

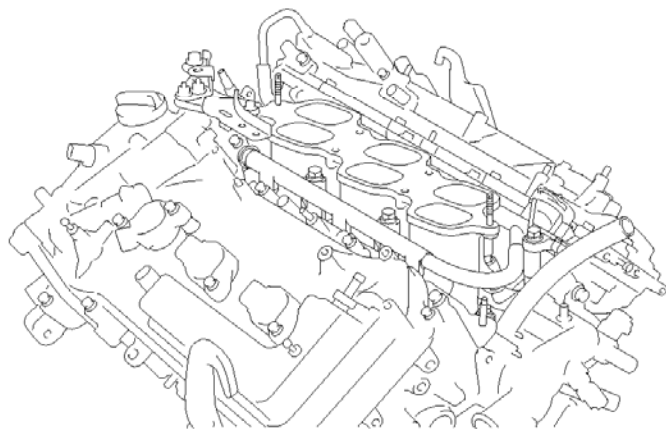
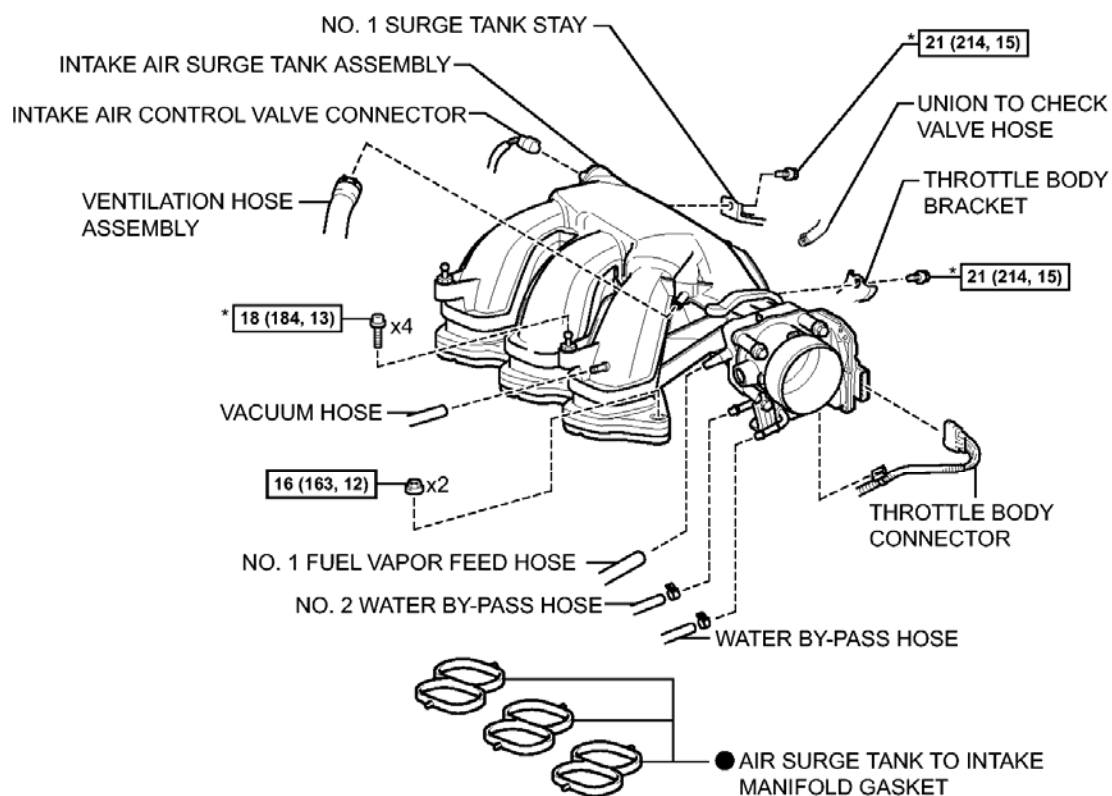
ENGINE

Exhaust System [2GR-FE] (Service Information) - Sienna

INTAKE MANIFOLD

COMPONENTS

ILLUSTRATION



[N*m (kgf*cm, ft.*lbf)]: Specified torque ● Non-reusable part * DO NOT apply oil

Fig. 1: Intake Manifold Replacement Components With Torque Specifications (1 of 2)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ILLUSTRATION

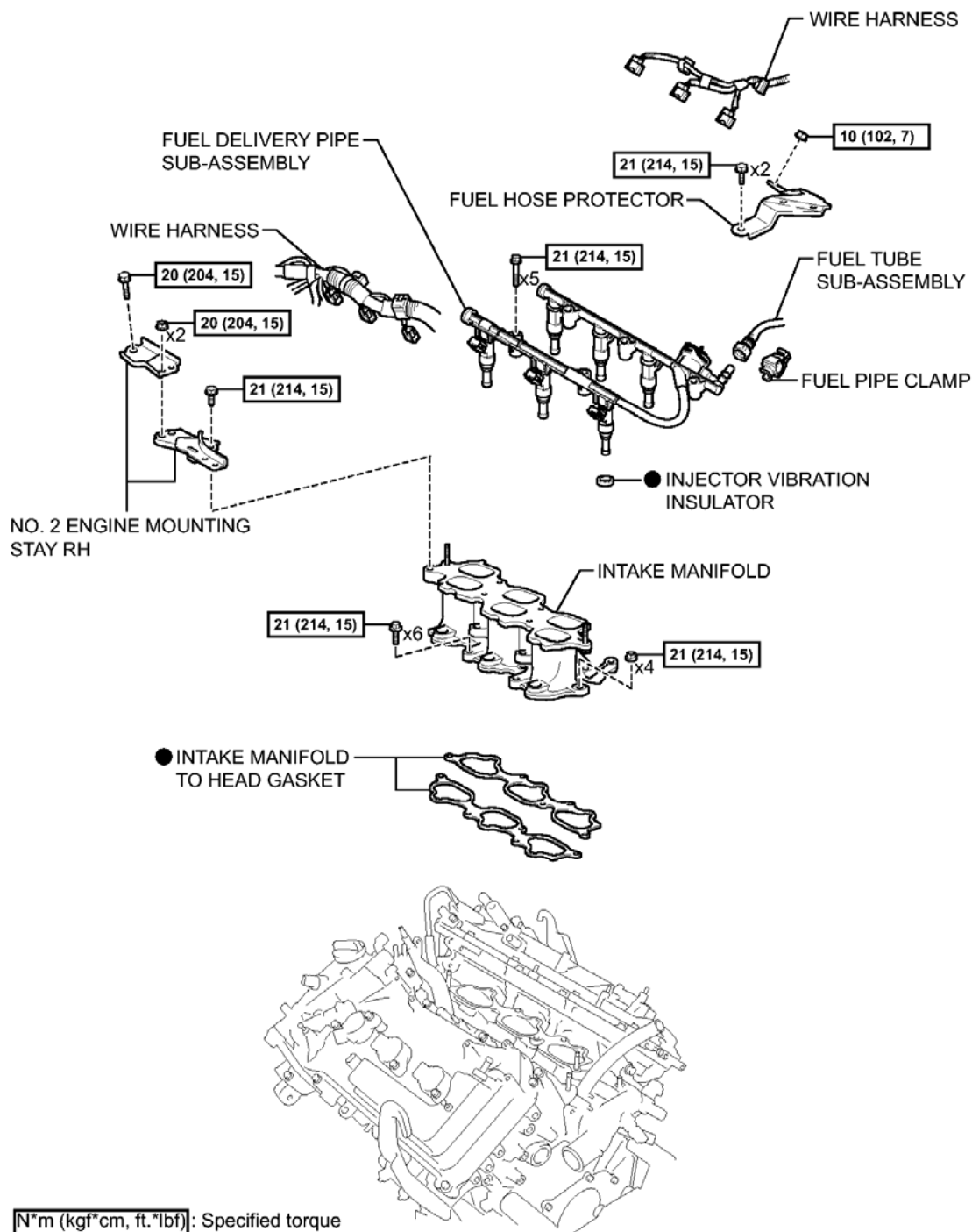


Fig. 2: Intake Manifold Replacement Components With Torque Specifications (2 of 2)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

REMOVAL

1. DISCHARGE FUEL SYSTEM PRESSURE

Refer to **PRECAUTION**

2. REMOVE AIR CLEANER AND HOSE

Refer to **REMOVAL**

3. REMOVE WATER BY-PASS HOSE . Refer to **REMOVAL - Step 8**

4. REMOVE NO. 2 WATER BY-PASS HOSE . Refer to **REMOVAL - Step 9**

5. REMOVE INTAKE AIR SURGE TANK ASSEMBLY

- a. Disconnect the union to check valve hose.

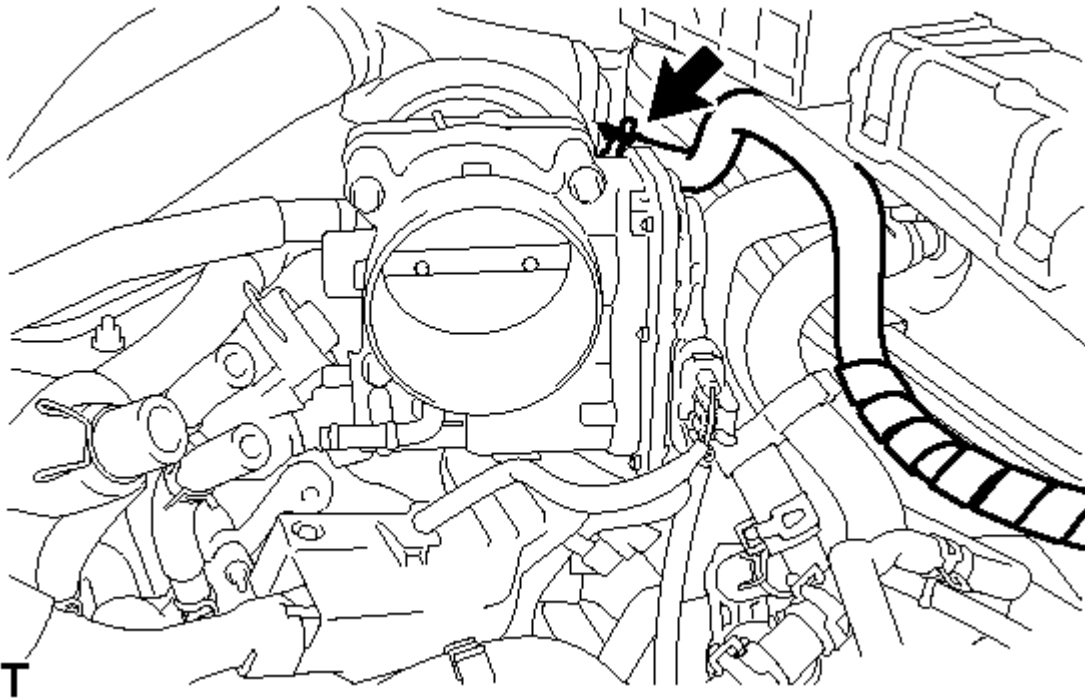
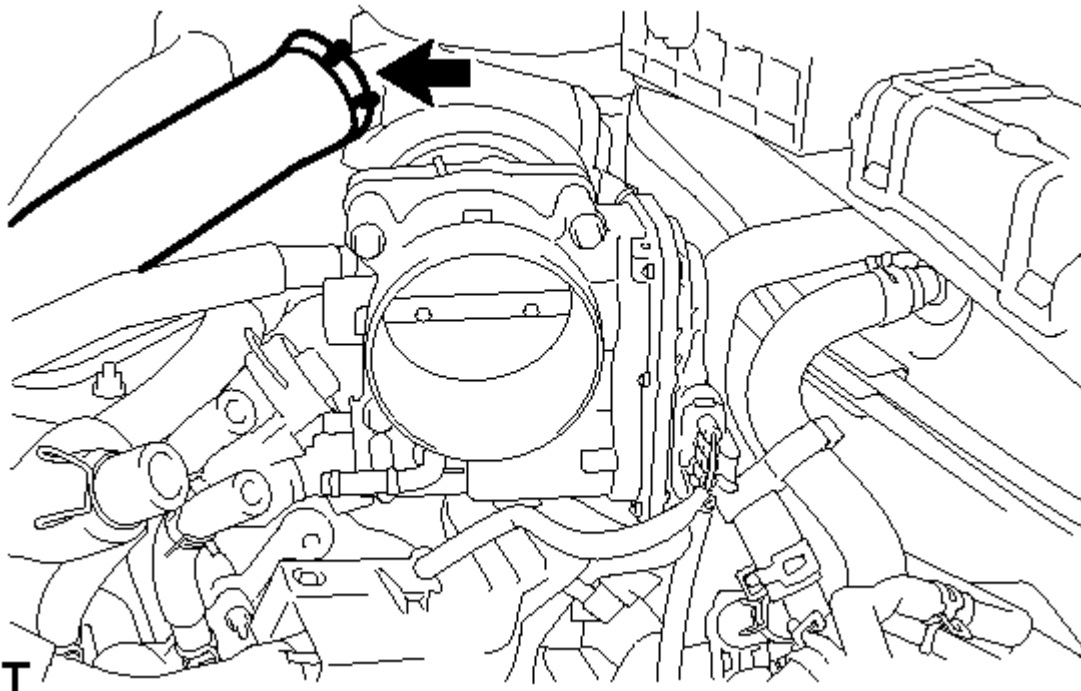


Fig. 3: Identifying Intake Air Surge Tank Assembly Check Valve Hose & Clip
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

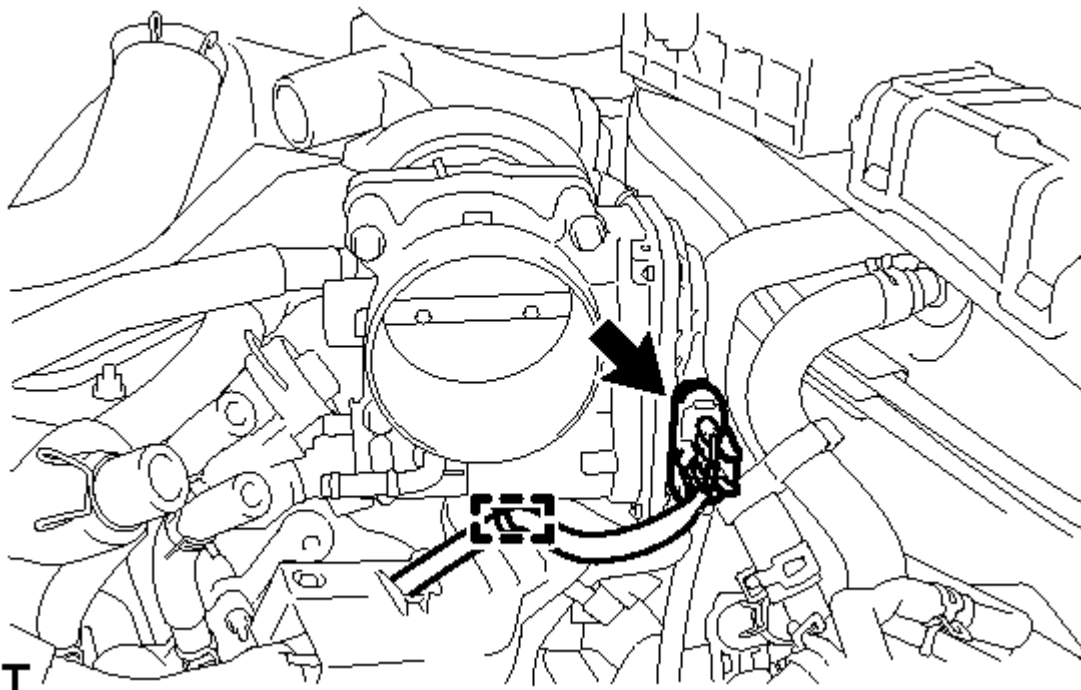
- b. Loosen the clip and disconnect the ventilation hose assembly.



T

Fig. 4: Identifying Ventilation Hose Assembly & Clip
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Disconnect the throttle body connector and wire harness clamp.



T

Fig. 5: Identifying Throttle Body Connector & Wire Harness Clamp
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Disconnect the No. 1 fuel vapor feed hose.

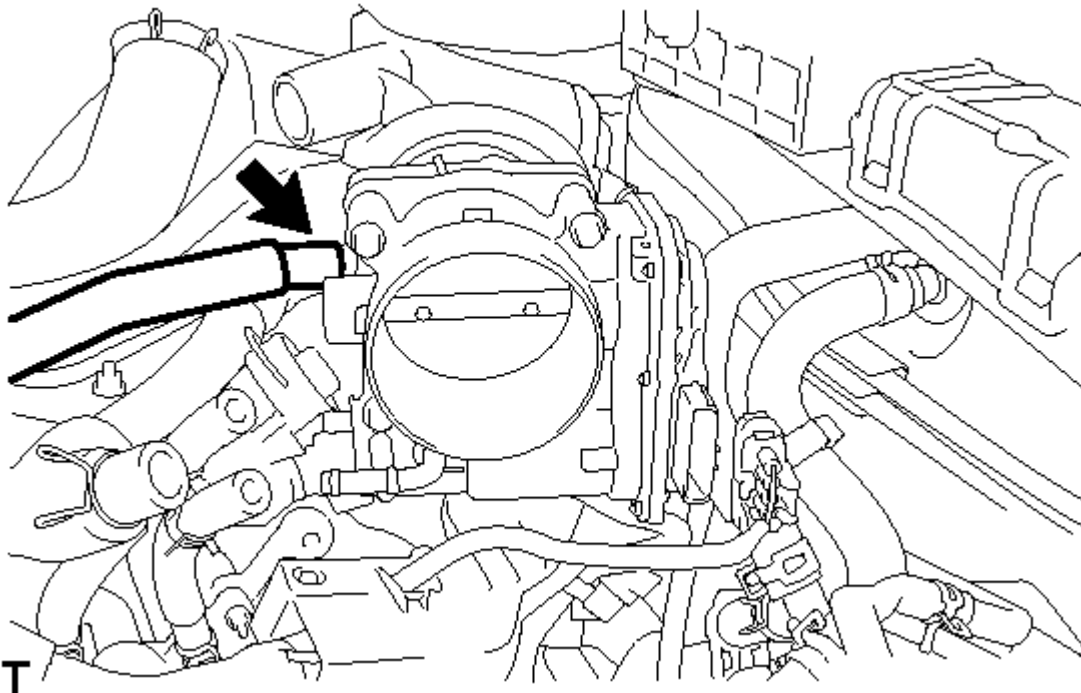


Fig. 6: Identifying No. 1 Fuel Vapor Feed Hose
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- e. Disconnect the vacuum hose and the hose clamp.

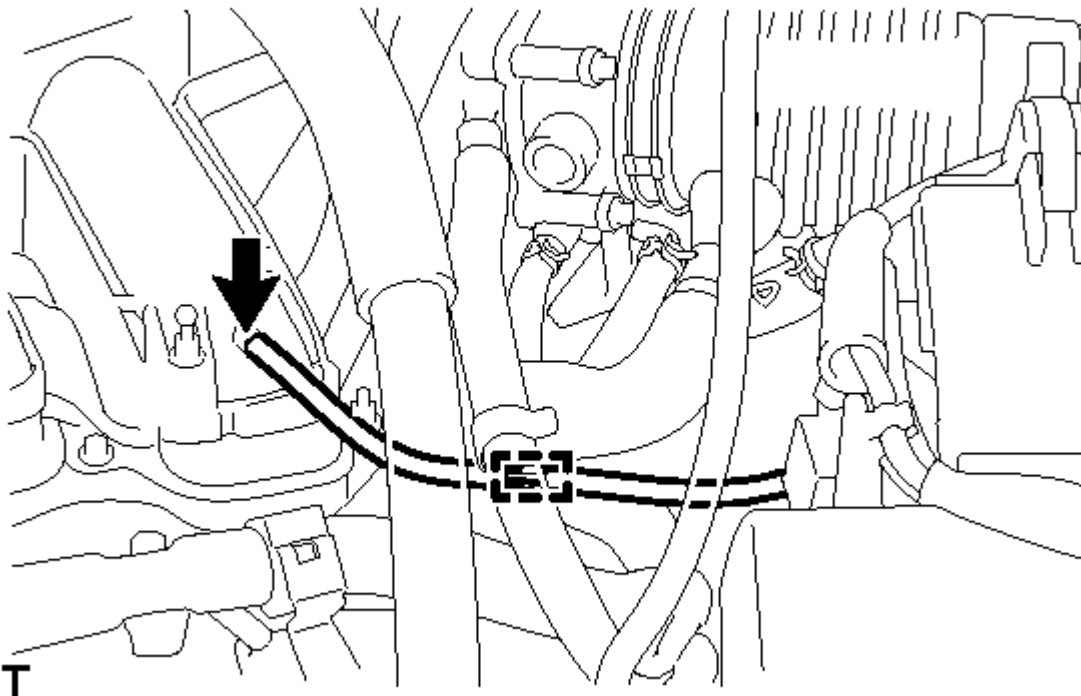


Fig. 7: Identifying Vacuum Hose & Clamp
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- f. Disconnect the intake air control valve connector.

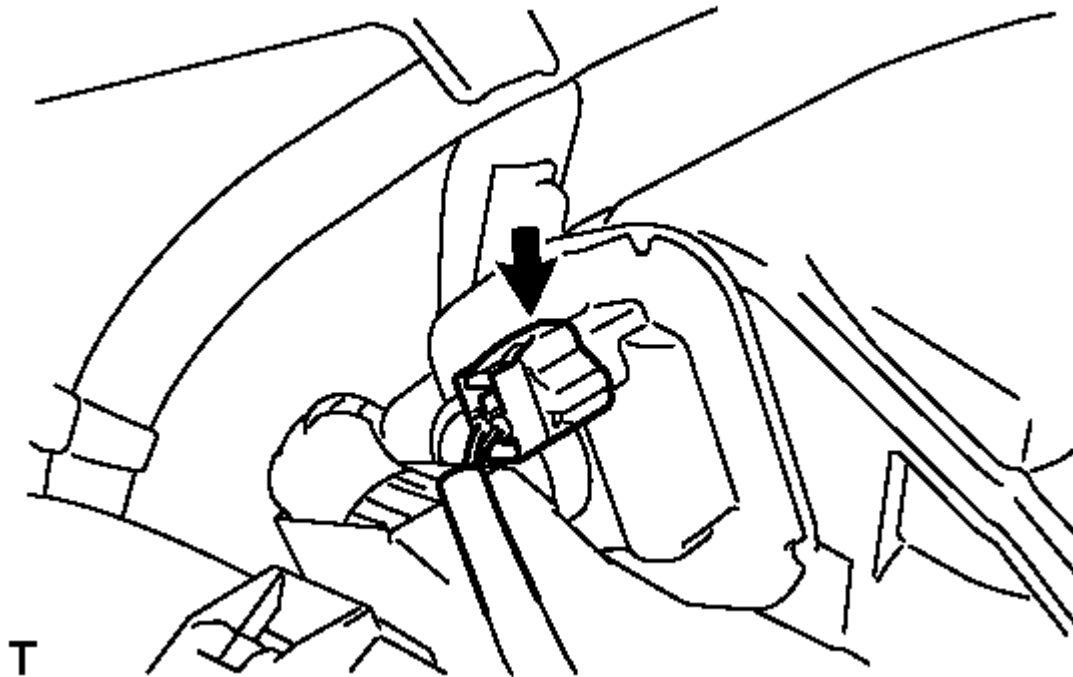
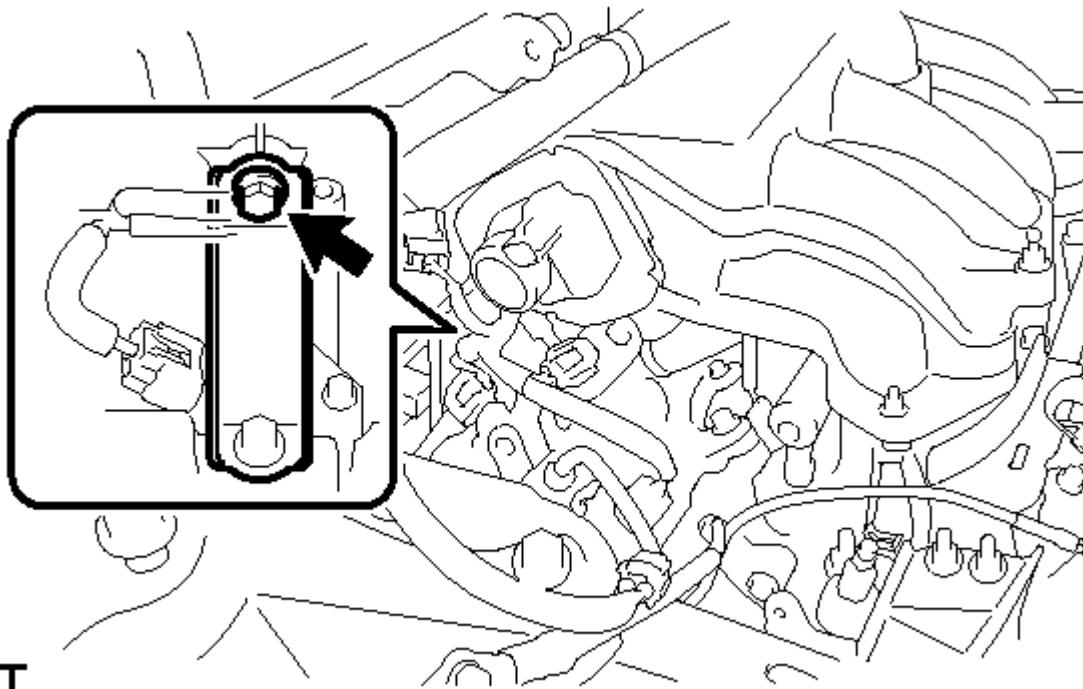


Fig. 8: Identifying Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

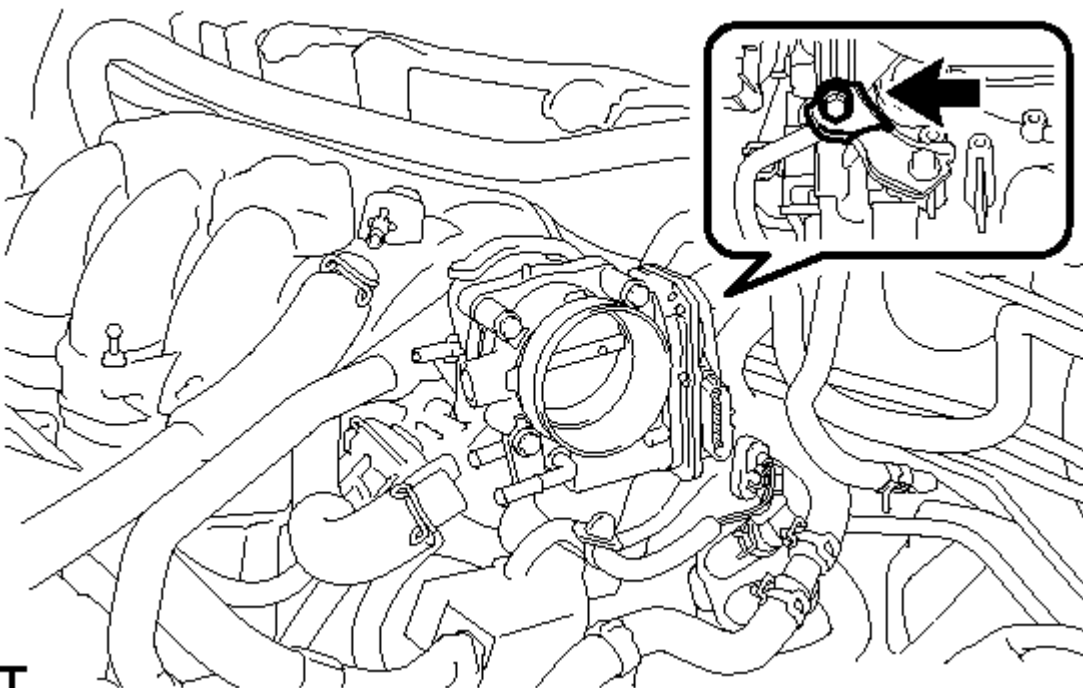
- g. Remove the bolt and separate the No. 1 surge tank stay from the intake air surge tank assembly.



T

Fig. 9: Identifying No. 1 Surge Tank Stay & Fastener
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- h. Remove the bolt and separate the throttle body bracket from the intake air surge tank assembly.



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Fig. 10: Identifying Throttle Body Bracket & Fastener
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- i. Remove the 2 nuts.

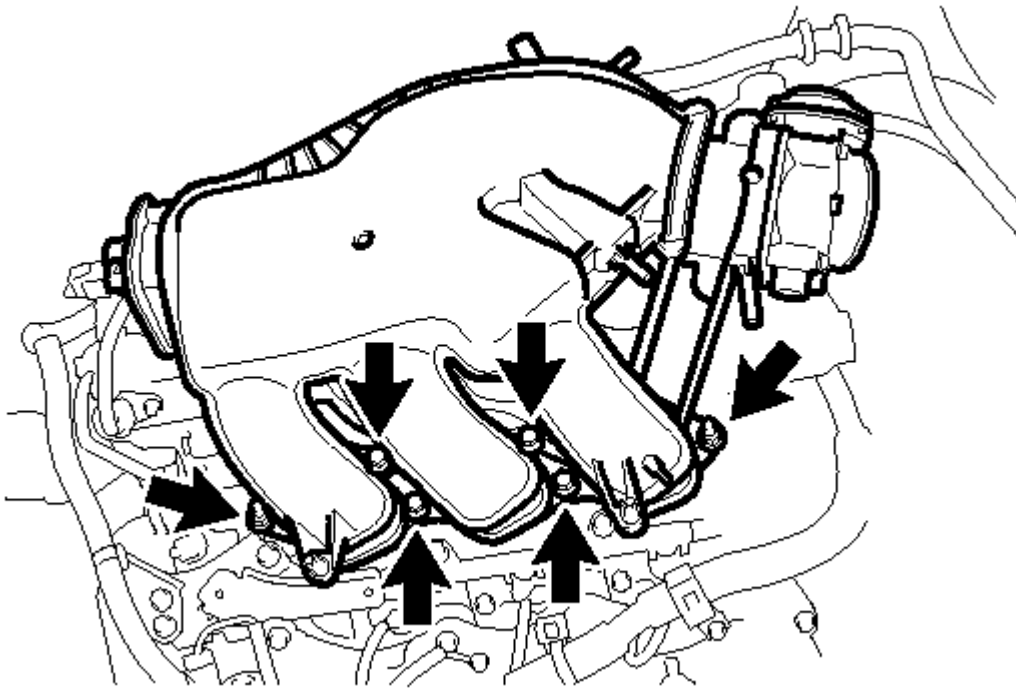
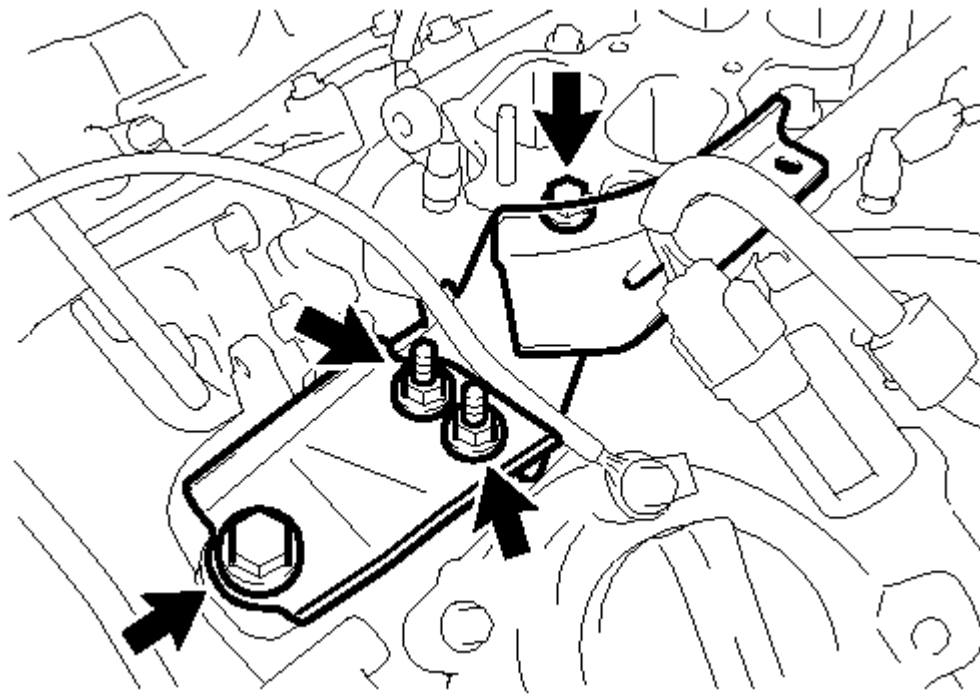


Fig. 11: Identifying Throttle Body & Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- j. Using a 5 mm socket hexagon wrench, remove the 4 bolts.
 - k. Remove the intake air surge tank assembly and 3 air surge tank to intake manifold gaskets.
6. **REMOVE FUEL HOSE PROTECTOR** . Refer to **REMOVAL - Step 5**
7. **REMOVE NO. 2 ENGINE MOUNTING STAY RH**
- a. Remove the 2 nuts, 2 bolts and the No. 2 engine mounting stay RH.



T

Fig. 12: Identifying No. 2 Engine Mounting Stay RH & Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

8. **DISCONNECT FUEL TUBE SUB-ASSEMBLY** . Refer to **REMOVAL - Step 6**
9. **REMOVE FUEL DELIVERY PIPE SUB-ASSEMBLY** . Refer to **REMOVAL - Step 7**
10. **REMOVE INTAKE MANIFOLD**
 - a. Remove the 6 bolts, 4 nuts and the intake manifold.

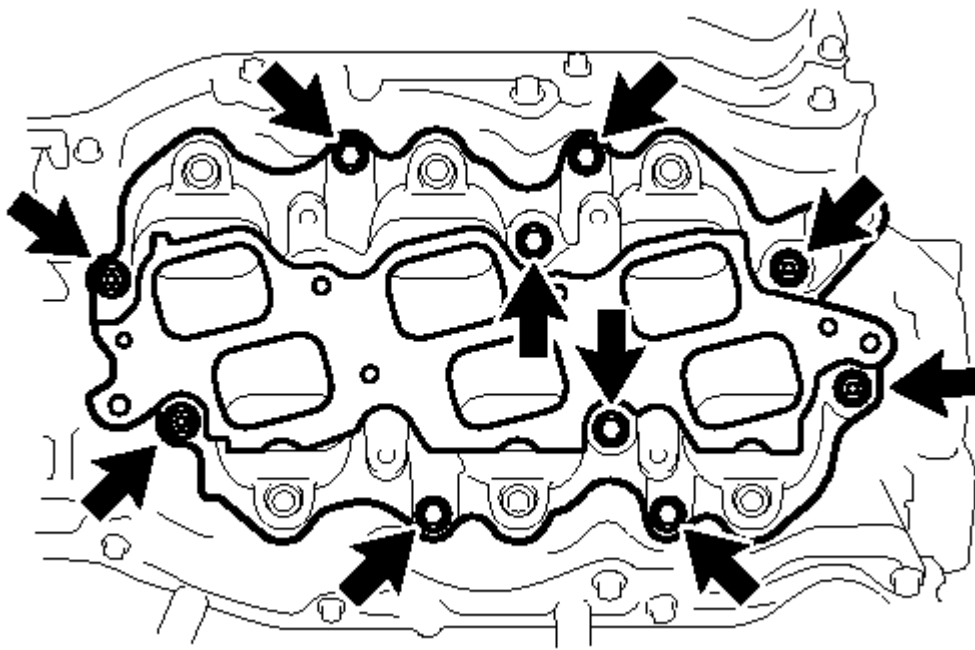


Fig. 13: Identifying Intake Manifold & Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the 2 intake manifold to head gaskets.

