

2008 Scion xD

2008 ENGINE 2ZR-FE Lubrication - xD

2008 ENGINE

2ZR-FE Lubrication - xD

LUBRICATION SYSTEM

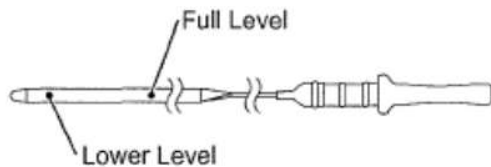
ON-VEHICLE INSPECTION

1. INSPECT ENGINE OIL LEVEL

- Warm up the engine, then stop the engine and wait for 5 minutes.
- Check that the engine oil level is between the low and full marks on the oil dipstick.

If low, check for leakage and add oil up to the full level mark.

NOTE: Do not add engine oil to above the full level mark.



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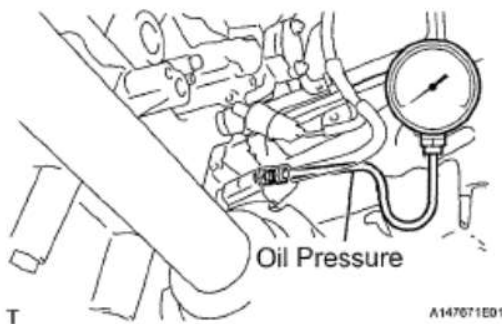
Fig. 1: Identifying Oil Dipstick Lower Level And Full Level
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. INSPECT ENGINE OIL QUALITY

- Check the oil for deterioration, water intrusion, discoloration or thinning. If the quality is visibly poor, replace the oil.

3. CHECK OIL PRESSURE

- Remove the engine oil pressure switch. (See **REMOVAL**)



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Fig. 2: Removing Engine Oil Pressure Switch
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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- b. Install the oil pressure gauge.
- c. Warm up the engine.
- d. Check the oil pressure.

Standard oil pressure**OIL PRESSURE SPECIFICATION**

Engine rpm	Oil Pressure
When idling	25 kPa (0.3 kgf/cm ² , 3.7 psi) or more
At 3,000 rpm	150 to 400 kPa (1.6 to 4.1 kgf/cm ² , 21.8 to 58.0 psi) or more

If the oil pressure is not as specified, check the oil pump. (See **INSPECTION**)

- e. Remove the oil pressure gauge.
- f. Install the engine oil pressure switch. (See **INSTALLATION**)

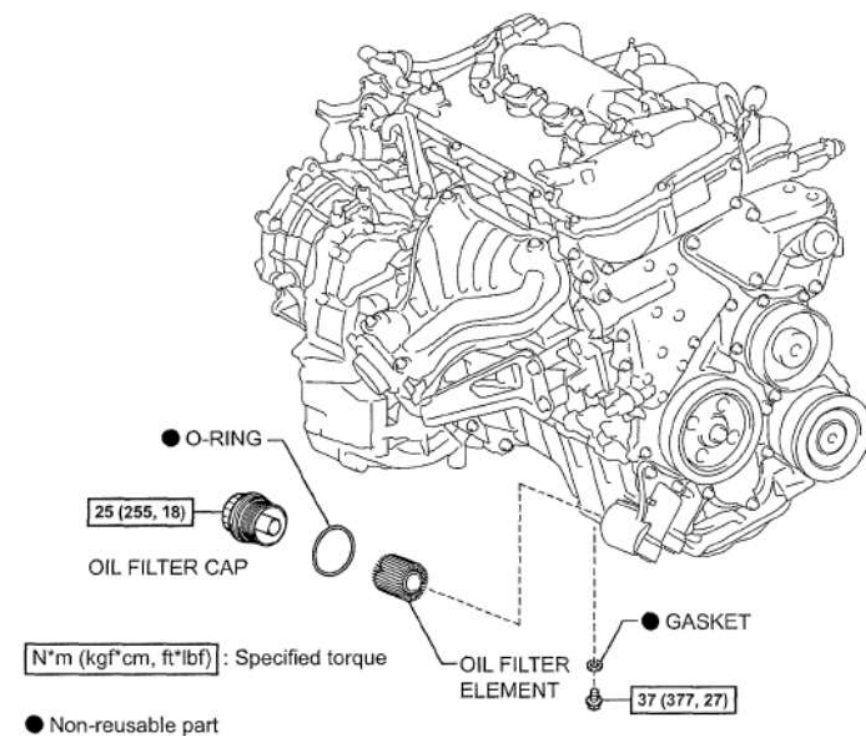
OIL AND OIL FILTER**COMPONENTS**

Fig. 3: Identifying Oil And Oil Filter Components With Torque Specifications
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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REPLACEMENT**CAUTION:**

- Prolonged and repeated contact with engine oil will result in the removal of natural oils from the skin, leading to dryness, irritation and dermatitis. Used engine oil contains potentially harmful contaminants which may cause skin cancer.
- Take precautions when replacing engine oil to minimize the risk of your skin making contact with used engine oil. Wear protective clothing and gloves that cannot be penetrated by oil. Wash skin with soap and water, or use waterless hand cleaner, to remove any used engine oil completely. Do not use gasoline, thinner, or solvents.
- Dispose of used oil and used oil filters at designated disposal sites in order to preserve the environment.

1. DRAIN ENGINE OIL

- a. Remove the oil pan drain plug and drain the engine oil.
- b. Clean the oil pan drain plug and install it with a new gasket.

Torque: 37 N*m (377 kgf*cm, 27 ft.*lbf)

2. REMOVE OIL FILTER ELEMENT

- a. Using SST, remove the oil filter cap.

SST 09228-06501

HINT:

Use a container to catch the draining oil. Once the oil filter cap is loosened approximately 4 turns, the cap ribs become vertical and engine oil drains from the gap between the oil filter cap and oil pan.

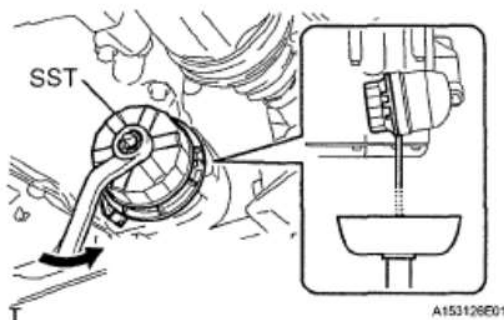


Fig. 4: Removing Oil Filter Cap

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- b. Remove the oil filter element and O-ring from the oil filter cap.

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NOTE: Be sure to remove the O-ring (from the cap) by hand, without using any tools, to prevent damage to the O-ring groove on the cap.

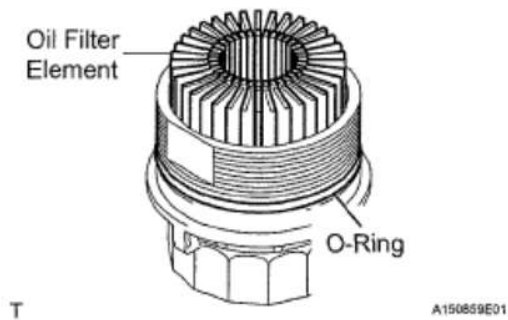


Fig. 5: Identifying Oil Filter Element And O-Ring
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. INSTALL OIL FILTER ELEMENT

- a. Clean the inside of the oil filter cap, threads and O-ring groove.

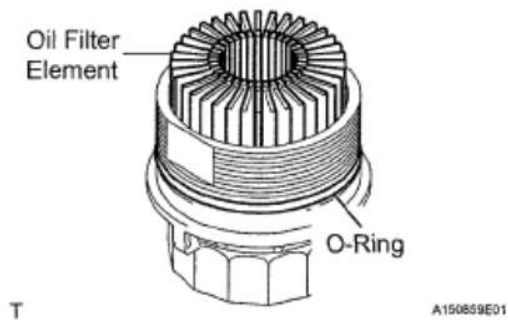


Fig. 6: Identifying Oil Filter Element And O-Ring
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Apply a small amount of engine oil to a new O-ring and install it onto the oil filter cap.
- c. Place a new oil filter element into the oil filter cap.
- d. Remove any dirt or foreign matter from the installation surface of the engine.
- e. Apply a small amount of engine oil to the O-ring again and install the oil filter cap.
- f. Using SST, tighten the oil filter cap.

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Torque: 25 N*m (255 kgf*cm, 18 ft.*lbf)

NOTE:

- Make sure that the oil filter is installed securely as shown in the illustration.

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- Make sure that the O-ring does not get caught between the parts.

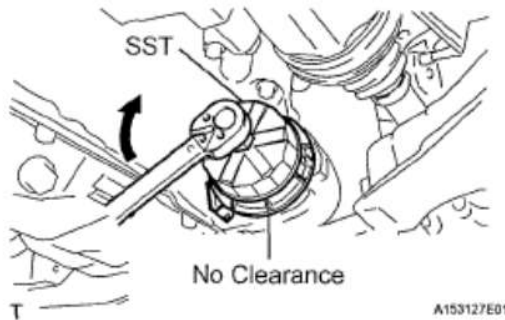


Fig. 7: Tightening Oil Filter Cap With SST
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. ADD ENGINE OIL

- Fill with new engine oil.

Engine oil

ENGINE OIL SPECIFICATION

Oil Grade	Oil Viscosity (SAE)
• ILSAC multigrade engine oil	• 0W-20 • 5W-20 • 5W-30 • 10W-30

Oil capacity

OIL CAPACITY SPECIFICATION

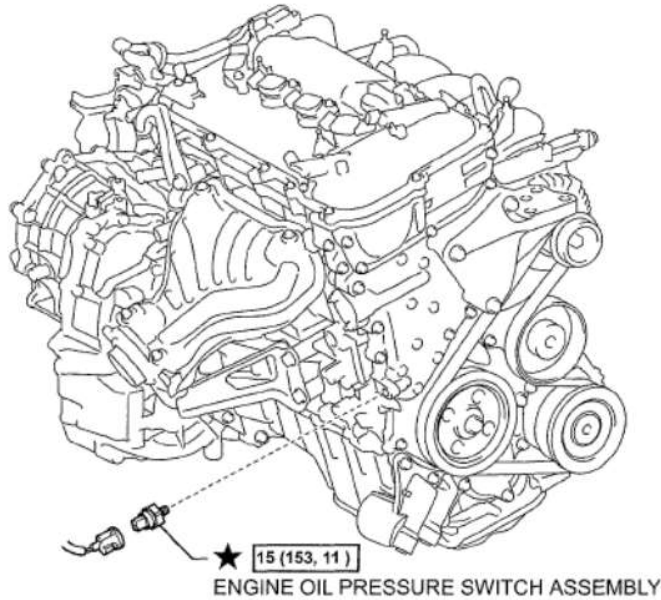
Item	Capacity
With oil filter change	4.2 liters (4.4 US qts, 3.7 Imp. qts)
Without oil filter change	3.9 liters (4.1 US qts, 3.4 Imp. qts)
Dry fill	4.7 liters (5.0 US qts, 4.1 Imp. qts)

5. INSPECT FOR ENGINE OIL LEAK

- INSPECT FOR OIL LEVEL (See ON-VEHICLE INSPECTION)

OIL PRESSURE SWITCH

COMPONENTS

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

★ Precoated part

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Fig. 8: Identifying Oil Pressure Switch Assembly With Torque Specification
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

1. REMOVE FRONT WHEEL RH
2. REMOVE ENGINE OIL PRESSURE SWITCH ASSEMBLY
 - a. Disconnect the oil pressure switch connector.

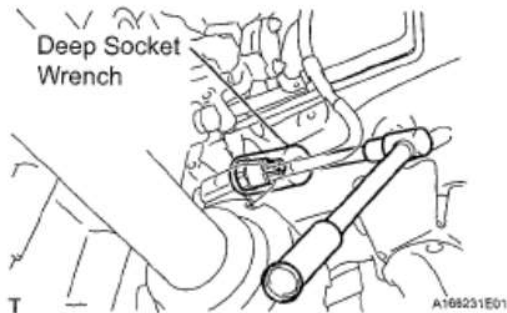


Fig. 9: Identifying Oil Pressure Switch Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Using a 24 mm deep socket wrench, remove the oil pressure switch.

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INSPECTION

1. INSPECT ENGINE OIL PRESSURE SWITCH ASSEMBLY

- a. Check the resistance.
 1. Disconnect the engine oil pressure switch connector.
 2. Measure the resistance according to the value(s) in the table below.

Standard resistance

RESISTANCE REFERENCE

Tester Connection	Condition	Specified Condition
1 - Switch body	Idling	10 ohms or higher
1 - Switch body	Engine stopped	Below 3 ohms

HINT:

If the value is not as specified, replace the engine oil pressure switch assembly.

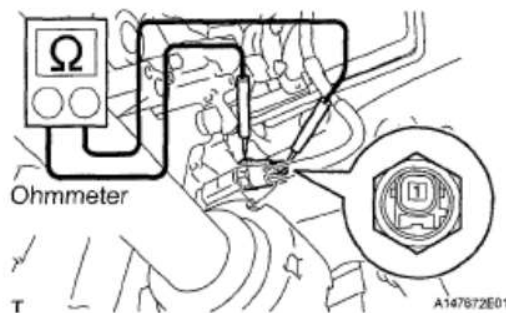


Fig. 10: Measuring Resistance With Ohmmeter

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

INSTALLATION

1. INSTALL ENGINE OIL PRESSURE SWITCH ASSEMBLY

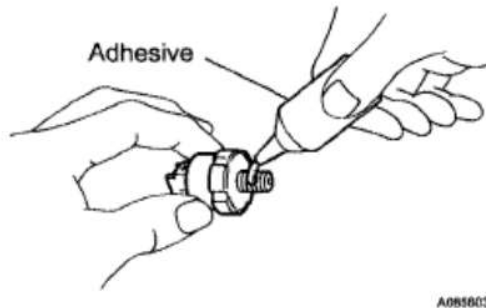
- a. Apply adhesive to 2 or 3 threads of the oil pressure switch.

