

2009 Toyota Highlander Limited

2009 ENGINE Exhaust (1AR-FE) - Highlander

2009 ENGINE

Exhaust (1AR-FE) - Highlander

EXHAUST MANIFOLD

COMPONENTS

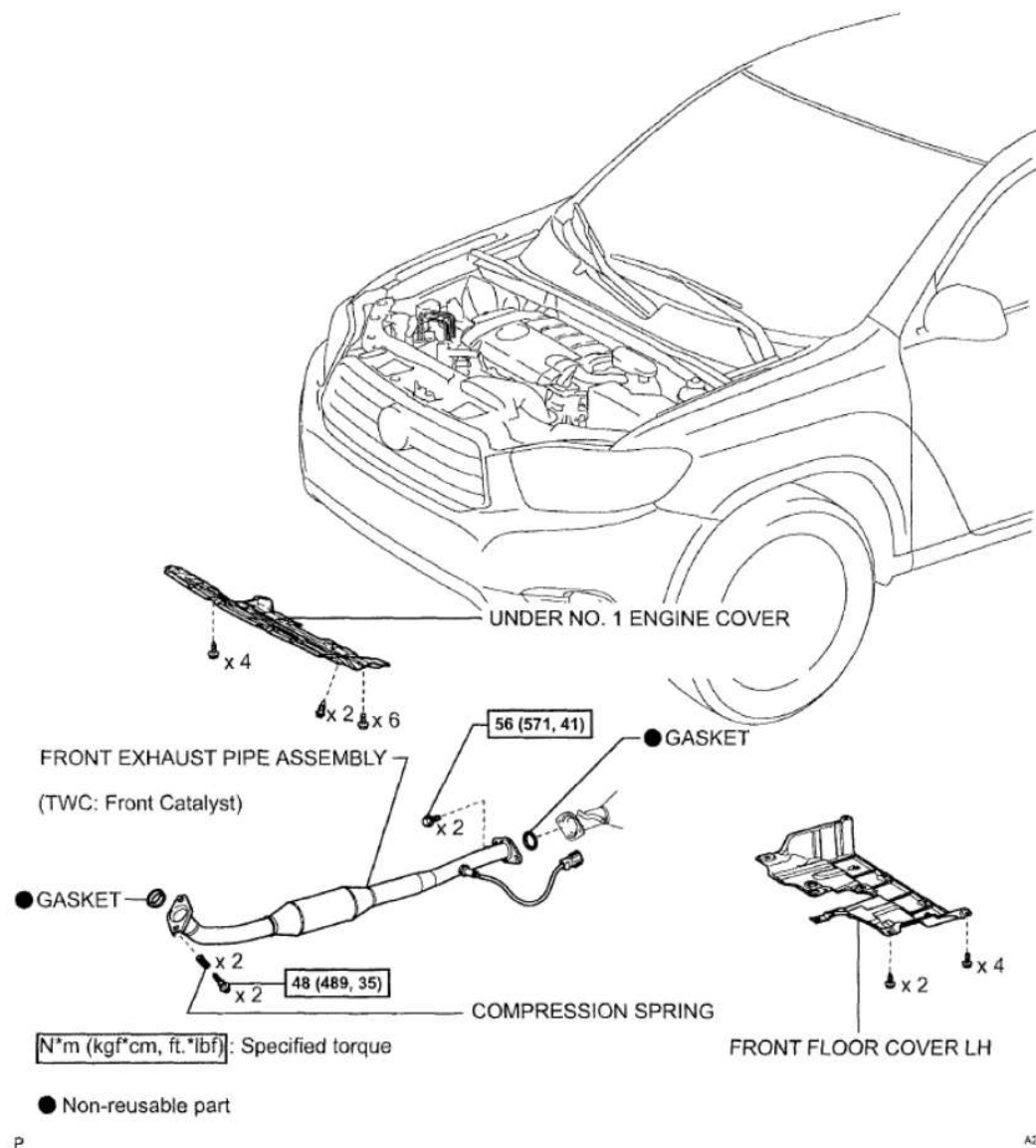


Fig. 1: Identifying Exhaust Manifold Components And Torque Specifications (1 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2009 Toyota Highlander Limited

