

|                                              |
|----------------------------------------------|
| 2009 Toyota Highlander Limited               |
| 2009 TRANSMISSION MF2A Transfer - Highlander |

2009 TRANSMISSION

MF2A Transfer - Highlander

TRANSFER SYSTEM

PRECAUTION

- NOTE:
- 1. Before disassembly, clean the transfer assembly of any sand or mud to prevent it from entering inside the transfer during disassembly and assembly.
  - 2. When removing any light alloy part such as a transfer cover, do not pry it off with a tool like a screwdriver, but tap it out with a plastic hammer instead.
  - 3. Always arrange the removed parts properly and protect them from dust.
  - 4. Before installation, clean and dry all parts completely, and then apply hypoid gear oil to each part. Do not use alkaline chemicals when cleaning aluminum, rubber parts, or ring gear set bolts. Also do not use any cleaning oil (ex. non-residue solvent) to clean the rubber parts such as O-rings and oil seals.
  - 5. Apply hypoid gear oil to any sliding surface or rotating part.
  - 6. Do not directly hold a part in a vise. Make sure to put an aluminum sheet between them.
  - 7. Replace any damaged or deformed snap ring with a new one.
  - 8. If there is a scratch on the contact surface of the case, it may cause oil leakage. Therefore, be careful not to damage the contact surface when handling it.
  - 9. Before applying a sealant, completely remove any old sealant stuck on the parts and clean with non-residue solvent.
  - 10. Do not add oil immediately after installing sealed parts. Leave for 1 hour or more
  - 11. Scratches on a contact surface of an oil seal, O-ring or gasket may cause oil leakage. Be careful not to damage the contact surface when handling the seals.
  - 12. When press - fitting an oil seal, be careful not to damage the oil seal lip and around it.
  - 13. When replacing a bearing, replace the inner and outer races as a set.

PROBLEM SYMPTOMS TABLE

Transfer system

PROBLEM SYMPTOMS CHART

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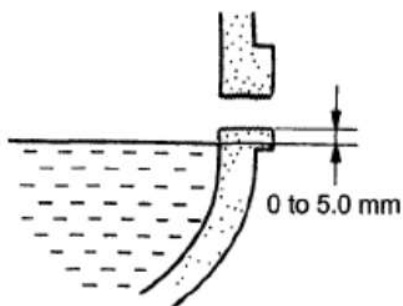
| Symptom     | Suspected Area                                    | Refer to            |
|-------------|---------------------------------------------------|---------------------|
| Noise       | Oil (level low)                                   | <u>TRANSFER OIL</u> |
|             | Backlash adjustment                               | <u>REASSEMBLY</u>   |
|             | Preload adjustment                                | <u>REASSEMBLY</u>   |
|             | Tooth contact adjustment                          | <u>REASSEMBLY</u>   |
|             | Transfer driven pinion bearing (worn)             | <u>DISASSEMBLY</u>  |
|             | Ring gear mounting case bearing (worn)            | <u>DISASSEMBLY</u>  |
| Oil leakage | Oil (level too high)                              | <u>TRANSFER OIL</u> |
|             | Oil seal (worn or damaged) Right bearing retainer | <u>REMOVAL</u>      |
|             | Oil seal (worn or damaged) Transfer case          | <u>REMOVAL</u>      |
|             | Oil seal (worn or damaged) Extension housing      | <u>REMOVAL</u>      |
|             | Gasket (damaged)                                  | <u>DISASSEMBLY</u>  |
|             | Seal (damaged)                                    | <u>DISASSEMBLY</u>  |

**TRANSFER OIL****ON-VEHICLE INSPECTION****1. INSPECT TRANSFER OIL**

- Remove the No. 1 transfer case plug and gasket.
- Check the oil level is within 0 to 5 mm (0 to 0.20 in.) below the lowest end of the hole for the No. 1 transfer case plug.

**NOTE:**

- When changing oil, recheck the oil level after driving.
- Excessively large or small quantity of oil may cause some trouble.



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**Fig. 1: Inspecting Transfer Oil Level**

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

- When the oil level is too low, check for oil leakage.
- Tighten the No. 1 transfer case plug with a new gasket.

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

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**2. ADD TRANSFER OIL**

- a. Remove the No. 1 transfer case plug and gasket and supply oil.

**NOTE:**

- When supplying oil, pour it slowly.
- Supply oil several times at several minutes interval.

**HINT:**

The oil level should be within 0 to 5 mm (0 to 0.20 in.) below the lowest end of the hole for the No. 1 transfer case plug.

- b. After leaving it alone for 5 minutes, recheck the oil level.  
c. Tighten the No. 1 transfer case plug with a new gasket.

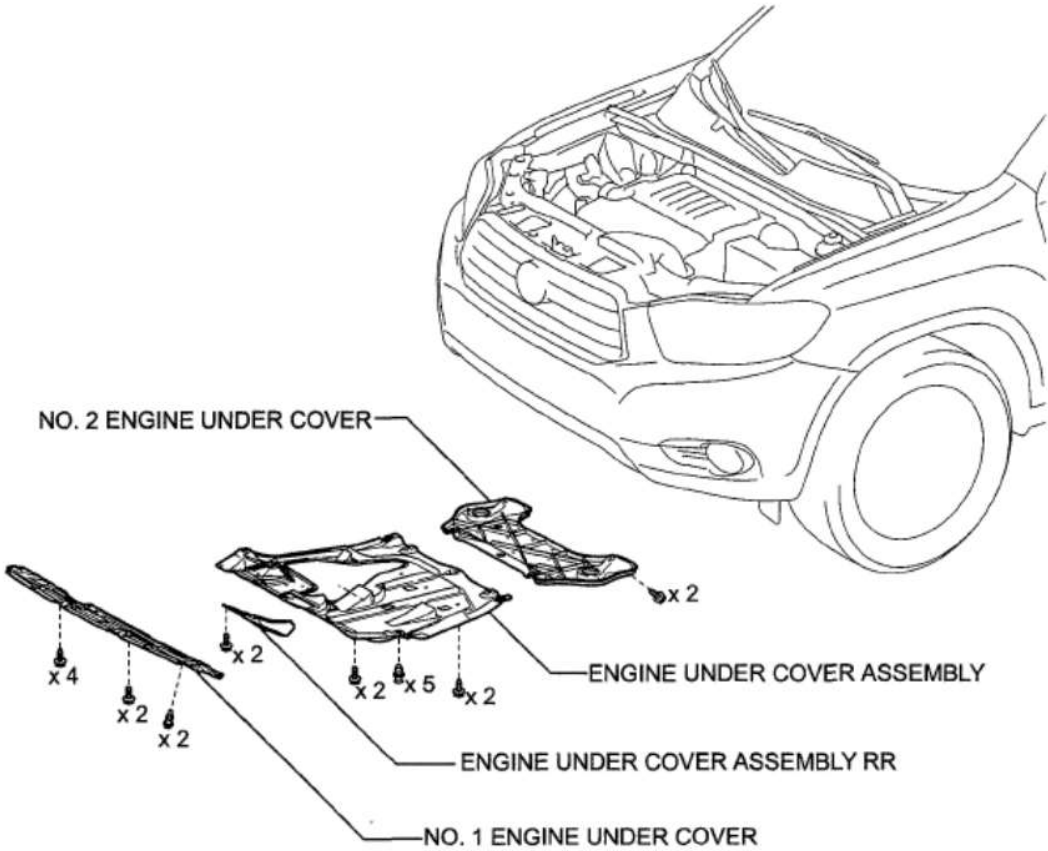
**Torque: 49 N\*m (500 kgf\*cm, 36 ft.\*lbf)**

**BEARING RETAINER OIL SEAL****COMPONENTS**

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**Fig. 2: Identifying Bearing Retainer Oil Seal Components (1 Of 2)**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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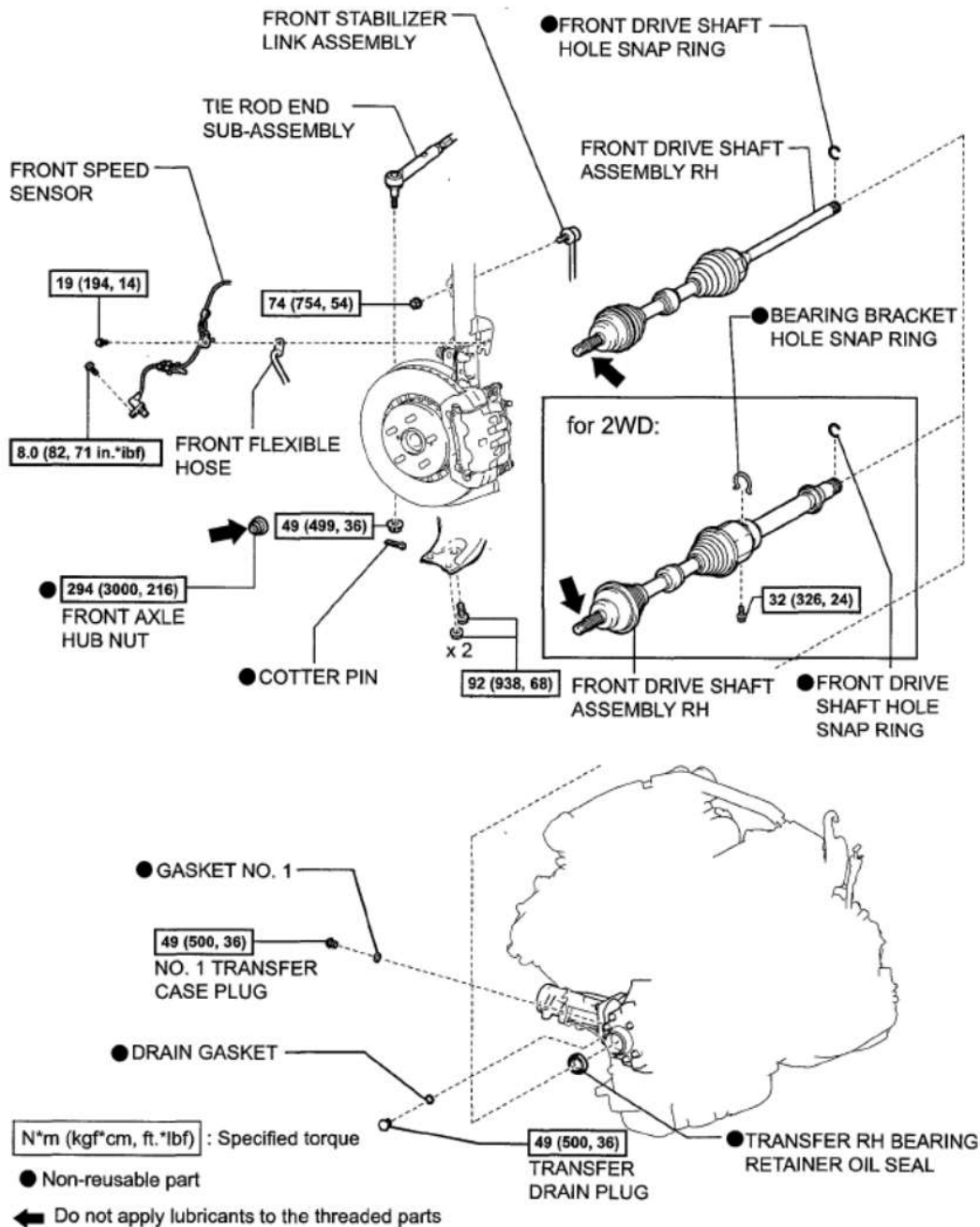


**Fig. 3: Identifying Bearing Retainer Oil Seal Components With Torque Specifications (2 Of 2)**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

### REMOVAL

1. DRAIN AUTOMATIC TRANSAXLE FLUID (See **REMOVAL**)
2. REMOVE NO. 1 TRANSFER CASE PLUG (See **DISASSEMBLY**)
3. REMOVE TRANSFER DRAIN PLUG (See **DISASSEMBLY**)

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4. **REMOVE ENGINE UNDER COVER ASSEMBLY**
5. **REMOVE NO. 1 ENGINE UNDER COVER**
6. **REMOVE NO. 2 ENGINE UNDER COVER**
7. **DRAIN AUTOMATIC TRANSAXLE FLUID** (See REMOVAL )
8. **REMOVE FRONT WHEEL**
9. **REMOVE FRONT AXLE HUB NUT** (See REMOVAL )
10. **SEPARATE FRONT STABILIZER LINK ASSEMBLY** (See REMOVAL )
11. **SEPARATE FRONT SPEED SENSOR** (See REMOVAL )
12. **SEPARATE TIE ROD END SUB-ASSEMBLY** (See REMOVAL )
13. **SEPARATE NO. 1 FRONT SUSPENSION LOWER ARM** (See REMOVAL )
14. **SECURE FRONT AXLE HUB SUB-ASSEMBLY** (See REMOVAL )
15. **REMOVE FRONT DRIVE SHAFT ASSEMBLY RH (for 2WD)** (See DISASSEMBLY )
16. **REMOVE FRONT DRIVE SHAFT ASSEMBLY RH (for 4WD)** (See DISASSEMBLY )
17. **FRONT DRIVE SHAFT HOLE SNAP RING** (See DISASSEMBLY )
18. **REMOVE TRANSFER RH BEARING RETAINER OIL SEAL**
  - a. Using SST, remove the transfer RH bearing retainer oil seal.

**SST 09308-00010**

**NOTE:** Do not damage the oil-seal-fitted surface of the case.

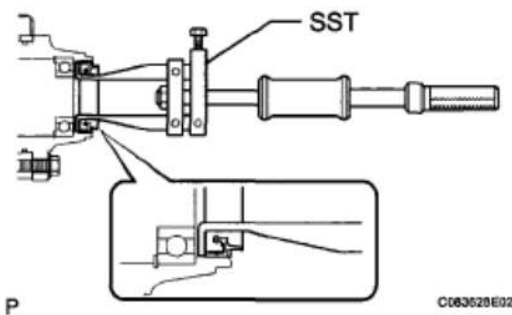


**Fig. 4: Removing Transfer RH Bearing Retainer Oil Seal**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

## INSTALLATION

1. **INSTALL TRANSFER RH BEARING RETAINER OIL SEAL**
  - a. Using SST, install a new transfer RH bearing retainer oil seal to the transfer case at the position as show in the illustration.

**SST 09223-46011**

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**NOTE:**

- Do not install the oil seal obliquely.
- Do not damage the oil seal lip.

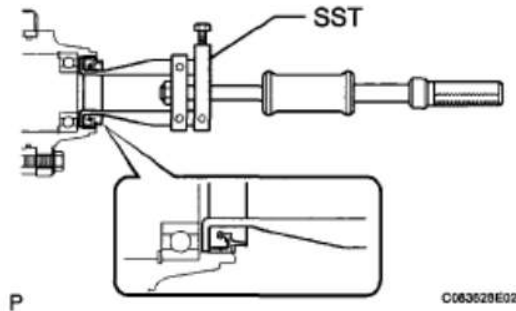


**Fig. 5: Installing Transfer RH Bearing Retainer Oil Seal To Transfer Case At Position**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

b. Apply small amount of MP grease to the oil seal lip.

2. **INSTALL FRONT DRIVE SHAFT HOLE SNAP RING** (See INSTALLATION )
3. **INSTALL FRONT DRIVE SHAFT ASSEMBLY RH (for 2WD)** (See INSTALLATION )
4. **INSTALL FRONT DRIVE SHAFT ASSEMBLY RH (for 4WD)** (See INSTALLATION )
5. **INSTALL FRONT AXLE ASSEMBLY** (See INSTALLATION )
6. **INSTALL NO. 1 FRONT SUSPENSION LOWER ARM** (See REMOVAL )
7. **CONNECT TIE ROD END SUB-ASSEMBLY** (See INSTALLATION )
8. **INSTALL FRONT SPEED SENSOR** (See INSTALLATION )
9. **INSTALL FRONT STABILIZER LINK ASSEMBLY** (See INSTALLATION )
10. **INSTALL FRONT AXLE HUB NUT** (See INSTALLATION )
11. **INSTALL FRONT WHEEL**

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

12. **ADD AUTOMATIC TRANSAXLE FLUID**
13. **INSPECT FLUID LEVEL** (See AUTOMATIC TRANSAXLE FLUID )
14. **INSTALL TRANSFER DRAIN PLUG** (See TRANSFER CASE OIL SEAL )
15. **INSTALL NO. 1 TRANSFER CASE PLUG** (See TRANSFER CASE OIL SEAL )
16. **INSPECT EXHAUST GAS LEAK** (See INSTALLATION )
17. **INSTALL NO. 2 ENGINE UNDER COVER**
18. **INSTALL NO. 1 ENGINE UNDER COVER**
19. **INSTALL ENGINE UNDER COVER ASSEMBLY**
20. **INSPECT AND ADJUST FRONT WHEEL ALIGNMENT**

**HINT:**

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(See **FRONT WHEEL ALIGNMENT** )

**21. CHECK ABS SPEED SENSOR SIGNAL**

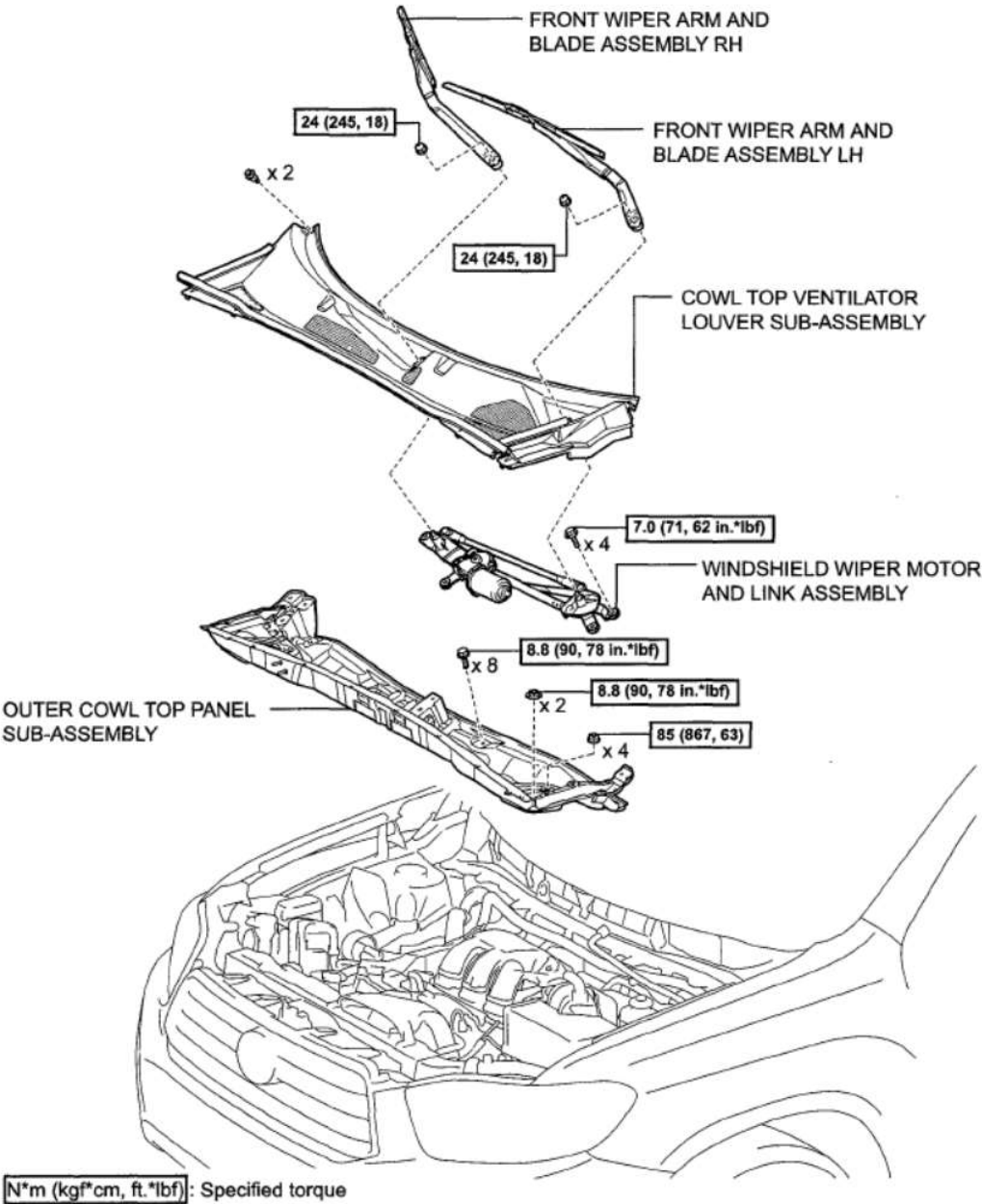
HINT:

(See **TEST MODE PROCEDURE** )

**TRANSFER ASSEMBLY****COMPONENTS**

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**Fig. 6: Identifying Transfer Assembly Components With Torque Specifications (1 Of 12)**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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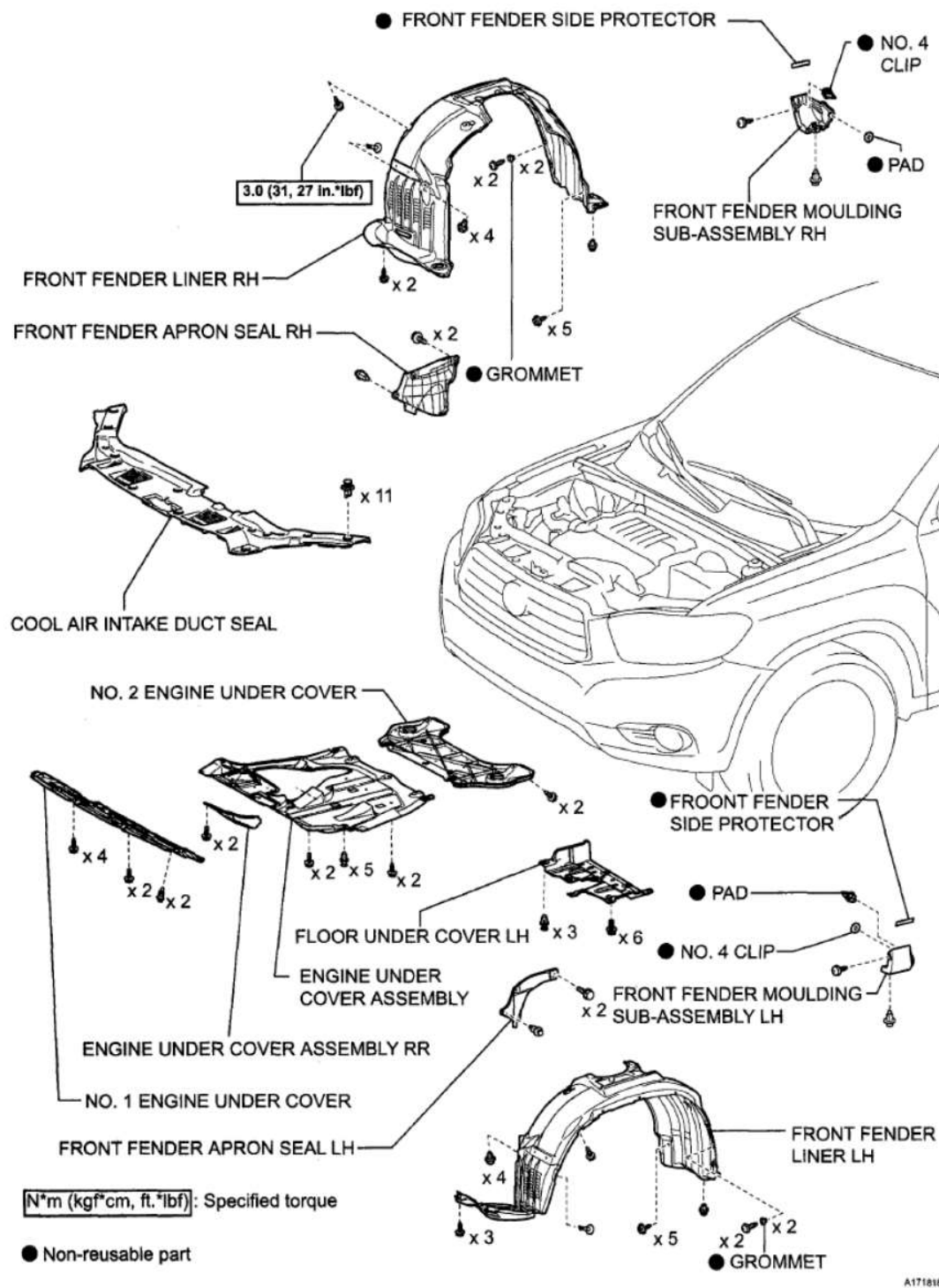
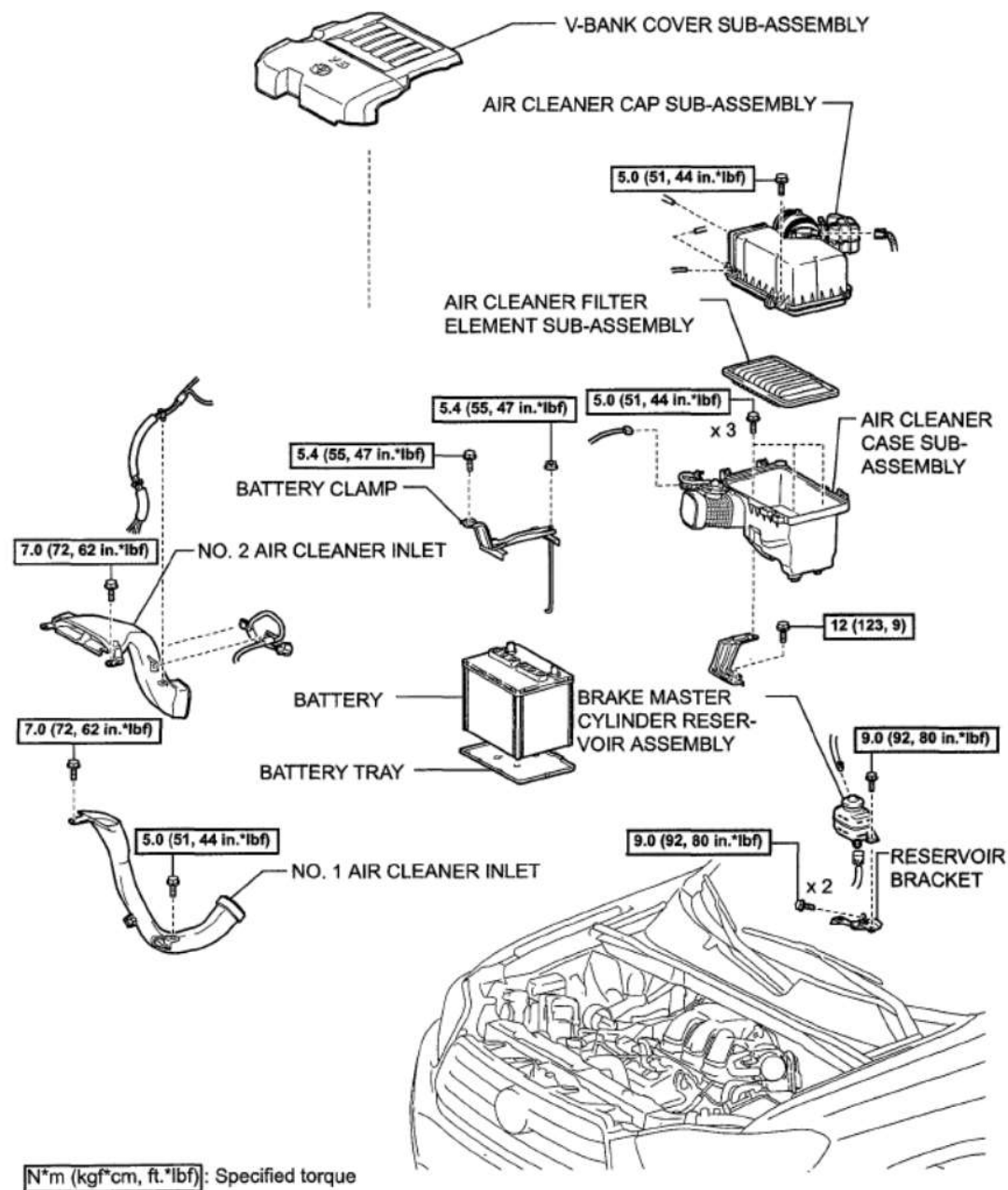