Adhesive:

Toyota Genuine Adhesive 1344, Three Bond 1344 or equivalent

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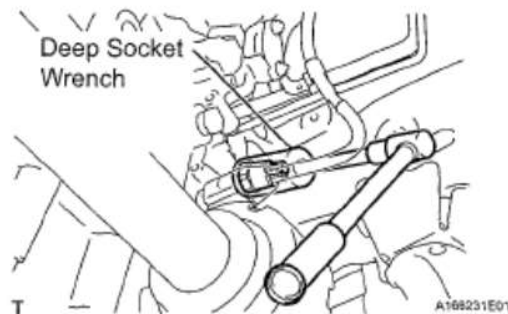
Fig. 11: Applying Adhesive To 2 Or 3 Threads Of Oil Pressure Switch
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Using a 24 mm deep socket wrench, install the oil pressure switch.

Torque: 15 N*m (153 kgf*cm, 11 ft.*lbf)

NOTE: Do not start the engine for at least 1 hour after installation.

- c. Connect the oil pressure switch connector.



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Fig. 12: Identifying Oil Pressure Switch Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. INSPECT FOR OIL LEAK
3. INSTALL FRONT WHEEL RH

Torque: 103 N*m (1050 kgf*cm, 76 ft.*lbf)

OIL PUMP

COMPONENTS

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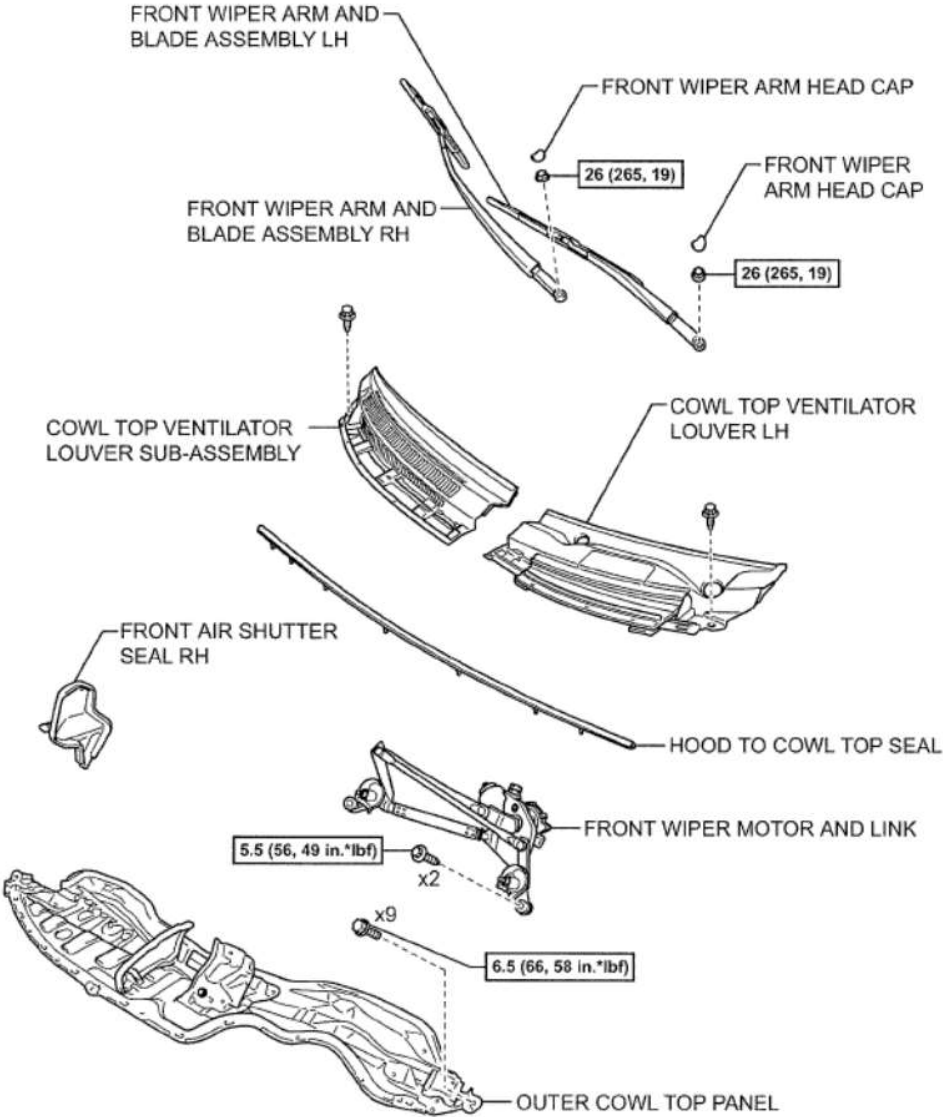
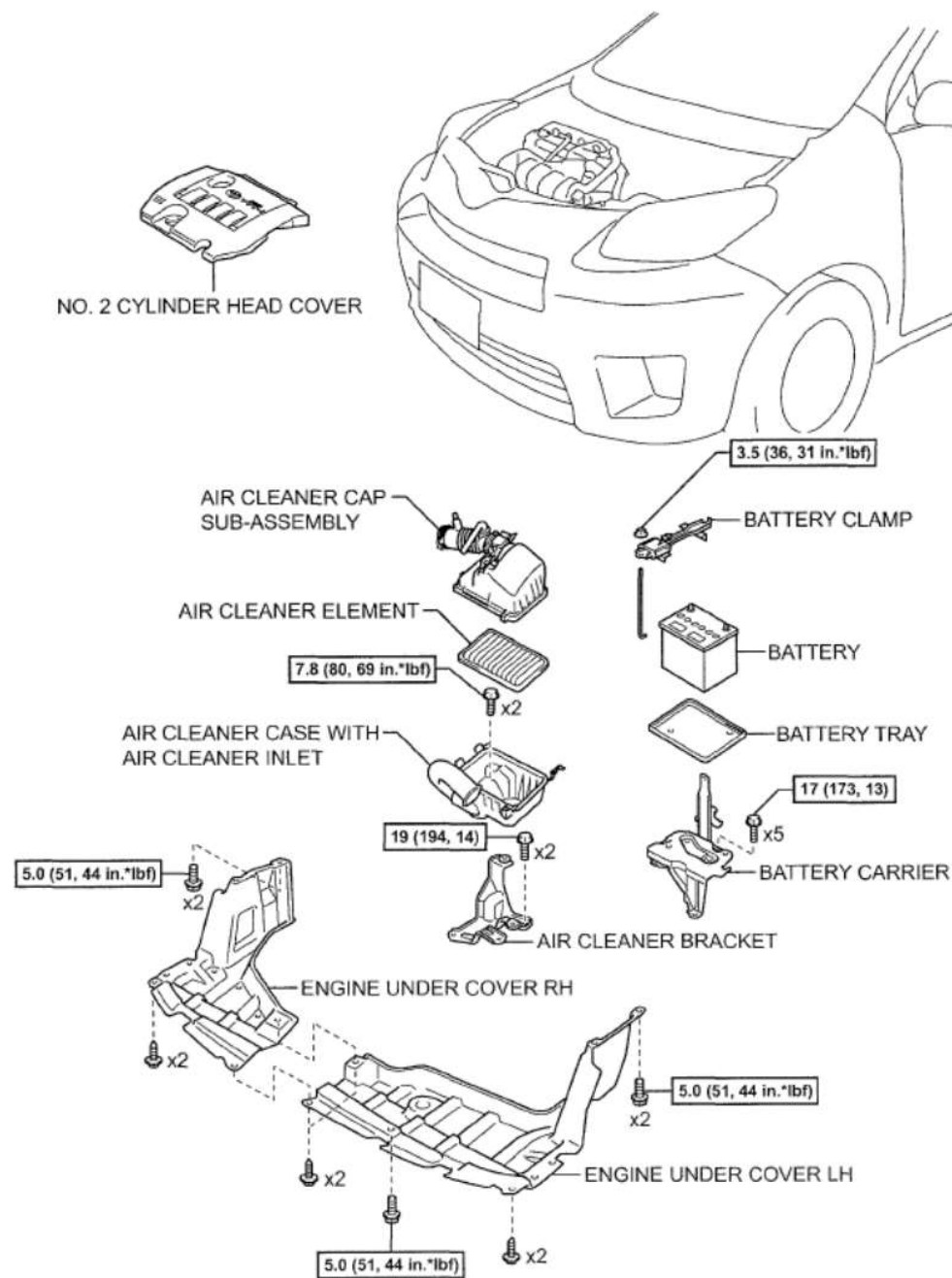


Fig. 13: Identifying Outer Cowl Top Panel Components With Torque Specifications
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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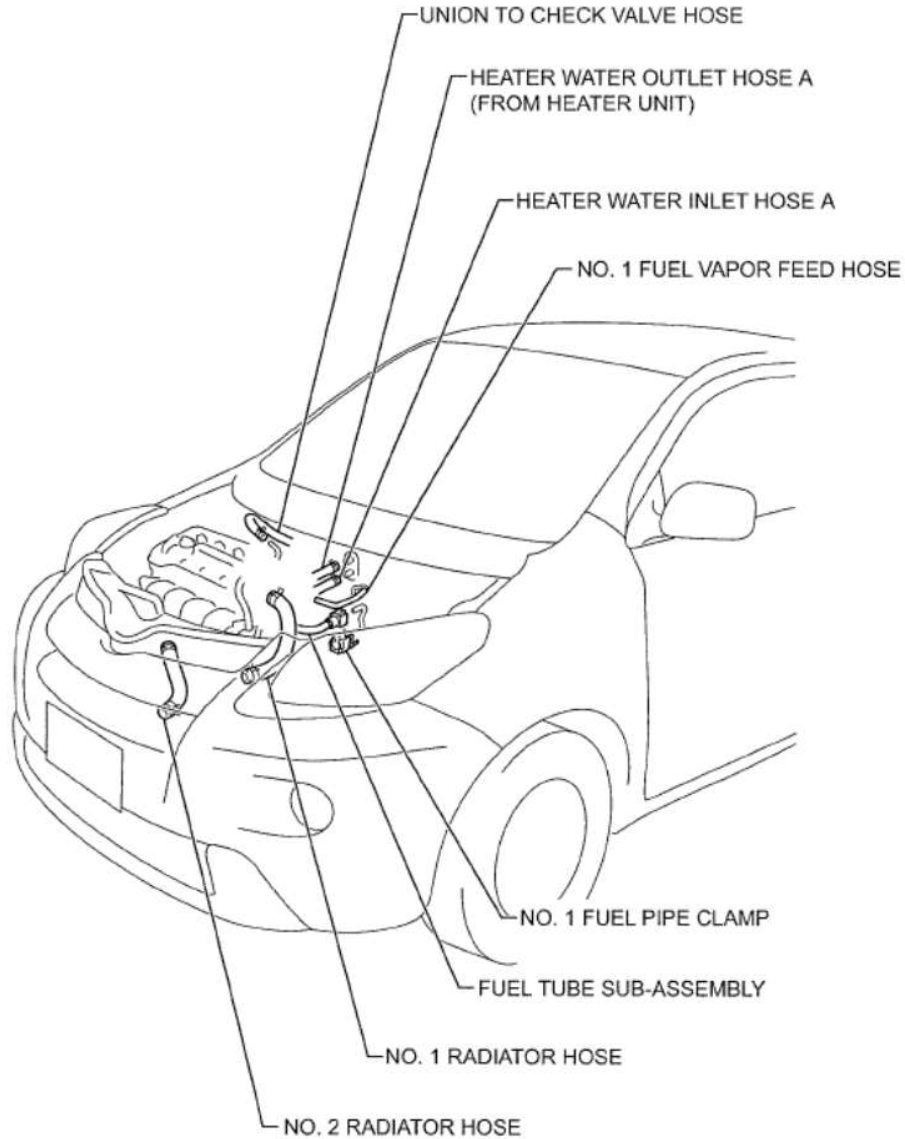
N*m (kgf*cm, ft*lbf) : Specified torque