INSTALLATION

INSTALLATION

1. INSTALL INTAKE MANIFOLD

- a. Set a new gasket on each cylinder head.

NOTE:

- Align the port holes of the gaskets and cylinder head.
- Make sure that the gaskets are installed in the correct direction.

- b. Set the intake manifold on the cylinder head.
- c. Tighten the 6 bolts and 4 nuts uniformly in several steps.

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

HINT:

Tighten the inner installation bolts of the intake manifold before tightening the outer bolts.

2. **INSTALL FUEL DELIVERY PIPE SUB-ASSEMBLY** . Refer to **INSTALLATION - Step 2**
3. **CONNECT FUEL TUBE SUB-ASSEMBLY** . Refer to **INSTALLATION - Step 3**

4. **INSTALL NO. 2 ENGINE MOUNTING STAY RH**

- a. Install the No. 2 engine mounting stay RH with the 2 nuts and 2 bolts.

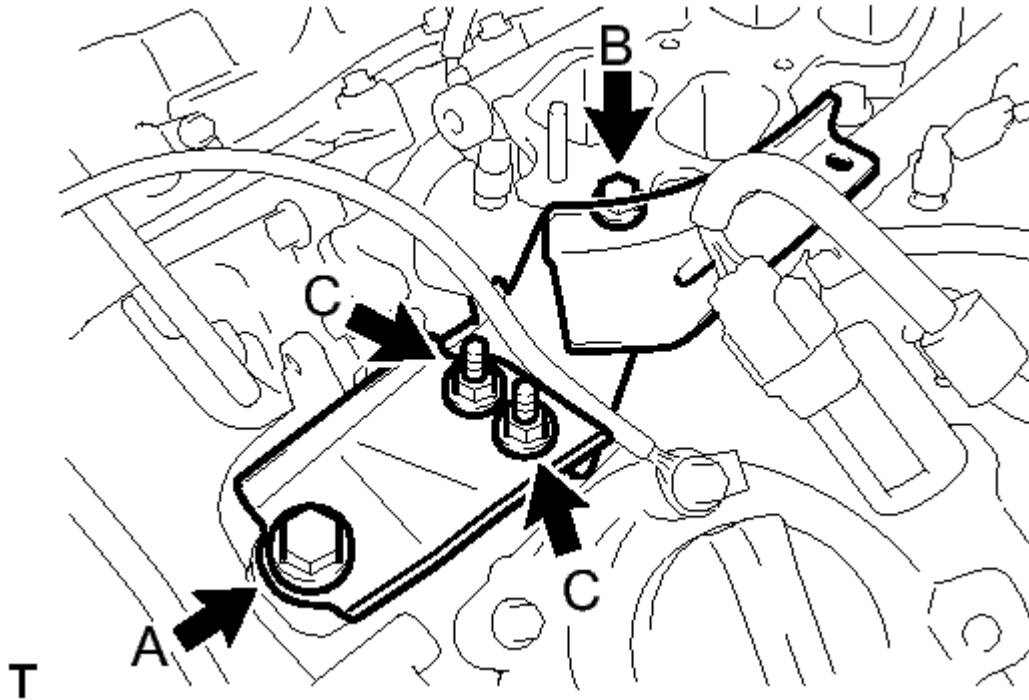


Fig. 14: Installing No. 2 Engine Mounting Stay RH & Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Bolt A

Torque: 20 N*m (204 kgf*cm, 15 ft.*lbf)

Bolt B

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

Nut C

Torque: 20 N*m (204 kgf*cm, 15 ft.*lbf)

5. **INSTALL FUEL HOSE PROTECTOR** . Refer to **INSTALLATION - Step 4**

6. **INSTALL INTAKE AIR SURGE TANK ASSEMBLY**

NOTE: **DO NOT** apply oil to the bolts listed below.

Tightening Part
Surge Tank

and Intake Manifold

No. 1 Surge Tank Stay and Surge Tank

Throttle Body Bracket and Surge Tank
--

- a. Install 3 new air surge tank to intake manifold gaskets to the intake air surge tank assembly.
- b. Using a 5 mm socket hexagon wrench, temporarily tighten the 4 bolts to the intake air surge tank assembly.

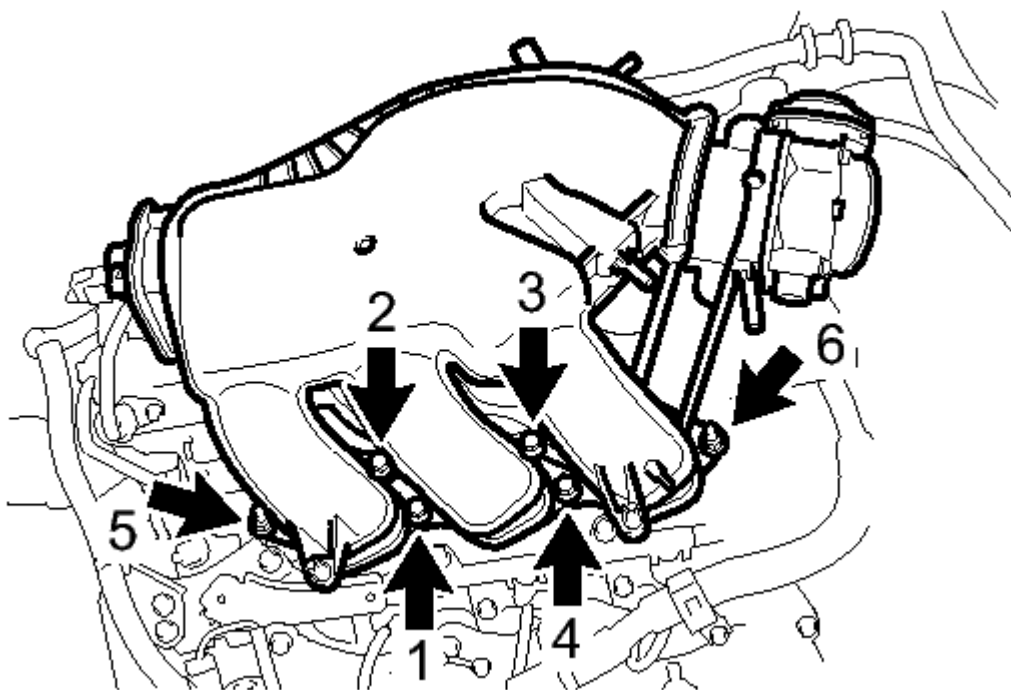


Fig. 15: Installing Intake Manifold & Fasteners

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Temporarily tighten the 2 nuts to the intake air surge tank assembly.
- d. Tighten the 4 bolts and 2 nuts in the order shown in the illustration.

Bolt

Torque: 18 N*m (184 kgf*cm, 13 ft.*lbf)

Nut

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

- e. Install the throttle body bracket to the intake air surge tank assembly with the bolt.

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

- f. Install the No. 1 surge tank stay to the intake air surge tank assembly with the bolt.

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

- g. Connect the intake air control valve connector.
- h. Connect the vacuum hose and the hose clamp.
- i. Connect the No. 1 fuel vapor feed hose.
- j. Connect the throttle body connector and wire harness clamp to the throttle with motor body assembly.
- k. Connect the ventilation hose assembly with the clip.

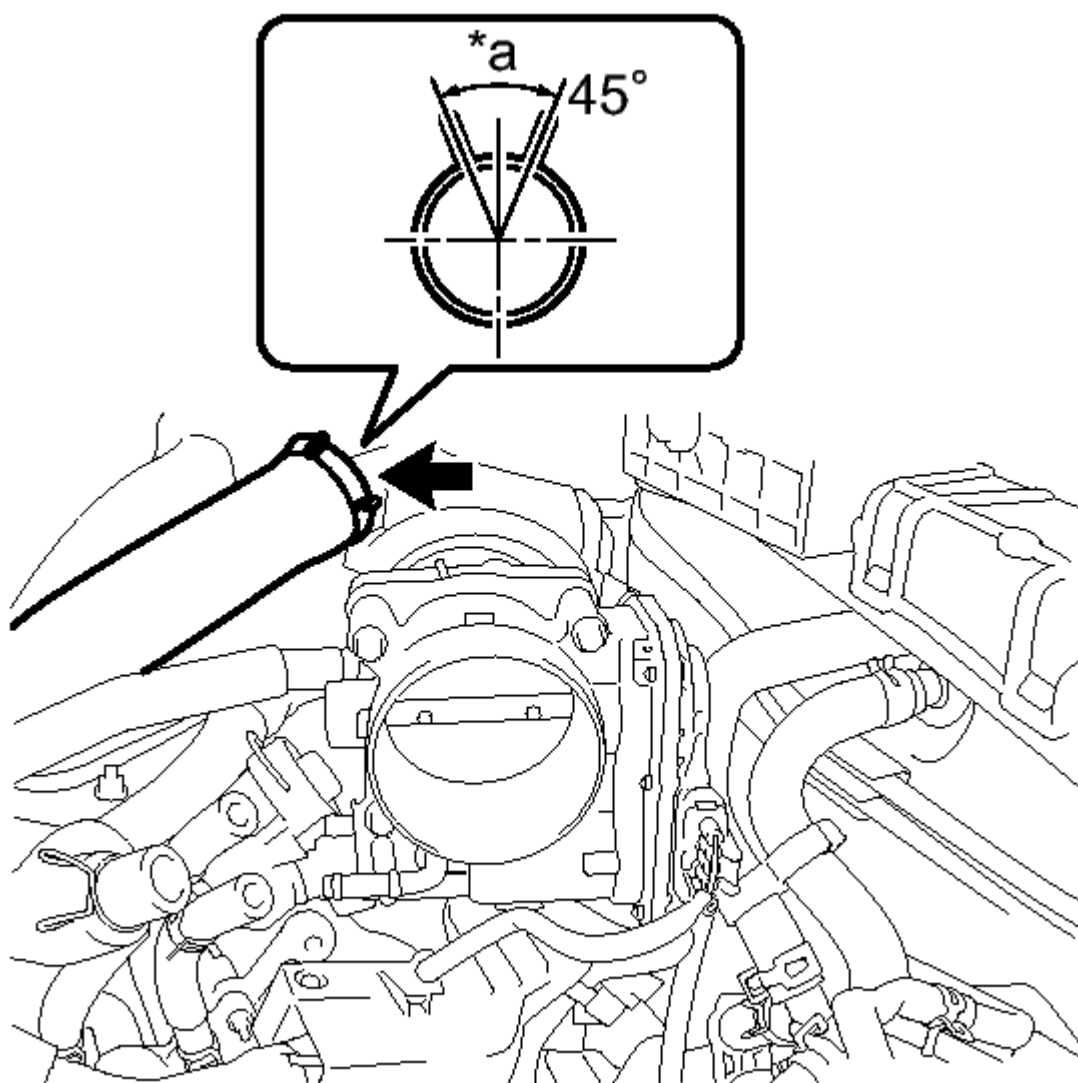


Fig. 16: Identifying Ventilation Hose/Clip Position
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*a Top

HINT:

Connect the hose so that the direction of the hose clip is as indicated in the illustration.

1. Connect the union to check valve hose.
7. **INSTALL WATER BY-PASS HOSE** . Refer to **INSTALLATION - Step 3**
8. **INSTALL NO. 2 WATER BY-PASS HOSE** . Refer to **INSTALLATION - Step 2**
9. **ADD ENGINE COOLANT** . Refer to **REPLACEMENT - Step 4**
10. **INSPECT FOR COOLANT LEAK** . Refer to **ON-VEHICLE INSPECTION - Step 1**

11. INSPECT FOR FUEL LEAK

- a. Check that there are no fuel leaks from the fuel system after doing any maintenance or repairs.
Refer to **ON-VEHICLE INSPECTION - Step 1** .

12. INSTALL AIR CLEANER AND HOSE

Refer to **INSTALLATION**

INTAKE AIR CONTROL VALVE

ON-VEHICLE INSPECTION

ON-VEHICLE INSPECTION

1. INSPECT INTAKE AIR SURGE TANK ASSEMBLY

- a. Perform the following inspection procedure when using the Techstream:
 1. Stop the engine.
 2. Remove the V-bank cover sub-assembly. Refer to **REMOVAL - Step 24** .
 3. Connect the Techstream to the DLC3.
 4. Start the engine and turn the Techstream on.
 5. Enter the following menus: Powertrain / Engine / Active Test / Active the VSV for Intake Control.
 6. Make sure that a clicking sound is heard from the intake air control valve when current flows.

If the intake air control valve does not operate, check the ACIS control circuit. Refer to **ACIS Control Circuit** .

7. Install the V-bank cover sub-assembly. Refer to **INSTALLATION - Step 95** .
- b. Perform the following inspection procedure when applying voltage between the terminals:
 1. Remove the V-bank cover sub-assembly. Refer to **REMOVAL - Step 24** .
 2. Disconnect the intake air control valve connector.

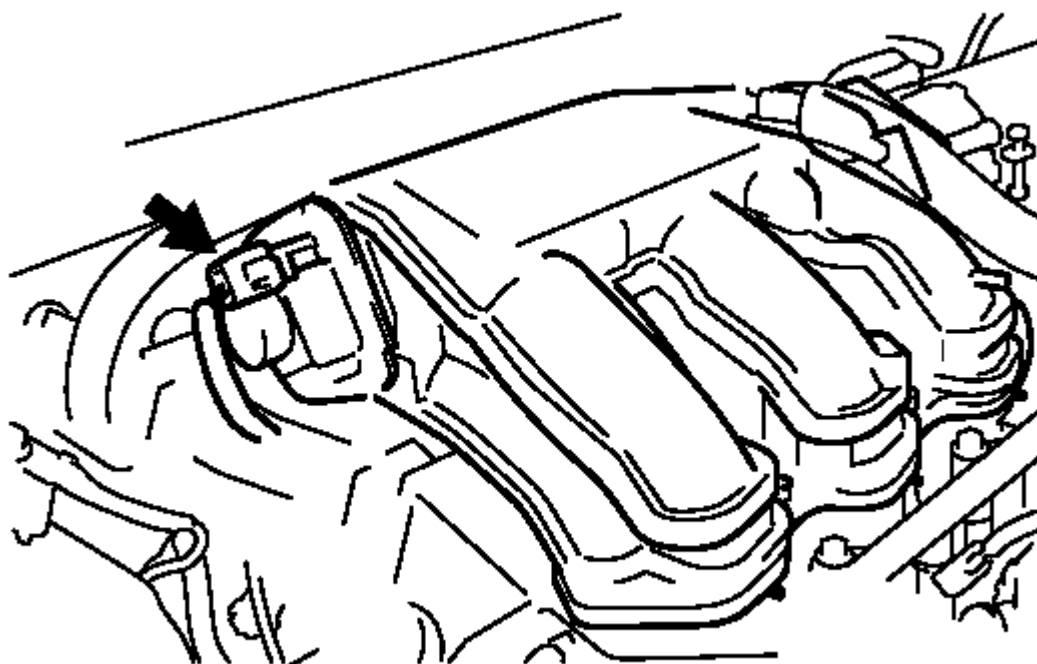
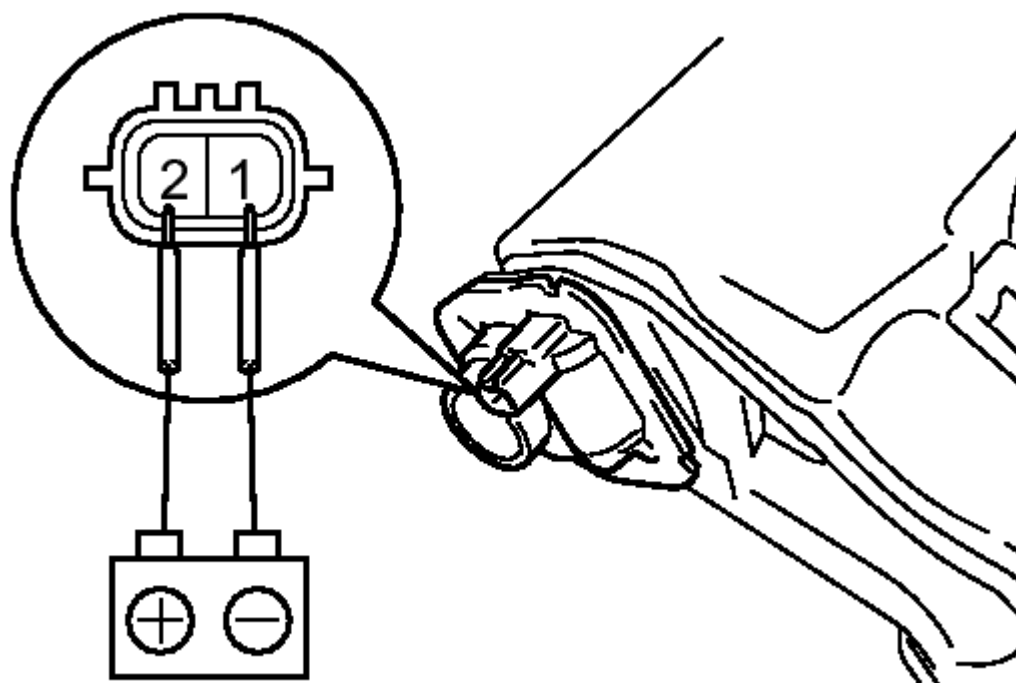


Fig. 17: Identifying Intake Air Control Valve
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. Apply battery voltage between terminals 2 (+) and 1 (-) of the intake air control valve. Check that a clicking sound is heard from the intake air control valve.

If the operation is not as specified, replace the intake air surge tank assembly.



Y

Fig. 18: Applying Battery Voltage Between Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. Install the V-bank cover sub-assembly. Refer to **INSTALLATION - Step 95** .

2. INSPECT AIR CLEANER AND HOSE

a. Inspect actuator operation.

1. Remove the air cleaner inlet cover assembly seal. Refer to **REMOVAL - Step 6** .
2. With 27 kPa (203 mmHg, 7.97 in. Hg) of vacuum applied to the actuator, check that the actuator rod moves.

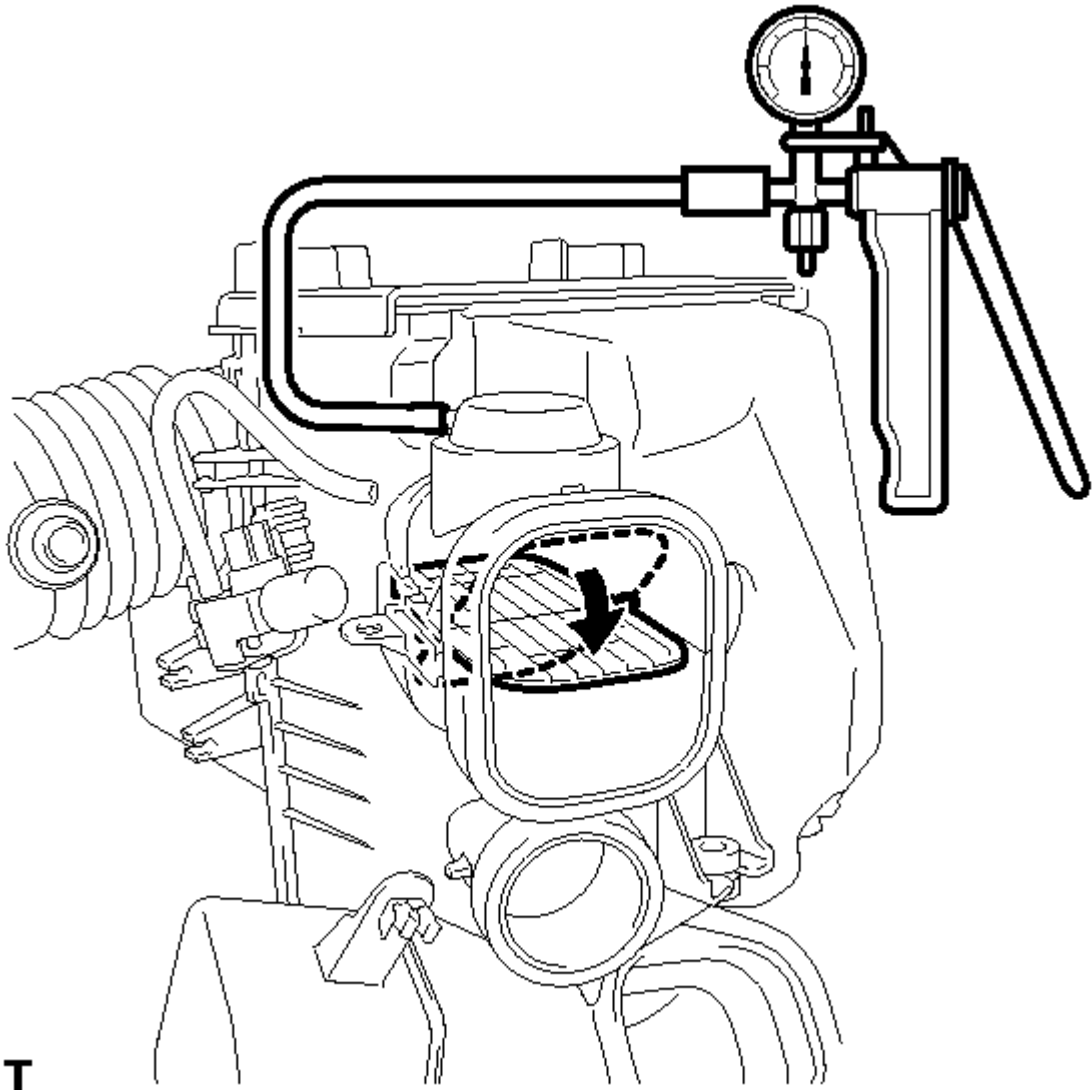


Fig. 19: Inspecting Air Cleaner & Hose Operation
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. One minute after applying the vacuum, check that the actuator rod does not return.

If the operation is not as specified, replace the air cleaner assembly.

4. Install the air cleaner inlet cover assembly seal. Refer to **INSTALLATION - Step 5** .

VACUUM TANK

ON-VEHICLE INSPECTION

ON-VEHICLE INSPECTION

1. INSPECT VACUUM SURGE TANK

- a. Check that air flows from port B to port A.

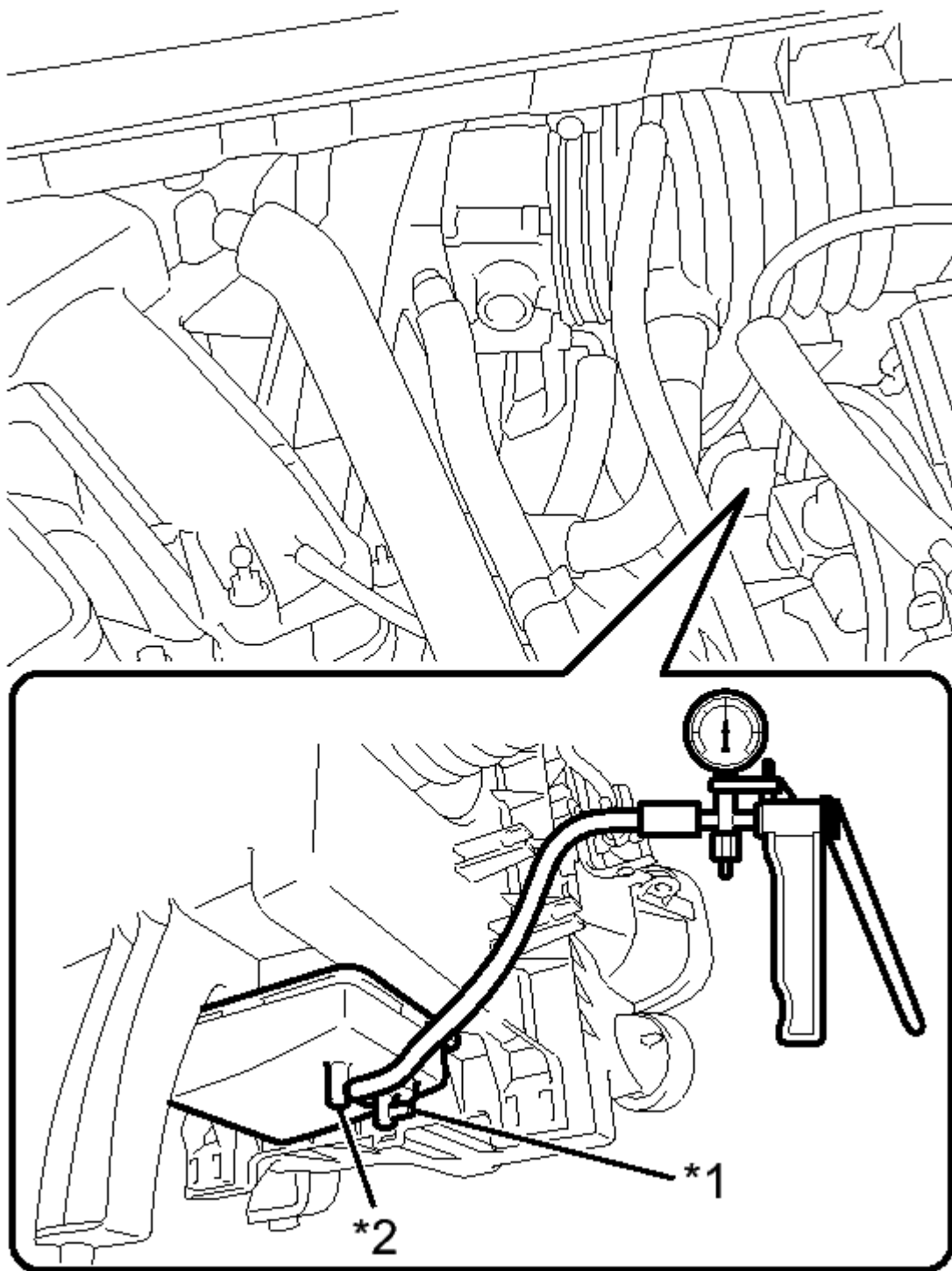


Fig. 20: Inspecting Vacuum Surge Tank Air Flow
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

Port

*1	A
*2	Port B

- b. Apply 60 kPa (450 mmHg, 17.7 in. Hg) of vacuum to port B. Check that there is no change in vacuum after one minute.

If the operation is not as specified, replace the air cleaner assembly.

VACUUM SWITCHING VALVE

ON-VEHICLE INSPECTION

ON-VEHICLE INSPECTION

1. INSPECT VACUUM SWITCHING VALVE

- a. Measure the resistance according to the value(s) in the table below.

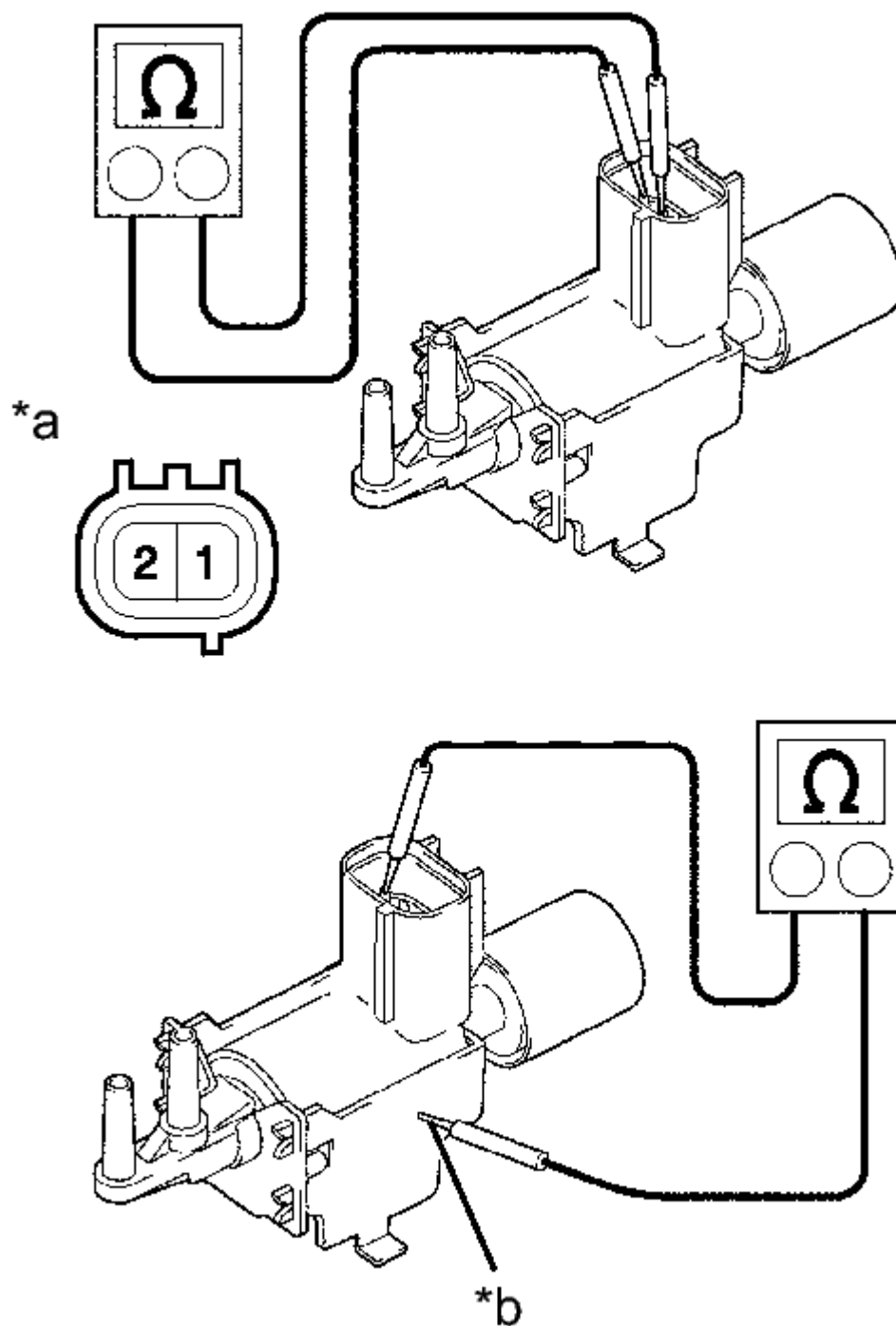


Fig. 21: Measuring Vacuum Switching Valve Resistance
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

Component

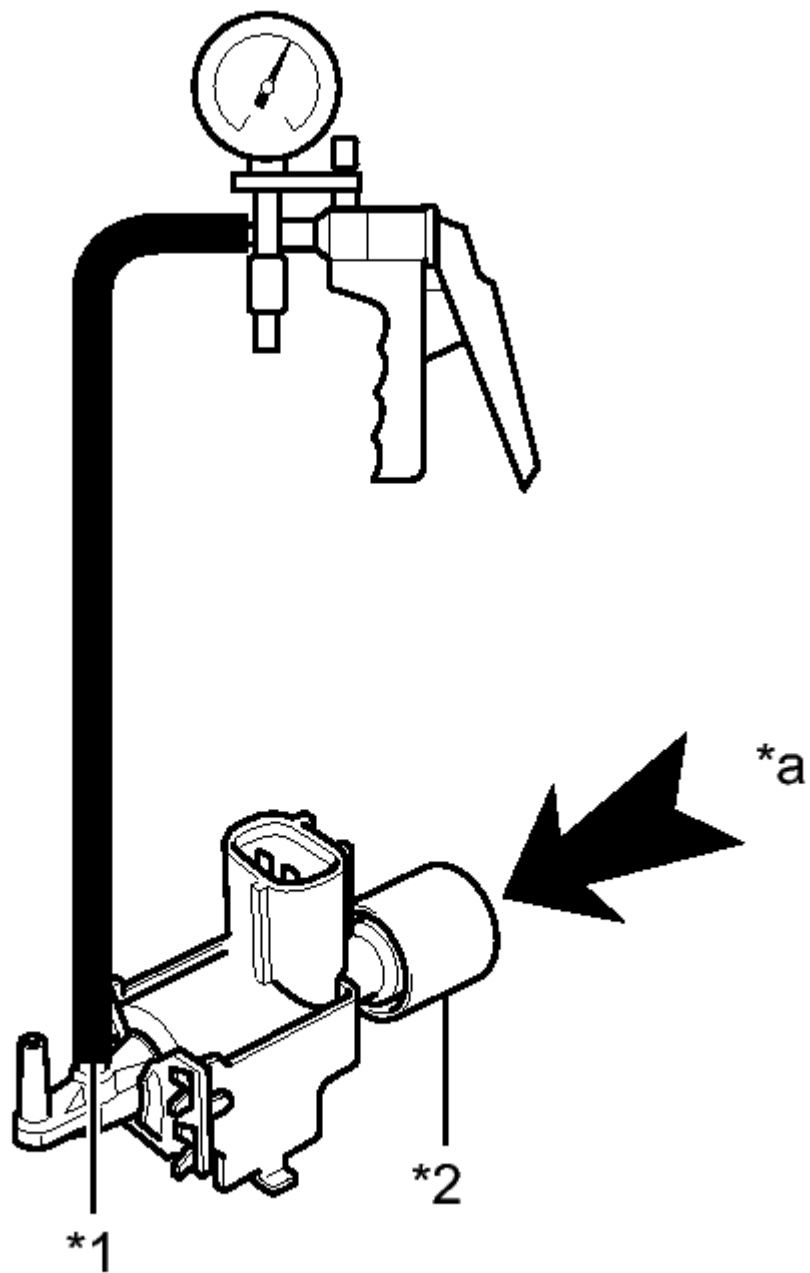
*a	without harness connected (Vacuum Switching Valve)
*b	Body Ground

Standard Resistance

Tester Connection	Condition	Specified Condition
1 - 2	20°C (68° F)	37 to 44 ohms
1 - Body ground	Always	1 Mohms or higher
2 - Body ground		

If the result is not as specified, replace the vacuum switching valve.

- b. Check the vacuum switching valve operation.
 1. When vacuum is applied to port E, check that air is sucked into the filter.



C

Fig. 22: Checking Vacuum Switching Valve Air Flow Operation
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

Port

*1	E
*2	Filter
*a	Air

If the result is not as specified, replace the vacuum switching valve.