**Fig. 7: Identifying Transfer Assembly Components With Torque Specifications (2 Of 12)**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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**Fig. 8: Identifying Transfer Assembly Components With Torque Specifications (3 Of 12)**  
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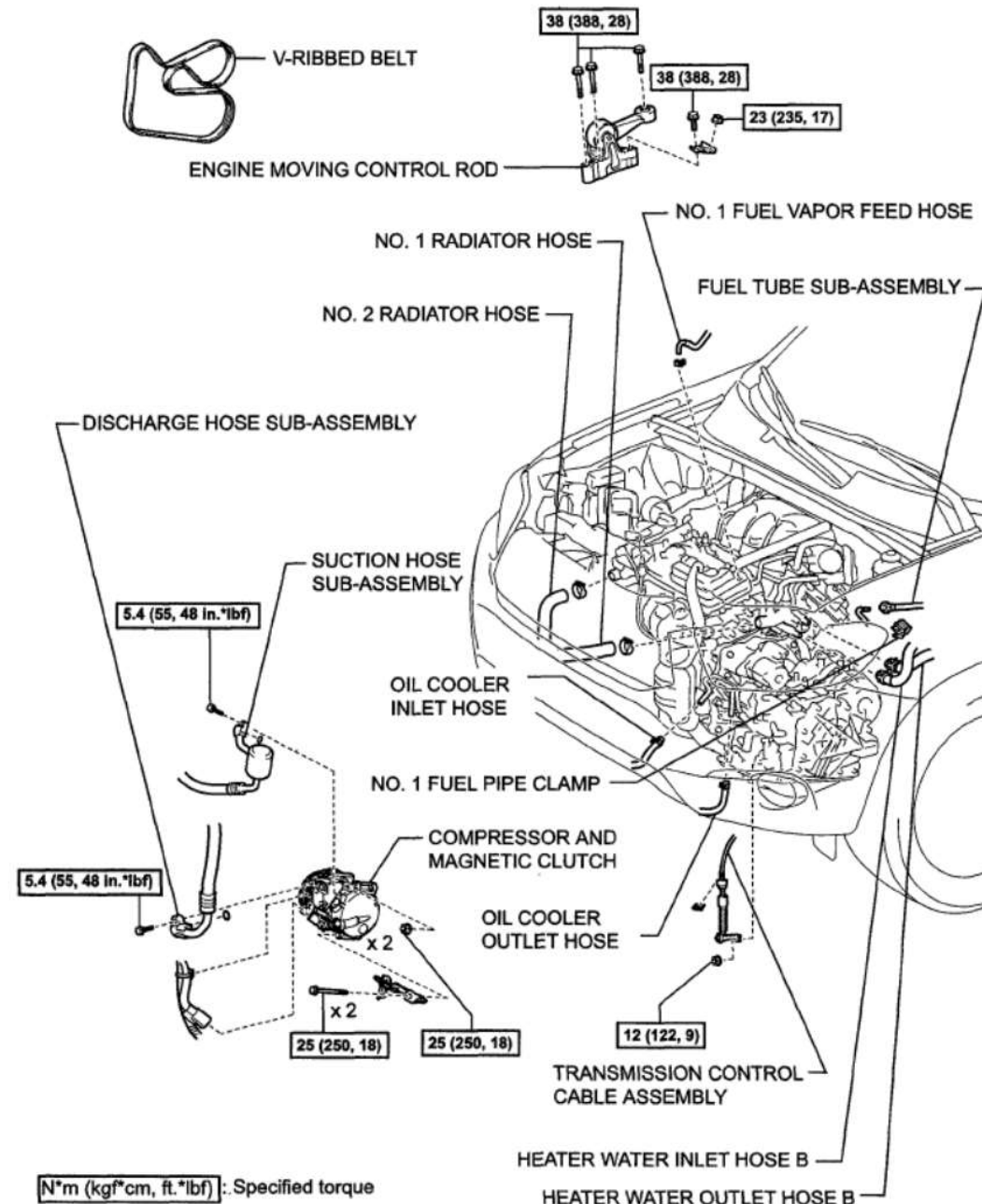
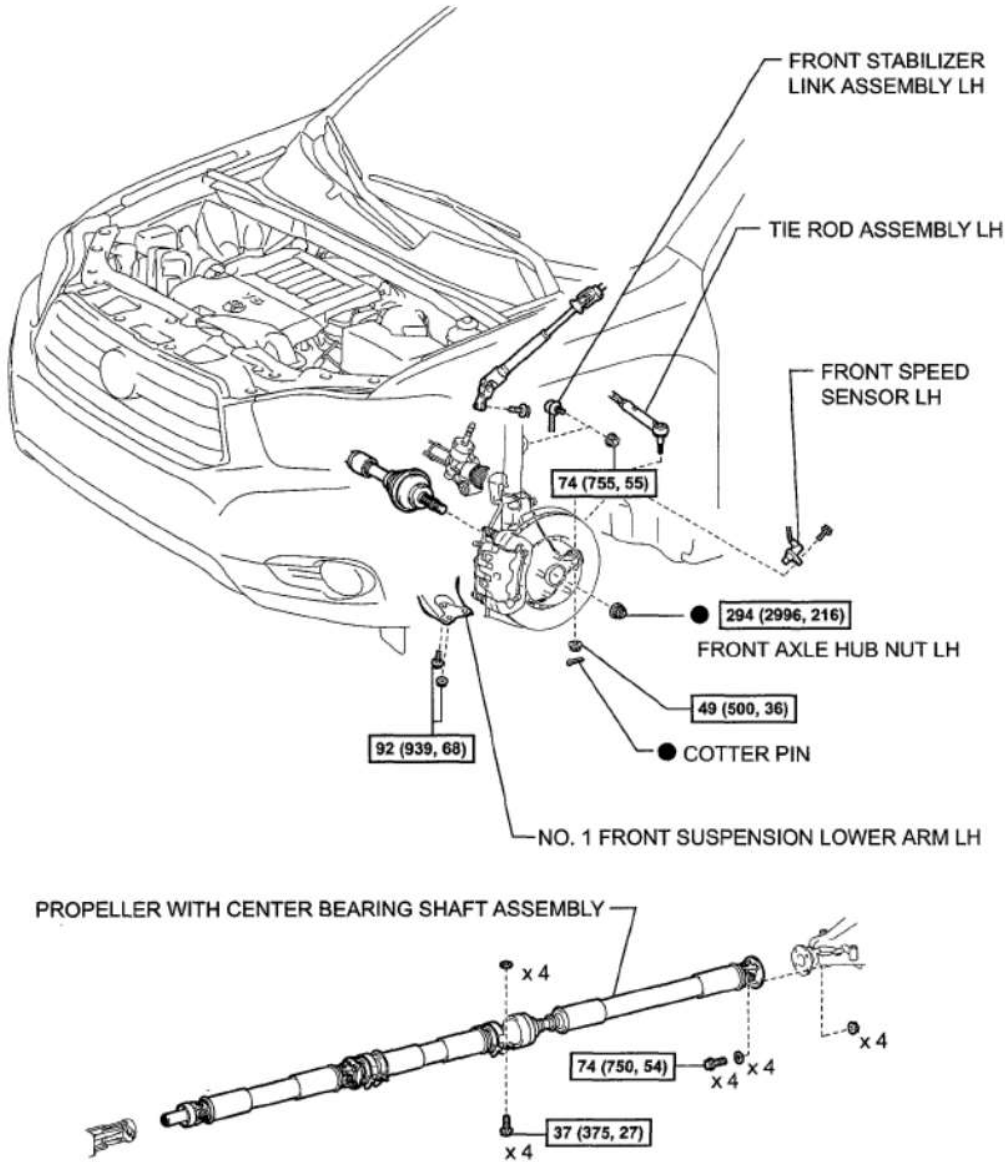


**Fig. 9: Identifying Transfer Assembly Components With Torque Specifications (4 Of 12)**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

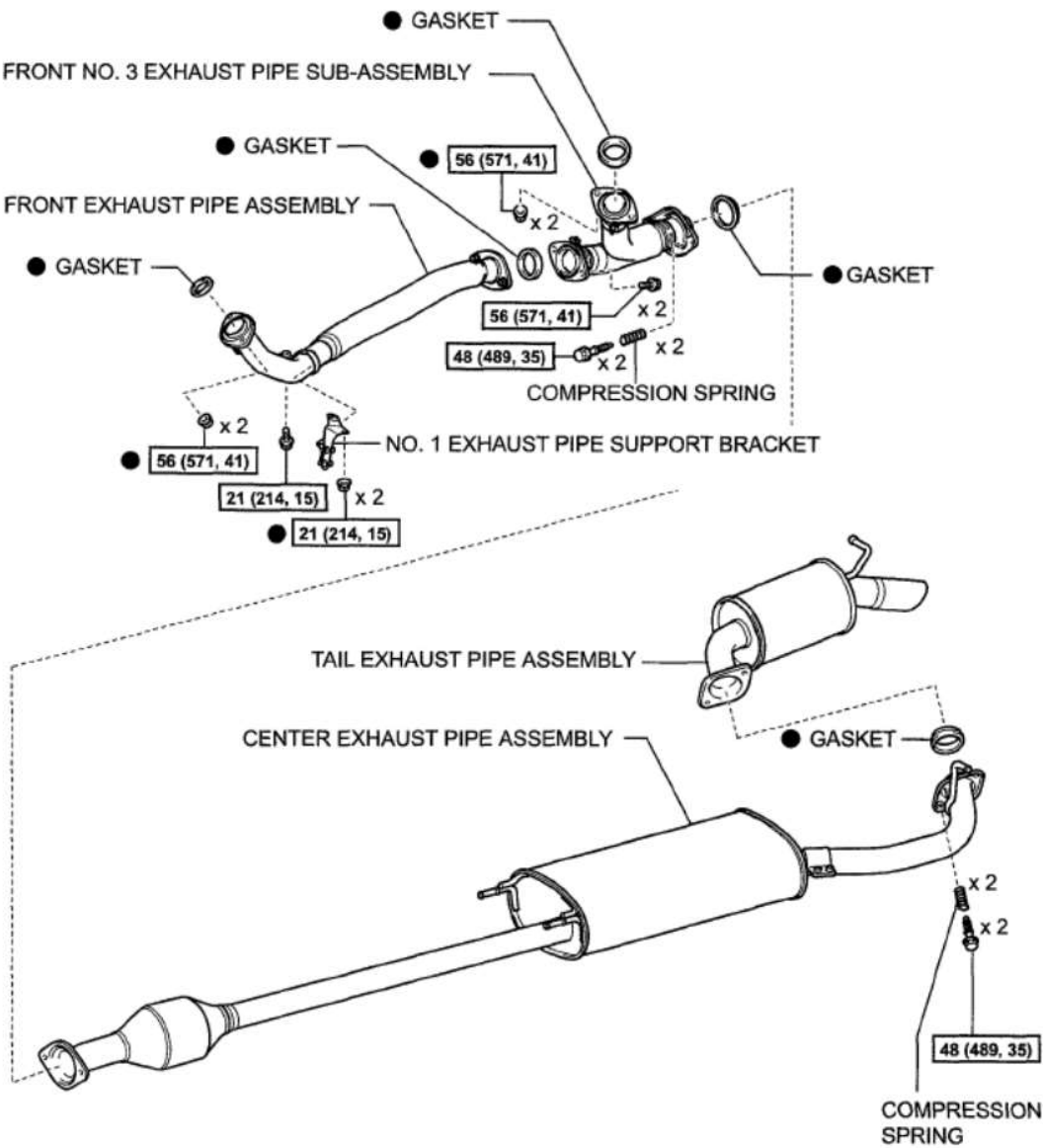
● Non-reusable part

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**Fig. 10: Identifying Transfer Assembly Components With Torque Specifications (5 Of 12)**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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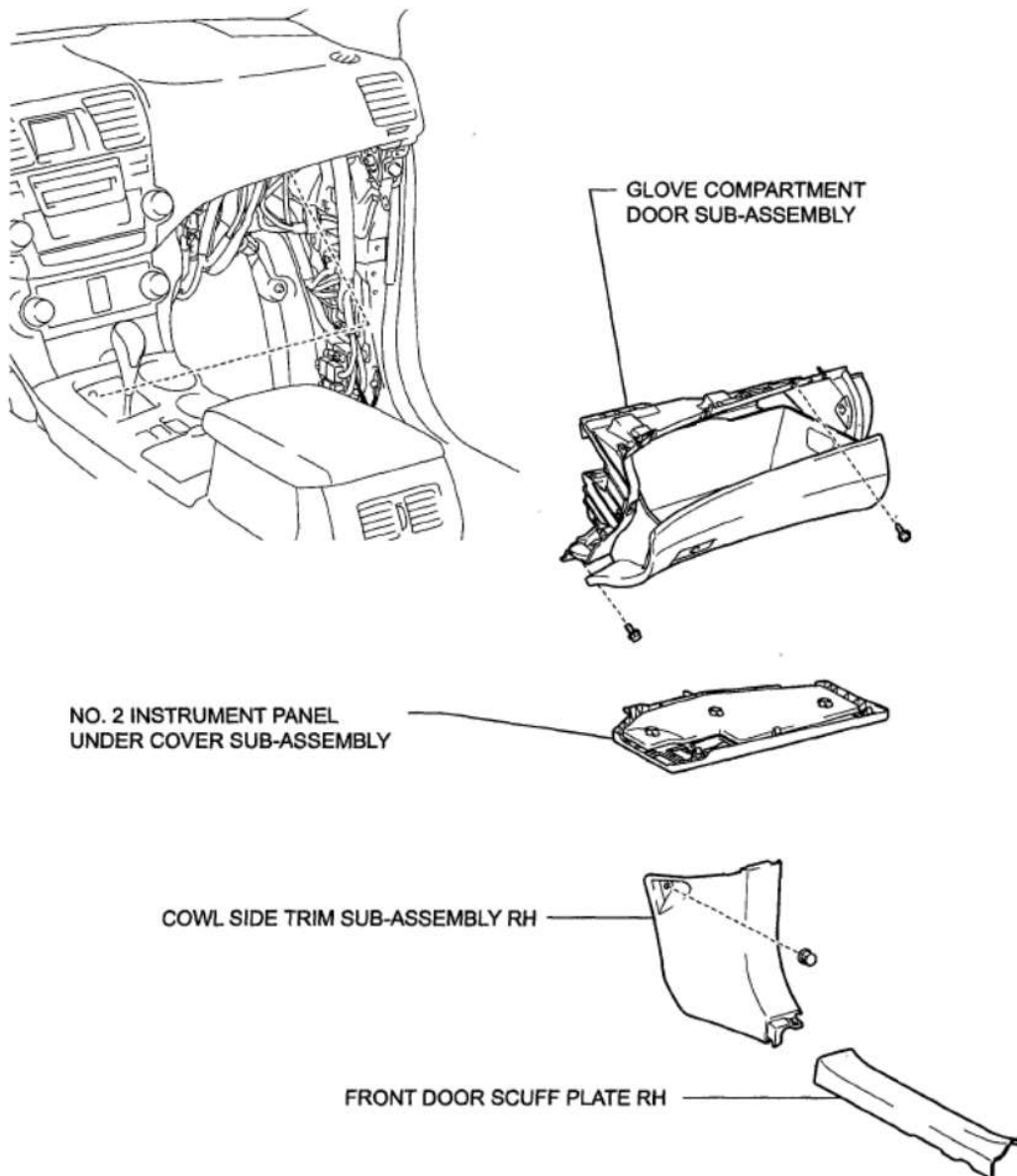
**N\*m (kgf\*cm, ft.\*lbf)** : Specified torque ● Non-reusable part

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**Fig. 11: Identifying Transfer Assembly Components With Torque Specifications (6 Of 12)**  
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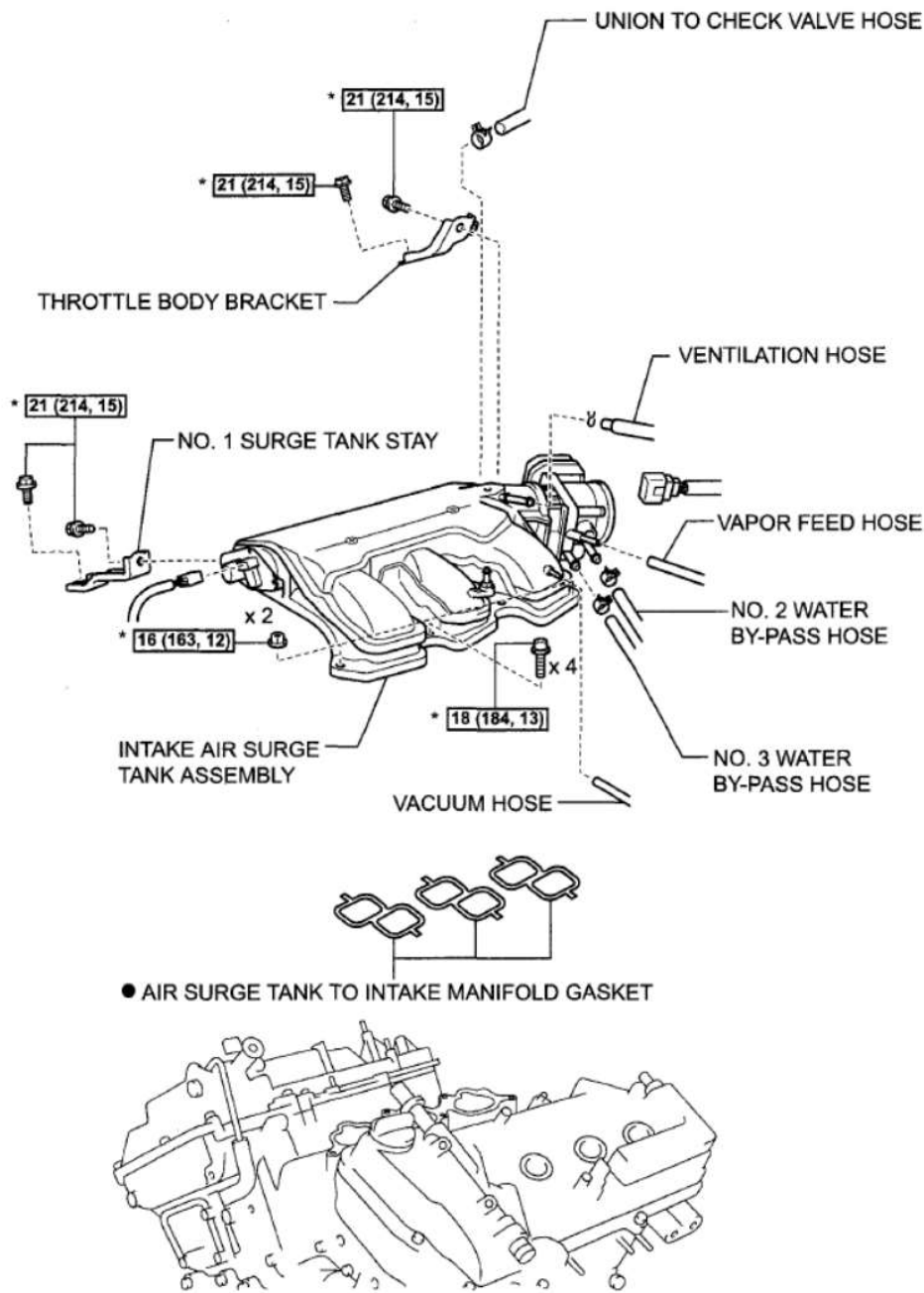


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**Fig. 12: Identifying Transfer Assembly Components With Torque Specifications (7 Of 12)**  
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N\*m (kgf\*cm, ft.\*lbf): Specified torque

● Non-reusable part

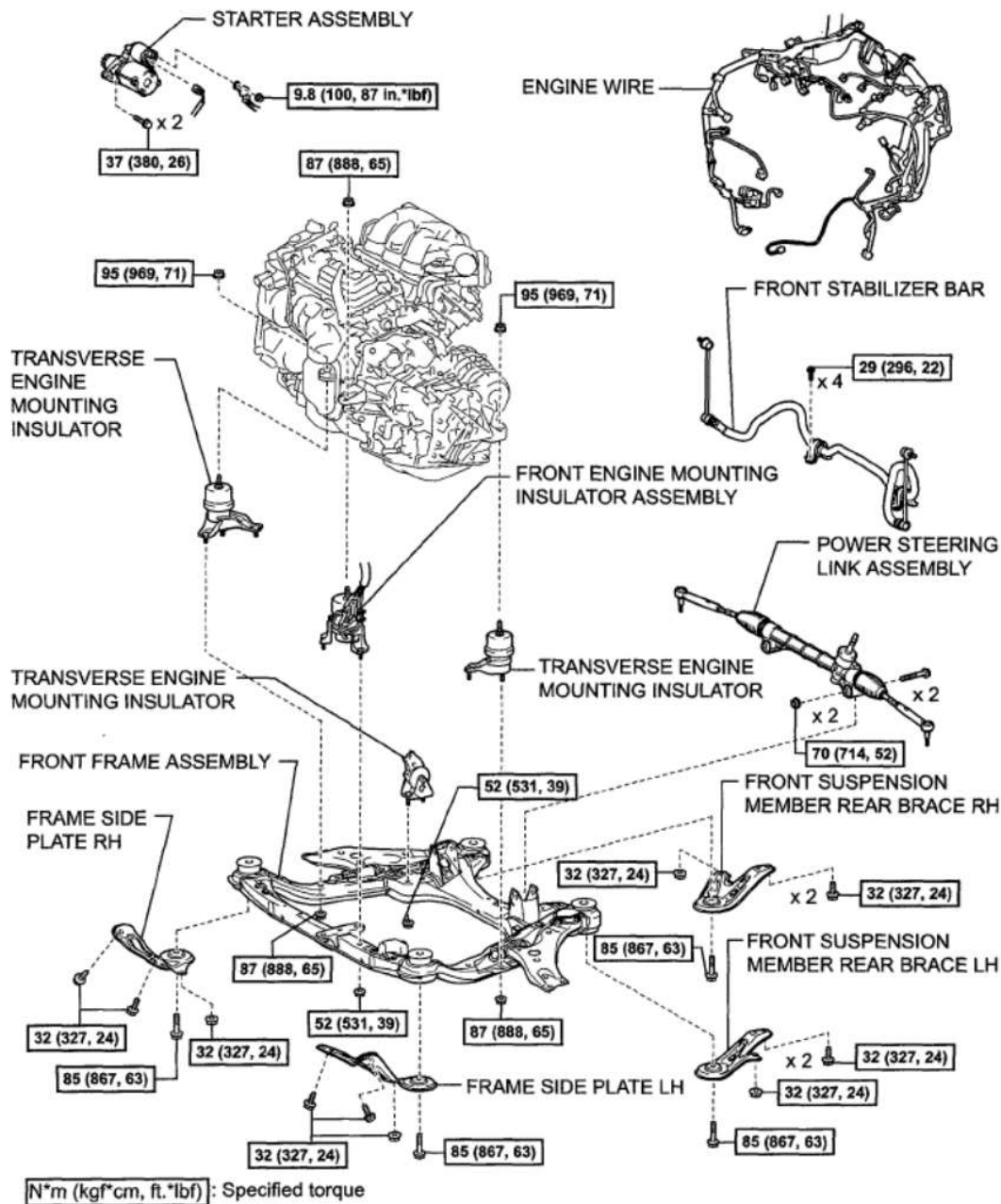
\* DO NOT apply oil

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**Fig. 13: Identifying Transfer Assembly Components With Torque Specifications (8 Of 12)**  
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**Fig. 14: Identifying Transfer Assembly Components With Torque Specifications (9 Of 12)**  
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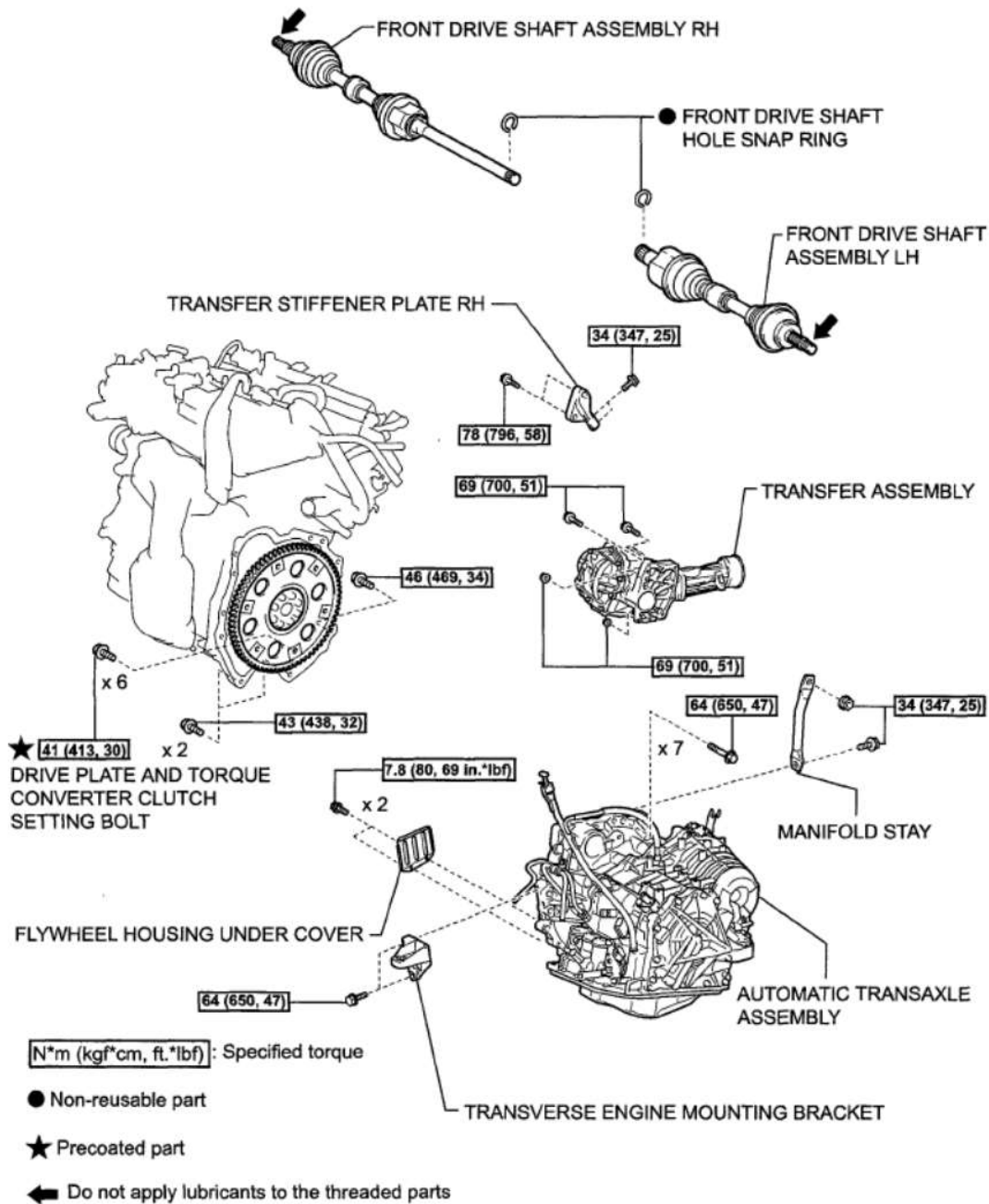


**Fig. 15: Identifying Transfer Assembly Components With Torque Specifications (10 Of 12)**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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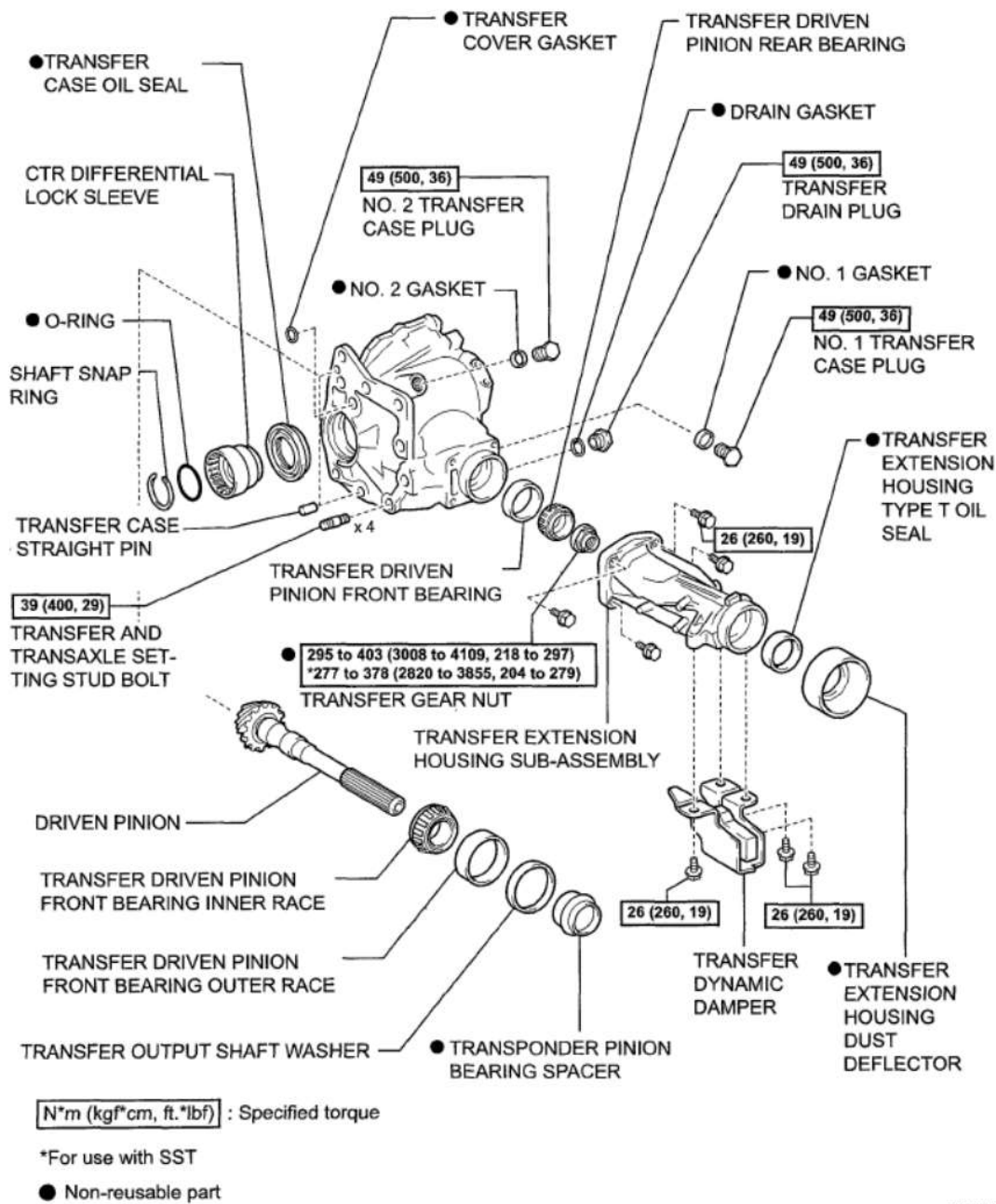


**Fig. 16: Identifying Transfer Assembly Components With Torque Specifications (11 Of 12)**  
**Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.**

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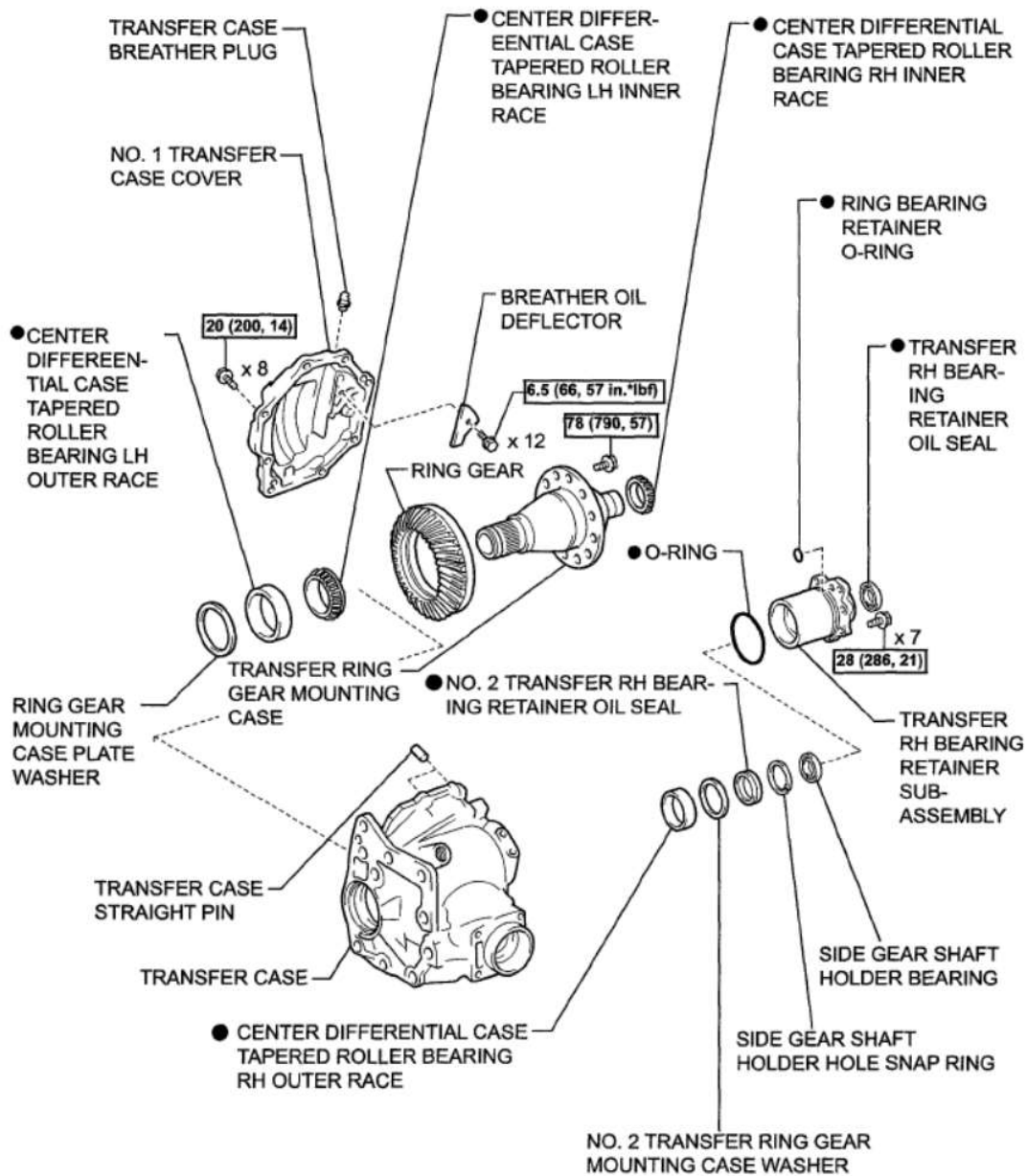


**Fig. 17: Identifying Transfer Assembly Components With Torque Specifications (12 Of 12)**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

### REMOVAL

1. **DISCHARGE FUEL SYSTEM PRESSURE** (See **FUEL INJECTOR** )
2. **RECOVER REFRIGERANT FROM REFRIGERATION SYSTEM** (See **REPLACEMENT** )
3. **REMOVE COOL AIR INTAKE DUCT SEAL** (See **SYSTEM DIAGRAM** )

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**4. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL**

**NOTE:** When disconnecting the cable, some systems need to be initialized after the cable is reconnected (See REASSEMBLY ).