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Fig. 14: Identifying Engine Under Cover Components With Torque Specifications
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Fig. 15: Identifying Fuel Tube Sub-Assembly Parts Location
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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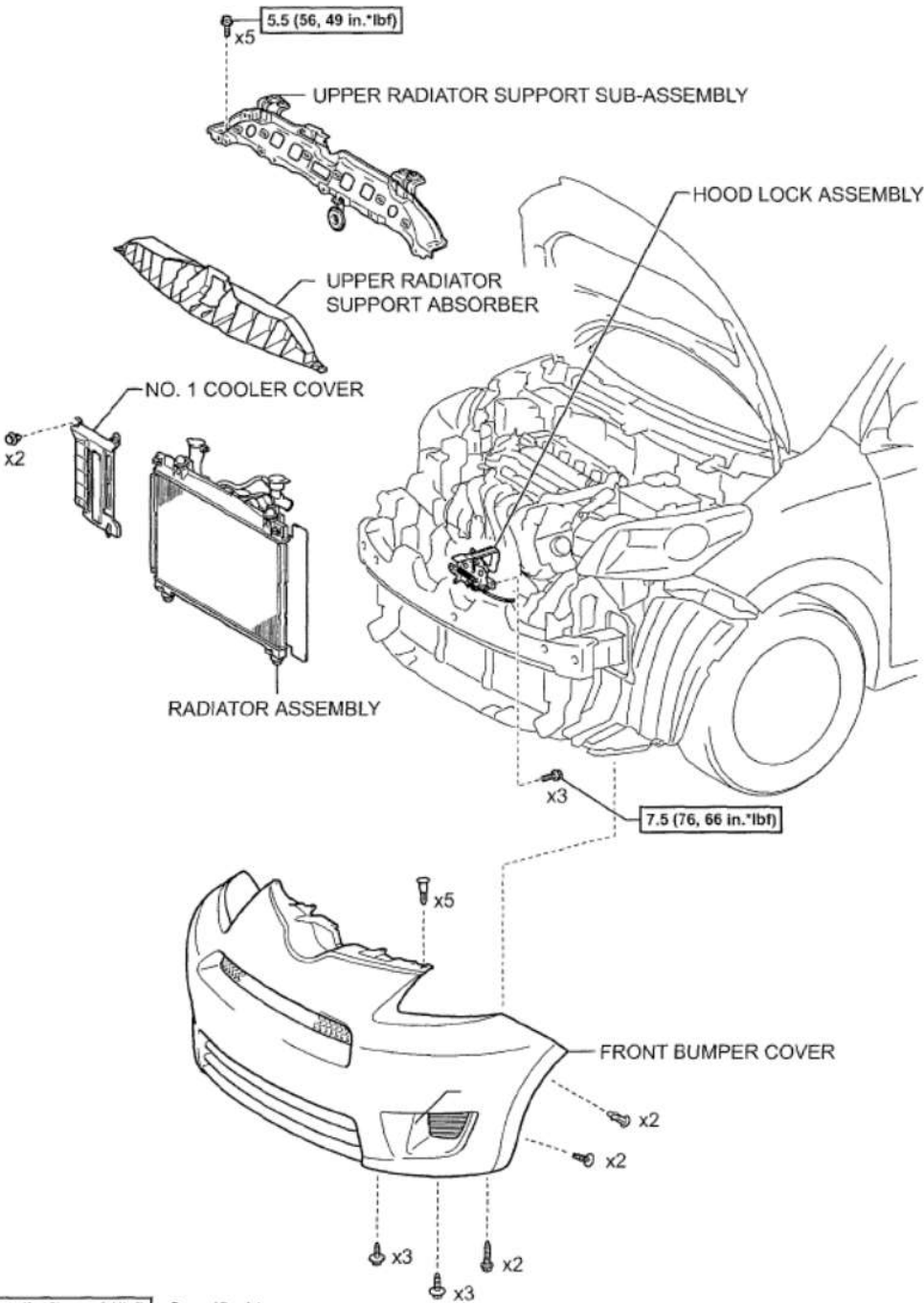


Fig. 16: Identifying Front Bumper Cover And Radiator Components With Torque Specifications
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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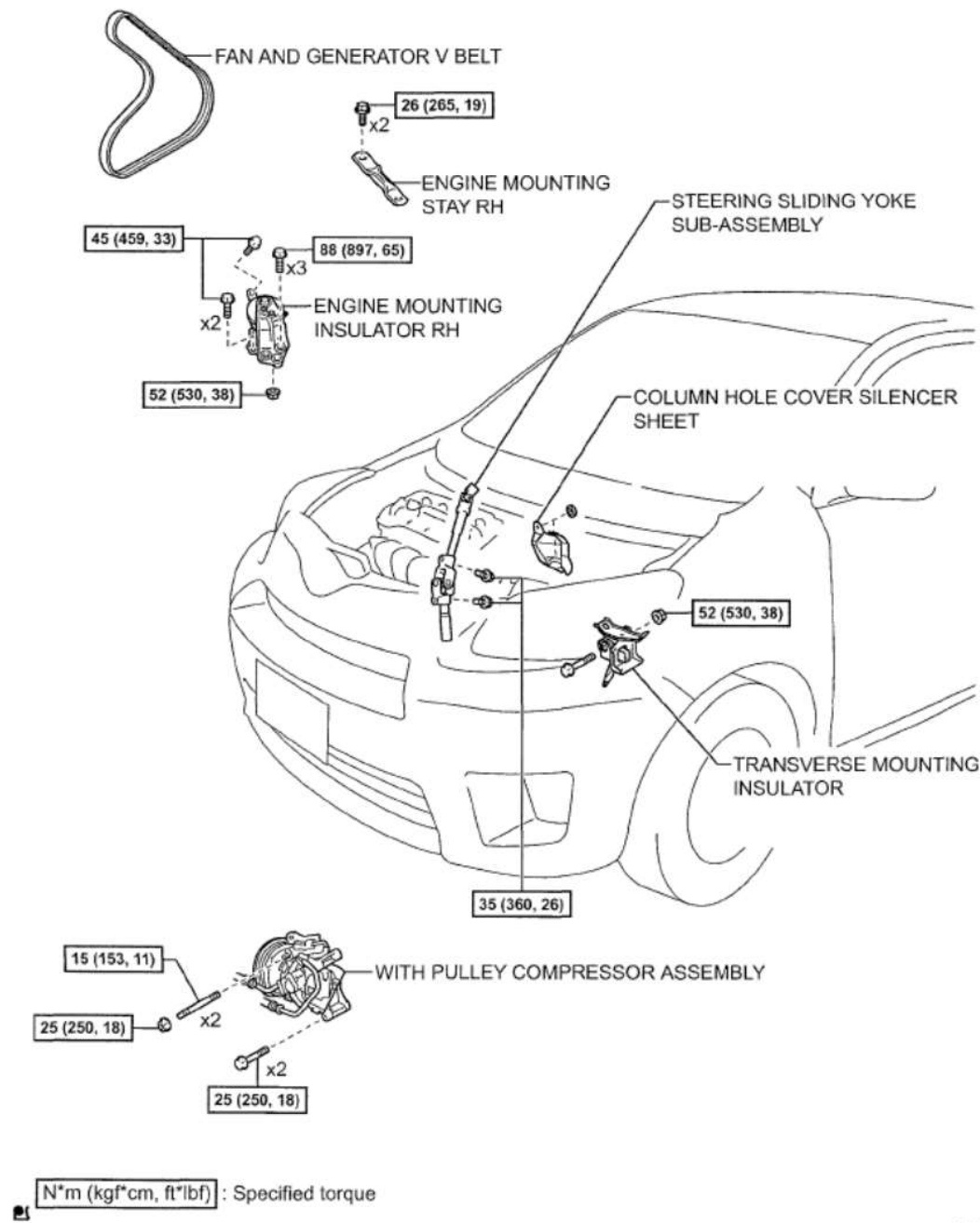
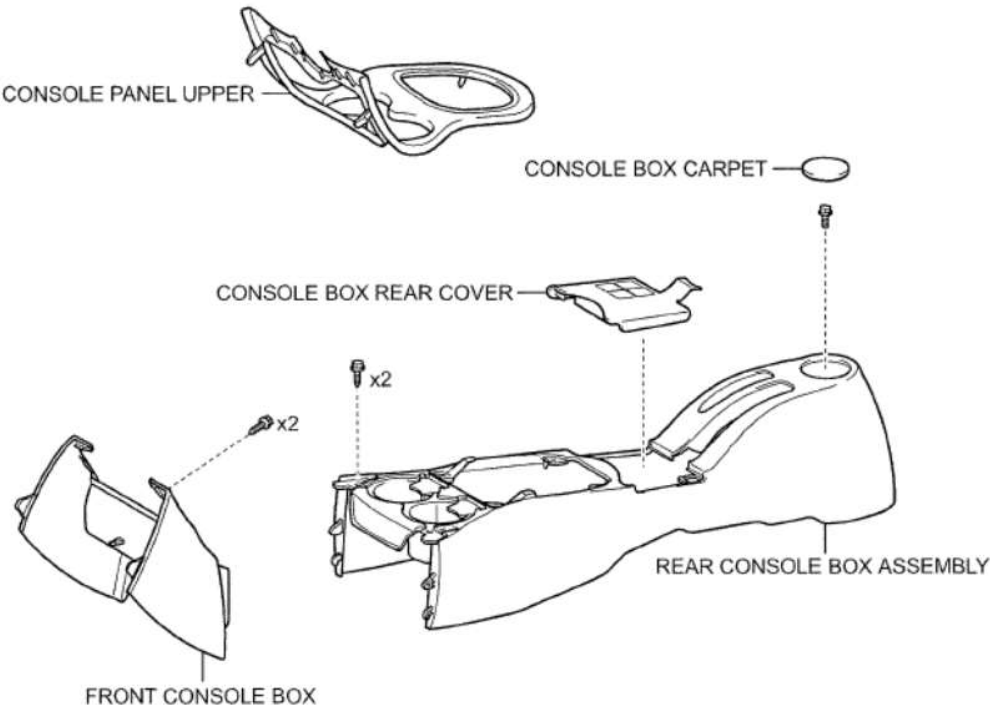
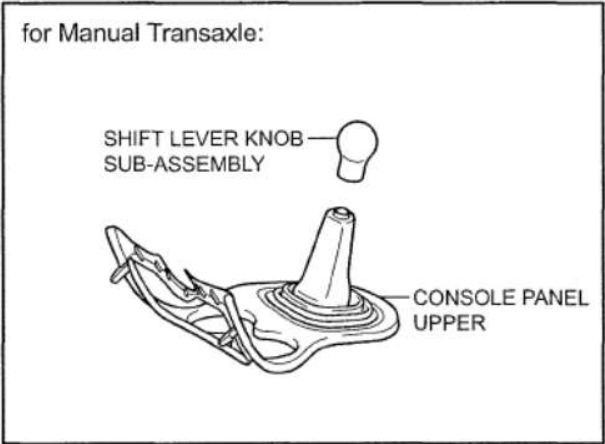


Fig. 17: Identifying Compressor Assembly And Engine Mounting Insulator With Torque Specifications
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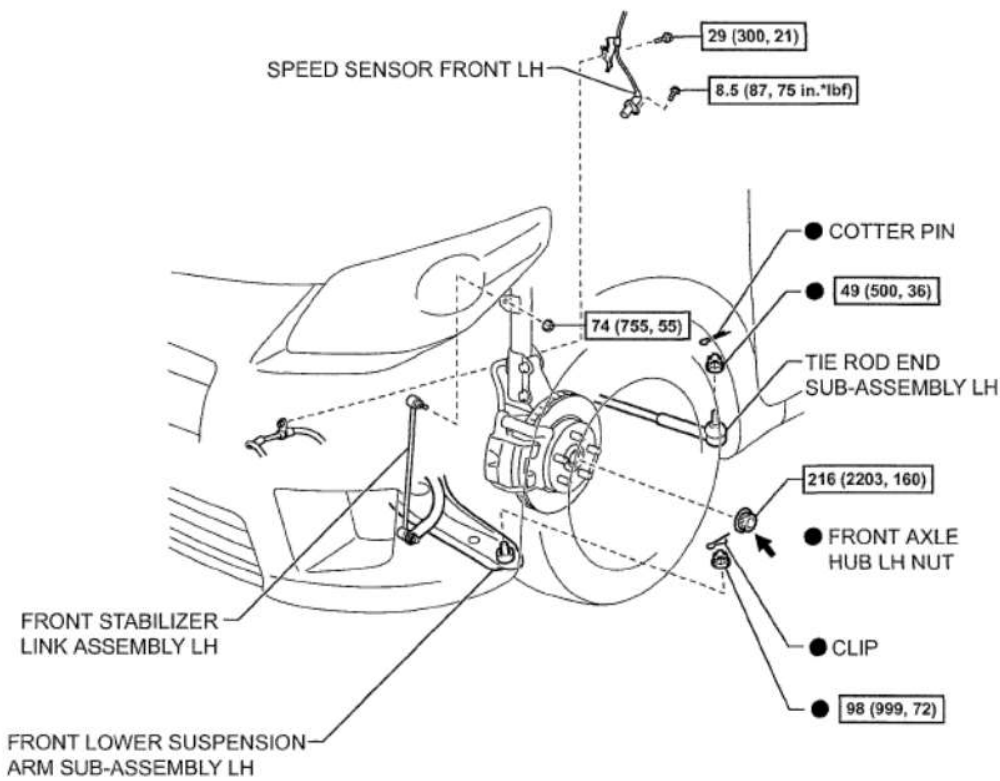
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Fig. 18: Identifying Rear Console Box Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

⬅ Do not apply lubricants to the threaded parts

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Fig. 19: Identifying Front Stabilizer Link Assembly With Torque Specifications
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