2. Apply battery voltage across the terminals. When vacuum is applied to port F, check that air is sucked into port E.

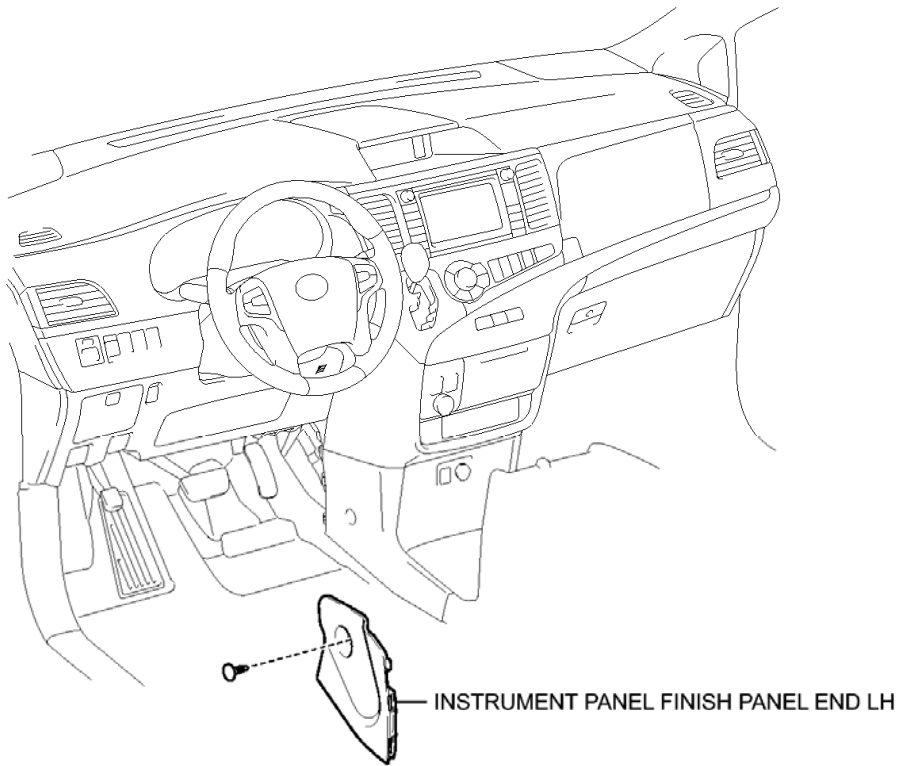
*1	Port E
*2	Port F
*a	Component without harness connected (Vacuum Switching Valve)
*b	Air

If the result is not as specified, replace the vacuum switching valve.

EXHAUST MANIFOLD

COMPONENTS

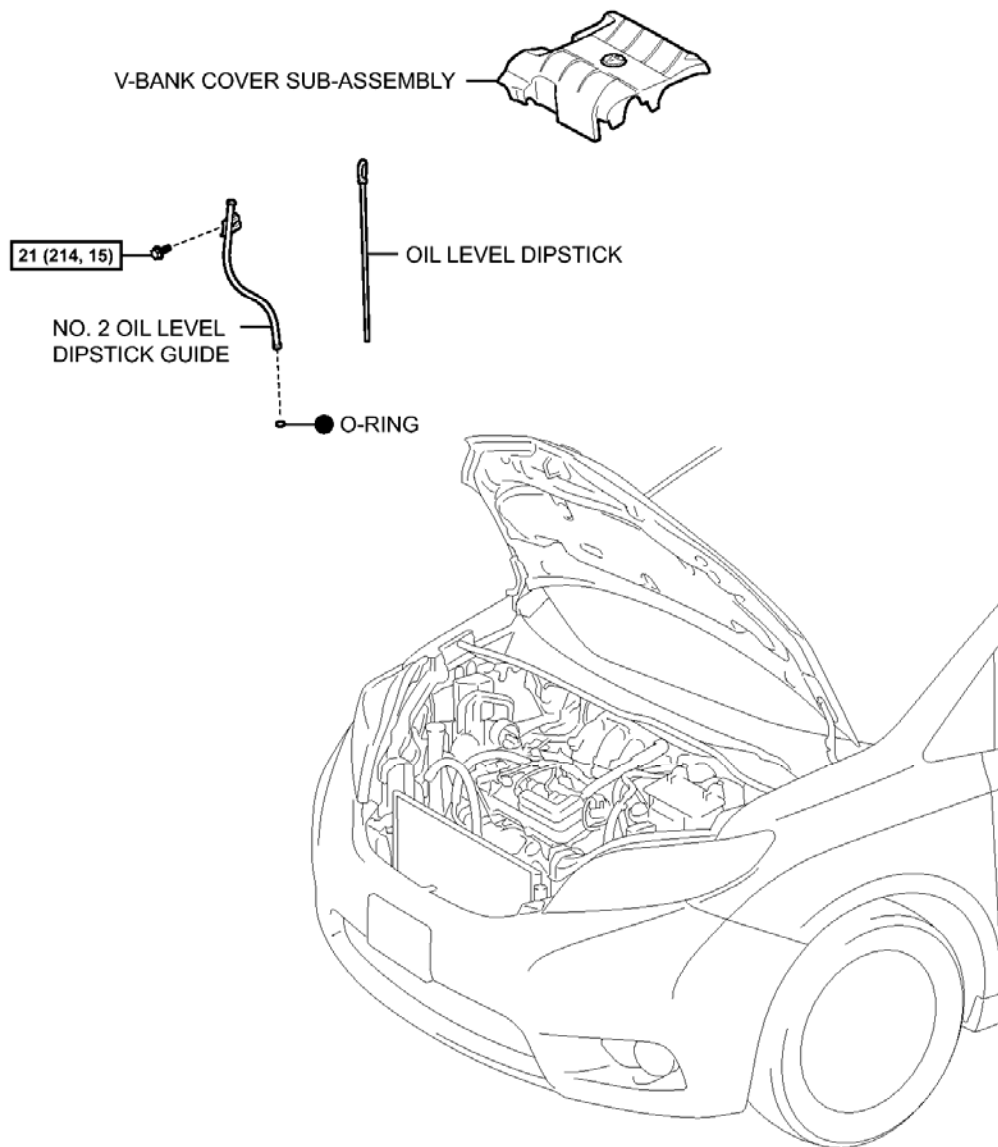
ILLUSTRATION



P

Fig. 24: Exhaust Manifold Replacement Components (1 of 5)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ILLUSTRATION



$\boxed{\text{N}^*\text{m (kgf}^*\text{cm, ft.}^*\text{lbf)}}$: Specified torque

● Non-reusable part

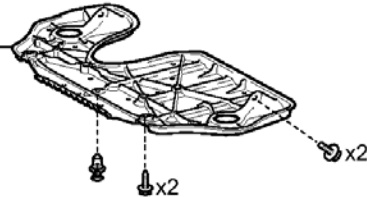
P

Fig. 25: Exhaust Manifold Replacement Components With Torque Specifications (2 of 5)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ILLUSTRATION

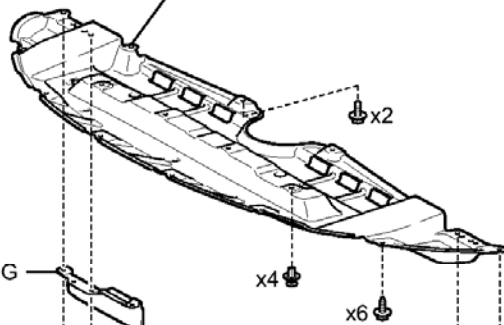
for AWD:

NO. 2 ENGINE UNDER COVER



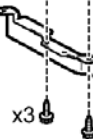
NO. 1 ENGINE UNDER COVER

FRONT WHEEL OPENING
EXTENSION PAD RH



7.0 (71, 62 in.*lbf)

FRONT WHEEL OPENING
EXTENSION PAD LH



7.0 (71, 62 in.*lbf)

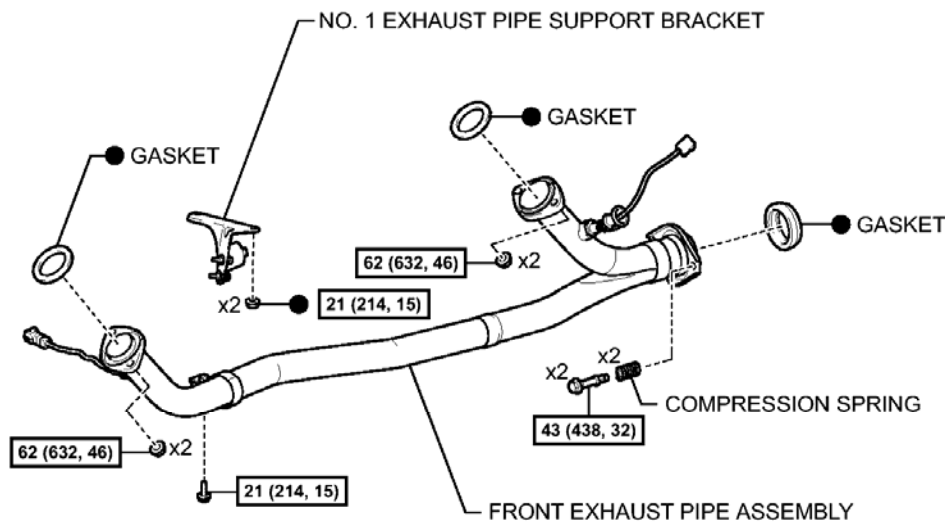
N*m (kgf*cm, ft.*lbf): Specified torque

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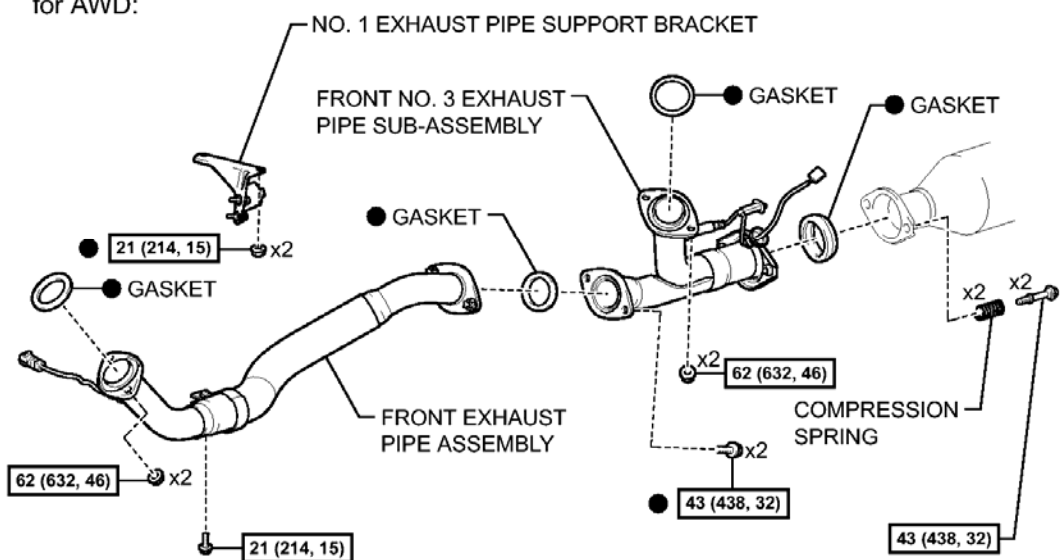
Fig. 26: Exhaust Manifold Replacement Components With Torque Specifications (3 of 5)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ILLUSTRATION

for 2WD:



for AWD:

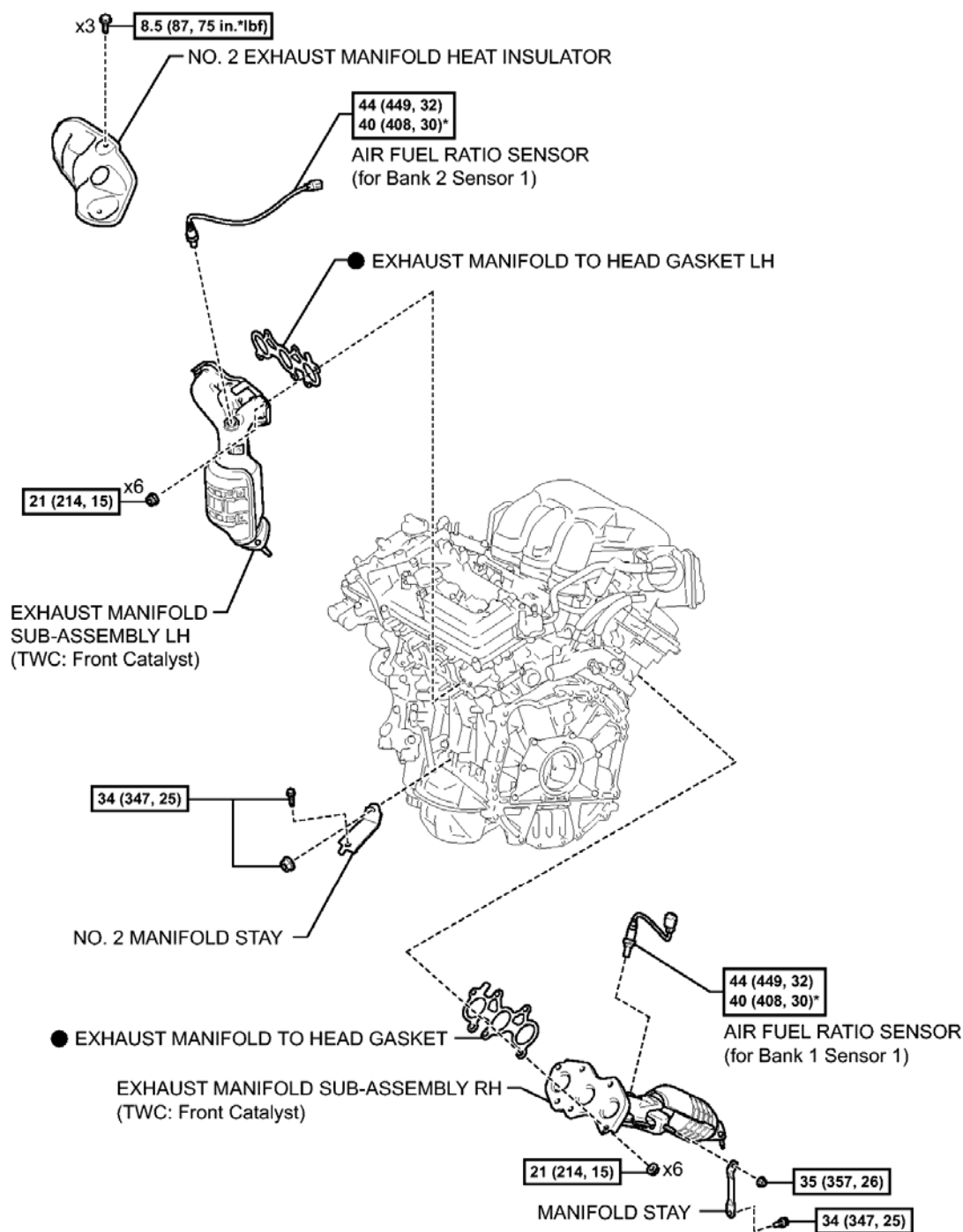


[N*m (kgf*cm, ft.*lbf)]: Specified torque ● Non-reusable part

P

Fig. 27: Exhaust Manifold Replacement Components With Torque Specifications (4 of 5)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ILLUSTRATION



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

* For use with SST

● Non-reusable part

P

Fig. 28: Exhaust Manifold Replacement Components With Torque Specifications (5 of 5)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

REMOVAL

1. REMOVE RADIATOR ASSEMBLY

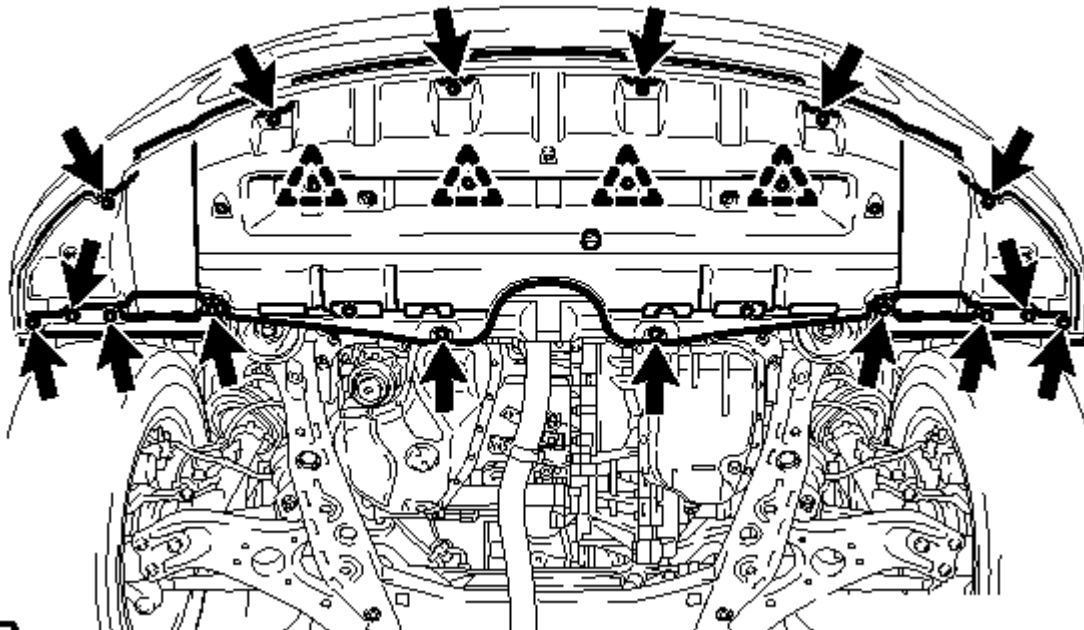
Refer to REMOVAL

2. REMOVE V-BANK COVER SUB-ASSEMBLY . Refer to REMOVAL - Step 24

3. REMOVE INSTRUMENT PANEL FINISH PANEL END LH See step 1

4. REMOVE NO. 1 ENGINE UNDER COVER

- a. Remove the 8 screws, front wheel opening extension pad RH and front wheel opening extension pad LH.



P

Fig. 29: Identifying No. 1 Engine Under Cover & Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the 2 bolts, 6 screws, 4 clips and No. 1 engine under cover.

5. REMOVE NO. 2 ENGINE UNDER COVER (for AWD)

- a. Remove the 2 bolts, 2 screws, clip and No. 2 engine under cover.

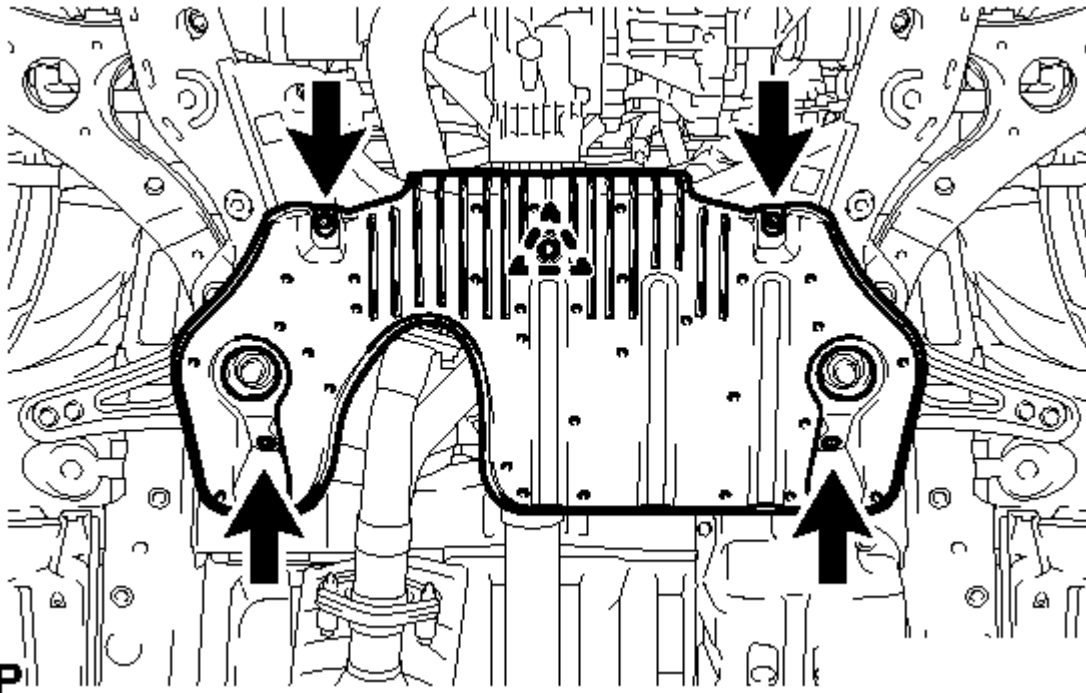


Fig. 30: Identifying No. 2 Engine Under Cover & Fasteners (For AWD)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

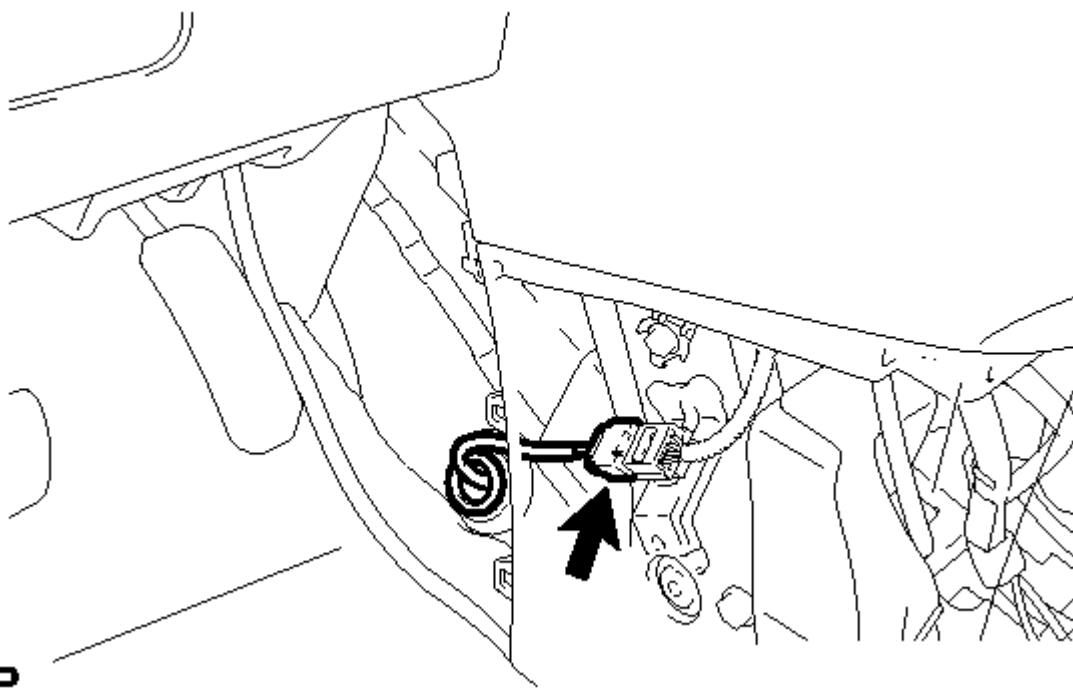
6. REMOVE PROPELLER WITH CENTER BEARING SHAFT ASSEMBLY (for AWD)

Refer to **REMOVAL**

7. REMOVE NO. 1 EXHAUST PIPE SUPPORT BRACKET See step 5

8. REMOVE FRONT EXHAUST PIPE ASSEMBLY (for 2WD)

- a. Disconnect the oxygen sensor (for bank 1 sensor 2) connector and pass the grommet through the floor.

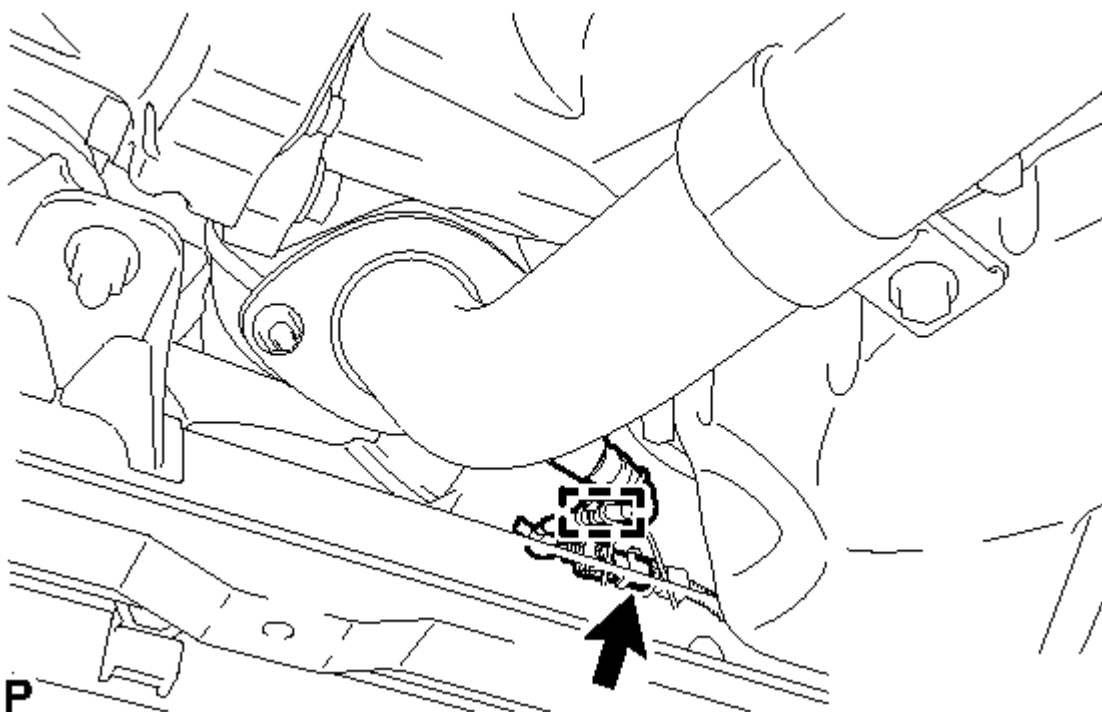


P

Fig. 31: Identifying Oxygen Sensor Connector (For Bank 1 Sensor 2)

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Disconnect the oxygen sensor (for bank 2 sensor 2) connector and disengage the harness clamp.

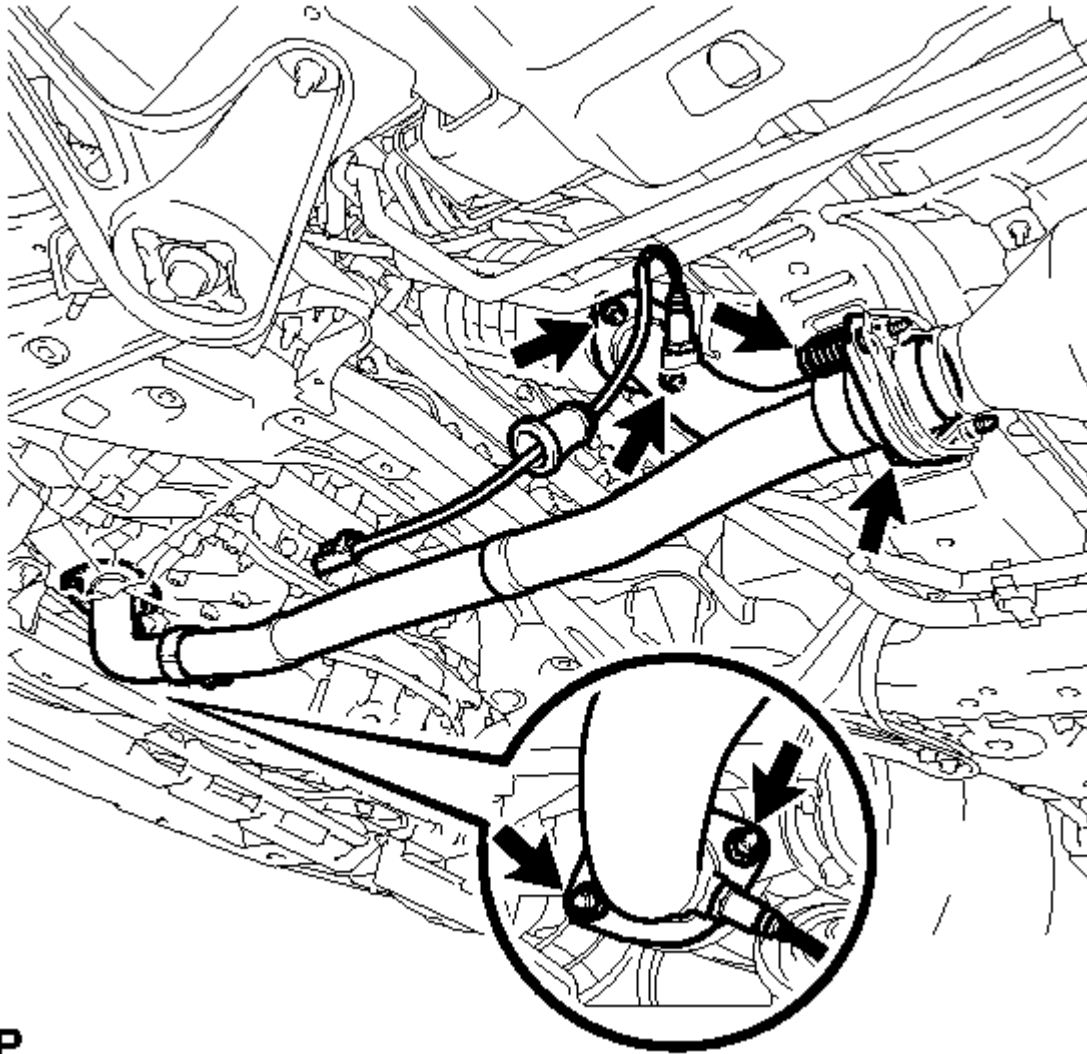


P

Fig. 32: Identifying Oxygen Sensor Connector & Clamp (For Bank 2 Sensor 2)

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

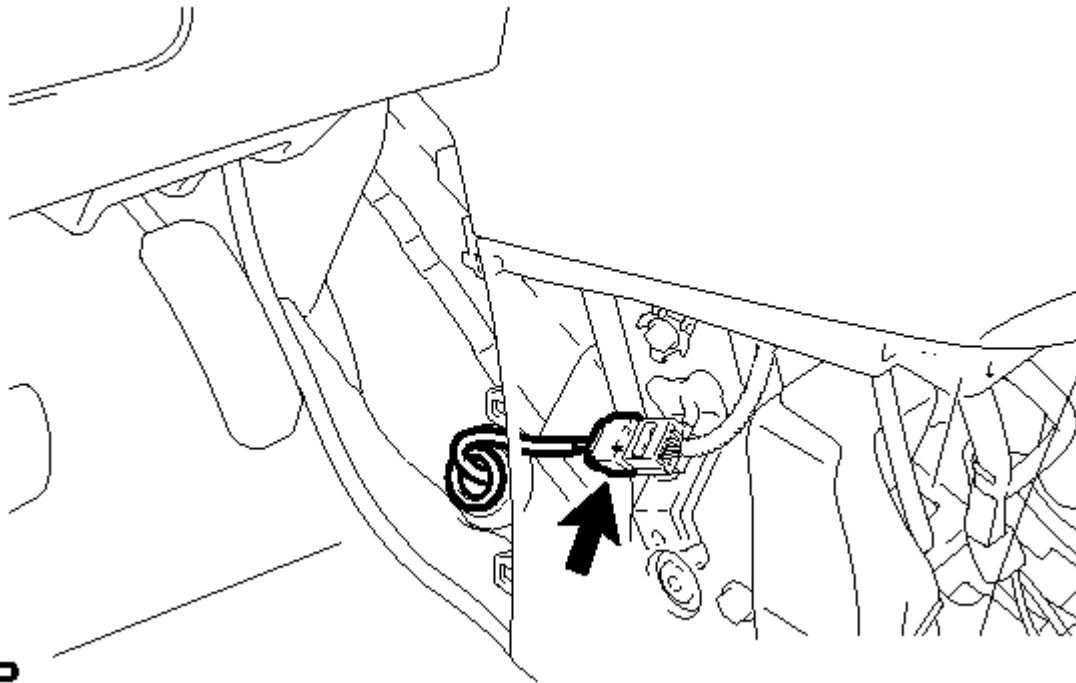
- c. Remove the 4 nuts, 2 bolts, 2 compression springs and front exhaust pipe assembly.



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Fig. 33: Identifying Front Exhaust Pipe Assembly, Compression Springs & Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

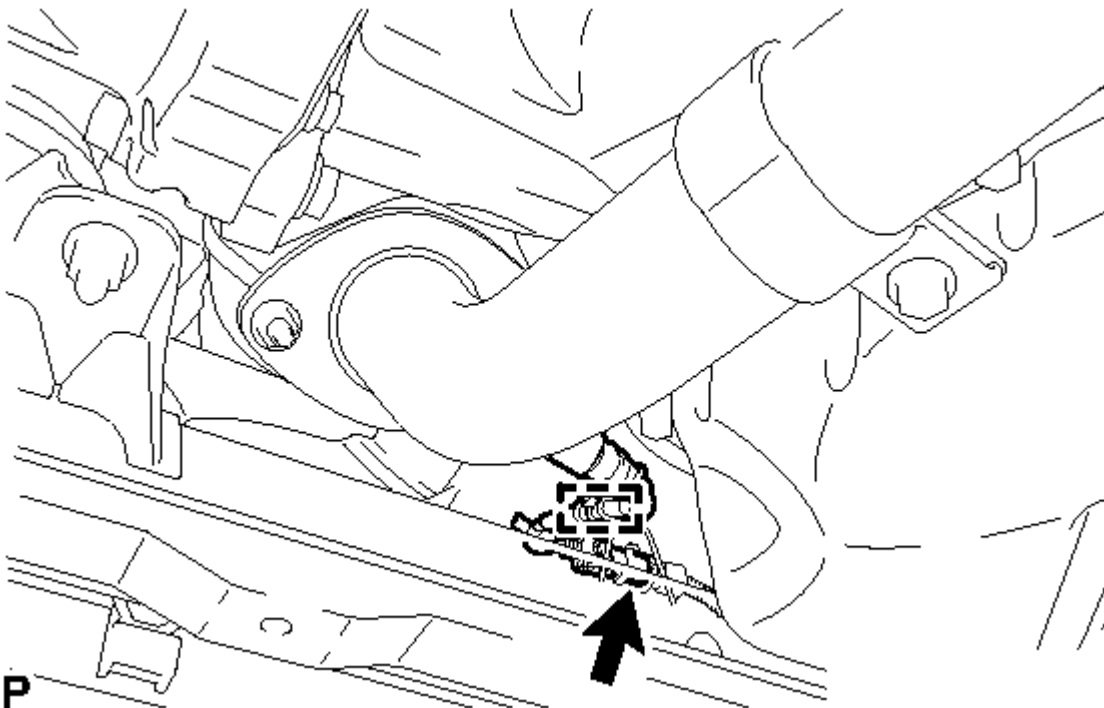
- d. Remove the 3 gaskets from the front exhaust pipe assembly.
- 9. REMOVE FRONT EXHAUST PIPE ASSEMBLY (for AWD)**
- a. Disconnect the oxygen sensor (for bank 1 sensor 2) connector and pass the grommet through the floor.



P

Fig. 34: Identifying Oxygen Sensor Connector (For Bank 1 Sensor 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Disconnect the oxygen sensor (for bank 2 sensor 2) connector and disengage the harness clamp.



P

Fig. 35: Identifying Oxygen Sensor Connector & Clamp (For Bank 2 Sensor 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Remove the 2 nuts, 4 bolts, 2 compression springs and front No. 3 exhaust pipe sub-assembly.