5. REMOVE BATTERY (See REASSEMBLY )
6. PLACE FRONT WHEELS FACING STRAIGHT AHEAD
7. REMOVE FRONT WHEELS
8. REMOVE ENGINE UNDER COVER ASSEMBLY (See REASSEMBLY )
9. REMOVE NO. 1 ENGINE UNDER COVER (See REASSEMBLY )
10. REMOVE NO. 2 ENGINE UNDER COVER (See REASSEMBLY )
11. REMOVE FLOOR UNDER COVER LH
12. REMOVE FRONT FENDER MOULDING SUB-ASSEMBLY LH (See REMOVAL )
13. REMOVE FRONT FENDER MOULDING SUB-ASSEMBLY RH (See REMOVAL )
14. REMOVE FRONT FENDER LINER LH (See REMOVAL )
15. REMOVE FRONT FENDER LINER RH (See REMOVAL )
16. REMOVE FRONT FENDER APRON SEAL LH (See REASSEMBLY )
17. REMOVE FRONT FENDER APRON SEAL RH (See REASSEMBLY )
18. DRAIN ENGINE OIL (See REPLACEMENT )
19. DRAIN ENGINE COOLANT (See COMPONENTS )
20. DRAIN AUTOMATIC TRANSAXLE FLUID (See REMOVAL )
21. REMOVE FRONT WIPER ARM AND BLADE ASSEMBLY LH (See REMOVAL )
22. REMOVE FRONT WIPER ARM AND BLADE ASSEMBLY RH (See REMOVAL )
23. REMOVE COWL TOP VENTILATOR LOUVER SUB-ASSEMBLY (See REMOVAL )
24. REMOVE WINDSHIELD WIPER MOTOR AND LINK ASSEMBLY (See REMOVAL )
25. REMOVE OUTER COWL TOP PANEL SUB-ASSEMBLY (See REASSEMBLY )
26. REMOVE V-BANK COVER SUB-ASSEMBLY (See REASSEMBLY )
27. REMOVE NO. 2 AIR CLEANER INLET (See SYSTEM DIAGRAM )
28. REMOVE NO. 1 AIR CLEANER INLET (See ON-VEHICLE INSPECTION )
29. REMOVE AIR CLEANER CAP SUB-ASSEMBLY (See ON-VEHICLE INSPECTION )
30. REMOVE AIR CLEANER FILTER ELEMENT SUB-ASSEMBLY (See REASSEMBLY )
31. REMOVE AIR CLEANER CASE SUB-ASSEMBLY (See ON-VEHICLE INSPECTION )
32. REMOVE AIR CLEANER BRACKET (See REASSEMBLY )
33. SEPARATE BRAKE MASTER CYLINDER RESERVOIR ASSEMBLY (See REASSEMBLY )
34. REMOVE RESERVOIR BRACKET (See REASSEMBLY )
35. REMOVE NO. 2 ENGINE MOUNTING STAY RH (See REASSEMBLY )
36. REMOVE ENGINE MOVING CONTROL ROD (See REASSEMBLY )
37. DISCONNECT NO. 1 FUEL VAPOR FEED HOSE (See REASSEMBLY )

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38. **DISCONNECT NO. 1 RADIATOR HOSE** (See REASSEMBLY )
39. **DISCONNECT NO. 2 RADIATOR HOSE** (See REASSEMBLY )
40. **DISCONNECT HEATER WATER HOSE OUTLET B** (See REASSEMBLY )
41. **DISCONNECT HEATER WATER HOSE INLET B** (See REASSEMBLY )
42. **DISCONNECT FUEL TUBE SUB-ASSEMBLY** (See REASSEMBLY )
43. **DISCONNECT OIL COOLER INLET HOSE** (See REASSEMBLY )
44. **REMOVE OIL COOLER OUTLET HOSE** (See REASSEMBLY )
45. **DISCONNECT TRANSMISSION CONTROL CABLE ASSEMBLY** (See REASSEMBLY )
46. **DISCONNECT ENGINE WIRE** (See REASSEMBLY )
47. **DISCONNECT UNION TO CHECK VALVE HOSE** (See INSTALLATION )
48. **REMOVE PROPELLER WITH CENTER BEARING SHAFT ASSEMBLY (for 4WD)** (See REMOVAL )
49. **REMOVE TAIL EXHAUST PIPE ASSEMBLY** (See INSTALLATION )
50. **REMOVE CENTER EXHAUST PIPE ASSEMBLY** (See INSTALLATION )
51. **REMOVE NO. 3 FRONT EXHAUST PIPE SUB-ASSEMBLY** (See INSTALLATION )
52. **REMOVE FRONT EXHAUST PIPE ASSEMBLY** (See INSTALLATION )
53. **DISCONNECT FRONT STABILIZER LINK ASSEMBLY LH** (See REMOVAL )
54. **DISCONNECT FRONT STABILIZER LINK ASSEMBLY RH** (See INSTALLATION )
55. **REMOVE FRONT AXLE HUB NUT LH** (See REMOVAL )
56. **REMOVE FRONT AXLE HUB NUT RH** (See INSTALLATION )
57. **DISCONNECT FRONT SPEED SENSOR LH** (See REMOVAL )
58. **DISCONNECT FRONT SPEED SENSOR RH** (See INSTALLATION )
59. **DISCONNECT TIE ROD ASSEMBLY LH** (See REMOVAL )
60. **DISCONNECT TIE ROD ASSEMBLY RH** (See INSTALLATION )
61. **SEPARATE NO. 1 FRONT SUSPENSION LOWER ARM LH** (See REMOVAL )
62. **SEPARATE NO. 1 FRONT SUSPENSION LOWER ARM RH** (See INSTALLATION )
63. **SEPARATE FRONT AXLE ASSEMBLY LH** (See REMOVAL )
64. **SEPARATE FRONT AXLE ASSEMBLY RH** (See INSTALLATION )
65. **DISCONNECT STEERING INTERMEDIATE SHAFT SUB-ASSEMBLY** (See REMOVAL )
66. **DISCONNECT DISCHARGE HOSE SUB-ASSEMBLY** (See REMOVAL )
67. **DISCONNECT SUCTION HOSE SUB-ASSEMBLY** (See REMOVAL )
68. **REMOVE ENGINE ASSEMBLY WITH TRANSAXLE** (See INSTALLATION )
69. **REMOVE V-RIBBED BELT** (See ON-VEHICLE INSPECTION )
70. **REMOVE FRONT STABILIZER BAR (for 4WD)** (See INSTALLATION )
71. **REMOVE POWER STEERING LINK ASSEMBLY (for 4WD)** (See REMOVAL )
72. **REMOVE COOLER COMPRESSOR ASSEMBLY** (See INSTALLATION )
73. **REMOVE VENTILATION HOSE** (See REMOVAL )
74. **REMOVE INTAKE AIR SURGE TANK ASSEMBLY** (See REMOVAL )

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75. **REMOVE ENGINE WIRE** (See REMOVAL )
76. **REMOVE STARTER ASSEMBLY** (See REMOVAL )
77. **REMOVE TRANSVERSE ENGINE MOUNTING BRACKET** (See REMOVAL )
78. **REMOVE MANIFOLD STAY** (See REMOVAL )
79. **INSTALL ENGINE HANGERS** (See REMOVAL )
80. **REMOVE FRONT FRAME ASSEMBLY** (See REMOVAL )
81. **REMOVE FRONT ENGINE MOUNTING INSULATOR ASSEMBLY** (See REMOVAL )
82. **REMOVE TRANSVERSE ENGINE MOUNTING INSULATOR** (See REMOVAL )
83. **REMOVE TRANSVERSE ENGINE MOUNTING INSULATOR** (See REMOVAL )
84. **REMOVE FRONT DRIVE SHAFT ASSEMBLY LH** (See REMOVAL )
85. **REMOVE FRONT DRIVE SHAFT ASSEMBLY RH (for 4WD)** (See DISASSEMBLY )
86. **REMOVE NO.2 TRANSMISSION CONTROL CABLE BRACKET** (See REMOVAL )
87. **REMOVE WIRE HARNESS CLAMP** (See REMOVAL )
88. **REMOVE WIRE HARNESS** (See REMOVAL )
89. **DISCONNECT CONNECTORS** (See REMOVAL )
90. **REMOVE TRANSFER STIFFENER PLATE RH** (See INSTALLATION )
91. **REMOVE AUTOMATIC TRANSAXLE WITH TRANSFER** (See INSTALLATION )
92. **REMOVE NO.1 TRANSFER CASE PLUG**
  - a. Remove the No. 1 transfer case plug.
  - b. Remove the No. 1 gasket from the No. 1 transfer case plug.
93. **REMOVE NO.2 TRANSFER CASE PLUG**
  - a. Remove the No. 2 transfer case plug.
  - b. Remove the No. 2 gasket from the No. 2 transfer case plug.
94. **REMOVE TRANSFER DRAIN PLUG**
  - a. Remove the transfer drain plug and bleed the oil.
  - b. Remove the drain gasket from the transfer drain plug.

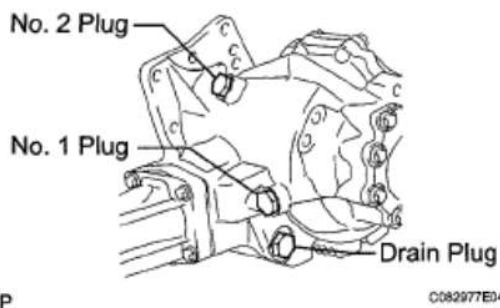


**Fig. 18: Identifying No. 1 Transfer Case Plug, No. 2 Transfer Case Plug And Transfer Drain Plug**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

95. **REMOVE TRANSFER ASSEMBLY**

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- a. Remove the 2 bolts and 6 nuts.
- b. Using a plastic hammer, remove the transfer assembly from the transaxle assembly.

#### NOTE:

- Remove the transfer assembly from the transaxle assembly without tilting it.
- When removing the transfer assembly, do not hold onto the oil seal parts on both sides of the assembly.

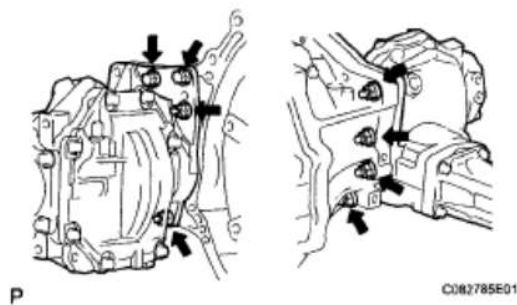


**Fig. 19: Locating Transfer Assembly Bolts And Nuts**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

#### DISASSEMBLY

##### 1. REMOVE TRANSFER COVER GASKET

- a. Remove the transfer cover gasket from the transfer assembly.

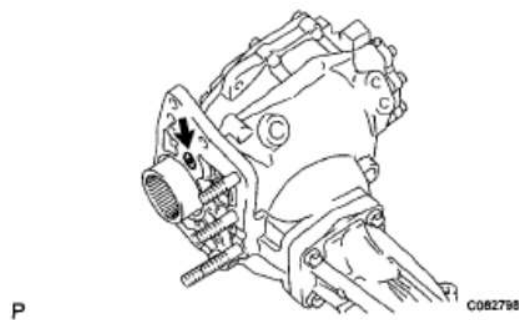


**Fig. 20: Locating Transfer Cover Gasket**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

##### 2. REMOVE TRANSFER CASE BREATHER PLUG

- a. Using a screwdriver and a hammer, remove the transfer case breather plug from the No. 1 transfer case cover.

#### NOTE:

**Be careful not to damage the contact surface of the No. 1 transfer case cover.**

## 2009 Toyota Highlander Limited

2009 TRANSMISSION MF2A Transfer - Highlander

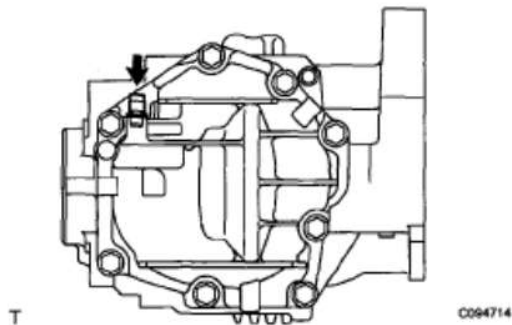


**Fig. 21: Locating Transfer Case Breather Plug**

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

### 3. REMOVE NO. 1 TRANSFER CASE COVER

- a. Remove the 8 bolts.

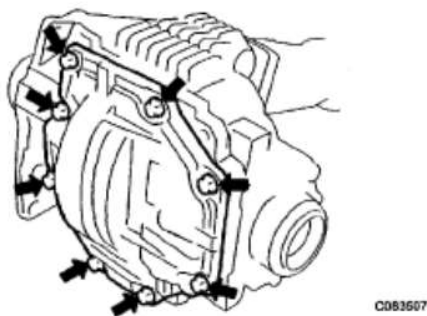


**Fig. 22: Locating No 1 Transfer Case Cover Bolts**

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

- b. Using a brass bar and a hammer, remove the No. 1 transfer case cover from the transfer case.

**NOTE:** Be careful not to damage the contact surfaces of the case and cover.

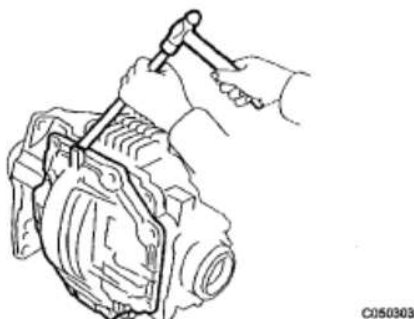


**Fig. 23: Removing No. 1 Transfer Case Cover From Transfer Case**

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

**2009 Toyota Highlander Limited**

2009 TRANSMISSION MF2A Transfer - Highlander

**4. REMOVE BREATHER OIL DEFLECTOR**

- a. Remove the bolt and breather oil deflector from the No. 1 transfer case cover.

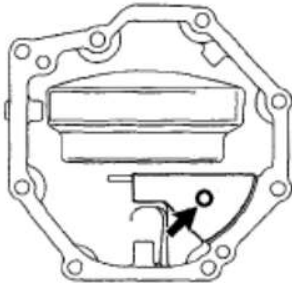


**Fig. 24: Locating Breather Oil Deflector Bolt**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**5. REMOVE TRANSFER DYNAMIC DAMPER**

- a. Remove the 3 bolts and the transfer dynamic damper from the transfer extension housing sub-assembly.

**6. REMOVE TRANSFER CASE STRAIGHT PIN**

- a. Remove the 4 transfer case straight pins from the transfer case.

**7. REMOVE TRANSFER AND TRANSAXLE SETTING STUD BOLT**

- a. Remove the 4 transfer and transaxle setting stud bolts.

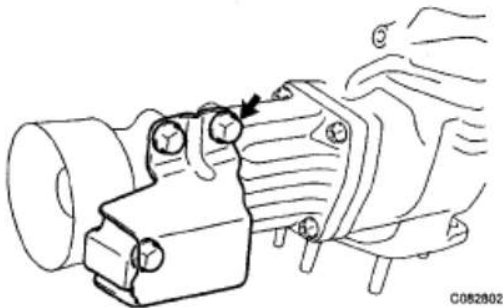


**Fig. 25: Locating Transfer Dynamic Damper Bolts**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**8. FIX TRANSFER ASSEMBLY**

- a. Fix the transfer assembly to the overhaul attachment.

**9. REMOVE TRANSFER EXTENSION HOUSING DUST DEFLECTOR**

- a. Using a plastic hammer, remove the transfer extension housing dust deflector from the transfer extension housing sub-assembly.

## 2009 Toyota Highlander Limited

2009 TRANSMISSION MF2A Transfer - Highlander

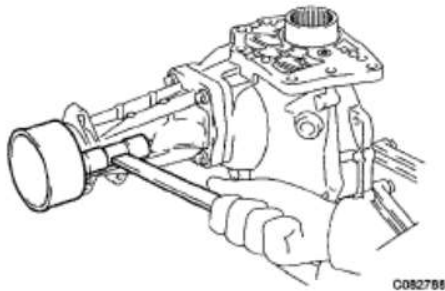


**Fig. 26: Removing Transfer Extension Housing Dust Deflector**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

### 10. REMOVE TRANSFER EXTENSION HOUSING TYPE T OIL SEAL

- Using SST, remove the transfer extension housing type T oil seal from the transfer extension housing.

SST 09308-00010

**NOTE:** Be careful not to damage the oil-seal-fitted surface of the housing and the inside surface of the bush.

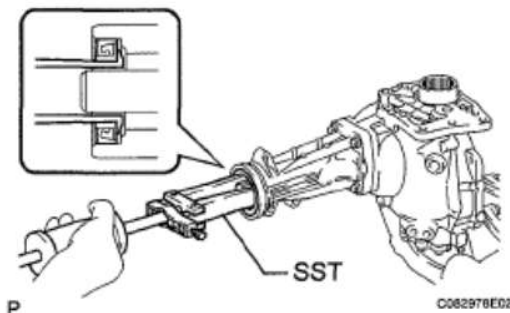
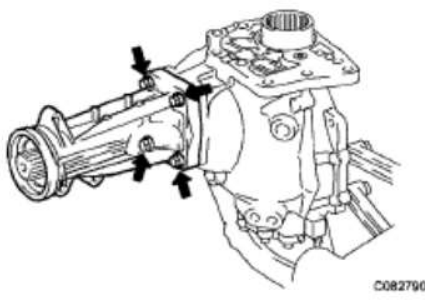


**Fig. 27: Removing Transfer Extension Housing Type T Oil Seal**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

### 11. REMOVE TRANSFER EXTENSION HOUSING SUB-ASSEMBLY

- Remove the 4 bolts.



## 2009 Toyota Highlander Limited

### 2009 TRANSMISSION MF2A Transfer - Highlander

**Fig. 28: Locating Transfer Extension Housing Sub-Assembly Bolts**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Using a plastic hammer, remove the transfer extension housing sub-assembly from the transfer case.

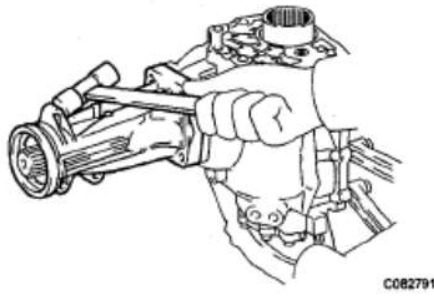


**Fig. 29: Removing Transfer Extension Housing Sub-Assembly**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

#### 12. INSPECT PRELOAD

- a. Using SST and a torque wrench, check the initial torque with the backlash range.

**SST 09326-20011**

**Torque: 0.9 to 1.4 N\*m (9 to 14 kgf\*cm, 8.0 to 12.4 in.\*lbf)**

**HINT:**

Use a torque wrench with a fulcrum length of 160 mm (6.30 in.).

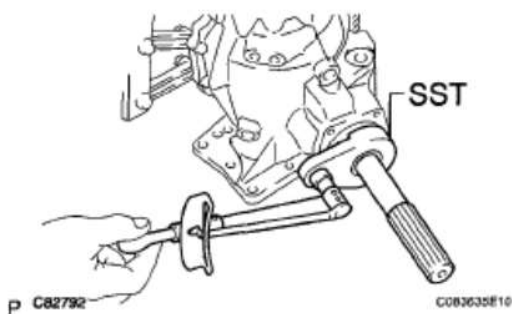


**Fig. 30: Checking Initial Torque With Backlash Range**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Using SST and a torque wrench, check the initial torque while the driven pinion is in contact with the ring gear face.

**SST 09326-20011**

**2009 Toyota Highlander Limited**

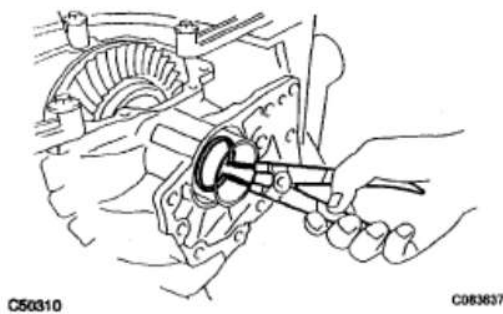
2009 TRANSMISSION MF2A Transfer - Highlander

**Torque: Preload****1.07 to 1.68 N\*m (10.9 to 17.1 kgf\*cm, 9.5 to 14.9 in.\*lbf)****HINT:**

Use a torque wrench with a fulcrum length of 160 mm (6.30 in.).

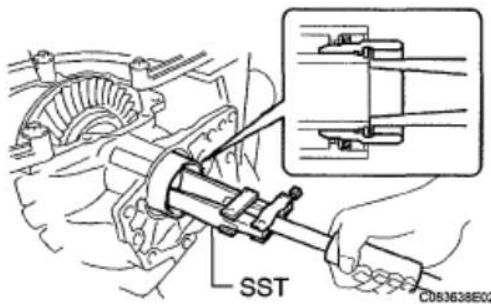
**13. REMOVE CENTER DIFFERENTIAL LOCK SLEEVE**

- a. Using snap ring pliers, remove the shaft snap ring.

**Fig. 31: Removing Shaft Snap Ring**

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

- b. Using SST, remove the CTR differential lock sleeve.

**SST 09308-00010****Fig. 32: Removing CTR Differential Lock Sleeve**

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

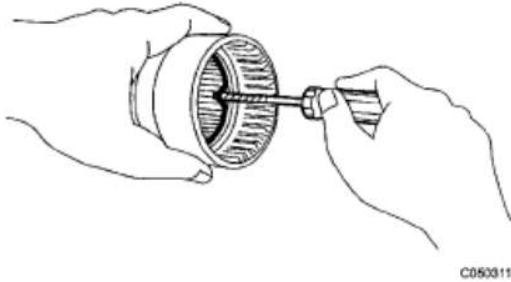
**14. REMOVE O-RING**

- a. Using a screwdriver with the tip protected by vinyl tape, remove the O-ring from the CTR differential lock sleeve.

**NOTE: Be careful not to damage the lock sleeve's groove for the O-ring.**

**2009 Toyota Highlander Limited**

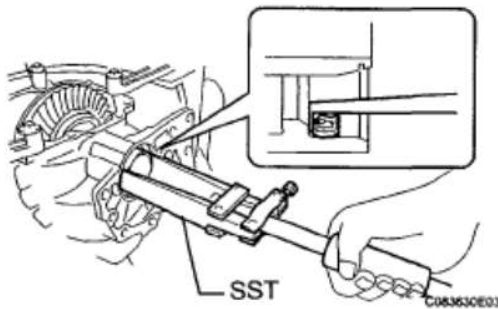
2009 TRANSMISSION MF2A Transfer - Highlander

**Fig. 33: Removing O-Ring**

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

**15. REMOVE TRANSFER CASE OIL SEAL**

- a. Using SST, remove the transfer case oil seal from the case.

**SST 09308-00010****NOTE: Be careful not to damage the oil-seal-fitted surface of the case.****Fig. 34: Removing Transfer Case Oil Seal From Case**

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

**16. REMOVE TRANSFER RH BEARING RETAINER OIL SEAL**

- a. Using SST, remove the transfer RH bearing retainer oil seal from the transfer RH bearing retainer sub-assembly.

**SST 09308-00010****NOTE: Be careful not to damage the oil-seal-fitted surface of the retainer.**

## 2009 Toyota Highlander Limited

2009 TRANSMISSION MF2A Transfer - Highlander

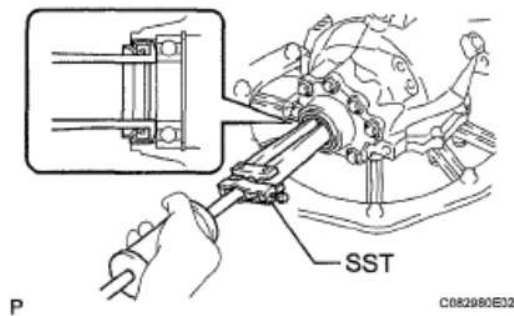


**Fig. 35: Removing Transfer RH Bearing Retainer Oil Seal**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

### 17. REMOVE TRANSFER RH BEARING RETAINER SUB-ASSEMBLY

- a. Remove the 7 bolts from the transfer RH bearing retainer sub-assembly.

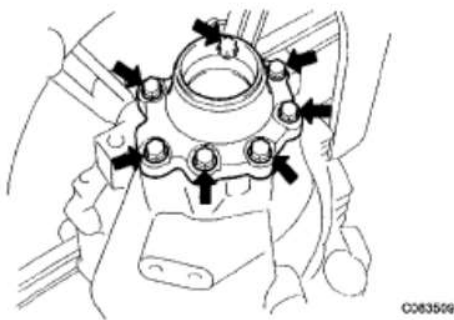


**Fig. 36: Locating Transfer RH Bearing Retainer Sub-Assembly With Bolts**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Using SST, make a clearance between the transfer RH bearing retainer sub-assembly and the transfer case.

**SST 09950-00020**

- c. Remove SST.

## 2009 Toyota Highlander Limited

2009 TRANSMISSION MF2A Transfer - Highlander

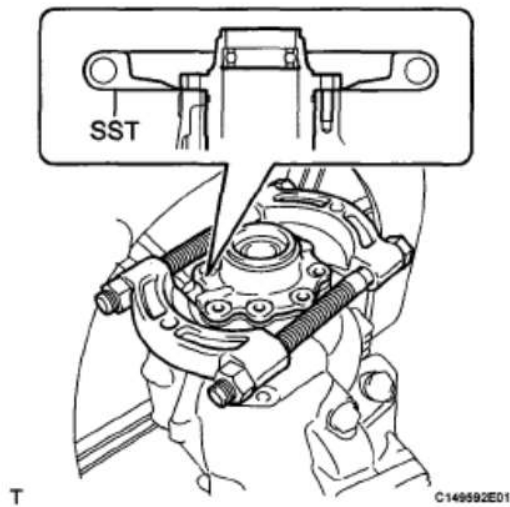


**Fig. 37: Identifying Transfer RH Bearing Retainer Sub-Assembly And Transfer Case With SST**

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

- d. Using SST, remove the transfer RH bearing retainer sub-assembly from the transfer case.