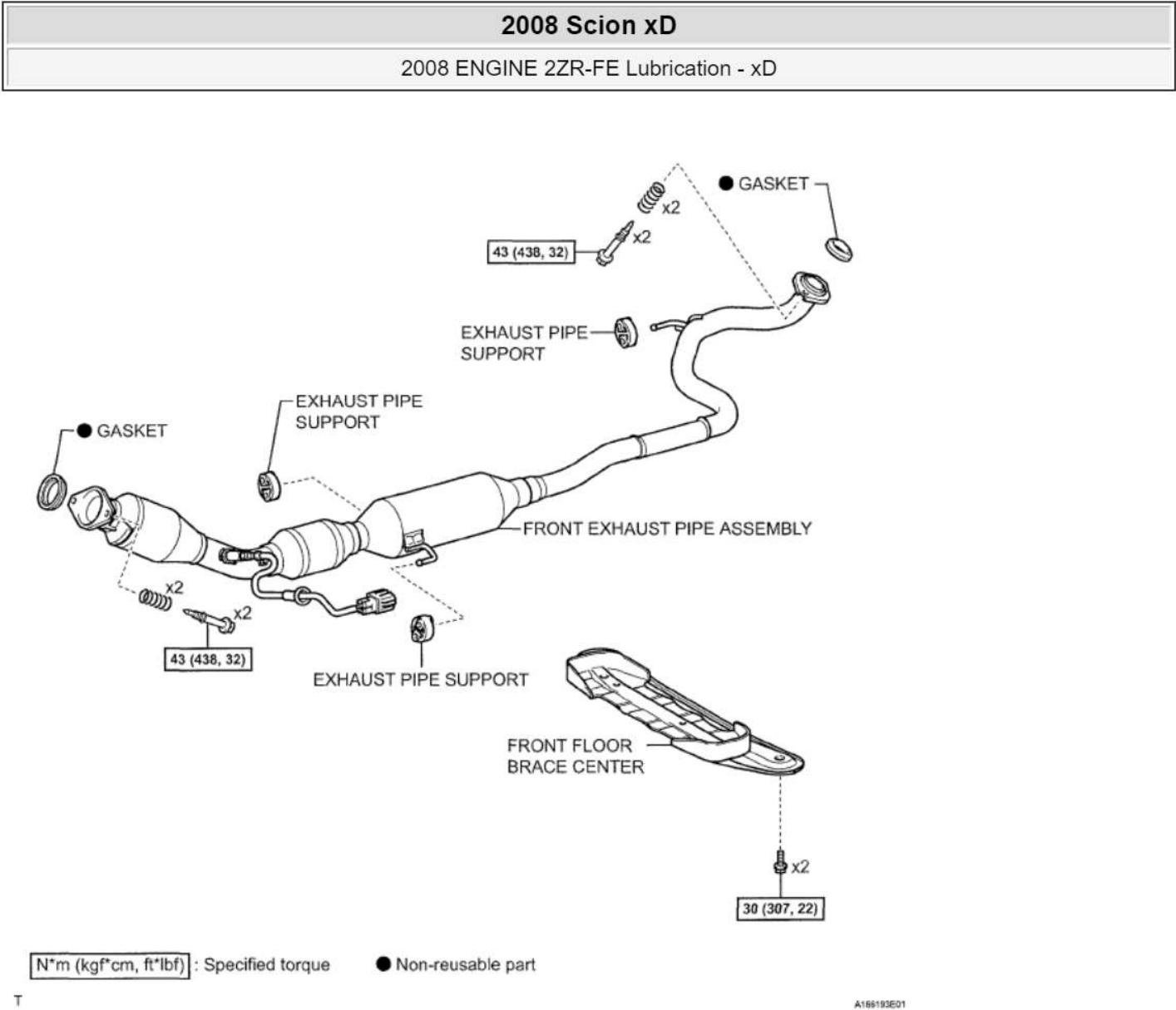
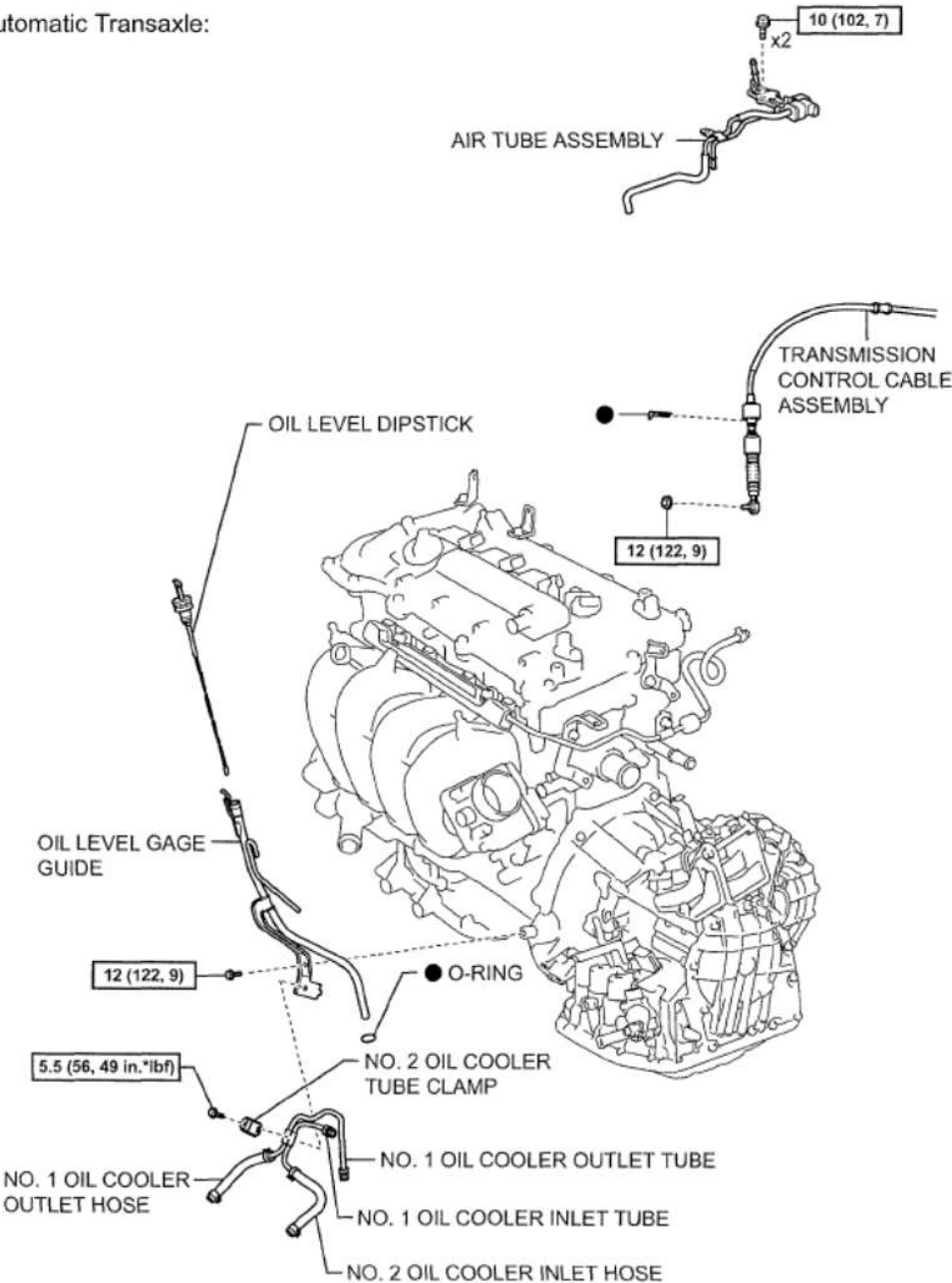


Fig. 20: Identifying Muffler Components With Torque Specifications
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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for Automatic Transaxle:



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

● Non-reusable part

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Fig. 21: Identifying Components For Automatic Transaxle With Torque Specifications
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for Manual Transaxle:

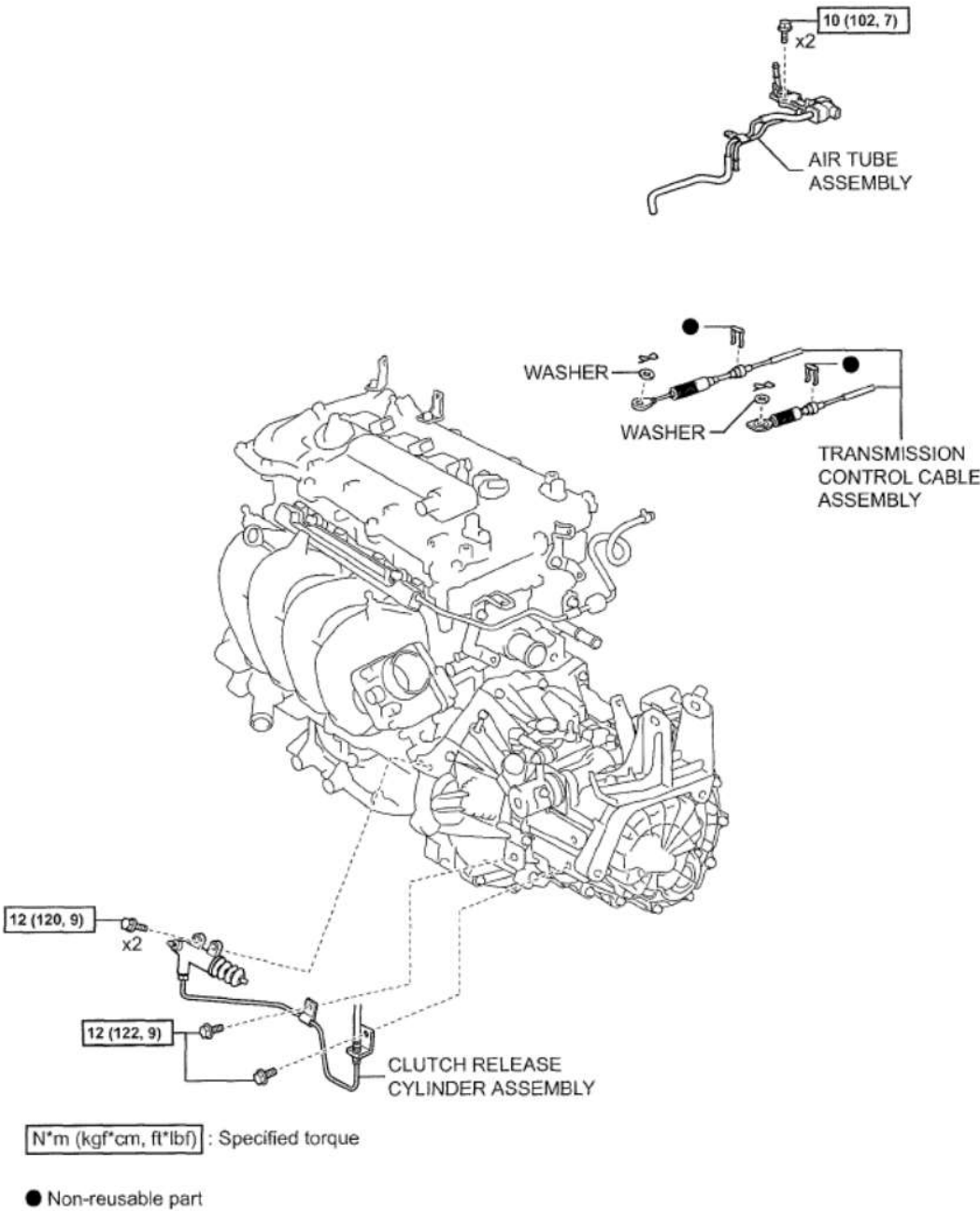
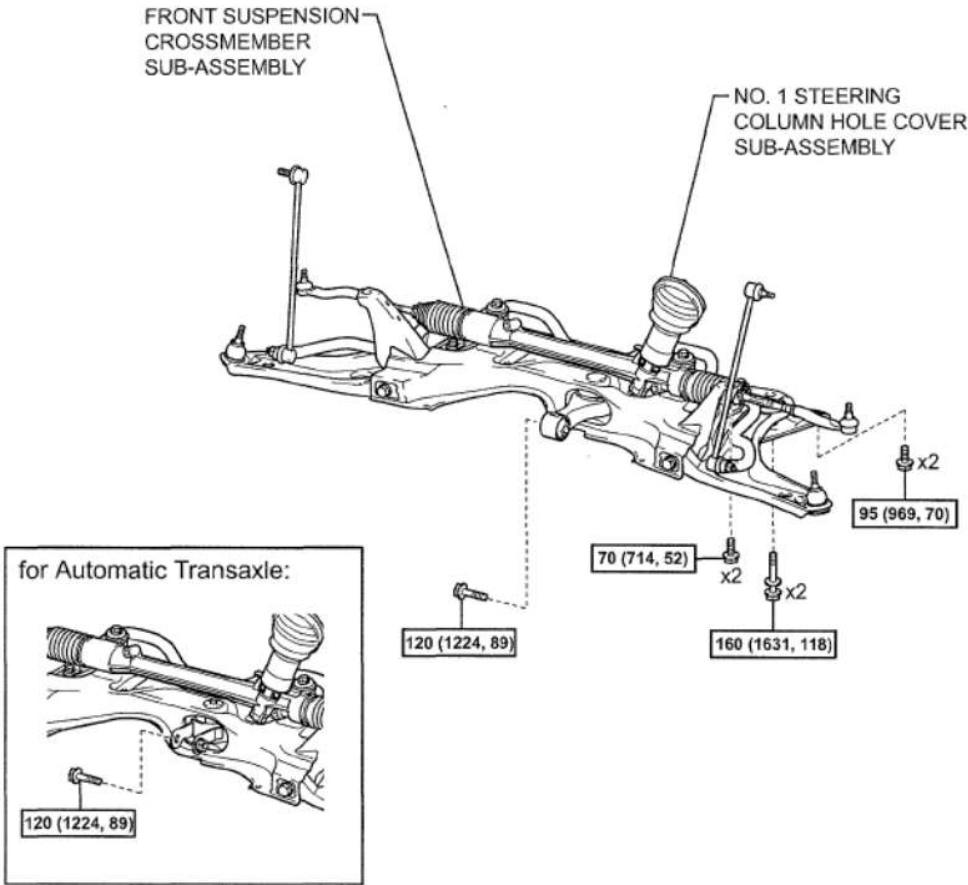