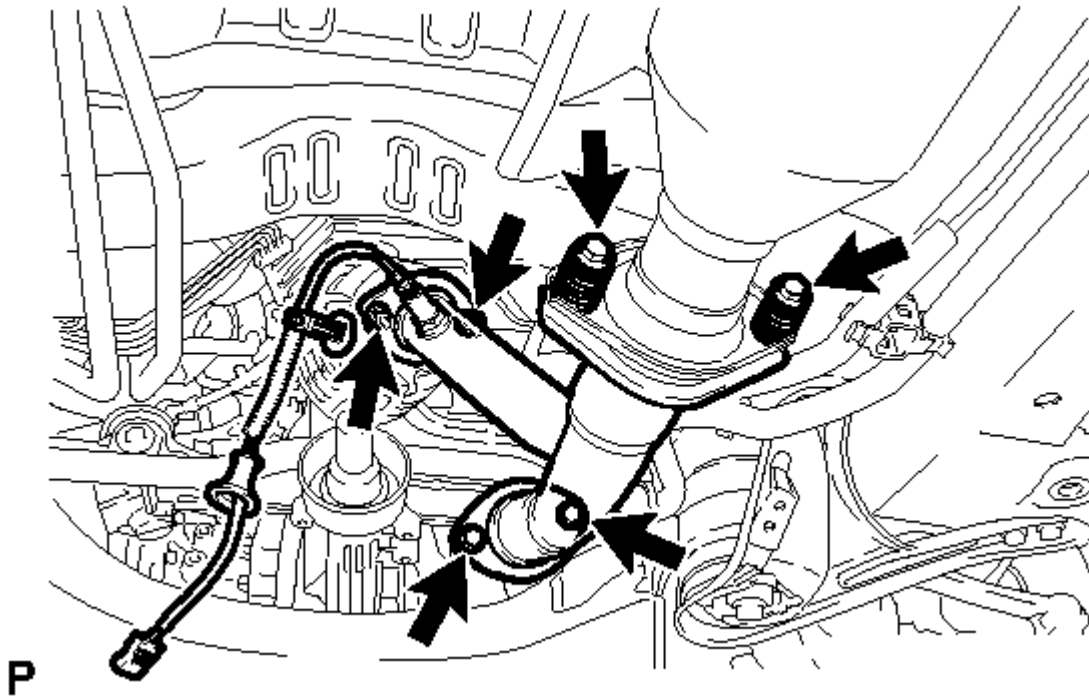


Fig. 36: Identifying No. 3 Exhaust Pipe Sub-Assembly, Compression Springs & Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Remove the 3 gaskets from the front No. 3 exhaust pipe sub-assembly and front exhaust pipe assembly.
- e. Remove the 2 nuts and front exhaust pipe assembly.

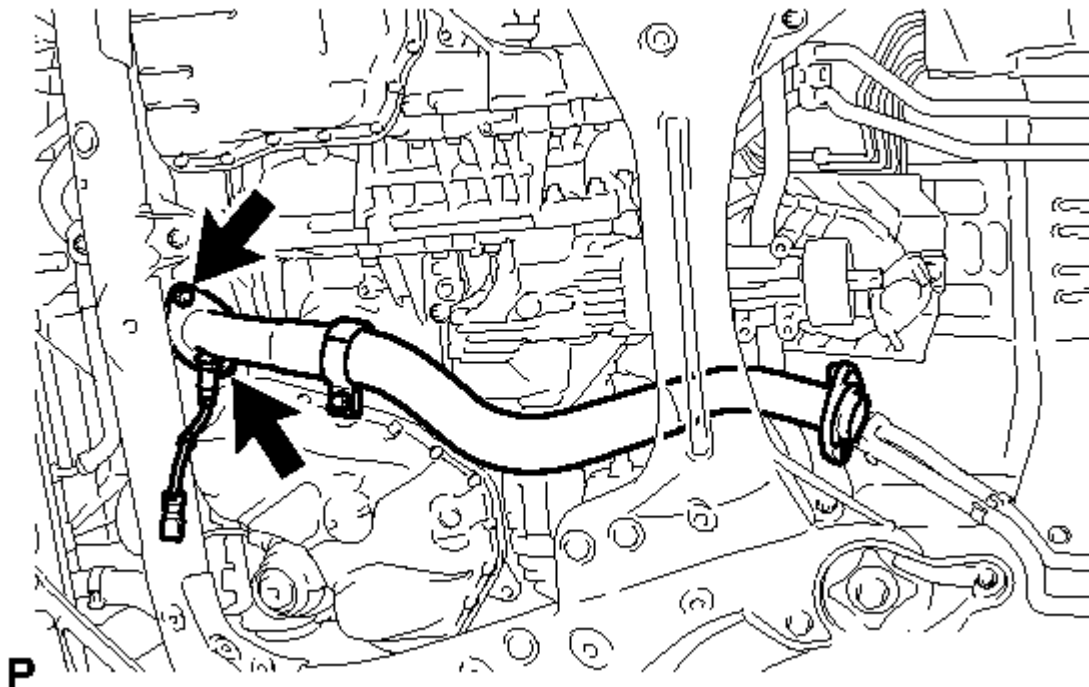


Fig. 37: Identifying Front Exhaust Pipe Assembly & Fasteners
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- f. Remove the gasket from the front exhaust pipe assembly.
- 10. **REMOVE MANIFOLD STAY**
 - a. Remove the bolt, nut and manifold stay.

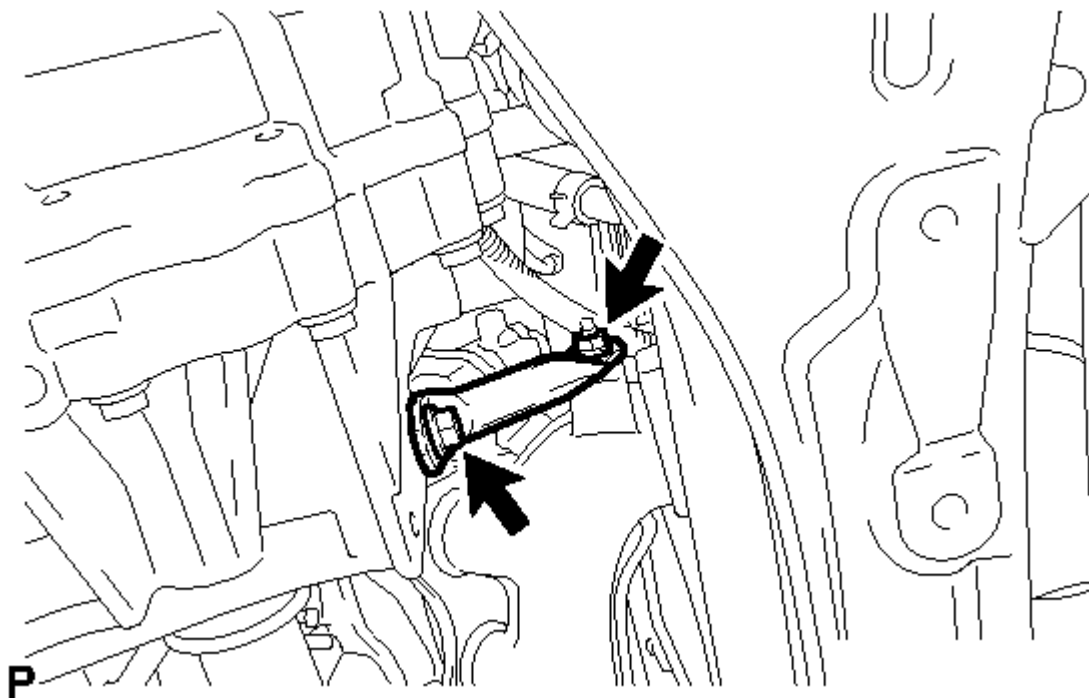
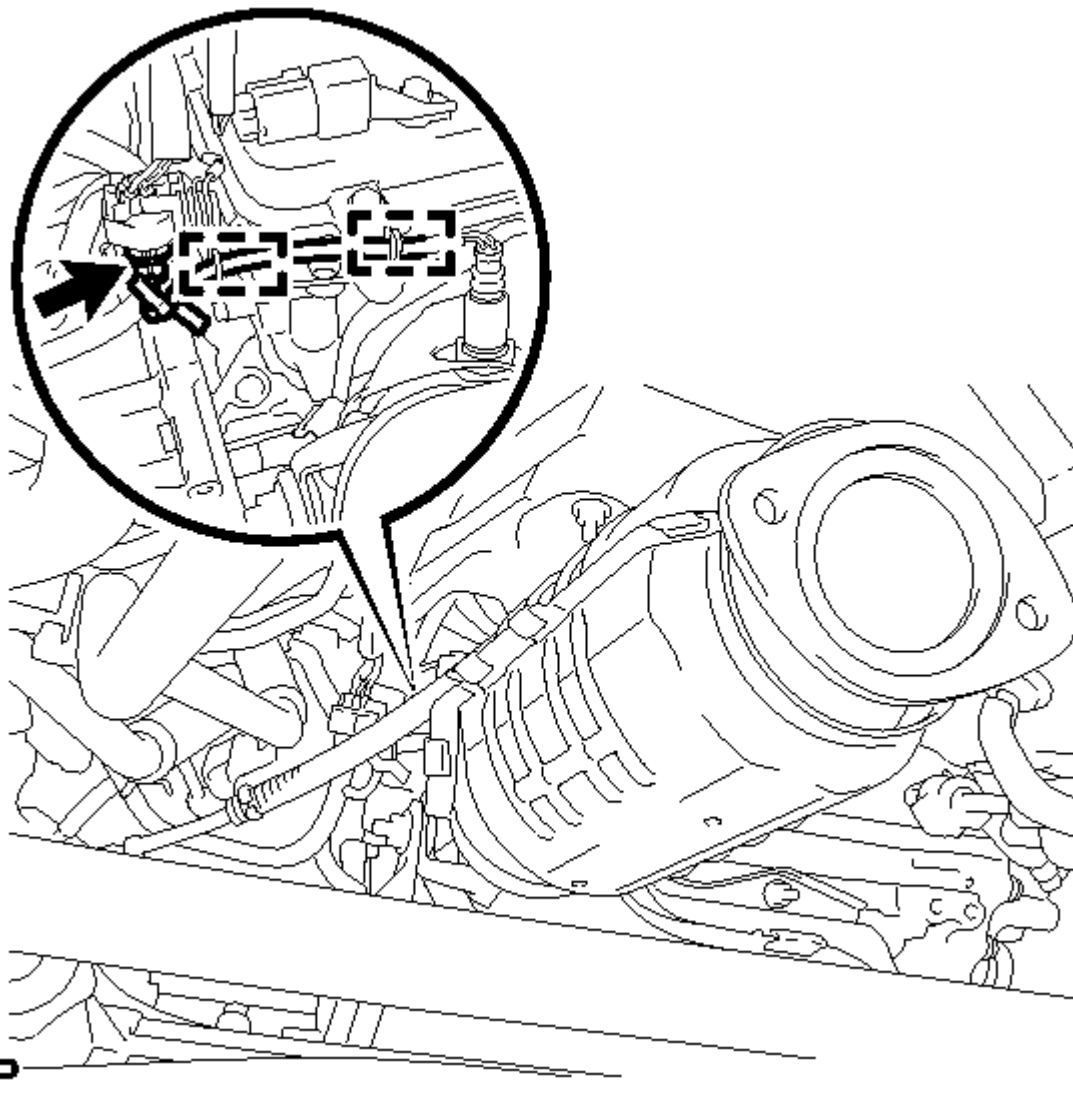


Fig. 38: Identifying Manifold Stay & Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

11. REMOVE EXHAUST MANIFOLD SUB-ASSEMBLY RH

- a. Disconnect the air fuel ratio sensor (for Bank 1 Sensor 1) connector and disengage the 2 harness clamps.



P

Fig. 39: Identifying Air Fuel Ratio Sensor (For Bank 1 Sensor 1) Connector & Harness Clamps
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Using a 12 mm deep socket wrench, remove the 6 nuts and exhaust manifold sub-assembly RH.

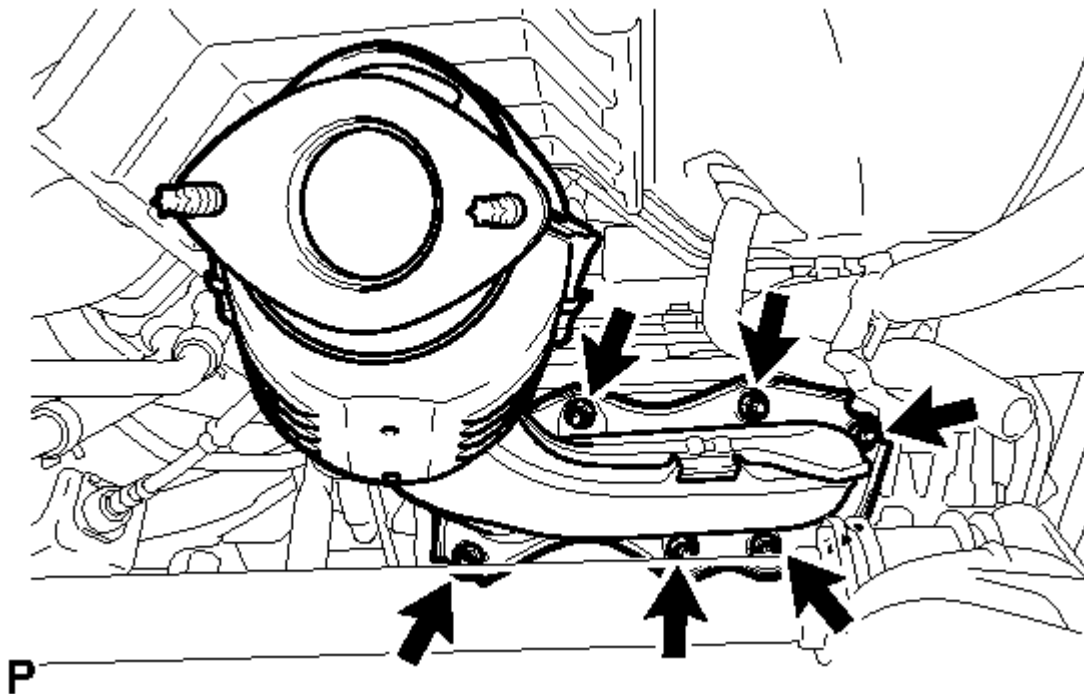


Fig. 40: Identifying Exhaust Manifold Sub-Assembly RH & Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

12. REMOVE EXHAUST MANIFOLD TO HEAD GASKET

- a. Remove the exhaust manifold to head gasket from the cylinder head sub-assembly.

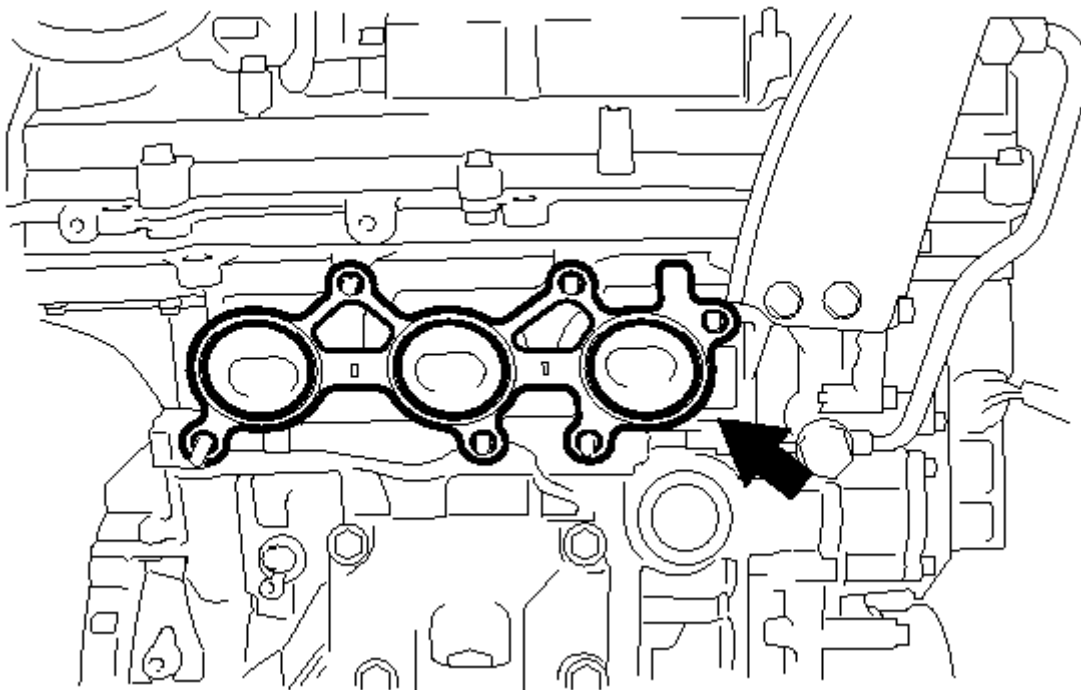


Fig. 41: Identifying Exhaust Manifold To Head Gasket

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

13. **REMOVE AIR FUEL RATIO SENSOR (for Bank 1 Sensor 1)** . Refer to **REMOVAL - Step 13**

14. **REMOVE NO. 2 OIL LEVEL DIPSTICK GUIDE**

- a. Remove the oil level dipstick.

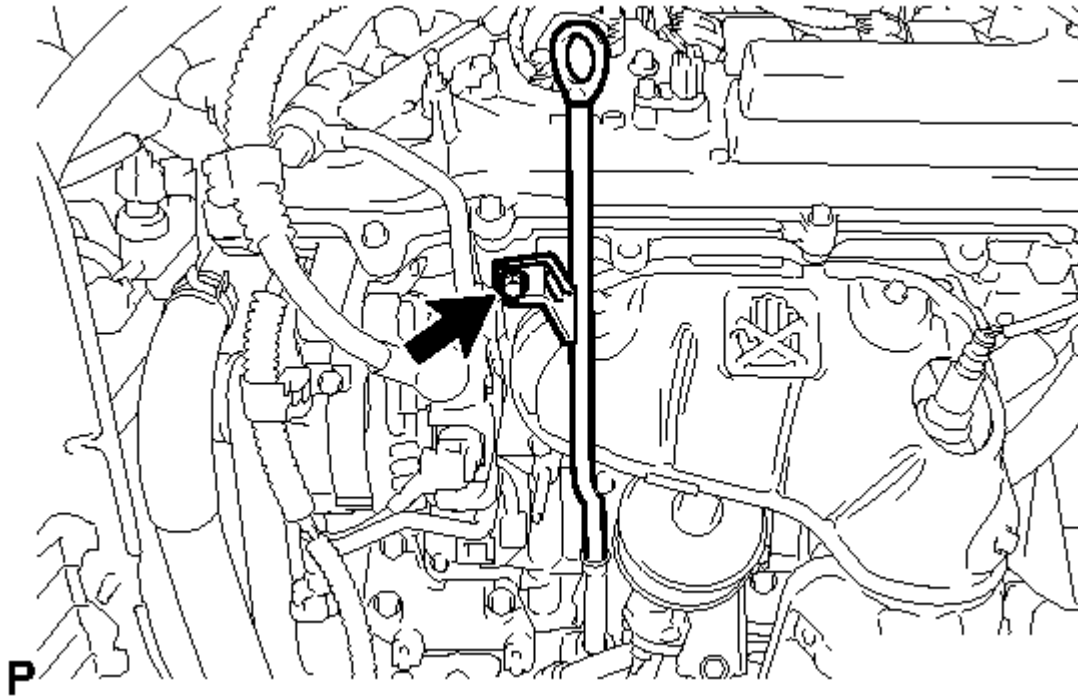
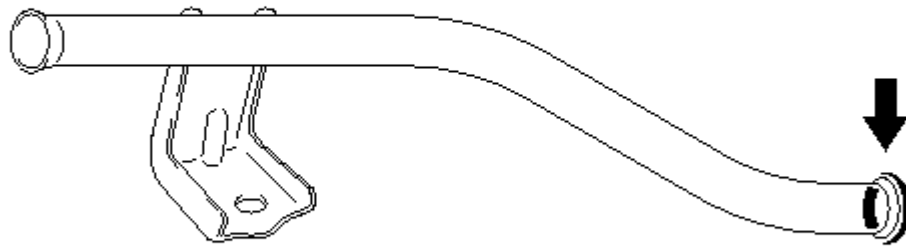


Fig. 42: Identifying No. 2 Oil Level Dipstick Guide & Fastener

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the bolt and No. 2 oil level dipstick guide.
- c. Remove the O-ring from the No. 2 oil level dipstick guide.



C

Fig. 43: Identifying No 2 Engine Oil Level Dipstick Guide And O-Ring
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

15. REMOVE NO. 2 MANIFOLD STAY

- a. Remove the bolt, nut and No. 2 manifold stay.

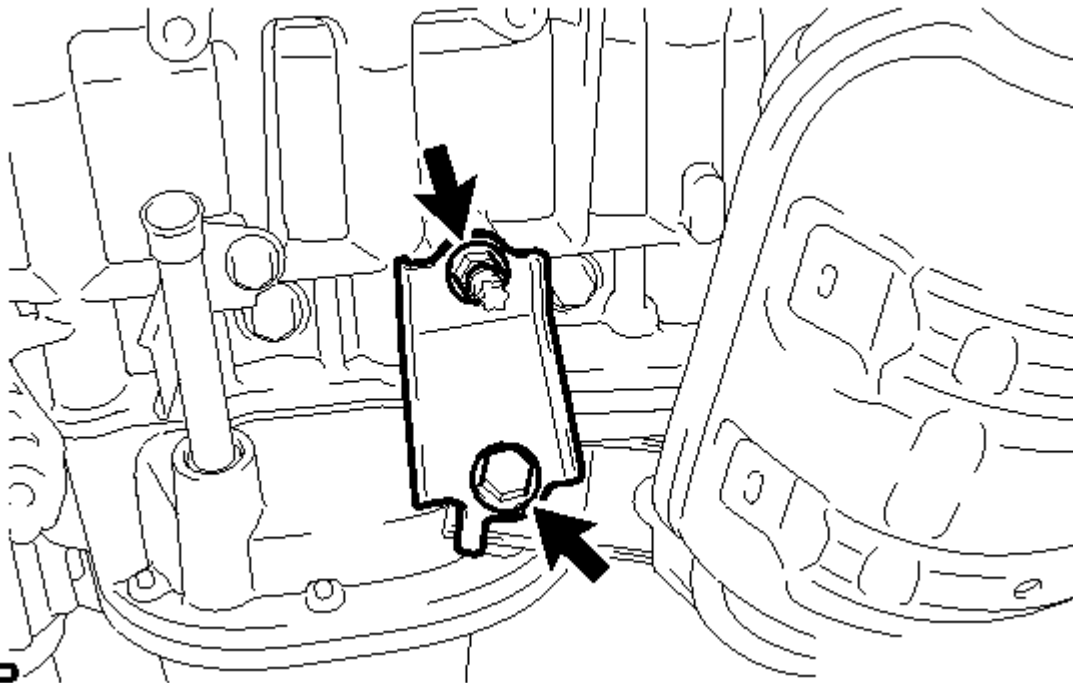


Fig. 44: Identifying No. 2 Manifold Stay & Fastener

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

16. REMOVE NO. 2 EXHAUST MANIFOLD HEAT INSULATOR

- a. Disconnect the air fuel ratio sensor (for Bank 2 Sensor 1) connector and disengage the 2 harness clamps.

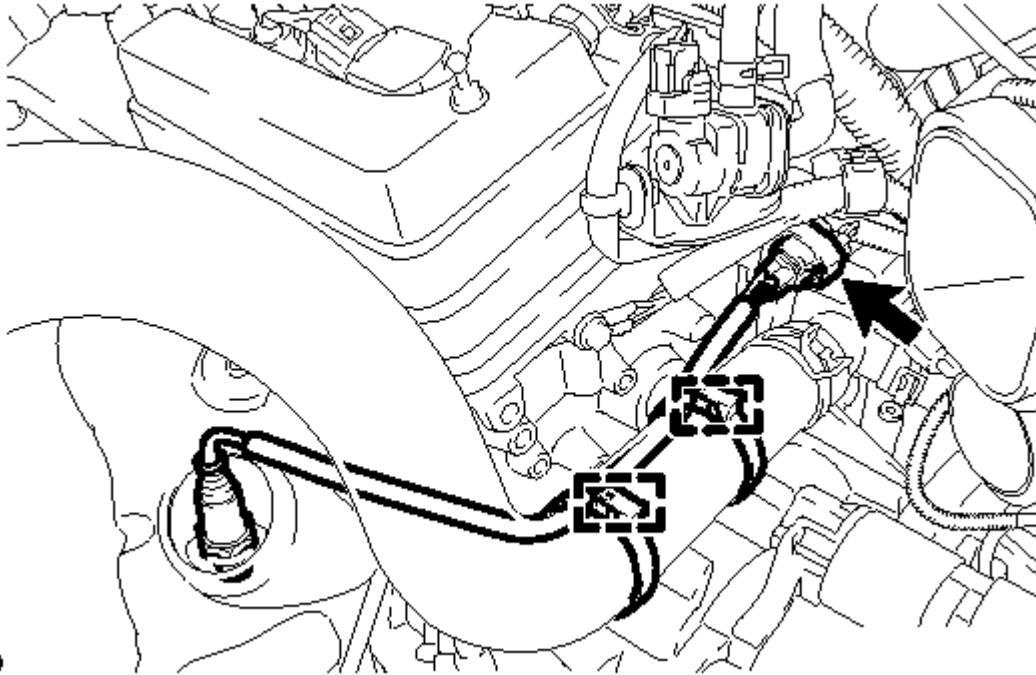


Fig. 45: Identifying Air Fuel Ratio Sensor (For Bank 2 Sensor 1) Connector & Harness Clamps

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the 3 bolts and No. 2 exhaust manifold heat insulator.

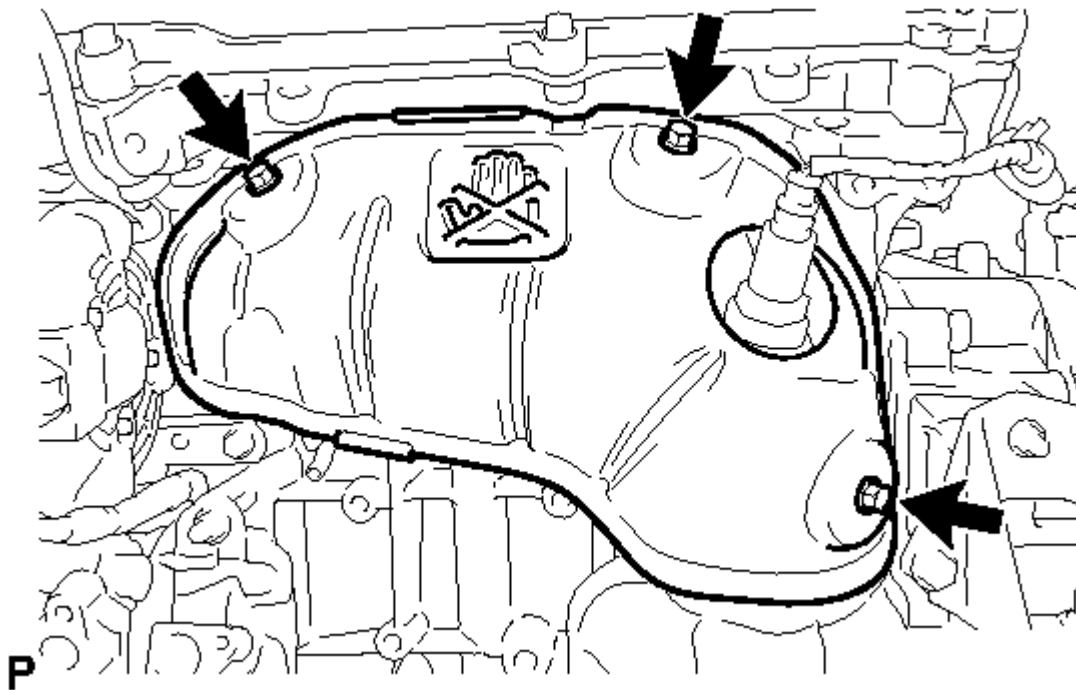
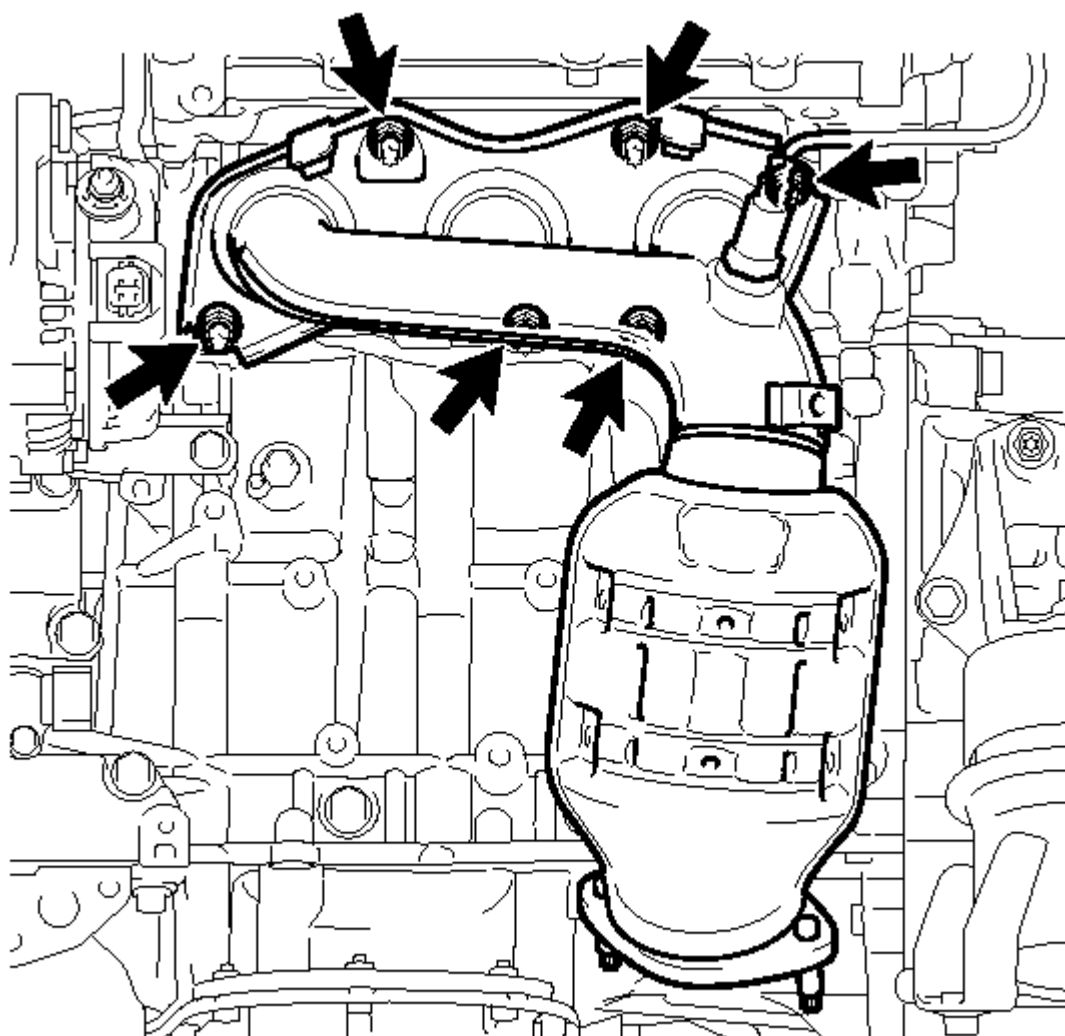


Fig. 46: Identifying No. 2 Exhaust Manifold Heat Insulator & Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

17. REMOVE EXHAUST MANIFOLD SUB-ASSEMBLY LH

- a. Using a 12 mm deep socket wrench, remove the 6 nuts and exhaust manifold sub-assembly LH.

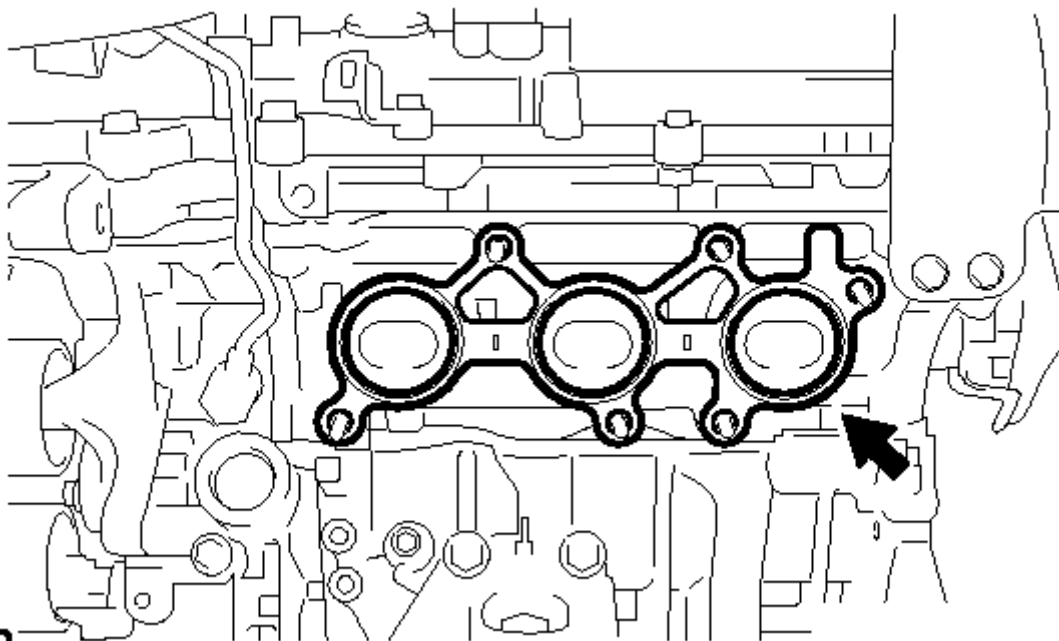


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Fig. 47: Identifying Exhaust Manifold Sub-Assembly LH & Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

18. REMOVE EXHAUST MANIFOLD TO HEAD GASKET LH

- a. Remove the exhaust manifold to head gasket LH from the cylinder head sub-assembly.

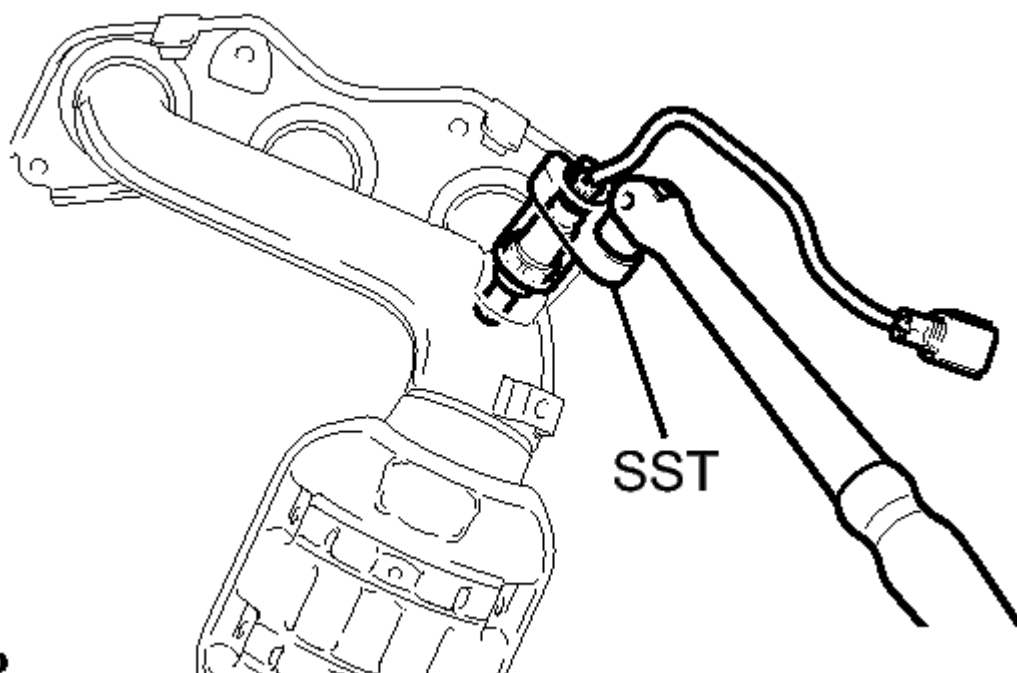


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Fig. 48: Identifying Exhaust Manifold To Head Gasket LH
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

19. REMOVE AIR FUEL RATIO SENSOR NO. 2 (for Bank 2 Sensor 1)

- a. Using SST, remove the air fuel ratio sensor (for Bank 2 Sensor 1) from the exhaust manifold sub-assembly LH.