2009 ENGINE Exhaust (1AR-FE) - Highlander

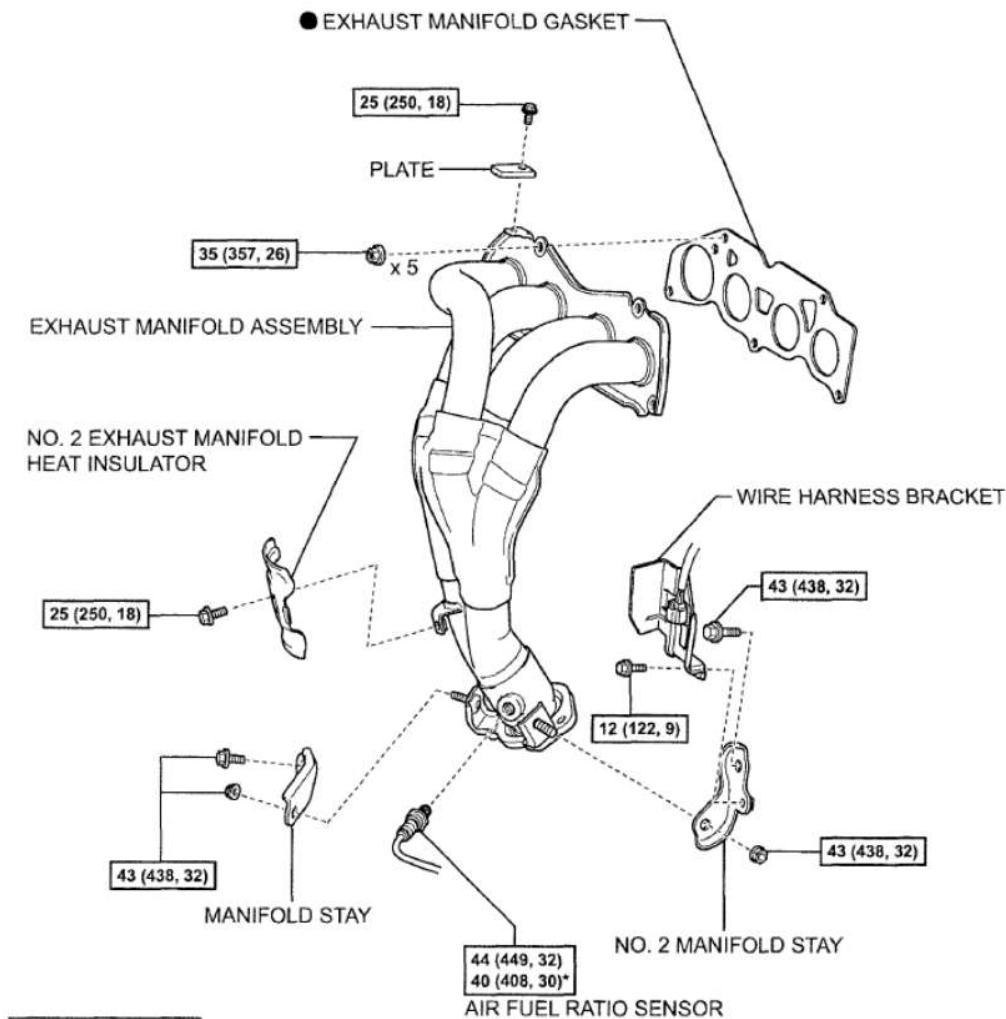


Fig. 2: Identifying Exhaust Manifold Components And Torque Specifications (2 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

1. REMOVE UNDER NO. 1 ENGINE COVER
2. REMOVE FRONT FLOOR COVER LH
 - a. Disconnect the 3 clips.
 - b. Remove the 2 screws, 4 bolts and front floor cover LH.

2009 Toyota Highlander Limited

2009 ENGINE Exhaust (1AR-FE) - Highlander

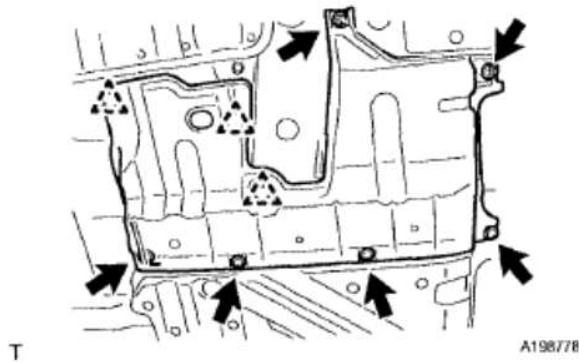


Fig. 3: Locating Screws, Bolts And Front Floor Cover LH
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. REMOVE FRONT EXHAUST PIPE ASSEMBLY

- a. Disconnect the clamp and connector.

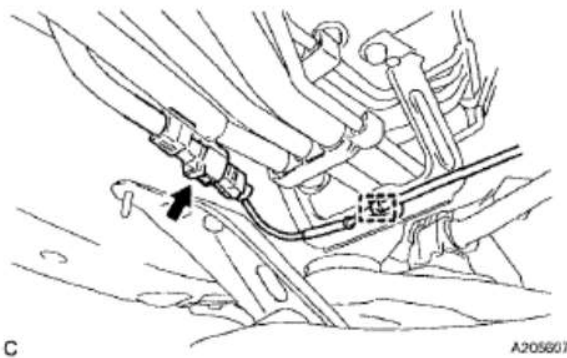
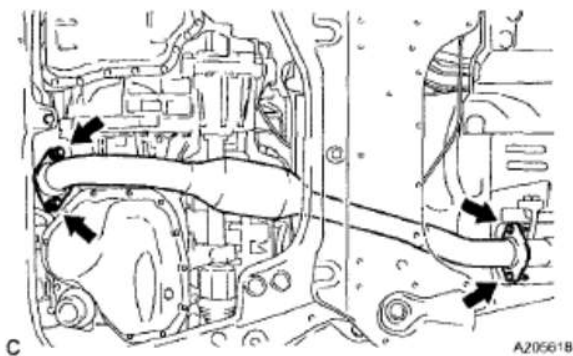


Fig. 4: Locating Clamp And Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the 4 bolts, 2 compression springs and front exhaust pipe.
- c. Remove the gasket from the front exhaust pipe.
- d. Remove the gasket from the exhaust manifold assembly.