Fig. 22: Identifying Components For Manual Transaxle With Torque Specifications
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N*m (kgf*cm, ft*lb) : Specified torque

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Fig. 23: Identifying Front Suspension Crossmember Sub-Assembly With Torque Specifications
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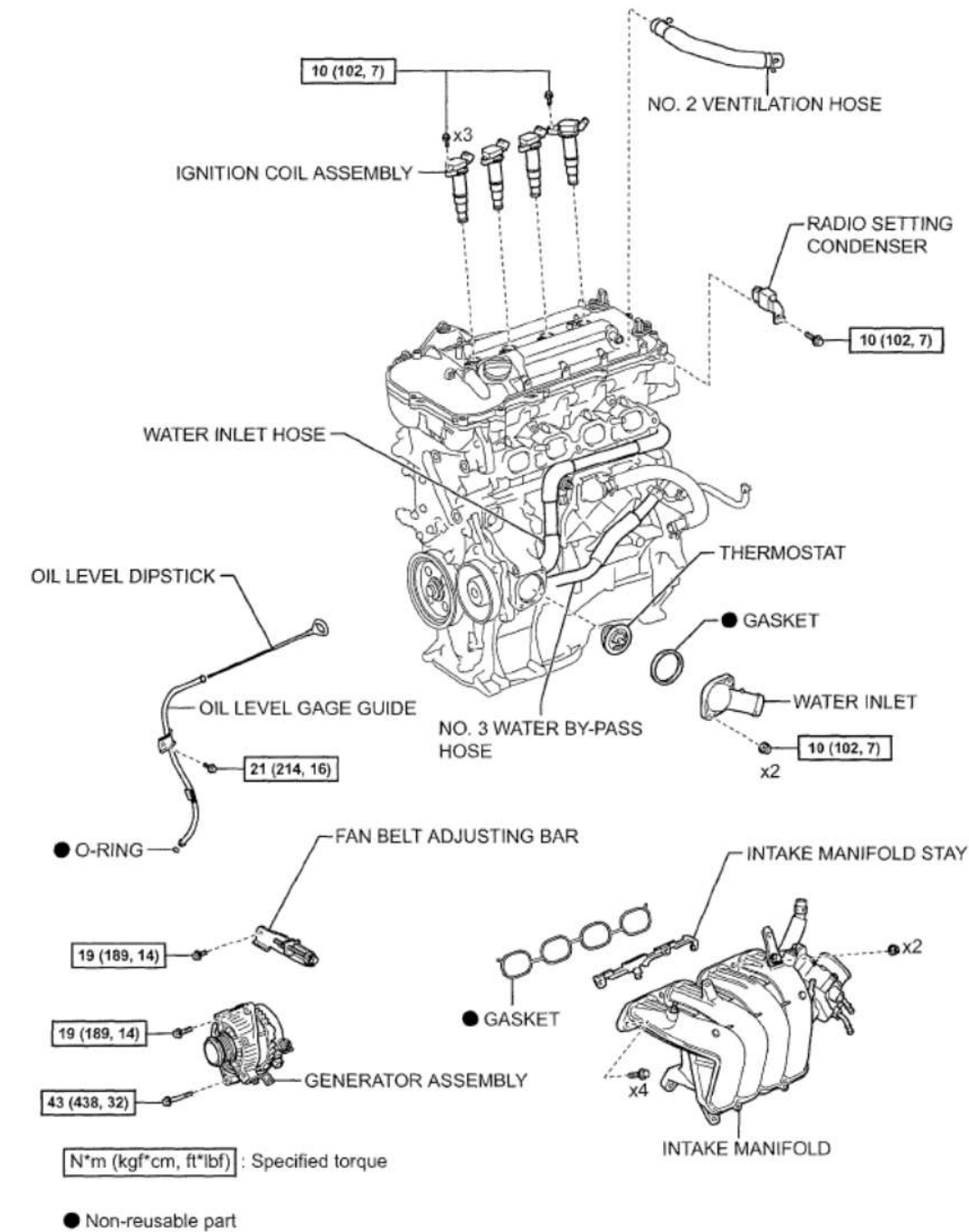
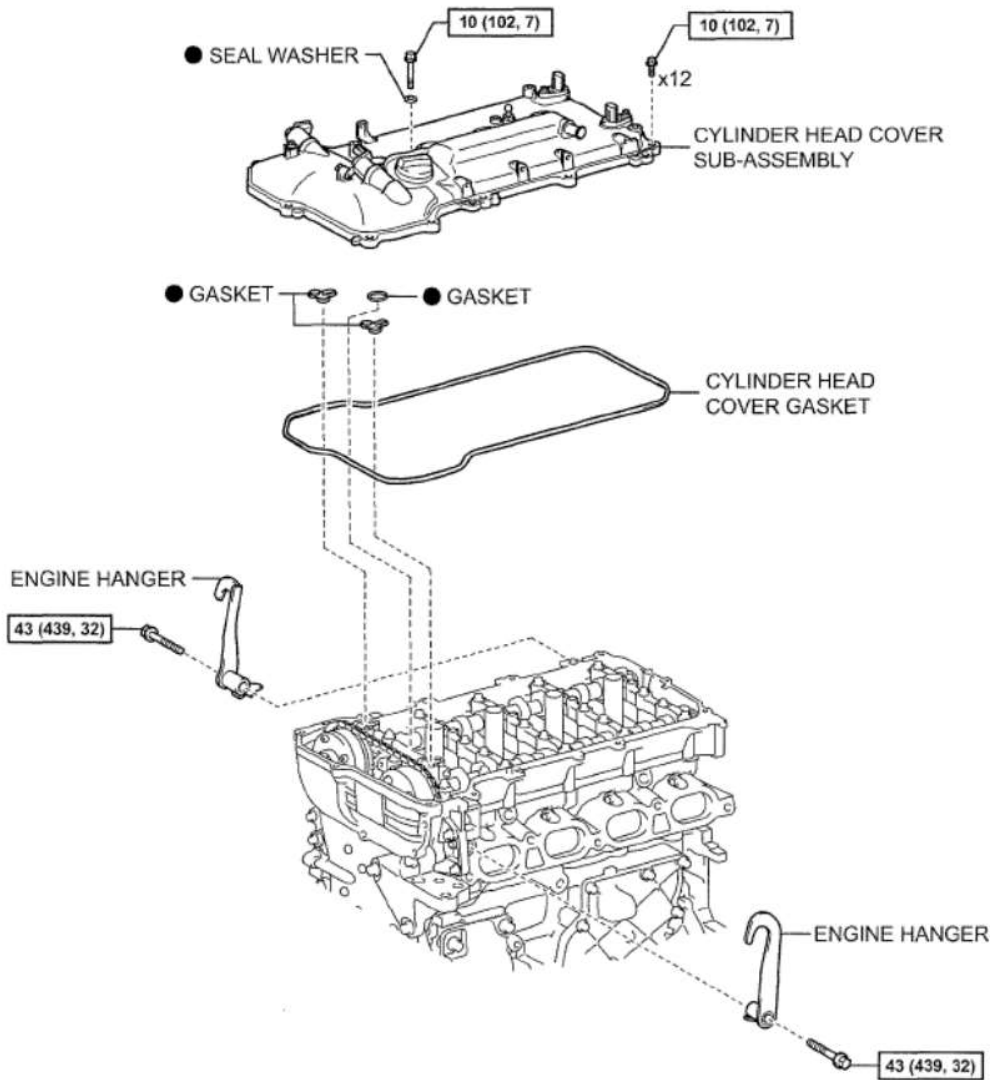


Fig. 24: Identifying Generator Assembly, Intake Manifold And Ignition Coil Assembly With Torque Specifications
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43 (439, 32) : Specified torque

● Non-reusable part

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Fig. 25: Identifying Cylinder Head Cover Sub-Assembly With Torque Specifications
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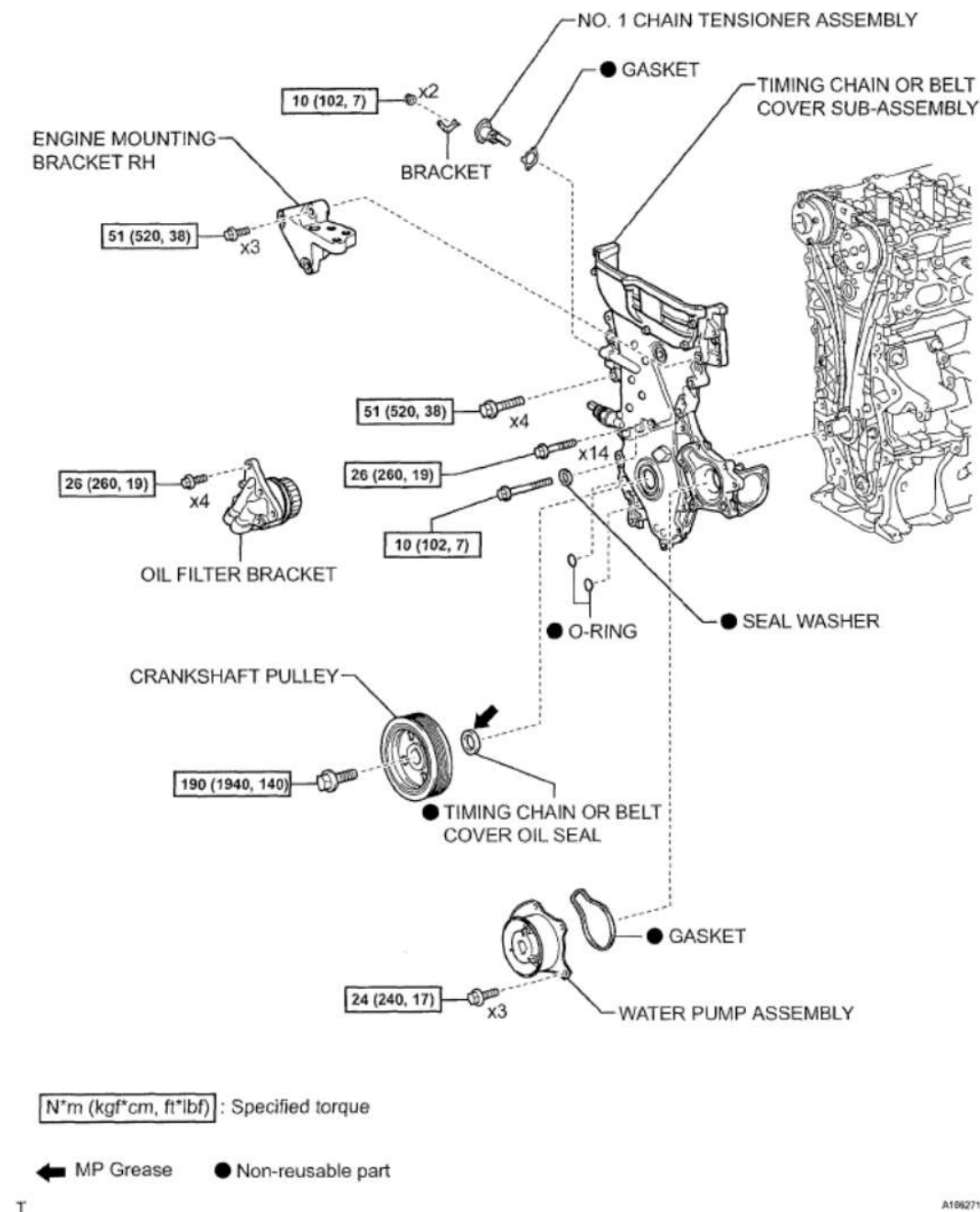


