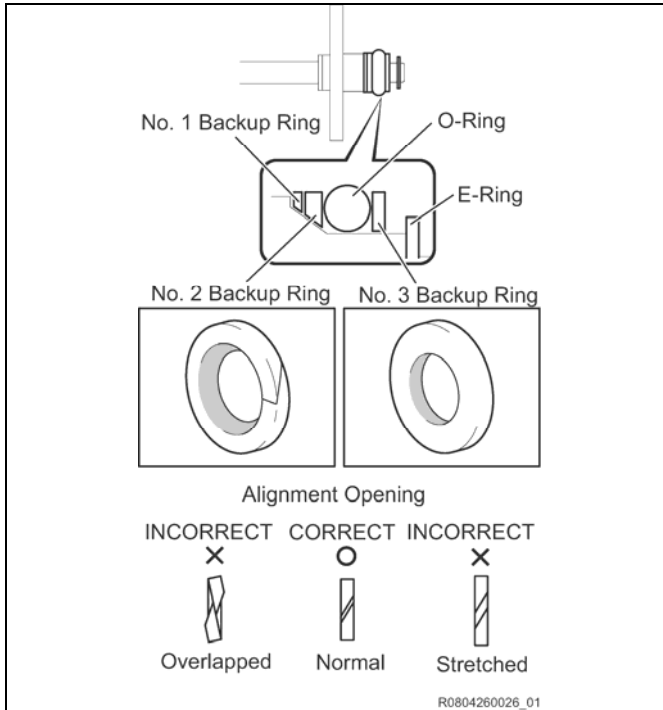
Torque Specification:
10 N·m (102 kgf·cm, 7 ft·lbf)

4. INSTALL NO. 2 FUEL PIPE

STOP WHEN REINSTALLING FUEL PIPE NO. 2 AND THE FUEL PUMP, FOLLOW THE TEMPORARY INSTALLATION, TIGHTENING AND OTHER PROCEDURES SHOWN TO PREVENT DAMAGE TO ALL SEALING SURFACES.



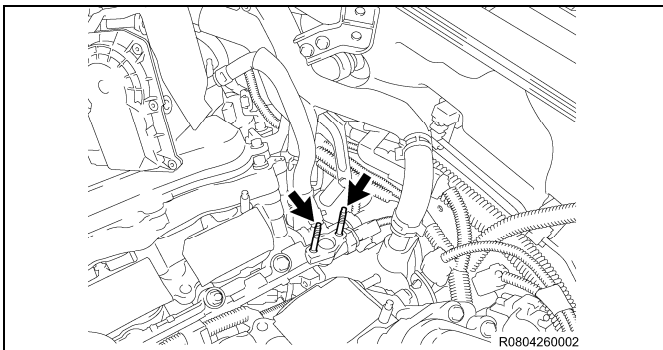
- a) Place protective tape over the taper section of the No.2 fuel pipe's fuel pump to prevent damage.



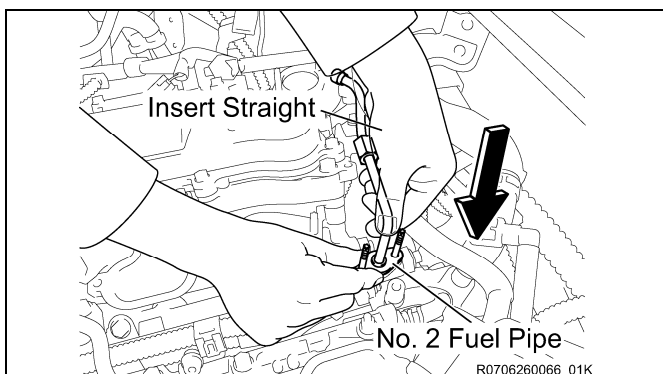
- b) Remove the O-ring, backup rings and E-ring from the No. 2 fuel pipe.
- c) Install a **NEW** O-ring, **NEW** backup rings (No. 1 No. 2, and No. 3) and **NEW** E-ring to the fuel injector as shown in the illustration.

NOTE:

- Check that the No. 1 and No. 2 backup rings are installed in the correct direction.
- Make sure that the backup rings and O-ring are installed in the correct order.
- Check that the alignment openings of the backup rings are not overlapped or stretched as shown in the illustration.
- After installing the O-ring, check that it is not contaminated with foreign matter and is not damaged.
- Check that the No. 3 fuel pipe installation end is not contaminated with foreign matter and is not damaged.



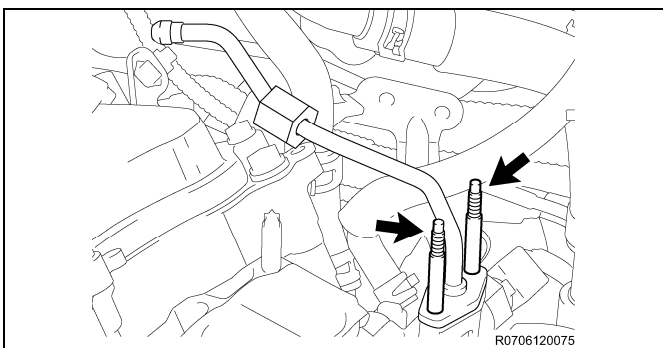
- d) Hand tighten the 2 stud bolts in the delivery pipe's bolt attachment holes. (torx® side up)



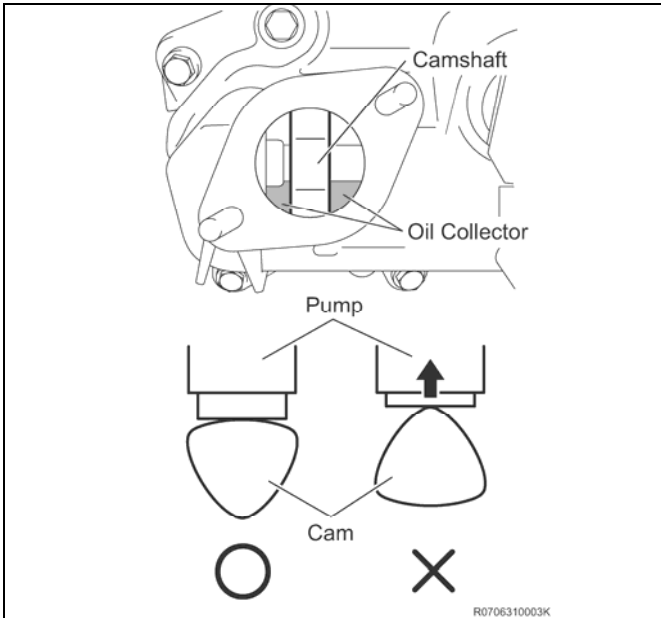
- e) Apply gasoline to the No. 2 fuel pipe's O-ring and into the attachment hole of the delivery pipe's No. 3 fuel pipe.
- f) Press the fuel pipe and delivery pipe together by hand until there is no gap between them.

NOTE:

- Apply gasoline on both the O-ring and into the attachment hole. Lubricant will run out immediately after insertion if only applied to the O-ring side.



- g) Remove the 2 stud bolts.
- h) Reinstall the 2 bolts but do not torque yet.

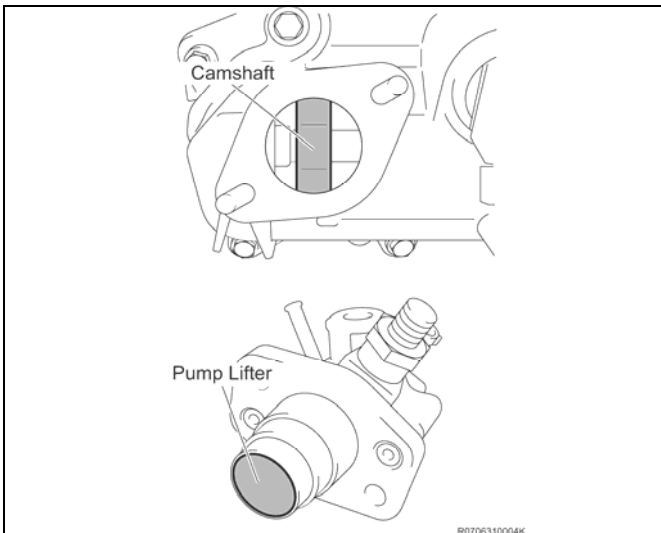


- i) Turn the crankshaft until the flat of the cam is facing the cylinder head cover's fuel pump attachment hole, as shown in the illustration.

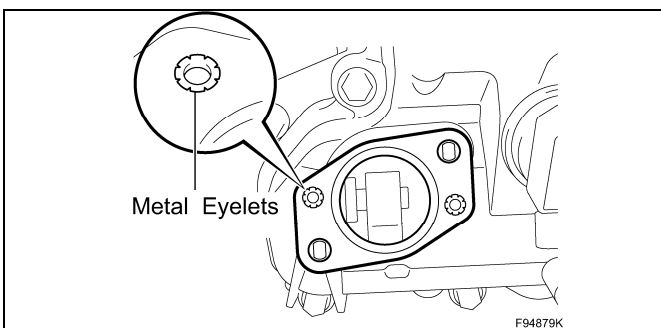
NOTE:

When installing the fuel pump by following the procedure described above: By not using the camshaft pointed side to push up the pump activation surface, it is easier to install the fuel pump and No. 2 fuel pipe later.

- j) Pour 30 cc of engine oil through the cylinder head cover's fuel pump attachment hole into the cylinder head oil collector.



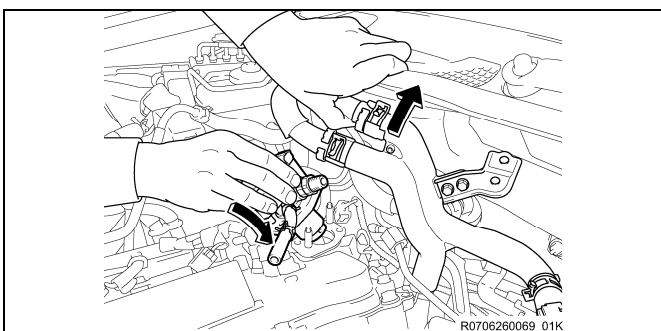
- k) Apply a coat of engine oil to the pump activation cam and pump lifter part.



- l) Install a **NEW** fuel pump insulator to the cylinder head cover.

NOTE:

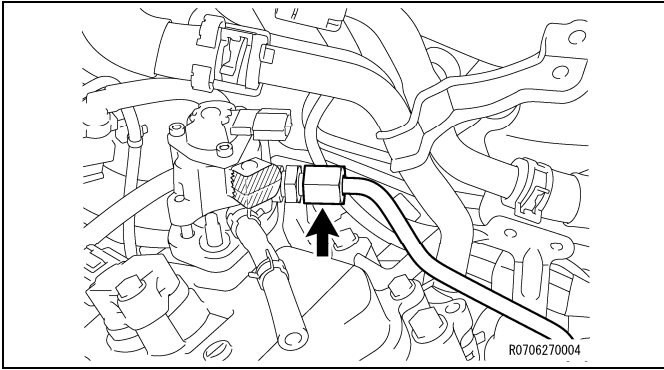
- Install the insulator so that the open sides of the metal eyelets are facing outward, as shown in the illustration.



- m) Reinstall the fuel pump.

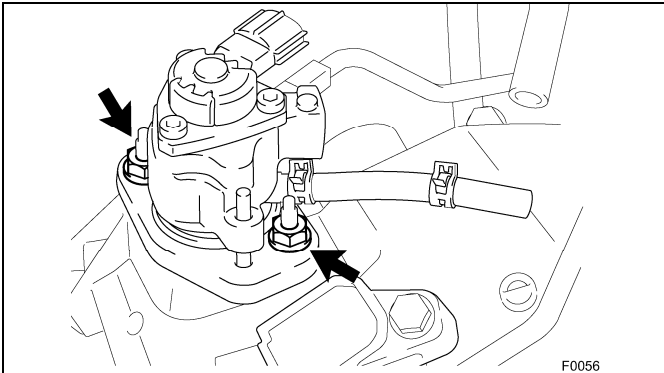
NOTE:

Do not apply excessive force to the heater hose and coolant pipe.



- n) Remove the Protective tape.
- o) Loosely install the No. 2 fuel pipe sub-assembly to the fuel pump assembly.

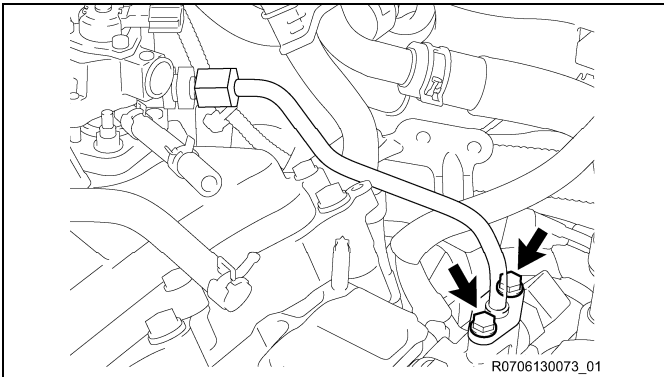
NOTE:
Be careful not to damage the sealing surface of the fuel pipe when temporarily installing the fuel pipe.



- p) Install the 2 nuts and tighten them in several passes.

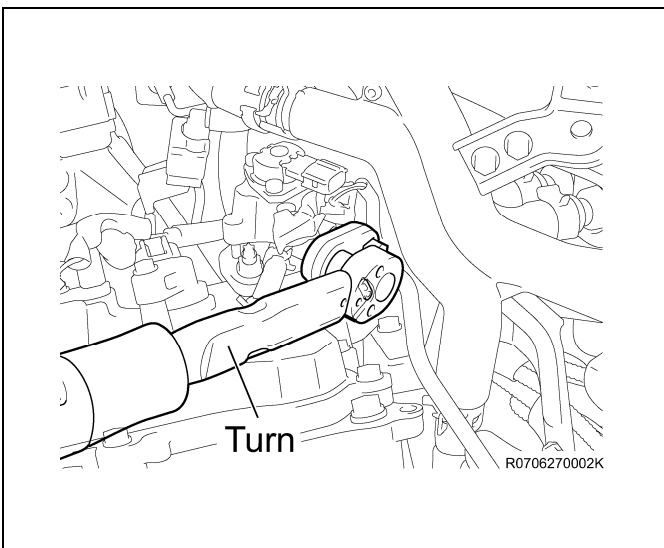
Torque Specification:
25 N-m (255 kgf-cm, 18 ft-lbf)

5. RECONNECT NO. 2 FUEL PIPE



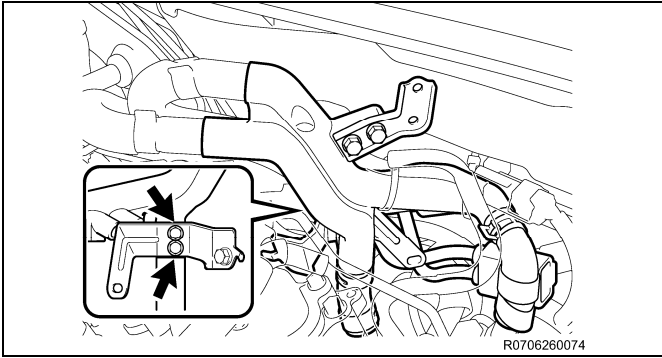
- a) Torque the 2 fuel pipe bolts.

Torque Specification:
10 N-m (102 kgf-cm, 7 ft-lbf)



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

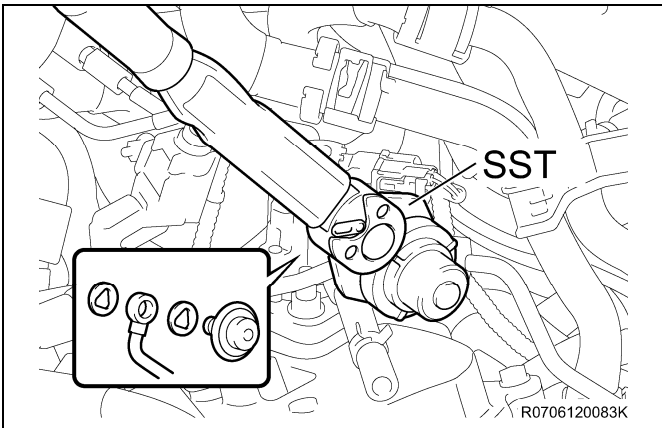
Torque Specification:
26 N-m (265 kgf-cm, 19 ft-lbf)



6. REINSTALL WATER HOSE JOINT (Step for GS350 2GR-FSE only)

- a) Reinstall the water hose joint with the 2 bolts.

Torque Specification:
10 N·m (102 kgf·cm, 7 ft·lbf)



7. REINSTALL FUEL PRESSURE PULSATION DAMPER

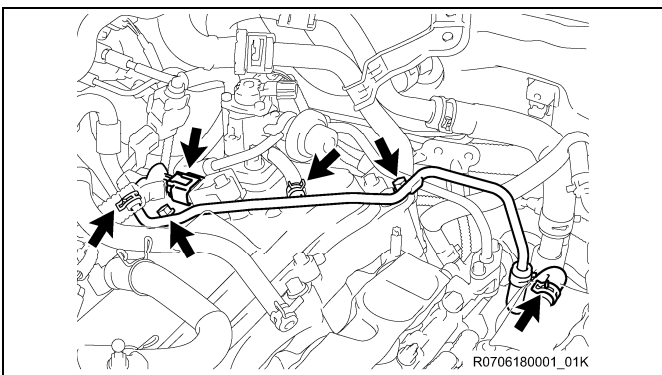
- a) Remove the protective tape and clean the attachment's surface.
- b) Once the 2 **NEW** gaskets and fuel tube have been installed, attach the fuel pressure pulsation damper and tighten by hand.
- c) Use SST or equivalent to securely tighten the pulsation damper.
- d) Connect the electrical connector to the fuel pump.

SST 09617-24011

NOTE:

Do not use pulsation dampers which have been dropped. Dropped dampers may not work properly.

Torque Specification:
For Use With SST :
33 N·m (337 kgf·cm, 24 ft·lbf)
For Use Without SST :
40 N·m (408 kgf·cm, 30 ft·lbf)



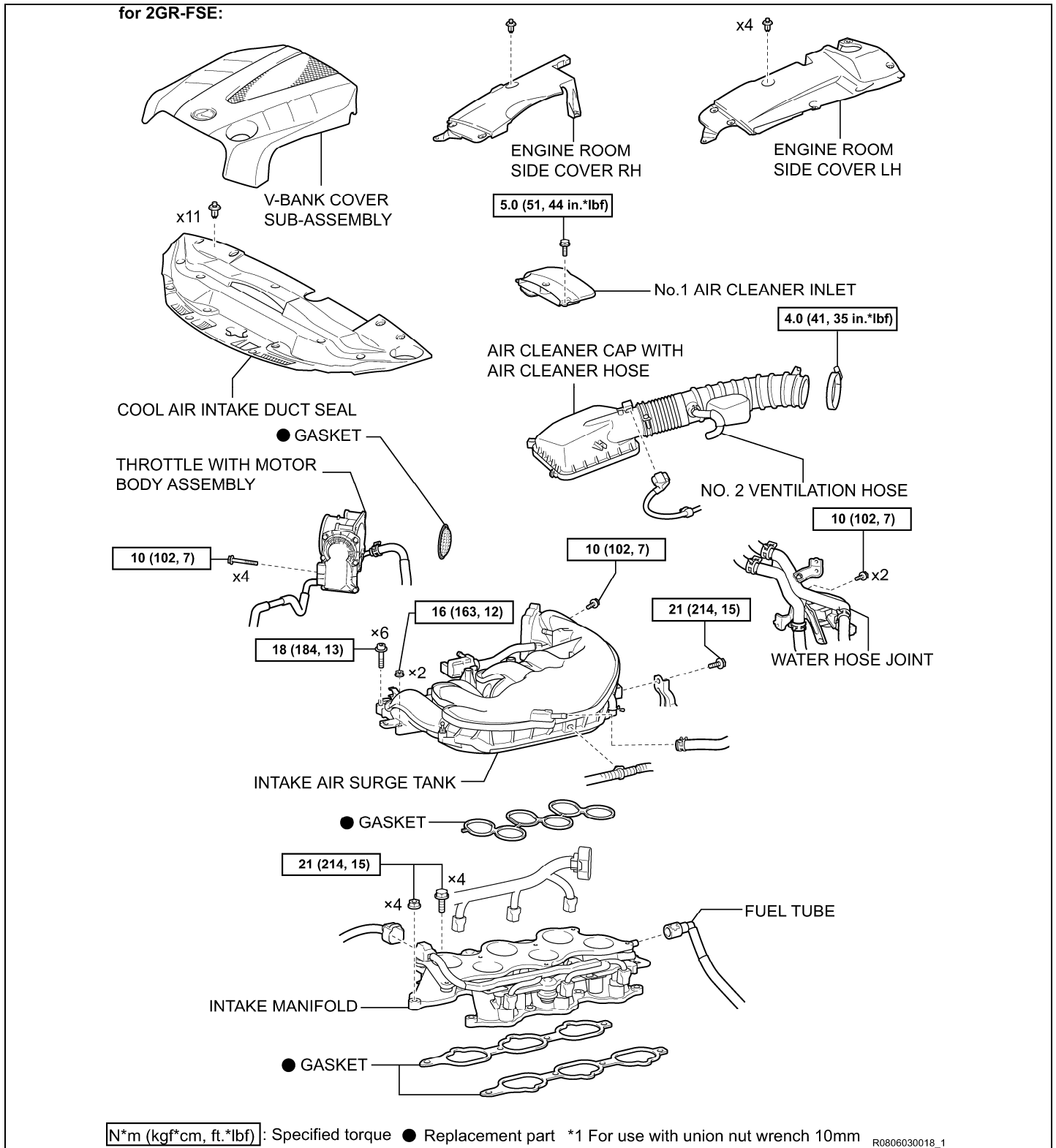
8. REINSTALL NO. 1 FUEL PIPE

- a) Reinstall the fuel pipe with the 2 bolts.

Torque Specification:
10 N·m (102 kgf·cm, 7 ft·lbf)

- b) Connect the 3 fuel hoses.
- c) Connect the ignition coil connector.

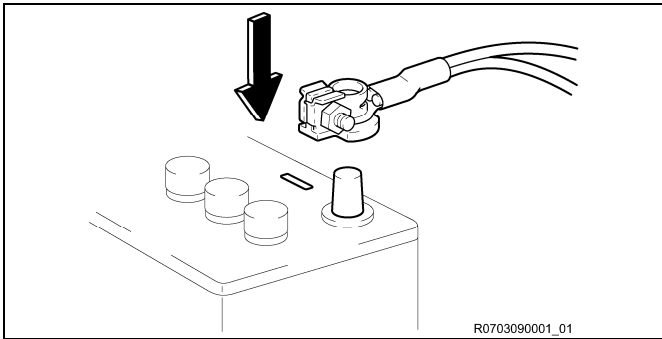
F. GS350 2GR-FSE INTAKE MANIFOLD REINSTALLATION



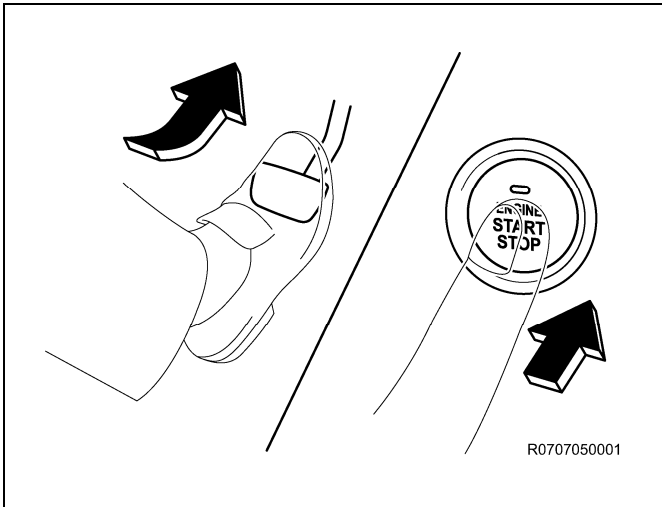
REINSTALL THE COMPONENTS SHOWN IN THE ILLUSTRATION ABOVE. Click link if additional assistance is required:

- [GS350 2GR-FSE FUEL: FUEL INJECTOR \(for Direct Injection\): INSTALLATION \(2007 GS350\)](#)

H. CHECK FOR FUEL LEAKS & REASSEMBLY



1. CONNECT THE NEGATIVE (-) BATTERY TERMINAL CABLE



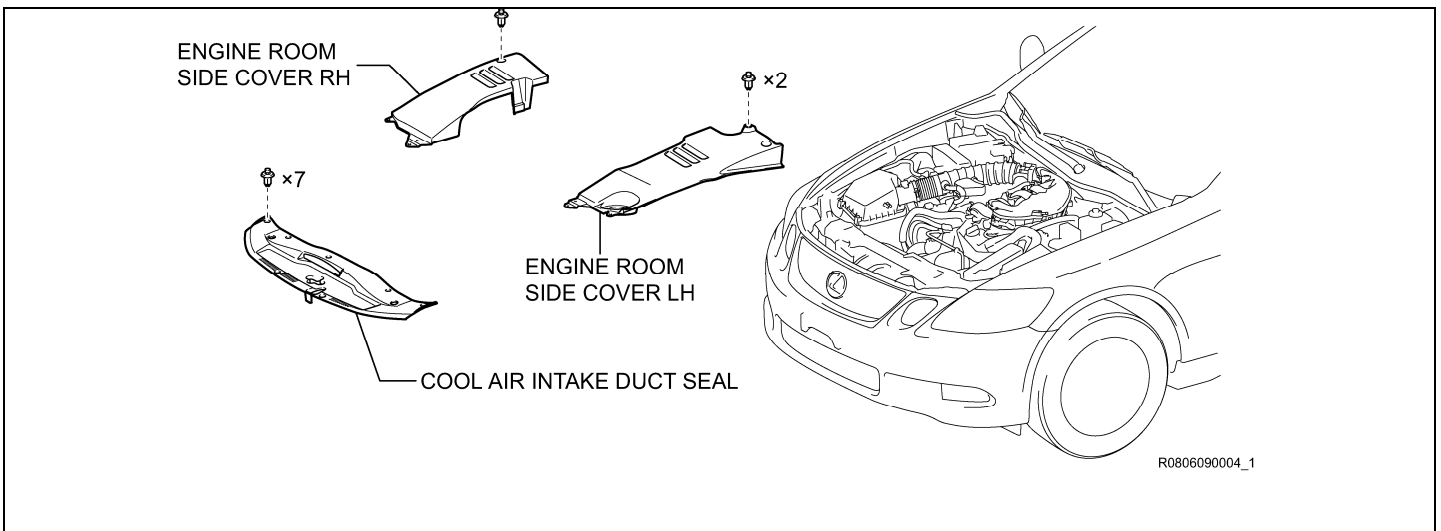
2. CHECK FOR FUEL LEAKS

- Start and then stop the engine after approximately 5 seconds.
- Inspect each part for fuel leakage.
- If there is no fuel leakage found in step (b), restart the engine and re-inspect.

NOTE:

- Prepare for fuel leakage. Next, start the engine and stop it approximately 5 seconds later. Inspect for fuel leakage.
- Cranking alone may not start the high pressure fuel pump solenoid values used to produce fuel pressure (high pressure).

3. REINSTALL ENGINE ROOM COVERS



4. CHECK THROTTLE BODY

- a) Check the throttle control motor operating sounds.
 - 1) Push the engine switch on.
 - 2) 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.

- b) Check the throttle position sensor.
 - 1) Connect the techstream to the DLC3.
 - 2) Push the engine switch on.
 - 3) Depress the accelerator pedal. When the value is fully opened, check that the value of the "Throttle Sensor Position" is within the specification.

Standard throttle valve opening percentage: 60% or more.

NOTE:

- **When checking the standard throttle valve opening percentage, the shift should be in the N position.**
- **If the percentage is less than 60%, replace the throttle body.**

5. CHECK FOR DTC

- a) If an error code displays, repair as necessary.

6. TEST DRIVE

- a) Test drive the vehicle and inspect for any abnormalities. (warning lamps, drivability, etc.)

7. PERFORM INITIALIZATIONS

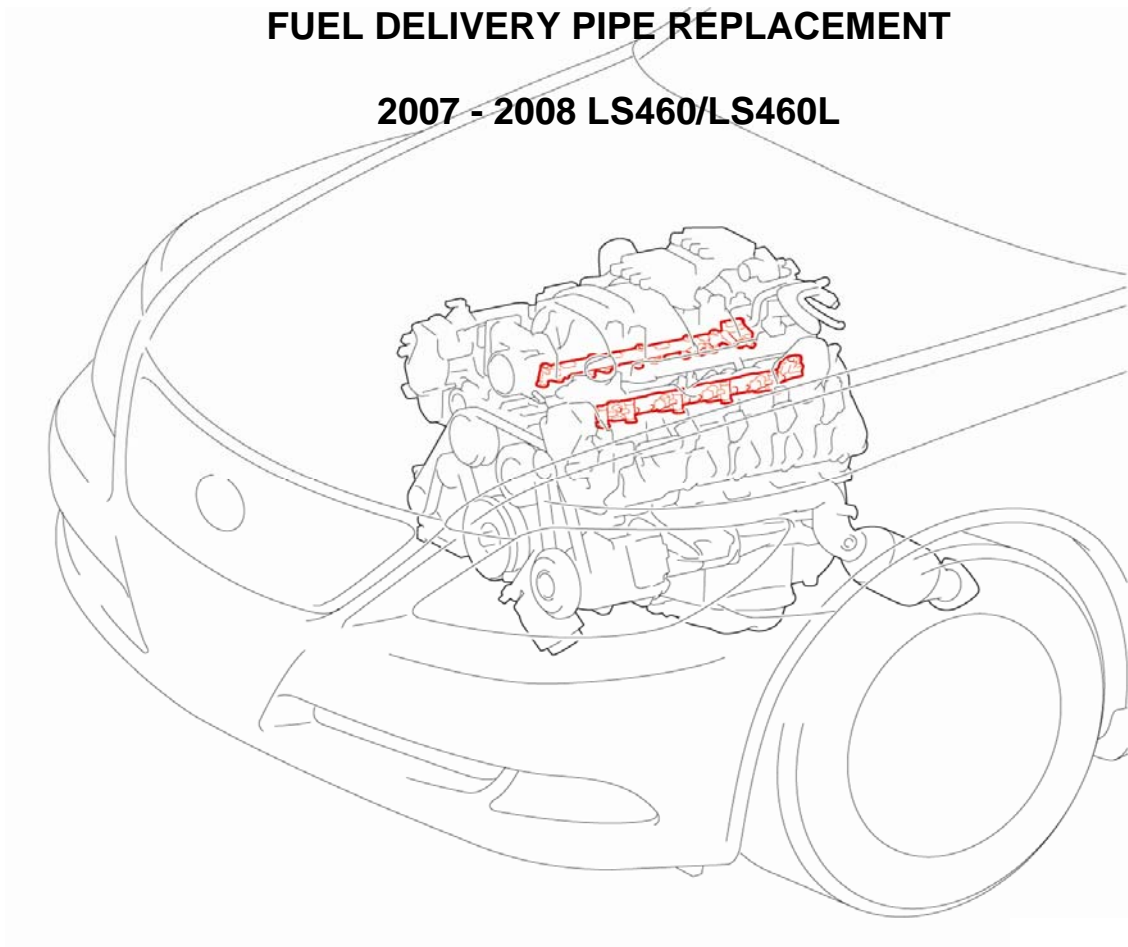
INITIALIZATION FUNCTION	GS300	GS350
Enter Recorded Presets	Required	Required
Power Window Control System	Required	Required
Sliding Roof System	Required	
Clearance Sonar System	Required	
Variable Gear Ratio Steering System	Required	Required
Intuitive Parking Assist System		Required

VIII. APPENDIX

A. CAMPAIGN PARTS DISPOSAL

As required by Federal Regulations, please make sure all campaign parts (original parts) removed from the vehicle are disposed of in a manner in which they will not be reused.