2009 Toyota Highlander Limited

2009 ENGINE Exhaust (1AR-FE) - Highlander

Fig. 5: Locating Bolts, Compression Springs And Front Exhaust Pipe
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. REMOVE MANIFOLD STAY

- a. Remove the bolt, nut and stay.

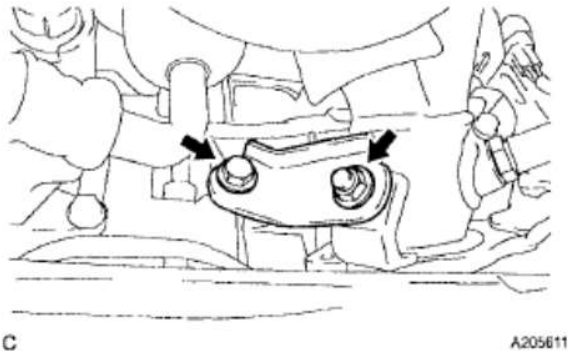


Fig. 6: Locating Bolt, Nut And Stay
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. REMOVE NO. 2 MANIFOLD STAY

- a. Disconnect the connector.
- b. Remove the bolt and wire harness clamp.



Fig. 7: Locating Bolt And Wire Harness Clamp
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

2009 Toyota Highlander Limited

2009 ENGINE Exhaust (1AR-FE) - Highlander

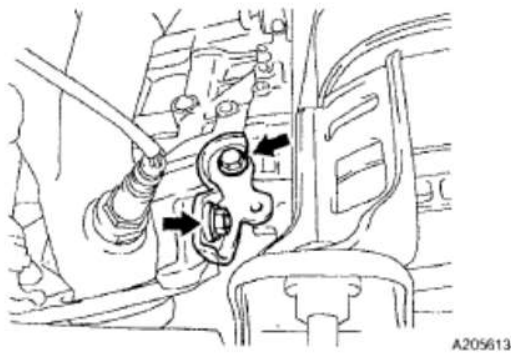


Fig. 8: Locating Bolt, Nut And No. 2 Manifold Stay
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

6. REMOVE EXHAUST MANIFOLD ASSEMBLY

- a. Remove the bolt and plate.

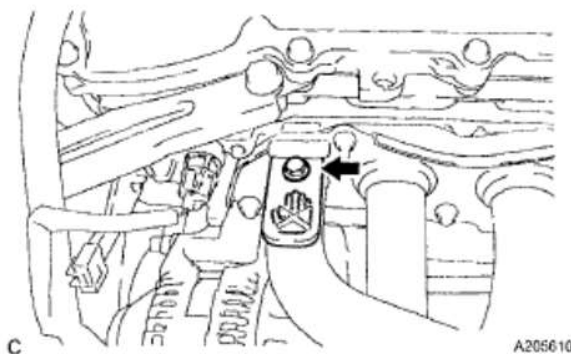


Fig. 9: Locating Bolt And Plate
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the 5 nuts and exhaust manifold.

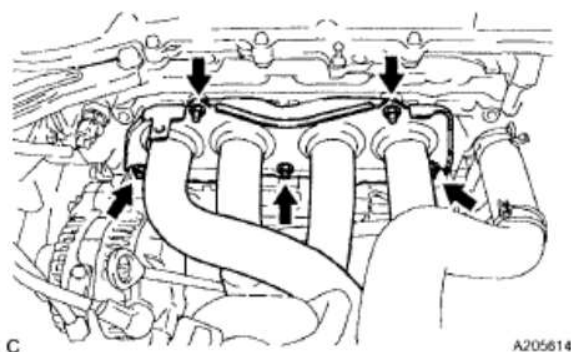


Fig. 10: Locating Nuts And Exhaust Manifold
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2009 Toyota Highlander Limited

2009 ENGINE Exhaust (1AR-FE) - Highlander

- c. Remove the exhaust manifold gasket.

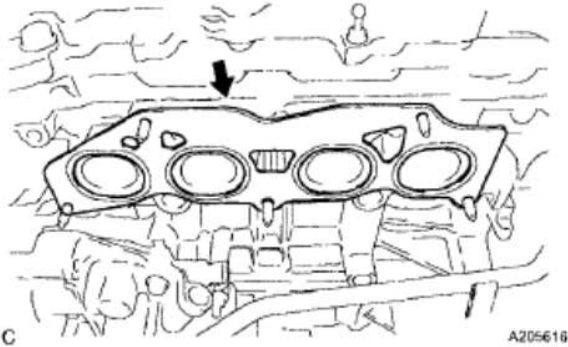


Fig. 11: Locating Exhaust Manifold Gasket

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

7. REMOVE NO. 2 EXHAUST MANIFOLD HEAT INSULATOR

- a. Remove the bolt and No. 2 exhaust manifold heat insulator.