**SST 09520-10021**

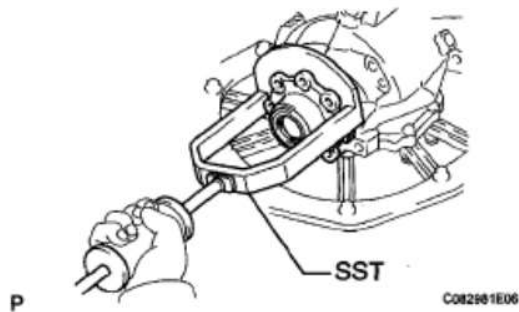


**Fig. 38: Removing Transfer RH Bearing Retainer Sub-Assembly From Transfer Case**

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

### 18. REMOVE O-RING

- a. Using a screwdriver with the tip protected by vinyl tape, remove the 2 O-rings from the transfer RH bearing retainer sub-assembly.

**NOTE:** Be careful not to damage the retainer's grooves for the O-rings.

## 2009 Toyota Highlander Limited

2009 TRANSMISSION MF2A Transfer - Highlander

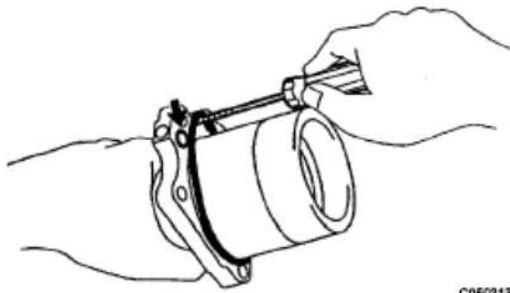


**Fig. 39: Removing O-Rings From Transfer RH Bearing Retainer Sub-Assembly**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

### 19. REMOVE CENTER DIFFERENTIAL CASE TAPERED ROLLER BEARING

- Fix the transfer RH bearing retainer sub-assembly in a vise.
- Using SST, remove the center differential case tapered roller bearing RH outer race, No. 2 transfer ring gear mounting case washer and No. 2 transfer RH bearing retainer oil seal from the transfer RH bearing retainer sub-assembly.

SST 09308-00010

**NOTE:** Be careful not to damage the oil-seal-fitted surface of the transfer RH bearing retainer sub-assembly.

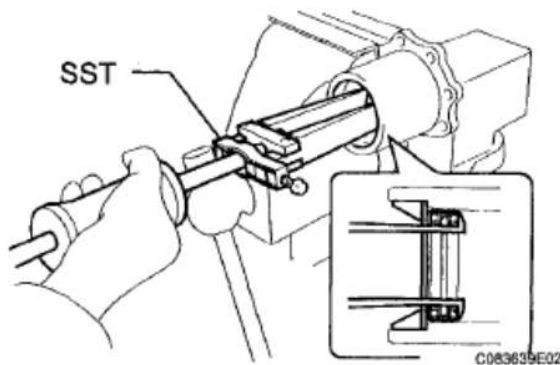


**Fig. 40: Removing Center Differential Case Tapered Roller Bearing RH Outer Race**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

### 20. REMOVE SIDE GEAR SHAFT HOLDER BEARING

- Using snap ring pliers, remove the side gear shaft holder hole snap ring.
- Remove the side gear shaft holder bearing from the transfer RH bearing retainer sub-assembly.

## 2009 Toyota Highlander Limited

2009 TRANSMISSION MF2A Transfer - Highlander

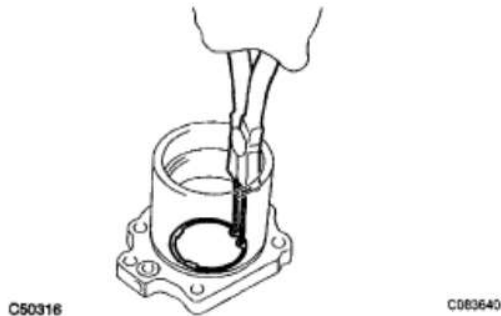


**Fig. 41: Removing Side Gear Shaft Holder Bearing**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

21. **REMOVE TRANSFER RING GEAR MOUNTING CASE**
  - a. Remove the transfer ring gear mounting case from the transfer case.
22. **REMOVE CENTER DIFFERENTIAL CASE TAPERED ROLLER BEARING**

SST 09950-40011 (09951-04010, 09952-04010, 09953-04020, 09954-04010, 09955-04061, 09957-04010, 09958-04011), 09950-60010 (09951-00430)

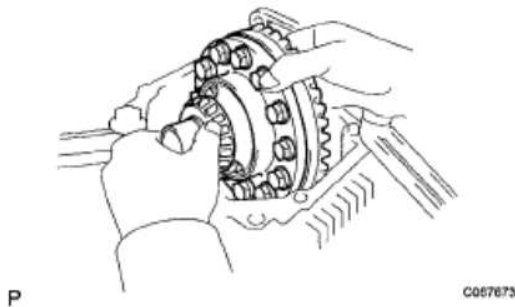


**Fig. 42: Removing Transfer Ring Gear Mounting Case**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- a. Using SST, remove the inner race of the center differential case tapered roller bearing from the transfer ring gear mounting case.

**NOTE:** Apply grease to the screw thread and tip of SST before use.

## 2009 Toyota Highlander Limited

2009 TRANSMISSION MF2A Transfer - Highlander

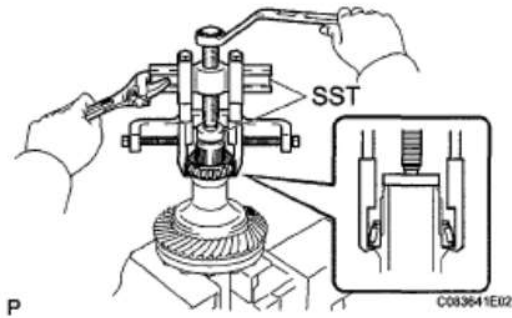


**Fig. 43: Removing Inner Race Of Center Differential Case Tapered Roller Bearing**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. When the roller comes off due to deformation of the gauge, completely remove the roller and remaining inner races of the center differential case tapered roller bearing from the transfer ring gear mounting case.

SST 09950-00020, 09950-00030, 09950-60010 (09951-00430)

**NOTE:** Apply grease to the screw thread and tip of SST before use.

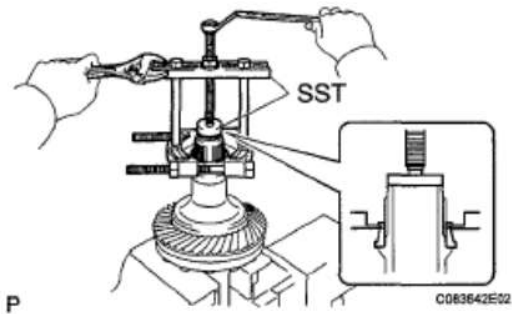


**Fig. 44: Removing Roller And Remaining Inner Races Of Center Differential Case Tapered Roller Bearing**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Using SST, remove the inner race of the center differential case tapered roller bearing from the transfer ring gear mounting case.

SST 09950-40011 (09951 -04010, 09952-04010, 09953-04020, 09954-04010, 09955-04061, 09957-04010, 09958-04011), 09950-60010 (09951-00360)

**NOTE:** Apply grease to the screw thread and tip of SST before use.

## 2009 Toyota Highlander Limited

2009 TRANSMISSION MF2A Transfer - Highlander

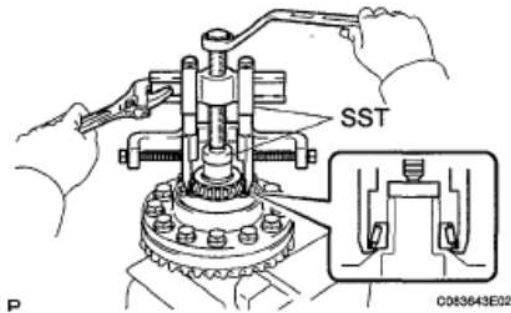


**Fig. 45: Removing Inner Race Of Center Differential Case Tapered Roller Bearing**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. When the roller comes off due to deformation of the gauge, completely remove the roller and remaining inner races of the center differential case tapered roller bearing from the transfer ring gear mounting case.

SST 09950-00020, 09950-00030, 09950-60010 (09951-00360)

**NOTE:** Apply grease to the screw thread and tip of SST before use.

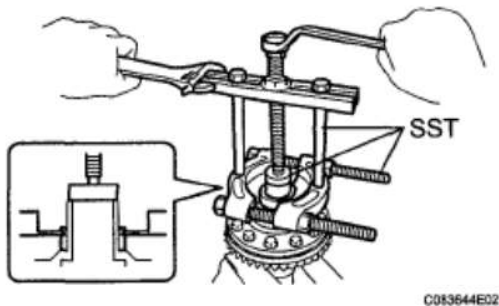


**Fig. 46: Removing Roller And Remaining Inner Races Of Center Differential Case Tapered Roller Bearing**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

### 23. REMOVE RING GEAR

- a. Put matchmarks on the transfer ring gear mounting case and the ring gear.
- b. Remove the 12 bolts.

## 2009 Toyota Highlander Limited

### 2009 TRANSMISSION MF2A Transfer - Highlander

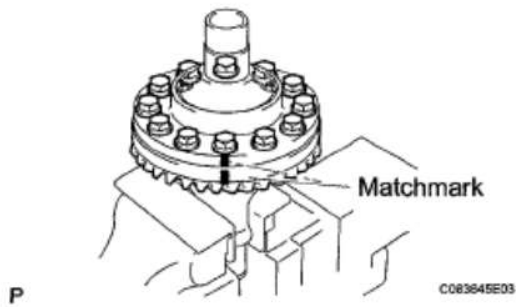


**Fig. 47: Identifying Matchmarks On Transfer Ring Gear Mounting Case And Ring Gear**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Using a plastic hammer, remove the ring gear by tapping around its periphery.

**NOTE:** Do not damage the teeth of the ring gear.

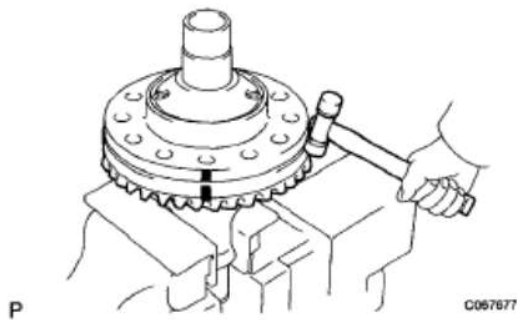


**Fig. 48: Removing Ring Gear**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

#### 24. REMOVE TRANSFER GEAR NUT

- a. Using SST and a hammer, unstake the transfer gear nut.

**SST 09930-00010**

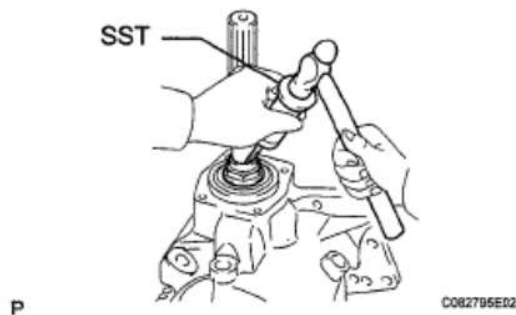


**Fig. 49: Unstaking Transfer Gear Nut**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

## 2009 Toyota Highlander Limited

2009 TRANSMISSION MF2A Transfer - Highlander

- b. Using SST, remove the transfer gear nut.

**SST 09326-20011,09556-16030**

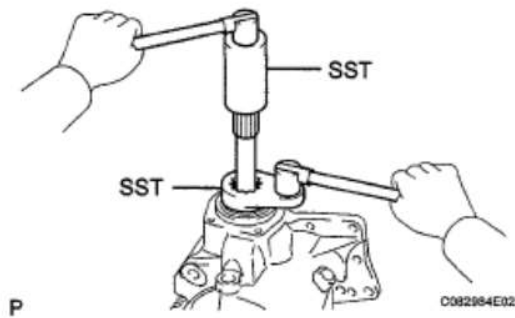


**Fig. 50: Removing Transfer Gear Nut**

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

- c. Using a press, remove the driven pinion, transfer driven pinion rear bearing inner race and transfer pinion bearing spacer.

**NOTE:**

- Put shop cloths around the transfer case to help prevent the driven pinion from dropping out of the bearing.
- Place something like wooden blocks under the case to keep its level.



**Fig. 51: Identifying Driven Pinion, Transfer Driven Pinion Rear Bearing Inner Race And Transfer Pinion Bearing Spacer**

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

### 25. REMOVE TRANSFER DRIVEN PINION FRONT BEARING

- a. Using SST and a press, remove the transfer driven pinion front bearing inner race from the driven pinion.

**SST 09950-00020**

## 2009 Toyota Highlander Limited

2009 TRANSMISSION MF2A Transfer - Highlander

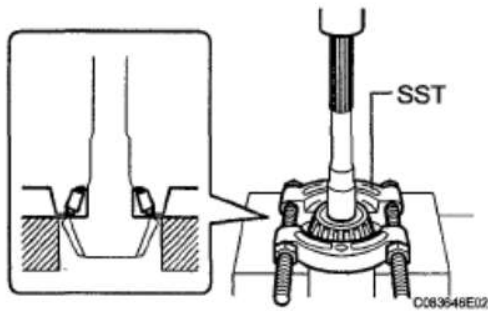


**Fig. 52: Removing Transfer Driven Pinion Front Bearing Inner Race**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

### 26. REMOVE CENTER DIFFERENTIAL CASE TAPERED ROLLER BEARING

- Using a brass bar and a hammer, lightly strike the center differential case tapered roller bearing LH outer race at 2 positions to remove it from the transfer case.

### 27. REMOVE TRANSFER OUTPUT SHAFT WASHER

- Remove the ring gear mounting case plate washer from the transfer case.

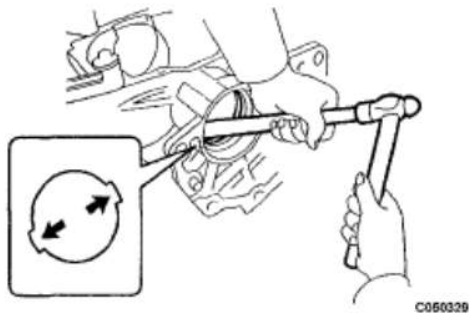


**Fig. 53: Removing Center Differential Case Tapered Roller Bearing**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

### 28. REMOVE CENTER DIFFERENTIAL CASE TAPERED ROLLER BEARING

- Using a brass bar and a hammer, lightly strike the transfer driven pinion front bearing outer race at 2 points to remove it from the transfer case.

### 29. REMOVE RING GEAR MOUNTING CASE PLATE WASHER

- Remove the transfer output washer from the transfer case.

## 2009 Toyota Highlander Limited

2009 TRANSMISSION MF2A Transfer - Highlander

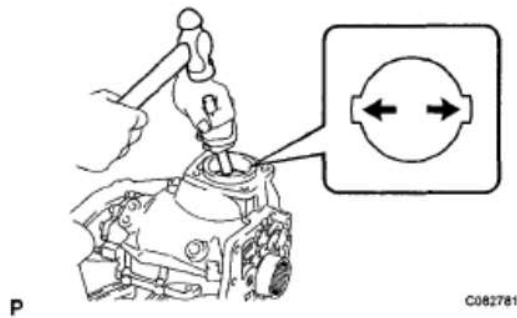


**Fig. 54: Removing Center Differential Case Tapered Roller Bearing**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

### 30. REMOVE TRANSFER DRIVEN PINION REAR BEARING

- Using a brass bar and a hammer, lightly strike the transfer driven pinion rear bearing outer race at 2 points to remove it from the transfer case.

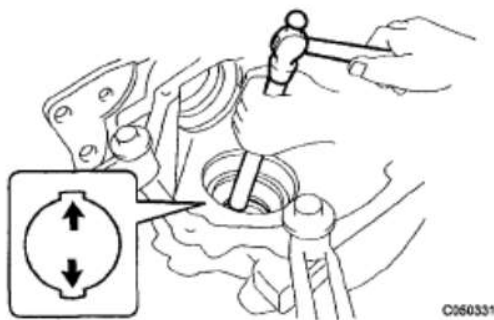


**Fig. 55: Removing Transfer Driven Pinion Rear Bearing**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

## INSPECTION

### 1. INSPECT PRELOAD

- Using SST and a torque wrench, check the initial torque within the backlash range.

**SST 09326-20011**

**Torque: 0.9 to 1.4 N\*m (9 to 14 kgf\*cm, 8.0 to 12.4 in.\*lbf)**

**HINT:**

Use a torque wrench with a fulcrum length of 160 mm (6.30 in.).

## 2009 Toyota Highlander Limited

2009 TRANSMISSION MF2A Transfer - Highlander

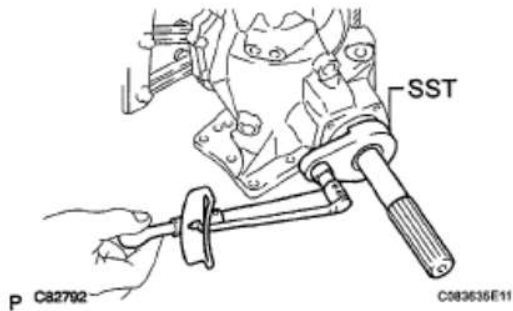


**Fig. 56: Checking Initial Torque Within Backlash Range**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Using SST and a torque wrench, check the initial torque while the driven pinion is in contact with the ring gear face.

**SST 09326-20011**

**Torque: Preload**

**1.07 to 1.68 N\*m (10.9 to 17.1 kgf\*cm, 9.5 to 14.9 in.\*lbf)**

**HINT:**

Use a torque wrench with a fulcrum length of 160 mm (6.30 in.).

### 2. INSPECT DIFFERENTIAL RING GEAR BACKLASH

- a. Set the dial gauge perpendicular to the tooth face of the ring gear, fix the driven pinion and inspect the backlash while moving the gear.

**Backlash:**

**0.08 to 0.15 mm (0.0031 to 0.0059 in.)**

**NOTE:** Inspect it at 3 points or more on the gear's periphery.

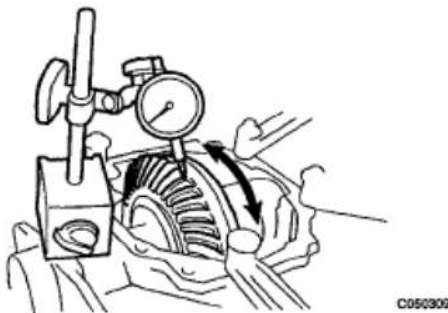


**Fig. 57: Inspecting Differential Ring Gear Backlash**

**2009 Toyota Highlander Limited**

2009 TRANSMISSION MF2A Transfer - Highlander

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

**3. INSPECT TOOTH CONTACT BETWEEN RING GEAR AND DRIVE PINION**

- a. Apply Prussian blue thinly and uniformly to both faces of the ring gear and rotate several times.

**NOTE:** Inspect the tooth contact on the ring gear at 4 places or more.

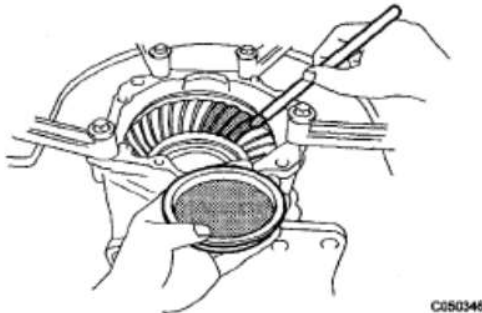


**Fig. 58: Applying Prussian Blue Thinly To Faces Of Ring Gear**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**4. INSPECT RUNOUT OF TRANSFER RING GEAR MOUNTING CASE**

- a. Using a dial gauge check the transfer ring gear mounting case runout.

**Maximum runout:**

**0.03 mm (0.0012 in.)**

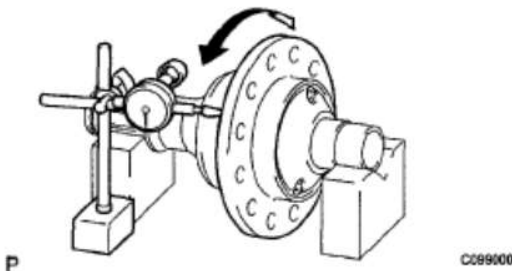


**Fig. 59: Inspecting Transfer Ring Gear Mounting Case Runout**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**REASSEMBLY****1. INSTALL TRANSFER DRIVEN PINION REAR BEARING**

- a. Using SST and a press, install the transfer driven pinion rear bearing outer race to the transfer case.

**SST 09950-60010 (09951 -00620), 09950-70010 (09951-07150)**

## 2009 Toyota Highlander Limited

2009 TRANSMISSION MF2A Transfer - Highlander

**NOTE:** Place something like wooden blocks under the case to keep its level.

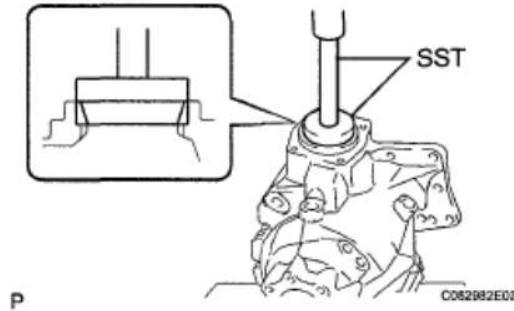


**Fig. 60: Installing Transfer Driven Pinion Rear Bearing Outer Race**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

### 2. INSTALL TRANSFER OUTPUT SHAFT WASHER

- Install the transfer output shaft washer to the transfer case.

HINT:

Reuse the washer.

### 3. INSTALL TRANSFER DRIVEN PINION FRONT BEARING

- Install the transfer driven pinion front bearing outer race to the transfer case with SST, bolt and nut.

SST 09316-60011 (09316-00061), 09950-60020 (09951-00750, 09951-00770, 09951-00810)

### 4. INSTALL RING GEAR MOUNTING CASE PLATE WASHER

- Install the ring gear mounting case plate washer to the transfer case.

HINT:

Reuse the washer.

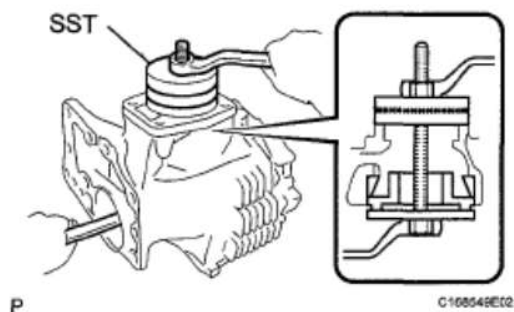


**Fig. 61: Installing Transfer Driven Pinion Front Bearing Outer Race**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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**5. INSTALL CENTER DIFFERENTIAL CASE TAPERED ROLLER BEARING**

- a. Using SST and a press, install the center differential case tapered roller bearing LH outer race to the transfer case.

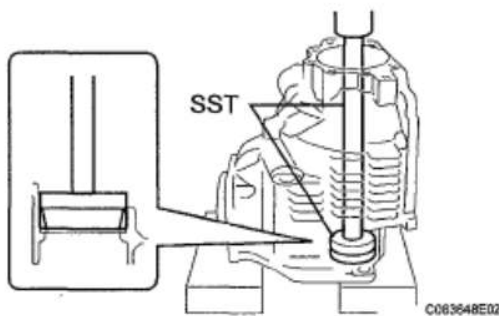
**SST 09950-60020 (09951-00680), 09950-70010 (09951-07200)****SST 09950-70010 (09951-07200)**

**Fig. 62: Installing Center Differential Case Tapered Roller Bearing LH Outer Race**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**6. INSTALL TRANSFER DRIVEN PINION FRONT BEARING**

- a. Using SST and a press, install the transfer driven pinion front bearing inner race to the driven pinion.

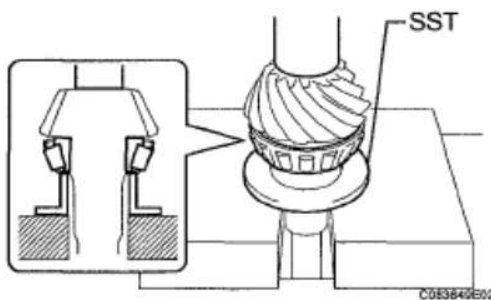
**SST 09316-60011 (09316-00041)**

**Fig. 63: Installing Transfer Driven Pinion Front Bearing Inner Race**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**7. INSTALL DRIVEN PINION**

- a. Install the driven pinion to the transfer case.

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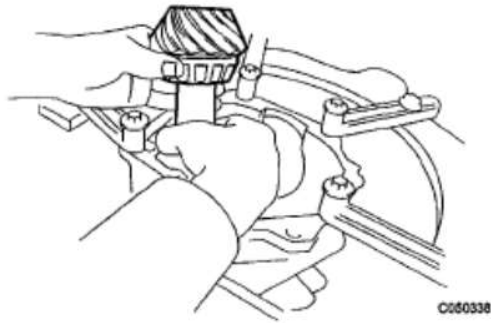


**Fig. 64: Installing Driven Pinion To Transfer Case**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Install a new transfer pinion bearing spacer and a new transfer driven pinion rear bearing inner race to the driven pinion.



**Fig. 65: Identifying Transfer Pinion Bearing Spacer And Inner Race To Driven Pinion**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Using SST, tighten a new transfer gear nut (at a standard torque.).

**SST 09326-20011, 09556-16030**

**Torque: 277 to 378 N\*m (2820 to 3855 kgf\*cm, 204 to 279 ft.\*lbf)**

**NOTE: Do not stake the transfer gear nut.**

**HINT:**

Use a torque wrench with a fulcrum length of 750 mm (29.53 in.).

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2009 TRANSMISSION MF2A Transfer - Highlander

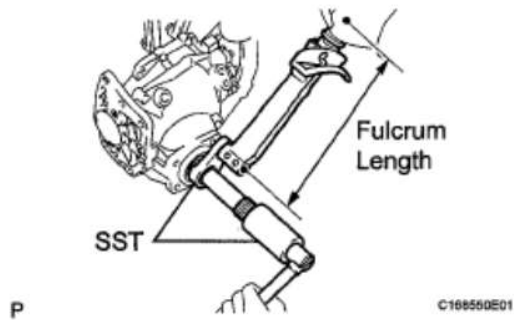


**Fig. 66: Tightening Transfer Gear Nut**

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

### 8. INSPECT AND ADJUST DRIVEN PINION PRELOAD

- Using SST and a torque wrench, measure the initial torque of the driven pinion.

**SST 09326-20011**

**Torque: New bearing**

**1.1 to 1.6 N\*m (10 to 16 kgf\*cm, 9.7 to 14.2 in.\*lbf)**

**Used bearing**

**0.9 to 1.4 N\*m (9 to 14 kgf\*cm, 8.0 to 12.4 in.\*lbf)**

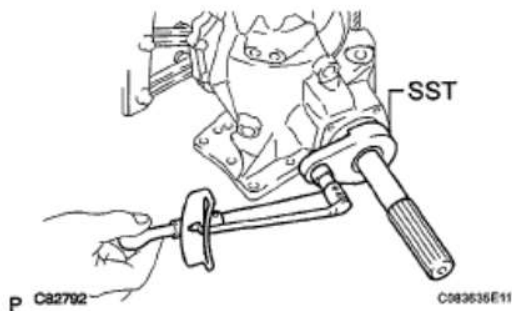


**Fig. 67: Measuring The Initial Torque Of Driven Pinion**

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

**HINT:**

Use a torque wrench with a fulcrum length of 160 mm (6.30 in.).

**NOTE:** Measure the preload after rotating the bearing both clockwise and counterclockwise to make it fit.

- If the preload is too large, replace the transfer pinion bearing spacer with a new one.

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### 2009 TRANSMISSION MF2A Transfer - Highlander

- c. If the preload is too small, repeatedly adjust the preload by tightening the transfer gear nut 5 to 10 degrees at a time until the standard value is obtained.
- d. If the preload is insufficient, even though the tightening torque of the transfer gear nut exceeds the maximum of the standard value, loosen the transfer gear nut and apply gear oil SAE 90 (GL-5) to the transfer gear nut and the screw thread and the base of the driven pinion. And then repeat the preceding operation. If the tightening torque is bearing spacer with a new one and adjust it.

**Torque: 378 N\*m (3855 kgf\*cm, 279 ft.\*lbf)**

#### 9. INSTALL RING GEAR

- a. Heat the ring gear in boiling water from 90 to 100°C (194 to 212°F).
- b. Completely remove grease and moisture on the contact surfaces of the ring gear and the transfer ring gear mounting case.

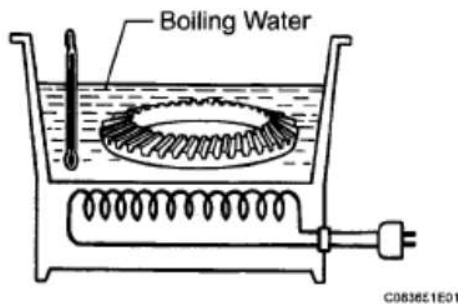


**Fig. 68: Heating Ring Gear**

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

- c. Align the matchmarks on the ring gear and transfer ring gear mounting case and quickly assemble them.
- d. Tighten the 12 bolts.

**Torque: 78 N\*m (790 kgf\*cm, 57 ft.\*lbf)**

#### NOTE:

- Tighten the bolts in diagonal order in splitting several times.
- After the ring gear has well cooled down, fully tighten the bolts.
- Make the bolt heads in order to check if they are retightened or not.