TECHNICAL INSTRUCTIONS
FOR
SPECIAL SERVICE CAMPAIGN 9LA
FUEL DELIVERY PIPE REPLACEMENT
2007 - 2008 LS460/LS460L

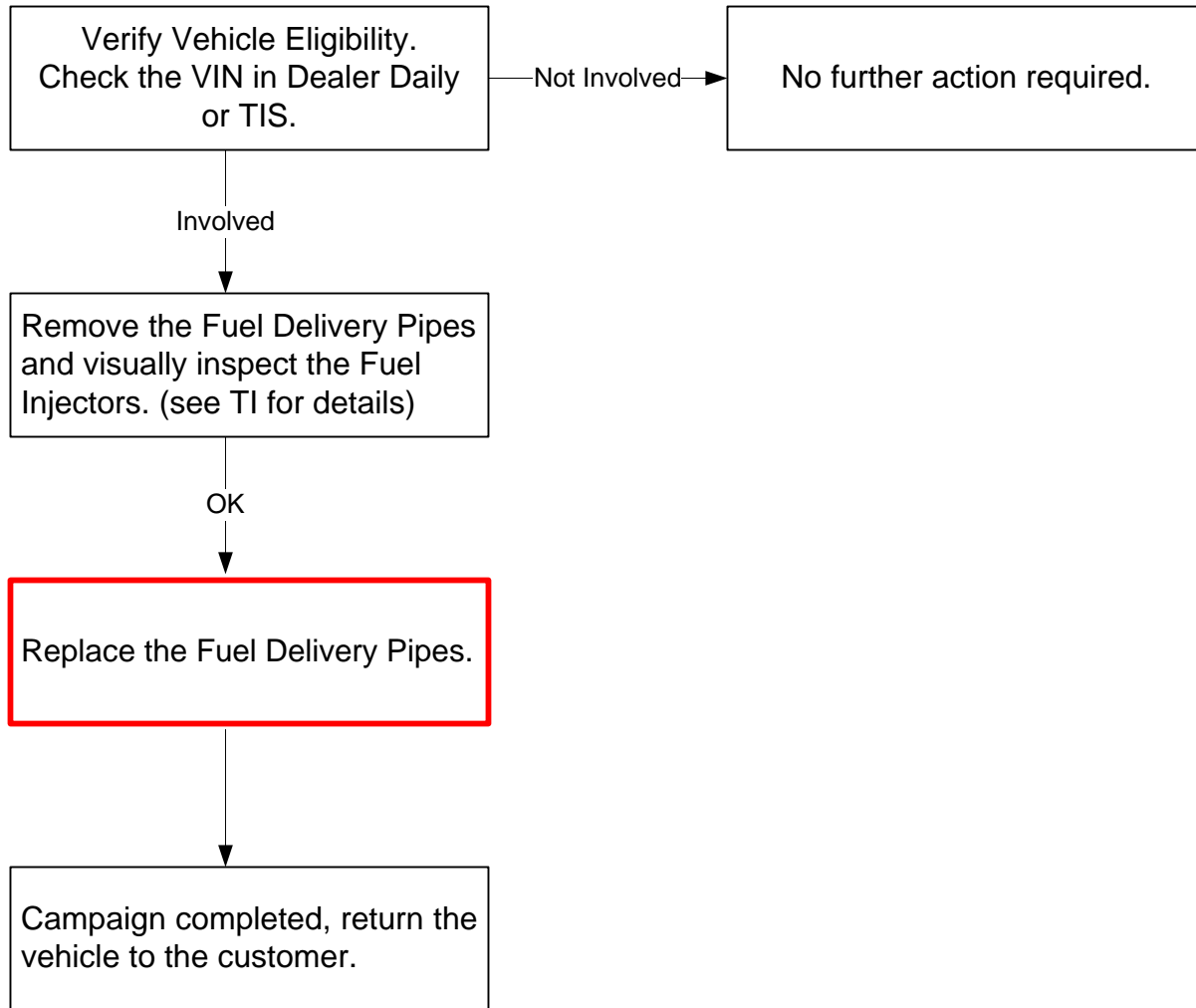


Revised January 26, 2011

TECHNICAL INSTRUCTION REVISION NOTICE:

- **January 26, 2011:**
 - **The Fuel Pressure Sensor torque value on Page 35 has been modified.**

I. OPERATION FLOW CHART



II. IDENTIFICATION OF AFFECTED VEHICLES

A. AFFECTED VIN RANGE

Vehicle Model	Year	WMI	VIN Range	
			VDS	Range
LS460	2007	JTH	BL46F	5000133 - 5051857
	2008			5051858 - 5055333
LS460L	2007		GL46F	5000112 - 5020667
	2008			5020680 - 5021639

III. PREPARATION

A. TOOLS

- Standard hand tools
- Torque wrench
- 22 mm union nut wrench
- SST: (non-essential) 09612-24014 (09617-24011)
- SST: Stud Bolt - 04007-32331 (2 stud bolts have been included in each Service Manager's Package.)
- SST: 09260-39015 Injector seal tool set. (02968-03020, 09268-03010) Lexus drawer 1

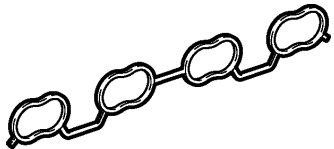

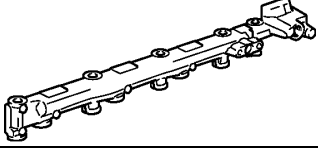
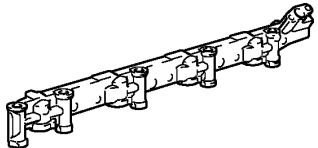
B. EQUIPMENT

- Techstream
- Radiator Cap Tester





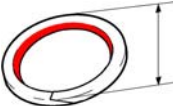
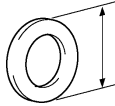

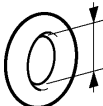
C. MATERIALS

- Protective Tape
- Coolant (Toyota SLLC P/N 00272-SLLC2 or equivalent)
- Wooden boards (for clamping purposes)

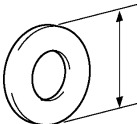
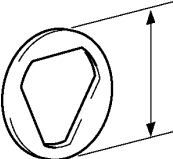
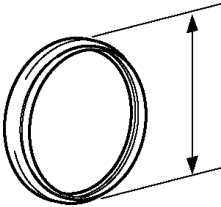
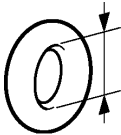
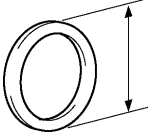


D. PARTS

Part Number	Part Description		Qty	
04008-18138	Pipe Kit, Fuel delivery, No. 1		1	
<p>The kit listed above includes the following parts:</p> <p>An illustration of the parts replaced and their installation location(s) have been provided. Please reference the tables below and on the next two pages.</p>				
Part Number	Part Description	Qty	Illustration	Installation Location(s)
17171-38020	Gasket (No. 1 Intake Manifold to Head)	2		See Page 6
22271-50050	Gasket (Throttle Body)	1		See Page 6
23814-38051	Fuel Delivery Pipe	1		See Pages 8 & 9
23815-38031	No 2 Fuel Delivery Pipe	1		See Pages 8 & 10

PARTS CONTINUED...

The parts listed below are packaged together in a clear plastic bag.				
Part Number	Part Description	Qty	Illustration	Installation Location(s)
16418-20290	Radiator Drain Packing	1	 7 mm (0.275 in.)	N/A
16492-21050	Radiator O-Ring	1	 10 mm (0.393 in.)	N/A
23255-31010	Fuel Injector Seal	16	 8.73 mm (0.344 in.)	See Pages 9 & 10
23256-38010	No.1 Fuel Pipe Backup Ring	4	 Tapered surface shown in red	See Pages 8, 9 & 10
23256-74010	No.1 Fuel Injector Backup Ring	8	 Tapered surface shown in red	See Pages 9 & 10
23257-38010	No. 2 Fuel Pipe Backup Ring	4	 12 mm (0.472 in.)	See Pages 8, 9 & 10
23257-74010	No.2 Fuel Injector Backup Ring	8	 Tapered surface shown in red	See Pages 9 & 10
90301-06019	O-Ring	4	 6.53 mm (0.257 in.)	See Pages 8, 9 & 10

PARTS CONTINUED...

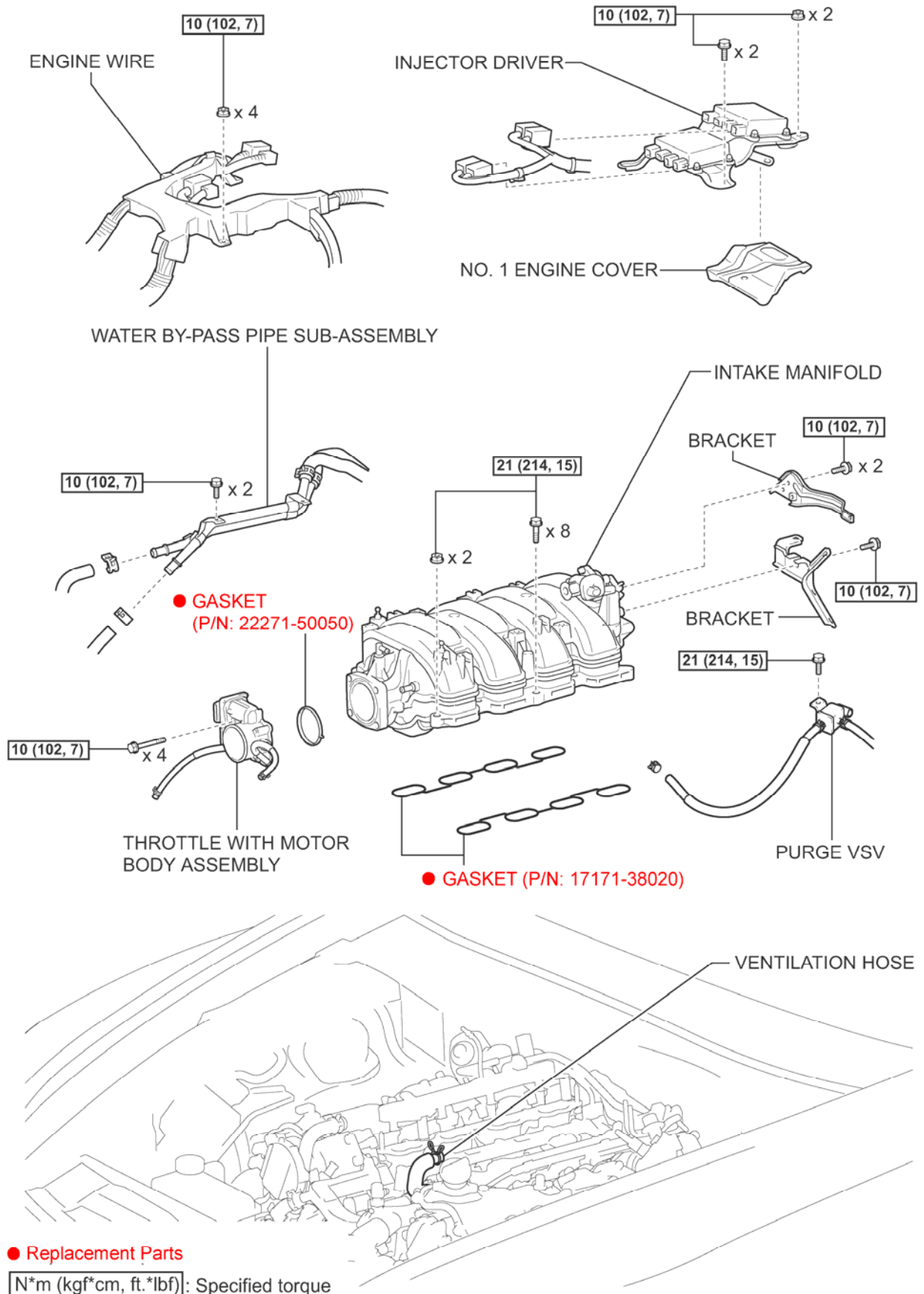
The parts listed below are packaged together in a clear plastic bag.				
Part Number	Part Description	Qty	Illustration	Installation Location(s)
23258-28011	No.3 Fuel Injector Backup Ring (Flat)	8	 14.4 mm (0.567 in.)	See Pages 9 & 10
23279-74010	Gasket (Fuel Pressure Pulsation Damper)	4	 19.5 mm (0.768 in.)	See Page 7
23291-31011	Injector Vibration Insulator	8	 25.6 mm (1.008 in.)	See Page 8
90301-06018	O-Ring	8	 6.65 mm (0.262 in.)	See Pages 9 & 10
90430-12026	Gasket	4	 16 mm (0.630 in.)	See Pages 9 & 10
90523-04006	E-Ring	4	 8 mm (0.314 in.)	See Pages 8, 9 & 10
90523-05007	E-Ring	8	 10 mm (0.393 in.)	See Pages 9 & 10

Based upon the inspection results you may need to replace the fuel injectors. Please keep all fuel injectors for possible parts recovery and inspections. If requested you will need a fuel injector shipping kit for dealers.

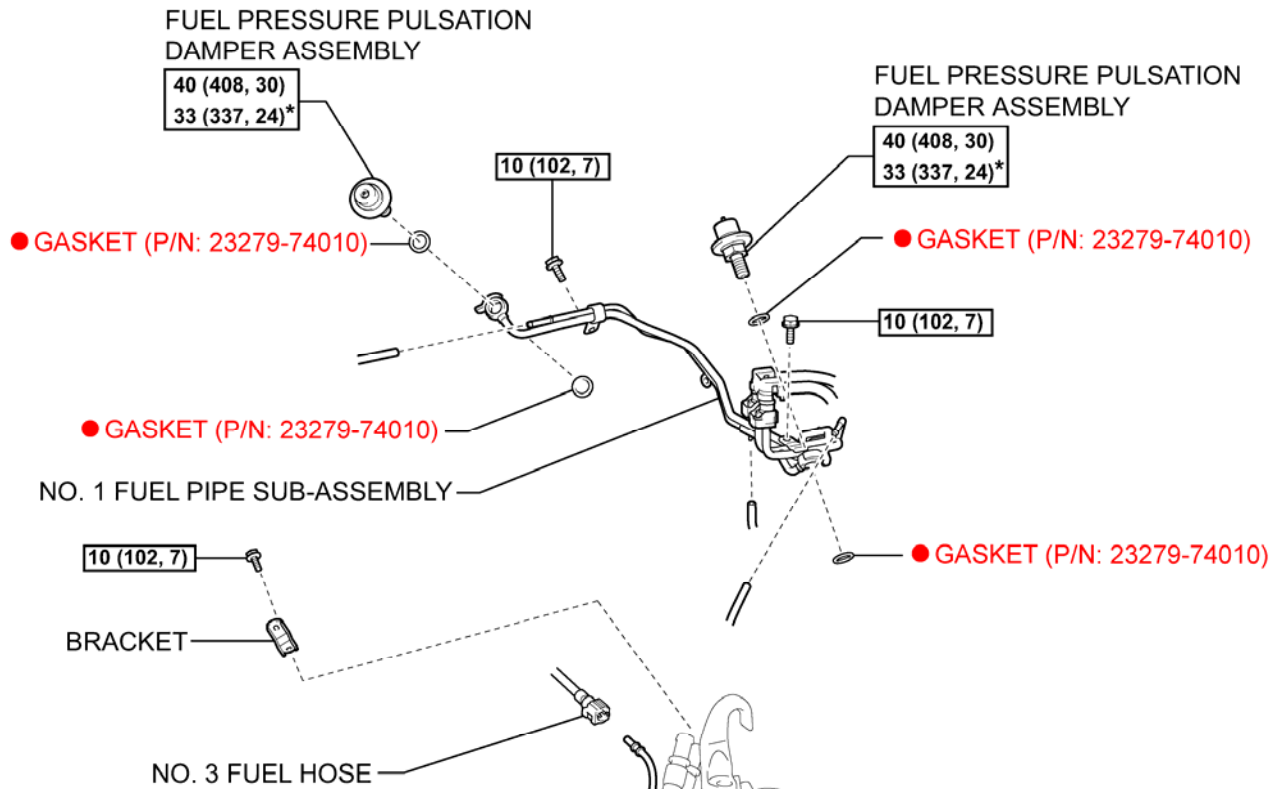
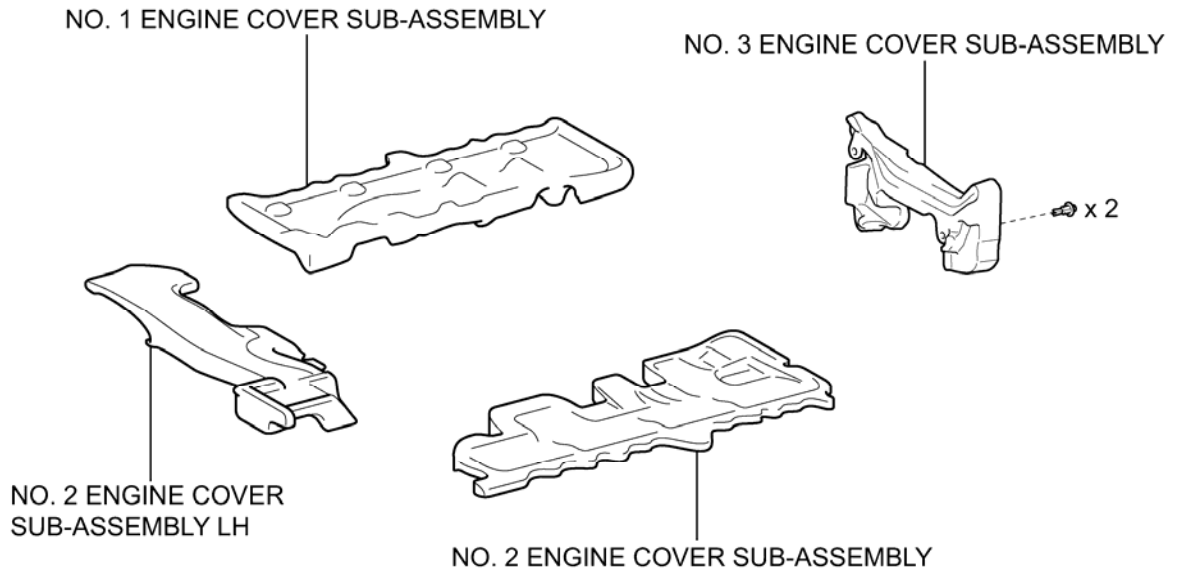
Model	Part No.	Insulator Color	Part Name	Qty/Unit
LS460/ LS460L	23209-39155-B0* or	Black	Injector Assy, Fuel	8 (as needed)
	23209-39155-C0* or	Reddish Brown		
	23209-39155-D0*	Green		

* Either injector listed for the vehicle type may be installed; however, make sure that all injectors installed on the vehicle are the same type. The injector may be identified by the injector insulator color. Please see page 32 for addition information.

E. PARTS INSTALLATION LOCATION(S)



PARTS INSTALLATION LOCATION(S) ...

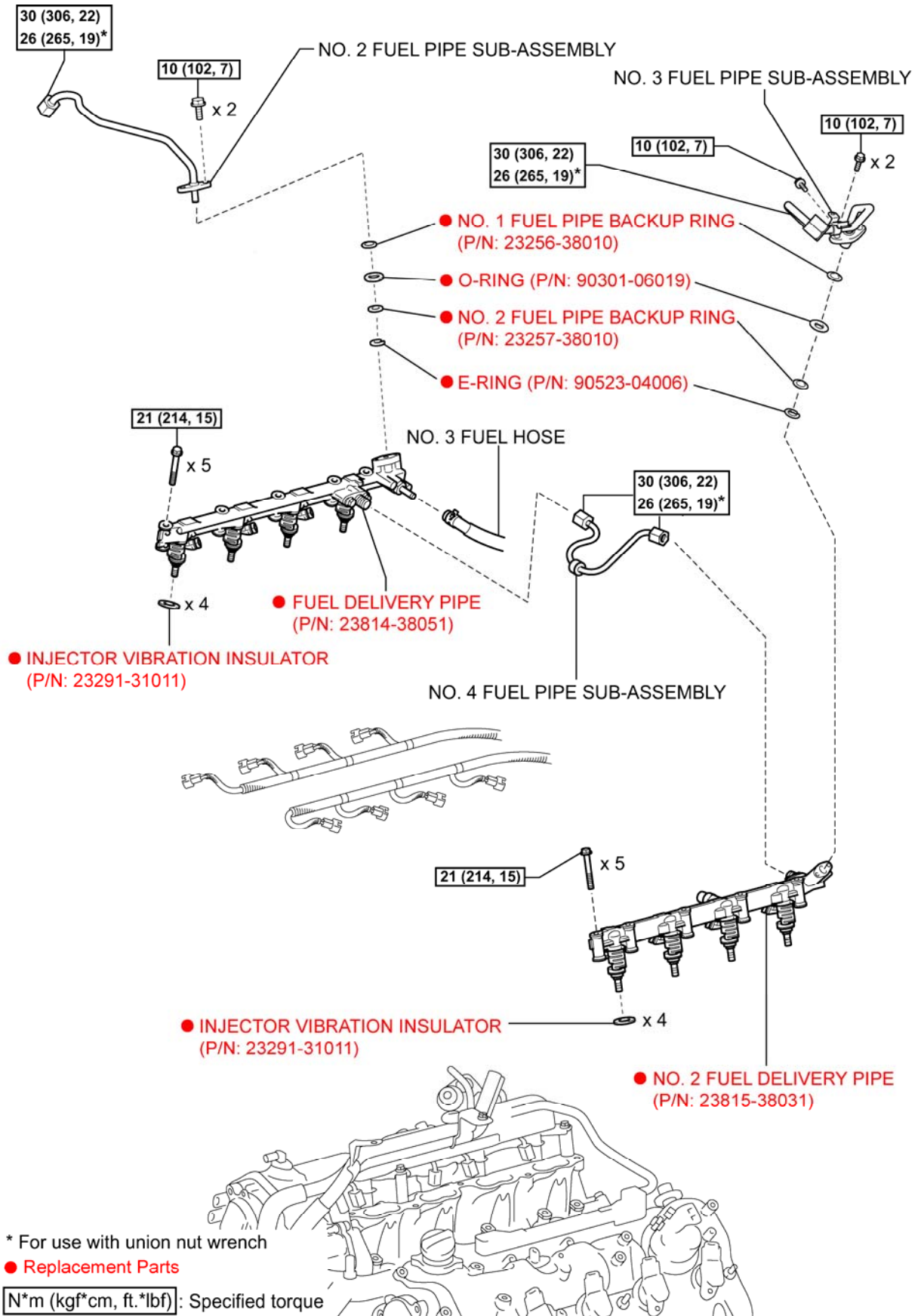


* For use with SST

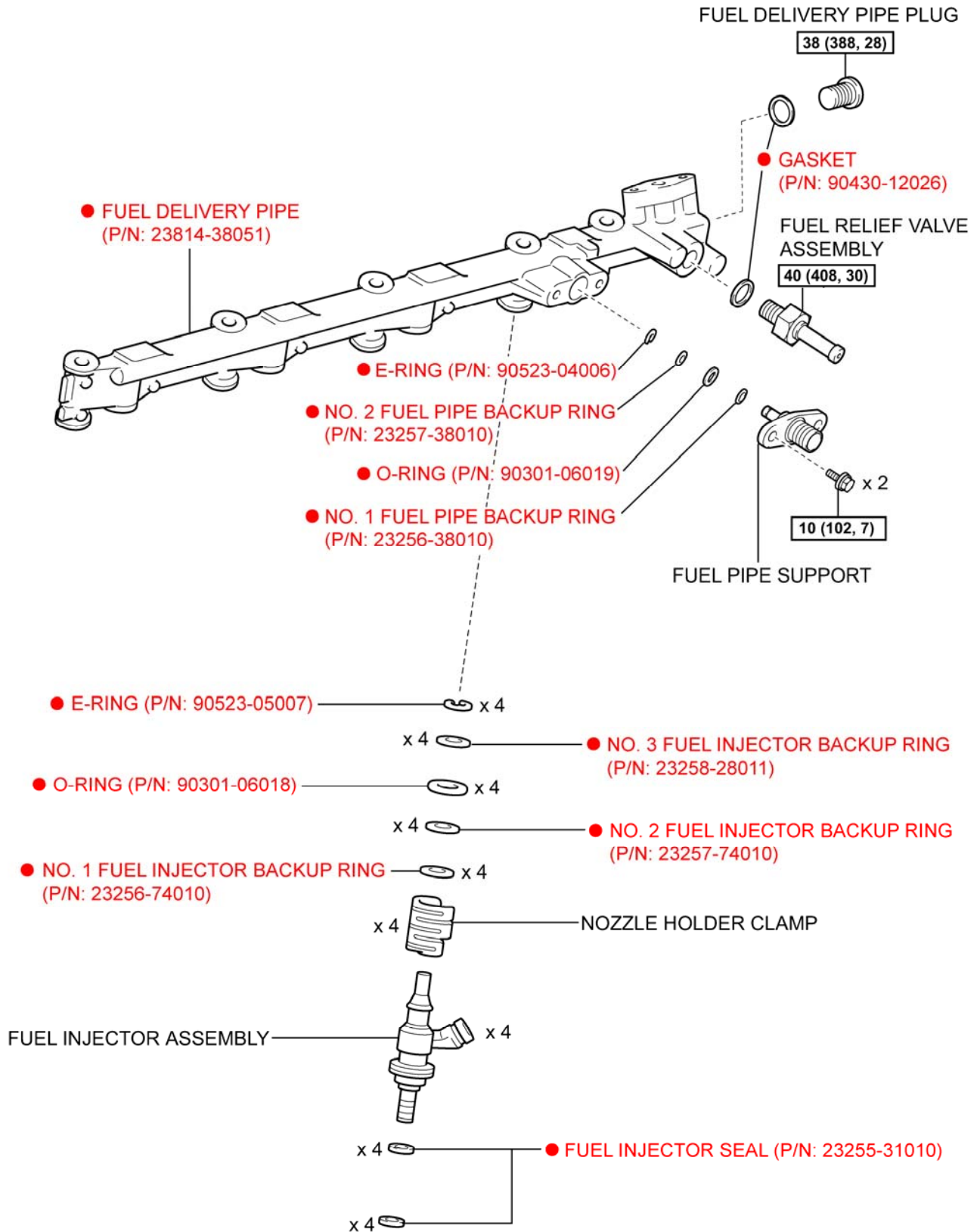
● Replacement Parts

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

PARTS INSTALLATION LOCATION(S) ...



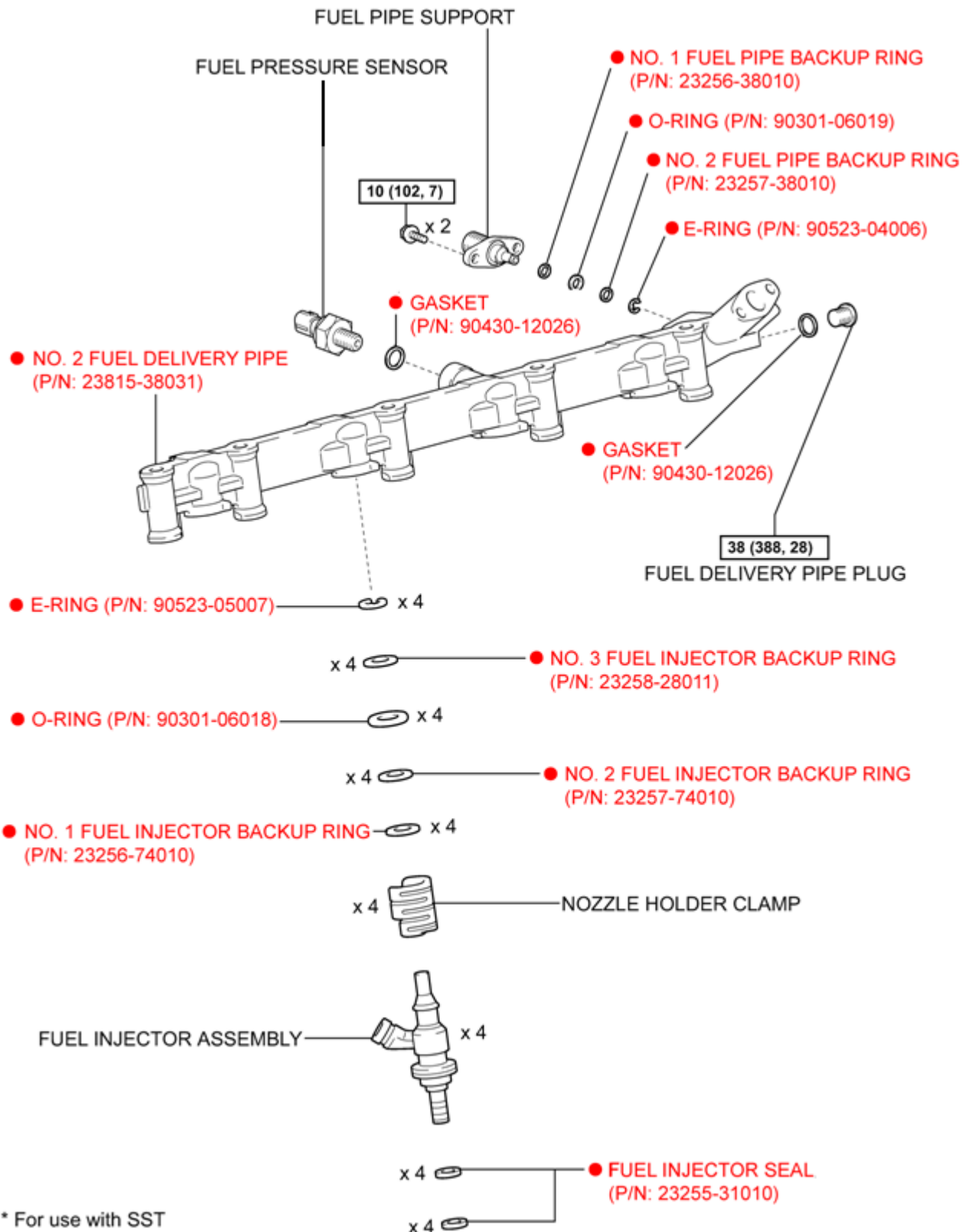
PARTS INSTALLATION LOCATION(S) ...