8. REMOVE AIR FUEL RATIO SENSOR (See REMOVAL)

INSTALLATION

1. INSTALL AIR FUEL RATIO SENSOR (See INSTALLATION)



Fig. 12: Locating Bolt And No. 2 Exhaust Manifold Heat Insulator

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

2. INSTALL NO. 2 EXHAUST MANIFOLD HEAT INSULATOR

- a. Install the No. 2 exhaust manifold heat insulator with the bolt.

Torque: 25 N*m (250 kgf*cm, 18 ft.*lbf)

2009 Toyota Highlander Limited

2009 ENGINE Exhaust (1AR-FE) - Highlander



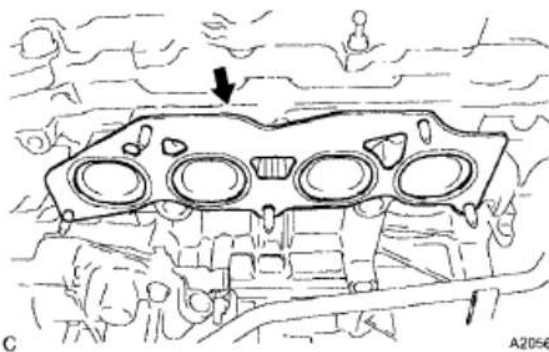
C

A205615

Fig. 13: Locating Bolt And No. 2 Exhaust Manifold Heat Insulator
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. INSTALL EXHAUST MANIFOLD ASSEMBLY

- a. Install a new gasket onto the cylinder head.



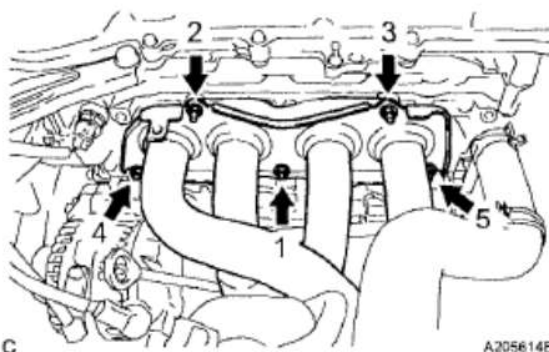
C

A205616

Fig. 14: Locating Exhaust Manifold Gasket
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Temporarily install the exhaust manifold assembly with the 5 nuts.
- c. Tighten the 5 nuts in the sequence shown in the illustration.

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



C

A205614E01

Fig. 15: Locating Exhaust Manifold Assembly And Nuts

2009 Toyota Highlander Limited

2009 ENGINE Exhaust (1AR-FE) - Highlander

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

- d. Install the plate with the bolt.

Torque: 25 N*m (250 kgf*cm, 18 ft.*lbf)

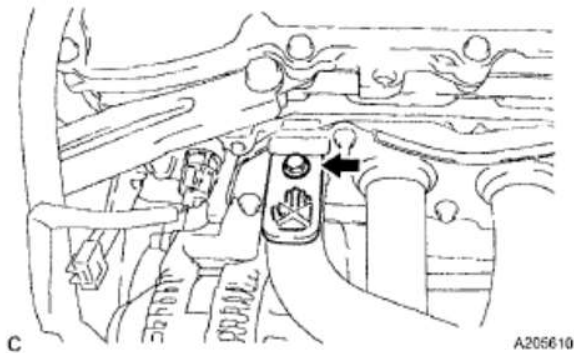


Fig. 16: Locating Plate With Bolt

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

4. INSTALL NO. 2 MANIFOLD STAY

- a. Install the No. 2 manifold stay with the bolt and nut.

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

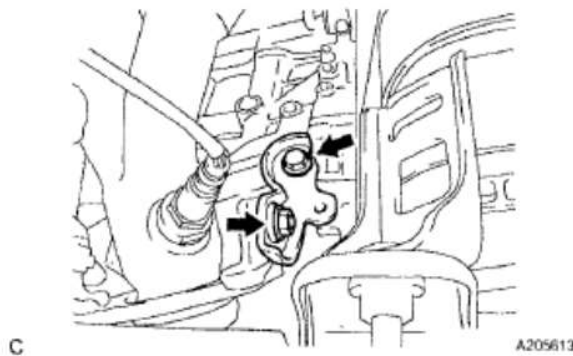


Fig. 17: Locating No. 2 Manifold Stay With Bolt And Nut

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

- b. Install the wire harness bracket with the bolt.

Torque: 12 N*m (122 kgf*cm, 9 ft.*lbf)

2009 Toyota Highlander Limited

2009 ENGINE Exhaust (1AR-FE) - Highlander

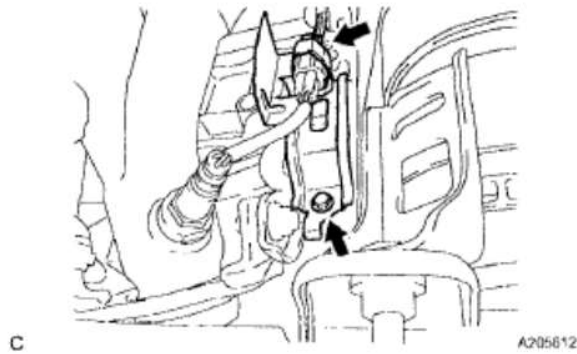


Fig. 18: Locating Wire Harness Bracket And Bolt
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. INSTALL MANIFOLD STAY