Fig. 26: Identifying Timing Chain Cover Sub-Assembly, Water Pump Assembly With Torque Specifications
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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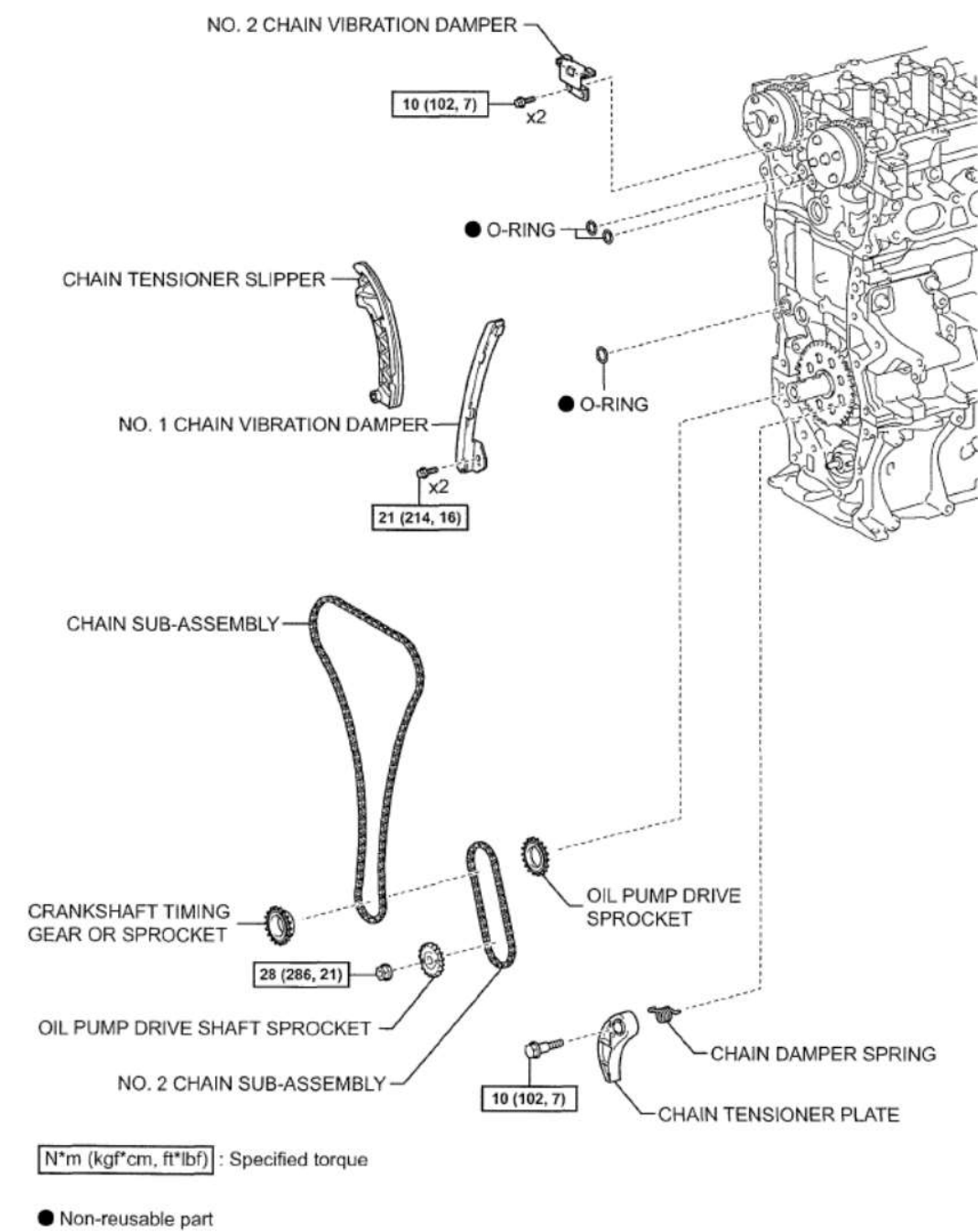
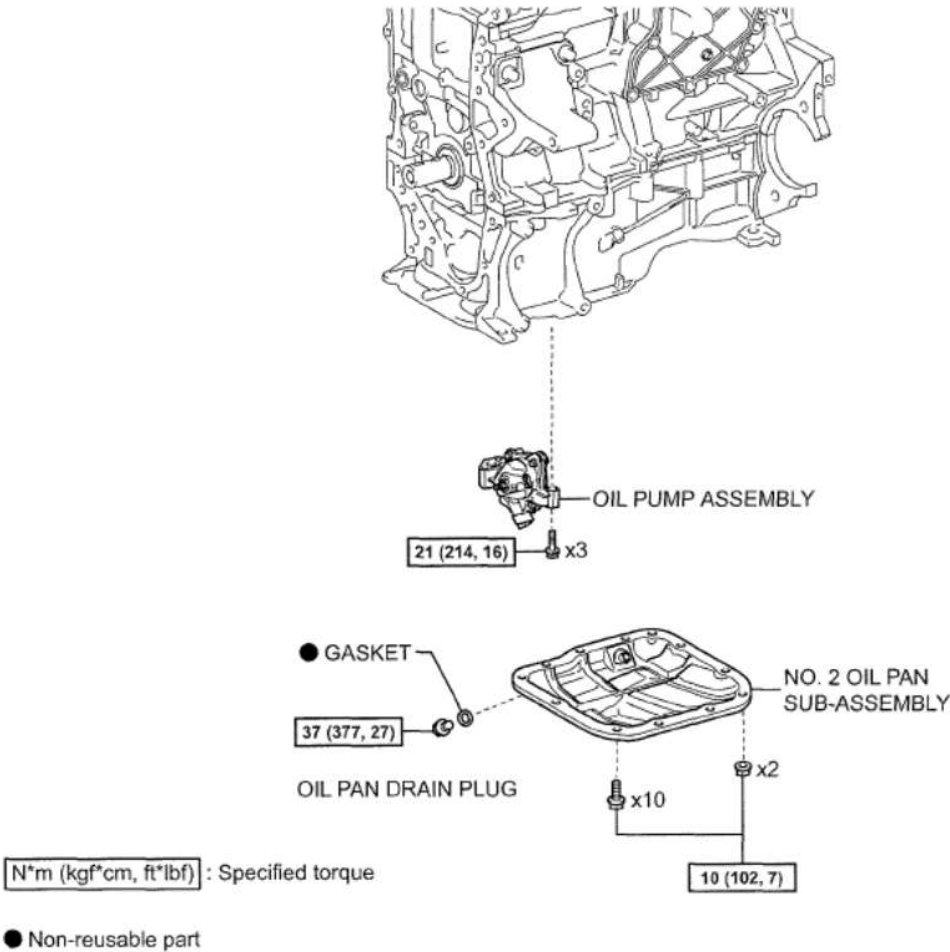


Fig. 27: Identifying Chain Tensioner Slipper, Chain Sub-Assembly And Chain Tensioner Plate With Torque Specifications
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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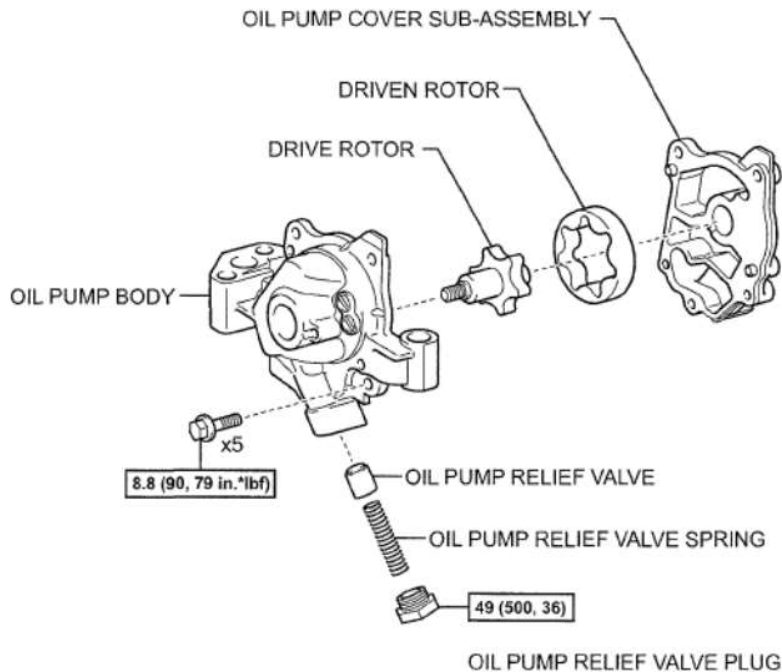


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Fig. 28: Identifying Oil Pump Assembly And Oil Pump Drain Plug With Torque Specifications
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N*m (kgf*cm, ft*lbf) : Specified torque

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Fig. 29: Identifying Oil Pump Cover Sub-Assembly, Driven Motor And Oil Pump Relay Valve With Torque Specifications

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

REMOVAL

1. DISCHARGE FUEL SYSTEM PRESSURE

(See **PRECAUTION**)

2. REMOVE BATTERY (See **REMOVAL**)
3. REMOVE BATTERY TRAY
4. REMOVE FRONT WHEELS
5. REMOVE ENGINE UNDER COVER LH
6. REMOVE ENGINE UNDER COVER RH
7. DRAIN ENGINE COOLANT (See **REPLACEMENT**)
8. DRAIN ENGINE OIL (See **REPLACEMENT**)
9. REMOVE FRONT WIPER ARM HEAD CAP (See **REMOVAL**)
10. REMOVE FRONT WIPER ARM AND BLADE ASSEMBLY LH (See **REMOVAL**)
11. REMOVE FRONT WIPER ARM AND BLADE ASSEMBLY RH (See **REMOVAL**)

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12. REMOVE HOOD TO COWL TOP SEAL (See REMOVAL)
13. REMOVE COWL TOP VENTILATOR LOUVER SUB-ASSEMBLY (See REMOVAL)
14. REMOVE COWL TOP VENTILATOR LOUVER LH (See REMOVAL)
15. REMOVE FRONT WIPER MOTOR AND LINK (See REMOVAL)
16. REMOVE FRONT AIR SHUTTER SEAL RH (See REMOVAL)
17. REMOVE OUTER COWL TOP PANEL (See REMOVAL)
18. REMOVE AIR CLEANER ASSEMBLY (See REMOVAL)
19. REMOVE AIR CLEANER BRACKET (See REMOVAL)
20. REMOVE BATTERY CARRIER (See REMOVAL)
21. REMOVE NO. 2 CYLINDER HEAD COVER (See REMOVAL)
22. REMOVE FAN AND GENERATOR V BELT (See REMOVAL)
23. REMOVE NO. 2 RADIATOR HOSE (See REMOVAL)
24. DISCONNECT NO. 1 RADIATOR HOSE (See REMOVAL)
25. REMOVE FRONT BUMPER COVER (See REMOVAL)
26. DISCONNECT NO. 1 OIL COOLER OUTLET HOSE (for Automatic Transaxle) (See REMOVAL)
27. DISCONNECT NO. 2 OIL COOLER INLET HOSE (for Automatic Transaxle) (See REMOVAL)
28. REMOVE HOOD LOCK ASSEMBLY (See REMOVAL)
29. REMOVE NO. 1 COOLER COVER (See REMOVAL)
30. REMOVE UPPER RADIATOR SUPPORT ABSORBER (See DISASSEMBLY)
31. REMOVE UPPER RADIATOR SUPPORT SUB-ASSEMBLY (See REMOVAL)
32. REMOVE RADIATOR ASSEMBLY (See REMOVAL)
33. SEPARATE WITH PULLEY COMPRESSOR ASSEMBLY (See REMOVAL)
34. SEPARATE TRANSMISSION CONTROL CABLE ASSEMBLY (for Automatic Transaxle) (See REMOVAL)
35. SEPARATE TRANSMISSION CONTROL CABLE ASSEMBLY (for Manual Transaxle) (See REMOVAL)
36. SEPARATE UNION TO CHECK VALVE HOSE (See REMOVAL)
37. SEPARATE NO. 1 FUEL VAPOR FEED HOSE (See REMOVAL)
38. DISCONNECT ENGINE WIRE (See REMOVAL)
39. DISCONNECT HEATER WATER OUTLET HOSE A(FROM HEATER UNIT) (See REMOVAL)
40. DISCONNECT HEATER WATER INLET HOSE A (See REMOVAL)
41. DISCONNECT FUEL TUBE SUB-ASSEMBLY (See REMOVAL)
42. SEPARATE CLUTCH RELEASE CYLINDER ASSEMBLY (for Manual Transaxle) (See REMOVAL)
43. REMOVE COLUMN HOLE COVER SILENCER SHEET (See REMOVAL)
44. SEPARATE STEERING SLIDING YOKE SUB-ASSEMBLY (See REMOVAL)

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45. **SEPARATE NO. 1 STEERING COLUMN HOLE COVER SUB-ASSEMBLY** (See **REMOVAL**)
46. **REMOVE SHIFT LEVER KNOB SUB-ASSEMBLY (for Manual Transaxle)** (See **REMOVAL**)
47. **REMOVE CONSOLE PANEL UPPER** (See **REMOVAL**)
48. **REMOVE CONSOLE BOX REAR COVER** (See **REMOVAL**)
49. **REMOVE CONSOLE BOX CARPET** (See **REMOVAL**)
50. **REMOVE REAR CONSOLE BOX ASSEMBLY** (See **REMOVAL**)
51. **REMOVE FRONT CONSOLE BOX** (See **REMOVAL**)
52. **REMOVE FRONT FLOOR BRACE CENTER** (See **REMOVAL**)
53. **REMOVE FRONT EXHAUST PIPE ASSEMBLY** (See **REMOVAL**)
54. **REMOVE FRONT AXLE SHAFT LH NUT** (See **REMOVAL**)
55. **REMOVE FRONT AXLE SHAFT RH NUT**

HINT:

The removal procedure for the RH side is the same as that for the LH side.

56. **SEPARATE SPEED SENSOR FRONT LH** (See **REMOVAL**)
57. **SEPARATE SPEED SENSOR FRONT RH**

HINT:

The removal procedure for the RH side is the same as that for the LH side.

58. **SEPARATE TIE ROD END SUB-ASSEMBLY LH** (See **REMOVAL**)
59. **SEPARATE TIE ROD END SUB-ASSEMBLY RH**

HINT:

The removal procedure for the RH side is the same as that for the LH side.