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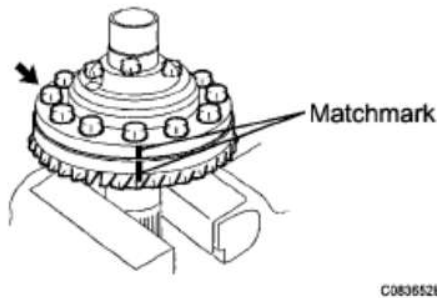


**Fig. 69: Locating Matchmarks On Ring Gear And Transfer Ring Gear Mounting Case**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

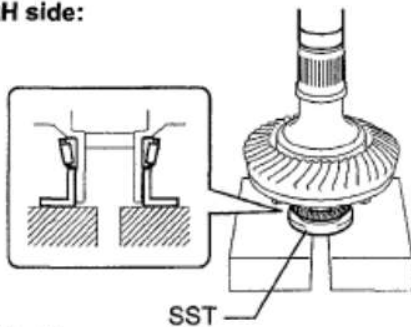
### 10. INSTALL CENTER DIFFERENTIAL CASE TAPERED ROLLER BEARING

- Using SST and a press, install the inner race of the center differential case tapered roller bearing to the transfer ring gear mounting case.

SST 09506-35010, 09950-60010 (09951 -00430), 09223-00010

**NOTE:** When replacing the inner race, replace it together with the outer race.

**RH side:**



**LH side:**

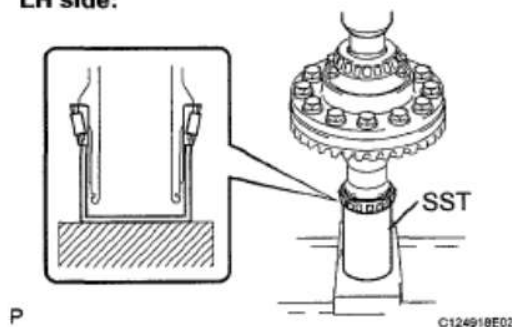


**Fig. 70: Installing Inner Race Of Center Differential Case Tapered Roller Bearing**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

### 11. INSTALL TRANSFER RING GEAR MOUNTING CASE

- Install the transfer ring gear mounting case to the transfer case.

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**NOTE:** Damage to the spline, the bearing's rotating surface and gear face may cause a decrease in their strength. Care should be taken when installing them.

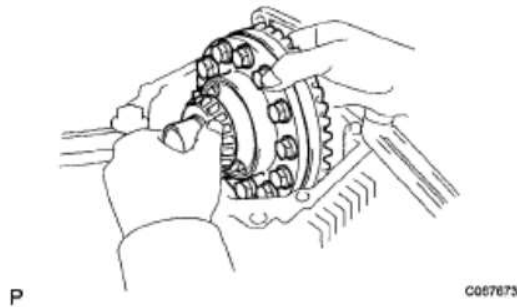


**Fig. 71: Installing Transfer Ring Gear Mounting Case**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

### 12. INSTALL NO. 2 TRANSFER RING GEAR MOUNTING CASE WASHER

- Install the No. 2 transfer ring gear mounting case washer to the transfer RH bearing retainer sub-assembly.

**HINT:**

Reuse the washer.

### 13. INSTALL CENTER DIFFERENTIAL CASE TAPERED ROLLER BEARING

- Using SST and a press, install the center differential case tapered roller bearing RH outer race to the transfer RH bearing retainer sub - assembly.

SST 09950-60010 (09951 -00620), 09950-70010 (09951-07150)

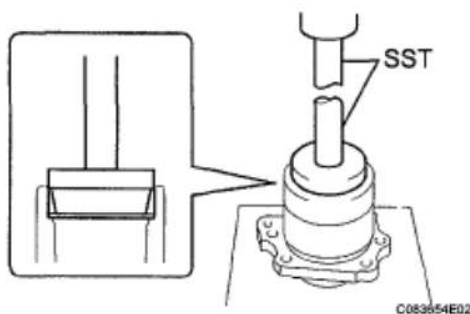


**Fig. 72: Installing Center Differential Case Tapered Roller Bearing RH Outer Race**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

### 14. INSTALL TRANSFER RH BEARING RETAINER SUB-ASSEMBLY

- Place the transfer with the surface where the transfer RH bearing retainer sub-assembly is facing up.

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- b. Align the centers of the transfer ring gear mounting case and the transfer case.

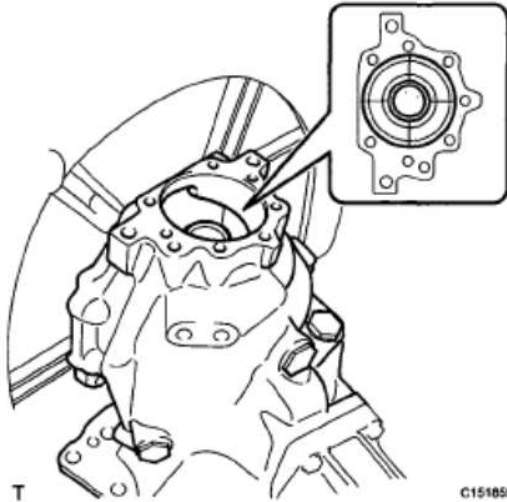


**Fig. 73: Identifying Transfer RH Bearing Retainer Sub-Assembly**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Insert SST into the transfer RH bearing retainer sub-assembly.

**SST 09387-00090**

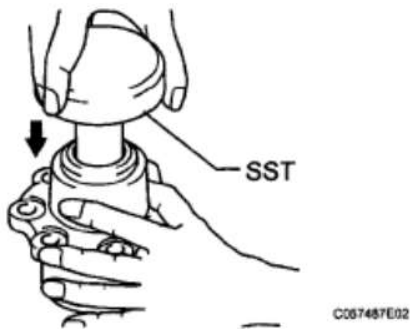


**Fig. 74: Inserting SST Into Transfer RH Bearing Retainer Sub-Assembly**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. With SST and the transfer RH bearing sub-assembly in close contact, install the transfer RH bearing retainer sub-assembly together with SST into the transfer case.

**NOTE:** Avoid interference between the case and the retainer, and between SST and the transfer ring gear mounting case.

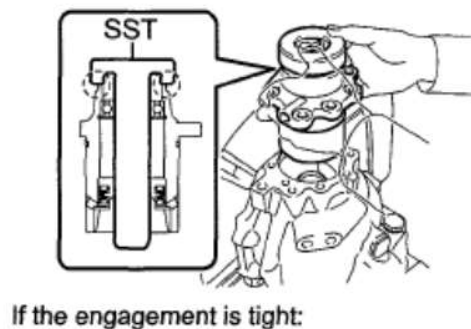
**HINT:**

If the engagement is tight, tap SST with a hammer placing a brass bar on the center of SST.

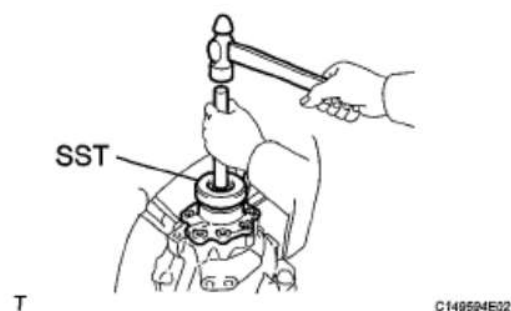
## 2009 Toyota Highlander Limited

### 2009 TRANSMISSION MF2A Transfer - Highlander

- e. Make sure that the transfer RH bearing retainer sub-assembly and transfer case contact closely.



If the engagement is tight:



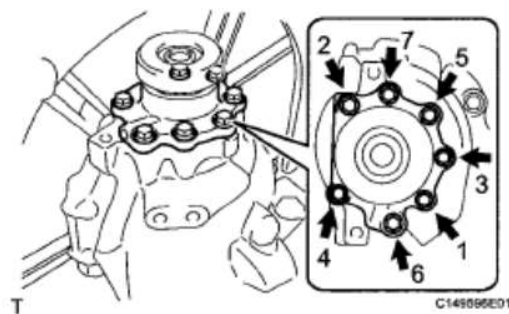
T

C149594E02

**Fig. 75: Installing Transfer RH Bearing Retainer Sub-Assembly**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- f. Tighten the 7 bolts evenly in order shown in the illustration.

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



T

C149596E01

**Fig. 76: Locating Bolts Tighten Sequence**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- g. Remove SST.

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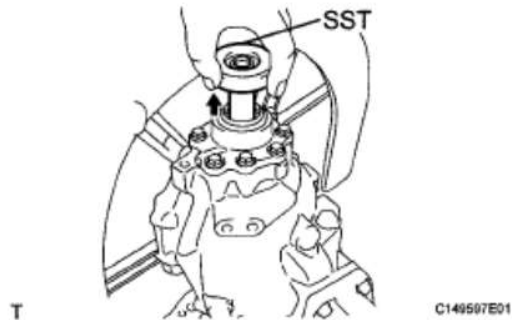


**Fig. 77: Removing SST**

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

### 15. INSPECT DIFFERENTIAL RING GEAR BACKLASH

- Set the dial gauge perpendicular to the ring gear face, fix the driven pinion, and check backlash by moving the ring gear.

**Backlash:**

0.08 to 0.15 mm (0.0031 to 0.0059 in.)

**NOTE:** Measure it at 3 points or more on the ring gear periphery.

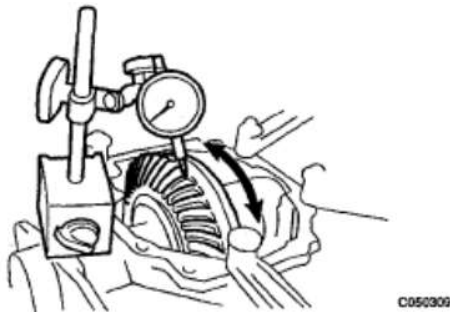


**Fig. 78: Inspecting Differential Ring Gear Backlash**

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

- If the measured value is out of standard, select a proper washer for the center differential case tapered roller bearing on the LH side from the table below and install it to obtain the standard value.

#### WASHER THICKNESS CHART

| Mark | Washer Thickness mm<br>(in.) | Mark | Washer Thickness mm<br>(in.) | Mark | Washer Thickness mm<br>(in.) |
|------|------------------------------|------|------------------------------|------|------------------------------|
| AA   | 2.07 (0.0814)                | AB   | 2.10 (0.0826)                | AC   | 2.13 (0.0838)                |
| BA   | 2.16 (0.0850)                | BB   | 2.19 (0.0862)                | BC   | 2.22 (0.0874)                |
| CA   | 2.25 (0.0885)                | CB   | 2.28 (0.0897)                | CC   | 2.31 (0.0909)                |

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|    |               |    |               |    |               |
|----|---------------|----|---------------|----|---------------|
| DA | 2.34 (0.0921) | DB | 2.37 (0.0933) | DC | 2.40 (0.0944) |
| EA | 2.43 (0.0956) | EB | 2.46 (0.0968) | EC | 2.49 (0.0980) |
| FA | 2.52 (0.0992) | FB | 2.55 (0.1003) | FC | 2.58 (0.1015) |
| GA | 2.61 (0.1027) | GB | 2.64 (0.1039) | GC | 2.67 (0.1051) |
| HA | 2.70 (0.1062) | HB | 2.73 (0.1074) | HC | 2.76 (0.1086) |
| JA | 2.79 (0.1098) | JB | 2.82 (0.1110) | JC | 2.85 (0.1122) |
| KA | 2.88 (0.1133) | KB | 2.91 (0.1145) | KC | 2.94 (0.1157) |
| LA | 2.97 (0.1169) | LB | 3.00 (0.1181) | -  | -             |

#### HINT:

When the backlash is larger or smaller than the standard, select a thinner or thicker washer respectively.

- c. Ring gear mounting case plate washer location is shown in the illustration.



**Fig. 79: Identifying Ring Gear Mounting Case Plate Washer Location**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

#### 16. INSPECT TOOTH CONTACT BETWEEN RING GEAR AND DRIVE PINION

- a. Apply Prussian blue thinly and uniformly to both faces of the ring gear and rotate it several times.

**NOTE:** Check the tooth contact on the ring gear at 4 places or more.

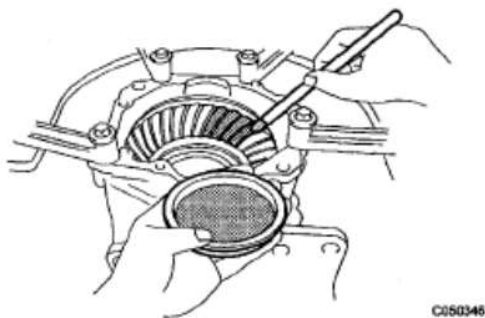


**Fig. 80: Applying Prussian Blue Thinly To Faces Of Ring Gear**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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- b. Observe the pattern shown by prussian blue.

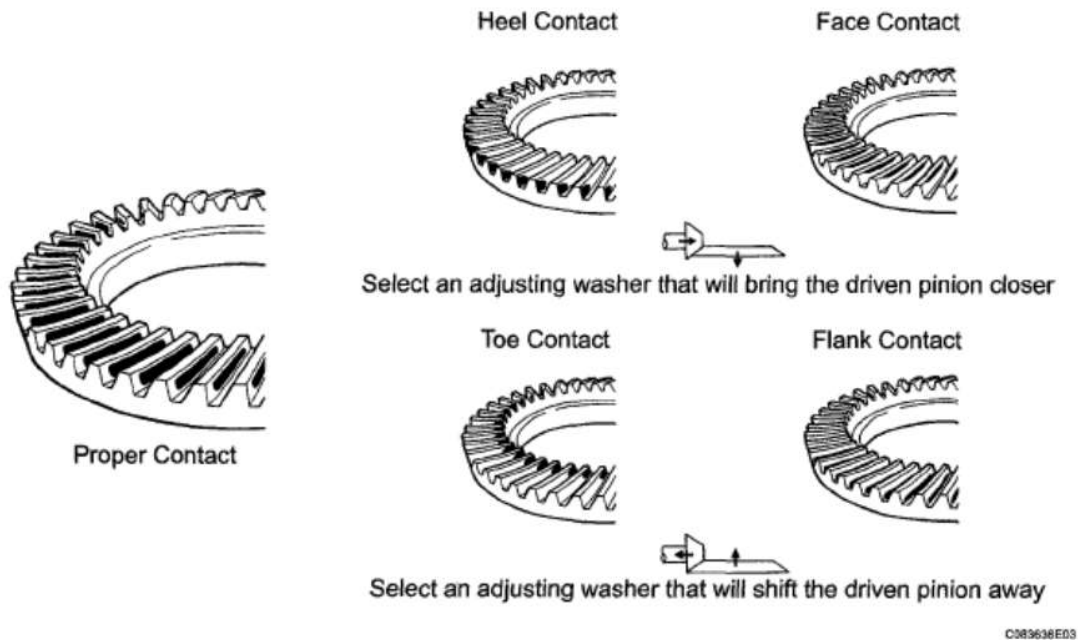


**Fig. 81: Identifying Tooth Contact Pattern**

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

- c. In case of poor tooth contact, select a washer for the driven pinion bearing front side from the following table and replace it.

**NOTE:** If the washer thickness is changed, the backlash will be also changed.

### WASHER THICKNESS CHART

| Mark | Washer Thickness mm<br>(in.) | Mark | Washer Thickness mm<br>(in.) | Mark | Washer Thickness mm<br>(in.) |
|------|------------------------------|------|------------------------------|------|------------------------------|
| AA   | 1.20 (0.0472)                | AC   | 1.22 (0.0480)                | BB   | 1.24 (0.0488)                |
| CA   | 1.26 (0.0496)                | CC   | 1.28 (0.0503)                | DB   | 1.30 (0.0511)                |
| EA   | 1.32 (0.0519)                | EC   | 1.34 (0.0527)                | FB   | 1.36 (0.0535)                |
| GA   | 1.38 (0.0543)                | GC   | 1.40 (0.0551)                | HB   | 1.42 (0.0559)                |
| JA   | 1.44 (0.0566)                | JC   | 1.46 (0.0574)                | KB   | 1.48 (0.0582)                |
| LA   | 1.50 (0.0590)                | LC   | 1.52 (0.0598)                | MB   | 1.54 (0.0606)                |
| NA   | 1.56 (0.0614)                | NC   | 1.58 (0.0622)                | PB   | 1.60 (0.0629)                |
| QA   | 1.62 (0.0637)                | QC   | 1.64 (0.0645)                | -    | -                            |

- d. The location of the transfer output washer for tooth contact adjustment is shown in the illustration.

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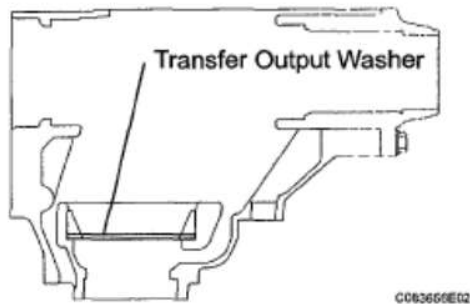


**Fig. 82: Identifying Transfer Output Washer**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

### 17. ADJUST TOTAL PRELOAD

- a. Using SST and a torque wrench, measure the initial torque with the driven pinion bearing contact with the ring gear face.

**SST 09326-20011**

**Torque: New bearing**

**1.3 to 1.98 N\*m (13.3 to 20.2 kgf\*cm, 11.5 to 17.5 in.\*lbf)**

**Used bearing**

**1.07 to 1.68 N\*m (10.9 to 17.1 kgf\*cm, 9.5 to 14.9 in.\*lbf)**

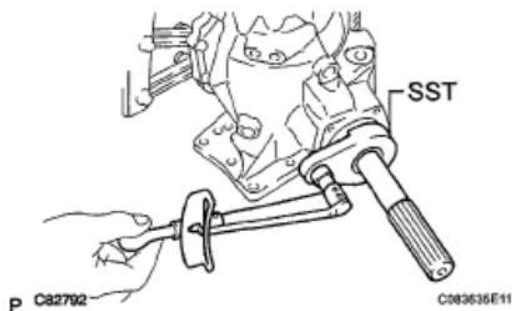


**Fig. 83: Measuring Initial Torque With Driven Pinion Bearing Contact**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**NOTE:** Before measurement, rotate the bearing in both directions several times to make it fit.

**HINT:**

Use a torque wrench with a fulcrum length of 160 mm (6.30 in.).

## 2009 Toyota Highlander Limited

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- b. If the value is out of standard range, select the washer for the center differential case tapered roller bearing RH side from the following table and replace it.

### WASHER THICKNESS CHART

| Mark | Washer Thickness mm<br>(In.) | Mark | Washer Thickness mm<br>(in.) | Mark | Washer Thickness mm<br>(in.) |
|------|------------------------------|------|------------------------------|------|------------------------------|
| AA   | 1.47 (0.0578)                | AB   | 1.50 (0.0590)                | AC   | 1.53 (0.0602)                |
| BA   | 1.56 (0.0614)                | BB   | 1.59 (0.0625)                | BC   | 1.62 (0.0637)                |
| CA   | 1.65 (0.0649)                | CB   | 1.68 (0.0661)                | CC   | 1.71 (0.0673)                |
| DA   | 1.74 (0.0685)                | DB   | 1.77 (0.0696)                | DC   | 1.80 (0.0708)                |
| EA   | 1.83 (0.0720)                | EB   | 1.86 (0.0732)                | EC   | 1.89 (0.0744)                |
| FA   | 1.92 (0.0755)                | FB   | 1.95 (0.0767)                | FC   | 1.98 (0.0779)                |
| GA   | 2.01 (0.0790)                | GB   | 2.04 (0.0803)                | GC   | 2.07 (0.0814)                |
| HA   | 2.10 (0.0826)                | HB   | 2.13 (0.0838)                | HC   | 2.16 (0.0850)                |
| JA   | 2.19 (0.0862)                | JB   | 2.22 (0.0874)                | JC   | 2.25 (0.0885)                |
| KA   | 2.28 (0.0897)                | KB   | 2.31 (0.0909)                | KC   | 2.34 (0.0921)                |
| LA   | 2.37 (0.0933)                | LB   | 2.40 (0.0944)                | LC   | 2.43 (0.0956)                |
| MA   | 2.46 (0.0968)                | MB   | 2.49 (0.0980)                | MC   | 2.52 (0.0992)                |
| NA   | 2.55 (0.1003)                | NB   | 2.58 (0.1015)                | -    | -                            |

- c. The location of the No. 2 transfer ring gear mounting case washer for preload adjustment is show in the illustration.

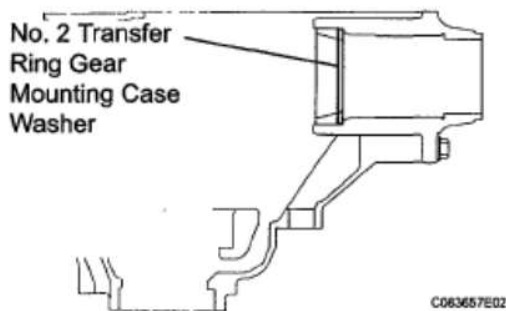
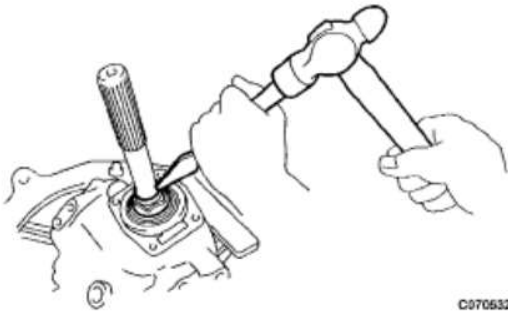


**Fig. 84: Identifying No. 2 Transfer Ring Gear Mounting Case Washer Location**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Using a chisel, stake the transfer gear nut.

**2009 Toyota Highlander Limited**

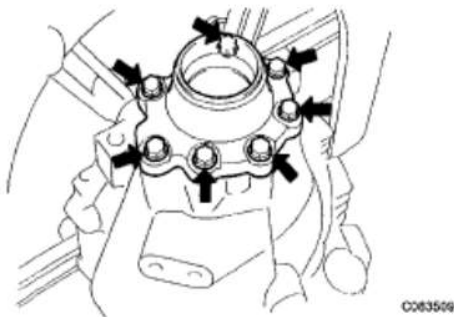
2009 TRANSMISSION MF2A Transfer - Highlander

**Fig. 85: Staking Transfer Gear Nut**

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

**18. REMOVE TRANSFER RH BEARING RETAINER SUB-ASSEMBLY**

- a. Remove the 7 bolts from the transfer RH bearing retainer sub-assembly.

**Fig. 86: Locating Transfer RH Bearing Retainer Sub-Assembly With Bolts**

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

- b. Using SST, make a clearance between the transfer RH bearing retainer sub-assembly and the transfer case.

**SST 09950-00020**

- c. Remove SST.

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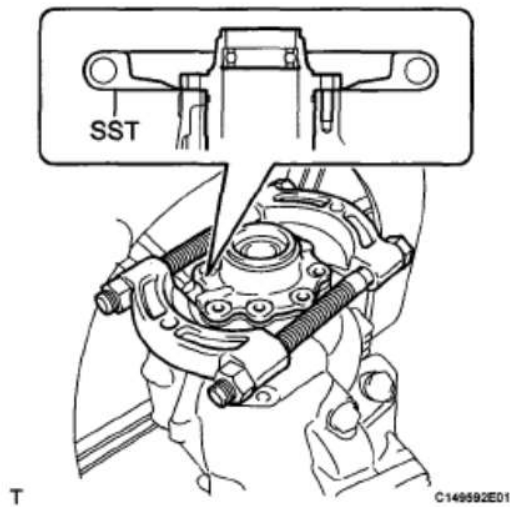


**Fig. 87: Identifying Transfer RH Bearing Retainer Sub-Assembly And Transfer Case With SST**

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

- d. Using SST, remove the transfer RH bearing retainer sub - assembly from the transfer case.

**SST 09520-10021**

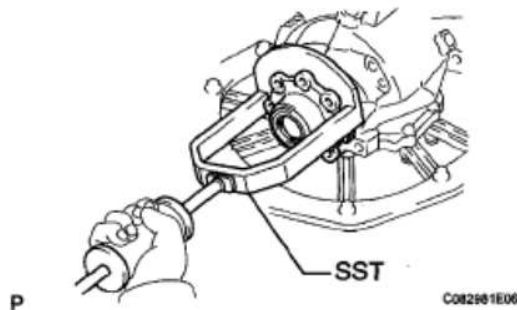


**Fig. 88: Removing Transfer RH Bearing Retainer Sub-Assembly**

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

### 19. REMOVE CENTER DIFFERENTIAL CASE TAPERED ROLLER BEARING

- a. Fix the transfer RH bearing retainer sub-assembly in a vise.
- b. Using SST, remove the center differential case tapered roller bearing RH outer race and transfer ring gear mounting case washer No. 2 from the transfer RH bearing retainer sub-assembly.

**SST 09308-00010**

## 2009 Toyota Highlander Limited

### 2009 TRANSMISSION MF2A Transfer - Highlander

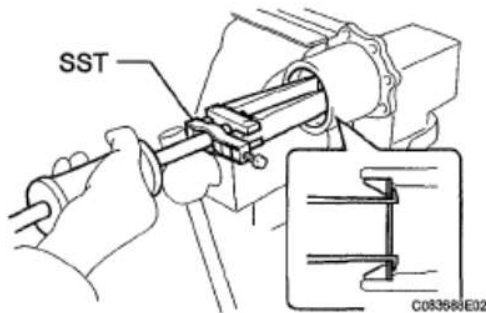


**Fig. 89: Removing Center Differential Case Tapered Roller Bearing RH Outer Race**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

#### 20. INSTALL SIDE GEAR SHAFT HOLDER BEARING

- Install the side gear shaft holder bearing to the transfer RH bearing retainer sub-assembly.
- Using snap ring pliers, install the side gear shaft holder hole snap ring.

##### HINT:

Check that the side gear shaft holder hole snap ring fits in the groove of the transfer RH bearing retainer sub-assembly.

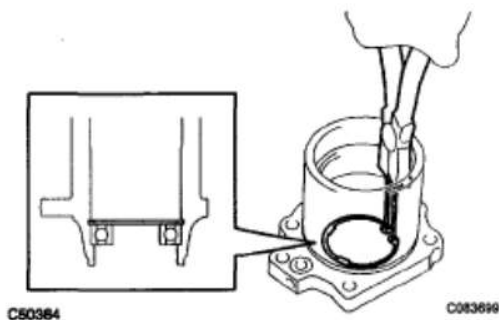


**Fig. 90: Installing Side Gear Shaft Holder Hole Snap Ring**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

#### 21. INSTALL TRANSFER RH BEARING RETAINER OIL SEAL

- Using SST and a press, install the No. 2 transfer RH bearing retainer oil seal to the transfer RH bearing retainer sub-assembly.

SST 09950-60010 (09951 -00350, 09951 -00540, 09952-06010), 09950-70010 (09951-07150)

**NOTE:** Carefully press-fit so that the oil seal will not be tilted.

- Apply small amount of MP grease No. 2 to the oil seal lip.

## 2009 Toyota Highlander Limited

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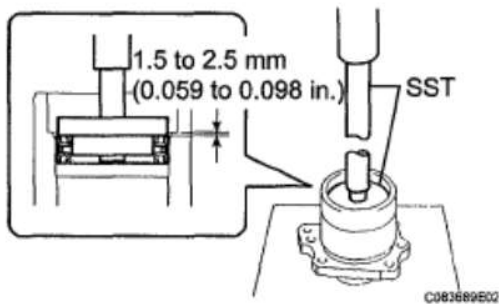


**Fig. 91: Installing No. 2 Transfer RH Bearing Retainer Oil Seal**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

### 22. INSTALL NO. 2 TRANSFER RING GEAR MOUNTING CASE WASHER

- Install the No. 2 transfer ring gear mounting washer to the transfer RH bearing retainer sub-assembly.

### 23. INSTALL CENTER DIFFERENTIAL CASE TAPERED ROLLER BEARING

- Using SST and a press, install the center differential case tapered roller bearing RH outer race to the transfer RH bearing retainer sub-assembly.

SST 09950-60010 (09951 -00620), 09950-70010 (09951-07150)

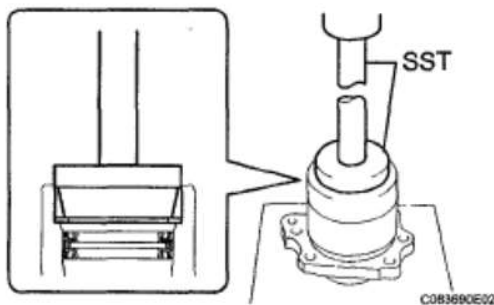


**Fig. 92: Installing Center Differential Case Tapered Roller Bearing RH Outer Race**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

### 24. INSTALL O-RING

- Coat 2 new O-rings with hypoid gear oil.
- Install the 2 new O-rings to the transfer RH bearing retainer sub-assembly.

**NOTE:** Be careful not to twist the O-ring and fit it properly in the retainer's groove.

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**Fig. 93: Installing O-Rings To Transfer RH Bearing Retainer Sub-Assembly**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

### 25. INSTALL TRANSFER RH BEARING RETAINER SUB-ASSEMBLY

- Place the transfer with the surface where the transfer RH bearing retainer sub-assembly is facing up.
- Align the centers of the transfer ring gear mounting case and the transfer case.
- Apply MP grease No. 2 thinly to area A as shown in the illustration.

HINT:

Apply MP grease No. 2 to prevent the oil seal lip from rolling back.