● Replacement Parts

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

PARTS INSTALLATION LOCATION(S) ...



* For use with SST
 ● Replacement Parts

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

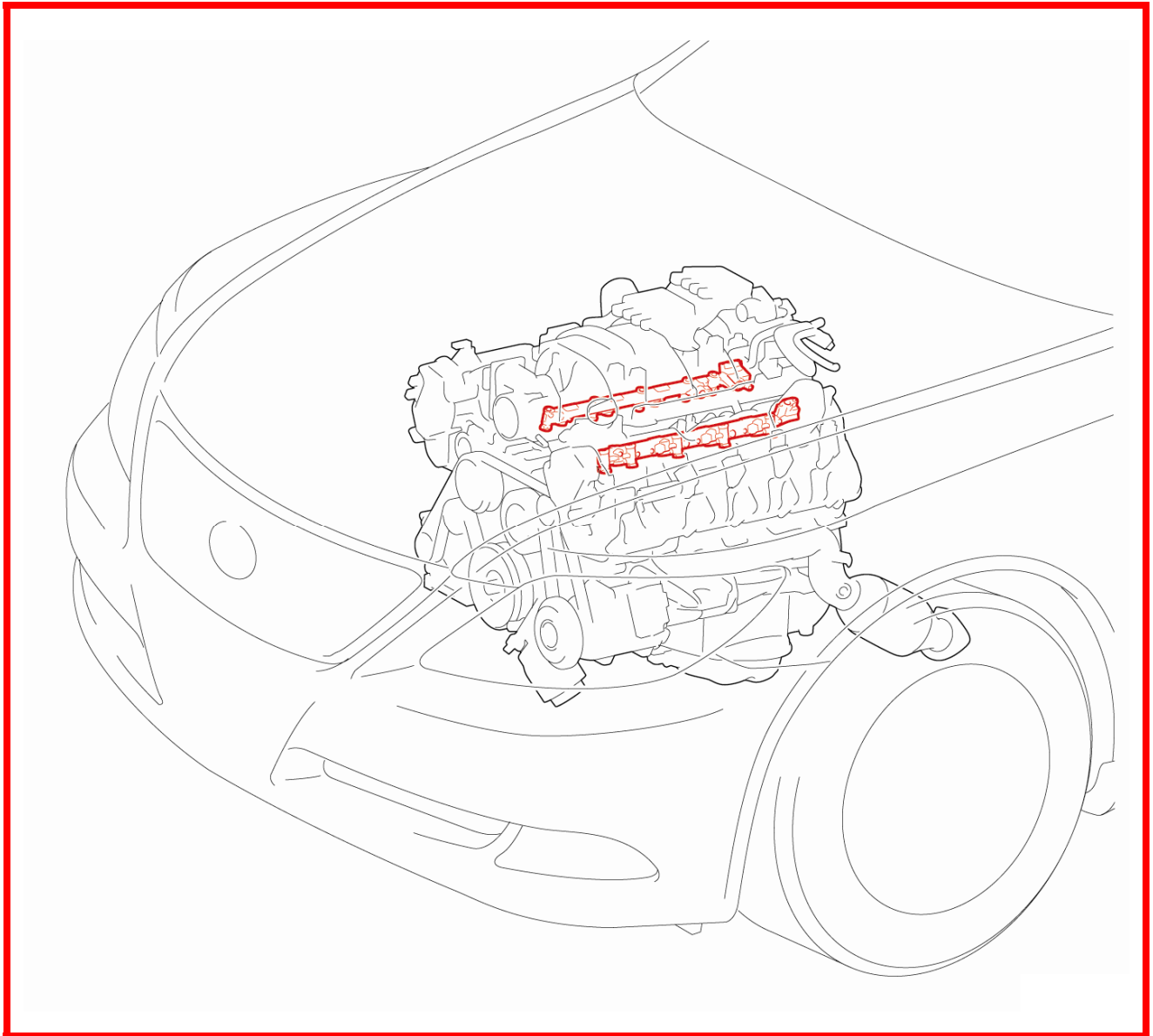
IV. TABLE OF CONTENTS

Background.....	page 11
Safety Precautions.....	page 12
Work Procedure	page 16
Fuel Delivery Pipe Replacement.....	page 31
Appendix	page 53

IMPORTANT: Only partial reinstallation steps are included in these Technical Instructions; please reference TIS for additional assistance if needed.

V. BACKGROUND


The involved vehicles are equipped with aluminum Fuel Delivery Pipes (Fuel Rails). Lexus has determined that ethanol fuels with a low moisture content will corrode the internal surface of the fuel rails. As this condition progresses, the engine Malfunction Indicator Light (MIL) may illuminate. Over time, the corrosion will create a pinhole resulting in fuel leakage.



WORK PROCEDURE

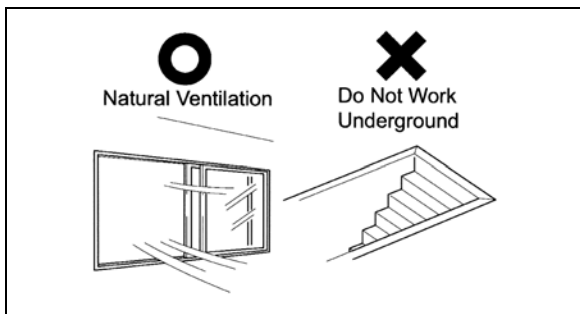
VI. SAFETY PRECAUTIONS

A. PRECAUTIONS WHEN WORKING ON THE FUEL SYSTEM



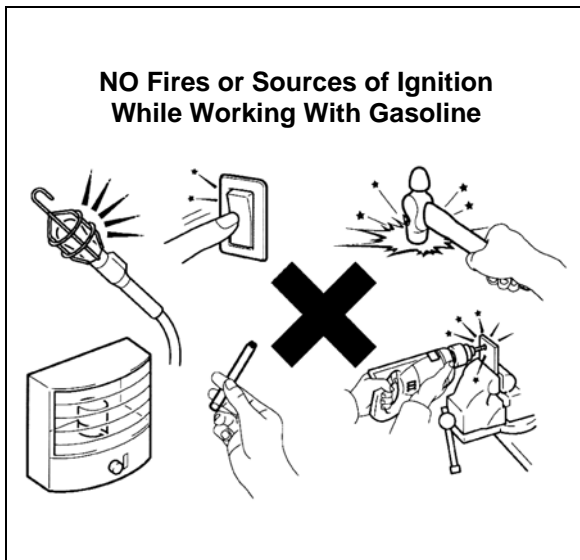
- ALWAYS REMEMBER **“SAFETY FIRST”**.
- IMMEDIATELY WIPE UP ANY SPILT FUEL.
- BE EXTREMELY CAREFUL WHEN HANDLING FUEL TO PREVENT FIRES FROM OCCURRING.
- BEFORE REMOVING ANY FUEL SYSTEM PART, DRAIN ALL FUEL TO PREVENT SPILLING.
- BEFORE WORKING ON THE FUEL SYSTEM, PERFORM THE FOLLOWING SAFETY CHECK LIST.

B. SAFETY CHECKLIST



A. AIR VENTILATION

- Perform work in a well ventilated area.
- DO NOT** work underground or in an area where fuel vapors may fill the room due to poor ventilation.
- Quickly clean up any spilled fuel with a dry cloth and dissipate the fuel vapors.
- Dry all cloths that have come in contact with fuel in a well ventilated area and dispose of them properly (according to applicable local regulations).



B. FIRES AND IGNITION SOURCES ARE STRICTLY PROHIBITED

- Fires and ignition sources are prohibited while working on the fuel system.
- Clearly display the sign found on the next page stating **“WORKING WITH GASOLINE, NO FIRES OR IGNITION SOURCES”**.
- Smoking is prohibited near the work area.
- DO NOT** work in areas where there are welders, grinders, drills, electric motors, heaters, etc.
- DO NOT** use work lamps or any other electrical appliance due to the risk of sparks flying from the power switch or a rise in temperature.
- DO NOT** use metal hammers while working, due to the risk of flying sparks.
- DO NOT** start any engine or perform any of the above in neighboring work bays.

C. FIRE EXTINGUISHER

- Have a fire extinguisher ready and available before beginning work.



D. PREVENT STATIC ELECTRICITY

- To help prevent static electricity, lightly wet the floor with water, but not to the point where it creates a hazardous working condition.
- Place appropriate warning cones or stand signs around the area as a caution.

■ Copy And Display When Working

**WORKING WITH
GASOLINE**

**NO FIRES
NO IGNITION
SOURCES**

Supervisor

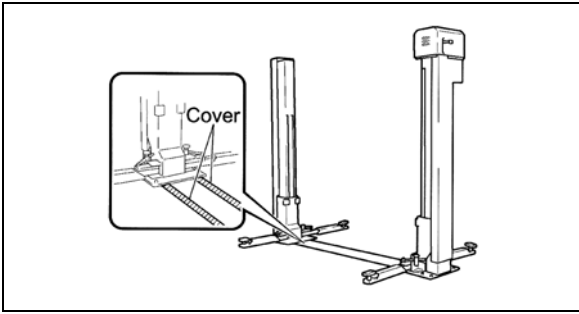
- Copiar y exhibir al trabajar

**TRABAJANDO CON
GASOLINA**

NINGÚN INCENDIOS

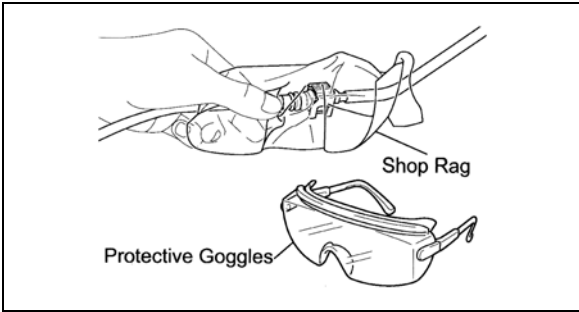
**NINGUNA FUENTE
DE IGNICIÓN**

Supervisor



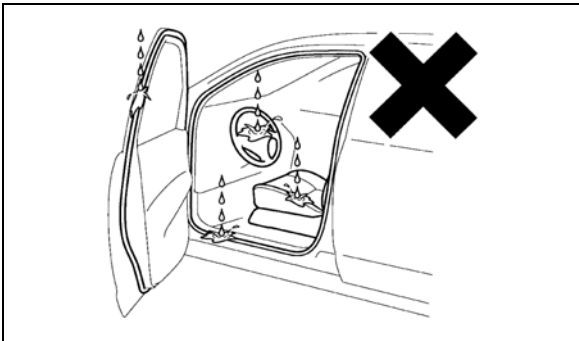
E. PRECAUTIONS WHEN USING A LIFT

- For bays equipped with auto lifts, cover all access cover joints with duct tape.
- In the event that fuel has leaked inside the auto lift, remove the access cover and clean up any spilled fuel. Dissipate fuel vapors until the smell is gone.



F. PREVENT THE FUEL FROM SPRAYING

- When disconnecting any fuel pipes or connectors there may still be some pressure remaining, even after discharging the system. To prevent the fuel from spraying, cover the pipe with a shop rag before disconnecting.
- Remember to always wear protective goggles especially when disconnecting fuel pipes.

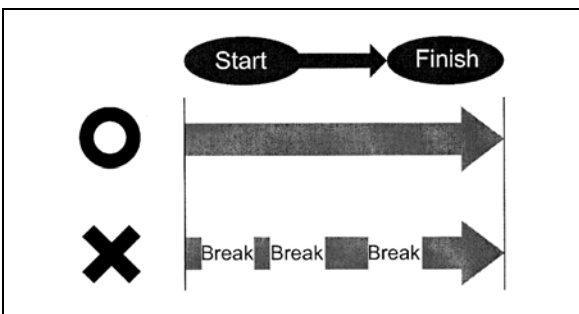


G. PREVENT THE FUEL FROM CONTACTING OTHER PARTS

- Do not allow the fuel to come in contact with any parts made of rubber or leather.

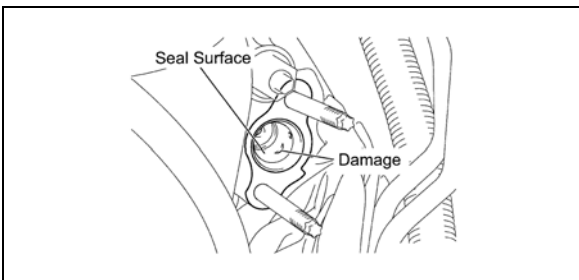
H. ASSIGN A SAFETY SUPERVISOR

- Assign a safety supervisor to be in charge of all safety precautions and fire hazards around the work area.



I. WORK SCHEDULING

- Work must be completed the same day.
- As a general rule, do not stop work midway. If work must stop midway, inform your safety supervisor.

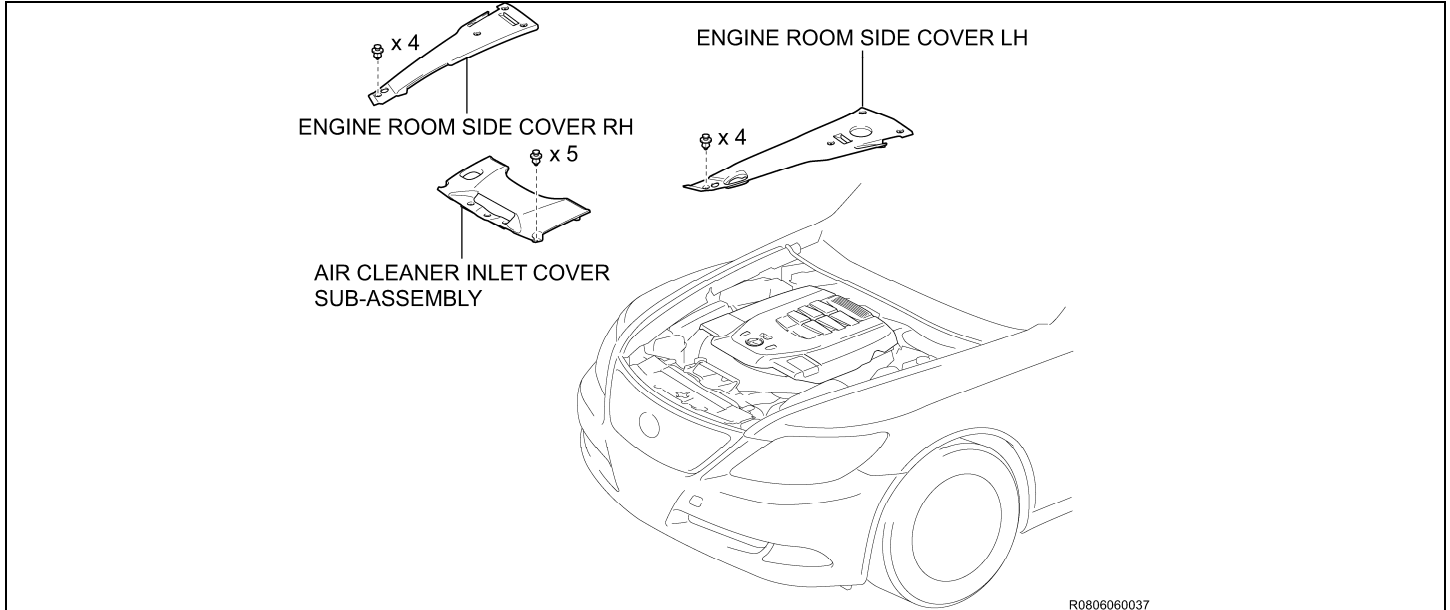


J. WHEN CONNECTING THE FUEL PIPE

- Any amount of damage or small foreign object (dust, a piece of thread, rust, etc.) may cause a fuel leak. Be thorough when inspecting and cleaning the fuel pipes and seal surface areas.

VII. FUEL DELIVERY PIPE REPLACEMENT

A. REMOVE THE ENGINE COVERS AND DISCHARGE THE FUEL SYSTEM

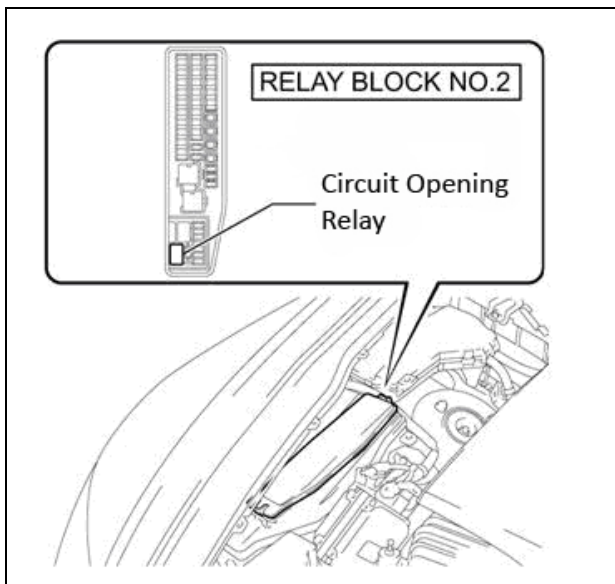


1. DTC CHECK

- a) If DTC(s) are present, verify them, view and record the freeze frame data, and perform the necessary repairs.

2. REMOVE THE ENGINE ROOM COVERS

- **DO NOT DISCONNECT ANY PART OF THE FUEL SYSTEM UNTIL YOU HAVE DISCHARGED THE FUEL SYSTEM PRESSURE.**
- **EVEN AFTER DISCHARGING THE FUEL SYSTEM PRESSURE, PLACE A PIECE OF CLOTH AROUND THE FITTINGS AS YOU SEPARATE THEM TO REDUCE THE RISK OF FUEL SPRAYING ON YOURSELF, IN THE ENGINE COMPARTMENT, AND ONTO OTHER PARTS.**



3. DISCHARGE THE FUEL SYSTEM PRESSURE

- a) Remove the relay block upper cover No. 2.
- b) Remove the circuit opening relay.
- c) Start the engine.
- d) After the engine has stopped, turn the ignition switch off.
- e) Crank the engine again to relieve any existing fuel pressure.

NOTE:

DTC P0171/25 and/or P0191/49 may be set.

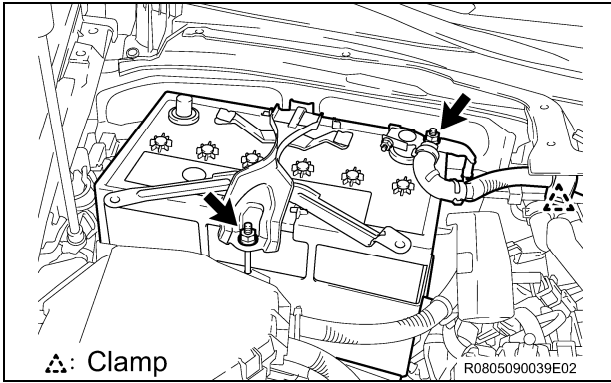
- f) Fully remove the fuel cap to discharge the fuel tank pressure and then reinstall cap.
- g) Record the radio station presets.

NOTE:

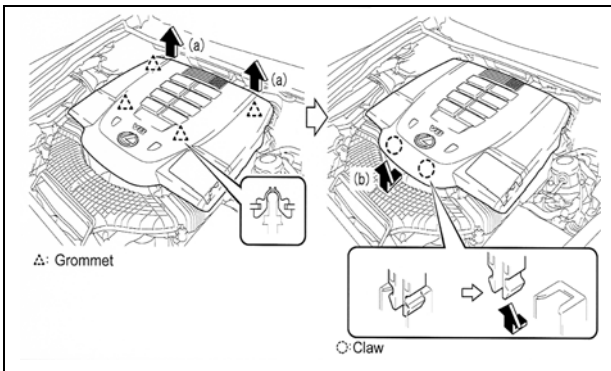
DO NOT disconnect the negative (-) battery cable until 6 minutes have elapsed. The HDD navigation system requires approximately 6 minutes to save memory and settings, after turning OFF the ignition.

- h) Disconnect the negative (-) battery cable.
- i) Reinstall the circuit opening relay and relay block upper cover No. 2.

B. REMOVE FUEL DELIVERY PIPE WITH FUEL INJECTOR



1. REMOVE BATTERY



2. REMOVE V-BANK COVER SUB-ASSEMBLY

- Pull up on the rear of the V-bank cover until the clips release.
- Slide the V-bank cover sub-assembly towards the front of the vehicle to unhook the 2 claws.

NOTE:

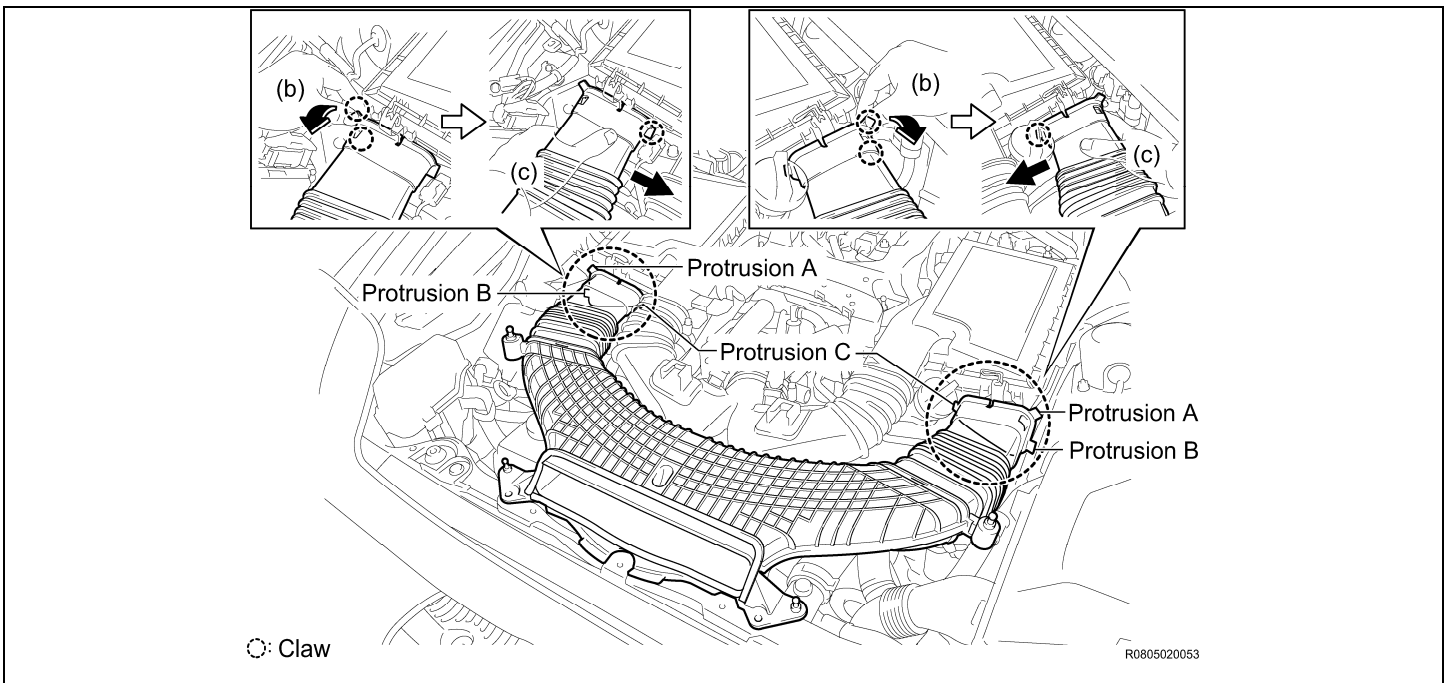
Do not lift the cover's front and back end together, as this may damage the claws.

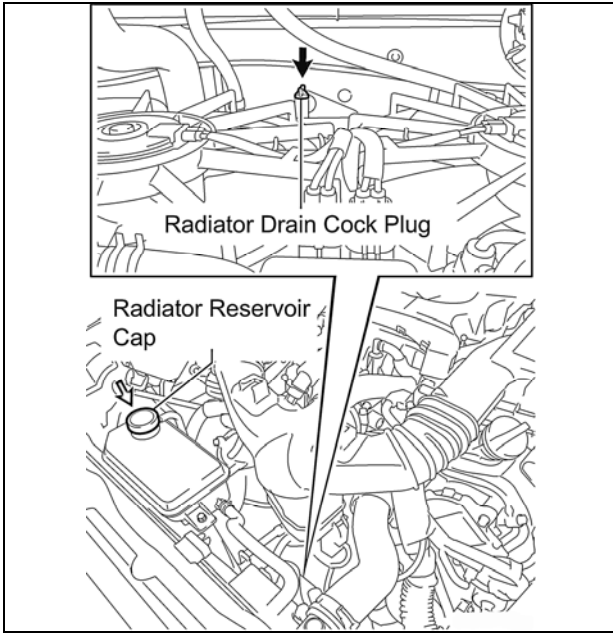
3. REMOVE NO.1 AIR CLEANER INLET

- Remove the 2 bolts located on the radiator support.
- For both the left and right sides, pull on protrusions A and B and then disconnect the 4 outer claws.
- Remove No. 1 air cleaner inlet without disconnecting the inner left and right 2 claws for protrusion C.

NOTE:

When removing the No. 1 air cleaner inlet, gently pull inwards to prevent damage.





4. DRAIN ENGINE COOLANT

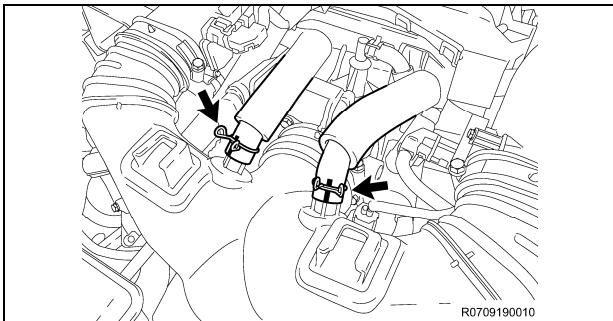
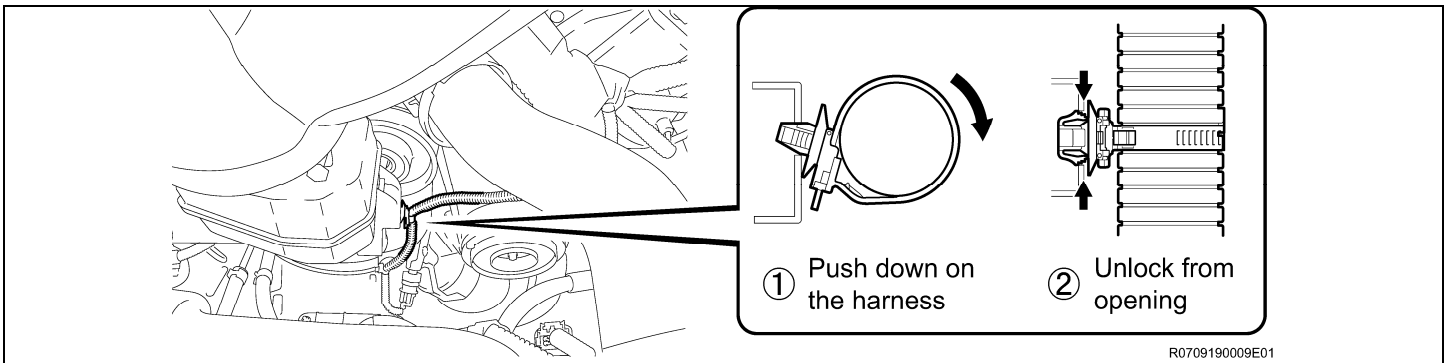
- a) Loosen the radiator drain plug and drain coolant.
- b) Remove plug and o-ring.
- c) Remove the radiator reservoir cap.
- d) Dispose coolant according to local regulations.

NOTE:

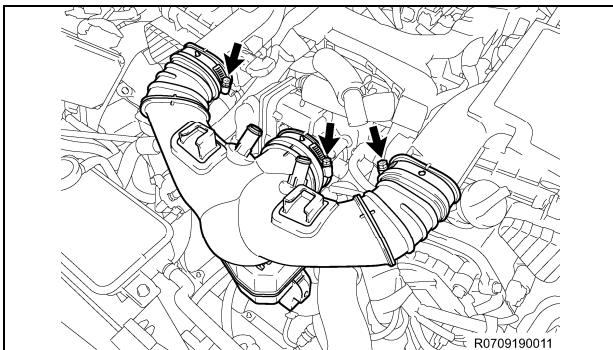
Wait until engine coolant temperature has dropped significantly before releasing pressurized coolant. Hot coolant may cause serious injuries or burns.

5. REMOVE INTAKE AIR CONNECTOR PIPE

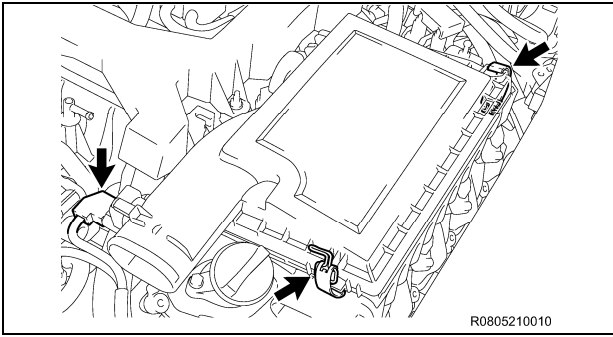
- a) Remove the clamp, and disconnect the wire harness.



- b) Disconnect the 2 ventilation hoses.