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

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

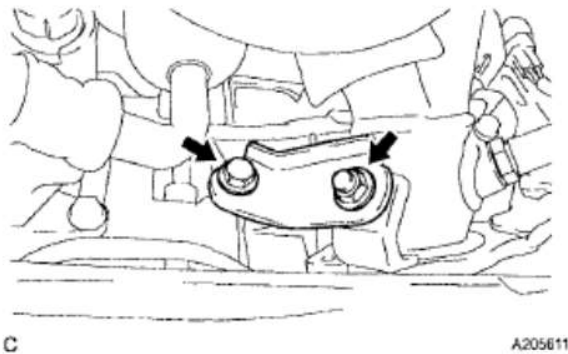


Fig. 19: Locating Manifold Stay With Bolt And Nut
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

6. INSTALL FRONT EXHAUST PIPE ASSEMBLY

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

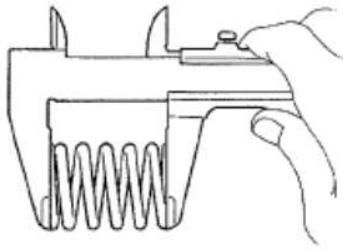
Minimum length: 41.5 mm (1.64 in.)

If the length is less than the minimum, replace the compression spring.

- b. Fully insert a new gasket to the exhaust manifold assembly.

2009 Toyota Highlander Limited

2009 ENGINE Exhaust (1AR-FE) - Highlander



A077857E03

Fig. 20: Measuring Free Length Of Compression Spring

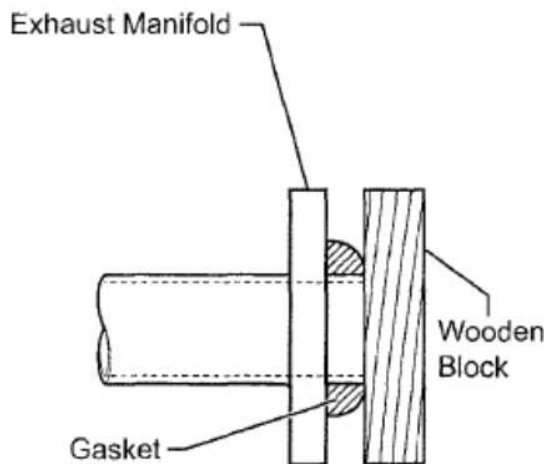
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

NOTE:

- Be sure to install the gasket in the correct direction.
- Do not reuse the gasket.
- Do not damage the gasket.
- Do not push in the gasket by using the exhaust pipe when connecting it.

- d. Install a new gasket to the front exhaust pipe.



A161728E1B

Fig. 21: Identifying Wooden Block And Exhaust Manifold Assembly

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

- e. Install the front exhaust pipe with the 2 compression springs and 4 bolts.

Torque: 48 N*m (489 kgf*cm, 35 ft.*lbf) for bolt A

2009 Toyota Highlander Limited

2009 ENGINE Exhaust (1AR-FE) - Highlander

56 N*m (571 kgf*cm, 41 ft.*lbf) for bolt B

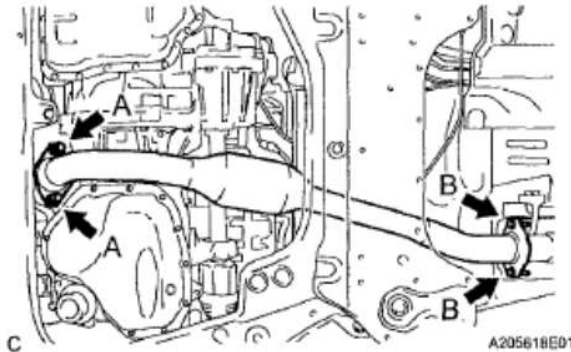


Fig. 22: Locating Front Exhaust Pipe, Compression Springs And Bolts
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

f. Connect the clamp and connector.

7. INSPECT FOR EXHAUST GAS LEAK

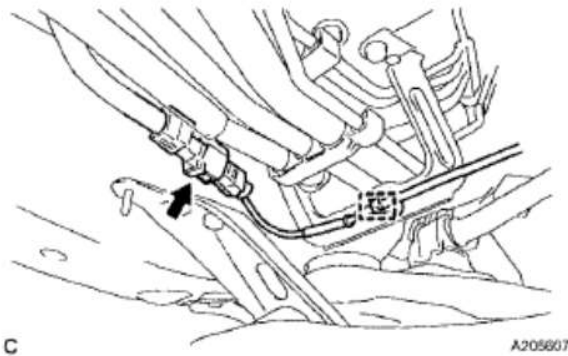


Fig. 23: Locating Clamp And Connector
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

8. INSTALL FRONT FLOOR COVER LH

- a. Connect the 3 clips.
- b. Install the front floor cover LH with the 2 screws and 4 bolts.