60. **SEPARATE FRONT STABILIZER LINK ASSEMBLY LH** (See **REMOVAL**)
61. **SEPARATE FRONT STABILIZER LINK ASSEMBLY RH**

HINT:

The removal procedure for the RH side is the same as that for the LH side.

62. **SEPARATE FRONT LOWER SUSPENSION ARM SUB-ASSEMBLY LH** (See **REMOVAL**)
63. **SEPARATE FRONT LOWER SUSPENSION ARM SUB-ASSEMBLY RH**

HINT:

The removal procedure for the RH side is the same as that for the LH side.

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- 64. **SEPARATE FRONT AXLE ASSEMBLY LH** (See **REMOVAL**)
- 65. **SEPARATE FRONT AXLE ASSEMBLY RH**

HINT:

The removal procedure for the RH side is the same as that for the LH side.

- 66. **REMOVE ENGINE ASSEMBLY WITH TRANSAXLE** (See **REMOVAL**)
- 67. **REMOVE FRONT SUSPENSION CROSSMEMBER SUB-ASSEMBLY** (See **REMOVAL**)
- 68. **REMOVE NO. 1 OIL COOLER INLET TUBE** (for Automatic Transaxle) (See **REMOVAL**)
- 69. **REMOVE NO. 1 OIL COOLER OUTLET TUBE** (for Automatic Transaxle) (See **REMOVAL**)
- 70. **REMOVE NO. 2 OIL COOLER TUBE CLAMP** (for Automatic Transaxle) (See **REMOVAL**)
- 71. **REMOVE TRANSMISSION OIL LEVEL GAGE SUB-ASSEMBLY** (for Automatic Transaxle)
- 72. **SEPARATE TRANSMISSION OIL FILLER TUBE SUB-ASSEMBLY** (for Automatic Transaxle) (See **REMOVAL**)
- 73. **REMOVE INTAKE MANIFOLD** (See **REMOVAL**)
- 74. **REMOVE OIL LEVEL DIPSTICK**
- 75. **REMOVE OIL LEVEL GAGE GUIDE** (See **REMOVAL**)
- 76. **REMOVE GENERATOR ASSEMBLY** (See **REMOVAL**)
- 77. **REMOVE FAN BELT ADJUSTING BAR** (See **REMOVAL**)
- 78. **SEPARATE WATER INLET HOSE** (See **REMOVAL**)
- 79. **SEPARATE NO. 3 WATER BY-PASS HOSE** (See **REMOVAL**)
- 80. **REMOVE WATER INLET** (See **REMOVAL**)
- 81. **REMOVE THERMOSTAT** (See **REMOVAL**)
- 82. **REMOVE IGNITION COIL ASSEMBLY** (See **REMOVAL**)
- 83. **REMOVE RADIO SETTING CONDENSER** (See **REMOVAL**)
- 84. **REMOVE NO. 2 VENTILATION HOSE** (See **REMOVAL**)
- 85. **REMOVE AIR TUBE ASSEMBLY** (See **REMOVAL**)
- 86. **REMOVE CYLINDER HEAD COVER SUB-ASSEMBLY** (See **DISASSEMBLY**)
- 87. **SET NO. 1 CYLINDER TO TDC / COMPRESSION** (See **DISASSEMBLY**)
- 88. **REMOVE CRANKSHAFT PULLEY** (See **DISASSEMBLY**)
- 89. **REMOVE NO. 1 CHAIN TENSIONER ASSEMBLY** (See **DISASSEMBLY**)
- 90. **REMOVE TIMING CHAIN OR BELT COVER SUB-ASSEMBLY** (See **DISASSEMBLY**)
- 91. **REMOVE TIMING CHAIN OR BELT COVER OIL SEAL**
 - a. Using a screwdriver and hammer, remove the oil seal

NOTE: **Be careful not to damage the timing chain or belt cover sub-assembly.**

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HINT:

Tape the screwdriver tip before use.

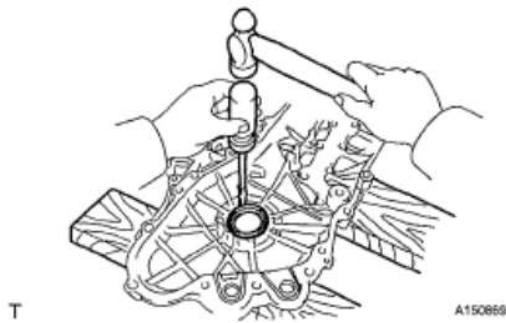


Fig. 30: Removing Oil Seal

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

92. REMOVE NO. 2 CHAIN VIBRATION DAMPER (See DISASSEMBLY)
93. REMOVE CHAIN TENSIONER SLIPPER (See DISASSEMBLY)
94. REMOVE NO. 1 CHAIN VIBRATION DAMPER (See DISASSEMBLY)
95. REMOVE CHAIN SUB-ASSEMBLY (See DISASSEMBLY)
96. REMOVE CRANKSHAFT TIMING GEAR OR SPROCKET (See DISASSEMBLY)
97. REMOVE NO. 2 CHAIN SUB-ASSEMBLY (See DISASSEMBLY)
98. REMOVE NO. 2 OIL PAN SUB-ASSEMBLY (See DISASSEMBLY)
99. REMOVE OIL PUMP ASSEMBLY
 - a. Remove the 3 bolts and remove the oil pump assembly.

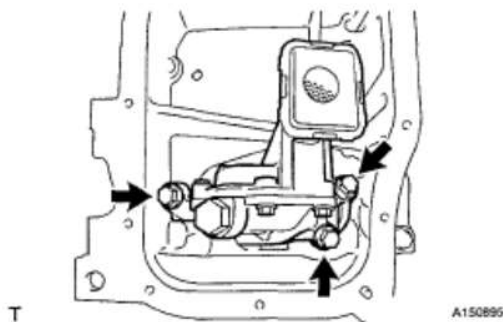


Fig. 31: Locating Oil Pump Assembly Bolts

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

DISASSEMBLY

1. REMOVE OIL PUMP RELIEF VALVE

- a. Using a 27 mm socket wrench, remove the oil pump relief valve plug.

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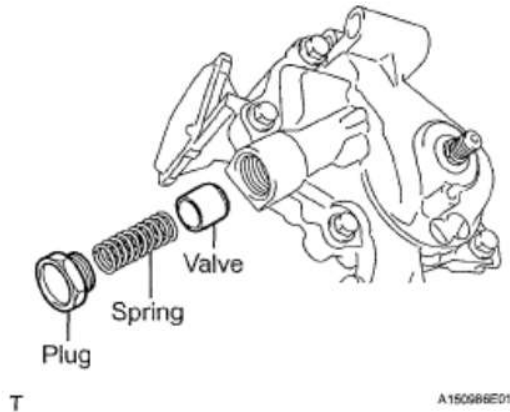


Fig. 32: Identifying Valve, Spring And Plug

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

- b. Remove the valve spring and oil pump relief valve.

2. REMOVE OIL PUMP COVER SUB-ASSEMBLY

- a. Remove the 5 bolts and remove the oil pump cover sub-assembly.

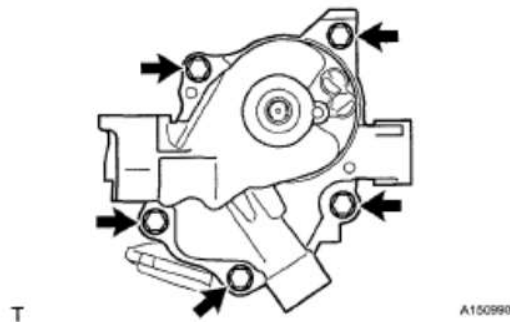


Fig. 33: Locating Oil Pump Cover Sub-Assembly Bolts

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

INSPECTION

1. INSPECT OIL PUMP RELIEF VALVE

- a. Check the relief valve.
 1. Coat the valve with engine oil, and then check that the valve falls smoothly into the valve hole under its own weight.

If the valve does not fall smoothly, replace the relief valve. If necessary, replace the oil pump assembly.

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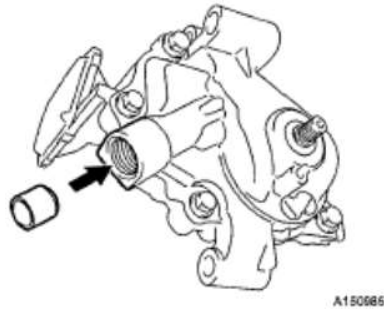


Fig. 34: Locating Relief Valve

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

2. INSPECT OIL PUMP ASSEMBLY

a. Check the side clearance.

1. Using a feeler gauge and precision straightedge, measure the clearance between the rotors and precision straightedge.

Standard clearance:

0.030 to 0.080 mm (0.0012 to 0.0031 in.)

Maximum clearance:

0.16 mm (0.0063 in.)

If the side clearance is greater than the maximum, replace the oil pump assembly.

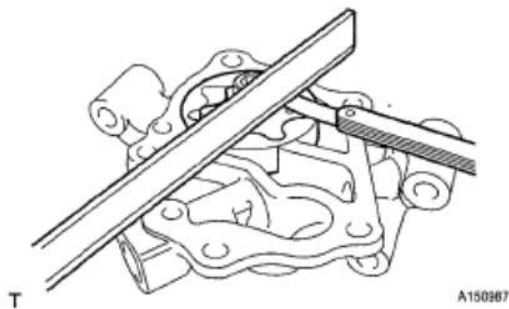


Fig. 35: Measuring Clearance Between Rotors And Precision Straightedge

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

b. Check the rotor tip clearance.

1. Using a feeler gauge, measure the clearance between the drive and driven rotor tips.

Standard tip clearance:

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0.08 to 0.16 mm (0.0032 to 0.0063 in.)

Maximum tip clearance:

0.35 mm (0.0138 in.)

If the tip clearance is greater than the maximum, replace the oil pump assembly.

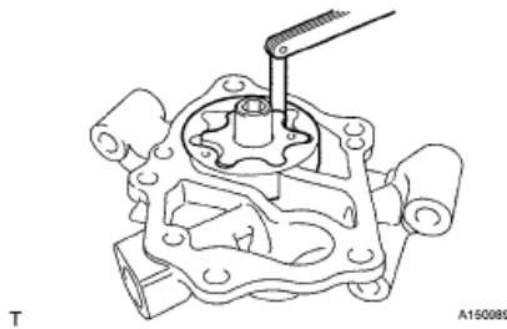


Fig. 36: Measuring Clearance Between Drive And Driven Rotor Tips
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Check the rotor body clearance.
1. Using a feeler gauge, measure the clearance between the driven rotor and the oil pump body.

Standard body clearance:

0.12 to 0.19 mm (0.0048 to 0.0074 in.)

Maximum body clearance:

0.325 mm (0.0128 in.)

If the body clearance is greater than the maximum, replace the oil pump assembly.

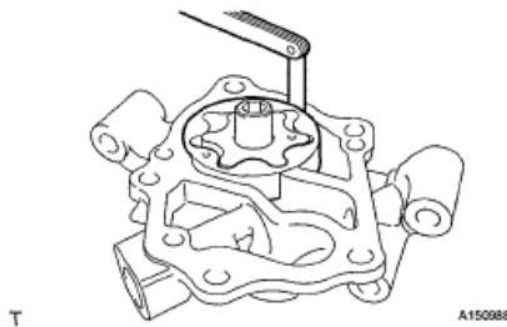


Fig. 37: Measuring Clearance Between Driven Rotor And Oil Pump Body
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2008 Scion xD**2008 ENGINE 2ZR-FE Lubrication - xD****REASSEMBLY****1. INSTALL OIL PUMP COVER SUB-ASSEMBLY**

- a. Coat the drive and driven rotors with engine oil, and place them into the oil pump with the marks facing the oil pump cover side, as shown in the illustration.

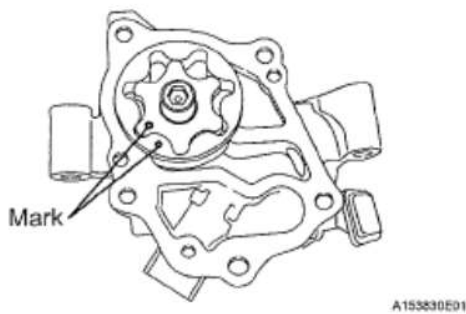


Fig. 38: Identifying Mark Of Oil Pump Covers
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Install the oil pump cover sub-assembly with the 5 bolts.

Torque: 8.8 N*m (90 kgf*cm, 79 in.*lbf)

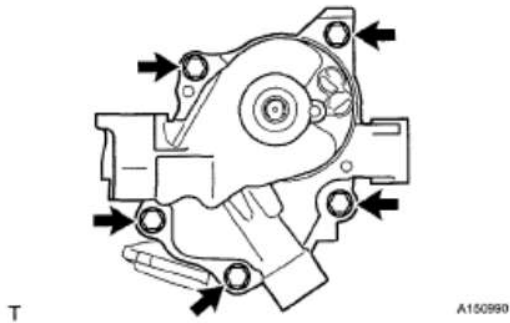


Fig. 39: Locating Oil Pump Cover Sub-Assembly With Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. INSTALL OIL PUMP RELIEF VALVE

- a. Coat the relief valve with engine oil.
- b. Insert the oil pump relief valve and valve spring into the oil pump body hole.
- c. Using a 27 mm socket wrench, install the oil pump relief valve plug.