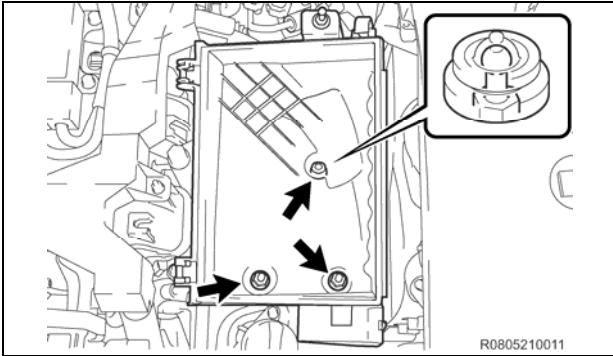


- c) Loosen the 3 hose clamps, and remove the intake air connector pipe.

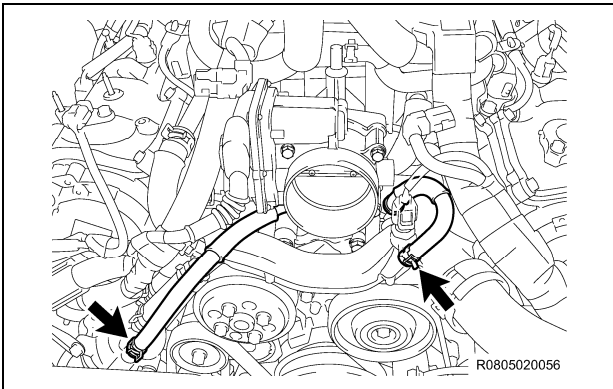


6. REMOVE AIR CLEANER ASSEMBLIES (LH SHOWN)

- a) Disconnect the MAF meter connector.
- b) Disconnect the 2 clamps, and air cleaner cap, then remove the air filter.

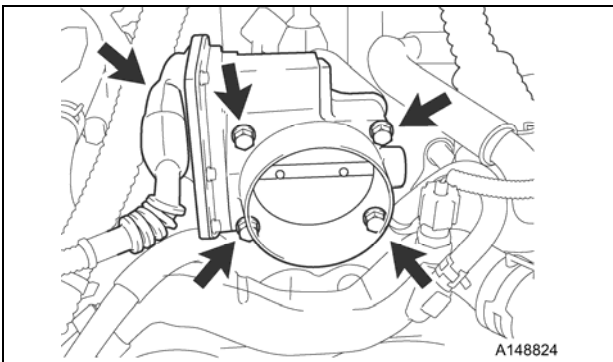


- c) Remove the 2 nuts, clip and air cleaner case LH.
- d) Repeat steps a) through c) for the RH side.

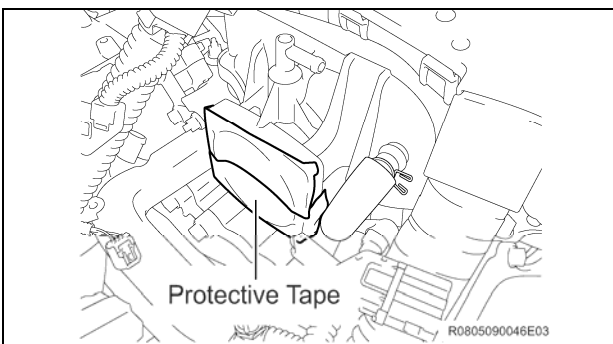


7. REMOVE THROTTLE WITH MOTOR BODY ASSEMBLY

- a) Disconnect the 2 water by-pass hoses.



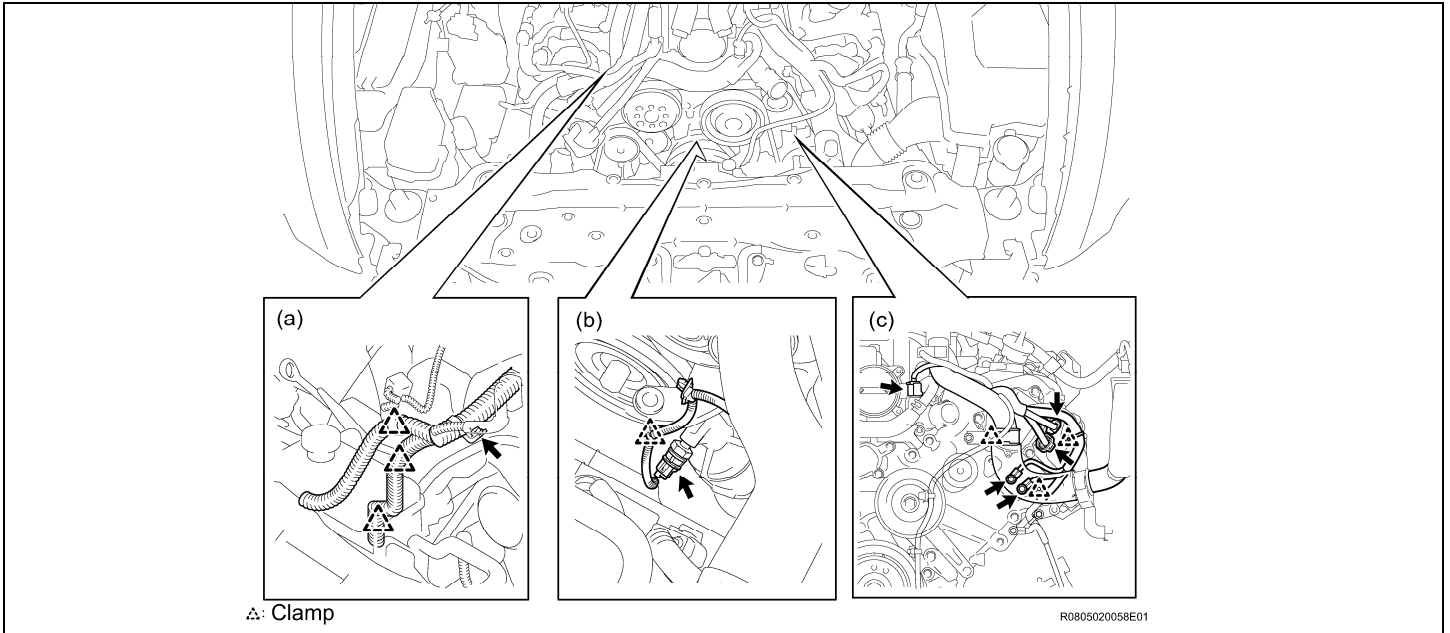
- b) Disconnect the throttle motor connector.
- c) Remove the 4 bolts, throttle with motor body assembly and gasket.



- d) Place protective tape over the throttle with motor body assembly openings.
- e) Place protective tape over the surge tank opening.

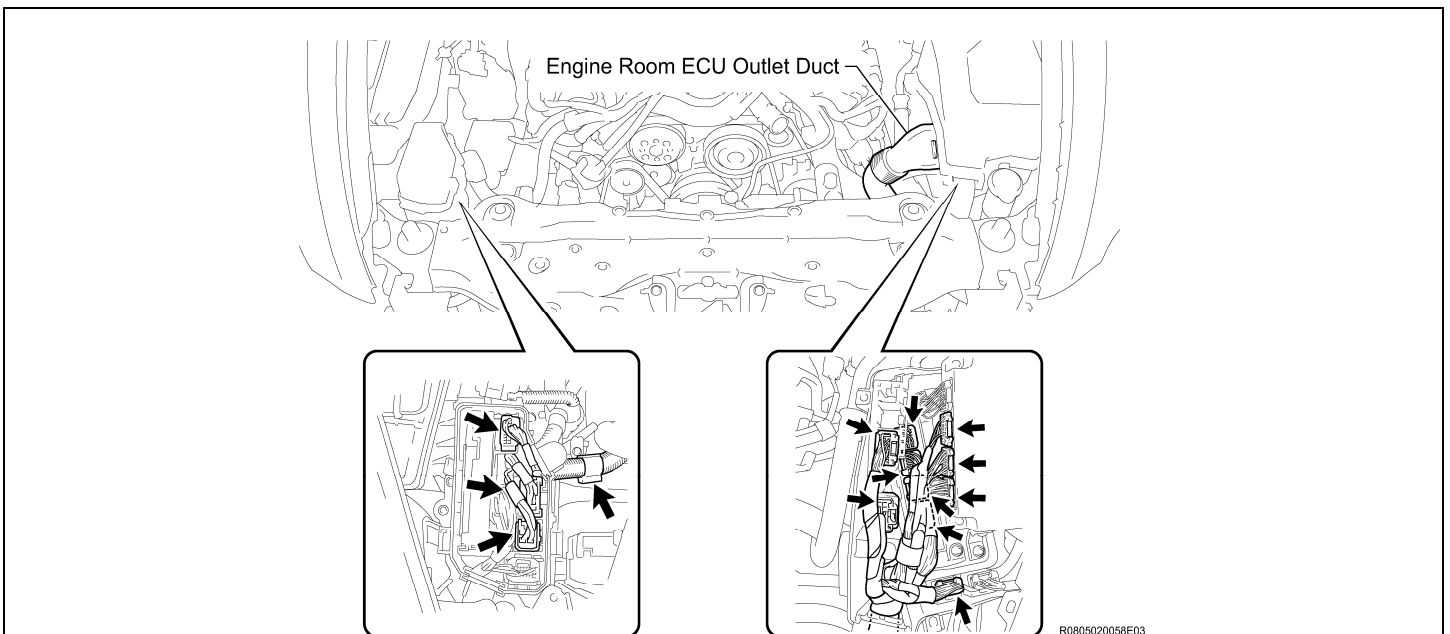
8. DISCONNECT ENGINE WIRE

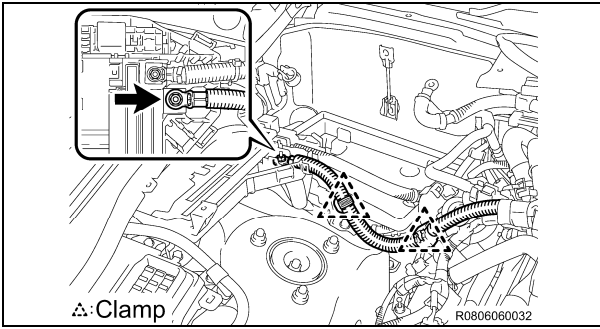
- a) Remove the bolt, and disconnect the 3 clamps.
- b) Disconnect the clamp and connector.
- c) Remove the 2 bolts, and disconnect the 3 clamps and 3 connectors.



See illustration below for steps d) ~ j)

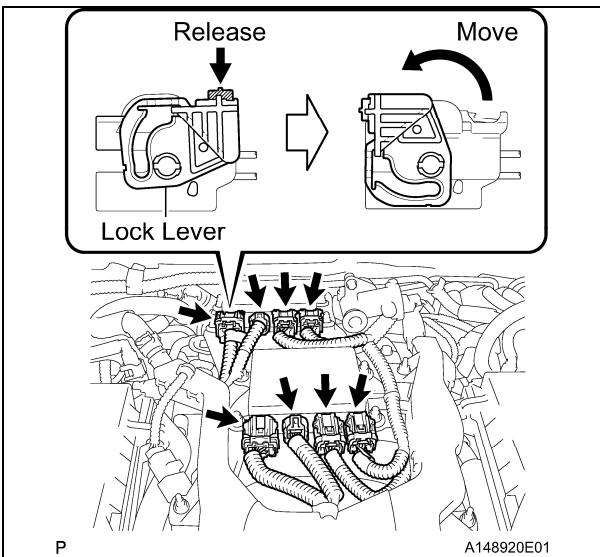
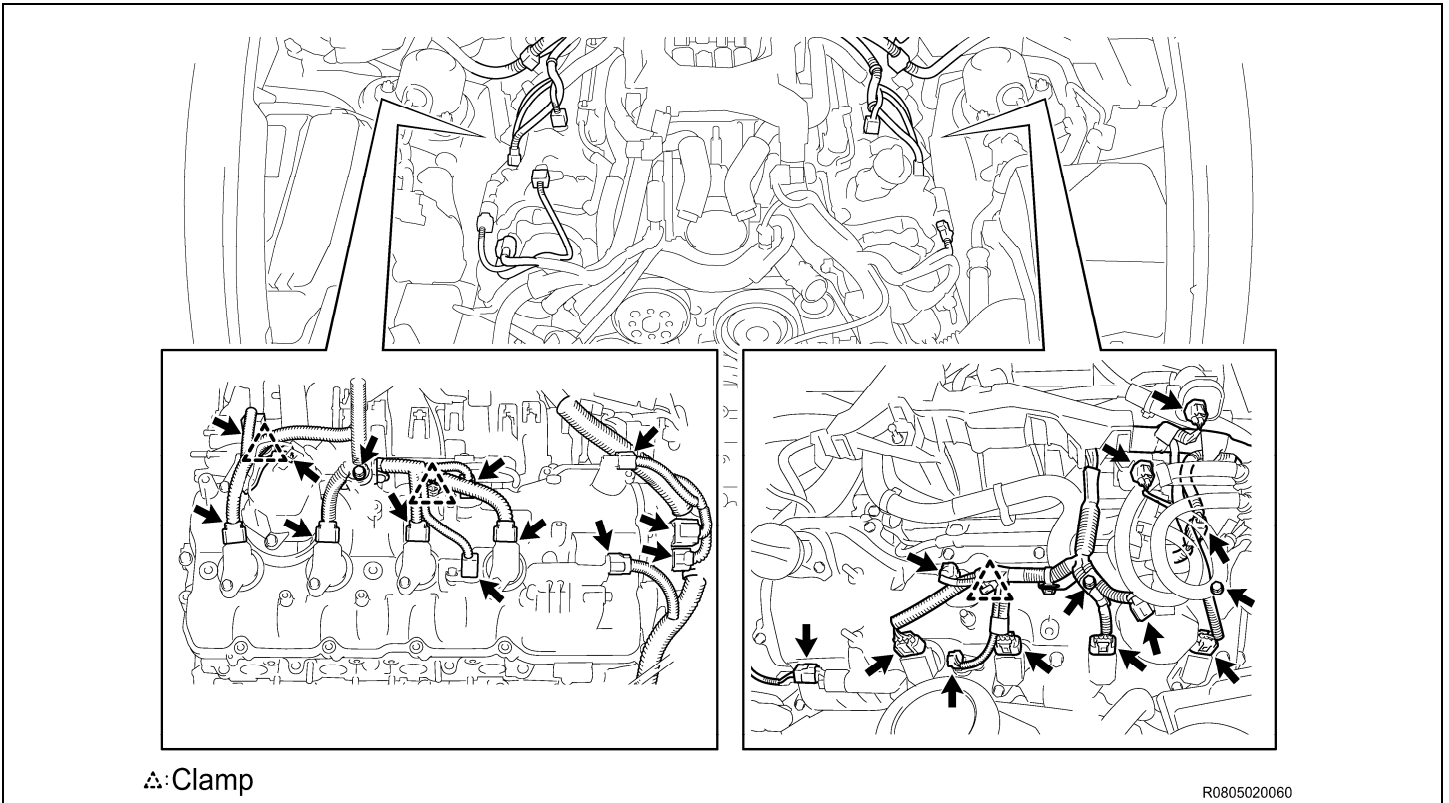
- d) Remove the engine room ECU outlet duct.
- e) Remove the 3 bolts and ECM box cover (upper).
- f) Disconnect the 3 ECT and 4 ECM connectors.
- g) Disconnect the 3 connectors.
- h) Remove the box cover (upper).
- i) Disconnect the 3 connectors and clamp.
- j) Disconnect the engine wire harness.



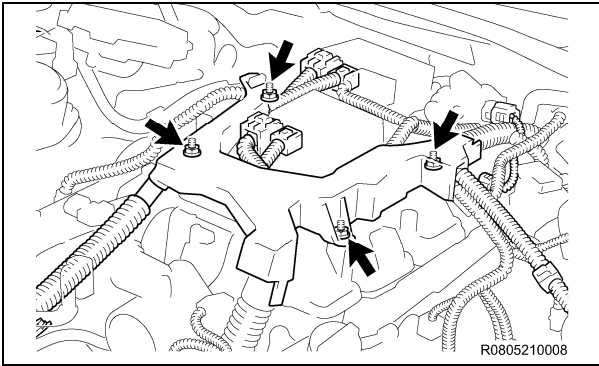


- k) Remove the box cover (upper).
- l) Remove the nut, and disconnect the 2 clamps and wire harness.

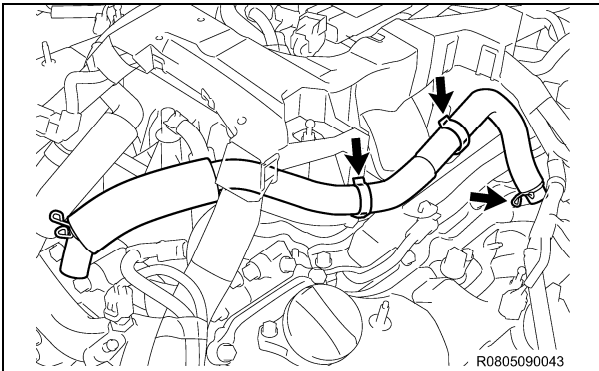
- m) Remove the 3 bolts, and disconnect the 3 clamps.
- n) Disconnect the 23 connectors.
- o) Disconnect the engine wire harness.



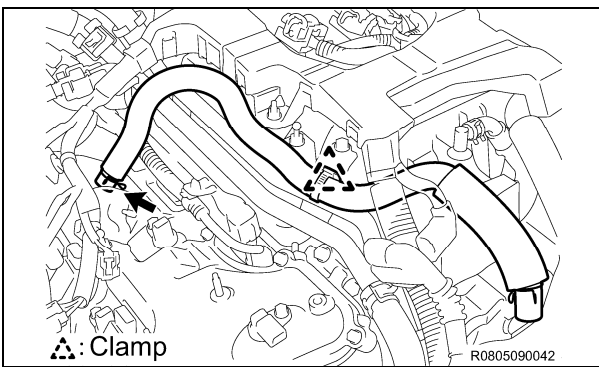
- p) Disconnect the 8 injector driver connectors as shown in the illustration.



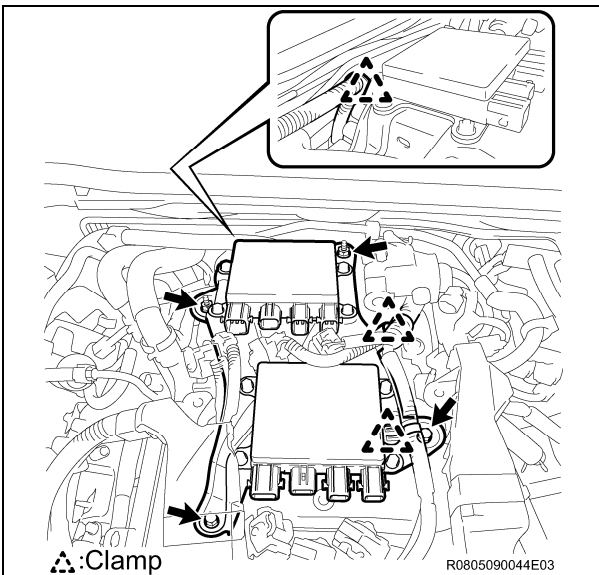
q) Remove the 4 nuts, and disconnect the engine wire.



9. REMOVE NO. 1 VENTILATION HOSE

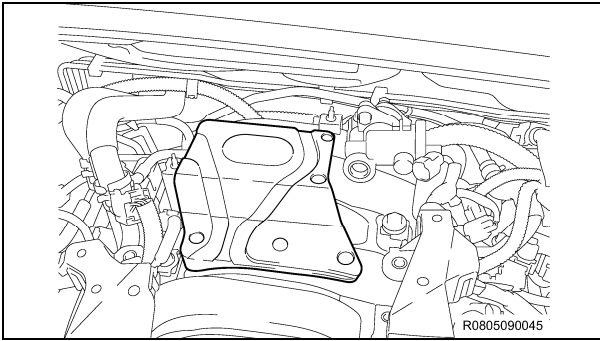


10. REMOVE NO. 2 VENTILATION HOSE

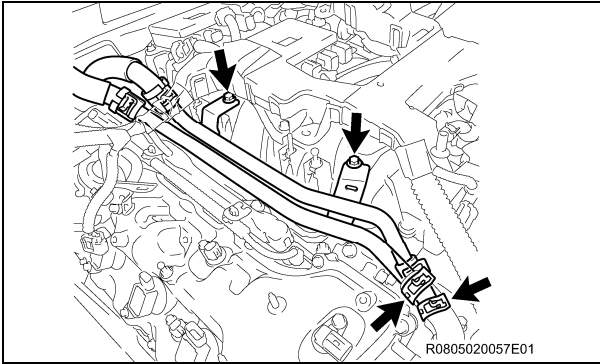


11. REMOVE INJECTOR DRIVER

- a) Using a deep 10mm socket wrench, remove the 2 bolts and 2 nuts.
- b) Disconnect the 3 clamps, and remove the injector driver.

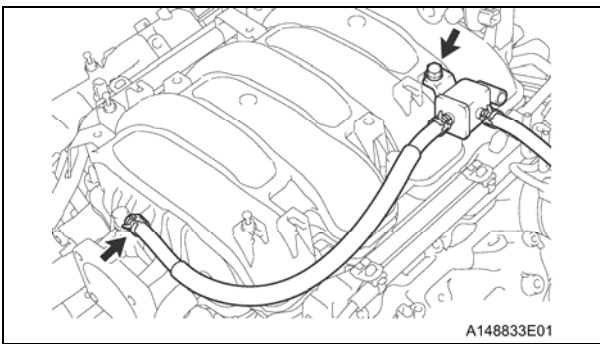


12. REMOVE NO. 1 ENGINE COVER



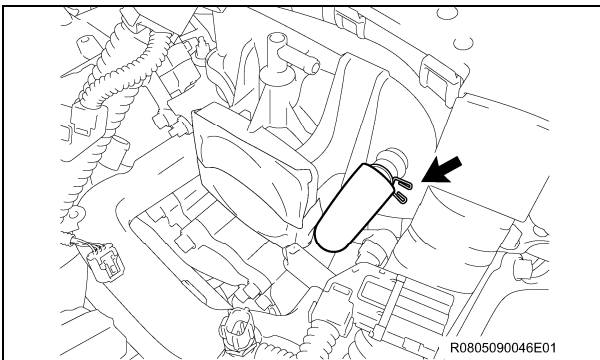
13. DISCONNECT WATER BY-PASS PIPE SUB-ASSEMBLY

- a) Disconnect the 2 heater water hoses.
- b) Remove the 2 bolts, and disconnect the water by-pass pipe sub-assembly.



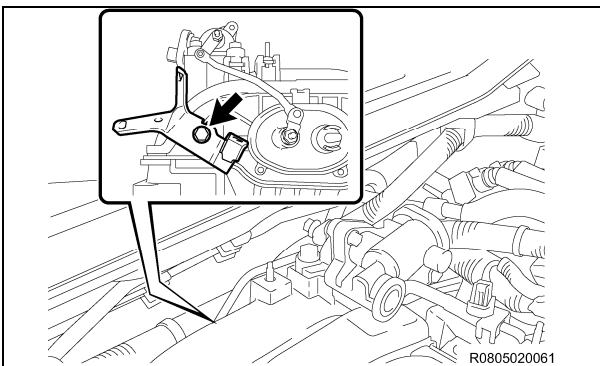
14. DISCONNECT PURGE VSV

- a) Disconnect the purge VSV hose.
- b) Remove the bolt, and disconnect the purge VSV.

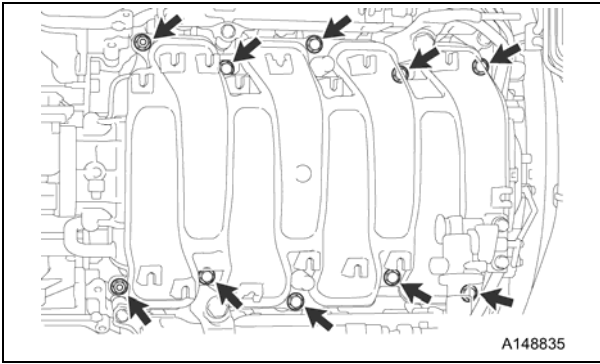


15. REMOVE INTAKE MANIFOLD

- a) Disconnect the ventilation hose.

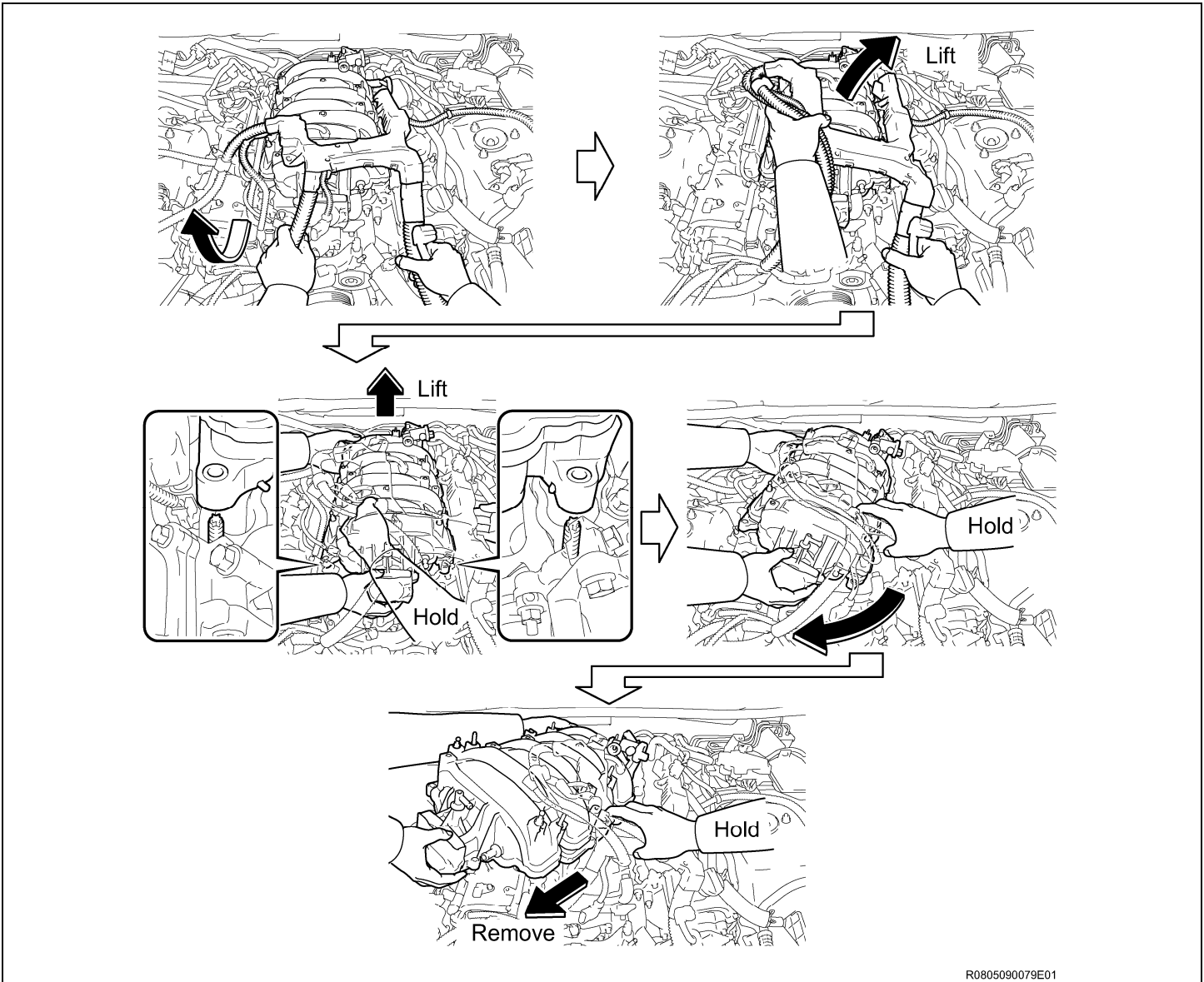


- b) Remove the bolt located on the back of the intake manifold.

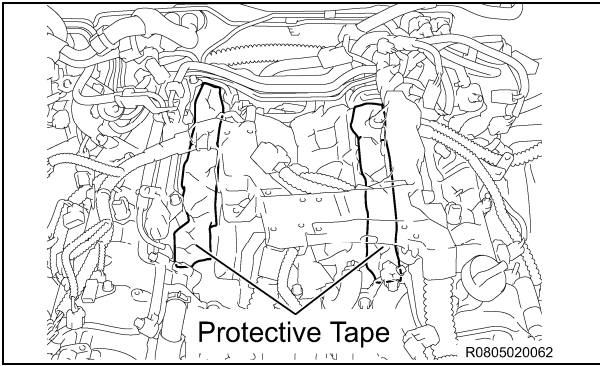


c) Using a 12 mm deep socket wrench, remove the 8 bolts and 2 nuts.

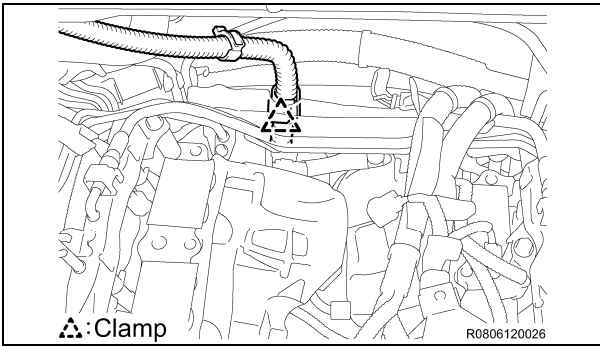
- d) Lift the engine wire harness towards yourself.
- e) Gather up the disconnected connectors of the engine wire harness and have an assistant lift the harness.
- f) With the harness raised, lift the intake manifold and disengage it from the studs. Then slide the front of the manifold towards the right bank.
- g) Remove the intake manifold from the right bank.
- h) Remove the 2 gaskets.



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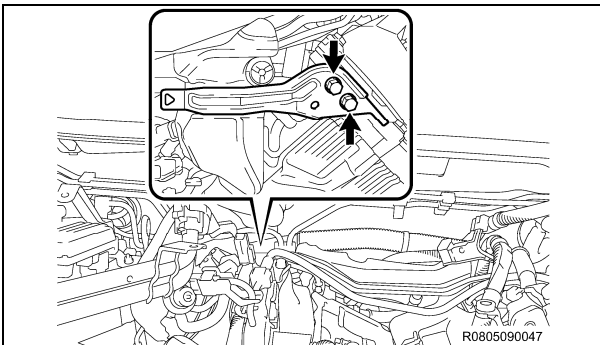


- i) Place protective tape over the intake manifold openings to prevent foreign objects from entering.