9. INSTALL UNDER NO. 1 ENGINE COVER

2009 Toyota Highlander Limited

2009 ENGINE Exhaust (1AR-FE) - Highlander

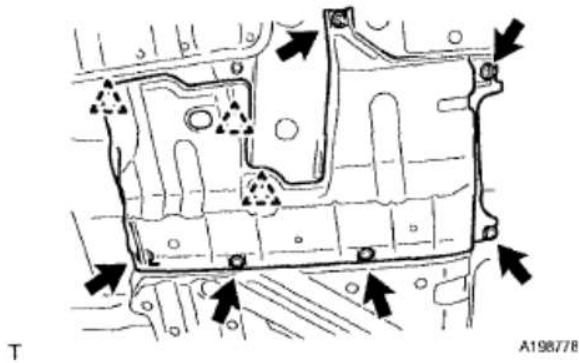


Fig. 24: Locating Front Floor Cover LH With Screws And Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

EXHAUST PIPE**COMPONENTS**

2009 Toyota Highlander Limited

2009 ENGINE Exhaust (1AR-FE) - Highlander

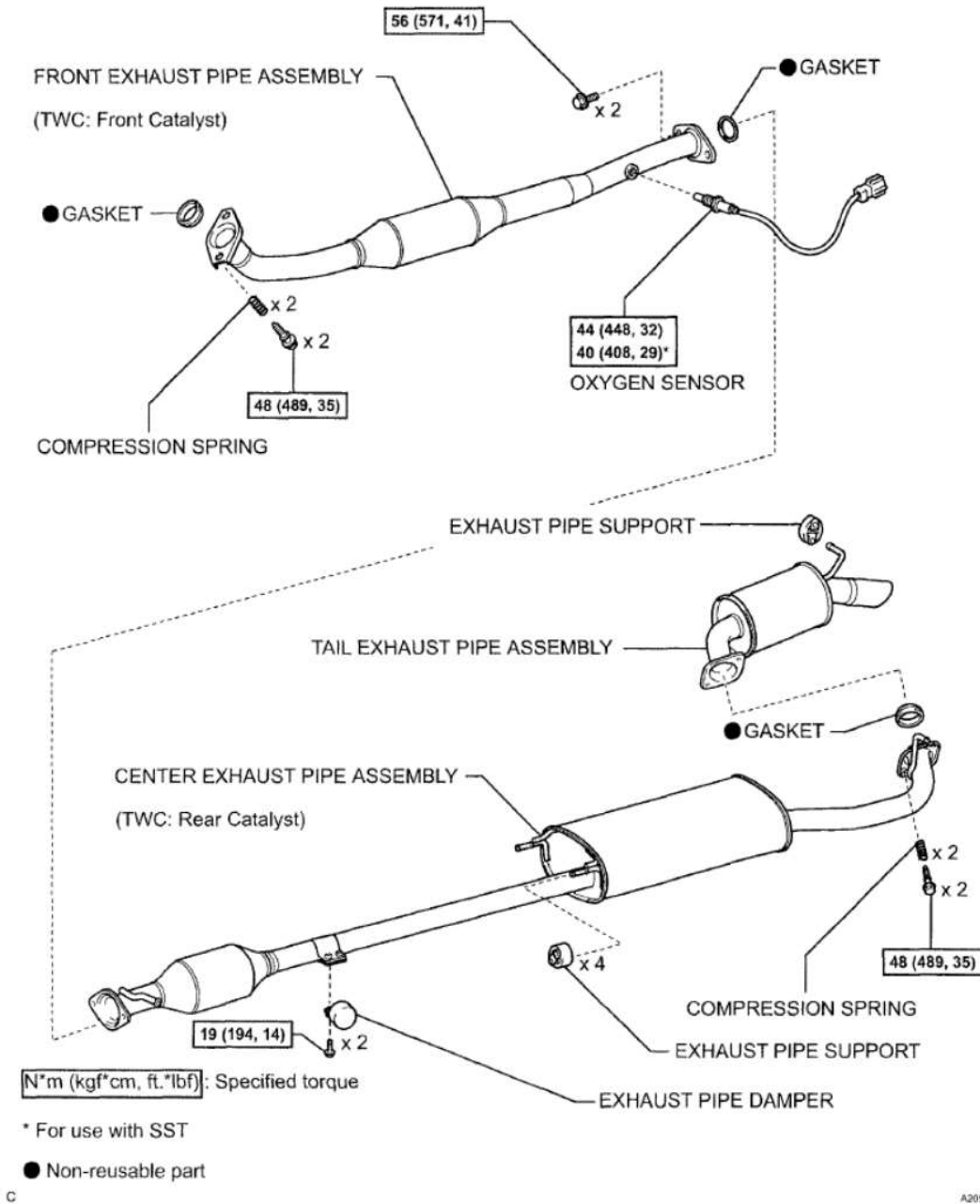


Fig. 25: Identifying Exhaust Pipe Components And Torque Specifications
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

1. REMOVE TAIL EXHAUST PIPE ASSEMBLY

- Remove the 2 bolts and 2 compression springs.
- Remove the tail exhaust pipe assembly from the exhaust pipe support.
- Remove the gasket from the center exhaust pipe assembly.