P

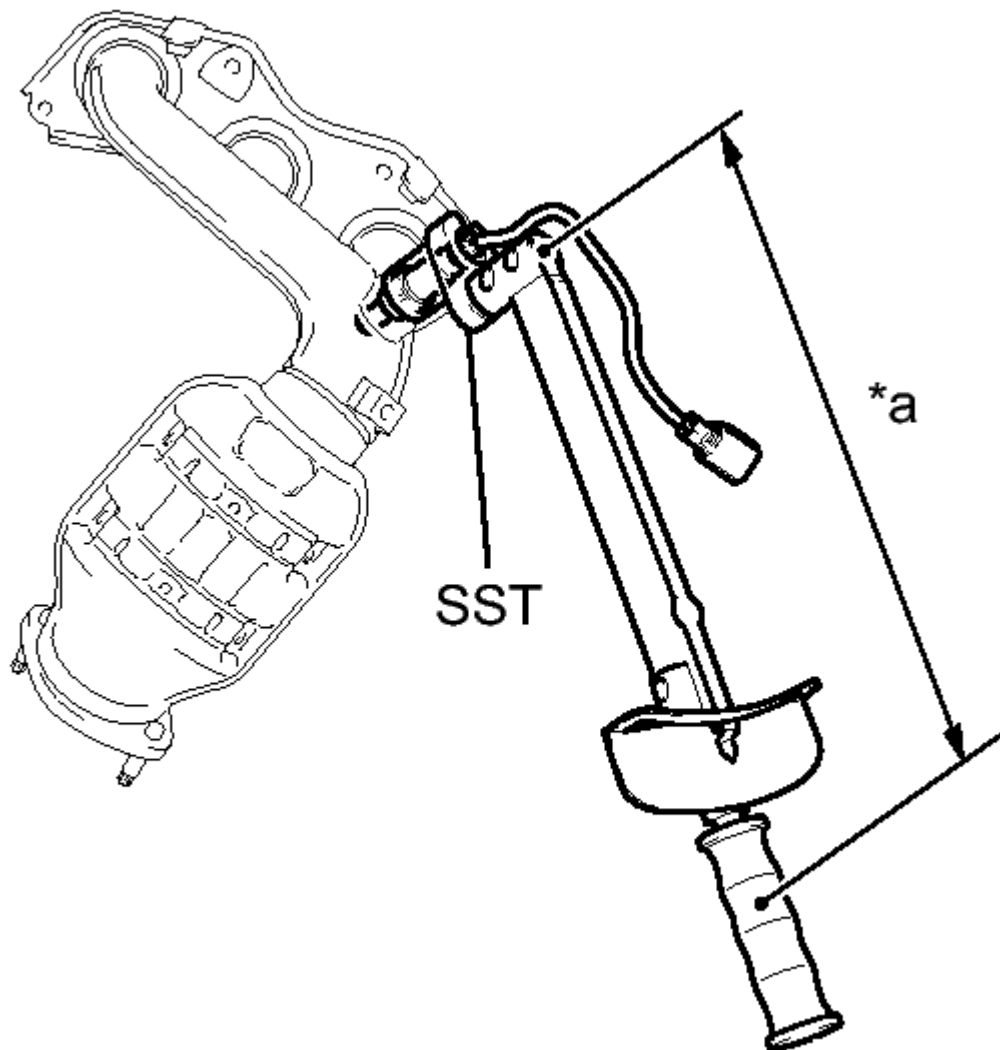
Fig. 49: Removing Air Fuel Ratio Sensor (For Bank 2 Sensor 1) Using SST
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- SST: 09224-00010

INSTALLATION

INSTALLATION

1. **INSTALL AIR FUEL RATIO SENSOR NO. 2 (for Bank 2 Sensor 1)**
 - a. Using SST, install the air fuel ratio sensor (for Bank 2 Sensor 1) to the front exhaust manifold sub-assembly LH.



P

Fig. 50: Installing Air Fuel Ratio Sensor (For Bank 2 Sensor 1) Using SST
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*a	Fulcrum
	Length

- SST: 09224-00010

without SST

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

with SST

Torque: 40 N*m (408 kgf*cm, 30 ft.*lbf)

HINT:

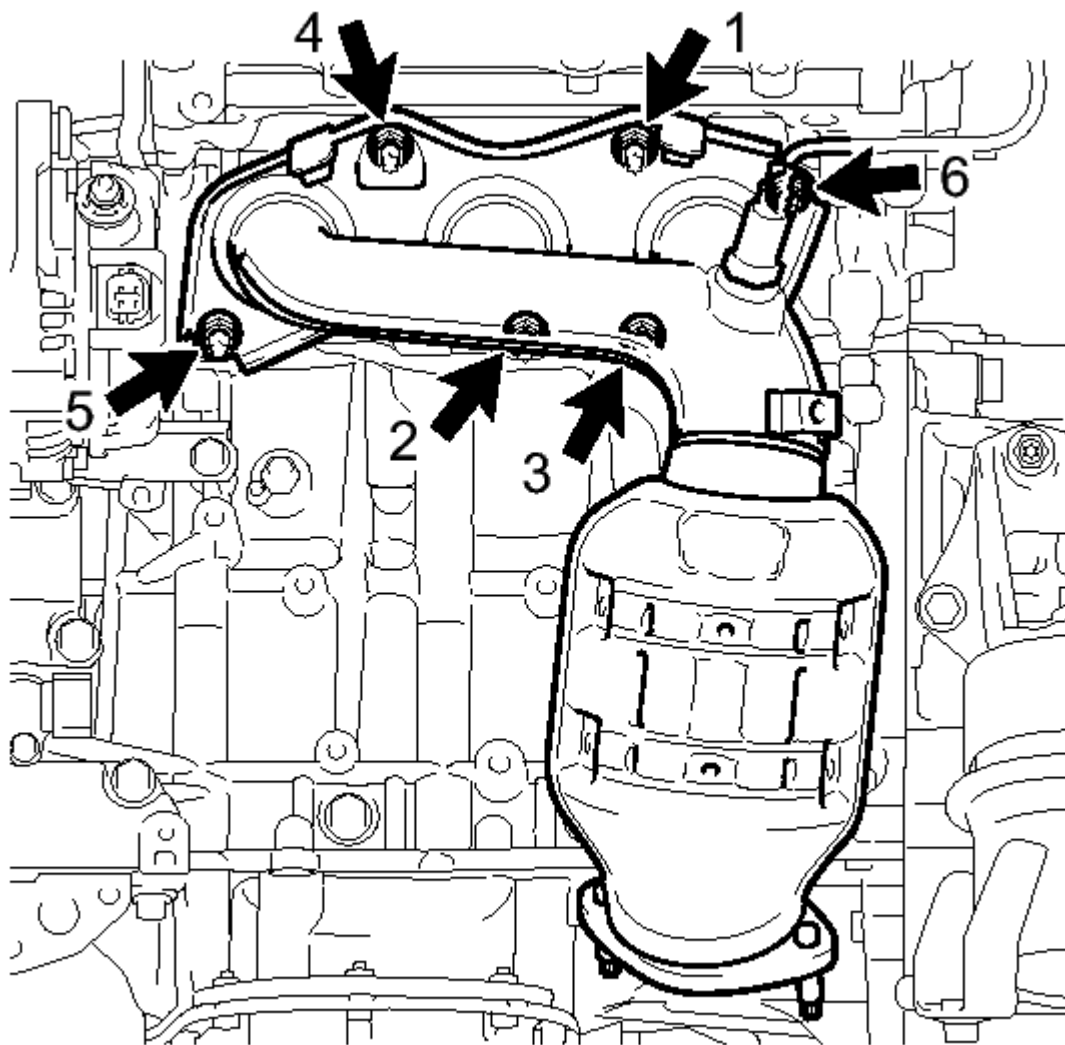
- The "with SST" torque value is effective when using SST with a fulcrum length of 30 mm (1.18 in.).
- The "with SST" torque value is effective when using a torque wrench with a fulcrum length of 300 mm (11.81 in.). Refer to **PRECAUTION** .
- The "with SST" torque value is effective when SST is parallel to the torque wrench.

2. INSTALL EXHAUST MANIFOLD TO HEAD GASKET LH

- a. Install a new exhaust manifold to head gasket LH.

3. INSTALL EXHAUST MANIFOLD SUB-ASSEMBLY LH

- a. Temporarily install the exhaust manifold sub-assembly LH with the 6 nuts.



P

Fig. 51: Installing Exhaust Manifold Sub-Assembly LH Fasteners With Tightening Sequence
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Using a 12 mm deep socket wrench, tighten the 6 nuts in the order shown in the illustration.

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

4. INSTALL NO. 2 EXHAUST MANIFOLD HEAT INSULATOR

- a. Install the No. 2 exhaust manifold heat insulator, tightening the 3 bolts in the order shown in the illustration.

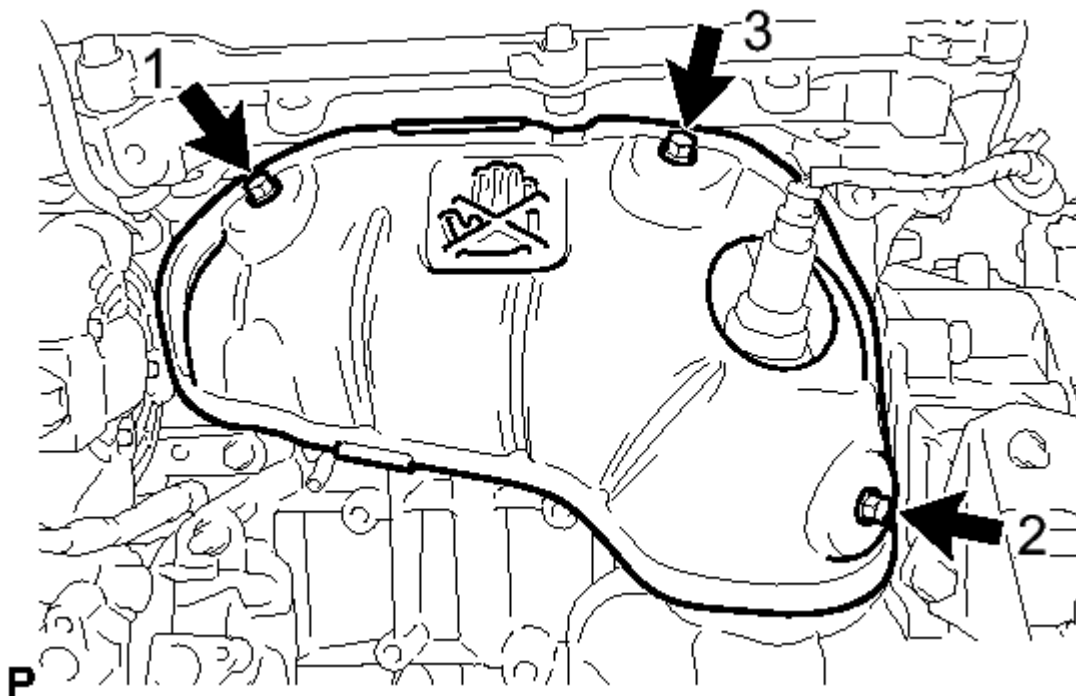


Fig. 52: Installing No. 2 Exhaust Manifold Heat Insulator Fasteners With Tightening Sequence

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Torque: 8.5 N*m (87 kgf*cm, 75 in.*lbf)

- b. Connect the air fuel ratio sensor (for Bank 2 Sensor 1) connector and engage the 2 harness clamps.

5. INSTALL NO. 2 MANIFOLD STAY

- a. Install the No. 2 manifold stay, tightening the bolt and nut in the order shown in the illustration.

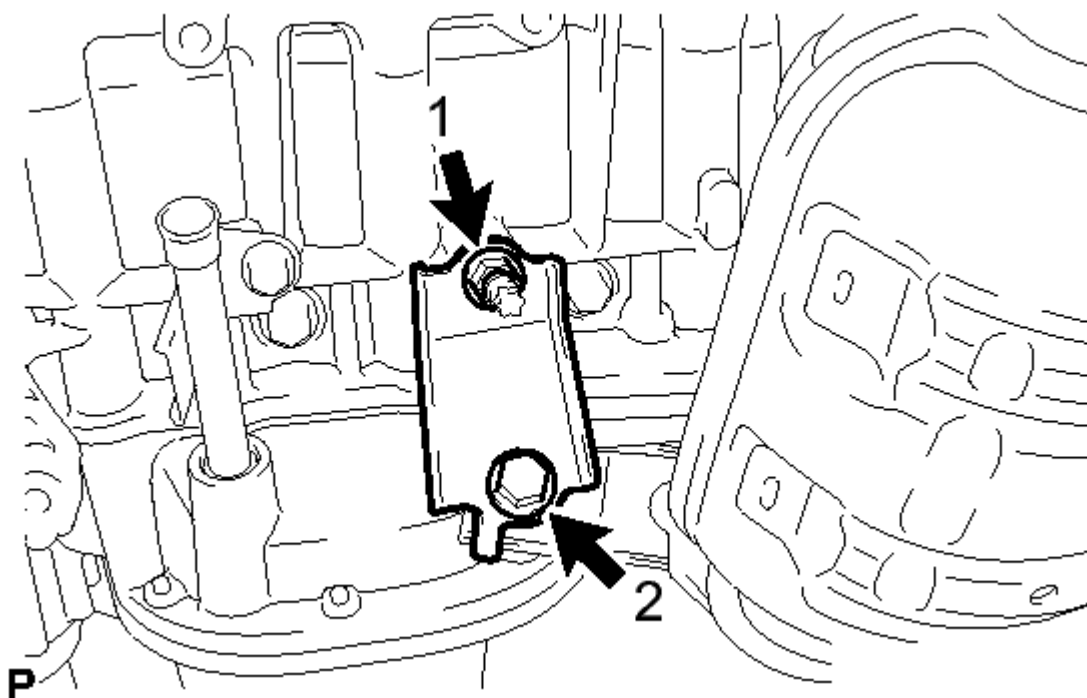


Fig. 53: Installing No. 2 Manifold Stay & Fasteners With Tightening Sequence
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Torque: 34 N*m (347 kgf*cm, 25 ft.*lbf)

6. INSTALL NO. 2 OIL LEVEL DIPSTICK GUIDE

- a. Install a new O-ring to the No. 2 oil level dipstick guide.
- b. Apply a light coat of engine oil to the O-ring.
- c. Push in the No. 2 oil level dipstick guide end into the oil level dipstick guide.
- d. Install the No. 2 oil level dipstick guide with the bolt.

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

- e. Install the oil level dipstick.

7. INSTALL AIR FUEL RATIO SENSOR (for Bank 1 Sensor 1) . Refer to INSTALLATION - Step 1

8. INSTALL EXHAUST MANIFOLD TO HEAD GASKET

- a. Install a new exhaust manifold to head gasket.

9. INSTALL EXHAUST MANIFOLD SUB-ASSEMBLY RH

- a. Temporarily install the exhaust manifold sub-assembly RH with the 6 nuts.

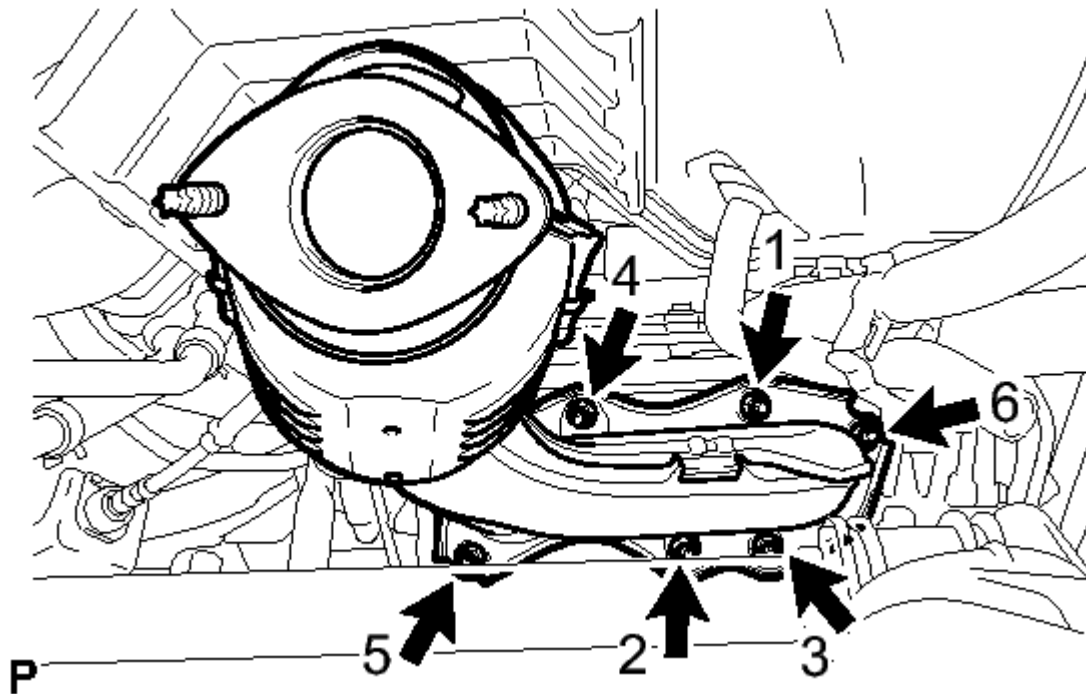


Fig. 54: Installing Exhaust Manifold Sub-Assembly RH With Tightening Sequence
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Using a 12 mm deep socket wrench, tighten the 6 nuts in the order shown in the illustration.

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

- c. Connect the air fuel ratio sensor (for Bank 1 Sensor 1) connector and engage the 2 harness clamps.

10. INSTALL MANIFOLD STAY

- a. Install the manifold stay with the bolt and nut.

Bolt

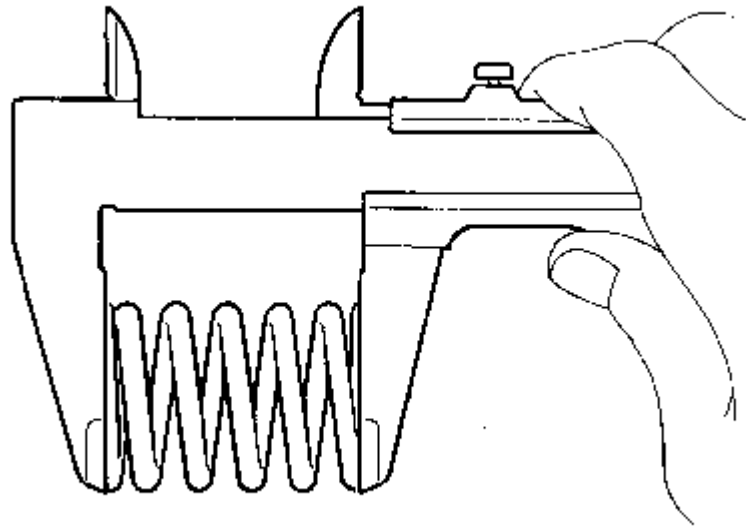
Torque: 34 N*m (347 kgf*cm, 25 ft.*lbf)

Nut

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

11. INSTALL FRONT EXHAUST PIPE ASSEMBLY (for 2WD)

- a. Using a vernier caliper, measure the free length of the compression springs.



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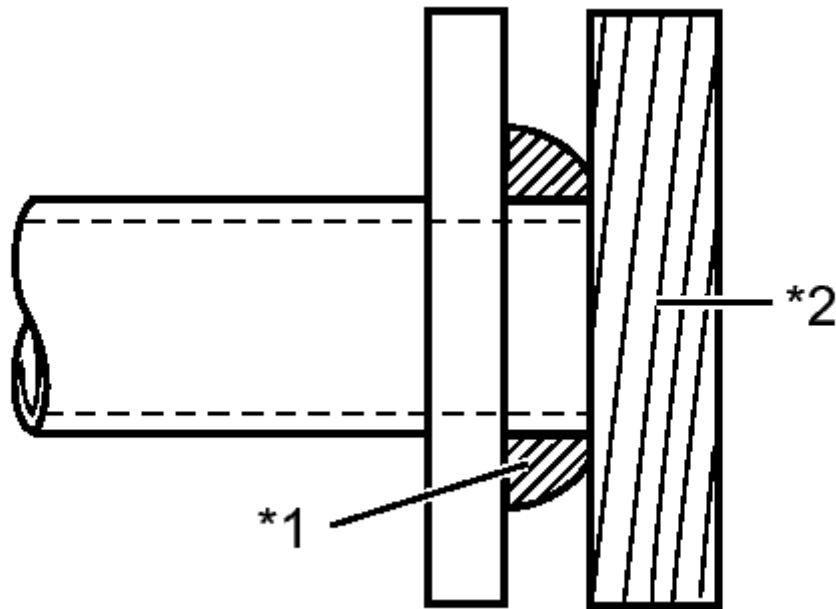
Fig. 55: Measuring Free Length Of Compression Spring
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Minimum length

38.86 mm (1.5299 in.)

If the length is not as specified, replace the compression spring.

- b. Using a plastic hammer and a wooden block, tap in a new exhaust pipe gasket until its surface is flush with the front exhaust pipe assembly.



Y

Fig. 56: Identifying Wooden Block & Gasket
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Gasket
*2	Wooden Block

NOTE:

- Install the gasket in the correct direction.
- Do not reuse the gasket.
- Do not damage the gasket by dropping it, etc.
- Do not damage the outer surface of the gasket.
- Do not push in the gasket with the exhaust pipe when connecting it.

- c. Install 2 new gaskets to the front exhaust pipe assembly.
- d. Install the front exhaust pipe assembly with the 4 nuts, 2 bolts, and 2 compression springs.

Bolt

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

Nut

Torque: 62 N*m (632 kgf*cm, 46 ft.*lbf)

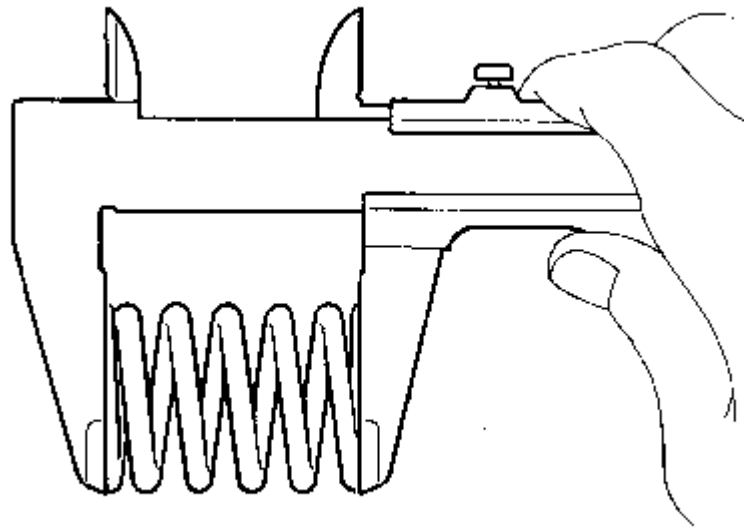
- e. Connect the oxygen sensor (for bank 2 sensor 2) connector and engage the harness clamp.
- f. Pull the oxygen sensor (for bank 1 sensor 2) harness through the floor, install the grommet in the floor, and connect the oxygen sensor (for bank 1 sensor 2) connector.

12. INSTALL FRONT EXHAUST PIPE ASSEMBLY (for AWD)

- a. Install a new gasket to the front exhaust pipe assembly.
- b. Install the front exhaust pipe assembly with the 2 nuts.

Torque: 62 N*m (632 kgf*cm, 46 ft.*lbf)

- c. Connect the oxygen sensor (for bank 2 sensor 2) connector and engage the harness clamp.
- d. Using a vernier caliper, measure the free length of the compression springs.



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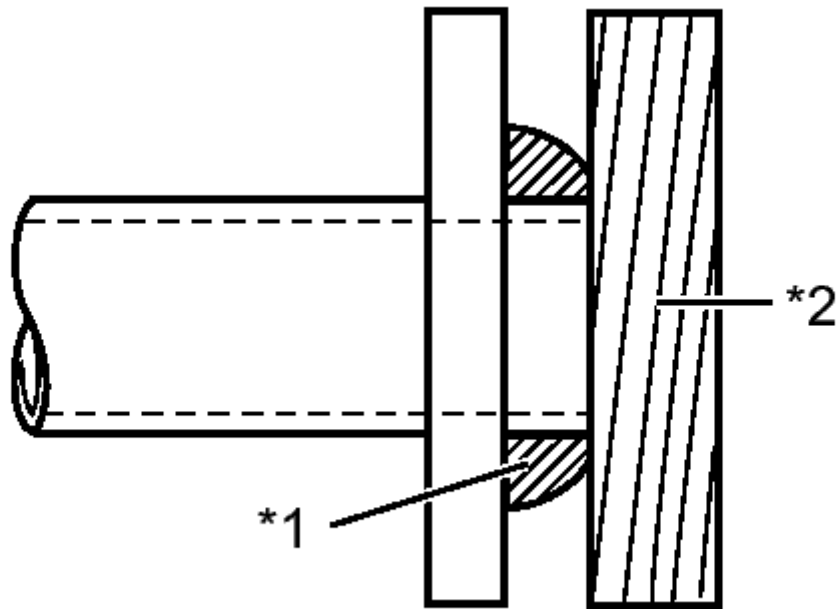
Fig. 57: Measuring Free Length Of Compression Spring
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Minimum length

40.5 mm (1.594 in.)

If the length is not as specified, replace the compression spring.

- e. Using a plastic hammer and a wooden block, tap in a new exhaust pipe gasket until its surface is flush with the front No. 3 exhaust pipe sub-assembly.



Y

Fig. 58: Identifying Wooden Block & Gasket
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Gasket
*2	Wooden Block

NOTE:

- Install the gasket in the correct direction.
- Do not reuse the gasket.
- Do not damage the gasket by dropping it, etc.
- Do not damage the outer surface of the gasket.
- Do not push in the gasket with the exhaust pipe when connecting it.

- f. Install 2 new gaskets to the front No. 3 exhaust pipe sub-assembly.
- g. Install the front No. 3 exhaust pipe sub-assembly with the 2 nuts, 2 bolts, 2 new bolts, and 2 compression springs.

Bolt

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

Nut

Torque: 62 N*m (632 kgf*cm, 46 ft.*lbf)

- h. Connect the oxygen sensor (for bank 2 sensor 2) connector and engage the harness clamp.
- i. Pull the oxygen sensor (for bank 1 sensor 2) harness through the floor, install the grommet in the floor, and connect the oxygen sensor (for bank 1 sensor 2) connector.

13. **INSTALL NO. 1 EXHAUST PIPE SUPPORT BRACKET** See step 4

14. **INSTALL PROPELLER WITH CENTER BEARING SHAFT ASSEMBLY (for AWD)**

Refer to **INSTALLATION**

15. **INSTALL NO. 2 ENGINE UNDER COVER (for AWD)**

- a. Install the No. 2 engine under cover with the 2 bolts, 2 screws and clip.

16. **INSTALL NO. 1 ENGINE UNDER COVER**

- a. Install the No. 1 engine under cover with the 2 bolts, 6 screws and 4 clips.

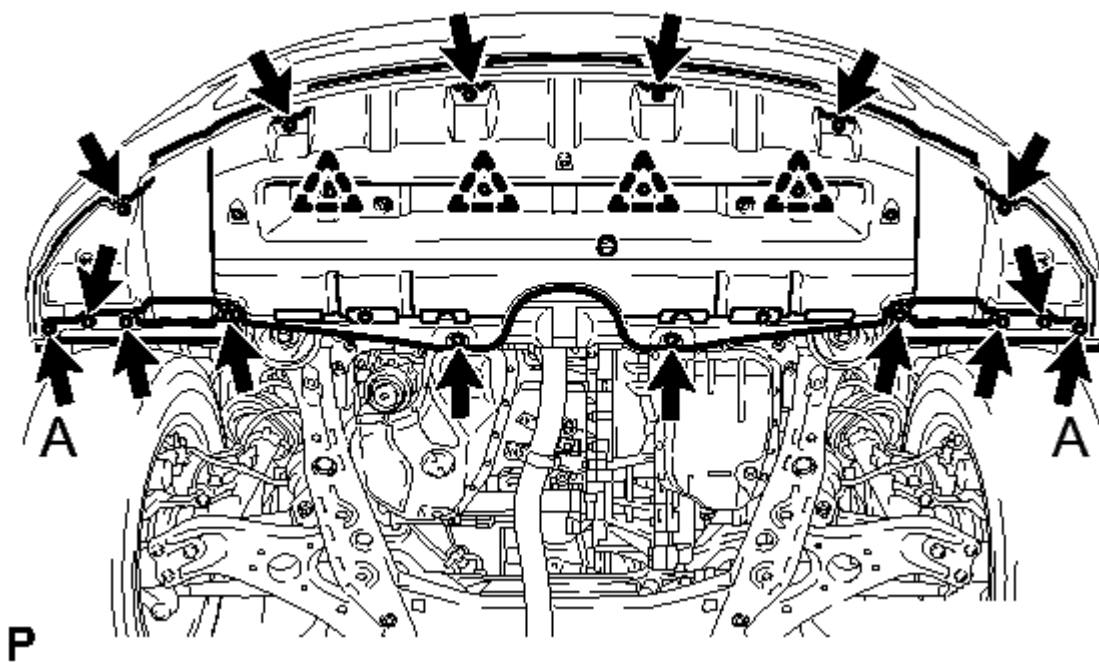


Fig. 59: Installing No. 1 Engine Under Cover & Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Install the front wheel opening extension pad RH and front wheel opening extension pad LH with the 8 screws.

Screw A

Torque: 7.0 N*m (71 kgf*cm, 62 in.*lbf)

17. **INSTALL INSTRUMENT PANEL FINISH PANEL END LH** See step 8

18. INSTALL V-BANK COVER SUB-ASSEMBLY

19. INSTALL RADIATOR ASSEMBLY

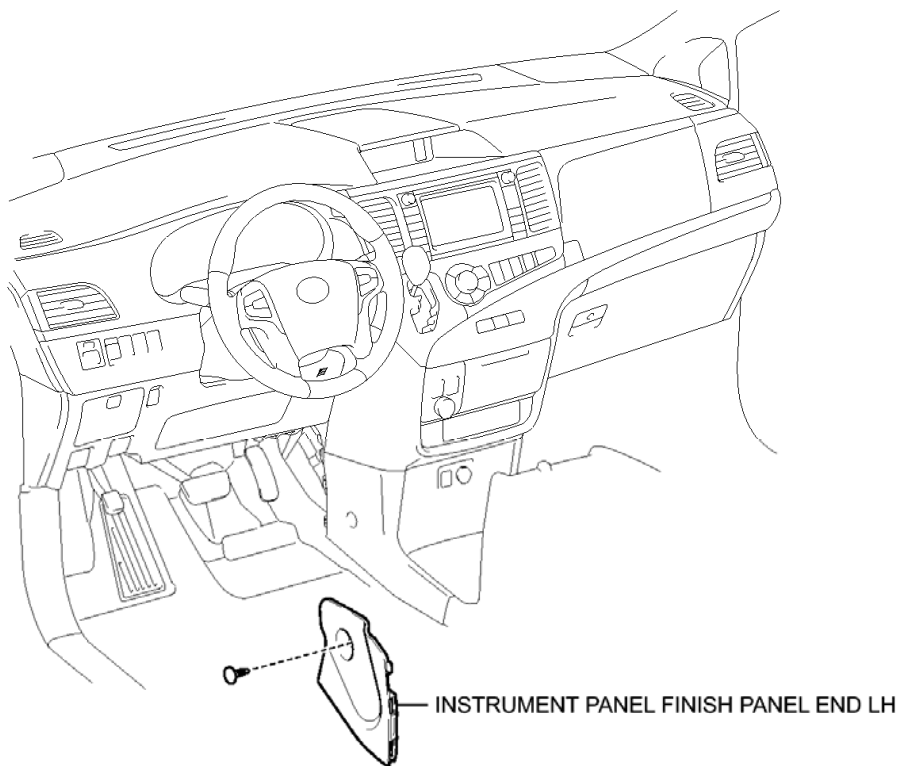
Refer to INSTALLATION

20. INSPECT FOR EXHAUST GAS LEAK

EXHAUST PIPE (FOR 2WD)

COMPONENTS

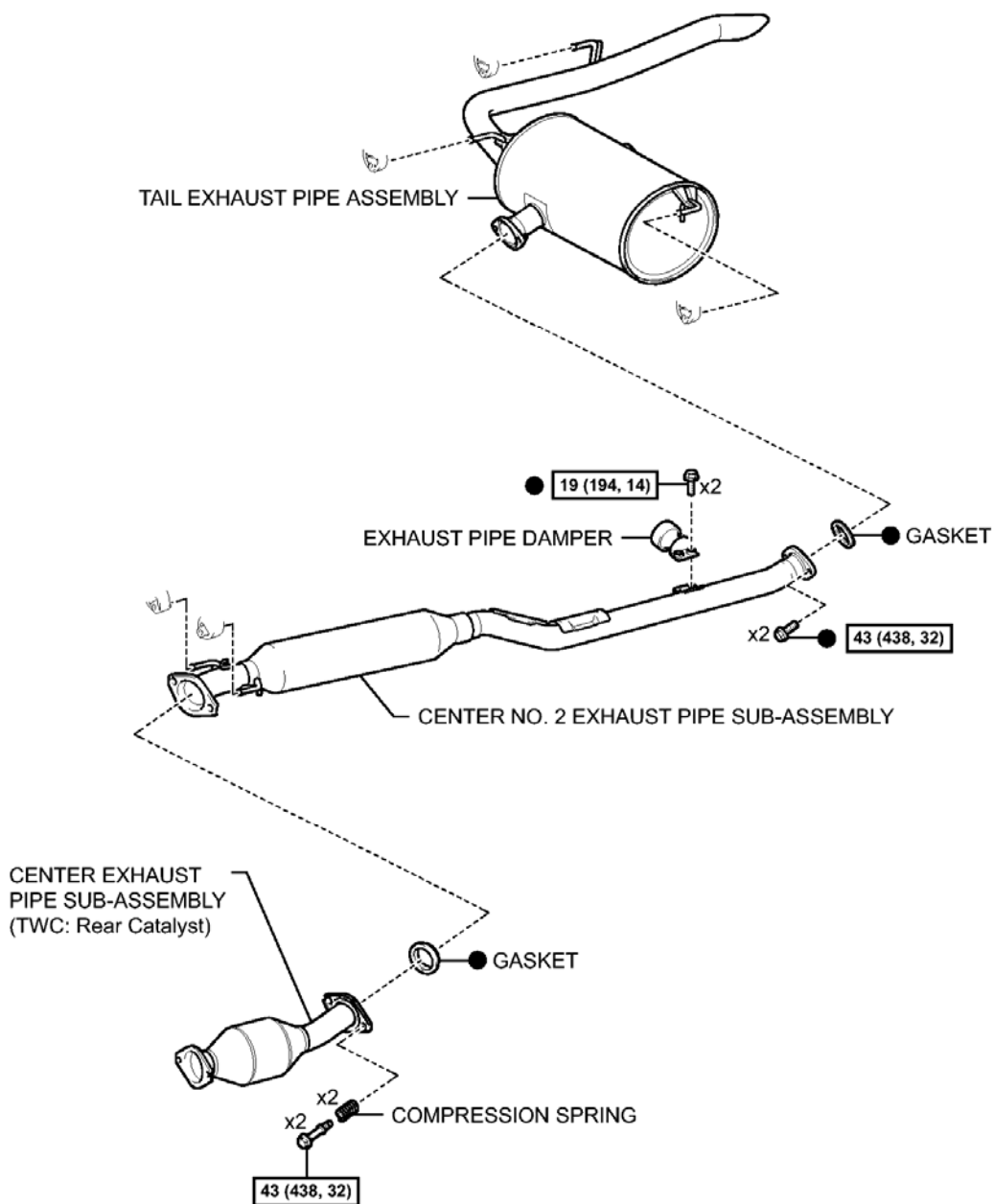
ILLUSTRATION



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Fig. 60: Exhaust Manifold Replacement Components With Torque Specifications (1 of 3)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ILLUSTRATION