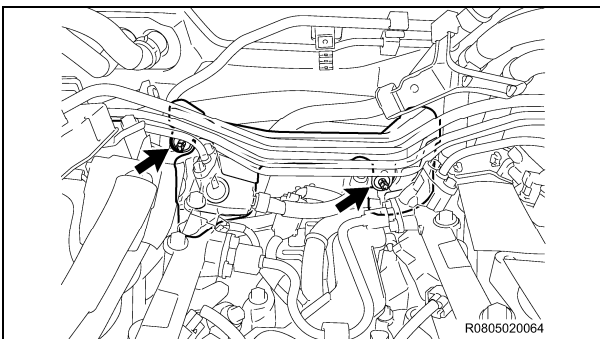
16. REMOVE NO. 3 ENGINE COVER SUB-ASSEMBLY

- a) Disconnect the clamp.

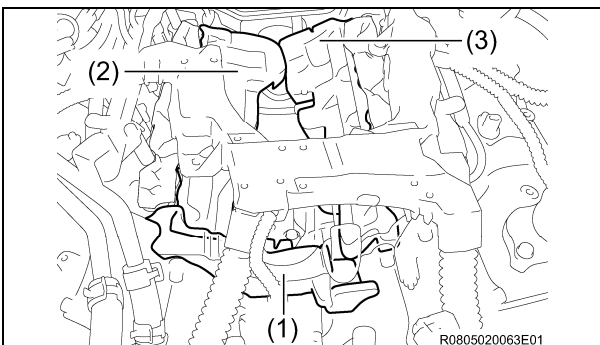


- b) Remove the 2 bolts, and disconnect the bracket.

NOTE: Do not disconnect the bolt connected to the cable.

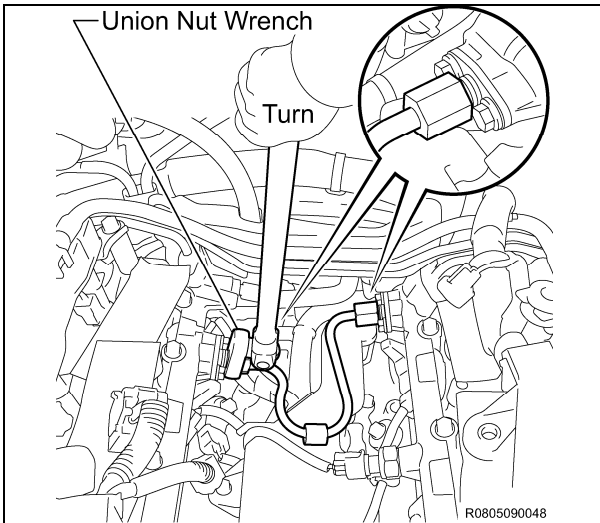


- c) Remove the 2 clips and No. 3 engine cover sub-assembly.



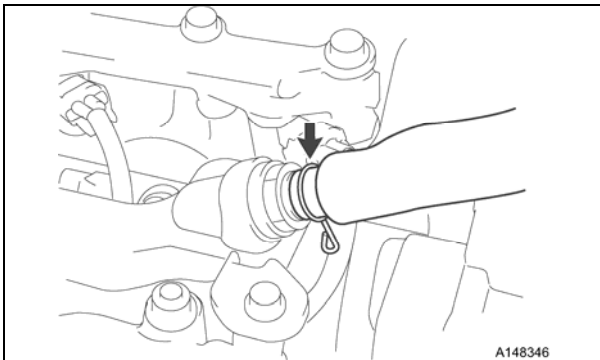
17. REMOVE ENGINE COVER SUB-ASSEMBLY

- a) Remove the 3 engine covers.

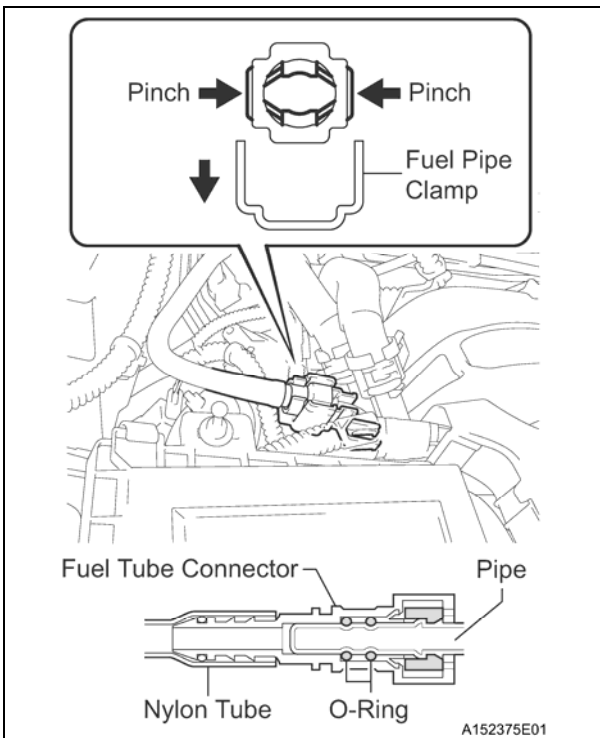


18. REMOVE NO. 4 FUEL PIPE SUB-ASSEMBLY

- a) Using a 19 mm union nut wrench, remove the No. 4 fuel pipe sub-assembly.



19. REMOVE PCV HOSE

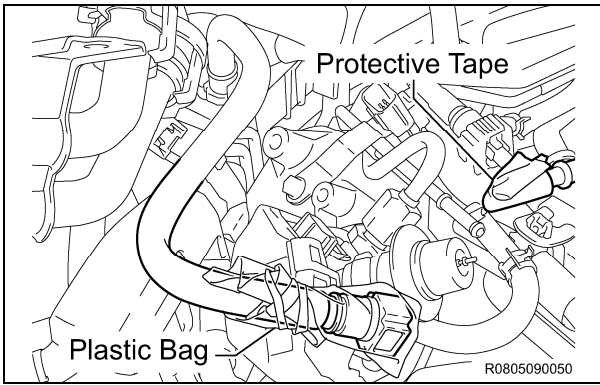


20. DISCONNECT NO. 3 FUEL HOSE

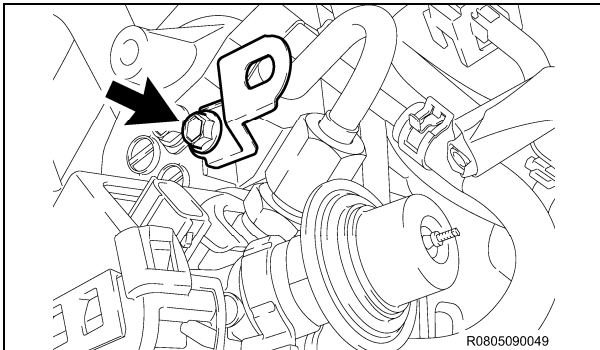
- a) Remove the fuel pipe clamp.
- b) Pinch and pull the fuel hose connector to disconnect the connector from the delivery pipe.
- c) Cover the pipe and connector ends to prevent damage and dirt contamination.

NOTE:

- Check for any dirt and foreign matter contamination in the pipe and around the connector. Clean if necessary. Foreign matter may damage the O-rings or cause leaks in the seal between the pipe and connector.
- Do not use any tools to separate the pipe and connector.
- Do not forcefully bend or twist the nylon tube.
- Check for any dirt and foreign matter on the pipe seal surface. Clean if necessary.
- If the pipe and connector are stuck together, pinch the tube between your fingers and turn it carefully to free it. Then disconnect the tube.



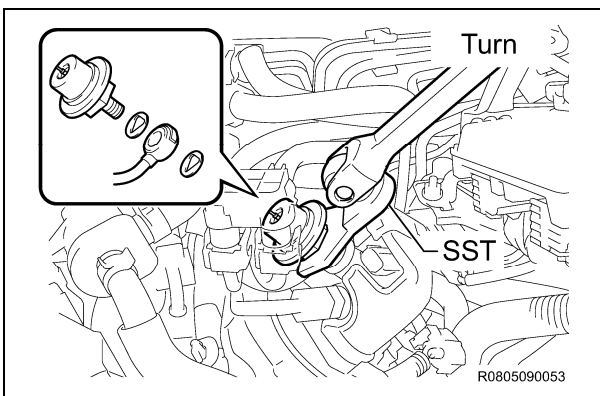
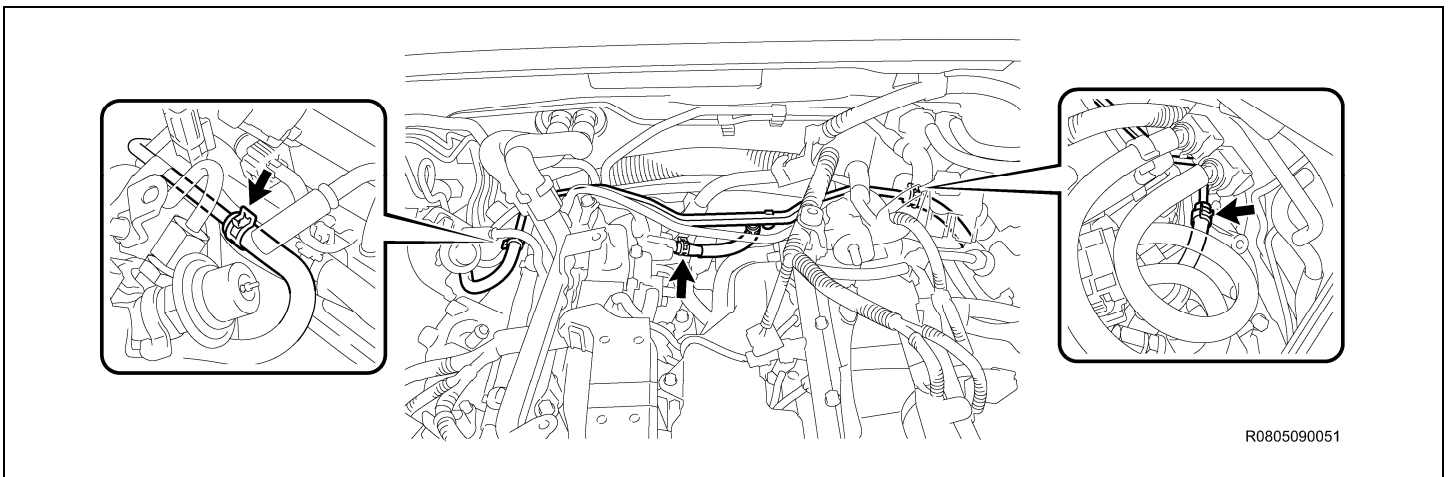
- d) Place and seal a plastic bag over the fuel tube to prevent damage or foreign objects from entering.
- e) Place protective tape around the sides of the pipe to prevent damage.



21. DISCONNECT NO. 1 FUEL PIPE SUB-ASSEMBLY

- a) Remove the bolt and bracket.

- b) Disconnect the 3 fuel hoses illustrated.

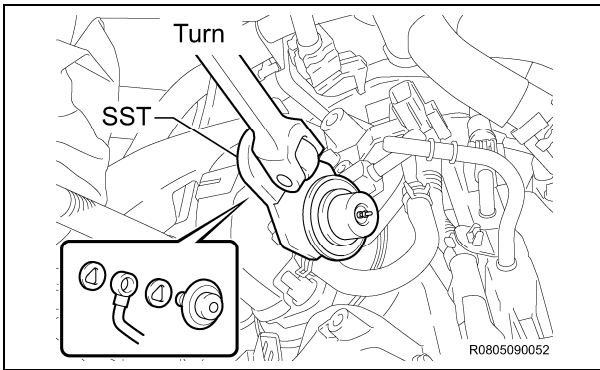


- c) Using SST or equivalent, remove the fuel pressure pulsation damper LH and 2 gaskets from the fuel pump.

SST 09612-24014 (09617-24011)

NOTE:

- When the gasket is attached, do not attempt to forcefully twist and remove the damper. Doing so may damage the seal surface.
- Do not blow air into the pulsation damper. The air pressure may damage the internal diaphragm.

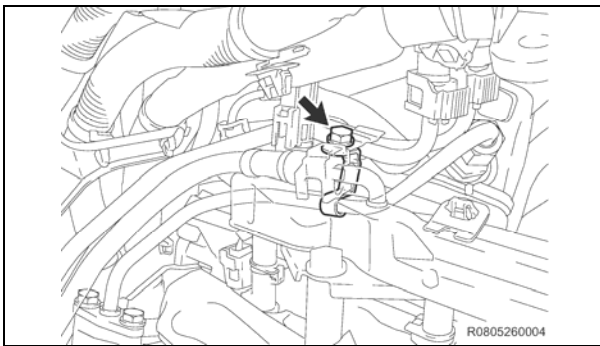


- d) Using SST or equivalent, remove the fuel pressure pulsation damper RH and 2 gaskets from the fuel pump.

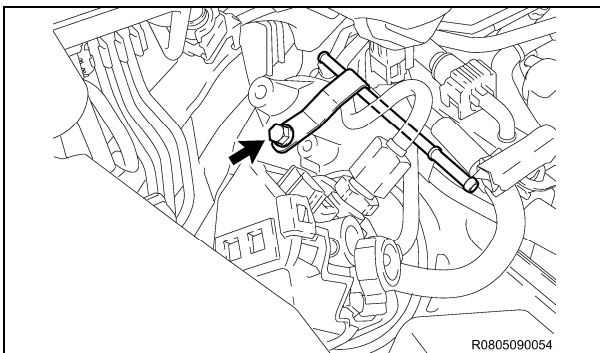
SST 09612-24014 (09617-24011)

NOTE:

- When the fuel pressure pulsation damper is removed, be careful not to let the fuel pump's return pipe from interfering.
- Do not blow air into the pulsation damper. The air pressure may damage the internal diaphragm.



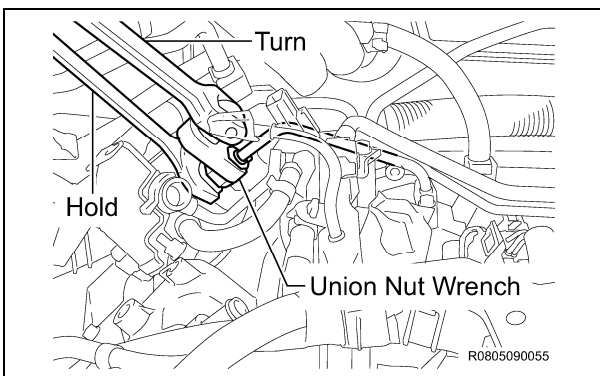
- e) Remove the bolt from the LH side of the engine bay.



- f) Remove the bolt, and disconnect the No.1 fuel pipe sub-assembly.

NOTE:

Wipe away any spilt fuel with a shop rag.

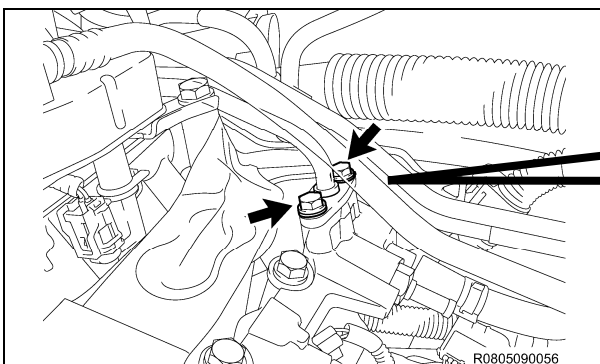


22. REMOVE NO. 2 FUEL PIPE SUB-ASSEMBLY

- a) Fix the union bolt on the fuel pump side in place with a 21 mm wrench. Using a 19 mm union nut wrench, loosen the union and remove the fuel pipe.

NOTE:

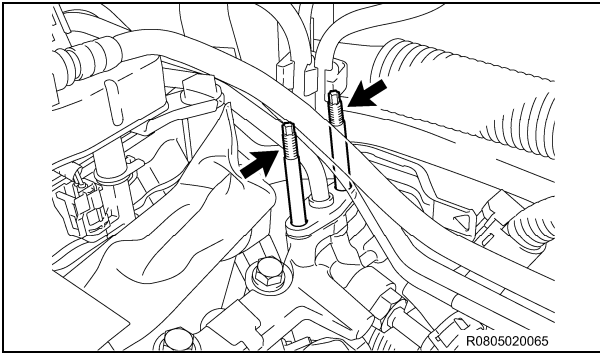
- There must be absolutely no free play in the union on the fuel pump side.
- **If the union on the fuel pump side has free play, replace the fuel pump.**



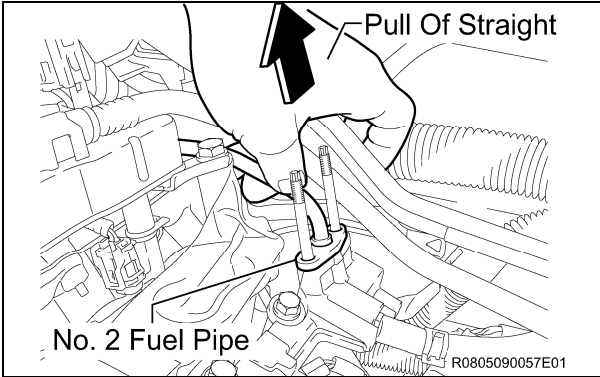
- b) Remove the 2 bolts.

NOTE:

Do not remove the fuel pipe from the delivery pipe. Only remove the 2 bolts.



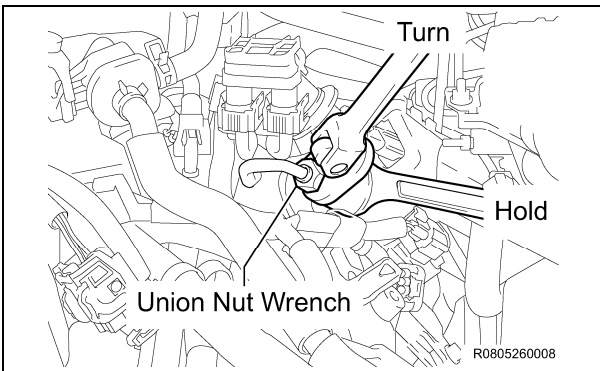
- c) Attach 2 stud bolts to the delivery pipe bolt attachment holes and hand tighten. (torx® side up)



- d) Remove the fuel pipe from the fuel delivery pipe.
e) Remove the 2 stud bolts.

NOTE:

Shifting the pipe too widely to the left and right may damage the part which may lead to a fuel leak.

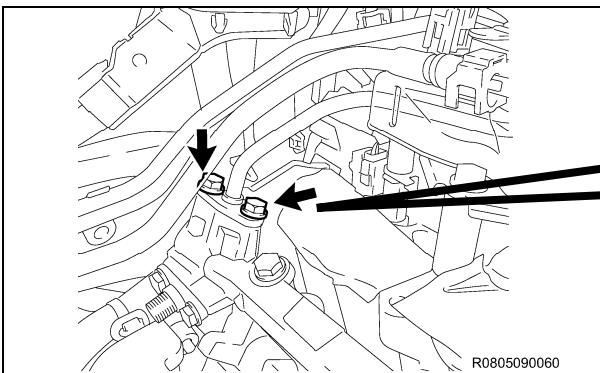


23. REMOVE NO. 3 FUEL PIPE SUB-ASSEMBLY

- a) Fix the union bolt on the fuel pump side in place with a 21 mm wrench. Using a 19 mm union nut wrench, loosen the union and remove the fuel pipe.

NOTE:

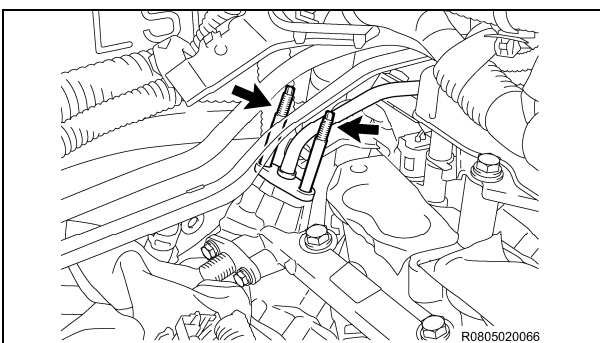
- **Must be absolutely no free play in the union on the fuel pump side.**
- **If the union on the fuel pump side has free play, replace the fuel pump.**



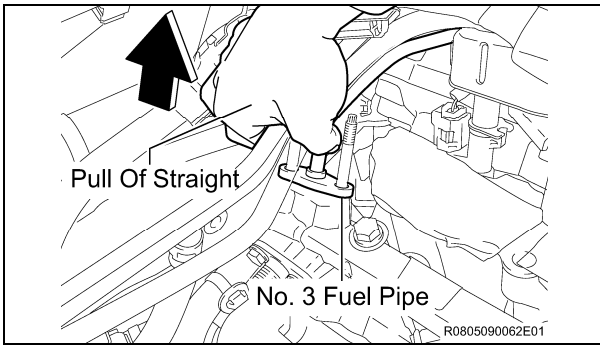
- b) Remove the 2 bolts illustrated.

NOTE:

Do not remove the fuel pipe from the delivery pipe. Only remove the 2 bolts.



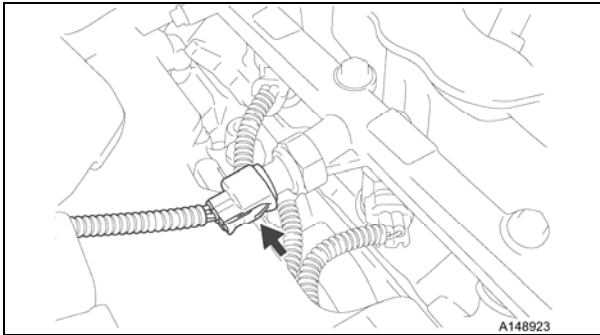
- c) Attach 2 stud bolts to the delivery pipe bolt attachment holes and hand tighten. (torx® side up)



- d) Remove the fuel pipe from the fuel delivery pipe.
- e) Remove the 2 stud bolts.

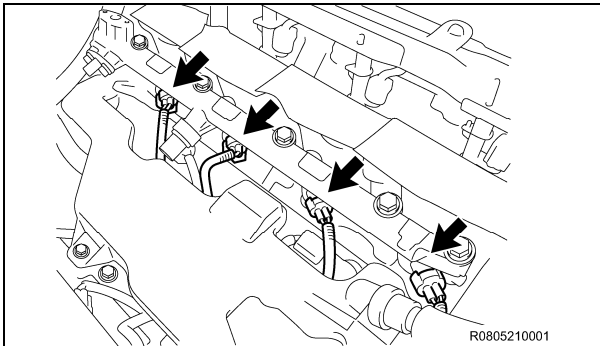
NOTE:

Shifting the pipe too widely to the left and right may damage the part which may lead to a fuel leak.

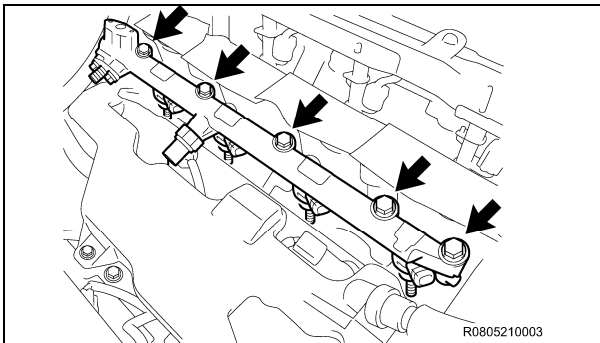


24. REMOVE FUEL DELIVERY PIPES

- a) Disconnect the fuel pressure sensor connector from the No. 2 fuel delivery pipe.



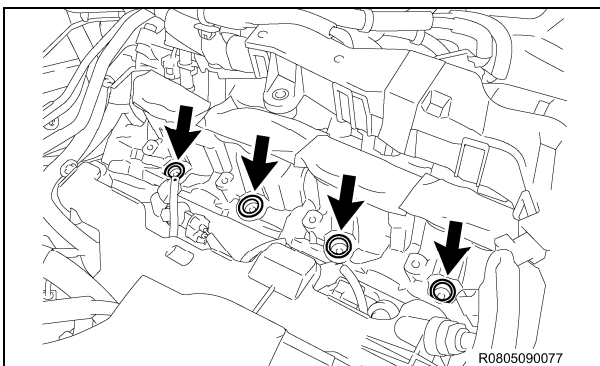
- b) Disconnect the 4 electrical injector connectors.



- c) Remove the 5 bolts and delivery pipe.

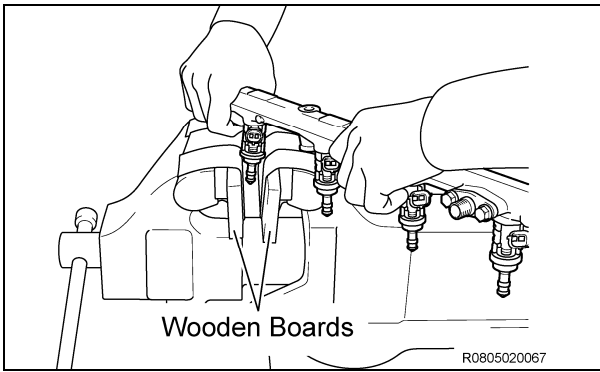
NOTE:

- **Be extremely careful not to touch or strike the tips of the injectors.**
- **Pull and remove the fuel delivery pipe in a straight line without tilting it.**



- d) Remove the 4 injector vibration insulators.
- e) Repeat steps b) ~ d) for the No. 1 fuel delivery pipe.

C. REPLACE FUEL DELIVERY PIPE



1. REMOVE FUEL INJECTOR ASSEMBLY

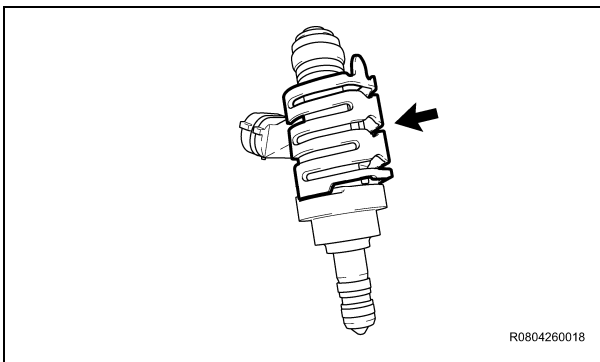
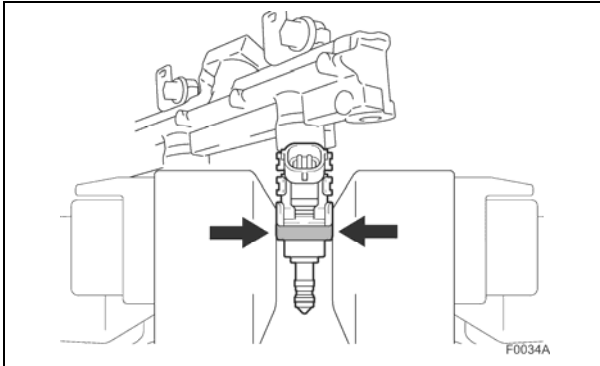
- With the No. 1 and No. 2 fuel delivery pipes still attached, clamp the fuel injector assembly in a vise with wooden boards placed in between the vise and assembly.
- Remove the fuel injector by pulling straight up.

NOTE:

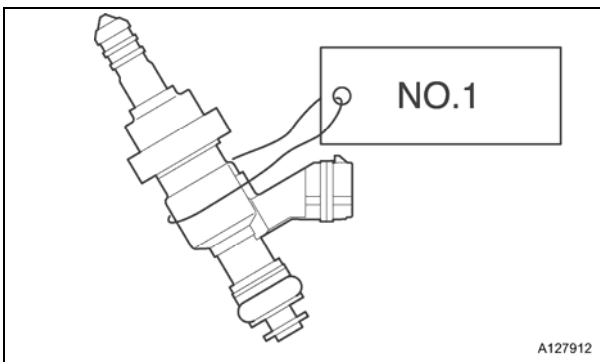
- Be extremely careful not to touch or strike the tips of the injectors.

NOTE:

- Clamp the vise to the areas illustrated on the fuel injector assembly. Do not clamp areas which are not indicated in the left illustration.
- Use both hands when clamping the fuel injector assembly to the vise.
- Do not over tighten. Also, do not allow the connector to come in contact with the vise.



- Remove the nozzle holder clamp from the injectors.



- Repeat steps a) ~ c) for the remaining injectors.

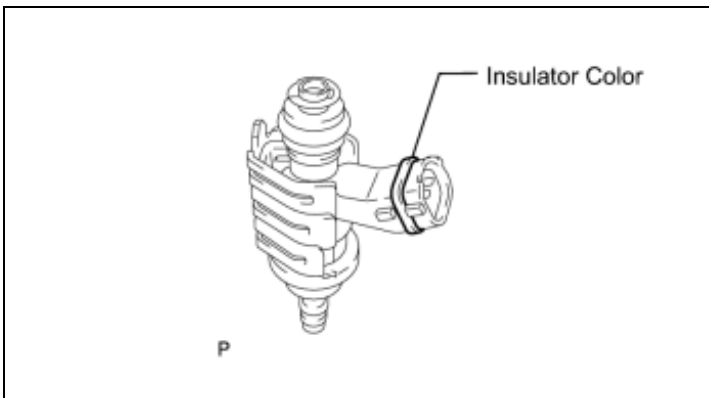
NOTE:

For reinstallation, attach a tag or label to the injector shaft.

1. FUEL INJECTOR INSPECTION

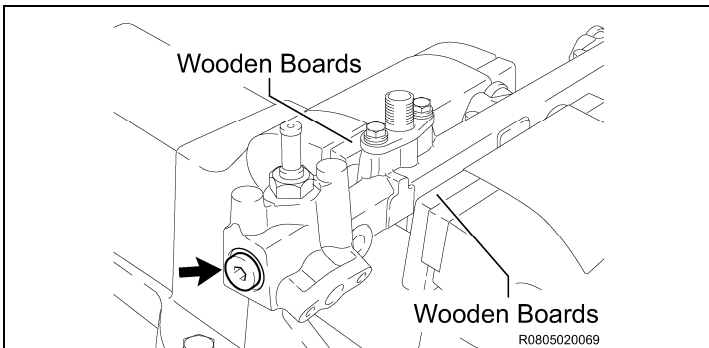
a) Inspect the condition of the fuel injector assembly as illustrated, and assess with the chart below.

Condition of fuel injector assembly	Results
No white adhesion at entrance	Reuse the fuel injector.
White adhesion at entrance	Replace ALL fuel injectors with new ones. Keep used injectors for possible parts recovery and inspection.