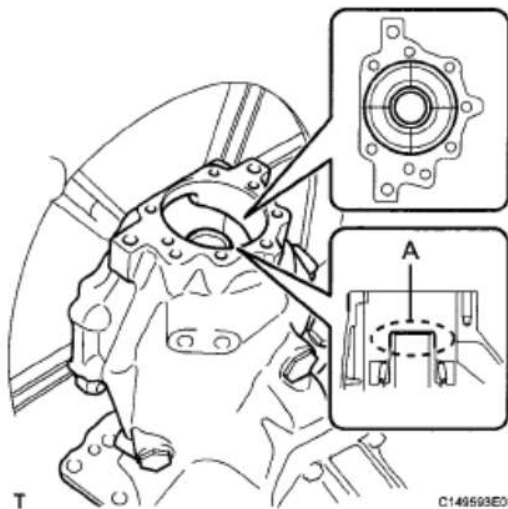


**Fig. 94: Identifying Transfer RH Bearing Retainer Sub-Assembly Grease Area**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- Insert SST into the transfer RH bearing retainer sub-assembly.

**SST 09387-00090**

**NOTE:** Insert SST straight in order not to damage the oil seal.

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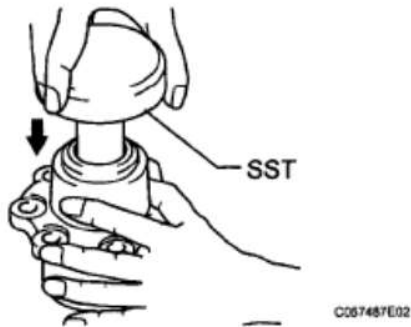


**Fig. 95: Inserting SST Into Transfer RH Bearing Retainer Sub-Assembly**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- e. With SST and the transfer RH bearing sub-assembly in close contact, install the transfer RH bearing retainer sub-assembly together with SST into the transfer case.

**NOTE:**

- **Avoid interference between the case and the retainer, and between SST and the transfer ring gear mounting case.**
- **Carefully check the retainer's O-ring for damage and incorrect fitting.**

**HINT:**

- If the engagement is tight, tap SST with a hammer placing a brass bar on the center of SST.
- If SST and retainer are not in close contact, the seal for the inner end of the retainer may not be properly aligned when the retainer goes into position. This may result in the lip of the oil seal being rolled back during installation.
- If SST and retainer are not in close contact, the center of the retainer or transfer ring gear mounting case may come out of position when the retainer is being installed. This can cause the lip of the oil seal to be rolled back.

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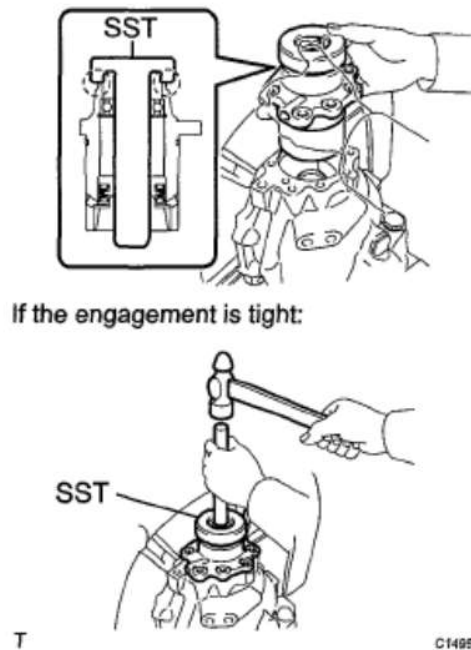


**Fig. 96: Installing Transfer RH Bearing Retainer Sub-Assembly**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- f. Make sure that the transfer RH bearing retainer sub-assembly and transfer case contact closely.
- g. Tighten the 7 bolts evenly in order shown in the illustration.

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

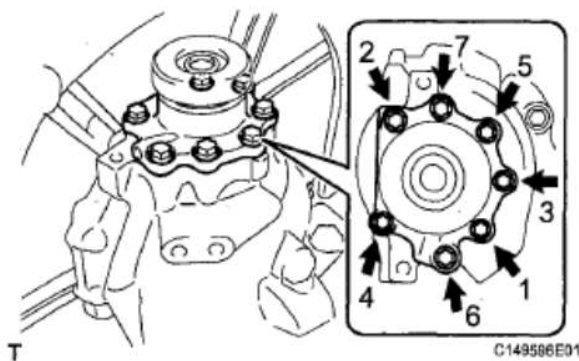


**Fig. 97: Locating Transfer RH Bearing Retainer Sub-Assembly Bolts**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- h. Remove SST.

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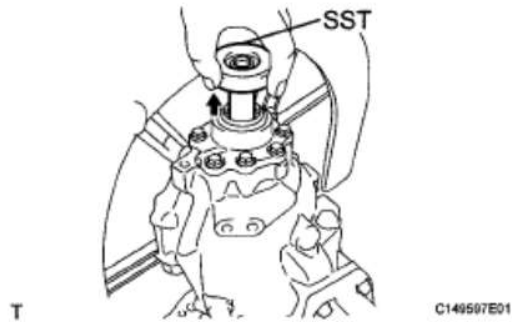


**Fig. 98: Removing SST**

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

### 26. INSPECT TOTAL PRELOAD

- Using SST(s) and a torque wrench, measure the initial torque with the driven pinion being in contact with the ring gear face.

**SST 09326-20011**

**Torque: New bearing**

**1.3 to 1.98 N\*m (13.3 to 20.2 kgf\*cm, 11.5 to 17.5 in.\*lbf)**

**Used bearing**

**1.07 to 1.68 N\*m (10.9 to 17.1 kgf\*cm, 9.5 to 14.9 in.\*lbf)**

**HINT:**

Use a torque wrench with a fulcrum length of 160 mm (6.30 in.).

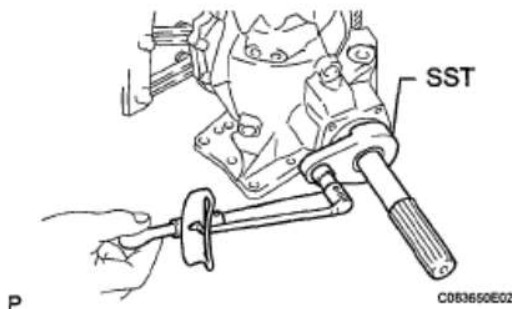


**Fig. 99: Measuring Initial Torque With Driven Pinion**

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

### 27. INSTALL TRANSFER RH BEARING RETAINER OIL SEAL

- Using SST, install the transfer RH bearing retainer oil seal to the transfer RH bearing retainer sub-assembly to the position as shown in the illustration.

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SST 09223-46011

**NOTE:**

- Do not install the oil seal obliquely.
- Do not damage the oil seal lip.

- b. Apply MP grease to the oil seal lip.

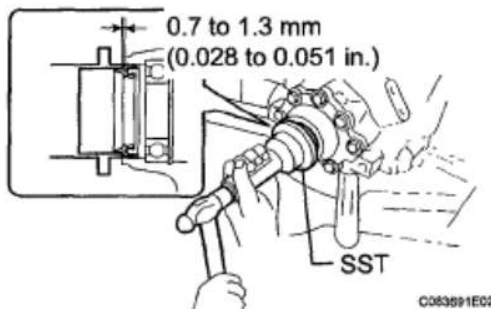


**Fig. 100: Installing Transfer RH Bearing Retainer Oil Seal**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

### 28. INSTALL TRANSFER CASE OIL SEAL

- a. Using SST, install the transfer case oil seal to the transfer case at the position as shown in the illustration.

SST 09387-00010, 09950-70010 (09951 -07150)

**NOTE:**

- Do not install the oil seal obliquely.
- Do not damage the oil seal lip.

- b. Apply small amount of MP grease to the oil seal lip.

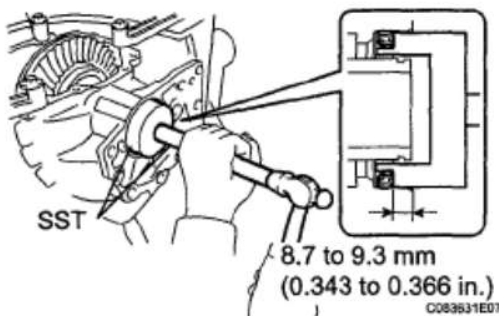


**Fig. 101: Installing Transfer Case Oil Seal**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

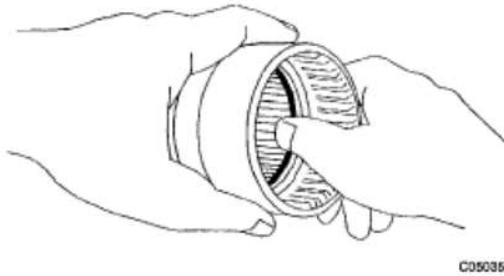
### 29. INSTALL CENTER DIFFERENTIAL LOCK SLEEVE

**2009 Toyota Highlander Limited**

## 2009 TRANSMISSION MF2A Transfer - Highlander

- a. Coat a new O-ring with hypoid gear oil.
- b. Install the O-ring to the CTR differential lock sleeve.

**NOTE:** Be careful not to twist the O-ring and fit it properly in the retainer's groove.

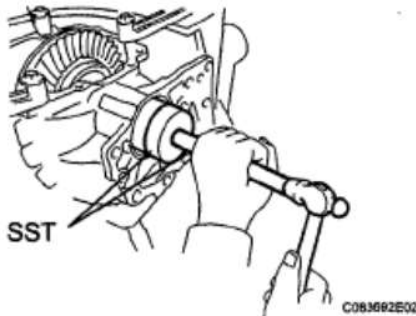


C050354

**Fig. 102: Installing O-Ring To CTR Differential Lock Sleeve**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Using SST, install the CTR differential lock sleeve to the transfer case.

SST 09950-60010 (09951 -00610), 09950-70010 (09951-07150)



C063682E02

**Fig. 103: Installing CTR Differential Lock Sleeve To Transfer Case**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Using snap ring pliers, install the shaft snap ring.

**NOTE:** Check that the snap ring is fitted in the groove of the ring gear mounting case.

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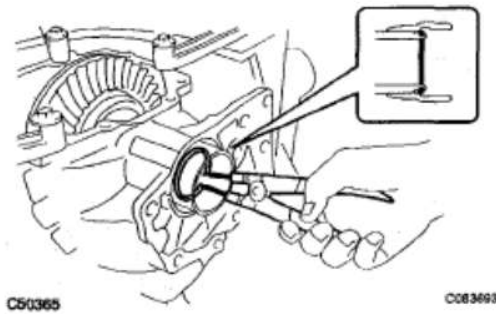


**Fig. 104: Installing Shaft Snap Ring**

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

### 30. INSTALL TRANSFER EXTENSION HOUSING TYPE T OIL SEAL

- Using SST, install the transfer extension housing type T oil seal to the transfer extension housing at the position as shown in the illustration.

SST 09950-60010 (09951 -00380, 09951 -00580, 09951 -07150, 09952-06010), 09950-70010

**NOTE:**

- Do not install the oil seal obliquely.
- Do not damage the oil seal lip.

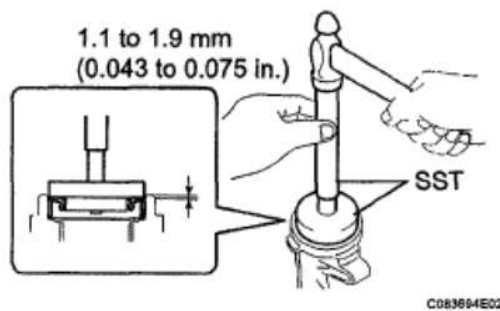


**Fig. 105: Installing Transfer Extension Housing Type T Oil Seal**

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

- Apply small amount of MP grease No. 2 to the oil seal lip.

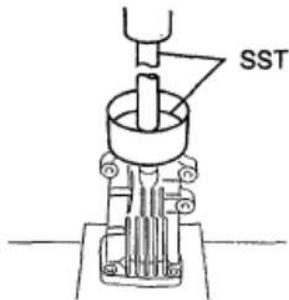
### 31. INSTALL TRANSFER EXTENSION HOUSING DUST DEFLECTOR

- Using SST and press, install a new transfer extension housing dust deflector to the transfer extension housing sub-assembly.

SST 09950-60020 (09951 -00710), 09950-70010 (09951-07150)

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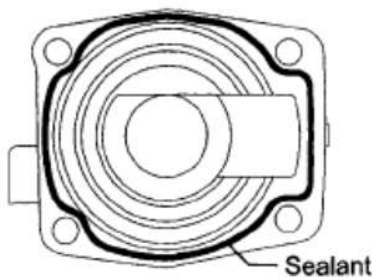
**Fig. 106: Installing Transfer Extension Housing Dust Deflector**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

### 32. INSTALL TRANSFER EXTENSION HOUSING SUB-ASSEMBLY

- Apply sealant 1281 to the transfer extension housing sub-assembly in a continuous bead of 1.2 mm diameter as shown in the illustration.

**NOTE:**

- Wipe any grease off from the attaching surfaces.
- Install the transfer extension housing sub-assembly within 10 minutes after applying the sealant.



C083696E01

**Fig. 107: Applying Sealant 1281 To Transfer Extension Housing Sub-Assembly**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- Install the transfer extension housing sub-assembly to the transfer case with the 4 bolts.

**Torque: 26 N\*m (260 kgf\*cm, 19 ft.\*lbf)**

- Remove the transfer assembly from the overhaul attachment.

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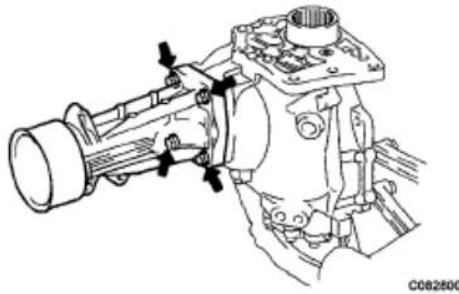


**Fig. 108: Locating Transfer Extension Housing Sub-Assembly To Transfer Case**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

### 33. INSTALL TRANSFER AND TRANSAXLE SETTING STUD BOLT

- Install the transfer and transaxle setting stud bolts to the parts of the transfer case as shown in the illustration.

**Torque: 39 N\*m (400 kgf\*cm, 30 ft.\*lbf)**

**NOTE:** Install the sealant-coated side of the transfer and transaxle stud bolt to the transfer case.

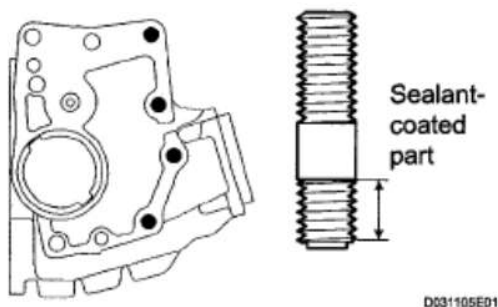


**Fig. 109: Identifying Sealant-Coated Part Of Transfer And Transaxle Setting Stud Bolt**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

### 34. INSTALL TRANSFER CASE STRAIGHT PIN

- Using a plastic hammer, install the 4 transfer case straight pins to the transfer case as shown in the illustration.

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2009 TRANSMISSION MF2A Transfer - Highlander

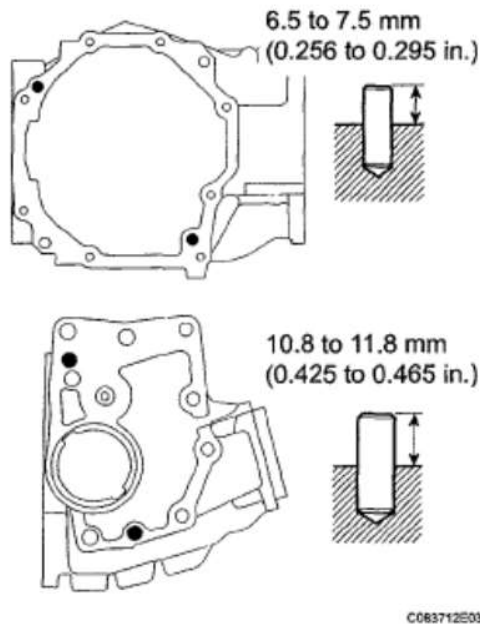


**Fig. 110: Identifying Transfer Case Straight Pins**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

### 35. INSTALL TRANSFER DYNAMIC DAMPER

- Install the transfer dynamic damper to the transfer extension housing sub-assembly with the 3 bolts.

**Torque: 26 N\*m (260 kgf\*cm, 19 ft.\*lbf)**

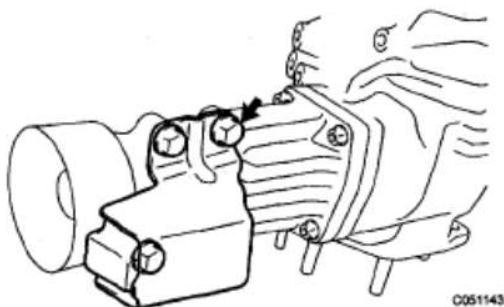


**Fig. 111: Locating Transfer Dynamic Damper**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

### 36. INSTALL BREATHER OIL DEFLECTOR

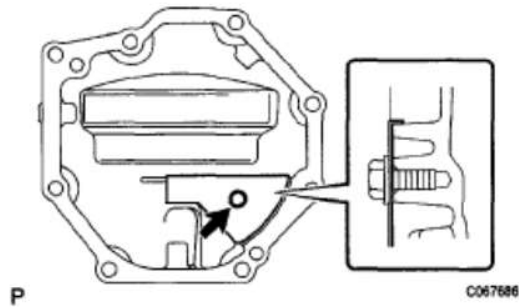
- Install the breather oil deflector to the No. 1 transfer case cover with the bolt.

**Torque: 6.5 N\*m (66 kgf\*cm, 57 in.\*lbf)**

**NOTE:** Be careful about the direction of the deflector's fold.

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**Fig. 112: Locating Breather Oil Deflector**

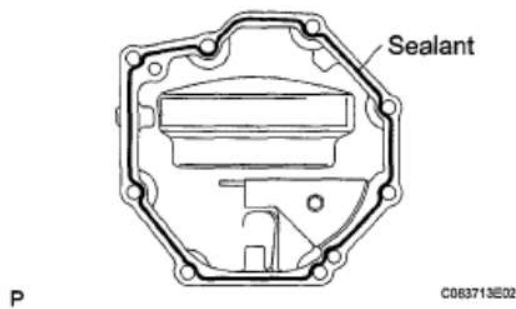
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**37. INSTALL NO. 1 TRANSFER CASE COVER**

- a. Apply sealant 1281 to the No. 1 transfer case cover in a continuous bead of 1.2 mm diameter as shown in the illustration.

**NOTE:**

- Wipe any grease off from the attaching surfaces.
- Install the No. 1 transfer case cover within 10 minutes after applying the sealant.

**Fig. 113: Applying Sealant 1281 To No. 1 Transfer Case Cover**

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

- b. Install the No. 1 transfer case cover to the transfer case with the 8 bolts.

**Torque: 20 N\*m (200 kgf\*cm, 14 ft.\*lbf)**

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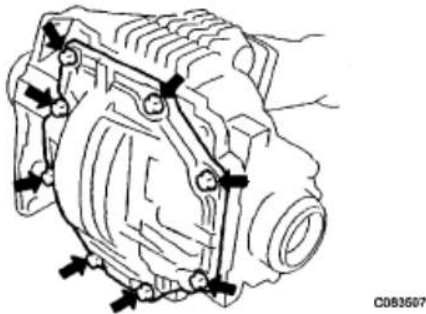


**Fig. 114: Locating Transfer Case Cover No 1 With Bolt**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

### 38. INSTALL TRANSFER CASE BREATHER PLUG

- a. Using SST and a hammer, install the transfer case breather plug to the No. 1 transfer case cover.

SST 09612-10093 (09612-10061)

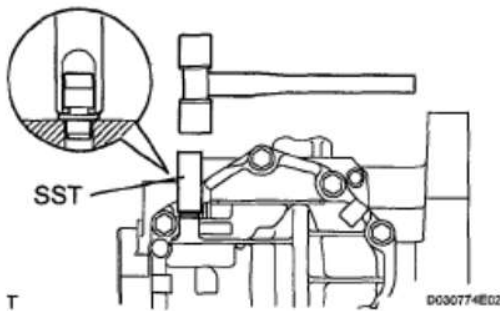


**Fig. 115: Installing Transfer Case Breather Plug To No. 1 Transfer Case Cover**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

### 39. INSTALL TRANSFER COVER GASKET

- a. Install a new transfer cover gasket to the transfer case.

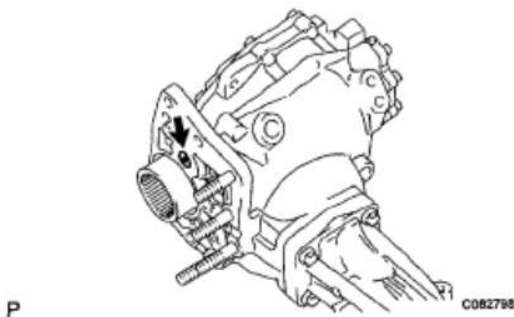


**Fig. 116: Locating Transfer Cover Gasket**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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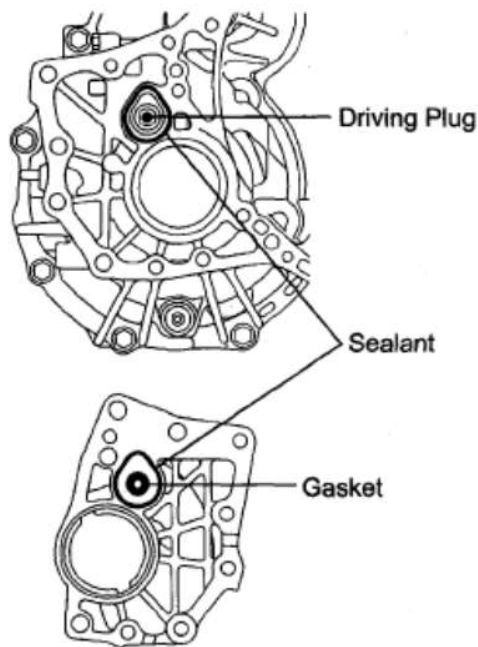
## INSTALLATION

### 1. INSTALL TRANSFER ASSEMBLY

- a. Apply sealant 1281 to the transaxle assembly and transfer assembly in a continuous bead of 1.2 mm diameter as shown in the illustration.

**NOTE:**

- Wipe any grease off from the attaching surfaces.
- Install it within 10 minutes after applying the sealant.
- Sealant stuck on the gasket, case oil seal and driving plug may cause oil leakage and seizure due to oil shortage. Care must be taken.



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**Fig. 117: Identifying Gasket, Sealant And Driving Plug**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Install the transfer assembly to the transaxle assembly with the 2 bolts and 6 nuts.

**Torque: 69 N\*m (700 kgf\*cm, 51 ft.\*lbf)**

**NOTE:**

- Check that the gasket is installed to the transfer assembly before installing them to the transaxle assembly.
- Install the transfer assembly to the transaxle assembly without tilting.
- When moving the transfer assembly, do not hold the oil seal on the both sides.

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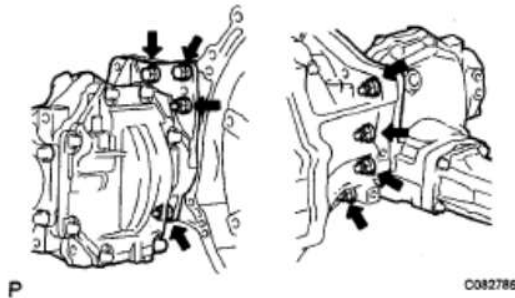


**Fig. 118: Locating Transfer Assembly Bolts And Nuts**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. **INSTALL AUTOMATIC TRANSAXLE WITH TRANSFER** (See INSTALLATION )
3. **INSTALL TRANSFER STIFFENER PLATE RH** (See INSTALLATION )
4. **CONNECT CONNECTORS** (See INSTALLATION )
5. **CONNECT WIRE HARNESS** (See INSTALLATION )
6. **INSTALL WIRE HARNESS CLAMP** (See INSTALLATION )
7. **INSTALL FRONT DRIVE SHAFT ASSEMBLY LH** (See INSTALLATION )
8. **INSTALL FRONT DRIVE SHAFT ASSEMBLY RH (for 4WD)** (See INSTALLATION )
9. **INSTALL TRANSVERSE ENGINE MOUNTING BRACKET** (See INSTALLATION )
10. **INSTALL FRONT ENGINE MOUNTING INSULATOR ASSEMBLY** (See INSTALLATION )
11. **INSTALL TRANSVERSE ENGINE MOUNTING INSULATOR** (See INSTALLATION )
12. **INSTALL TRANSVERSE ENGINE MOUNTING INSULATOR** (See INSTALLATION )
13. **INSTALL FRONT FRAME ASSEMBLY** (See INSTALLATION )
14. **INSTALL POWER STEERING LINK ASSEMBLY (for 4WD)** (See INSTALLATION )
15. **INSTALL FRONT STABILIZER BAR** (See INSTALLATION )
16. **REMOVE ENGINE HANGERS** (See INSTALLATION )
17. **INSTALL MANIFOLD STAY** (See INSTALLATION )
18. **INSTALL STARTER ASSEMBLY** (See INSTALLATION )
19. **INSTALL ENGINE WIRE** (See INSTALLATION )
20. **INSTALL INTAKE AIR SURGE TANK ASSEMBLY** (See INSTALLATION )
21. **INSTALL VENTILATION HOSE** (See INSTALLATION )
22. **TEMPORARILY TIGHTEN COMPRESSOR AND MAGNETIC CLUTCH** (See INSTALLATION )
23. **INSTALL COMPRESSOR AND MAGNETIC CLUTCH** (See INSTALLATION )
24. **INSTALL ENGINE ASSEMBLY WITH TRANSAXLE** (See INSTALLATION )
25. **RECONNECT SUCTION HOSE SUB-ASSEMBLY** (See INSTALLATION )
26. **RECONNECT DISCHARGE HOSE SUB-ASSEMBLY** (See INSTALLATION )
27. **INSTALL STEERING INTERMEDIATE SHAFT SUB-ASSEMBLY** (See INSTALLATION )
28. **INSTALL FRONT AXLE ASSEMBLY LH** (See INSTALLATION )

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29. **INSTALL FRONT AXLE ASSEMBLY RH** (See INSTALLATION )
30. **INSTALL NO. 1 FRONT SUSPENSION LOWER ARM LH** (See INSTALLATION )
31. **INSTALL NO. 1 FRONT SUSPENSION LOWER ARM RH** (See INSTALLATION )
32. **CONNECT TIE ROD ASSEMBLY LH** (See INSTALLATION )
33. **CONNECT TIE ROD ASSEMBLY RH** (See INSTALLATION )
34. **INSTALL FRONT SPEED SENSOR LH** (See INSTALLATION )
35. **INSTALL FRONT SPEED SENSOR RH** (See INSTALLATION )
36. **INSTALL FRONT AXLE HUB NUT LH** (See INSTALLATION )
37. **INSTALL FRONT AXLE HUB NUT RH** (See INSTALLATION )
38. **INSTALL FRONT STABILIZER LINK ASSEMBLY LH** (See INSTALLATION )
39. **INSTALL FRONT STABILIZER LINK ASSEMBLY RH** (See INSTALLATION )
40. **INSTALL FRONT EXHAUST PIPE ASSEMBLY** (See INSTALLATION )
41. **INSTALL NO. 3 FRONT EXHAUST PIPE SUB-ASSEMBLY** (See INSTALLATION )
42. **INSTALL CENTER EXHAUST PIPE ASSEMBLY** (See INSTALLATION )
43. **INSTALL TAIL EXHAUST PIPE ASSEMBLY** (See INSTALLATION )
44. **TEMPORARILY TIGHTEN PROPELLER WITH CENTER BEARING SHAFT ASSEMBLY** (See INSTALLATION )
45. **FULLY TIGHTEN PROPELLER WITH CENTER BEARING SHAFT ASSEMBLY** (See INSTALLATION )
46. **CONNECT ENGINE WIRE** (See INSTALLATION )
47. **CONNECT TRANSMISSION CONTROL CABLE ASSEMBLY** (See INSTALLATION )
48. **CONNECT FUEL TUBE SUB-ASSEMBLY** (See INSTALLATION )
49. **CONNECT OIL COOLER OUTLET HOSE** (See INSTALLATION )
50. **CONNECT OIL COOLER INLET HOSE** (See INSTALLATION )
51. **CONNECT HEATER WATER HOSE INLET B** (See INSTALLATION )
52. **CONNECT HEATER WATER HOSE OUTLET B** (See INSTALLATION )
53. **INSTALL NO. 1 RADIATOR HOSE** (See INSTALLATION )
54. **INSTALL NO. 2 RADIATOR HOSE** (See INSTALLATION )
55. **CONNECT UNION TO CHECK VALVE HOSE** (See INSTALLATION )
56. **CONNECT NO. 1 FUEL VAPOR FEED HOSE** (See INSTALLATION )
57. **INSTALL ENGINE MOVING CONTROL ROD** (See INSTALLATION )
58. **INSTALL NO. 2 ENGINE MOUNTING STAY RH** (See INSTALLATION )
59. **INSTALL RESERVOIR BRACKET** (See INSTALLATION )
60. **INSTALL BRAKE MASTER CYLINDER RESERVOIR ASSEMBLY** (See INSTALLATION )
61. **INSTALL AIR CLEANER BRACKET** (See INSTALLATION )
62. **INSTALL BATTERY** (See INSTALLATION )
63. **CONNECT CABLE TO NEGATIVE BATTERY TERMINAL**

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2009 TRANSMISSION MF2A Transfer - Highlander

**CAUTION:** Wait at least 90 seconds after disconnecting the cable from the negative (-) battery terminal to prevent airbag and seat belt pretensioner activation.

**NOTE:** When disconnecting the cable, some systems need to be initialized after the cable is reconnected (See INITIALIZATION ).