2009 Toyota Highlander Limited

2009 ENGINE Exhaust (1AR-FE) - Highlander

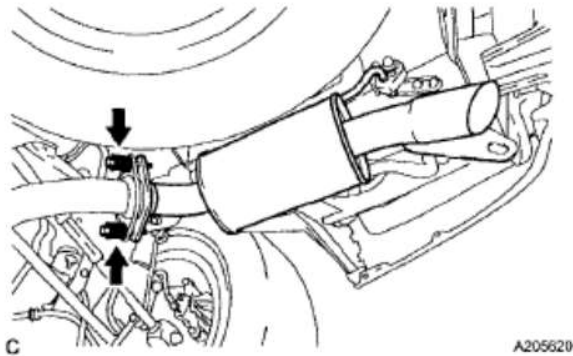


Fig. 26: Locating Bolts And Compression Springs
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. REMOVE EXHAUST PIPE DAMPER

- Remove the exhaust pipe damper from the center exhaust pipe assembly.



Fig. 27: Locating Exhaust Pipe Damper And Center Exhaust Pipe Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. REMOVE CENTER EXHAUST PIPE ASSEMBLY

- Remove the 2 bolts.
- Remove the center exhaust pipe assembly from the 4 exhaust pipe supports.
- Remove the gaskets from the front exhaust pipe assembly.

4. REMOVE OXYGEN SENSOR

- Remove the oxygen sensor (See **REMOVAL**).

2009 Toyota Highlander Limited

2009 ENGINE Exhaust (1AR-FE) - Highlander

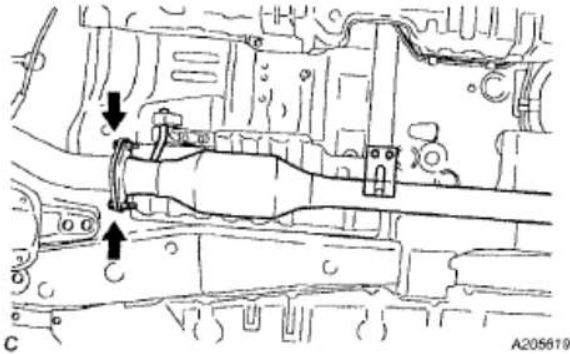


Fig. 28: Locating Center Exhaust Pipe Assembly And Exhaust Pipe Supports
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. REMOVE FRONT EXHAUST PIPE ASSEMBLY

- Remove the 2 bolts, 2 compression springs and front exhaust pipe assembly.
- Remove the gasket from the exhaust manifold assembly.

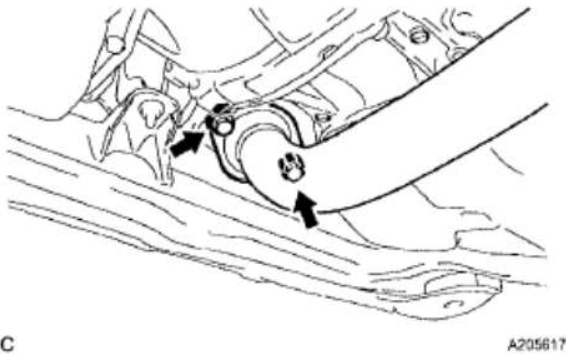


Fig. 29: Locating Bolts, Compression Springs And Front Exhaust Pipe Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSTALLATION

1. INSTALL FRONT EXHAUST PIPE ASSEMBLY

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

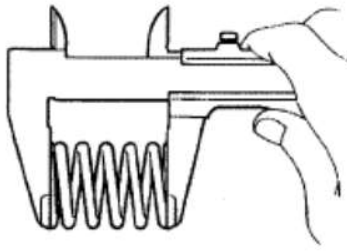
Minimum length: 41.5 mm (1.64 in.)

If the free length is less than the minimum, replace the compression spring.

- Fully insert a new gasket to the exhaust manifold assembly.

2009 Toyota Highlander Limited

2009 ENGINE Exhaust (1AR-FE) - Highlander



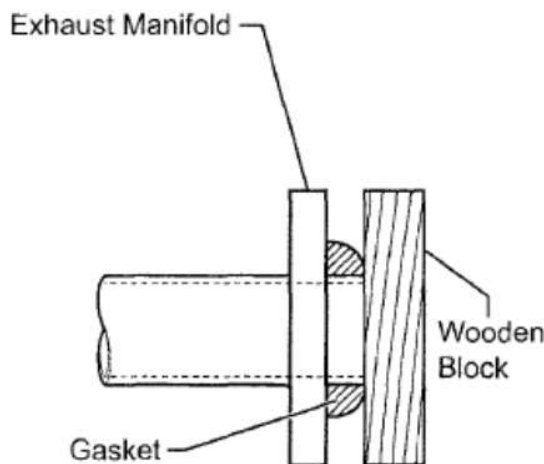
A077857

Fig. 30: Measuring Free Length Of Compression Springs
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

NOTE:

- Be sure to install the gasket in the correct direction.
- Do not reuse the gasket.
- Do not damage the gasket.
- Do not push in the gasket by using the exhaust pipe when connecting it.



A161728E1B

Fig. 31: Identifying Wooden Block And Exhaust Manifold Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Install the front exhaust pipe assembly with the 2 bolts and 2 compression springs.