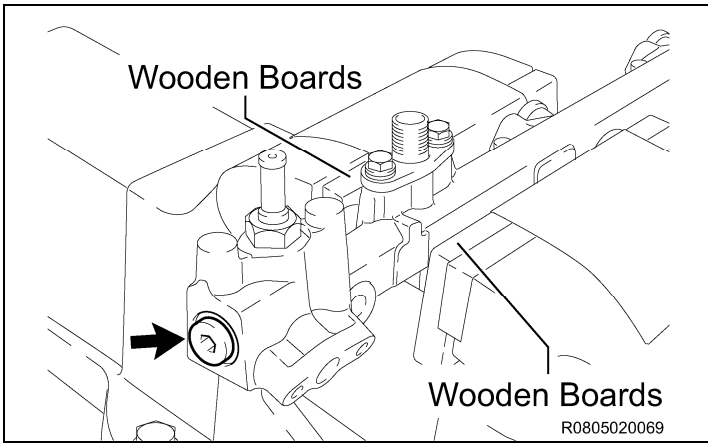
NOTE:

- Either injector listed in the parts table for a particular vehicle type may be installed; however, make sure that all injectors installed on the vehicle have the same color insulator.
- -B0 = Black insulator color
- -C0 = Reddish brown insulator color
- -D0 = Green insulator color



2. REMOVE FUEL DELIVERY PIPE PLUGS

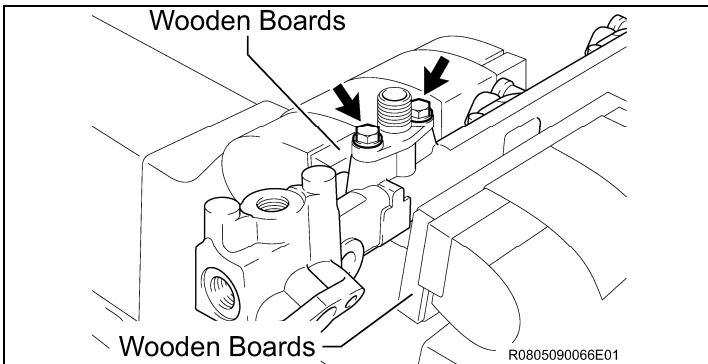
- Clamp the No. 1 fuel delivery pipe in a vise with wooden boards placed in between the pipe and vise as illustrated.
- Using a socket hexagon wrench 6mm, remove the fuel delivery pipe plug and gasket.
- Repeat steps a) ~ b) for the No. 2 fuel delivery pipe.



3. INSTALL FUEL DELIVERY PIPE PLUGS

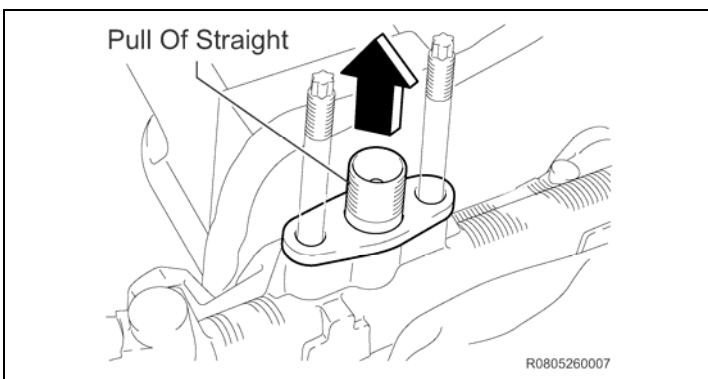
- Clamp a **NEW** No. 1 fuel delivery pipe in a vise with wooden boards placed in between the pipe and vise
- Install a **NEW** gasket to the fuel relief valve.
- Repeat steps a) ~ b), for the No. 2 fuel delivery pipe.

Torque Specification:
38 N·m (388 kgf·cm, 28 ft·lbf)



4. REMOVE FUEL PIPE SUPPORTS.

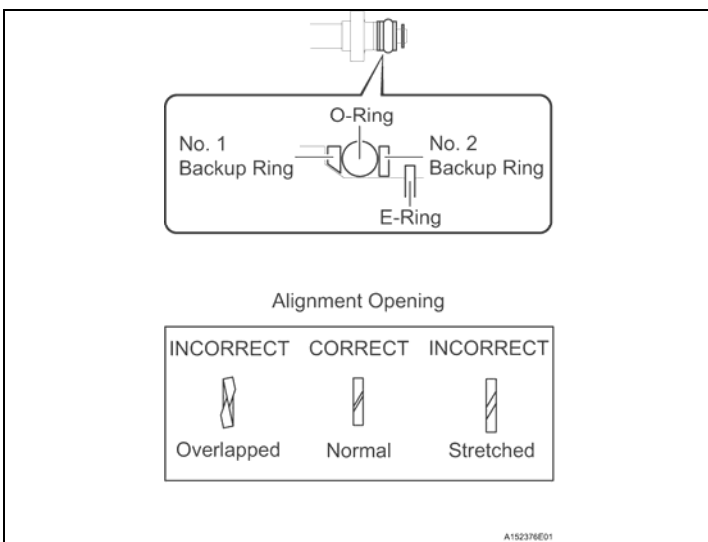
- Clamp the No. 1 fuel delivery pipe in a vise with wooden boards placed in between the pipe and vise as illustrated.
- Using a 10mm deep socket wrench, remove the 2 bolts.



- Hand tighten the 2 stud bolts to the delivery pipe bolt attachment holes. (torx® side up)
- Remove the fuel delivery pipe support.
- Remove the 2 stud bolts.
- Repeat steps a) ~ e) and remove the No. 2 fuel delivery pipe supports.

NOTE:

- Shifting the fuel pipe support too widely may damage the part which may lead to a fuel leak

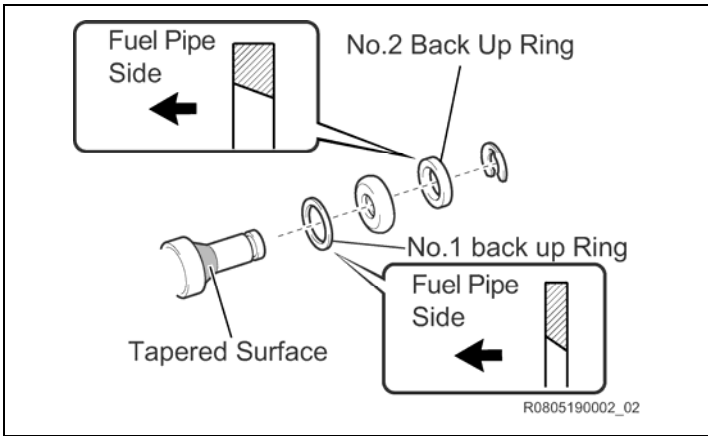


5. INSTALL FUEL PIPE SUPPORT

- Remove the O-ring, backup rings and E-ring from the fuel pipe support.

NOTE:

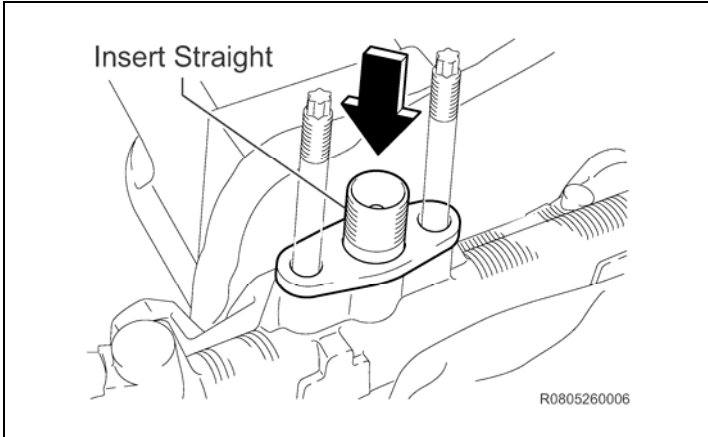
- Check that there is no foreign matter or damaged areas in the injector's O-ring groove.
- Check that the No. 1 and No. 2 fuel pipe rings, o-ring and backup ring are installed in the correct direction and order.
- Check that the alignment openings of the fuel pipe rings are not overlapped or stretched.



- b) Install a **NEW** O-ring, **NEW** backup rings (No. 1 and No. 2) and **NEW** E-ring to the fuel pipe support as illustrated.

NOTE:

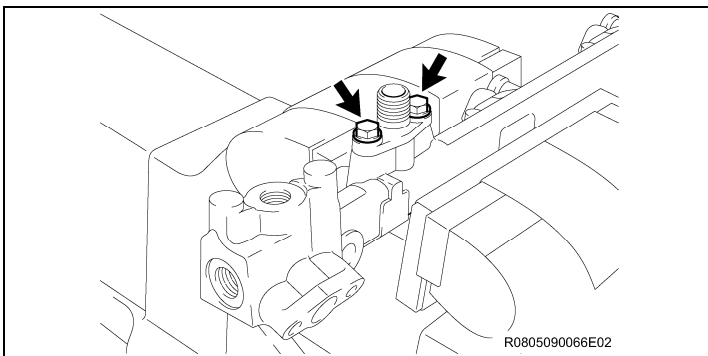
Align and install the No.1 and No.2 backup rings to the fuel pipe support tapered surface.



- c) Clamp a **NEW** No. 1 fuel delivery pipe in a vise with wooden boards placed in between the pipe and vise as illustrated.
- d) Hand tighten 2 stud bolts to the delivery pipe bolt attachment holes. (torx® side up)
- e) Apply gasoline to the fuel pipe support's O-ring and into the attachment hole of the delivery pipe's fuel pipe support.
- f) Press the fuel pipe support and delivery pipe together by hand until there is no gap between them.
- g) Remove the 2 stud bolts.

NOTE:

- Do not over apply lubricant.
- Apply gasoline on both the O-ring and into the attachment hole. The gasoline will run out immediately after insertion if only applied to the O-ring side.

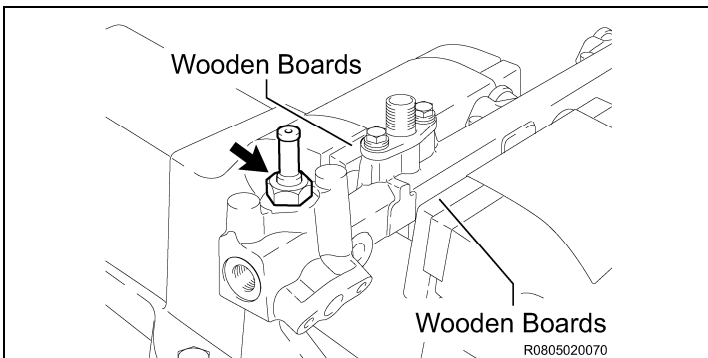


- h) Using a 10mm deep socket wrench, install the 2 bolts.
- i) Repeat steps a) ~ h), for the No. 2 fuel delivery pipe.

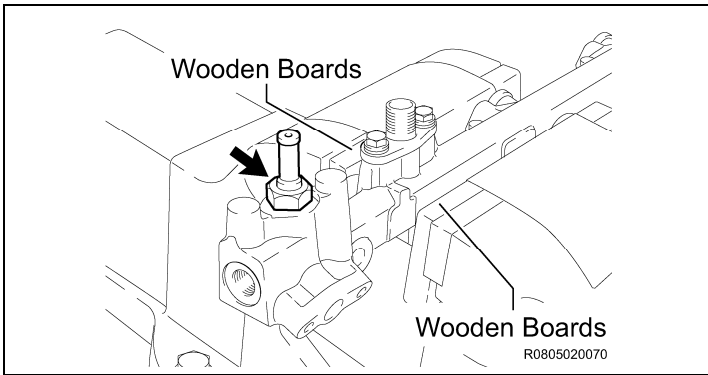
Torque Specification:

10 N·m (102 kgf·cm, 7 ft·lbf)

6. REMOVE FUEL RELIEF VALVE ASSY



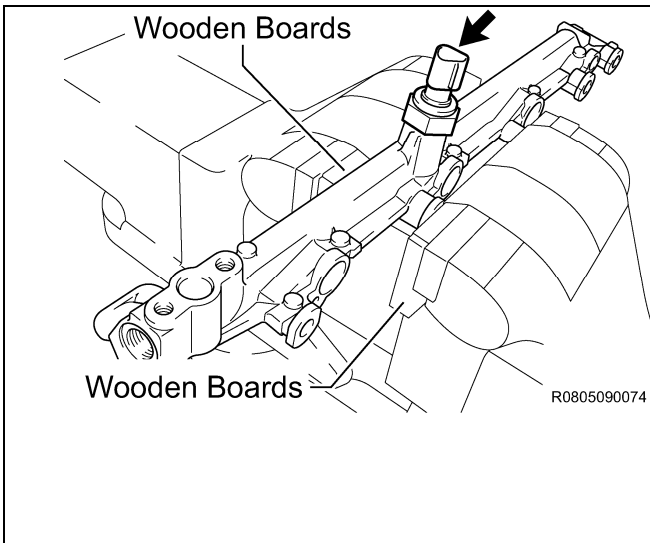
- a) Clamp the No. 1 fuel delivery pipe in a vise with wooden boards placed in between the pipe and vise.
- b) Using a 17mm deep socket wrench, remove the fuel relief valve and gasket.



7. INSTALL FUEL RELIEF VALVE ASSY

- Clamp a **NEW** No. 1 fuel delivery pipe in a vise with wooden boards placed in between the pipe and vise as illustrated.
- Install a **NEW** gasket to the fuel relief valve.
- Using a 17mm deep socket wrench, install the fuel relief valve assembly.

Torque Specification:
40 N·m (408 kgf·cm, 30 ft·lbf)



8. REMOVE FUEL PRESSURE SENSOR

- Clamp the No. 2 fuel delivery pipe in a vise with wooden boards placed in between the pipe and vise.
- Remove the fuel pressure sensor and gasket.

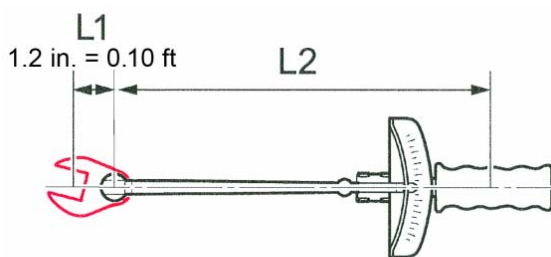
9. INSTALL FUEL PRESSURE SENSOR

- Clamp a **NEW** No. 2 fuel delivery pipe in a vise with wooden boards placed in between the pipe and vise as illustrated.
- Install a **NEW** gasket to the fuel pressure sensor.
- Install the fuel pressure sensor to the No. 1 delivery pipe and torque to specification.

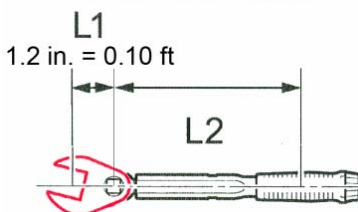
10. CALCULATE THE FUEL PRESSURE SENSOR TORQUE VALUE



- The calculated torque (C) is the value at which the torque wrench **MUST** be set.
- To determine the calculated torque, **READ**, and **CLOSELY** follow the steps below.
- If using the formula L1 and L2 **MUST** be measured in feet.



Torque wrench adapter
and union nut wrench



Connect the torque wrench to the union nut so that they form a straight line when tightening.

- Measure the length of the torque wrench from the center of the drive to the middle of the handle as shown in the illustration (L2)
- Determine the calculated torque (C) value to set the wrench to by referencing the table below.

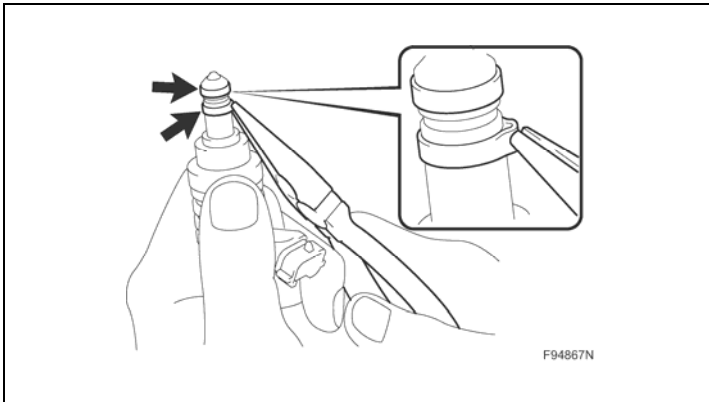
Torque Wrench Length – L2 (inches)	Calculated Torque (ft lbs)
10"	27.6
12"	28.1
14"	28.5
16"	28.8
18"	29
20"	29.2

NOTE:
The torque wrench union nut **MUST** be used when using the values in this table.

Calculated Torque Formula:

$$C = (T) \times L2 / (L1 + L2)$$

C	Calculated Torque (ft·lbf)
T	Specified torque (ft·lbf) (31 ft·lbf)
L1	Torque wrench adapter length or length of tool (ft.)
L2	Length of torque wrench (ft.)

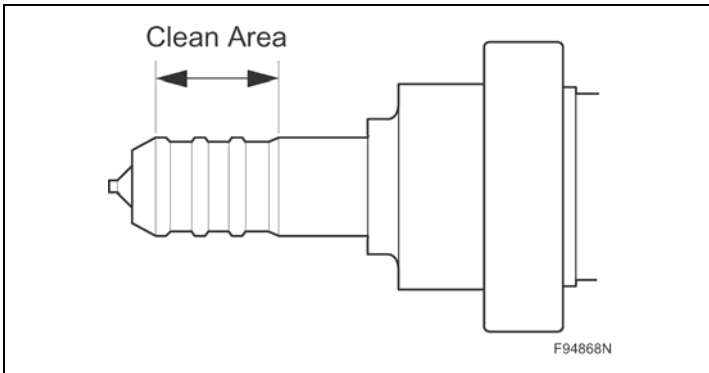


11. REMOVE FUEL INJECTOR SEAL

- Using the tips of a pair of needle nose pliers, pinch and pull one of the 2 injector seals at several points to stretch it. Repeat this for the other injector seal.
- Repeat step a) for the remaining injectors.

NOTE:

If an injector is dropped or the tips of the injectors are struck, replace it with a **NEW** one.



12. INSTALL FUEL INJECTOR SEAL

- Using a piece of cloth and engine conditioner, clean carbon deposits from the injector and its grooves.

NOTE:

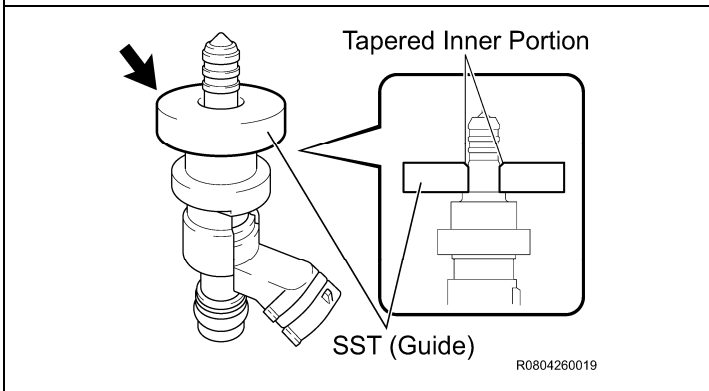
- Do not clean the tip of the injector.
- Do not clean with a wire brush.
- If an injector is dropped or the tips of the injectors are struck, replace it.

- Apply engine oil to the injector contact surface of SST (guide). Then attach SST (guide) to the injector with the tapered inner portion facing the tip of the injector, as shown in the illustration.

SST 09260-39015 (09268-03020, guide)

NOTE:

Due to the specific tolerances needed to seat the seals it will be difficult to slide the SST. Slowly wiggle it from side to side while sliding it up the injector little by little.

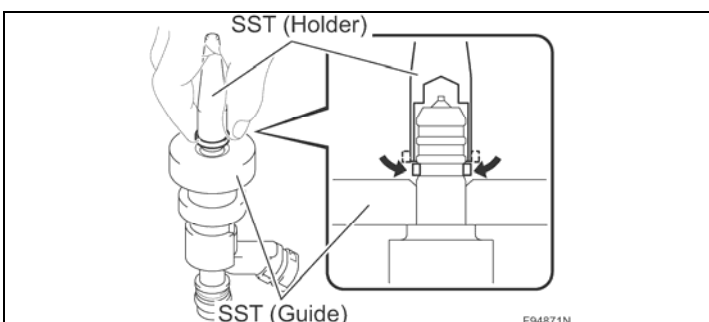
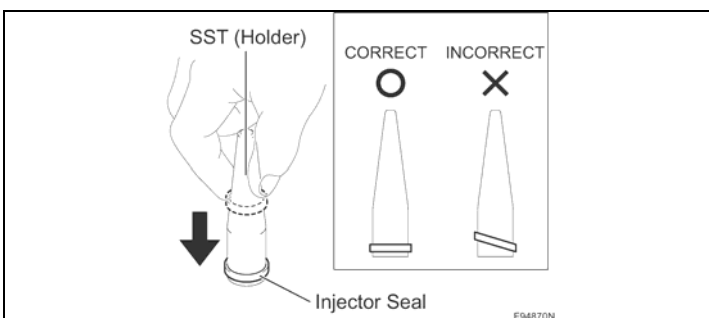


- Install a **NEW** injector seal to SST (holder).

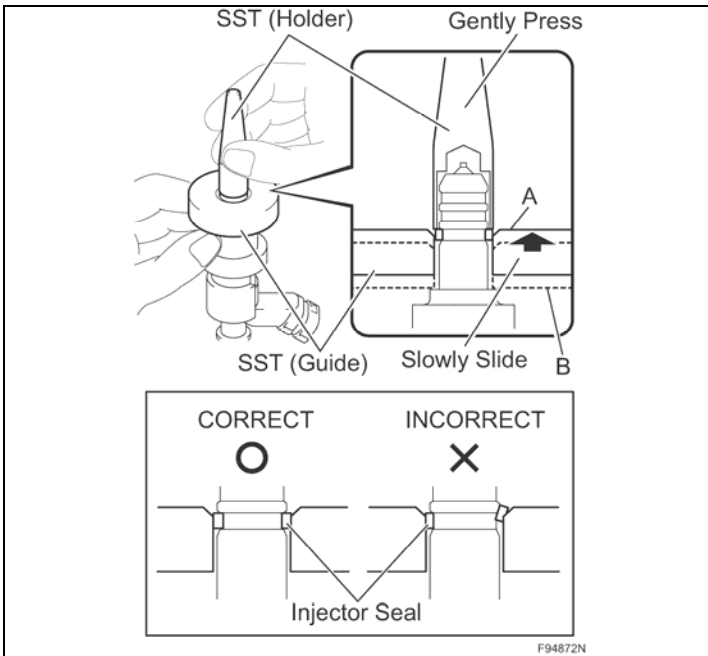
SST 09260-39015 (09268-03010, holder)

NOTE:

Be careful not to install the injector seal to the SST (holder) at an angle. Doing so will stretch the seal.



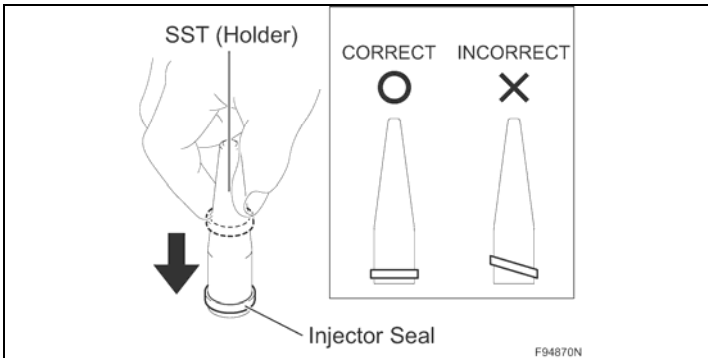
- Install SST (holder with injector seal) to the tip of the injector. Slide the seal downward into the injector groove (injector connector side) with your fingers, as shown in the illustration.



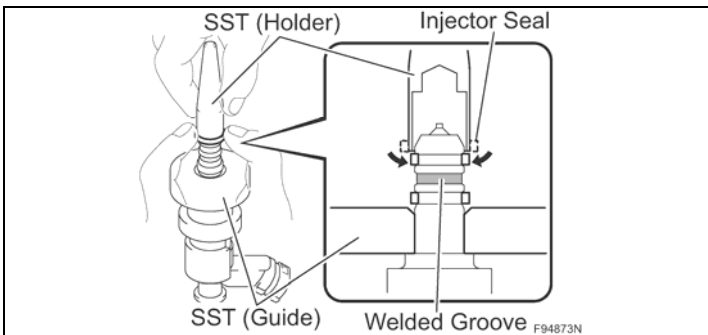
- e) Using SST (holder), gently press downward on the injector seal (injector connector side). Then slowly slide SST (guide) towards the injector tip to settle the seal into the injector groove.

NOTE:

- Be careful that the seal is not pinched between SST (guide) and the injector groove. Replace the seal if it becomes damaged.
- When using SST (guide) to settle the seal into the groove, SST (guide) only needs to be slid upward to the position labeled A in the illustration.
- After using SST (guide) to settle the seal into the groove, return SST (guide) to its position labeled B in the illustration.



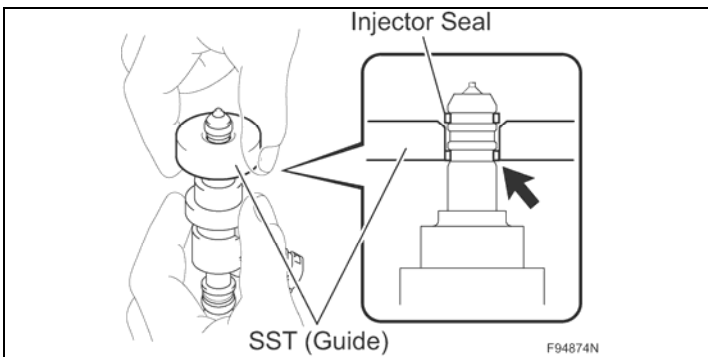
- f) Install a **NEW** injector seal to SST (holder).



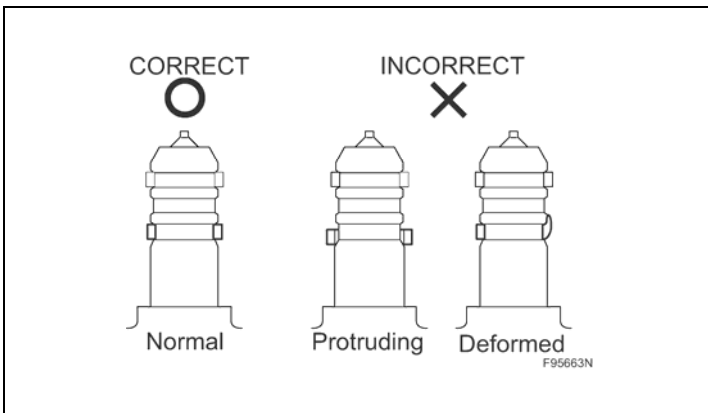
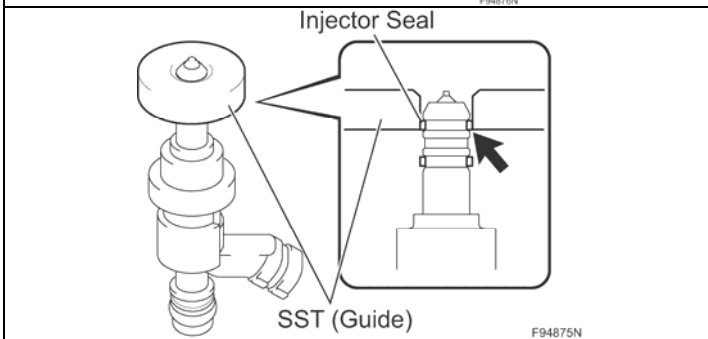
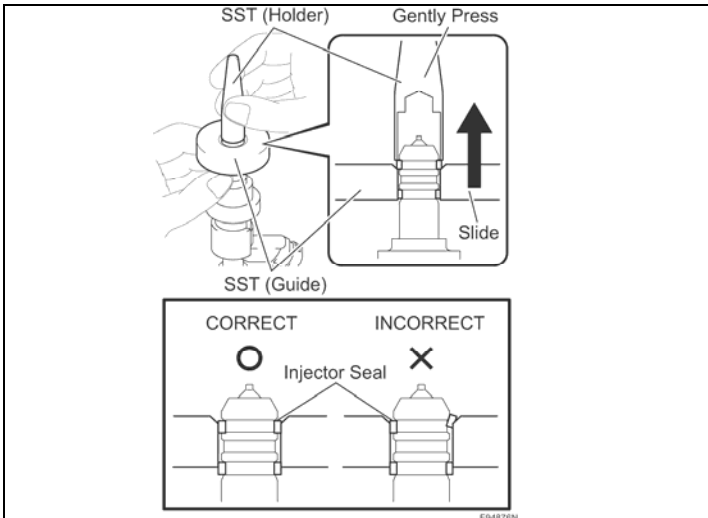
- g) Install a **NEW** injector seal to the injector groove (injector tip side) as shown in the illustration.
- h) Check that the seal covers the circumference of the injector groove as shown in the illustration.

NOTE:

Make sure that the seal does not slip into the welded groove of the injector shown in the illustration. If it does, replace it with a **NEW seal.**



- i) Slowly slide SST (guide) towards the tip of the injector. When the injector contact surface of SST (guide) aligns with the seal (injector connector side) as shown in the illustration, hold the position for 5 seconds or more to fully align the seal into the injector groove.



- j) Using SST (holder), gently press downward on the injector seal (injector tip side). Then slowly slide SST (guide) towards the injector tip to settle the seal into the injector groove.

NOTE:

Be careful that the seal is not pinched between SST (guide) and the injector groove. Replace the seal if it becomes damaged.