64. **INSTALL AIR CLEANER CASE SUB-ASSEMBLY** (See ON-VEHICLE INSPECTION )
65. **INSTALL AIR CLEANER FILTER ELEMENT SUB-ASSEMBLY** (See INSTALLATION )
66. **INSTALL AIR CLEANER CAP SUB-ASSEMBLY** (See INTAKE MANIFOLD )
67. **INSTALL NO. 1 AIR CLEANER INLET** (See INTAKE MANIFOLD )
68. **INSTALL NO. 2 AIR CLEANER INLET** (See COMPONENTS )
69. **CONNECT VACUUM HOSES** (See INSTALLATION )
70. **INSTALL V-RIBBED BELT** (See INSTALLATION )
71. **INSTALL OUTER COWL TOP PANEL SUB-ASSEMBLY** (See INSTALLATION )
72. **INSTALL WINDSHIELD WIPER MOTOR AND LINK ASSEMBLY** (See INSTALLATION )
73. **INSTALL COWL TOP VENTILATOR LOUVER SUB-ASSEMBLY** (See INSTALLATION )
74. **INSTALL FRONT WIPER ARM AND BLADE ASSEMBLY LH** (See INSTALLATION )
75. **INSTALL FRONT WIPER ARM AND BLADE ASSEMBLY RH** (See INSTALLATION )
76. **INSTALL FRONT WHEELS** (See INSTALLATION )
77. **ADD ENGINE OIL** (See OIL PRESSURE SWITCH )
78. **ADD ENGINE COOLANT** (See REMOVAL )
79. **INSTALL TRANSFER DRAIN PLUG**

- a. Install the transfer drain plug with a new drain gasket.

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

80. **INSTALL NO.2 TRANSFER CASE PLUG**

- a. Install the No. 2 transfer case plug with a new No. 2 gasket.

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

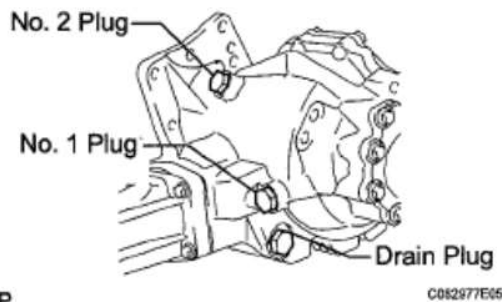


**Fig. 119: Identifying No. 2 Transfer Case Plug And No. 1 Transfer Case Plug**

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## 2009 TRANSMISSION MF2A Transfer - Highlander

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

**81. INSTALL NO.1 TRANSFER CASE PLUG**

- a. Add oil up to 0 to 5 mm below the lower side of the plug hole.

**Oil quantity:**

**0.9 liters (0.95 US qts, 0.79 Imp.qts)**

**HINT:**

When adding oil, pour it slowly.

- b. Install the No. 1 transfer case plug with a new No. 1 gasket.

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

**82. ADD AUTOMATIC TRANSAXLE FLUID****83. CHECK AUTOMATIC TRANSAXLE FLUID (See AUTOMATIC TRANSAXLE FLUID )****84. INSPECT FOR FUEL LEAK (See PARTS LOCATION )****85. INSPECT FOR ENGINE OIL LEAK (See OIL PRESSURE SWITCH )****86. INSPECT FOR COOLANT LEAK (See COOLING SYSTEM )****87. INSPECT FOR EXHAUST GAS LEAK (See INSTALLATION )****88. CHECK SHIFT LEVER POSITION (See ON-VEHICLE INSPECTION )****89. CHECK AND ADJUST FRONT WHEEL ALIGNMENT (See INSTALLATION )****90. CHECK IGNITION TIMING (See ENGINE )****91. CHECK ENGINE IDLE SPEED (See ON-VEHICLE INSPECTION )****92. CHECK CO/HC (See ON-VEHICLE INSPECTION )****93. CHECK FUNCTION OF THROTTLE BODY ASSEMBLY (See INSPECTION PROCEDURE )****94. INSTALL FRONT FENDER APRON SEAL LH (See INSTALLATION )****95. INSTALL FRONT FENDER APRON SEAL RH (See INSTALLATION )****96. INSTALL FRONT FENDER LINER LH (See INSTALLATION )****97. INSTALL FRONT FENDER LINER RH (See INSTALLATION )****98. INSTALL FRONT FENDER MOULDING SUB-ASSEMBLY LH (See INSTALLATION )****99. INSTALL FRONT FENDER MOULDING SUB-ASSEMBLY RH (See INSTALLATION )****100. INSTALL FLOOR UNDER COVER LH****101. INSTALL NO. 2 ENGINE UNDER COVER (See INSTALLATION )****102. INSTALL NO. 1 ENGINE UNDER COVER (See INSTALLATION )****103. INSTALL ENGINE UNDER COVER ASSEMBLY (See INSTALLATION )****104. INSTALL V-BANK COVER SUB-ASSEMBLY (See INSTALLATION )****105. CHECK ABS SPEED SENSOR SIGNAL (See INSTALLATION )**

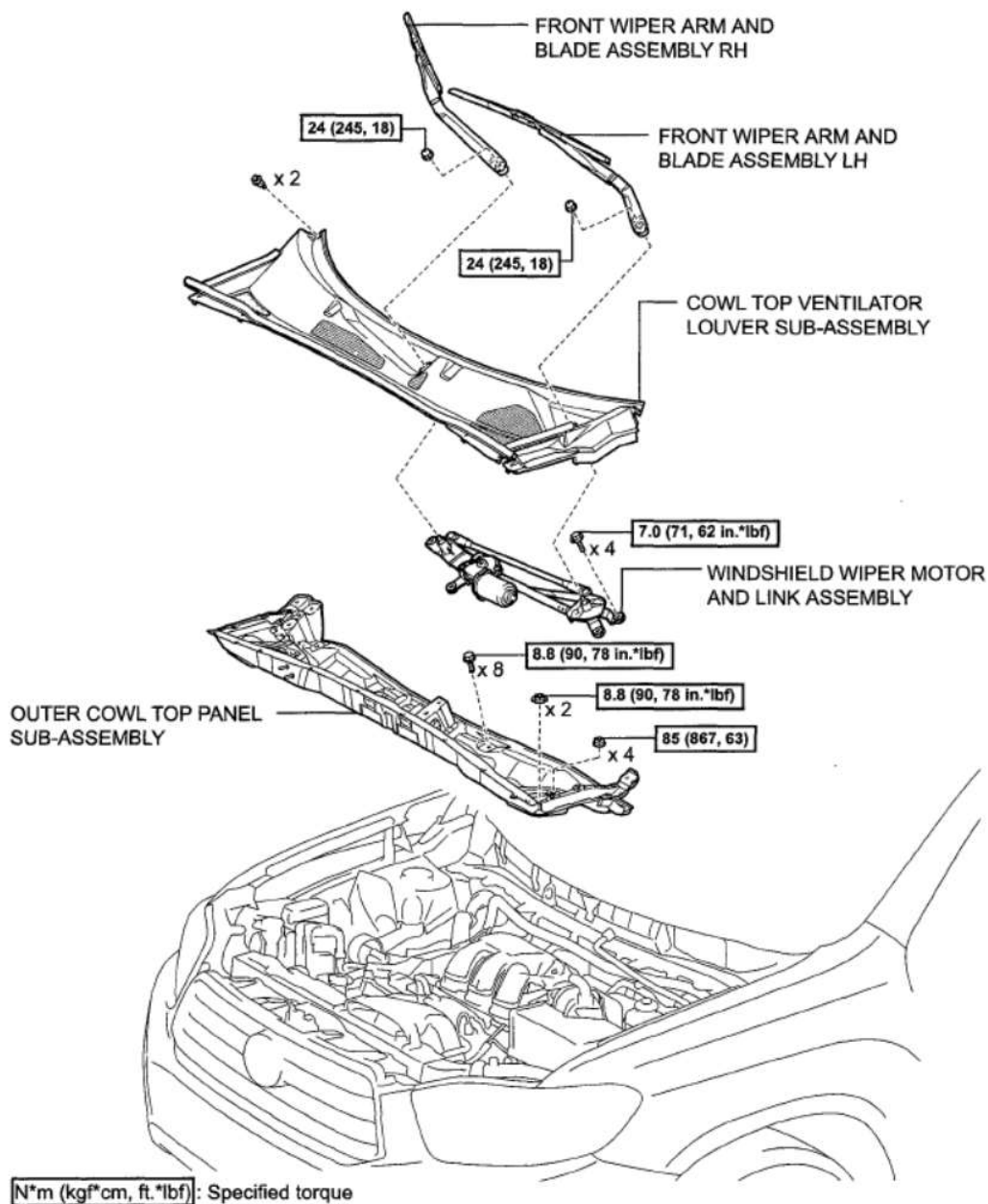
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### 106. RESET MEMORY (See INSTALLATION )

## TRANSFER CASE OIL SEAL

### COMPONENTS



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**Fig. 120: Identifying Transfer Case Oil Seal Components And Torque Specifications (1 Of 11)**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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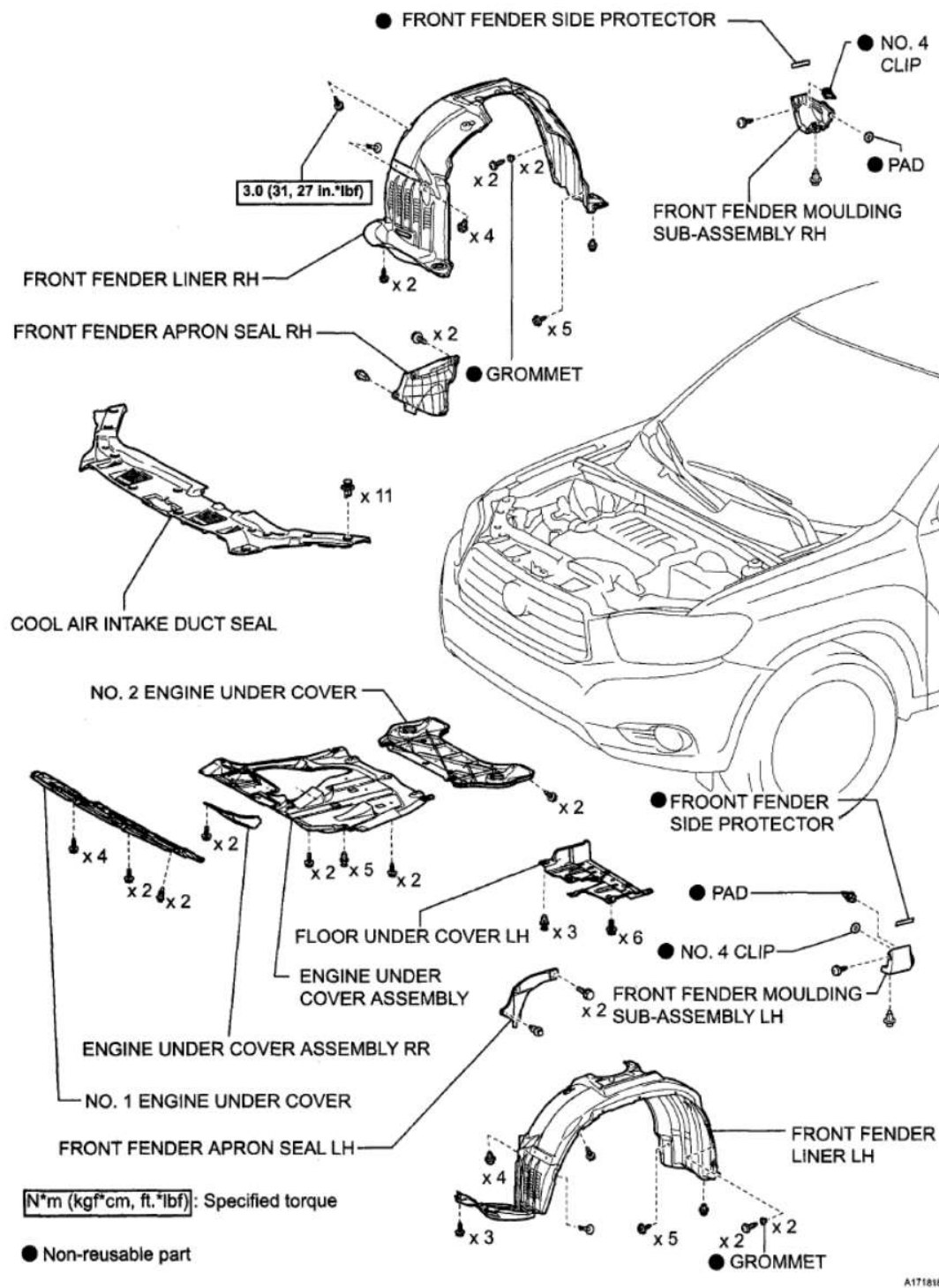
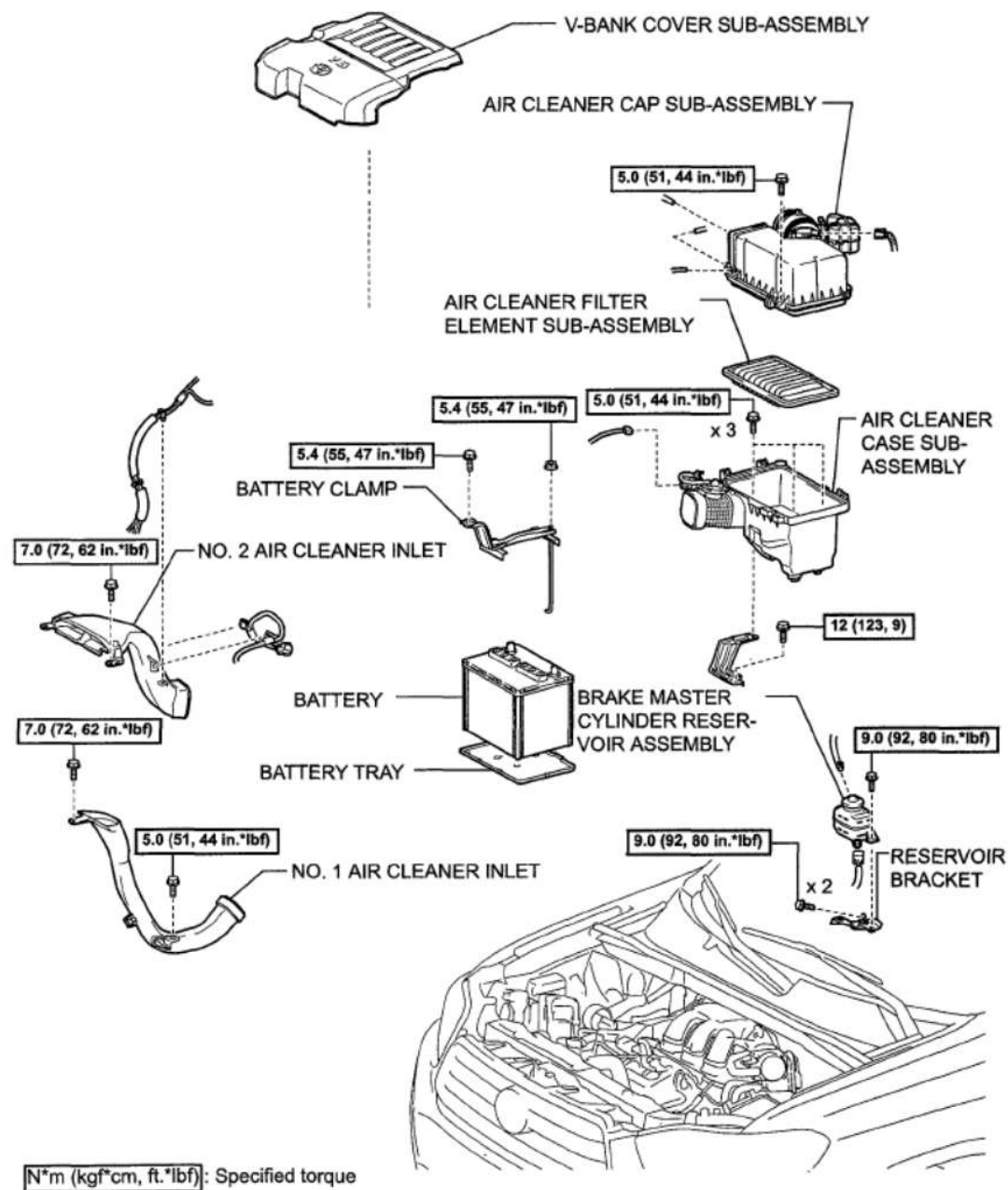


**Fig. 121: Identifying Transfer Case Oil Seal Components And Torque Specifications (2 Of 11)**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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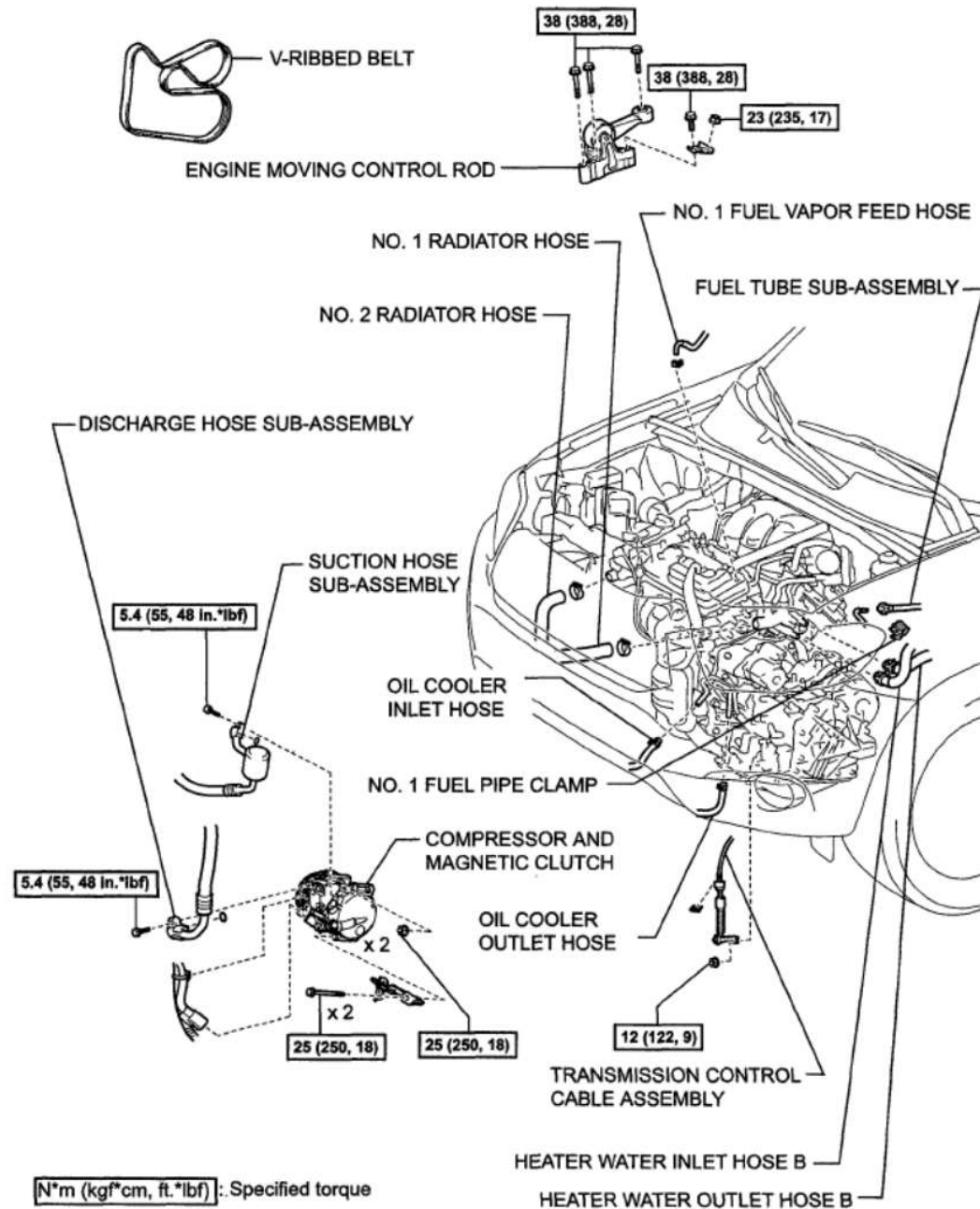


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**Fig. 122: Identifying Transfer Case Oil Seal Components And Torque Specifications (3 Of 11)**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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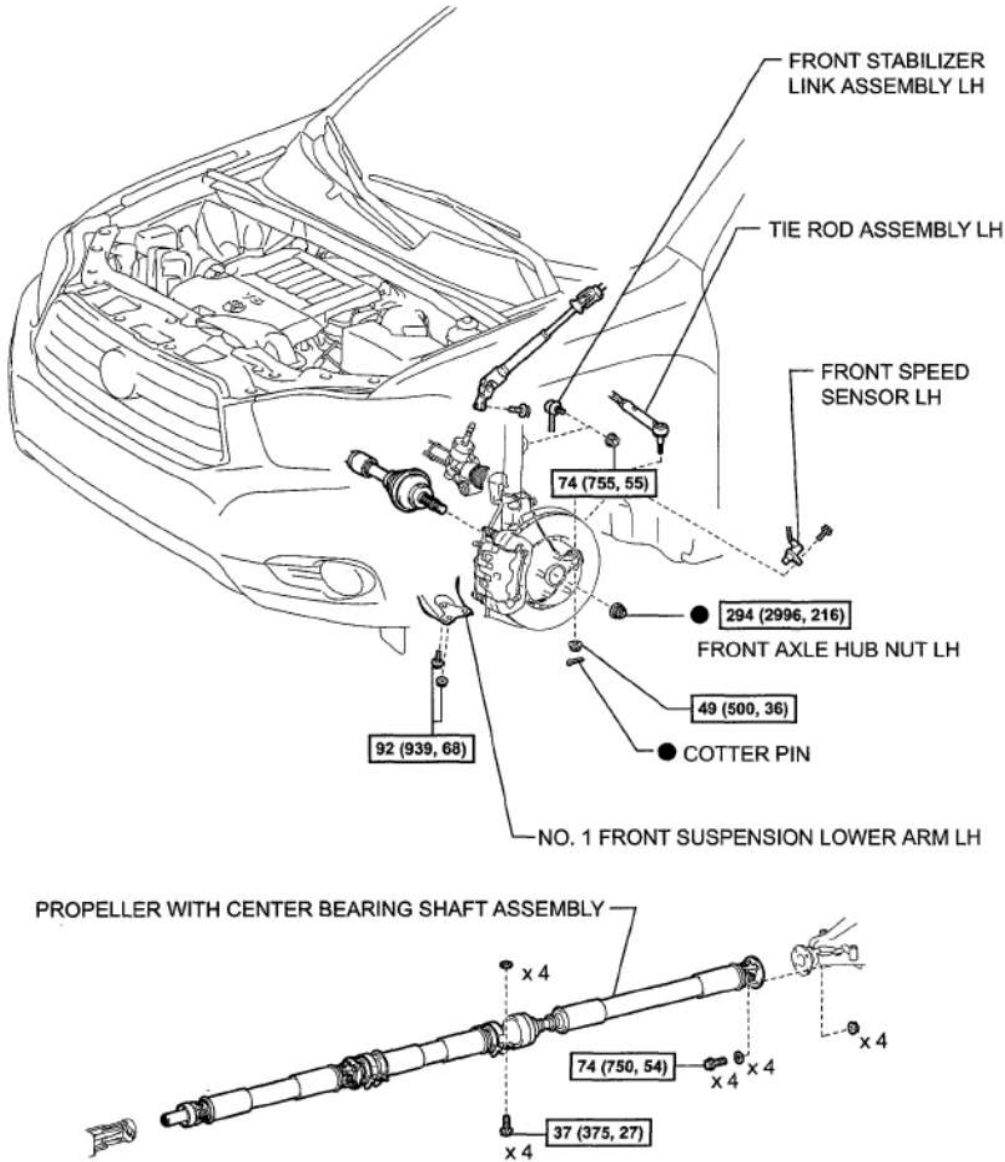


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**Fig. 123: Identifying Transfer Case Oil Seal Components And Torque Specifications (4 Of 11)**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

● Non-reusable part

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**Fig. 124: Identifying Transfer Case Oil Seal Components And Torque Specifications (5 Of 11)**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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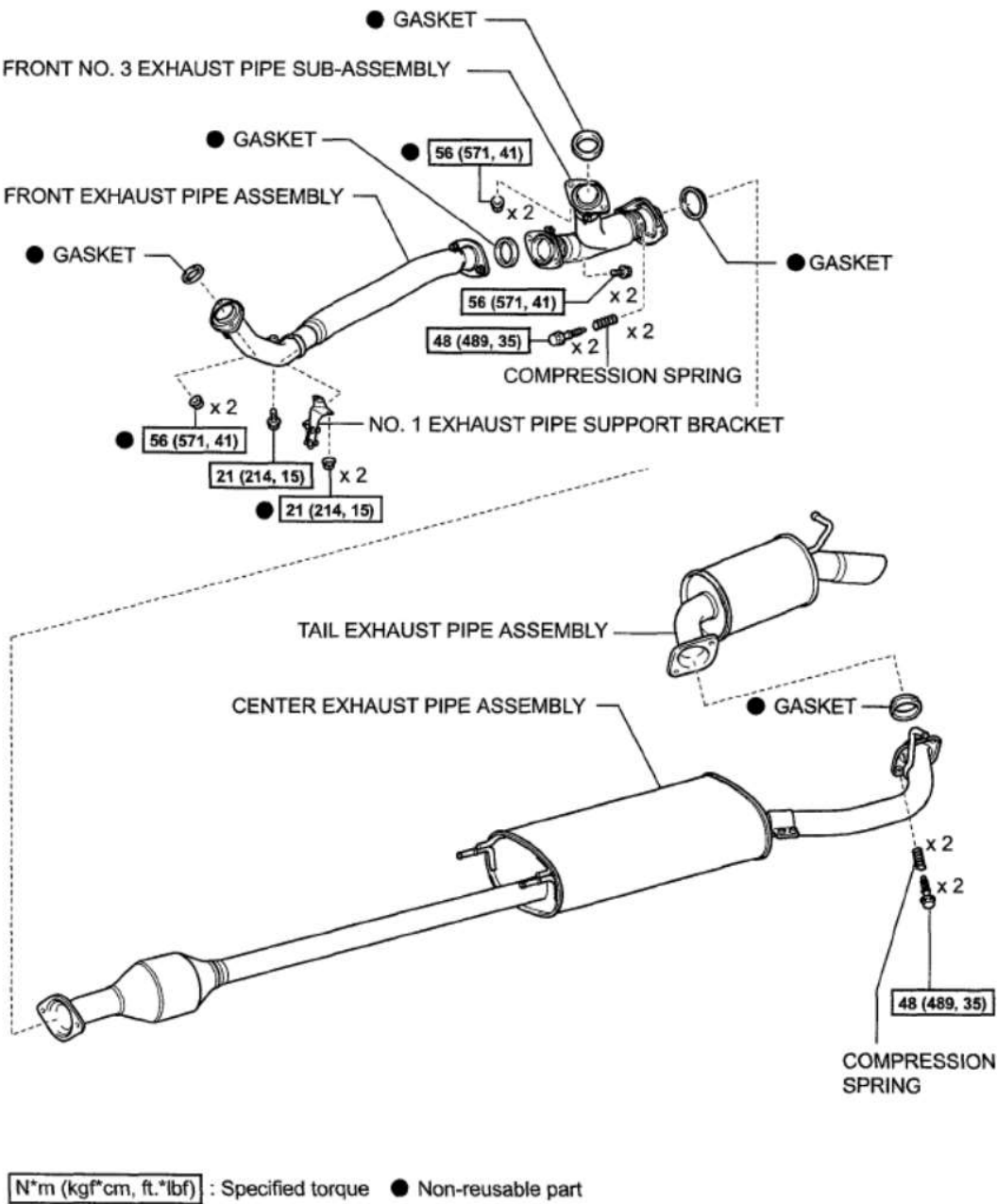


**Fig. 125: Identifying Transfer Case Oil Seal Components And Torque Specifications (6 Of 11)**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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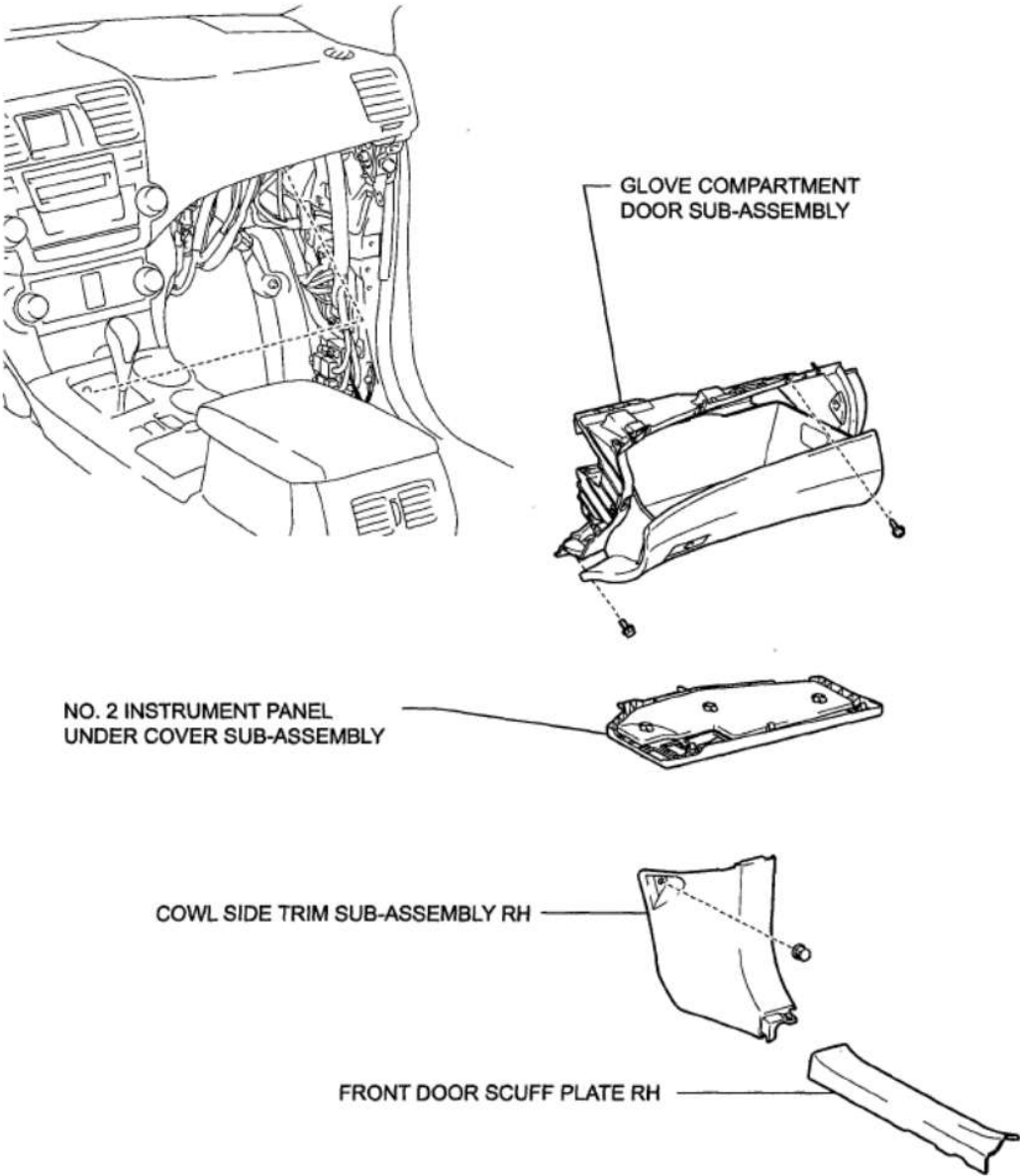