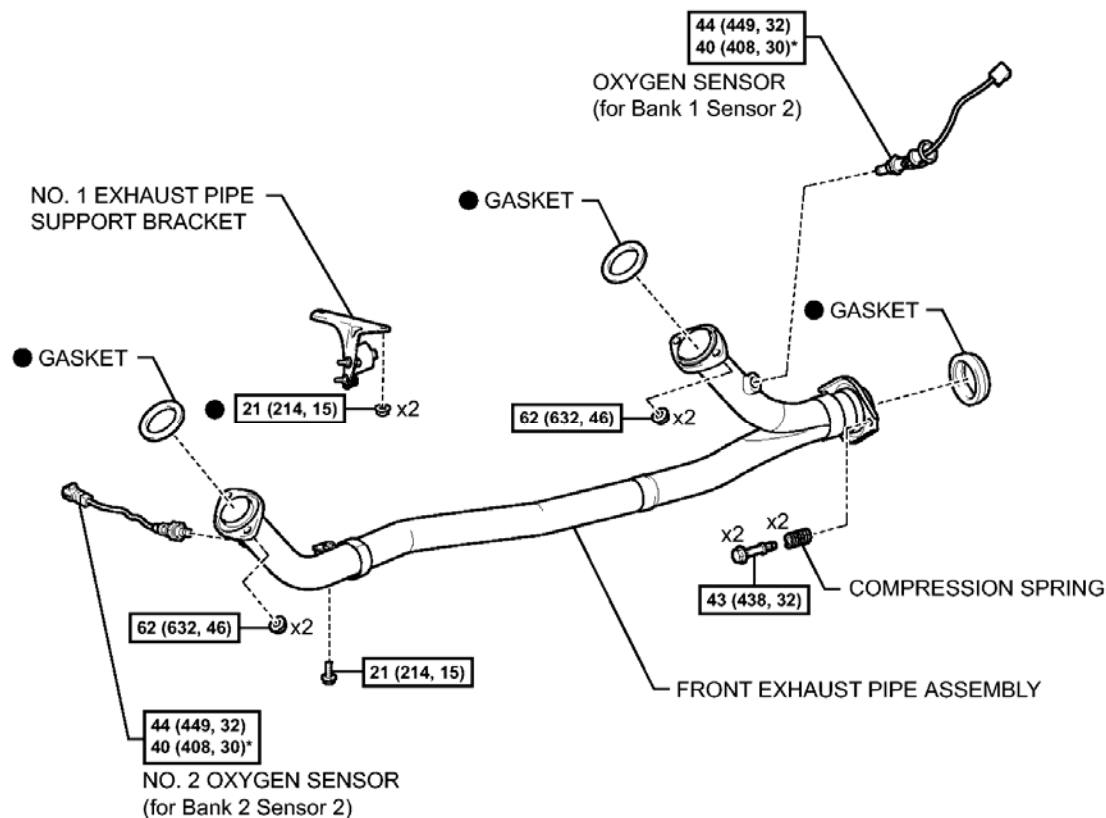
[N*m (kgf*cm, ft.*lbf)]: Specified torque

● Non-reusable part

P

Fig. 61: Exhaust Manifold Replacement Components With Torque Specifications (2 of 3)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ILLUSTRATION



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

* For use with SST

● Non-reusable part

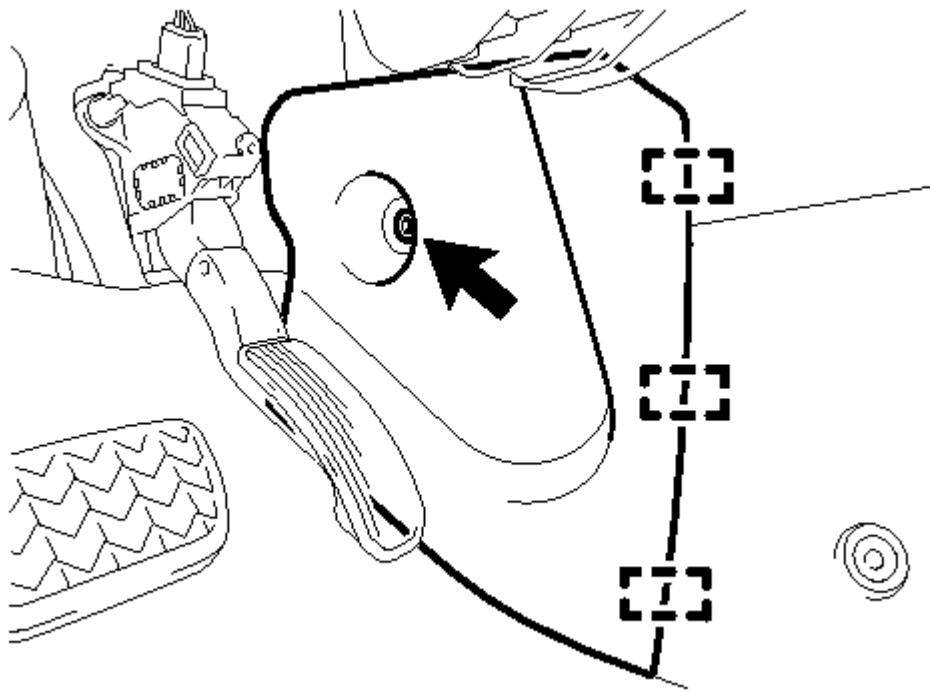
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Fig. 62: Exhaust Manifold Replacement Components With Torque Specifications (3 of 3)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

REMOVAL

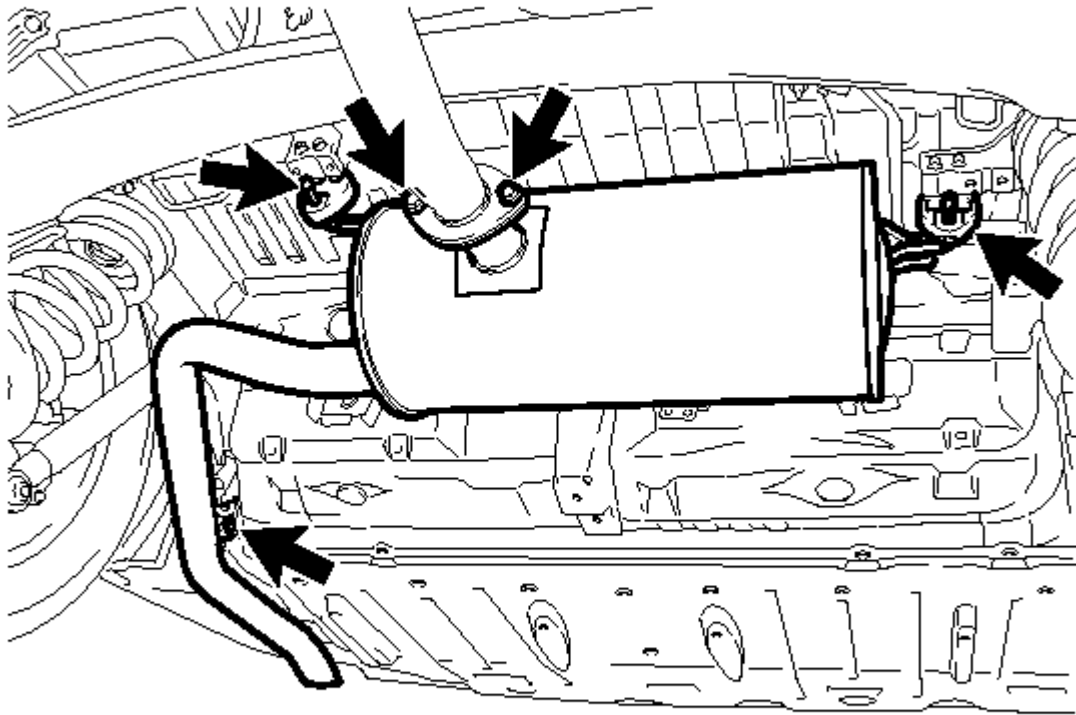
1. **REMOVE INSTRUMENT PANEL FINISH PANEL END LH**
 - a. Using a clip remover, remove the clip.



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Fig. 63: Identifying Instrument Panel Finish Panel End LH Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

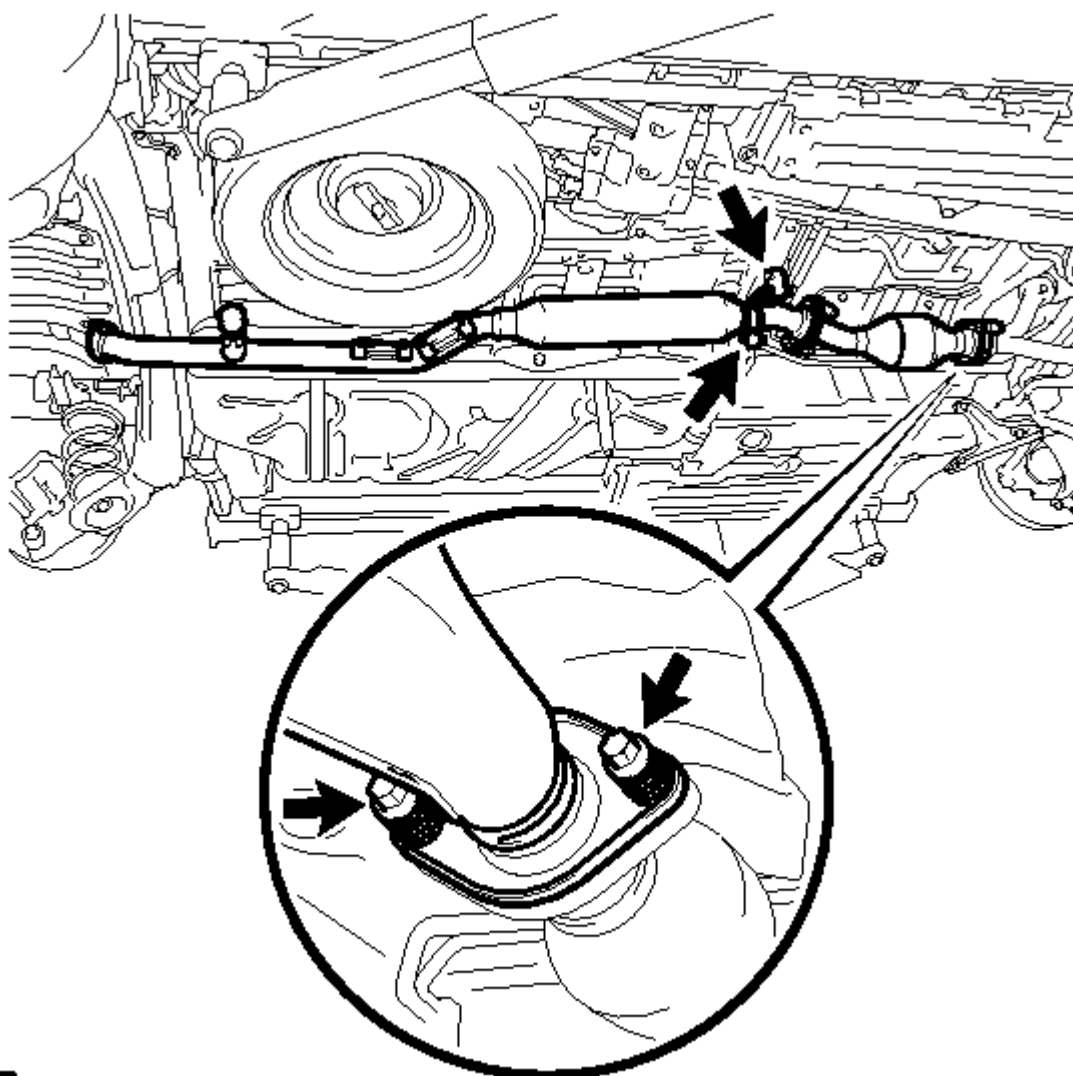
- b. Disengage the 3 guides and remove the instrument panel finish panel end LH.
- 2. **REMOVE TAIL EXHAUST PIPE ASSEMBLY**
 - a. Remove the 2 bolts.



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Fig. 64: Identifying Tail Exhaust Pipe Assembly, Supports & Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

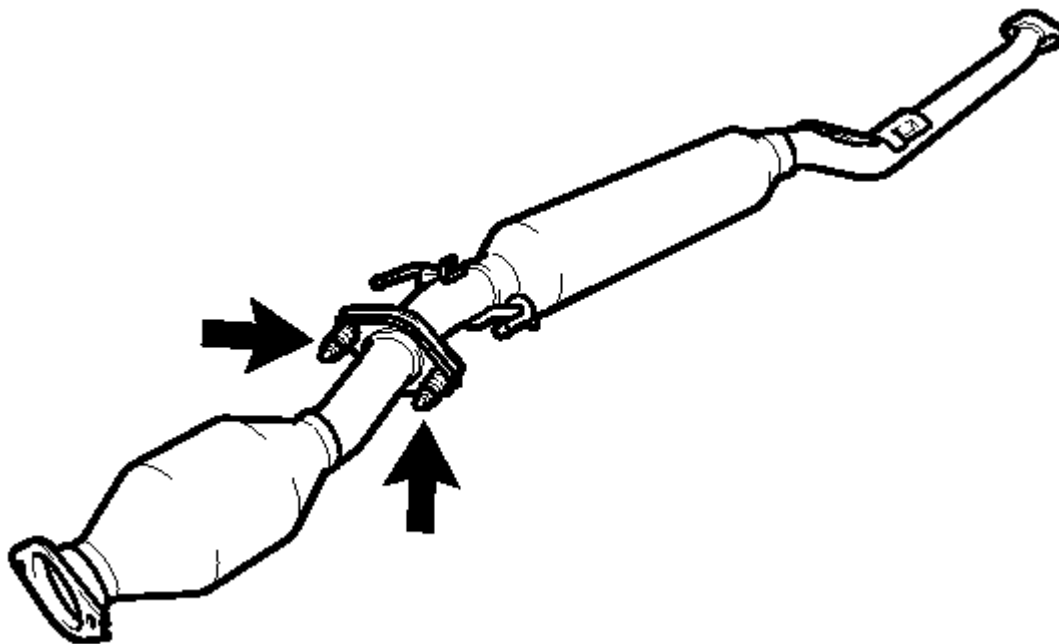
- b. Disconnect the 3 exhaust pipe supports and remove the tail exhaust pipe assembly.
 - c. Remove the gasket from the center exhaust pipe assembly.
- 3. REMOVE CENTER EXHAUST PIPE ASSEMBLY**
- a. Remove the 2 bolts and 2 compression springs.



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Fig. 65: Identifying Center Exhaust Pipe Assembly Compression Springs & Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

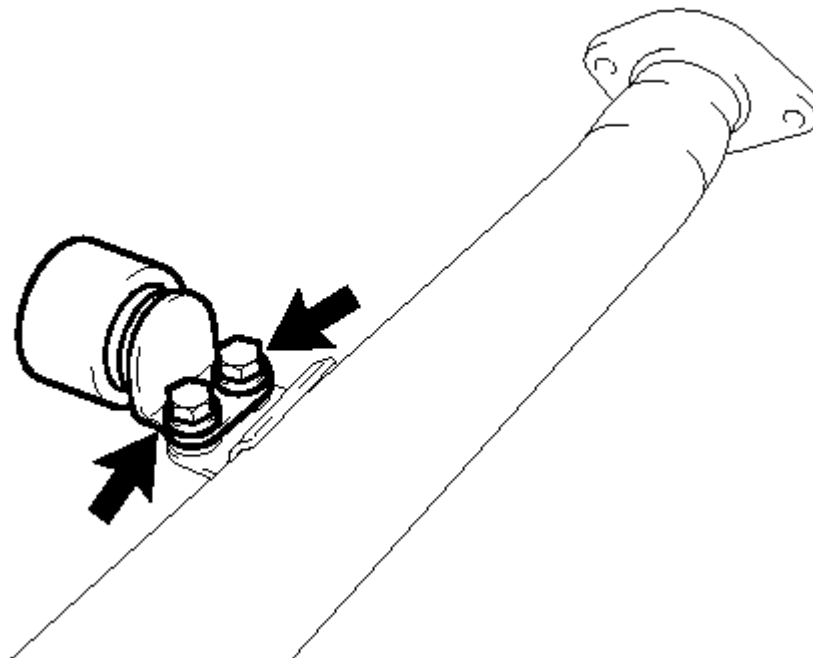
- b. Disconnect the 2 exhaust pipe supports and remove the center exhaust pipe assembly.
- c. Remove the gasket from the front exhaust pipe assembly.
- d. Remove the 2 bolts and 2 compression springs.



P

Fig. 66: Identifying Center Exhaust Pipe Assembly Compression Springs & Fasteners
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- e. Remove the gasket from the center exhaust pipe sub-assembly.
- 4. **REMOVE EXHAUST PIPE DAMPER**
 - a. Remove the 2 bolts and exhaust pipe damper.



P

Fig. 67: Identifying Exhaust Pipe Damper & Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. REMOVE NO. 1 EXHAUST PIPE SUPPORT BRACKET

- a. Remove the bolt, 2 nuts and No. 1 exhaust pipe support bracket.

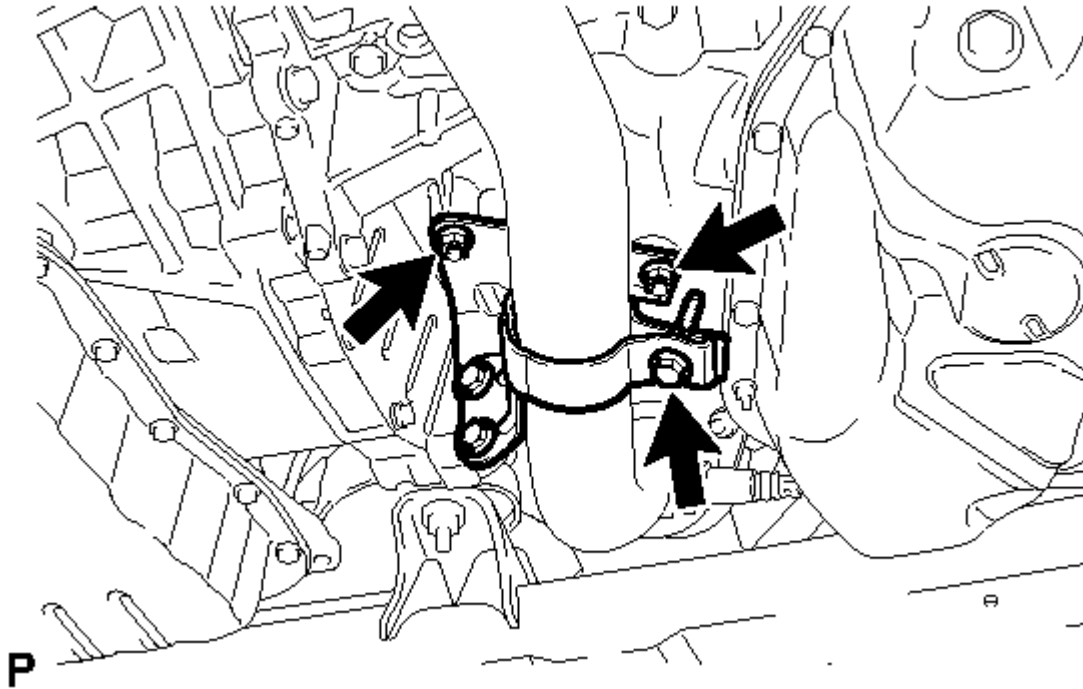


Fig. 68: Identifying No. 1 Exhaust Pipe Support Bracket & Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

6. REMOVE FRONT EXHAUST PIPE ASSEMBLY

- a. Disconnect the oxygen sensor (for bank 1 sensor 2) connector and pass the grommet through the floor.

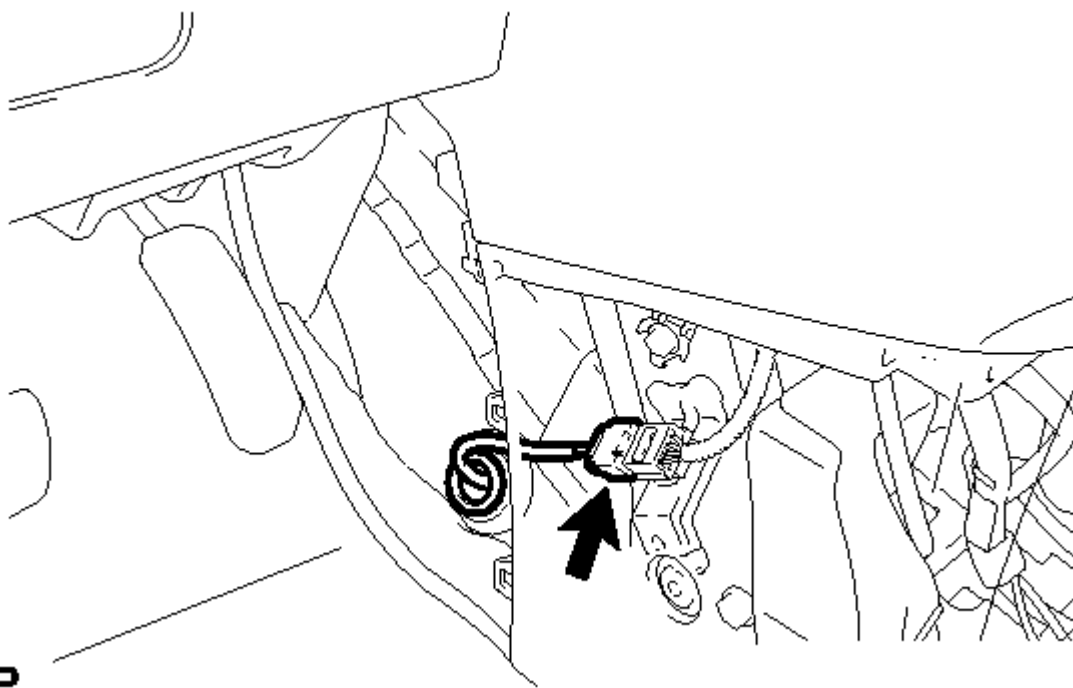


Fig. 69: Identifying Oxygen Sensor Connector (For Bank 1 Sensor 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Disconnect the oxygen sensor (for bank 2 sensor 2) connector and disengage the harness clamp.

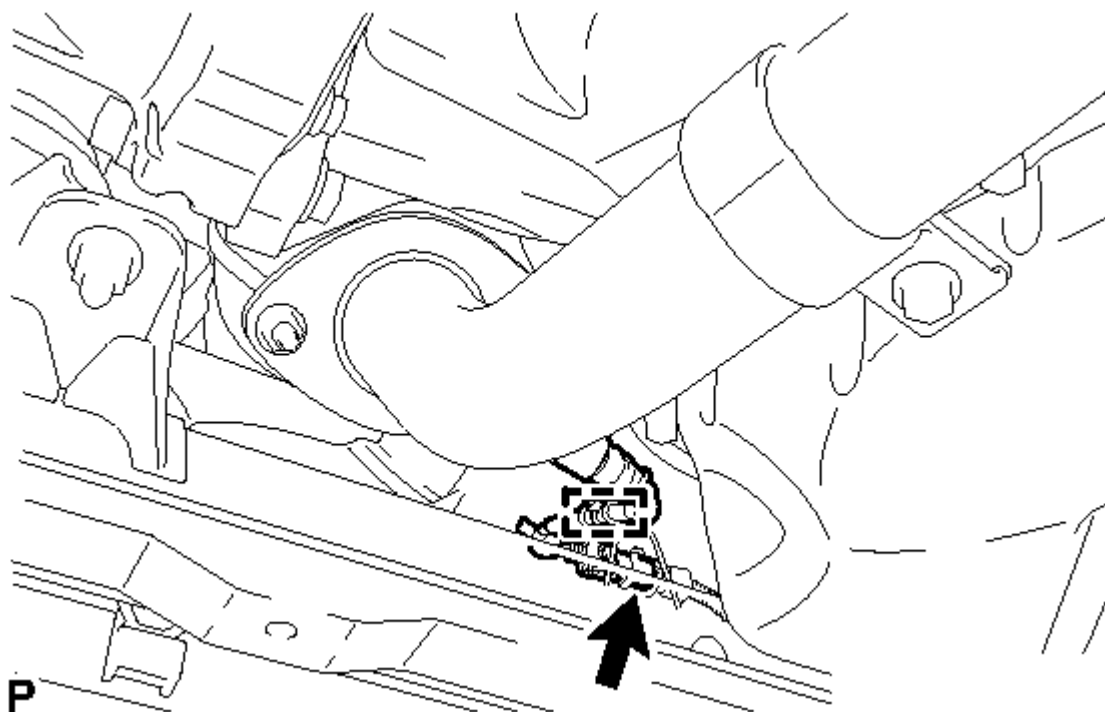
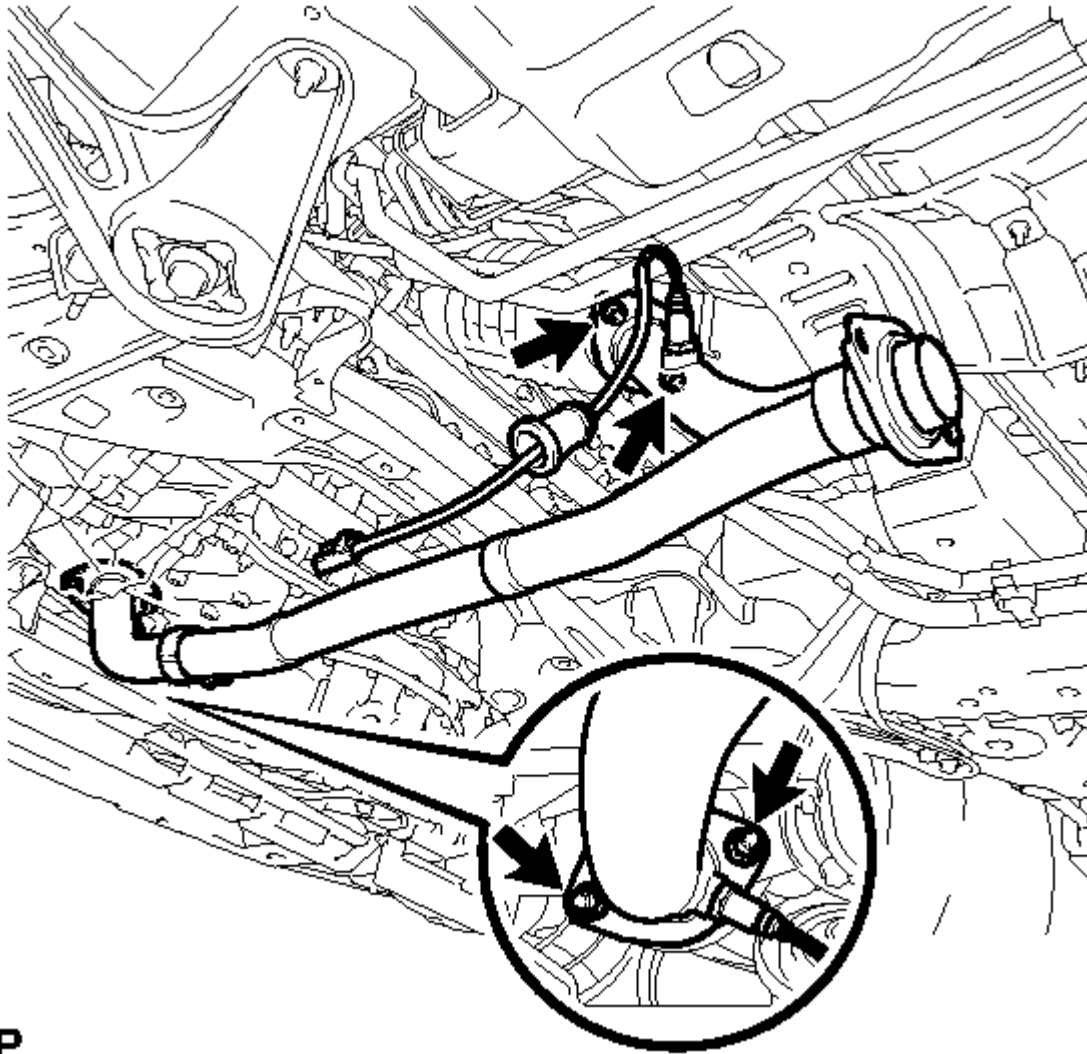


Fig. 70: Identifying Oxygen Sensor Connector & Clamp (For Bank 2 Sensor 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

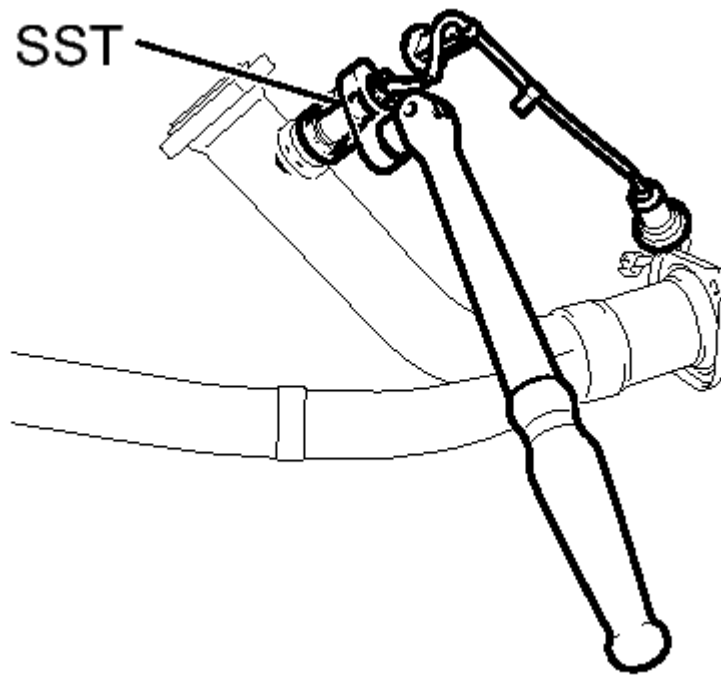
- c. Remove the 4 nuts and front exhaust pipe assembly.



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Fig. 71: Identifying Front Exhaust Pipe Assembly & Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Remove the 2 gaskets from the front exhaust pipe assembly.
- 7. REMOVE OXYGEN SENSOR (for Bank 1 Sensor 2)**
- a. Using SST, remove the oxygen sensor from the front exhaust pipe assembly.



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Fig. 72: Removing Oxygen (For Bank 1 Sensor 2) Using SST
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- SST: 09224-00010

8. REMOVE NO. 2 OXYGEN SENSOR (for Bank 2 Sensor 2)

- Using SST, remove the No. 2 oxygen sensor from the front exhaust pipe assembly.

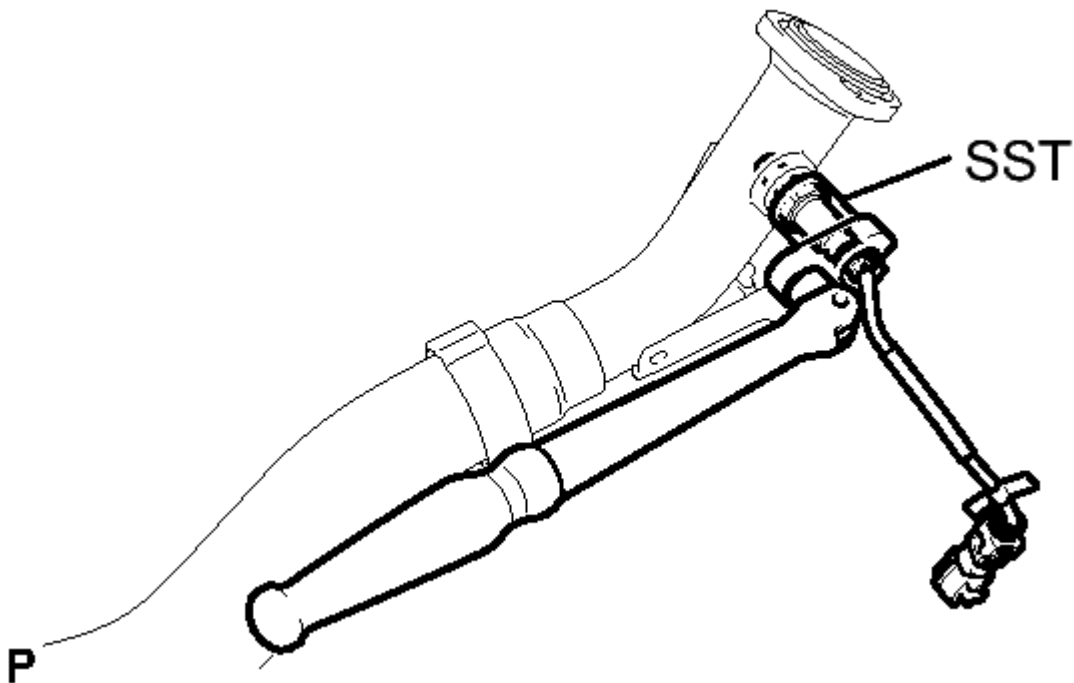


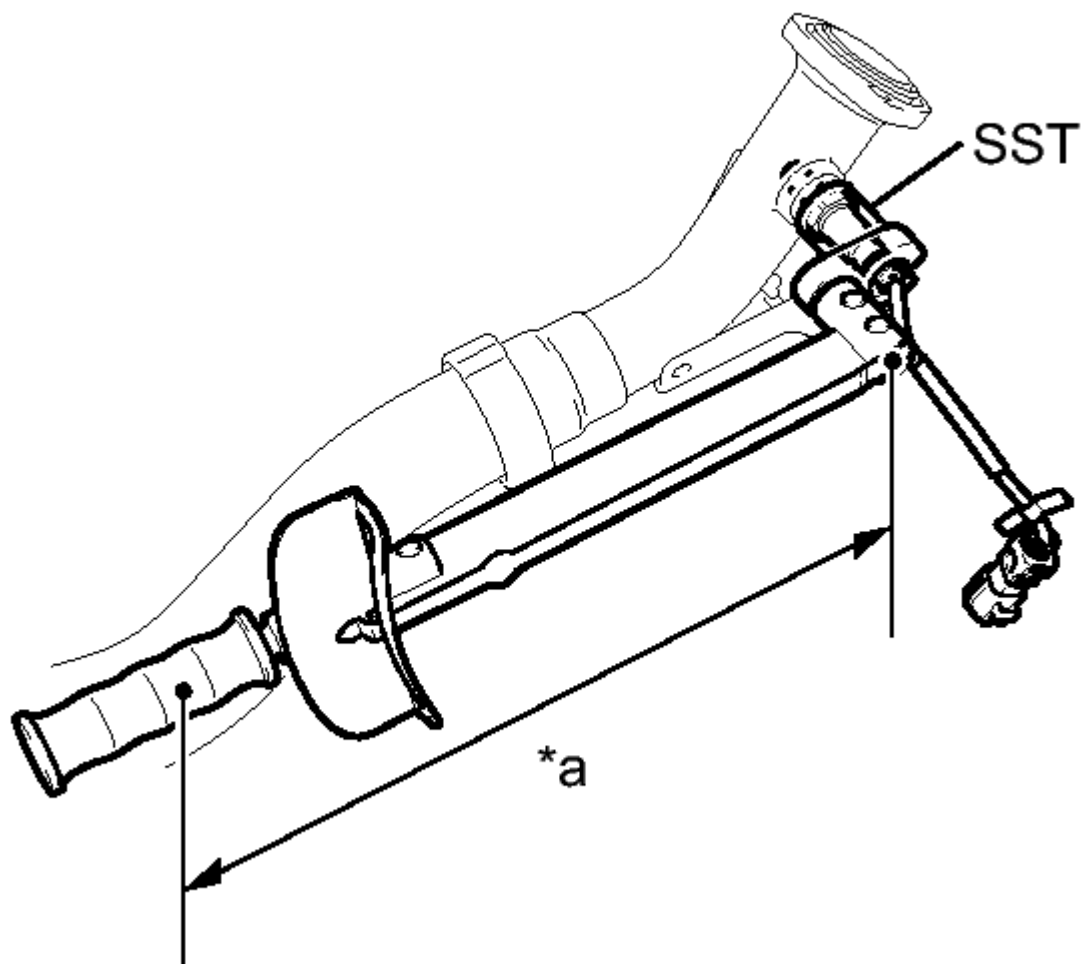
Fig. 73: Removing No. 2 Oxygen Sensor (For Bank 2 Sensor 2) Using SST
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- SST: 09224-00010

INSTALLATION

INSTALLATION

1. **INSTALL NO. 2 OXYGEN SENSOR (for Bank 2 Sensor 2)**
 - a. Using SST, install the No. 2 oxygen sensor to the front exhaust pipe assembly.