Torque: 49 N*m (500 kgf*cm, 36 ft.*lbf)

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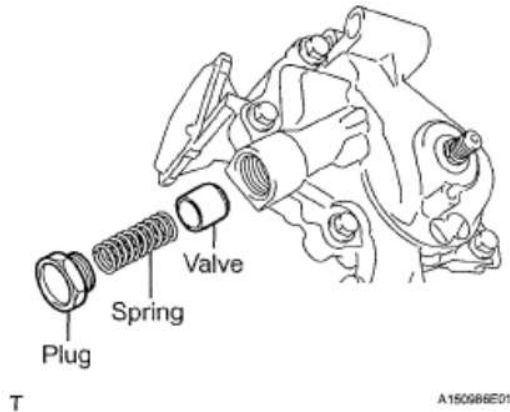


Fig. 40: Identifying Spring, Valve And Plug
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSTALLATION

1. INSTALL OIL PUMP ASSEMBLY

- a. Install the oil pump assembly with the 3 bolts.

Torque: 21 N*m (214 kgf*cm, 16 ft.*lbf)

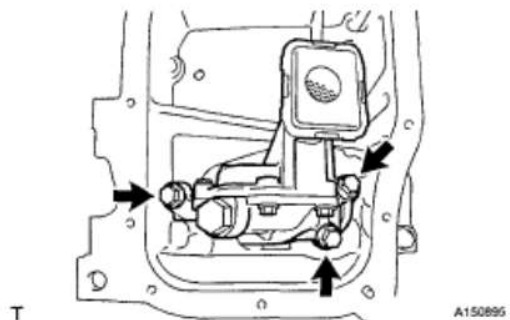


Fig. 41: Identifying Oil Pump Assembly With Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. **INSTALL NO. 2 OIL PAN SUB-ASSEMBLY** (See REASSEMBLY)
3. **INSTALL NO. 2 CHAIN SUB-ASSEMBLY** (See REASSEMBLY)
4. **INSTALL CRANKSHAFT TIMING GEAR OR SPROCKET** (See REASSEMBLY)
5. **INSTALL NO. 1 CHAIN VIBRATION DAMPER** (See REASSEMBLY)
6. **INSTALL CHAIN SUB-ASSEMBLY** (See REASSEMBLY)
7. **INSTALL CHAIN TENSIONER SLIPPER** (See REASSEMBLY)
8. **INSTALL NO. 2 CHAIN VIBRATION DAMPER** (See REASSEMBLY)
9. **INSTALL TIMING CHAIN OR BELT COVER OIL SEAL**
 - a. Using SST, tap in a new oil seal until its surface is flush with the timing gear case edge.

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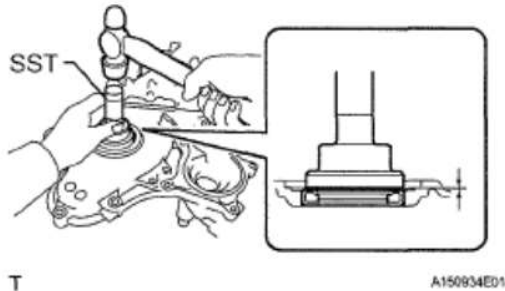


Fig. 42: Installing Timing Chain Or Belt Cover Oil Seal
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Apply a light coat of MP grease to the lip of the oil seal.

NOTE:

- Keep the lip free of foreign matter.
- Do not tap on the oil seal at an angle.
- Make sure that the oil seal edge does not stick out of the timing chain cover.

10. INSTALL TIMING CHAIN OR BELT COVER SUB-ASSEMBLY (See REASSEMBLY)
11. INSTALL CRANKSHAFT PULLEY (See REASSEMBLY)
12. INSTALL NO. 1 CHAIN TENSIONER ASSEMBLY (See REASSEMBLY)
13. INSTALL CYLINDER HEAD COVER SUB-ASSEMBLY (See REASSEMBLY)
14. INSTALL AIR TUBE ASSEMBLY (See INSTALLATION)
15. INSTALL NO. 2 VENTILATION HOSE (See INSTALLATION)
16. INSTALL RADIO SETTING CONDENSER (See INSTALLATION)
17. INSTALL IGNITION COIL ASSEMBLY (See INSTALLATION)
18. INSTALL THERMOSTAT (See INSTALLATION)
19. INSTALL WATER INLET (See INSTALLATION)
20. INSTALL NO. 3 WATER BY-PASS HOSE (See INSTALLATION)
21. INSTALL WATER INLET HOSE (See INSTALLATION)
22. INSTALL FAN BELT ADJUSTING BAR (See INSTALLATION)
23. INSTALL GENERATOR ASSEMBLY (See INSTALLATION)
24. INSTALL OIL LEVEL GAGE GUIDE (See INSTALLATION)
25. INSTALL OIL LEVEL DIPSTICK
26. INSTALL INTAKE MANIFOLD (See INSTALLATION)
27. INSTALL TRANSMISSION OIL FILLER TUBE SUB-ASSEMBLY (for Automatic Transaxle)
(See INSTALLATION)
28. INSTALL TRANSMISSION OIL LEVEL GAGE SUB-ASSEMBLY (for Automatic Transaxle)

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29. **INSTALL NO. 1 OIL COOLER OUTLET TUBE (for Automatic Transaxle) (See INSTALLATION)**
30. **INSTALL NO. 1 OIL COOLER INLET TUBE (for Automatic Transaxle) (See INSTALLATION)**
31. **INSTALL NO. 2 OIL COOLER TUBE CLAMP (for Automatic Transaxle) (See INSTALLATION)**
32. **INSTALL FRONT SUSPENSION CROSSMEMBER SUB-ASSEMBLY (See INSTALLATION)**
33. **INSTALL ENGINE ASSEMBLY WITH TRANSAXLE (See INSTALLATION)**
34. **INSTALL FRONT AXLE ASSEMBLY LH (See INSTALLATION)**
35. **INSTALL FRONT AXLE ASSEMBLY RH**

HINT:

The installation procedure for the RH side is the same as that for the LH side.

36. **INSTALL FRONT LOWER SUSPENSION ARM SUB-ASSEMBLY LH (See INSTALLATION)**
37. **INSTALL FRONT LOWER SUSPENSION ARM SUB-ASSEMBLY RH**

HINT:

The installation procedure for the RH side is the same as that for the LH side.

38. **INSTALL FRONT STABILIZER LINK ASSEMBLY LH (See INSTALLATION)**
39. **INSTALL FRONT STABILIZER LINK ASSEMBLY RH**

HINT:

The installation procedure for the RH side is the same as that for the LH side.

40. **INSTALL TIE ROD END SUB-ASSEMBLY LH (See INSTALLATION)**
41. **INSTALL TIE ROD END SUB-ASSEMBLY RH**

HINT:

The installation procedure for the RH side is the same as that for the LH side.

42. **INSTALL SPEED SENSOR FRONT LH (See INSTALLATION)**
43. **INSTALL SPEED SENSOR FRONT RH**

HINT:

The installation procedure for the RH side is the same as that for the LH side.

44. **INSTALL FRONT AXLE SHAFT LH NUT (See INSTALLATION)**
45. **INSTALL FRONT AXLE SHAFT RH NUT**

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HINT:

The installation procedure for the RH side is the same as that for the LH side.

46. **INSTALL FRONT EXHAUST PIPE ASSEMBLY** (See **INSTALLATION**)
47. **INSTALL FRONT FLOOR BRACE CENTER** (See **INSTALLATION**)
48. **INSTALL FRONT CONSOLE BOX** (See **INSTALLATION**)
49. **INSTALL REAR CONSOLE BOX ASSEMBLY** (See **INSTALLATION**)
50. **INSTALL CONSOLE BOX CARPET** (See **INSTALLATION**)
51. **INSTALL CONSOLE BOX REAR COVER** (See **INSTALLATION**)
52. **INSTALL CONSOLE PANEL UPPER** (See **INSTALLATION**)
53. **INSTALL SHIFT LEVER KNOB SUB-ASSEMBLY** (for Manual Transaxle) (See **INSTALLATION**)
54. **INSTALL NO. 1 STEERING COLUMN HOLE COVER SUB-ASSEMBLY** (See **INSTALLATION**)
55. **INSTALL STEERING SLIDING YOKE SUB-ASSEMBLY** (See **INSTALLATION**)
56. **INSTALL COLUMN HOLE COVER SILENCER SHEET** (See **INSTALLATION**)
57. **INSTALL CLUTCH RELEASE CYLINDER ASSEMBLY** (for Manual Transaxle) (See **INSTALLATION**)
58. **CONNECT FUEL TUBE SUB-ASSEMBLY** (See **INSTALLATION**)
59. **CONNECT HEATER WATER INLET HOSE A** (See **INSTALLATION**)
60. **CONNECT HEATER WATER OUTLET HOSE A(FROM HEATER UNIT)** (See **INSTALLATION**)
61. **CONNECT ENGINE WIRE** (See **INSTALLATION**)
62. **INSTALL NO. 1 FUEL VAPOR FEED HOSE** (See **INSTALLATION**)
63. **INSTALL UNION TO CHECK VALVE HOSE** (See **INSTALLATION**)
64. **INSTALL TRANSMISSION CONTROL CABLE ASSEMBLY** (for Automatic Transaxle) (See **INSTALLATION**)
65. **INSTALL TRANSMISSION CONTROL CABLE ASSEMBLY** (for Manual Transaxle) (See **INSTALLATION**)
66. **INSTALL WITH PULLEY COMPRESSOR ASSEMBLY** (See **INSTALLATION**)
67. **INSTALL RADIATOR ASSEMBLY** (See **INSTALLATION**)
68. **INSTALL UPPER RADIATOR SUPPORT SUB-ASSEMBLY** (See **INSTALLATION**)
69. **INSTALL UPPER RADIATOR SUPPORT ABSORBER** (See **REASSEMBLY**)
70. **INSTALL NO. 1 COOLER COVER** (See **INSTALLATION**)
71. **INSTALL HOOD LOCK ASSEMBLY** (See **INSTALLATION**)
72. **CONNECT NO. 2 OIL COOLER INLET HOSE** (for Automatic Transaxle) (See **INSTALLATION**)
73. **CONNECT NO. 1 OIL COOLER OUTLET HOSE** (for Automatic Transaxle) (See **INSTALLATION**)

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74. **INSTALL FRONT BUMPER COVER** (See INSTALLATION)
75. **CONNECT NO. 1 RADIATOR HOSE** (See INSTALLATION)
76. **INSTALL NO. 2 RADIATOR HOSE** (See INSTALLATION)
77. **INSTALL FAN AND GENERATOR V BELT** (See INSTALLATION)
78. **ADJUST FAN AND GENERATOR V BELT** (See INSTALLATION)
79. **INSPECT FAN AND GENERATOR V BELT** (See INSTALLATION)
80. **INSTALL NO. 2 CYLINDER HEAD COVER** (See INSTALLATION)
81. **INSTALL BATTERY CARRIER** (See INSTALLATION)
82. **INSTALL AIR CLEANER BRACKET** (See INSTALLATION)
83. **INSTALL AIR CLEANER ASSEMBLY** (See INSTALLATION)
84. **INSTALL OUTER COWL TOP PANEL** (See INSTALLATION)
85. **INSTALL FRONT AIR SHUTTER SEAL RH** (See INSTALLATION)
86. **INSTALL FRONT WIPER MOTOR AND LINK** (See INSTALLATION)
87. **INSTALL COWL TOP VENTILATOR LOUVER LH** (See INSTALLATION)
88. **INSTALL COWL TOP VENTILATOR LOUVER SUB-ASSEMBLY** (See INSTALLATION)
89. **INSTALL HOOD TO COWL TOP SEAL** (See INSTALLATION)
90. **INSTALL FRONT WIPER ARM AND BLADE ASSEMBLY LH** (See INSTALLATION)
91. **INSTALL FRONT WIPER ARM AND BLADE ASSEMBLY RH** (See INSTALLATION)
92. **INSTALL FRONT WIPER ARM HEAD CAP** (See INSTALLATION)
93. **INSTALL BATTERY TRAY**
94. **INSTALL BATTERY** (See INSTALLATION)
95. **ADD ENGINE COOLANT** (See REPLACEMENT)
96. **ADD ENGINE OIL** (See REPLACEMENT)
97. **INSPECT FOR FUEL LEAK**
98. **INSPECT FOR ENGINE OIL LEAK**
99. **INSPECT FOR EXHAUST GAS LEAK**
100. **INSPECT FOR ENGINE COOLANT LEAK** (See ON-VEHICLE INSPECTION)
101. **INSTALL ENGINE UNDER COVER RH**
102. **INSTALL ENGINE UNDER COVER LH**
103. **INSTALL FRONT WHEELS** (See INSTALLATION)
104. **INSPECT IGNITION TIMING** (See ON-VEHICLE INSPECTION)
105. **INSPECT ENGINE IDLING SPEED** (See ON-VEHICLE INSPECTION)
106. **INSPECT CO/HC** (See ON-VEHICLE INSPECTION)
107. **INSPECT FRONT WHEEL ALIGNMENT**

(See ADJUSTMENT)
108. **INSPECT ABS SENSOR SIGNAL**

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(See **TEST MODE PROCEDURE**)

109. INSPECT VSC SENSOR SIGNAL

(See **TEST MODE PROCEDURE**)