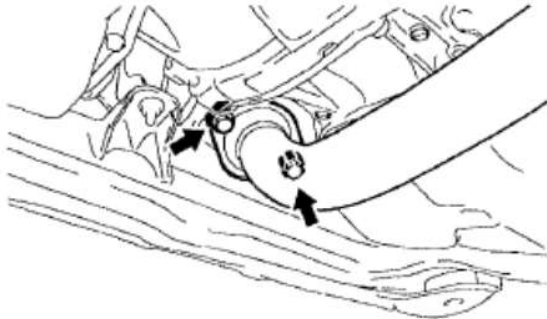
Torque: 48 N*m (489 kgf*cm, 35 ft.*lbf)

2. INSTALL OXYGEN SENSOR

2009 Toyota Highlander Limited

2009 ENGINE Exhaust (1AR-FE) - Highlander

- a. Install the oxygen sensor (See **INSTALLATION**).



C

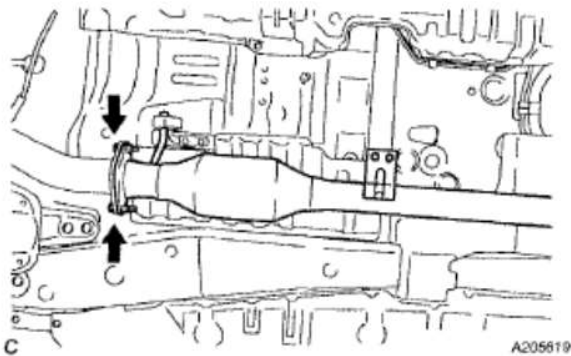
A205617

Fig. 32: Locating Bolts, Compression Springs And Front Exhaust Pipe Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. INSTALL CENTER EXHAUST PIPE ASSEMBLY

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

Torque: 56 N*m (571 kgf*cm, 41 ft.*lbf)



C

A205619

Fig. 33: Locating Center Exhaust Pipe Assembly And Exhaust Pipe Supports
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. INSTALL EXHAUST PIPE DAMPER

- a. Install the exhaust pipe damper to the center exhaust pipe assembly.

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

2009 Toyota Highlander Limited

2009 ENGINE Exhaust (1AR-FE) - Highlander



Fig. 34: Locating Exhaust Pipe Damper And Center Exhaust Pipe Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. INSTALL TAIL EXHAUST PIPE ASSEMBLY

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

Minimum length: 40.5 mm (1.60 in.)

If the free length is less than the minimum, replace the compression spring.

- b. Fully insert a new gasket to the center exhaust pipe assembly.

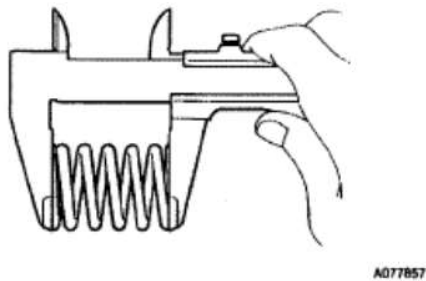


Fig. 35: Measuring Free Length Of Compression Springs
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

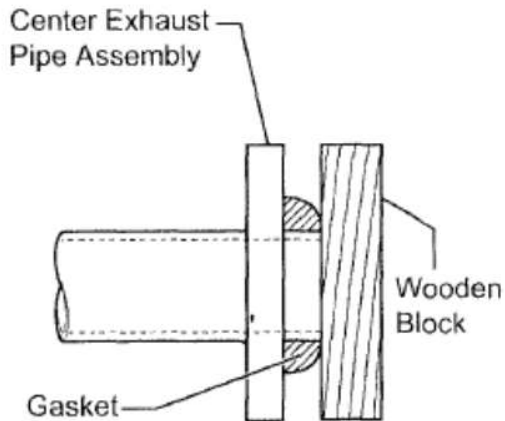
NOTE:

- Be sure to install the gasket in the correct direction.
- Do not reuse the gasket.
- Do not damage the gasket.
- Do not push in the gasket by using the exhaust pipe when connecting it.

- d. Connect the tail exhaust pipe assembly to the exhaust pipe support.

2009 Toyota Highlander Limited

2009 ENGINE Exhaust (1AR-FE) - Highlander



A161726E19

Fig. 36: Identifying Wooden Block, Gasket And Center Exhaust Pipe Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- e. Install the tail exhaust pipe assembly with the 2 bolts and 2 compression springs.

Torque: 48 N*m (489 kgf*cm, 35 ft.*lbf)

6. INSPECT FOR EXHAUST GAS LEAK

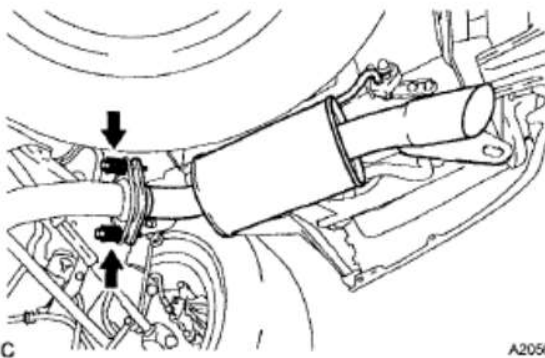


Fig. 37: Locating Bolts And Compression Springs
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.