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Fig. 74: Installing No. 2 Oxygen Sensor (For Bank 2 Sensor 2) Using SST
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION



*a	Fulcrum
	Length

- SST: 09224-00010

without SST

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

with SST

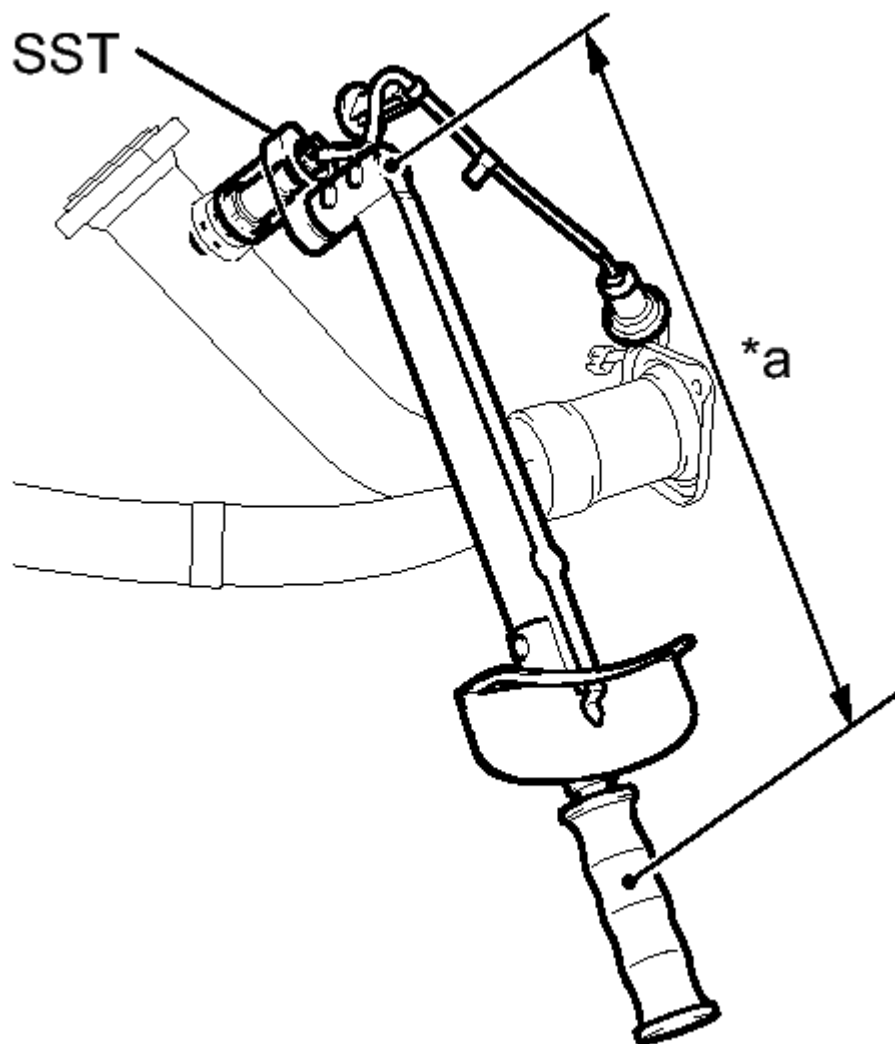
Torque: 40 N*m (408 kgf*cm, 30 ft.*lbf)

HINT:

- The "with SST" torque value is effective when using SST with a fulcrum length of 30 mm (1.18 in.).
- The "with SST" torque value is effective when using a torque wrench with a fulcrum length of 300 mm (11.81 in.). Refer to **PRECAUTION** .
- The "with SST" torque value is effective when SST is parallel to the torque wrench.

2. INSTALL OXYGEN SENSOR (for Bank 1 Sensor 2)

- a. Using SST, install the oxygen sensor to the front exhaust pipe assembly.



P

Fig. 75: Installing Oxygen Sensor (For Bank 1 Sensor 2) Using SST
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*a	Fulcrum Length
----	-------------------

- SST: 09224-00010

without SST

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

with SST

Torque: 40 N*m (408 kgf*cm, 30 ft.*lbf)

HINT:

- The "with SST" torque value is effective when using SST with a fulcrum length of 30 mm (1.18 in.).
- The "with SST" torque value is effective when using a torque wrench with a fulcrum length of 300 mm (11.81 in.). Refer to **PRECAUTION**.
- The "with SST" torque value is effective when SST is parallel to the torque wrench.

3. INSTALL FRONT EXHAUST PIPE ASSEMBLY

- a. Install 2 new gaskets to the front exhaust pipe assembly.
- b. Install the front exhaust pipe assembly with the 4 nuts.

Torque: 62 N*m (632 kgf*cm, 46 ft.*lbf)

- c. Connect the oxygen sensor (for bank 2 sensor 2) connector and engage the harness clamp.
- d. Pull the oxygen sensor (for bank 1 sensor 2) harness through the floor, install the grommet in the floor, and connect the oxygen sensor (for bank 1 sensor 2) connector.

4. INSTALL NO. 1 EXHAUST PIPE SUPPORT BRACKET

- a. Install the No. 1 exhaust pipe support bracket to oil pan sub-assembly with 2 new nuts.

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

- b. Slide the clamp to install it to the No. 1 exhaust pipe support bracket.
- c. Tighten the bolt to secure the clamp.

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

5. INSTALL EXHAUST PIPE DAMPER

- a. Install the exhaust pipe damper with the 2 new bolts.

Torque: 19 N*m (194 kgf*cm, 14 ft.*lbf)

6. INSTALL CENTER EXHAUST PIPE ASSEMBLY

- a. Using a vernier caliper, measure the free length of the compression spring.

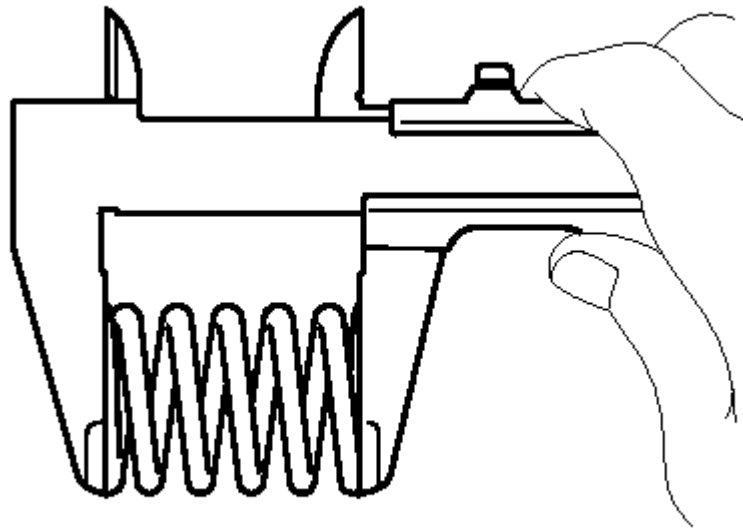


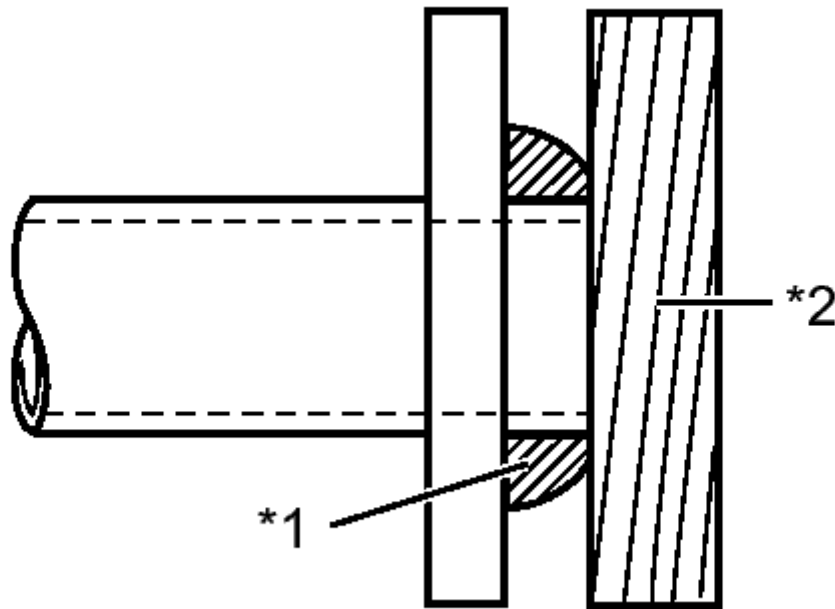
Fig. 76: Measuring Free Length Of Compression Spring
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Minimum Length

38.86 mm (1.5299 in.)

If the length is not as specified, replace the compression spring.

- b. Using a plastic hammer and a wooden block, tap in a new exhaust pipe gasket until its surface is flush with the center exhaust pipe sub-assembly.



Y

Fig. 77: Identifying Wooden Block & Gasket
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Gasket
*2	Wooden Block

NOTE:

- Install the gasket in the correct direction.
- Do not reuse the gasket.
- Do not damage the gasket by dropping it, etc.
- Do not damage the outer surface of the gasket.
- Do not push in the gasket with the exhaust pipe when connecting it.

- c. Install the center exhaust pipe sub-assembly to the center No. 2 exhaust pipe sub-assembly with the 2 compression springs and 2 bolts.

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

- d. Using a vernier caliper, measure the free length of the compression spring.

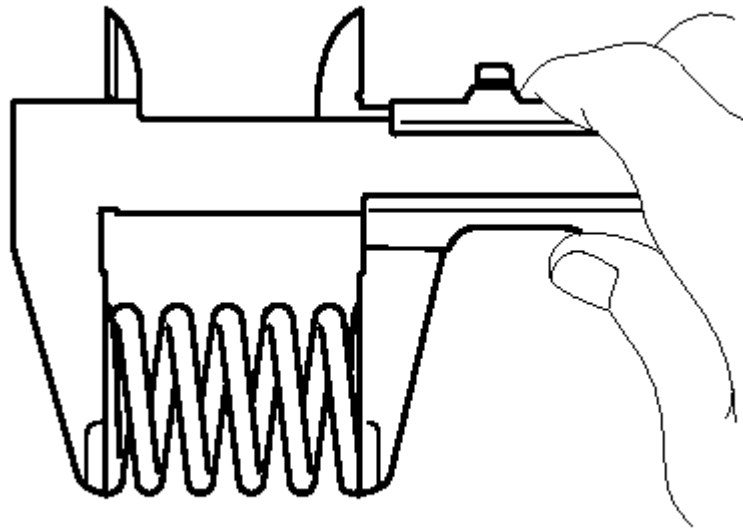


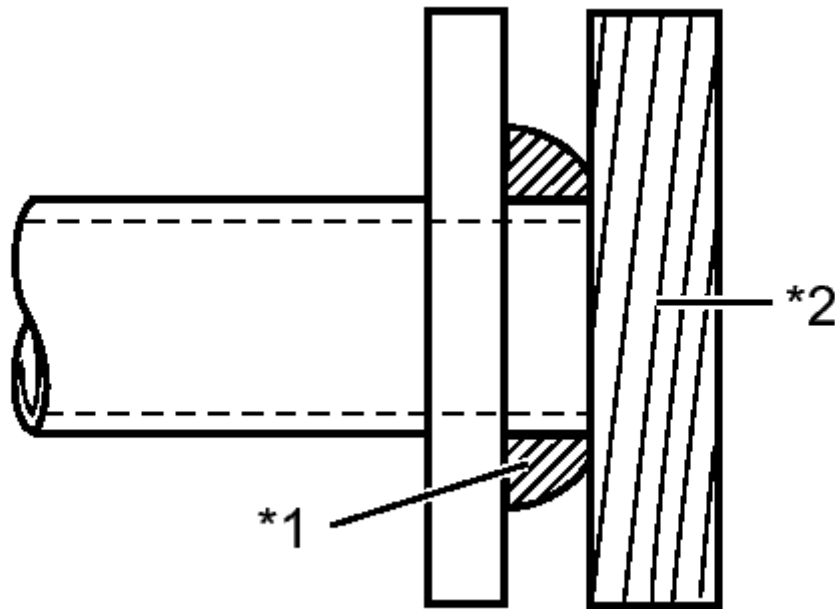
Fig. 78: Measuring Free Length Of Compression Spring
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Minimum Length

38.86 mm (1.5299 in.)

If the length is not as specified, replace the compression spring.

- e. Using a plastic hammer and a wooden block, tap in a new exhaust pipe gasket until its surface is flush with the front exhaust pipe assembly.



Y

Fig. 79: Identifying Wooden Block & Gasket
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Gasket
*2	Wooden Block

NOTE:

- Install the gasket in the correct direction.
- Do not reuse the gasket.
- Do not damage the gasket by dropping it, etc.
- Do not damage the outer surface of the gasket.
- Do not push in the gasket with the exhaust pipe when connecting it.

- Hang the center exhaust pipe assembly with the 2 exhaust pipe supports.
- Install the 2 compression springs and 2 bolts.

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

7. INSTALL TAIL EXHAUST PIPE ASSEMBLY

- Install a new gasket to the center exhaust pipe assembly.
- Hang the tail exhaust pipe assembly with the 3 exhaust pipe supports.
- Install 2 new bolts.

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

8. INSTALL INSTRUMENT PANEL FINISH PANEL END LH

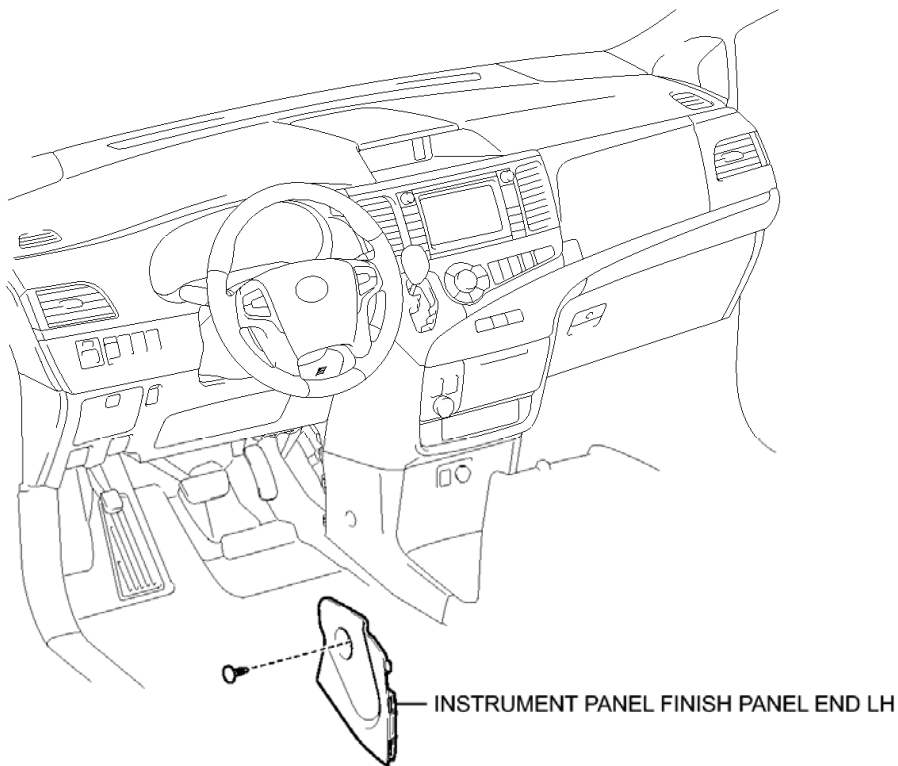
- a. Engage the 3 guides and install the instrument panel finish panel end LH.
- b. Install the clip.

9. INSPECT FOR EXHAUST GAS LEAK

EXHAUST PIPE (FOR 4WD)

COMPONENTS

ILLUSTRATION



P

Fig. 80: Exhaust Pipe Replacement Components With Torque Specifications (1 of 3)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

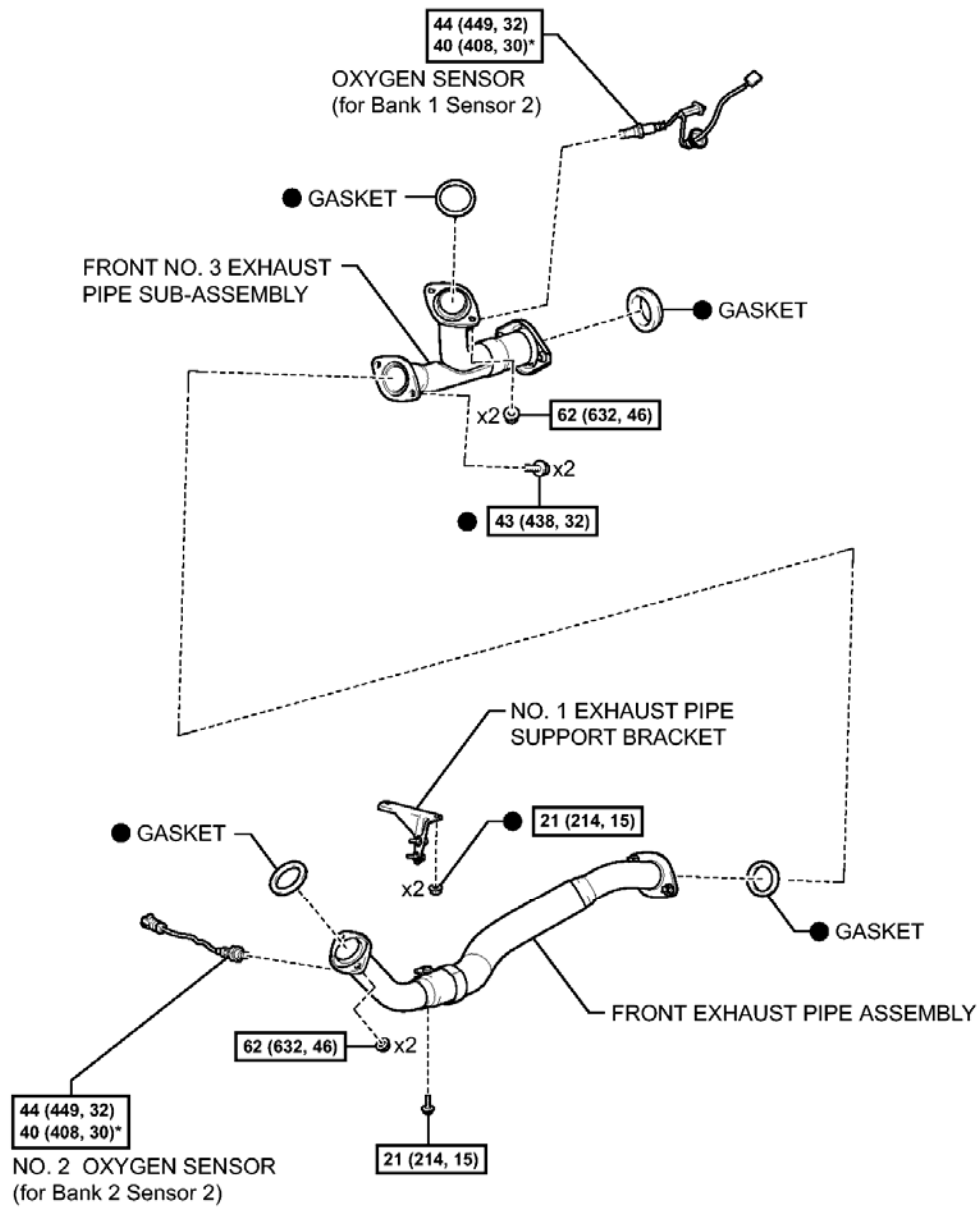
P



* For use with SST

- Non-reusable part

ILLUSTRATION



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

* For use with SST

● Non-reusable part

P

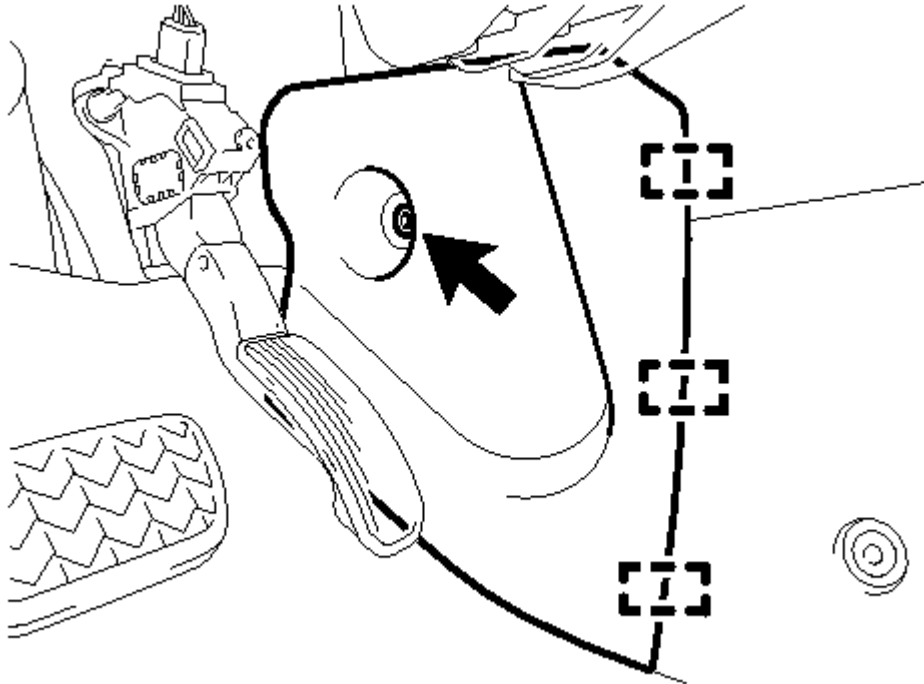
Fig. 82: Exhaust Pipe Replacement Components With Torque Specifications (3 of 3)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

REMOVAL

1. REMOVE INSTRUMENT PANEL FINISH PANEL END LH

- a. Using a clip remover, remove the clip.



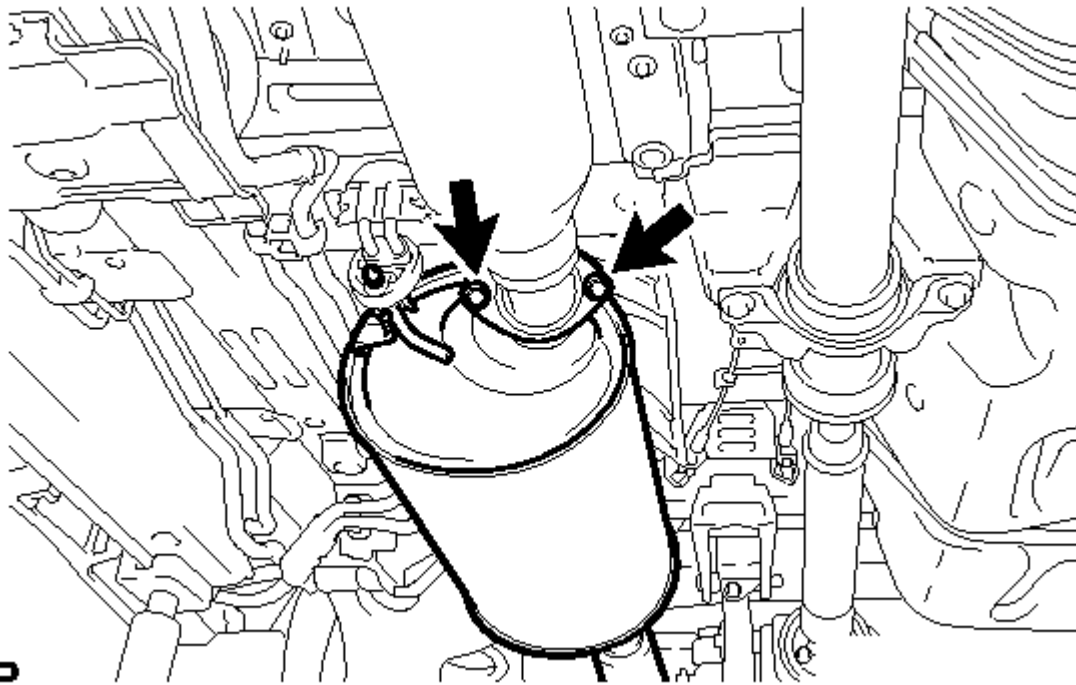
P

Fig. 83: Identifying Instrument Panel Finish Panel End LH Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Disengage the 3 guides and remove the instrument panel finish panel end LH.

2. REMOVE TAIL EXHAUST PIPE ASSEMBLY

- a. Remove the 2 bolts.



P

Fig. 84: Identifying Tail Exhaust Pipe Assembly & Fasteners
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Disconnect the 4 exhaust pipe supports and remove the tail exhaust pipe assembly.

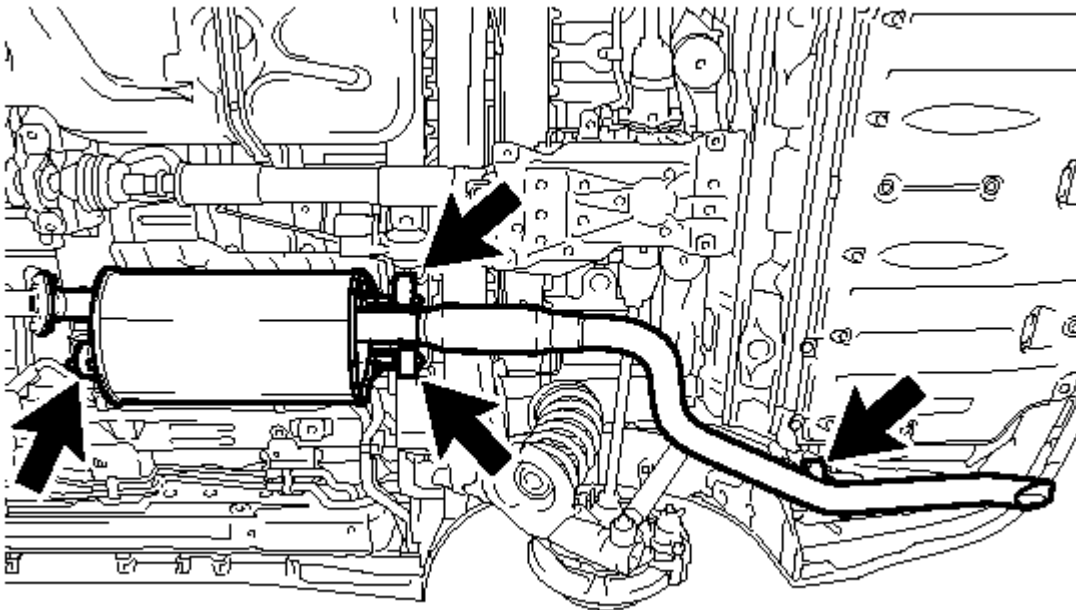


Fig. 85: Identifying Tail Exhaust Pipe Assembly Supports
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Remove the gasket from the center exhaust pipe assembly.

3. REMOVE CENTER EXHAUST PIPE ASSEMBLY

- a. Disconnect the oxygen sensor (for bank 1 sensor 2) connector and pass the grommet through the floor.

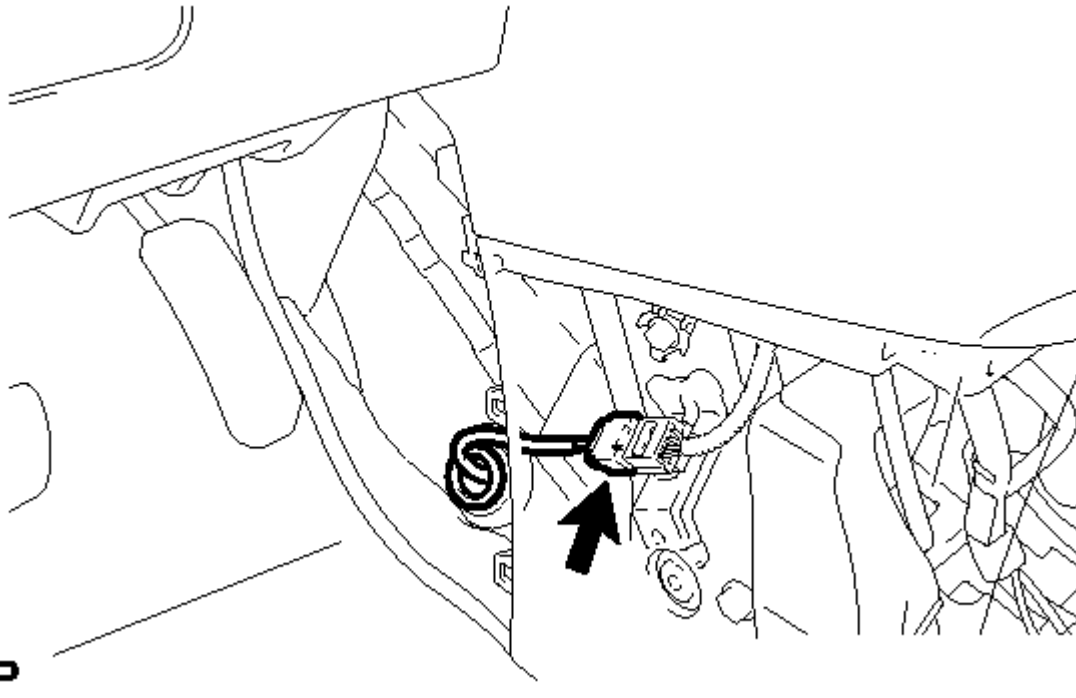


Fig. 86: Identifying Oxygen Sensor Connector (For Bank 1 Sensor 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Disengage the harness clamp.

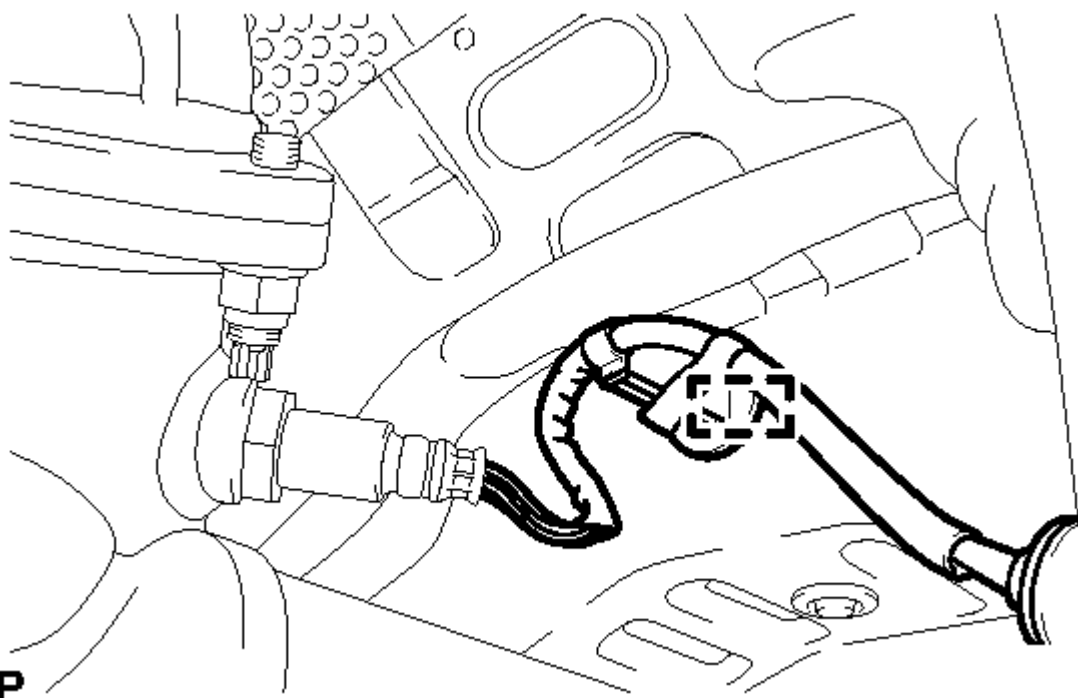


Fig. 87: Identifying Oxygen Sensor Harness Clamp
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Remove the 2 bolts and 2 nuts.