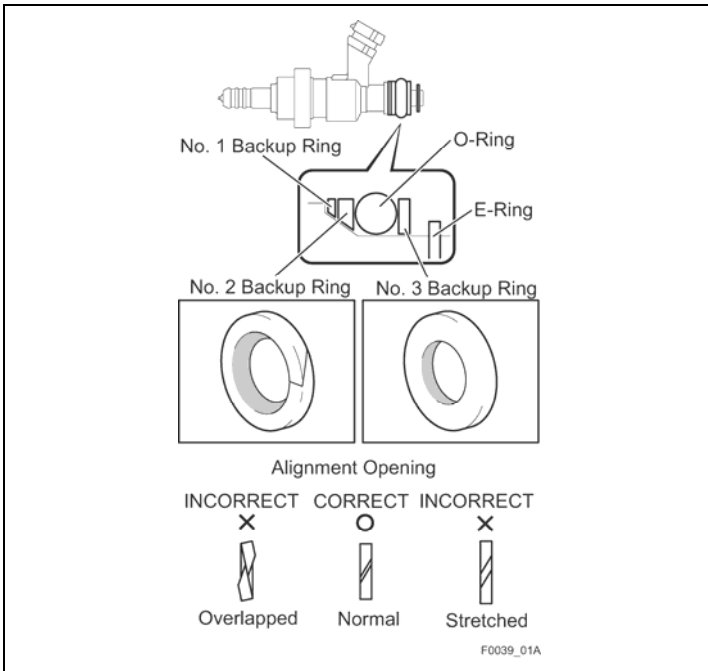
- k) Slowly slide SST (guide) towards the tip of the injector. When the injector contact surface of SST (guide) aligns with the seal (injector tip side) as shown in the illustration, hold the position for 5 seconds or more to fully align the seal into the injector groove.

- l) After installing the seals, check that the seal is not scratched, deformed or protruding from the injector groove, if the seal is damaged, replace it with a new one.

NOTE:

- **The second seal from the injector tip is next to a tapered surface so after installation it may slide up to 0.5 mm.**

- m) Repeat steps a) ~ l), for the remaining injectors.



13. REPLACE FUEL INJECTOR O-RING, BACKUP RINGS AND E-RING

- Remove the O-ring, backup rings and E-ring from the fuel injector.
- Install a **NEW** O-ring, **NEW** backup rings (No. 1, No. 2, No. 3) and **NEW** E-ring to the fuel injector as shown in the illustration.

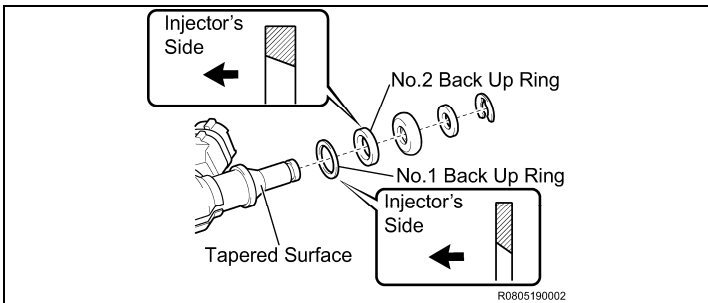
NOTE:

- Check that there is no foreign matter or damaged areas in the injector's O-ring groove.
- Check that the No. 1 and No. 2 backup rings are installed in the correct direction.
- Make sure that the backup rings and O-ring are installed in the correct order.
- Check that the alignment openings of the backup rings are not overlapped or stretched as shown in the illustration.

NOTE:

Align and install the No.1 and No.2 backup rings to the fuel injector's tapered surface.

- Repeat steps a) ~ b), and install the 8 **NEW** O-ringS, **NEW** backup rings (No. 1 No. 2, and No. 3) and **NEW** E-rings.



14. INSTALL FUEL INJECTOR ASSEMBLY

- Install the injector nozzle holder clamp.
- Apply gasoline to the fuel injector's O-ring and into the attachment hole of the fuel delivery pipe.

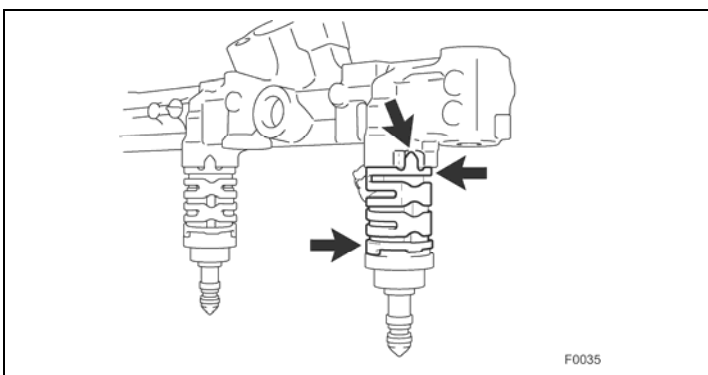
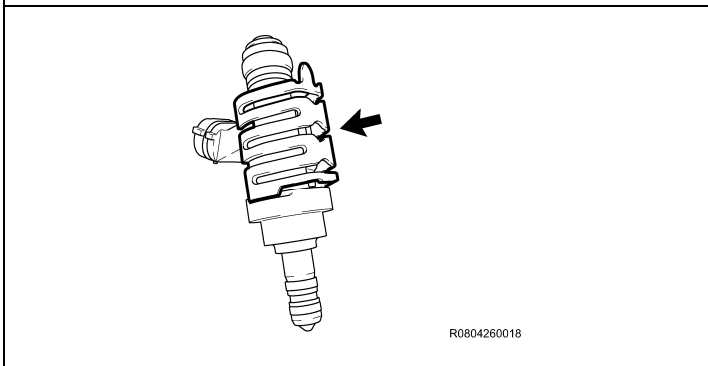
NOTE:

Apply gasoline on both the O-ring and into the attachment hole. The gasoline will run out immediately after insertion if only applied to the O-ring side.

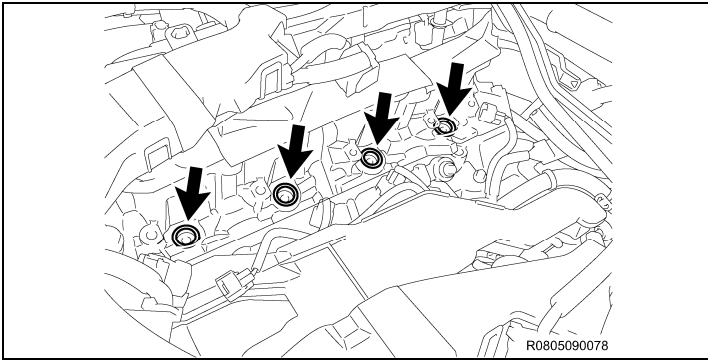
- Install the nozzle holder clamp by aligning the protruding part of the clamp to the notch of the delivery pipe.
- Repeat steps a) ~ c) for the remaining injectors.

NOTE:

- Make sure that there is no gap between the delivery pipe and clamp.
- Check that there is no foreign matter or damage to the injector insertion hole of the delivery pipe.

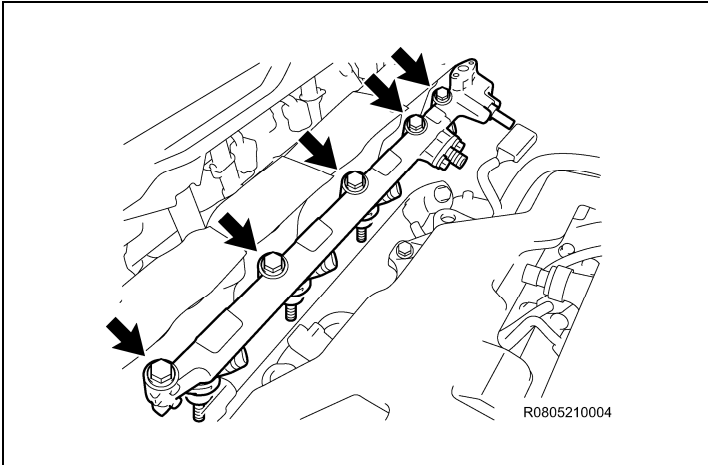


D. INSTALL FUEL DELIVERY PIPE WITH FUEL INJECTOR



1. INSTALL FUEL DELIVERY PIPES

- a) Install 4 **NEW** injector vibration insulators.
- b) Apply lubricant to the installation injector seal and holes of the cylinder head.

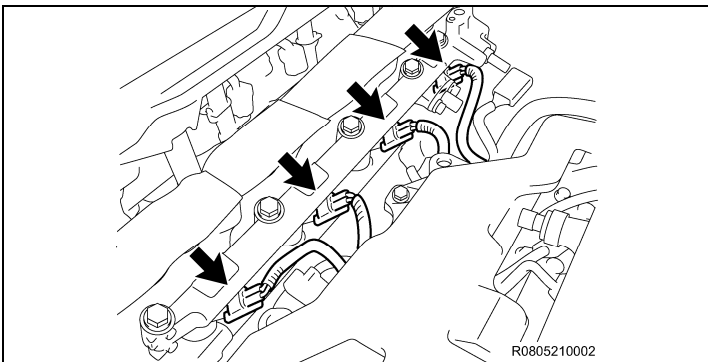


- c) Install the No. 1 delivery pipe with the 5 bolts.

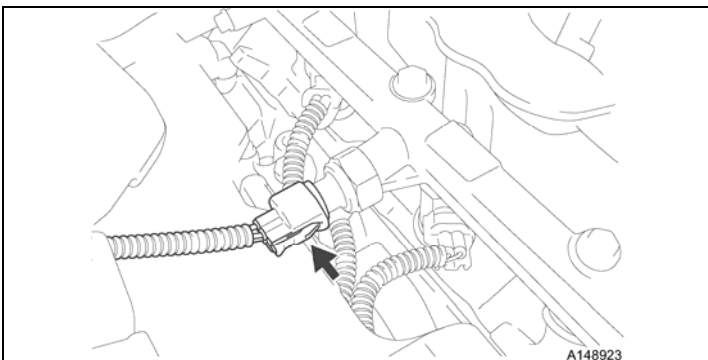
Torque Specification:
21 N·m (214 kgf·cm, 15 ft·lbf)

NOTE:

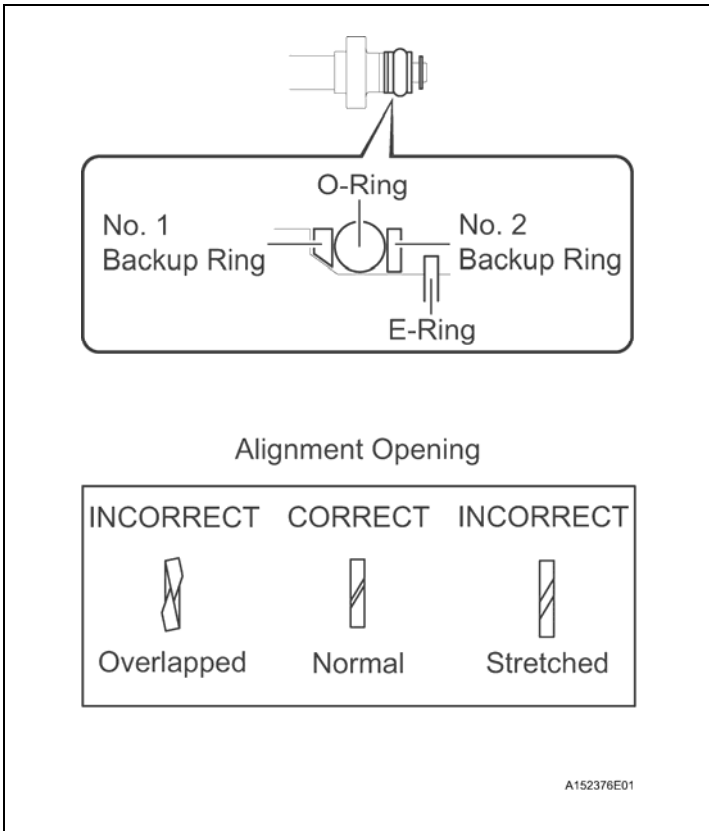
- If an injector is dropped or the tips of the injectors are struck, replace it with a **NEW** one.
- Check that there is no foreign matter or damage to the injector insertion hole of the cylinder head.
- When inserting the fuel delivery pipe, push it in evenly without tilting it.



- d) Connect the 4 injector connectors.
- e) Repeat steps a) ~ d) for the No. 2 Fuel delivery pipe.



2. REINSTALL THE FUEL PRESSURE SENSOR CONNECTOR.

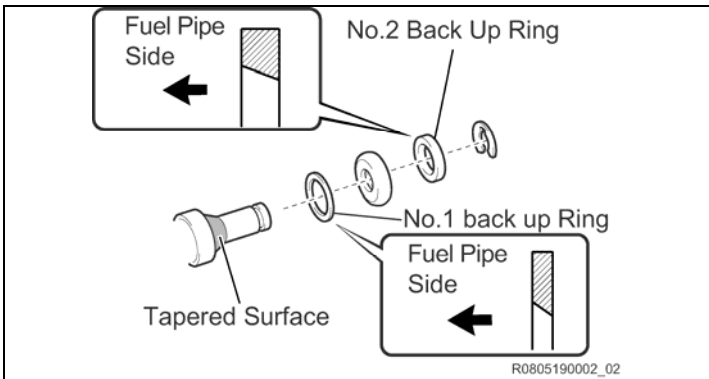


3. INSTALL NO. 3 FUEL PIPE SUB-ASSEMBLY

- a) Remove the O-ring, backup rings and E-ring from the No. 3 fuel pipe.
- b) Install a **NEW** O-ring, **NEW** backup rings (No. 1 and No. 2) and **NEW** E-ring to the fuel pipe.

NOTE:

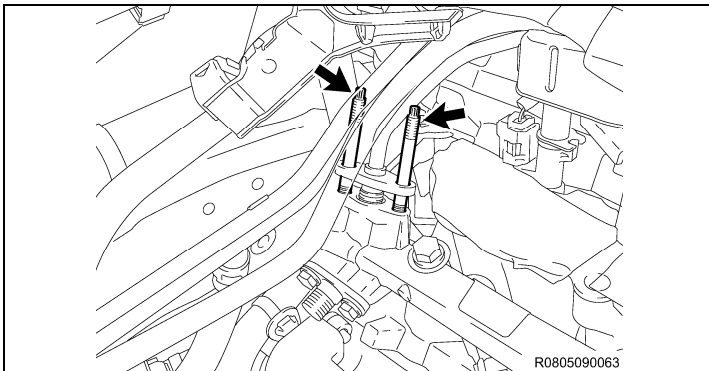
- Check that there is no foreign matter or damaged areas in the pipe's O-ring groove.
- Check that the No. 1 and No. 2 backup rings are installed in the correct direction.
- Make sure that the backup rings and O-ring are installed in the correct order.
- Check that the alignment openings of the backup rings are not overlapped or stretched as shown in the illustration.
- After installing the O-ring, check that it is not contaminated with foreign matter and is not damaged.
- Check that the fuel pipe installation end is not contaminated with foreign matter and is not damaged.



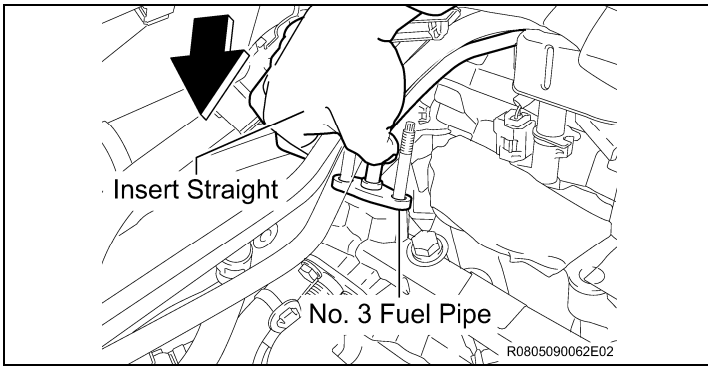
- c) Apply gasoline to the No. 3 fuel pipe's O-ring and into the attachment hole of the delivery pipe's No. 3 fuel pipe.

NOTE:

- Do not over apply lubricant.
- Apply gasoline on both the O-ring and into the attachment hole. Lubricant will run out immediately after insertion if only applied to the O-ring side.



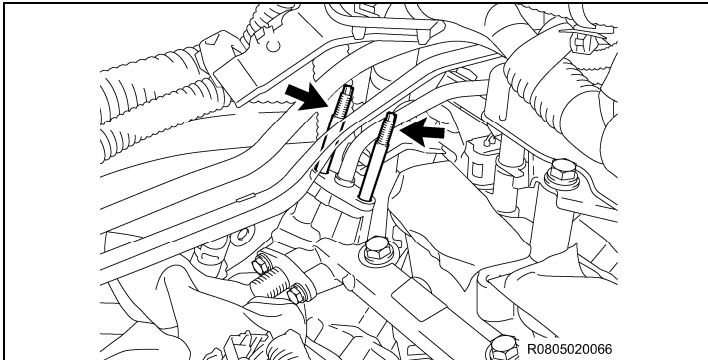
- d) Hand tighten the 2 stud bolts to the delivery pipe bolt attachment holes. (torx® side up)



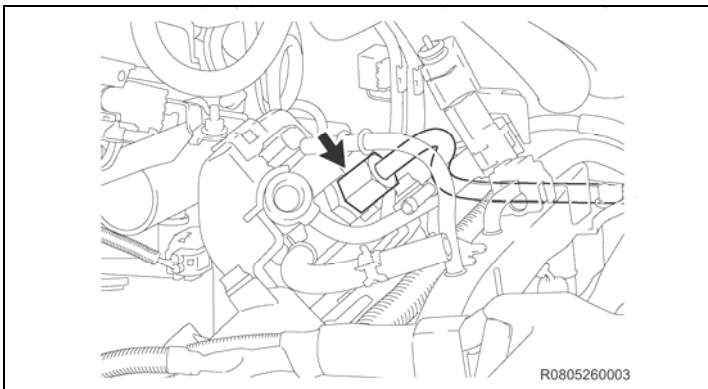
- e) Press the fuel pipe and delivery pipe together by hand until there is no gap between them.

NOTE:

Shifting the pipe too widely to the left and right may damage the part which may lead to a fuel leak.



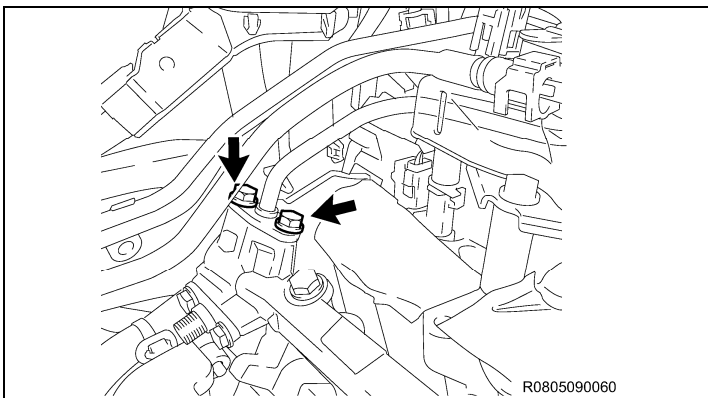
- f) Remove the 2 stud bolts.



- g) Loosely install the No. 3 fuel pipe sub-assembly to the fuel pump assembly.

NOTE:

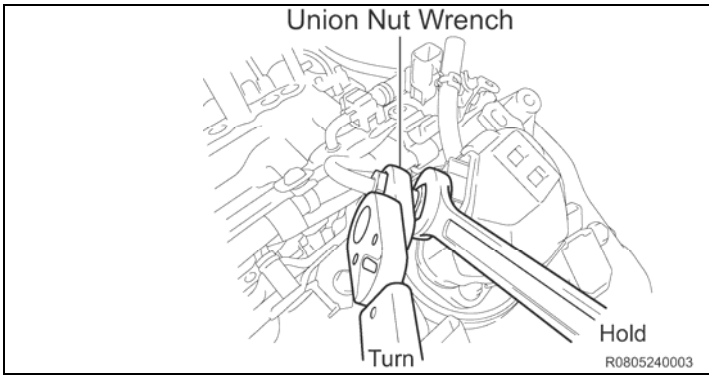
Be careful not to damage the sealing surface of the fuel pipe when temporarily installing the fuel pipe.



- h) Install the 2 bolts.

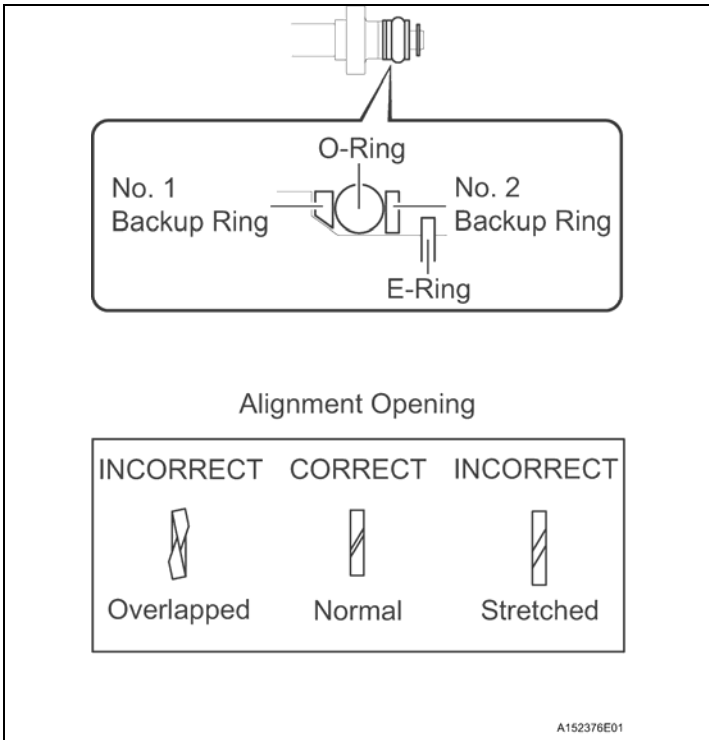
Torque Specification:

10 N·m (102 kgf·cm, 7 ft·lbf)



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

Torque Specification:
26 N-m (265 kgf-cm, 19 ft-lbf)

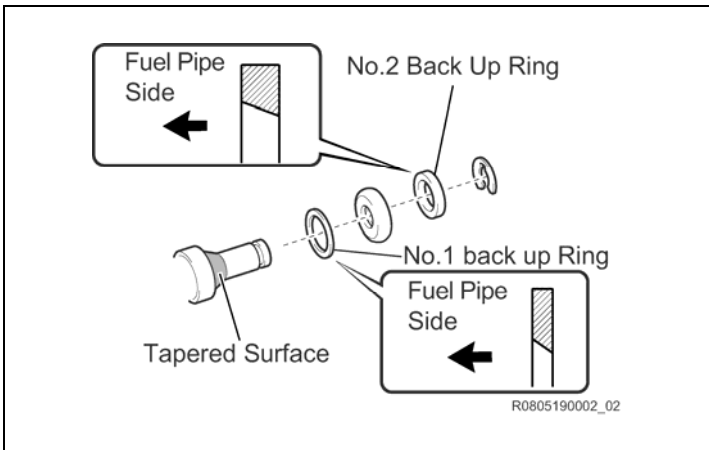


4. INSTALL NO. 2 FUEL PIPE SUB-ASSEMBLY

- a) Remove the O-ring, backup rings and E-ring from the No. 2 fuel pipe.
 b) Install a **NEW** O-ring, **NEW** backup rings (No. 1 and No. 2) and **NEW** E-ring to the fuel pipe.

NOTE:

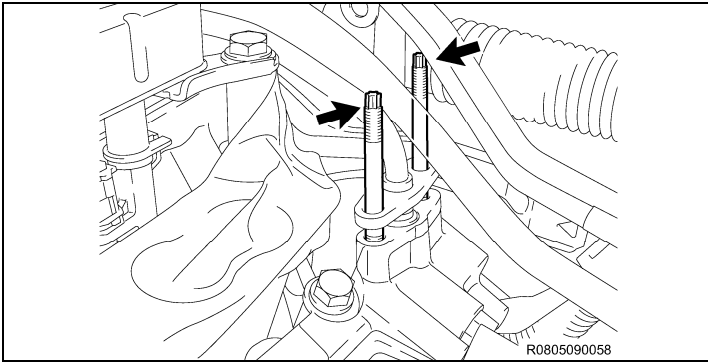
- Check that the No. 1 and No. 2 backup rings are installed in the correct direction.
- Make sure that the backup rings and O-ring are installed in the correct order.
- Check that the alignment openings of the backup rings are not overlapped or stretched as shown in the illustration.
- After installing the O-ring, check that it is not contaminated with foreign matter and is not damaged.
- Check that the fuel pipe installation end is not contaminated with foreign matter and is not damaged.



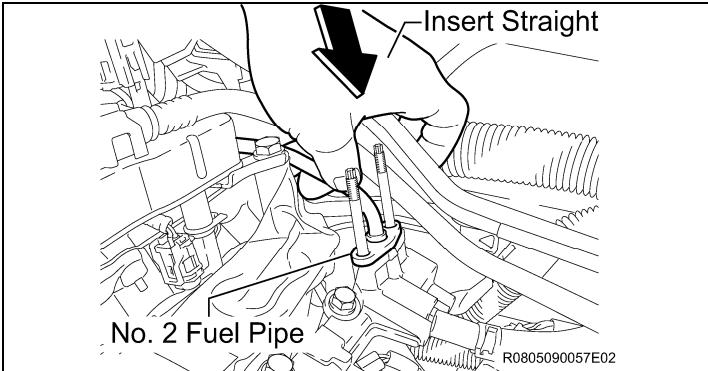
- c) Apply gasoline to the No. 2 fuel pipe's O-ring and into the attachment hole of the delivery pipe's No. 2 fuel pipe.

NOTE:

- Do not over apply lubricant.
- Apply gasoline on both the O-ring and into the attachment hole. The gasoline will run out immediately after insertion if only applied to the O-ring side.



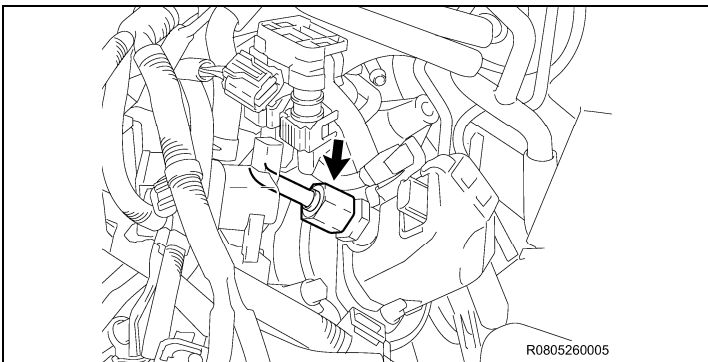
- d) Hand tighten the 2 stud bolts to the delivery pipe bolt attachment holes. (torx® side up)



- e) Press the fuel pipe and delivery pipe together by hand until there is no gap between them.
f) Remove the 2 stud bolts.

NOTE:

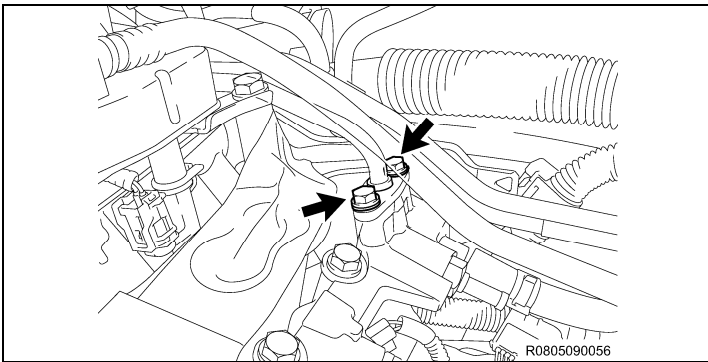
Shifting the pipe too widely to the left and right may damage the part which may lead to a fuel leak.



- g) Loosely install the No. 2 fuel pipe sub-assembly to the fuel pump assembly.

NOTE:

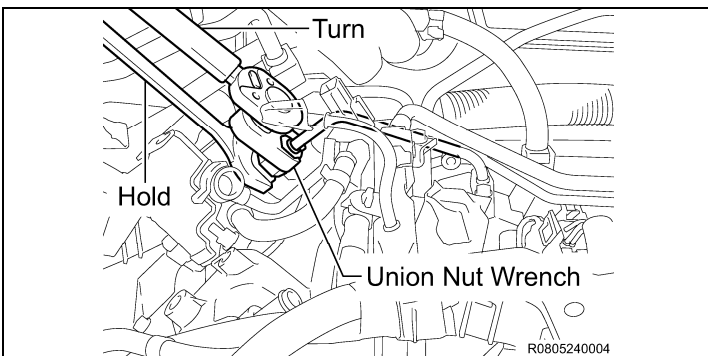
Be careful not to damage the sealing surface of the fuel pipe when temporarily installing the fuel pipe.



- h) Install the 2 bolts.

Torque Specification:

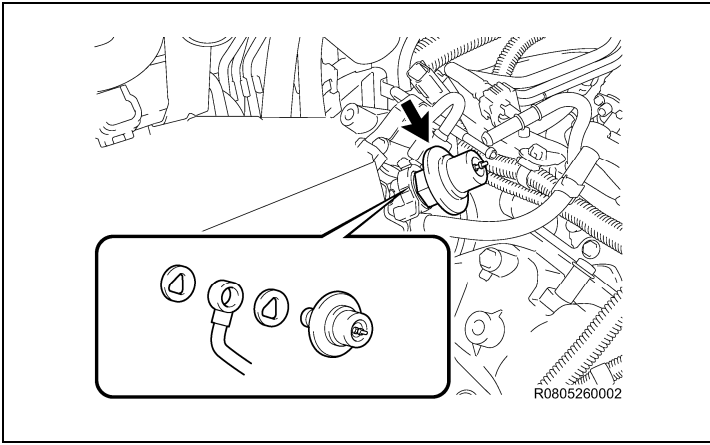
10 N·m (102 kgf·cm, 7 ft·lbf)



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

Torque Specification:

26 N·m (265 kgf·cm, 19 ft·lbf)

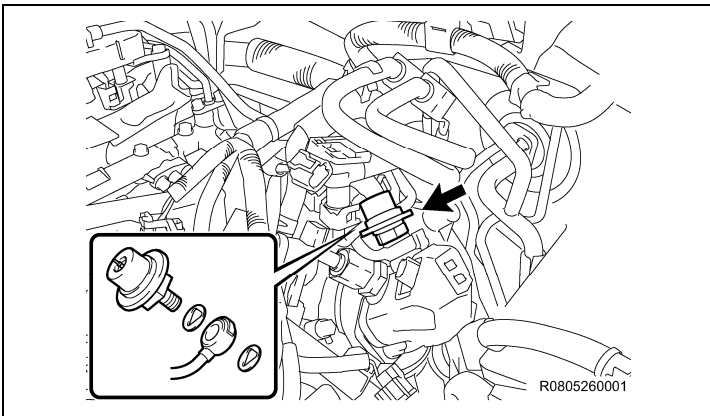


5. CONNECT NO. 1 FUEL PIPE SUB-ASSEMBLY

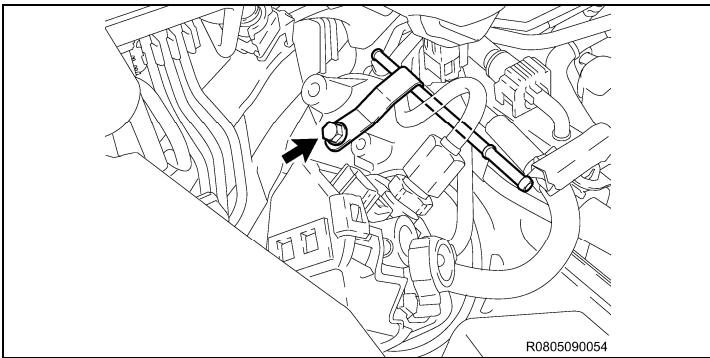
- a) Once the 2 **NEW** gaskets and fuel tube have been installed, attach the fuel pressure pulsation damper RH and tighten by hand.

NOTE:

- Do not damage the seal surface when installing the pipe and fuel pump. Doing so may lead to a fuel leak.
- Do not use pulsation dampers which have been dropped. Dropped dampers may not work properly.
- Do not blow air into the pulsation dampers. The air pressure may damage the internal diaphragm.

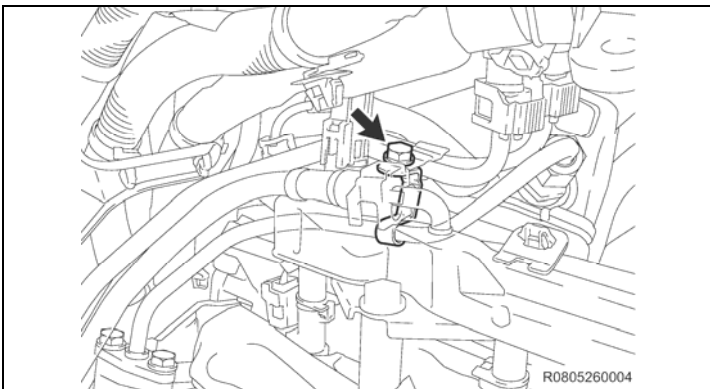


- b) Once the 2 **NEW** gaskets and fuel tube have been installed, attach the fuel pressure pulsation damper LH and tighten by hand.



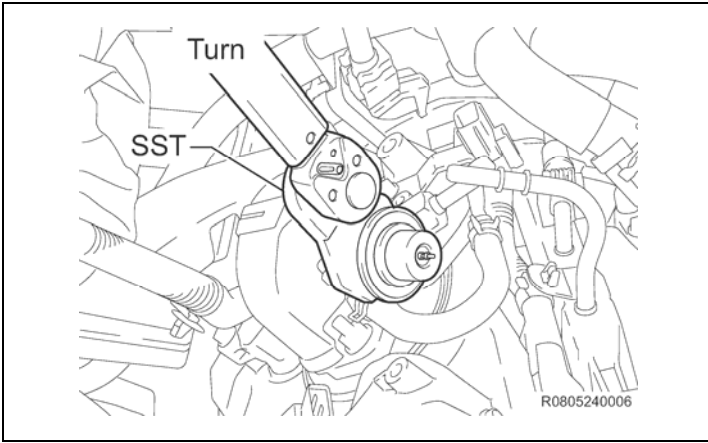
- c) Install the bolt illustrated.

Torque Specification:
10 N·m (102 kgf·cm, 7 ft·lbf)



- d) Install the bolt illustrated.

Torque Specification:
10 N·m (102 kgf·cm, 7 ft·lbf)



e) Use SST or equivalent, securely tighten the fuel pressure pulsation damper RH.

SST 09612-24014 (09617-24011)

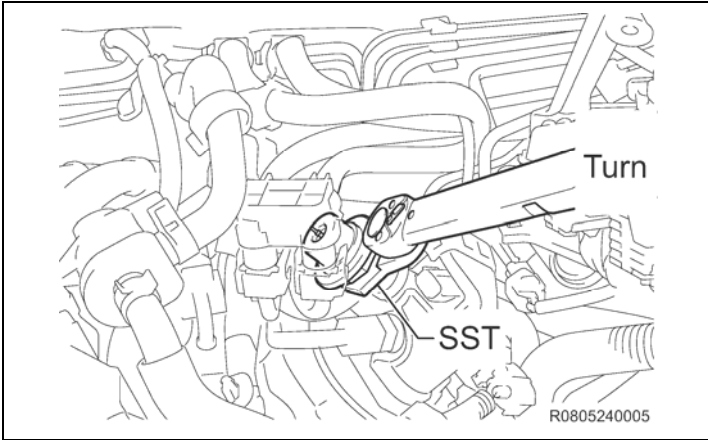
Torque Specification:

With SST

33 N·m (337 kgf·cm, 24 ft·lbf)

With out SST

40 N·m (408 kgf·cm, 30 ft·lbf)



f) Use SST or equivalent, securely tighten the fuel pressure pulsation damper LH.

SST 09612-24014 (09617-24011)

Torque Specification:

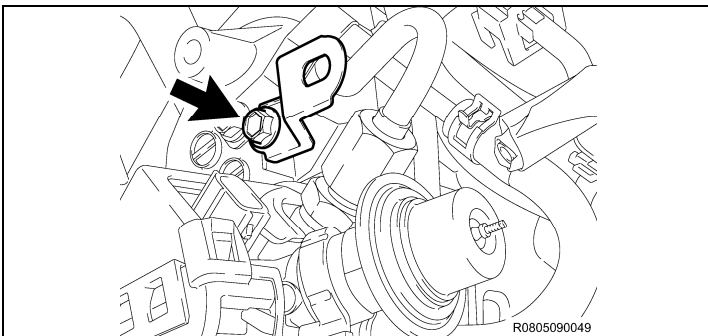
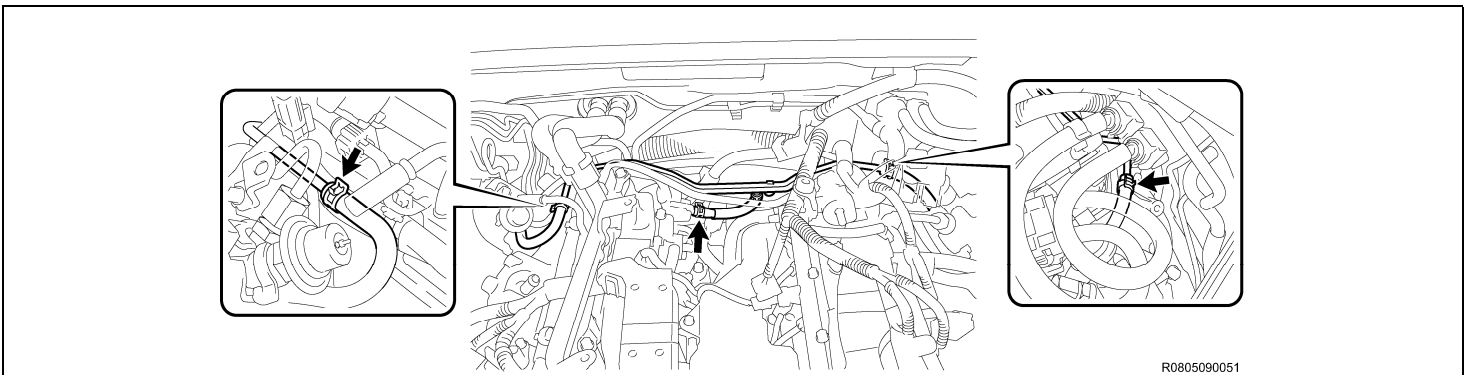
With SST

33 N·m (337 kgf·cm, 24 ft·lbf)

With out SST

40 N·m (408 kgf·cm, 30 ft·lbf)

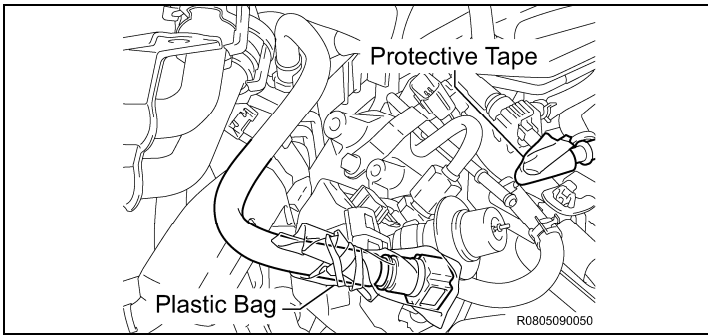
g) Connect the 3 fuel hoses. (illustration below)



h) Install the bracket with the bolt.

Torque Specification:

10 N·m (102 kgf·cm, 7 ft·lbf)

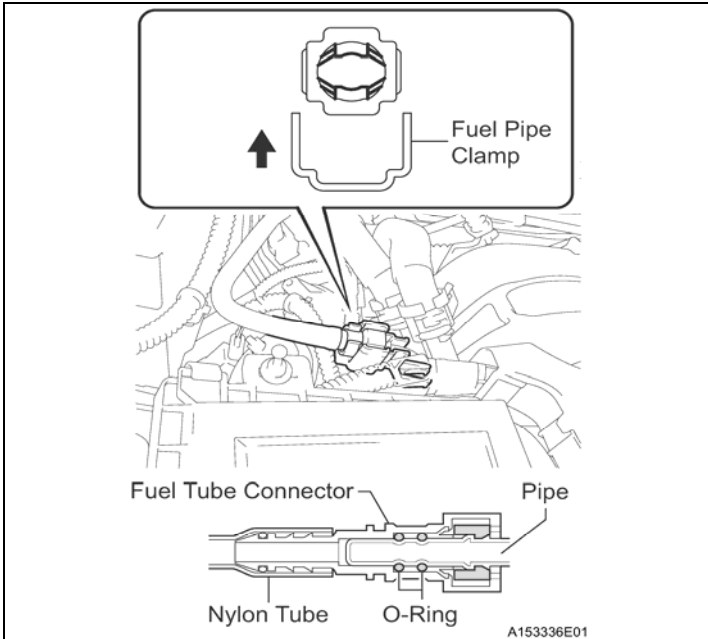


6. CONNECT NO. 3 FUEL HOSE

- a) Remove the plastic bag and protective tape and clean the attachment surface.

NOTE:

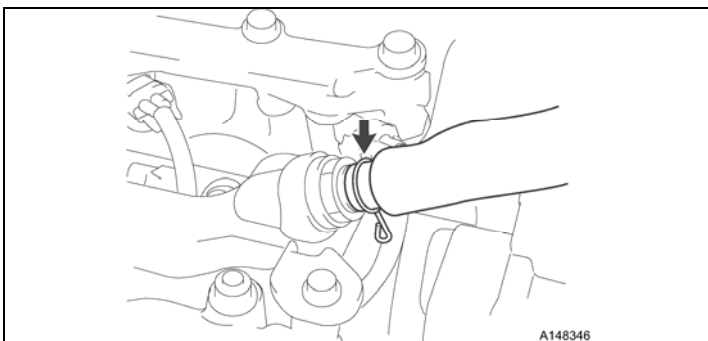
Check for damage or foreign objects on the connector.



- b) Push in the fuel tube connector to the delivery pipe sub-assembly and push up the retainer to engage the claws.
- c) Install the fuel pipe clamp.

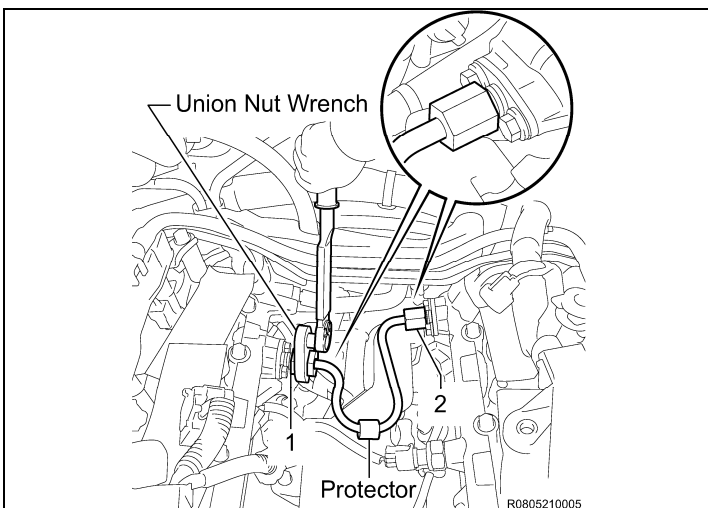
NOTE:

After connecting, check that the fuel tube connector and the pipe are securely connected by pulling on them.



7. CONNECT PCV HOSE

- a) Connect the PCV hose.

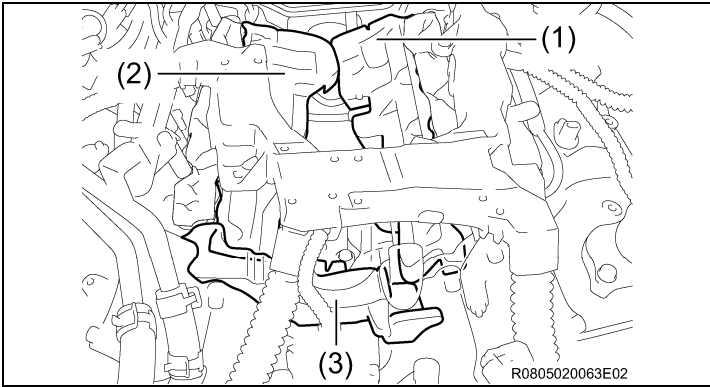


8. INSTALL NO. 4 FUEL PIPE SUB-ASSEMBLY

- a) Hand tighten the fuel pipe.
- b) Using a 19 mm union nut wrench, tighten the fuel pipe in the order shown in the illustration.

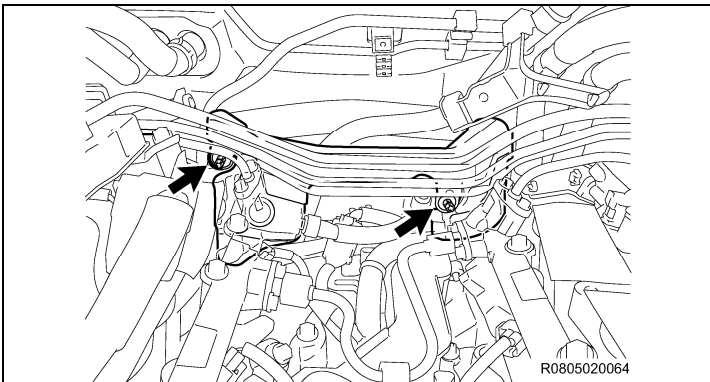
Torque Specification:

26 N·m (265 kgf·cm, 19 ft·lbf)



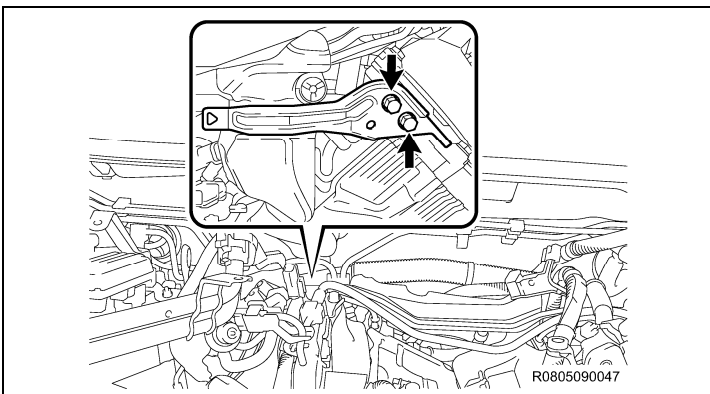
9. INSTALL ENGINE COVER SUB-ASSEMBLY

- a) Install the 3 engine covers.



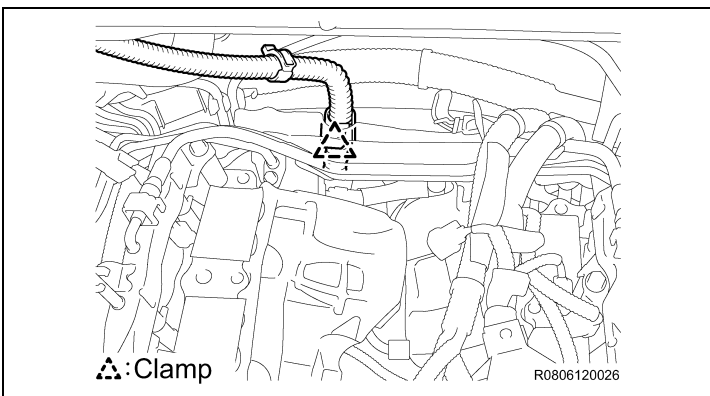
10. INSTALL NO. 3 ENGINE COVER SUB-ASSEMBLY

- a) Install the No. 3 engine cover sub-assembly with the 2 clips.



- b) Install the bracket with the 2 bolts.

Torque Specification:
10 N·m (102 kgf·cm, 7 ft·lbf)



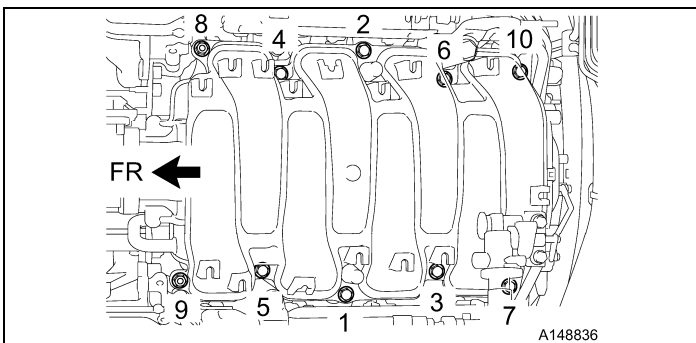
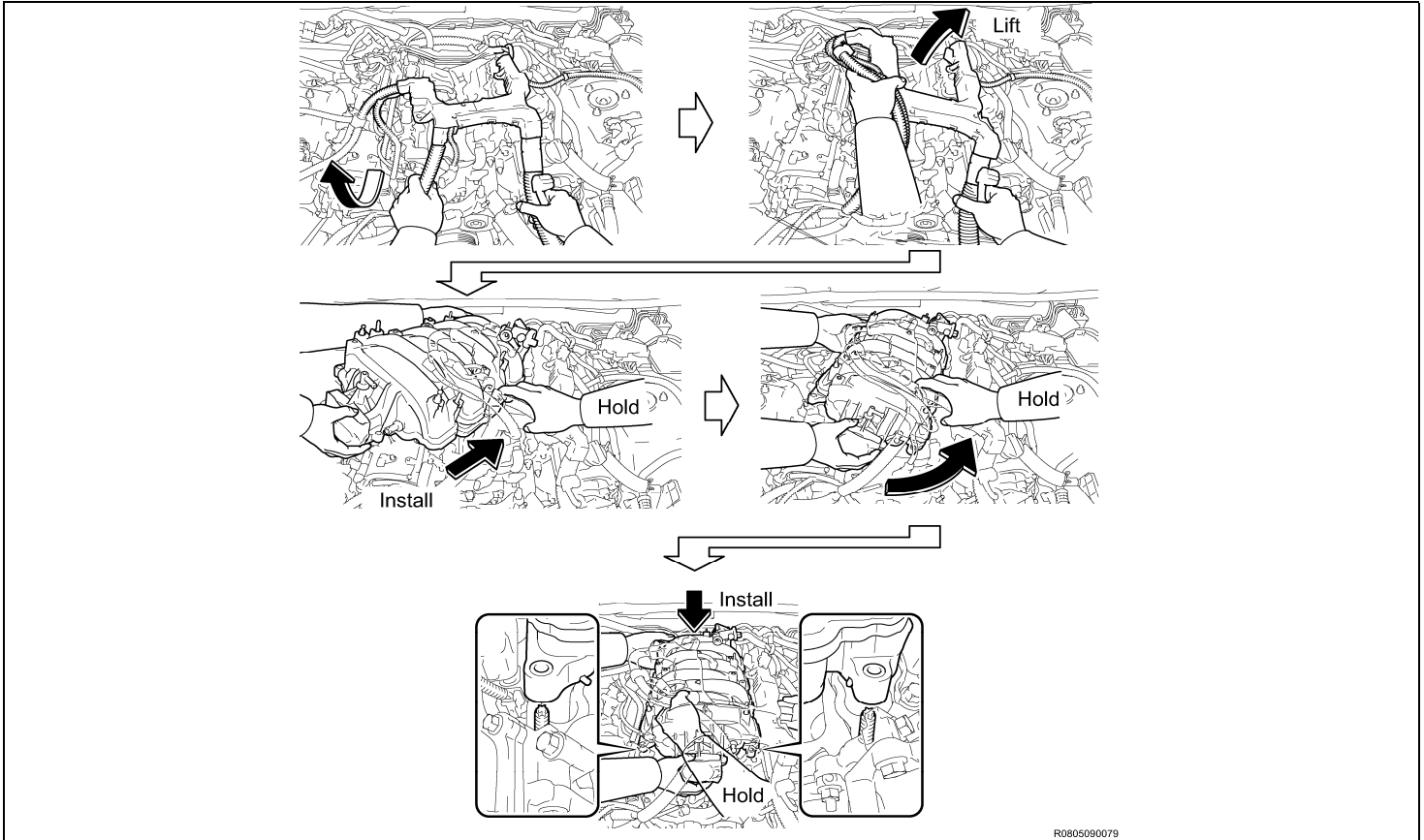
- c) Install the clamp.

△: Clamp

E. REINSTALL THE INTAKE MANIFOLD

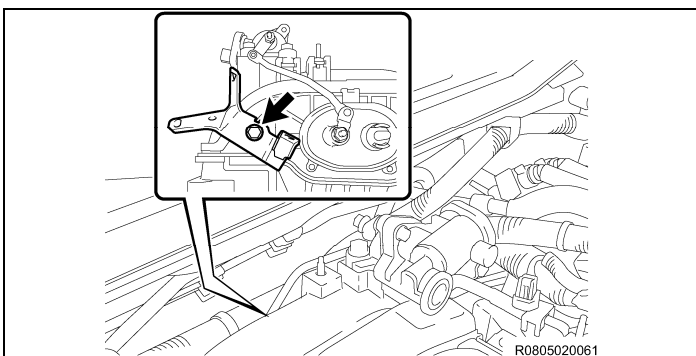
1. REINSTALL INTAKE MANIFOLD

- a) Remove the protective tape and clean the attachment surface.
- b) Install 2 **NEW** gaskets.
- c) Have one person assist by lifting the engine wire harness.
- d) Install the intake manifold from the right bank.



- e) Using a 12 mm deep socket wrench, install the 8 bolts and 2 nuts.

Torque Specification:
21 N-m (214 kgf-cm, 15 ft-lbf)

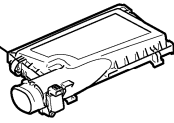


- f) Install the bolt located on the rear of the manifold.

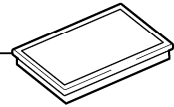
Torque Specification:
10 N-m (102 kgf-cm, 7 ft-lbf)

AIR CLEANER ASSEMBLY RH

AIR CLEANER CAP
SUB-ASSEMBLY RH



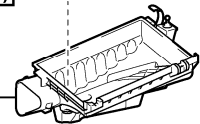
ELEMENT



5.0 (51, 44 in.*lbf)

x 2

AIR CLEANER
CASE RH



NO. 2 VENTILATION HOSE

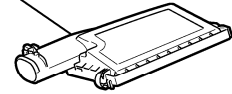


NO. 1 VENTILATION HOSE



AIR CLEANER ASSEMBLY LH

AIR CLEANER CAP
SUB-ASSEMBLY LH



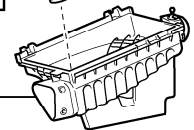
ELEMENT



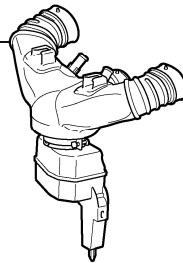
5.0 (51, 44 in.*lbf)

x 2

AIR CLEANER
CASE LH

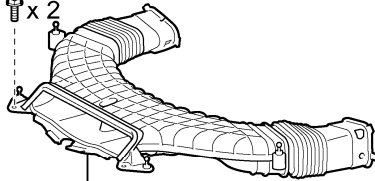


INTAKE AIR CONNECTOR PIPE

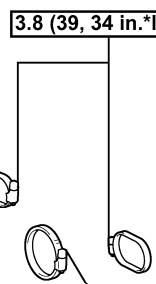


5.0 (51, 44 in.*lbf)

x 2



NO. 1 AIR CLEANER INLET



3.8 (39, 34 in.*lbf)

4.8 (49, 43 in.*lbf)

BOX COVER



BOX COVER



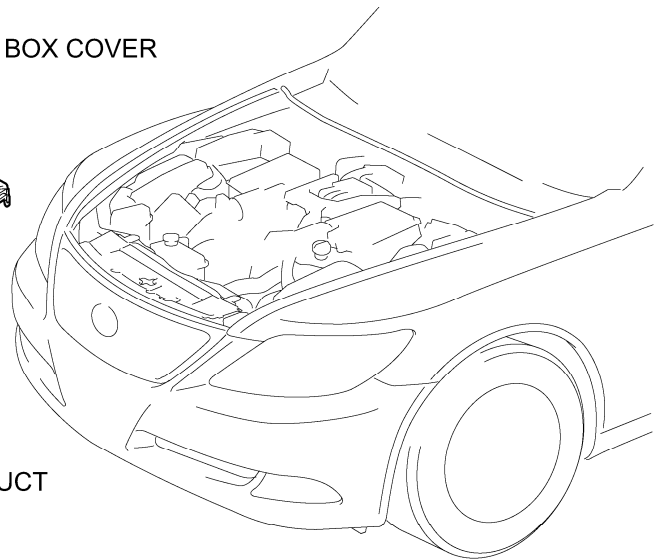
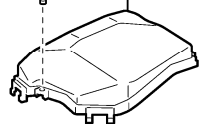
ECM BOX COVER

5.5 (56, 49 in.*lbf)

x 3

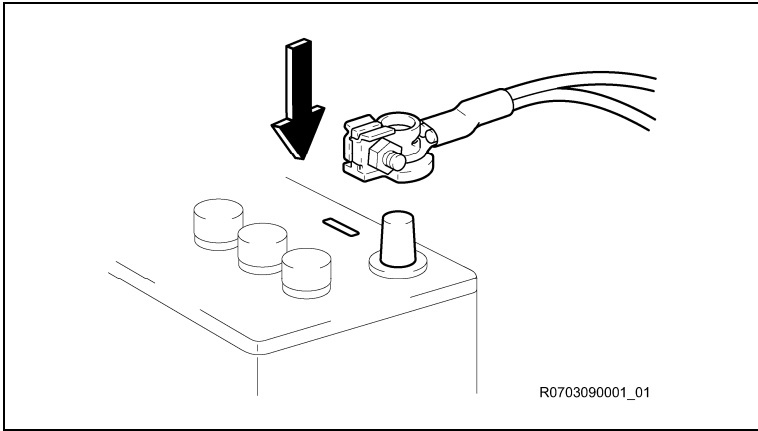


ENGINE ROOM ECU OUTLET DUCT



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

R0805090034



- a) Reinstall and reconnect the battery and insulator.
- b) Install the cowl top ventilator cover RH.

E. CHECK FOR FUEL LEAKS & REASSEMBLY

1. CHECK FOR FUEL LEAKS

- a) Connect the Techstream to the DLC3.
- b) Push the engine switch on (IG).

NOTE:

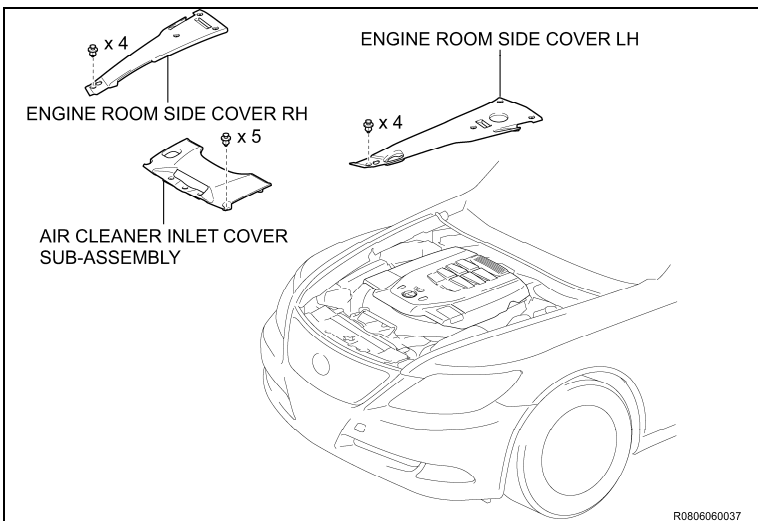
Do not start the engine.

- c) Push the tester ON.
- d) Enter the following menus: Powertrain / Engine / Active Test / Control the Fuel Pump Speed.
- e) Check that there are no fuel leaks anywhere on the system after performing maintenance. If there is a fuel leak, repair or replace parts as necessary.

2. COOLANT REPLACEMENT

- a) Click the link for additional assistance.

[1UR-FSE COOLING: COOLANT: REPLACEMENT \(2007 LS460\)](#)



3. REINSTALL ENGINE ROOM COVERS

3. CHECK THROTTLE BODY

- a) Check the throttle control motor operating sounds.
 - 1) Push the engine switch on (IG).
 - 2) 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.

- b) Check the throttle position sensor.
 - 1) Connect the techs ream to the DLC3.
 - 2) Push the engine switch on (IG).
 - 3) Push the tester main switch ON.
 - 4) Enter the following menus: Powertrain / Engine / Data List / Throttle Sensor Position.
 - 5) Depress the accelerator pedal. When the throttle value is fully opened, check that the value of the "Throttle Sensor Position" is within the specification.

Standard throttle valve opening percentage: 60% or more.

NOTE:

When checking the standard throttle valve opening percentage, the shifter should be in the N position.

NOTE:

If the percentage is less than 60%, replace the throttle body.

4. TEST DRIVE AND CHECK FOR DTC'S

- a) Test drive the vehicle, inspect for any abnormalities. (warning lamps, drivability, etc.)
- b) If an error code displays, repair as necessary.

5. PERFORM INITIALIZATIONS

NOTE:

Certain systems need to be initialized after reconnecting the cable to the negative (-) battery terminal.

- a) Navigation system (for DVD) initialization.
- b) Correction of steering angle neutral point.
- c) Rear curtain position reset operation.
- d) Reset power trunk lid system.

VIII. APPENDIX

A. CAMPAIGN PARTS DISPOSAL

As required by Federal Regulations, please make sure all campaign parts (original parts) removed from the vehicle are disposed of in a manner in which they will not be reused.