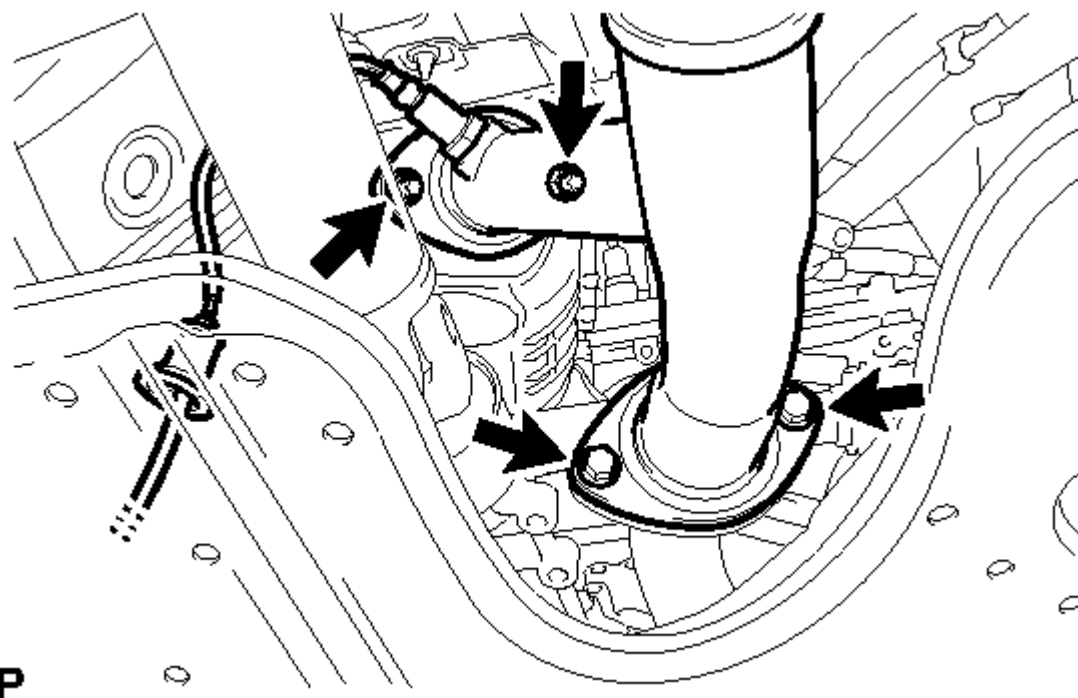


Fig. 88: Identifying Center Exhaust Pipe Assembly & Fasteners
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Disconnect the 2 exhaust pipe supports and remove the center exhaust pipe assembly.

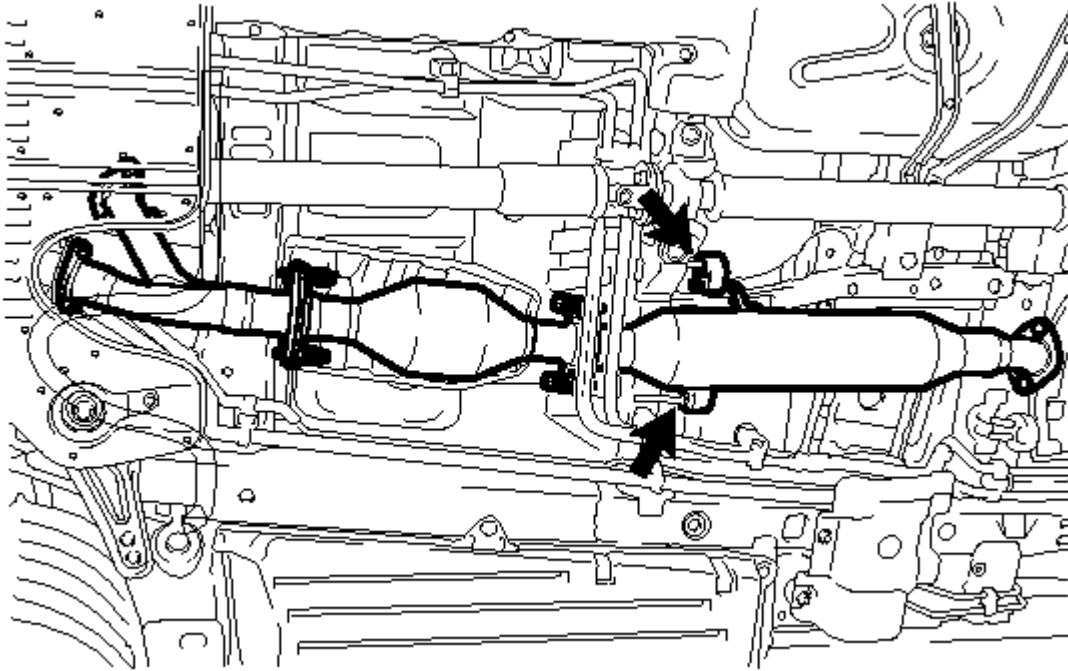
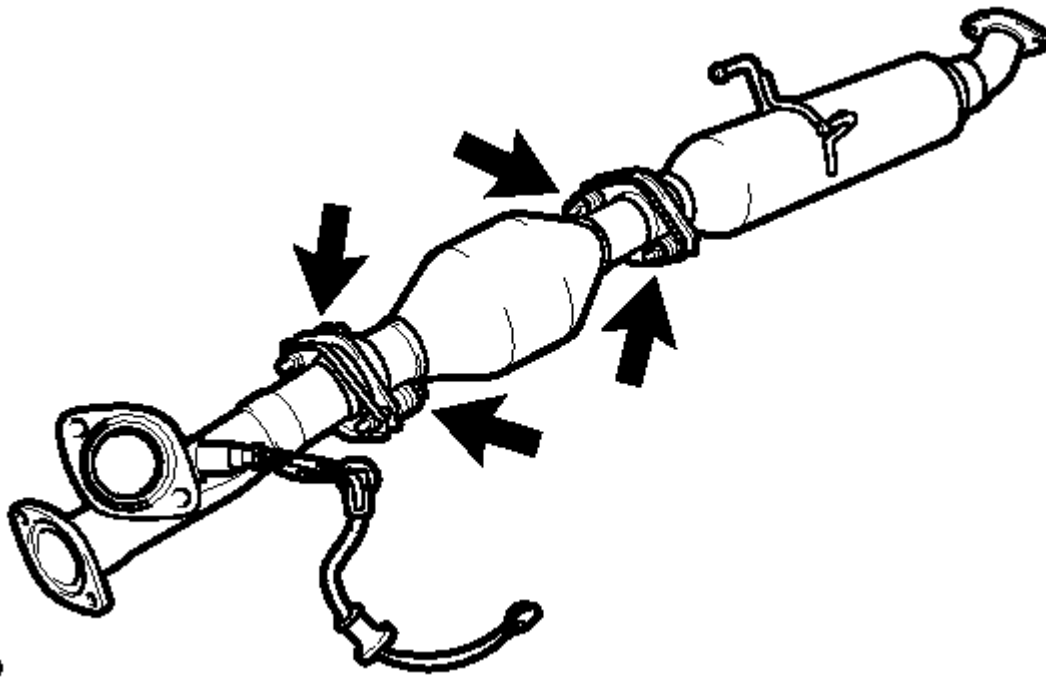


Fig. 89: Identifying Center Exhaust Pipe Assembly & Pipe Supports
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- e. Remove the 2 gaskets from the center exhaust pipe assembly and the front exhaust pipe assembly.
- f. Remove the 4 bolts and 4 compression springs.



P

Fig. 90: Identifying Compression Springs & Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- g. Remove the 2 gaskets from the front No. 3 exhaust pipe sub-assembly and center exhaust pipe sub-assembly.
- 4. **REMOVE NO. 1 EXHAUST PIPE SUPPORT BRACKET**
 - a. Remove the bolt, 2 nuts and No. 1 exhaust pipe support bracket.

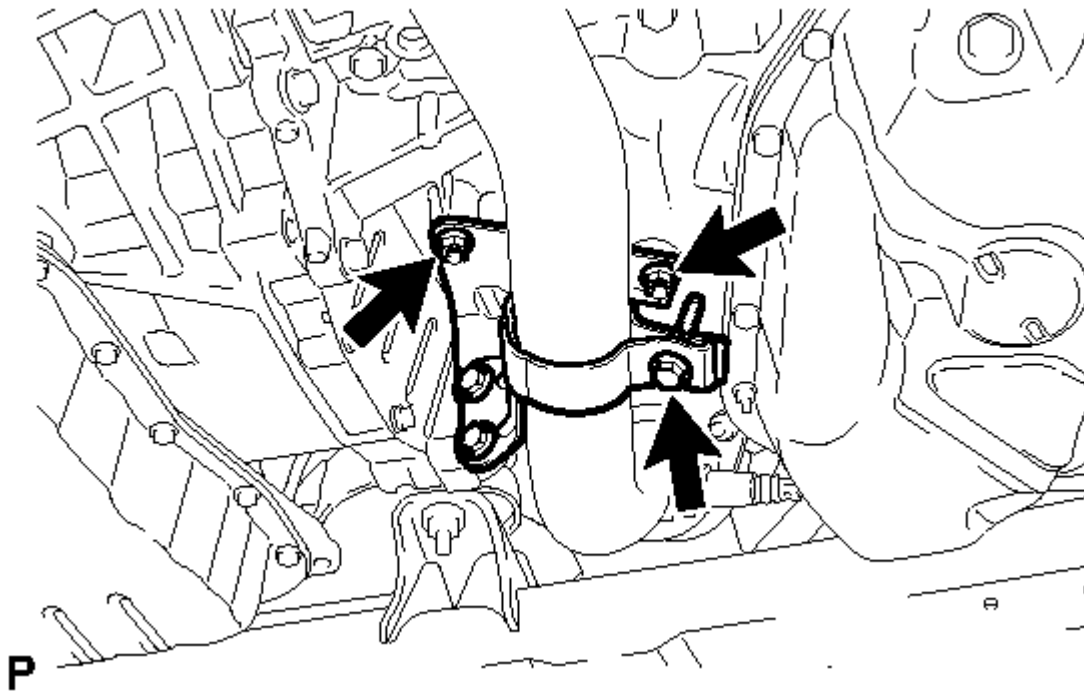


Fig. 91: Identifying No. 1 Exhaust Pipe Support Bracket & Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. REMOVE FRONT EXHAUST PIPE ASSEMBLY

- a. Disconnect the oxygen sensor (for bank 2 sensor 2) connector and disengage the harness clamp.

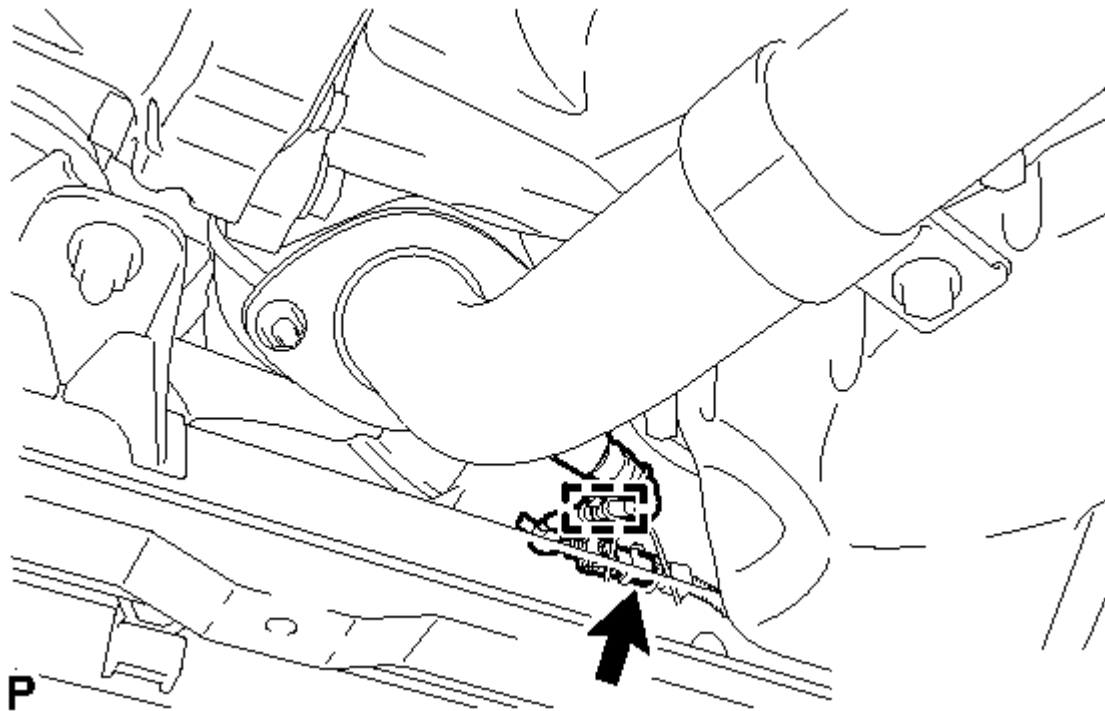


Fig. 92: Identifying Oxygen Sensor Connector & Clamp (For Bank 2 Sensor 2)

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the 2 nuts and front exhaust pipe assembly.

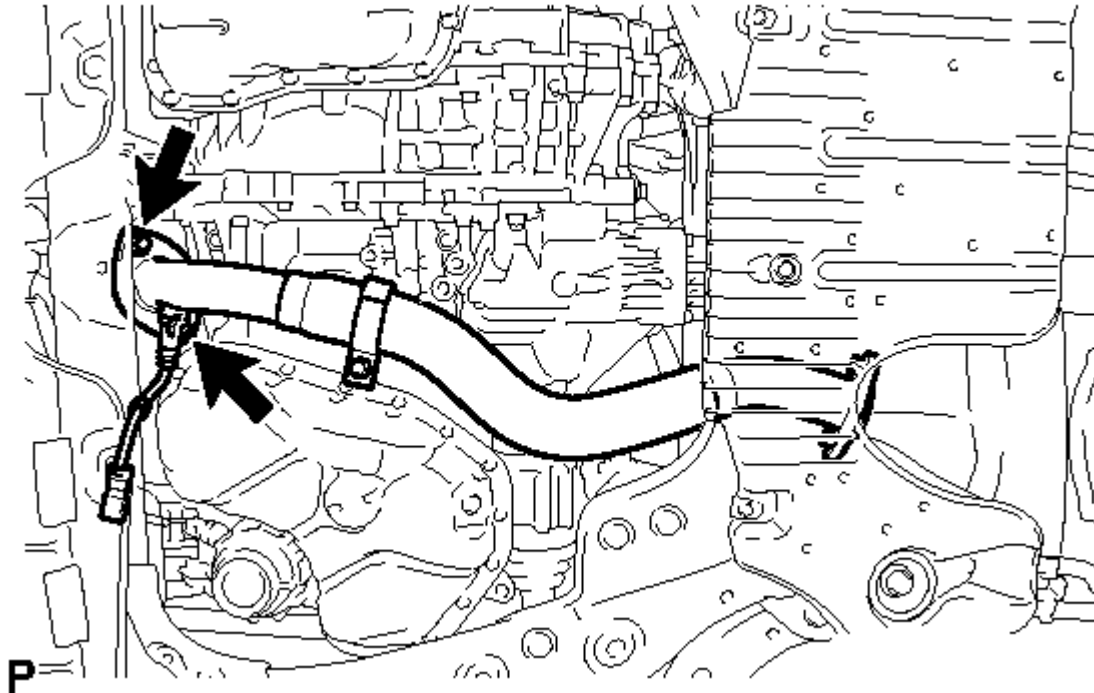
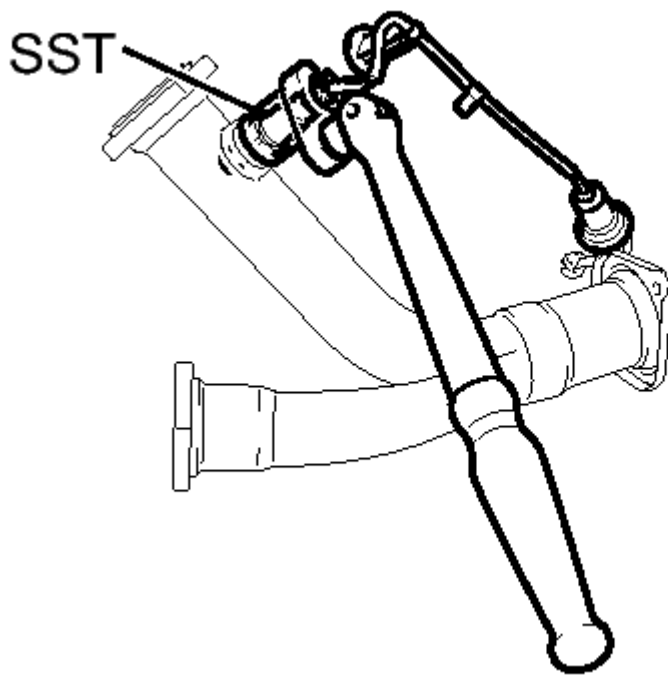


Fig. 93: Identifying Front Exhaust Pipe Assembly & Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Remove the gasket from the front exhaust pipe assembly.
6. **REMOVE OXYGEN SENSOR (for Bank 1 Sensor 2)**
- a. Using SST, remove the oxygen sensor from the front No. 3 exhaust pipe sub-assembly.



P

Fig. 94: Removing Oxygen Sensor (For Bank 1 Sensor 2) Using SST
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- SST: 09224-00010

7. REMOVE NO. 2 OXYGEN SENSOR (for Bank 2 Sensor 2)

- Using SST, remove the No. 2 oxygen sensor from the front exhaust pipe assembly.

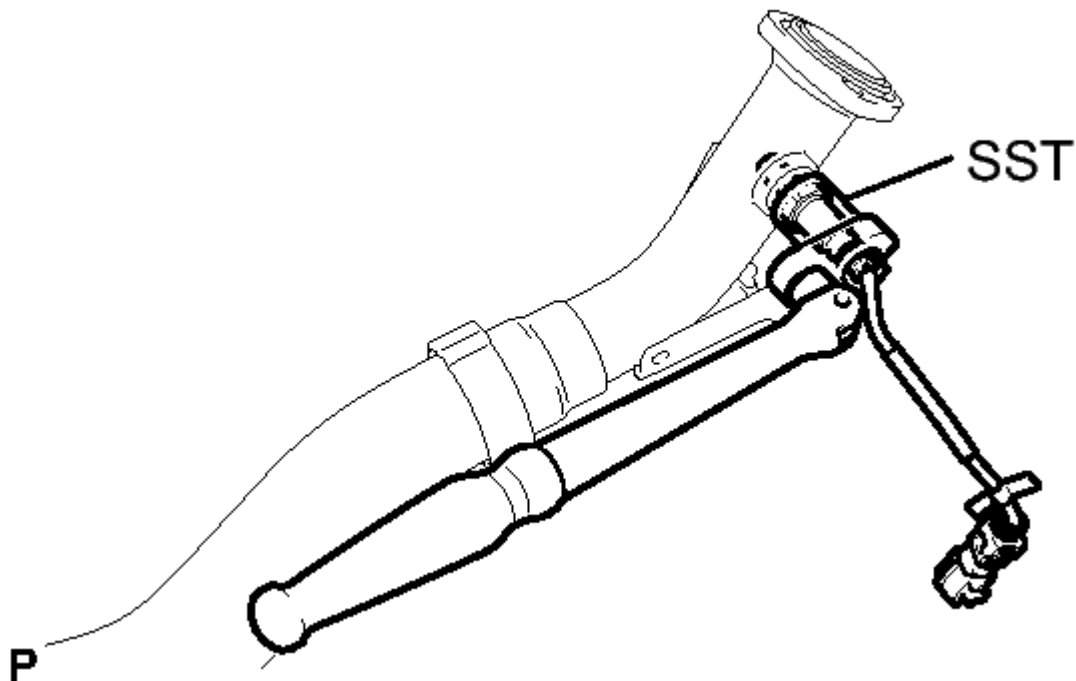


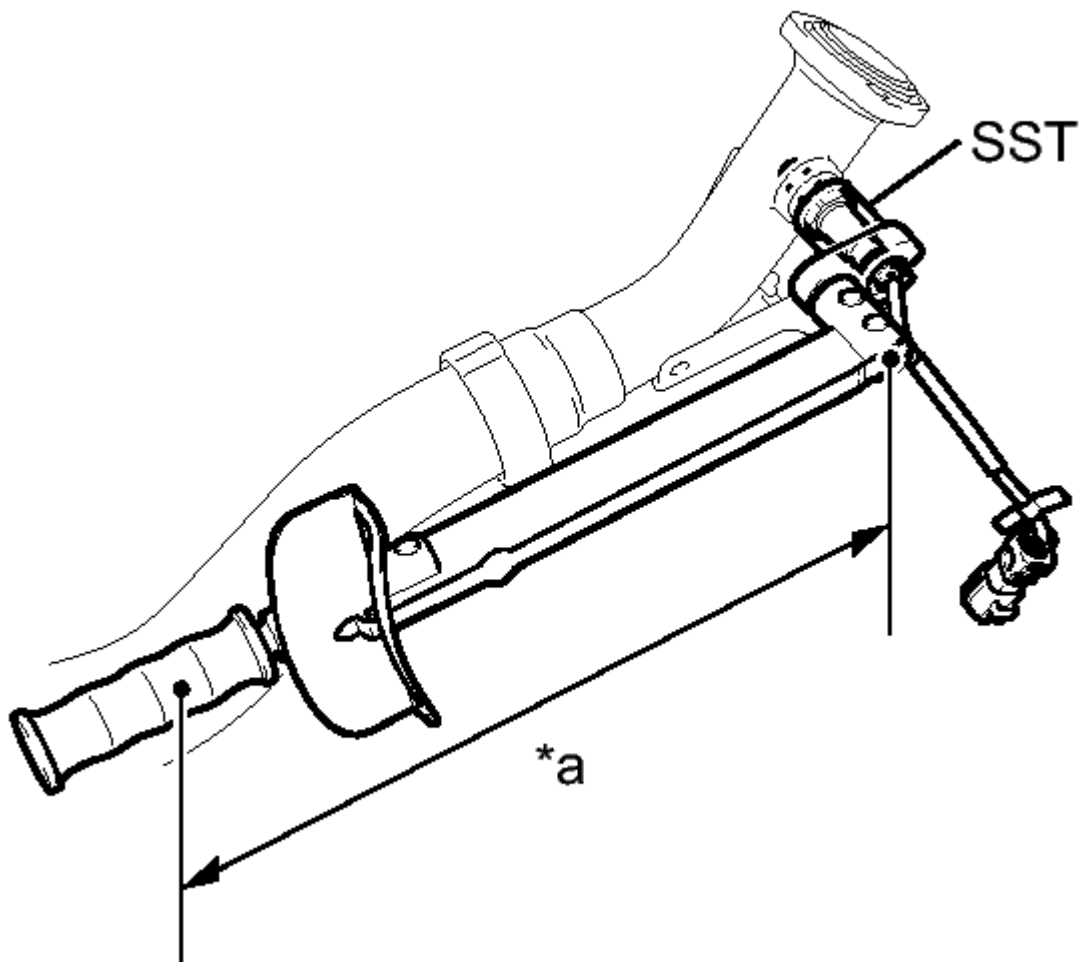
Fig. 95: Removing No. 2 Oxygen Sensor (For Bank 2 Sensor 2) Using SST
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- SST: 09224-00010

INSTALLATION

INSTALLATION

1. **INSTALL NO. 2 OXYGEN SENSOR (for Bank 2 Sensor 2)**
 - a. Using SST, install the No. 2 oxygen sensor to the front exhaust pipe assembly.



P

Fig. 96: Installing No. 2 Oxygen Sensor (For Bank 2 Sensor 2) Using SST
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION



*a	Fulcrum Length
----	-------------------

- SST: 09224-00010

without SST

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

with SST

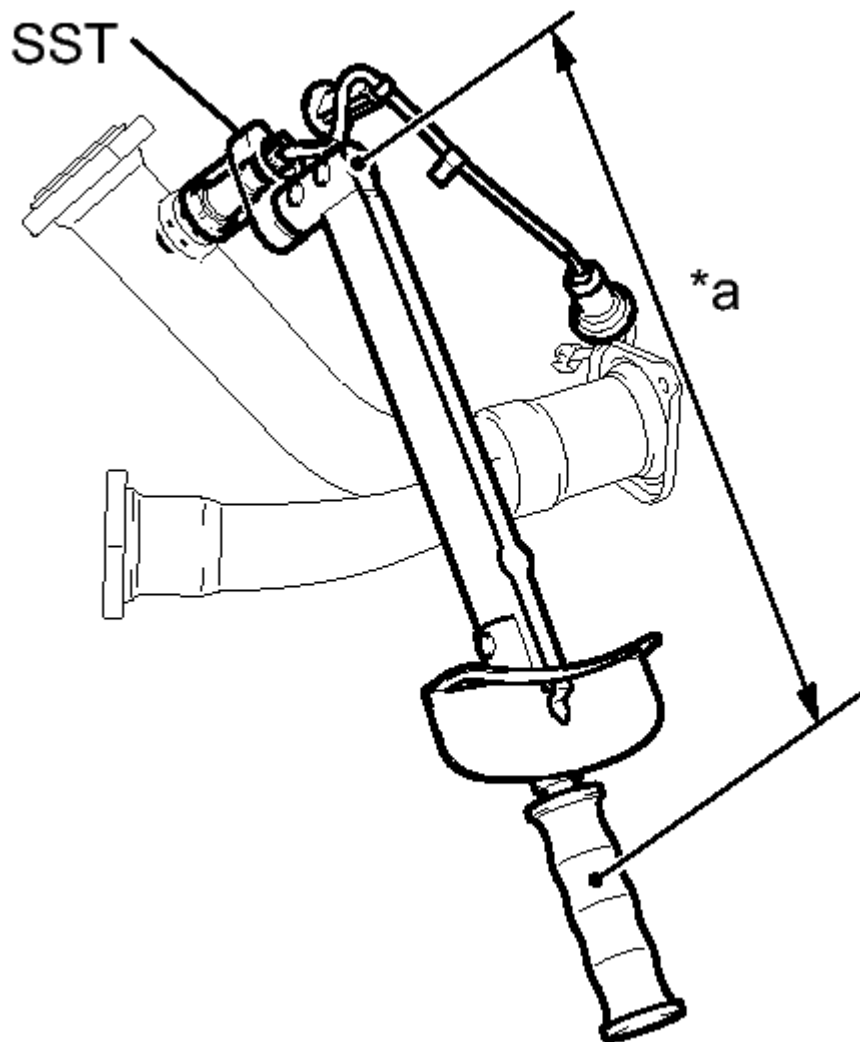
Torque: 40 N*m (408 kgf*cm, 30 ft.*lbf)

HINT:

- The "with SST" torque value is effective when using SST with a fulcrum length of 30 mm (1.18 in.).
- The "with SST" torque value is effective when using a torque wrench with a fulcrum length of 300 mm (11.81 in.). Refer to **PRECAUTION** .
- The "with SST" torque value is effective when SST is parallel to the torque wrench.

2. INSTALL OXYGEN SENSOR (for Bank 1 Sensor 2)

- Using SST, install the oxygen sensor to the front No. 3 exhaust pipe sub-assembly.



P

Fig. 97: Installing Oxygen Sensor (For Bank 1 Sensor 2) Using SST
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*a	Fulcrum
	Length

- SST: 09224-00010

without SST

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

with SST

Torque: 40 N*m (408 kgf*cm, 30 ft.*lbf)

HINT:

- The "with SST" torque value is effective when using SST with a fulcrum length of 30 mm (1.18 in.).
- The "with SST" torque value is effective when using a torque wrench with a fulcrum length of 300 mm (11.81 in.). Refer to **PRECAUTION** .
- The "with SST" torque value is effective when SST is parallel to the torque wrench.

3. INSTALL FRONT EXHAUST PIPE ASSEMBLY

- a. Install a new gasket to the front exhaust pipe assembly.
- b. Install the front exhaust pipe assembly with the 2 nuts.

Torque: 62 N*m (632 kgf*cm, 46 ft.*lbf)

- c. Connect the oxygen sensor (for bank 2 sensor 2) connector and engage the harness clamp.

4. INSTALL NO. 1 EXHAUST PIPE SUPPORT BRACKET

- a. Install the No. 1 exhaust pipe support bracket to oil pan sub-assembly with 2 new nuts.

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

- b. Slide the clamp to install it to the No. 1 exhaust pipe support bracket.
- c. Tighten the bolt to secure the clamp.

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

5. INSTALL CENTER EXHAUST PIPE ASSEMBLY

- a. Using a vernier caliper, measure the free length of the compression spring.

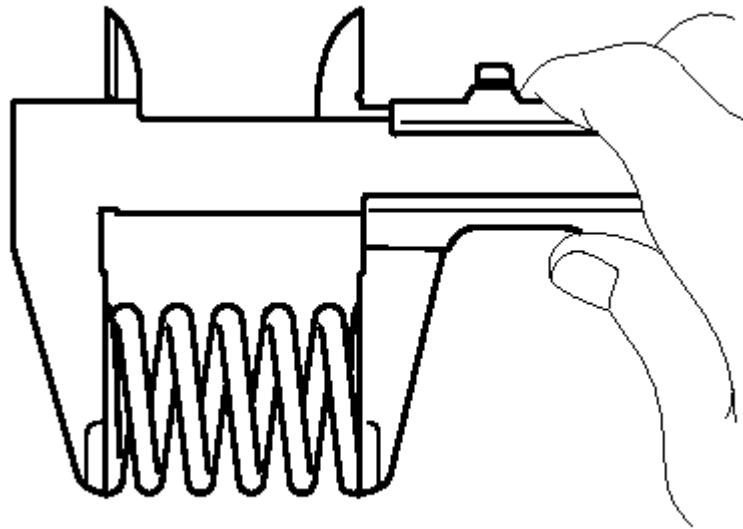


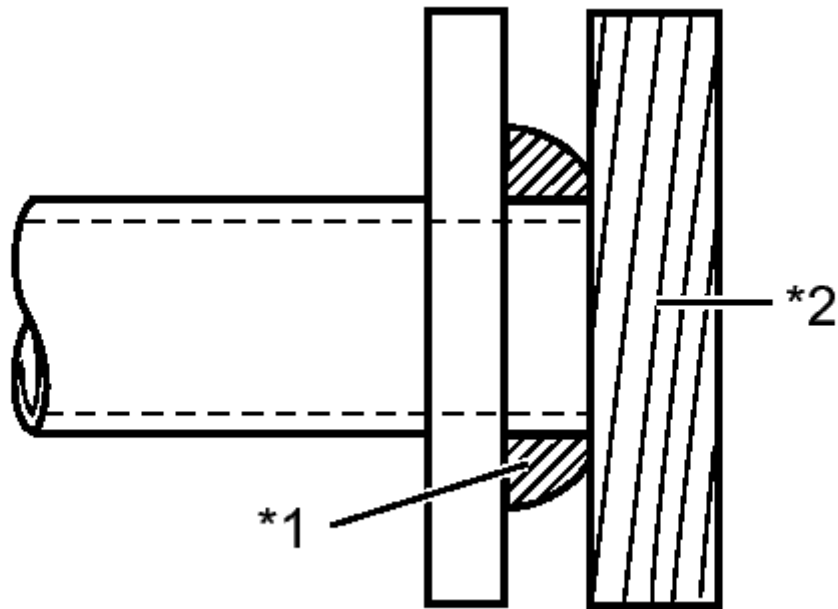
Fig. 98: Measuring Free Length Of Compression Spring
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Minimum Length

40.5 mm (1.594 in.)

If the length is not as specified, replace the compression spring.

- b. Using a plastic hammer and a wooden block, tap in a new exhaust pipe gasket until its surface is flush with the front No. 3 exhaust pipe sub-assembly



Y

Fig. 99: Identifying Wooden Block & Gasket
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Gasket
*2	Wooden Block

NOTE:

- Install the gasket in the correct direction.
- Do not reuse the gasket.
- Do not damage the gasket by dropping it, etc.
- Do not damage the outer surface of the gasket.
- Do not push in the gasket with the exhaust pipe when connecting it.

- c. Using a vernier caliper, measure the free length of the compression spring.

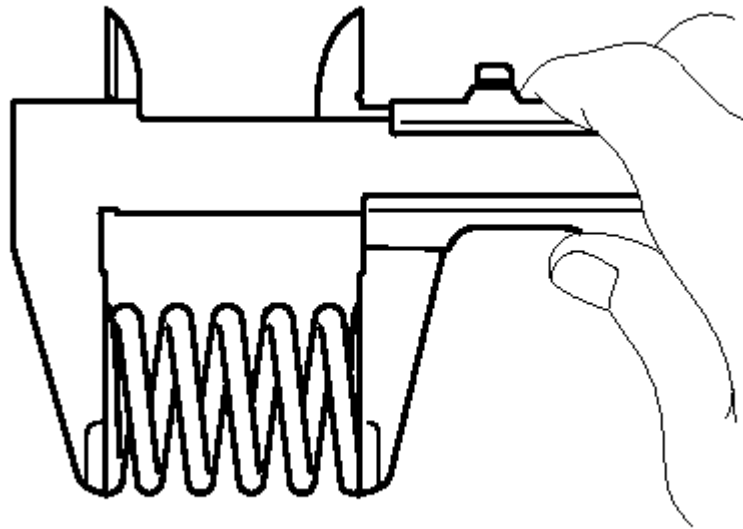


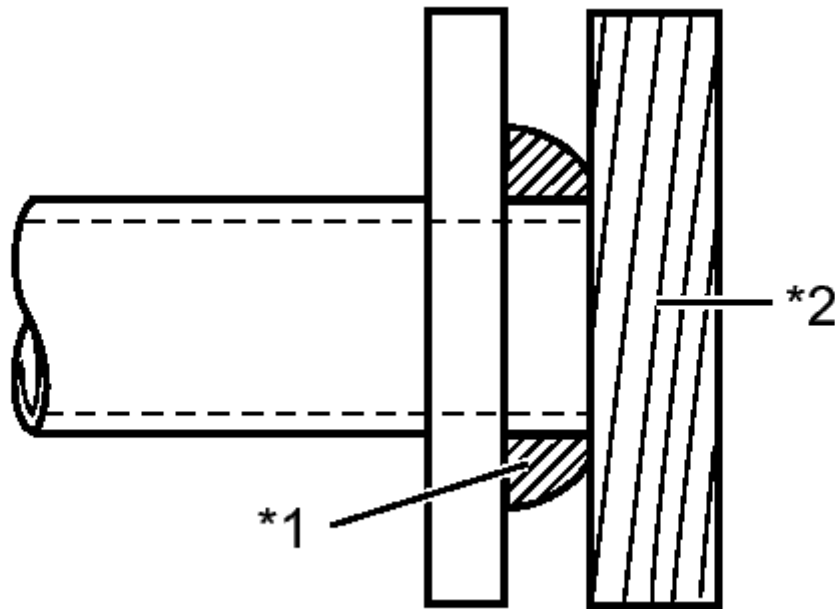
Fig. 100: Measuring Free Length Of Compression Spring
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Minimum Length

40.5 mm (1.594 in.)

If the length is not as specified, replace the compression spring.

- d. Using a plastic hammer and a wooden block, tap in a new exhaust pipe gasket until its surface is flush with the center exhaust pipe sub-assembly.



Y

Fig. 101: Identifying Wooden Block & Gasket
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Gasket
*2	Wooden Block

NOTE:

- Install the gasket in the correct direction.
- Do not reuse the gasket.
- Do not damage the gasket by dropping it, etc.
- Do not damage the outer surface of the gasket.
- Do not push in the gasket with the exhaust pipe when connecting it.

e. Install the 4 compression springs and 4 bolts.

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

- f. Install 2 new gaskets to the center exhaust pipe assembly and the front exhaust pipe assembly.
- g. Hang the center exhaust pipe assembly with the 2 exhaust pipe supports.
- h. Install 2 new bolts and 2 nuts.

Bolt

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

Nut

Torque: 62 N*m (632 kgf*cm, 46 ft.*lbf)

- i. Connect the harness clamp.
- j. Pull the oxygen sensor (for bank 1 sensor 2) harness through the floor, install the grommet in the floor, and connect the oxygen sensor (for bank 1 sensor 2) connector.

6. INSTALL TAIL EXHAUST PIPE ASSEMBLY

- a. Install a new gasket to the center exhaust pipe assembly.
- b. Hang the tail exhaust pipe assembly with the 4 exhaust pipe supports.
- c. Install 2 new bolts.

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

7. INSTALL INSTRUMENT PANEL FINISH PANEL END LH

- a. Engage the 3 guides and install the instrument panel finish panel end LH.
- b. Install the clip.

8. INSPECT FOR EXHAUST GAS LEAK