**Fig. 126: Identifying Transfer Case Oil Seal Components And Torque Specifications (7 Of 11)**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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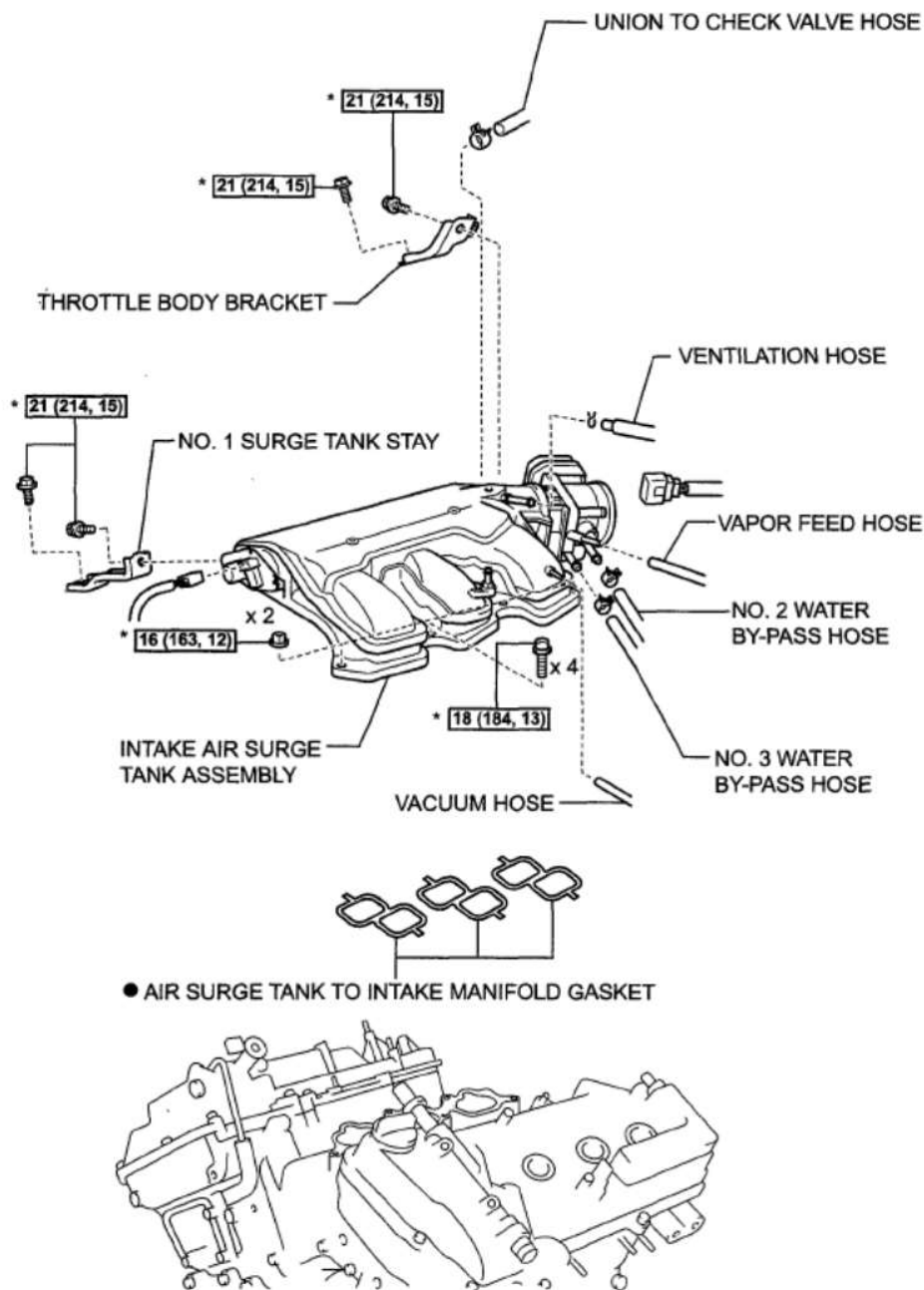
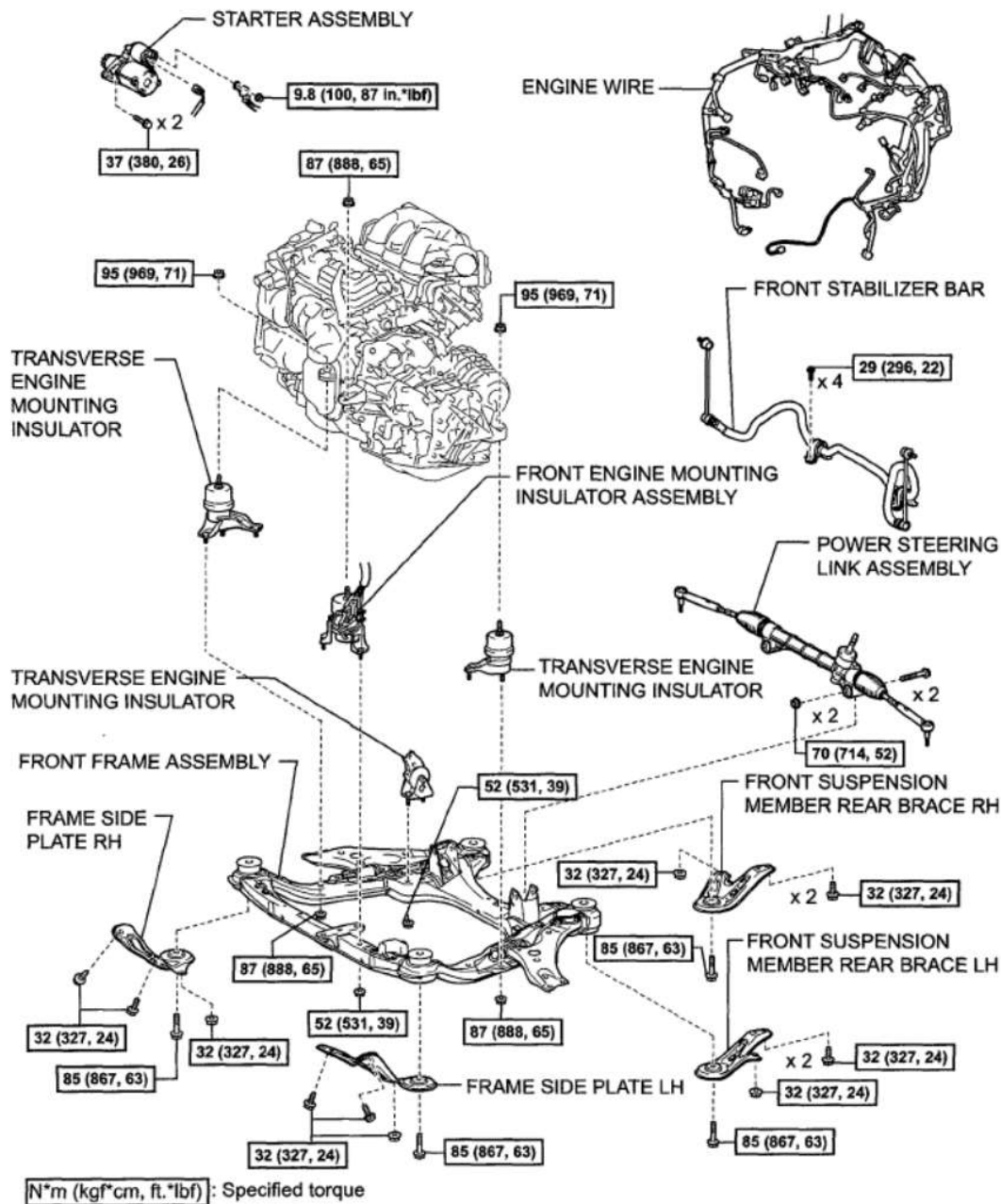


**Fig. 127: Identifying Transfer Case Oil Seal Components And Torque Specifications (8 Of 11)**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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**Fig. 128: Identifying Transfer Case Oil Seal Components And Torque Specifications (9 Of 11)**  
**Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.**

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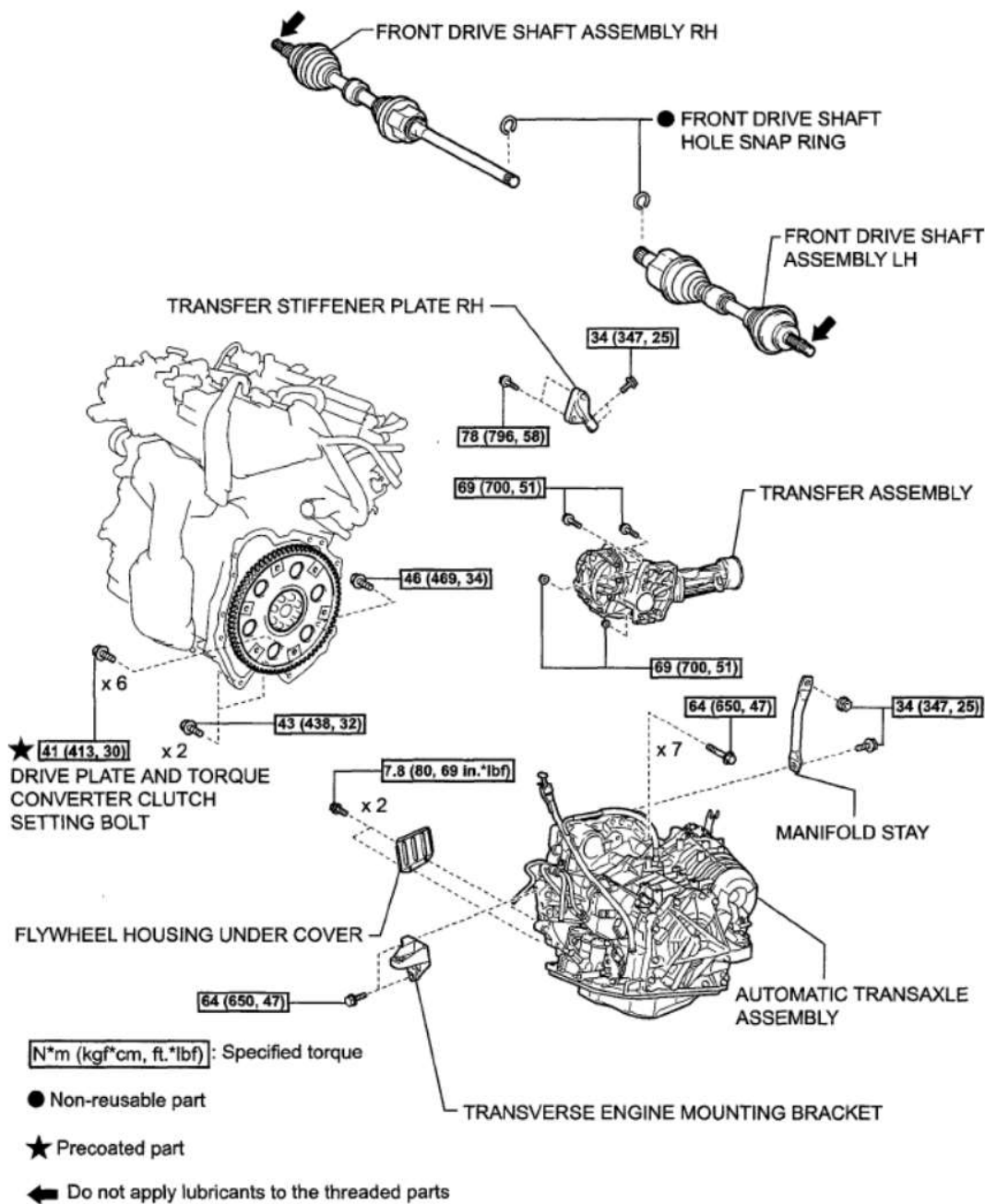
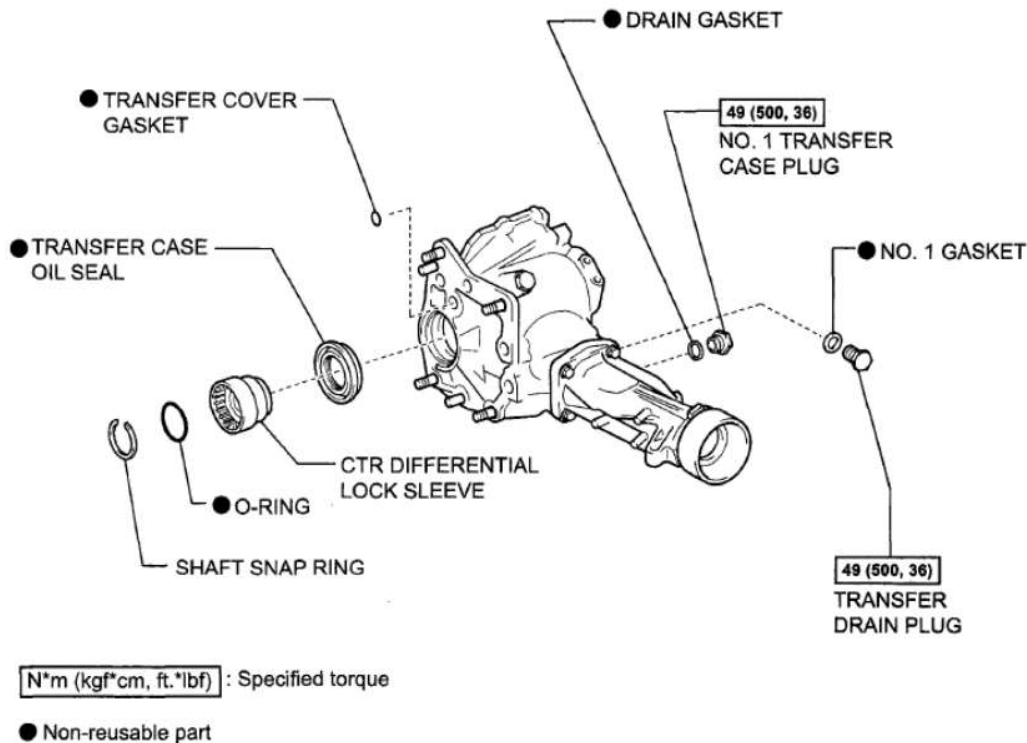


**Fig. 129: Identifying Transfer Case Oil Seal Components And Torque Specifications (10 Of 11)**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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### 2009 TRANSMISSION MF2A Transfer - Highlander



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**Fig. 130: Identifying Transfer Case Oil Seal Components And Torque Specifications (11 Of 11)**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

#### REMOVAL

1. **DISCHARGE FUEL SYSTEM PRESSURE** (See FUEL INJECTOR )
2. **RECOVER REFRIGERANT FROM REFRIGERATION SYSTEM** (See REPLACEMENT )
3. **REMOVE COOL AIR INTAKE DUCT SEAL** (See SYSTEM DIAGRAM )
4. **DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL**

**NOTE:** When disconnecting the cable, some systems need to be initialized after the cable is reconnected (See REASSEMBLY ).

5. **REMOVE BATTERY** (See REASSEMBLY )
6. **PLACE FRONT WHEELS FACING STRAIGHT AHEAD**
7. **REMOVE FRONT WHEELS**
8. **REMOVE ENGINE UNDER COVER ASSEMBLY** (See REASSEMBLY )
9. **REMOVE NO. 1 ENGINE UNDER COVER** (See REASSEMBLY )
10. **REMOVE NO. 2 ENGINE UNDER COVER** (See REASSEMBLY )
11. **REMOVE FLOOR UNDER COVER LH**
12. **REMOVE FRONT FENDER MOULDING SUB-ASSEMBLY LH** (See REMOVAL )

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13. **REMOVE FRONT FENDER MOULDING SUB-ASSEMBLY RH** (See REMOVAL )
14. **REMOVE FRONT FENDER LINER LH** (See REMOVAL )
15. **REMOVE FRONT FENDER LINER RH** (See REMOVAL )
16. **REMOVE FRONT FENDER APRON SEAL LH** (See REASSEMBLY )
17. **REMOVE FRONT FENDER APRON SEAL RH** (See REASSEMBLY )
18. **DRAIN ENGINE OIL** (See REPLACEMENT )
19. **DRAIN ENGINE COOLANT** (See COMPONENTS )
20. **DRAIN AUTOMATIC TRANSAXLE FLUID** (See REMOVAL )
21. **REMOVE FRONT WIPER ARM AND BLADE ASSEMBLY LH** (See REMOVAL )
22. **REMOVE FRONT WIPER ARM AND BLADE ASSEMBLY RH** (See REMOVAL )
23. **REMOVE COWL TOP VENTILATOR LOUVER SUB-ASSEMBLY** (See REMOVAL )
24. **REMOVE WINDSHIELD WIPER MOTOR AND LINK ASSEMBLY** (See REMOVAL )
25. **REMOVE OUTER COWL TOP PANEL SUB-ASSEMBLY** (See REASSEMBLY )
26. **REMOVE V-BANK COVER SUB-ASSEMBLY** (See REASSEMBLY )
27. **REMOVE NO. 2 AIR CLEANER INLET** (See SYSTEM DIAGRAM )
28. **REMOVE NO. 1 AIR CLEANER INLET** (See ON-VEHICLE INSPECTION )
29. **REMOVE AIR CLEANER CAP SUB-ASSEMBLY** (See ON-VEHICLE INSPECTION )
30. **REMOVE AIR CLEANER FILTER ELEMENT SUB-ASSEMBLY** (See REASSEMBLY )
31. **REMOVE AIR CLEANER CASE SUB-ASSEMBLY** (See ON-VEHICLE INSPECTION )
32. **REMOVE AIR CLEANER BRACKET** (See REASSEMBLY )
33. **SEPARATE BRAKE MASTER CYLINDER RESERVOIR ASSEMBLY** (See REASSEMBLY )
34. **REMOVE RESERVOIR BRACKET** (See REASSEMBLY )
35. **REMOVE NO. 2 ENGINE MOUNTING STAY RH** (See REASSEMBLY )
36. **REMOVE ENGINE MOVING CONTROL ROD** (See REASSEMBLY )
37. **DISCONNECT NO. 1 FUEL VAPOR FEED HOSE** (See REASSEMBLY )
38. **DISCONNECT NO. 1 RADIATOR HOSE** (See REASSEMBLY )
39. **DISCONNECT NO. 2 RADIATOR HOSE** (See REASSEMBLY )
40. **DISCONNECT HEATER WATER HOSE OUTLET B** (See REASSEMBLY )
41. **DISCONNECT HEATER WATER HOSE INLET B** (See REASSEMBLY )
42. **DISCONNECT FUEL TUBE SUB-ASSEMBLY** (See REASSEMBLY )
43. **DISCONNECT OIL COOLER INLET HOSE** (See REASSEMBLY )
44. **REMOVE OIL COOLER OUTLET HOSE** (See REASSEMBLY )
45. **DISCONNECT TRANSMISSION CONTROL CABLE ASSEMBLY** (See REASSEMBLY )
46. **DISCONNECT ENGINE WIRE** (See REASSEMBLY )
47. **DISCONNECT UNION TO CHECK VALVE HOSE** (See INSTALLATION )
48. **REMOVE PROPELLER WITH CENTER BEARING SHAFT ASSEMBLY (for 4WD)** (See REMOVAL )
49. **REMOVE TAIL EXHAUST PIPE ASSEMBLY** (See INSTALLATION )

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50. REMOVE CENTER EXHAUST PIPE ASSEMBLY (See INSTALLATION )
51. REMOVE NO. 3 FRONT EXHAUST PIPE SUB-ASSEMBLY (See INSTALLATION )
52. REMOVE FRONT EXHAUST PIPE ASSEMBLY (See INSTALLATION )
53. DISCONNECT FRONT STABILIZER LINK ASSEMBLY LH (See REMOVAL )
54. DISCONNECT FRONT STABILIZER LINK ASSEMBLY RH (See INSTALLATION )
55. REMOVE FRONT AXLE HUB NUT LH (See REMOVAL )
56. REMOVE FRONT AXLE HUB NUT RH (See INSTALLATION )
57. DISCONNECT FRONT SPEED SENSOR LH (See REMOVAL )
58. DISCONNECT FRONT SPEED SENSOR RH (See INSTALLATION )
59. DISCONNECT TIE ROD ASSEMBLY LH (See REMOVAL )
60. DISCONNECT TIE ROD ASSEMBLY RH (See INSTALLATION )
61. SEPARATE NO. 1 FRONT SUSPENSION LOWER ARM LH (See REMOVAL )
62. SEPARATE NO. 1 FRONT SUSPENSION LOWER ARM RH (See INSTALLATION )
63. SEPARATE FRONT AXLE ASSEMBLY LH (See REMOVAL )
64. SEPARATE FRONT AXLE ASSEMBLY RH (See INSTALLATION )
65. DISCONNECT STEERING INTERMEDIATE SHAFT SUB-ASSEMBLY (See REMOVAL )
66. DISCONNECT DISCHARGE HOSE SUB-ASSEMBLY (See REMOVAL )
67. DISCONNECT SUCTION HOSE SUB-ASSEMBLY (See REMOVAL )
68. REMOVE ENGINE ASSEMBLY WITH TRANSAXLE (See INSTALLATION )
69. REMOVE V-RIBBED BELT (See ON-VEHICLE INSPECTION )
70. REMOVE FRONT STABILIZER BAR (for 4WD) (See INSTALLATION )
71. REMOVE POWER STEERING LINK ASSEMBLY (for 4WD) (See REMOVAL )
72. REMOVE COOLER COMPRESSOR ASSEMBLY (See INSTALLATION )
73. REMOVE VENTILATION HOSE (See REMOVAL )
74. REMOVE INTAKE AIR SURGE TANK ASSEMBLY (See REMOVAL )
75. REMOVE ENGINE WIRE (See REMOVAL )
76. REMOVE STARTER ASSEMBLY (See REMOVAL )
77. REMOVE TRANSVERSE ENGINE MOUNTING BRACKET (See REMOVAL )
78. REMOVE MANIFOLD STAY (See REMOVAL )
79. INSTALL ENGINE HANGERS (See REMOVAL )
80. REMOVE FRONT FRAME ASSEMBLY (See REMOVAL )
81. REMOVE FRONT ENGINE MOUNTING INSULATOR ASSEMBLY (See REMOVAL )
82. REMOVE TRANSVERSE ENGINE MOUNTING INSULATOR (See REMOVAL )
83. REMOVE TRANSVERSE ENGINE MOUNTING INSULATOR (See REMOVAL )
84. REMOVE FRONT DRIVE SHAFT ASSEMBLY LH (See REMOVAL )
85. REMOVE FRONT DRIVE SHAFT ASSEMBLY RH (for 4WD) (See DISASSEMBLY )
86. REMOVE WIRE HARNESS CLAMP (See REMOVAL )
87. DISCONNECT WIRE HARNESS (See REMOVAL )

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88. **DISCONNECT CONNECTORS** (See REMOVAL )
89. **REMOVE TRANSFER STIFFENER PLATE RH** (See INSTALLATION )
90. **REMOVE AUTOMATIC TRANSAXLE WITH TRANSFER** (See INSTALLATION )
91. **REMOVE NO.1 TRANSFER CASE PLUG** (See DISASSEMBLY )
92. **REMOVE NO.2 TRANSFER CASE PLUG** (See DISASSEMBLY )
93. **REMOVE TRANSFER DRAIN PLUG** (See DISASSEMBLY )
94. **REMOVE TRANSFER ASSEMBLY** (See DISASSEMBLY )
95. **REMOVE CENTER DIFFERENTIAL LOCK SLEEVE** (See INSPECTION )
96. **REMOVE TRANSFER CASE OIL SEAL**
  - a. Using SST, remove the transfer case oil seal from the transfer case.

**SST 09308-00010**

**NOTE:** Do not damage the oil-seal-fitted surface of the case.

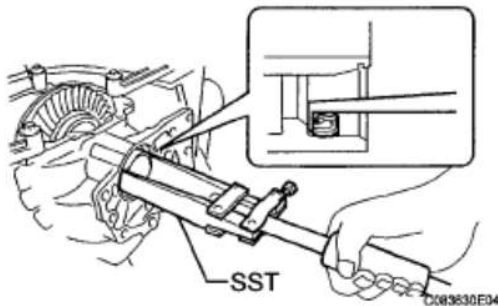


**Fig. 131: Removing Transfer Case Oil Seal From Transfer Case**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

## INSTALLATION

### 1. INSTALL TRANSFER CASE OIL SEAL

- a. Using SST, install a new transfer case oil seal to the transfer case at the position shown in the illustration.

**SST 09387-00010, 09950-70010 (09951 -07150)**

**NOTE:**

- Do not install the oil seal obliquely.
- Do not damage the oil seal lip.

- b. Apply small amount of MP grease to the oil seal lip.

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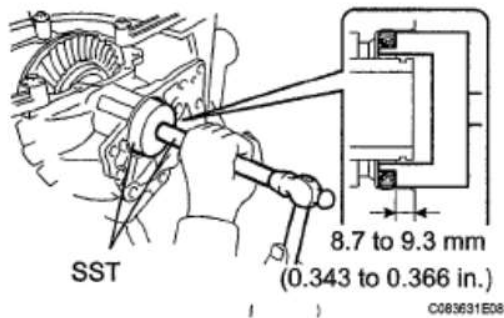


**Fig. 132: Installing Transfer Case Oil Seal**

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

2. **INSTALL CENTER DIFFERENTIAL LOCK SLEEVE** (See INSTALLATION)
3. **INSTALL TRANSFER ASSEMBLY** (See INSTALLATION)
4. **INSTALL AUTOMATIC TRANSAXLE WITH TRANSFER** (See INSTALLATION)
5. **INSTALL TRANSFER STIFFENER PLATE RH** (See INSTALLATION)
6. **CONNECT CONNECTORS** (See INSTALLATION)
7. **CONNECT WIRE HARNESS** (See INSTALLATION)
8. **INSTALL WIRE HARNESS CLAMP** (See INSTALLATION)
9. **INSTALL FRONT DRIVE SHAFT ASSEMBLY LH** (See INSTALLATION)
10. **INSTALL FRONT DRIVE SHAFT ASSEMBLY RH (for 4WD)** (See INSTALLATION)
11. **INSTALL TRANSVERSE ENGINE MOUNTING BRACKET** (See INSTALLATION)
12. **INSTALL FRONT ENGINE MOUNTING INSULATOR ASSEMBLY** (See INSTALLATION)
13. **INSTALL TRANSVERSE ENGINE MOUNTING INSULATOR** (See INSTALLATION)
14. **INSTALL TRANSVERSE ENGINE MOUNTING INSULATOR** (See INSTALLATION)
15. **INSTALL FRONT FRAME ASSEMBLY** (See INSTALLATION)
16. **INSTALL POWER STEERING LINK ASSEMBLY (for 4WD)** (See INSTALLATION)
17. **INSTALL FRONT STABILIZER BAR** (See INSTALLATION)
18. **REMOVE ENGINE HANGERS** (See INSTALLATION)
19. **INSTALL MANIFOLD STAY** (See INSTALLATION)
20. **INSTALL STARTER ASSEMBLY** (See INSTALLATION)
21. **INSTALL ENGINE WIRE** (See INSTALLATION)
22. **INSTALL INTAKE AIR SURGE TANK ASSEMBLY** (See INSTALLATION)
23. **INSTALL VENTILATION HOSE** (See INSTALLATION)
24. **TEMPORARILY TIGHTEN COMPRESSOR AND MAGNETIC CLUTCH** (See INSTALLATION)
25. **INSTALL COMPRESSOR AND MAGNETIC CLUTCH** (See INSTALLATION)
26. **INSTALL ENGINE ASSEMBLY WITH TRANSAXLE** (See INSTALLATION)
27. **RECONNECT SUCTION HOSE SUB-ASSEMBLY** (See INSTALLATION)
28. **RECONNECT DISCHARGE HOSE SUB-ASSEMBLY** (See INSTALLATION)

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29. **INSTALL STEERING INTERMEDIATE SHAFT SUB-ASSEMBLY** (See [INSTALLATION](#) )
30. **INSTALL FRONT AXLE ASSEMBLY LH** (See [INSTALLATION](#) )
31. **INSTALL FRONT AXLE ASSEMBLY RH** (See [INSTALLATION](#) )
32. **INSTALL NO. 1 FRONT SUSPENSION LOWER ARM LH** (See [INSTALLATION](#) )
33. **INSTALL NO. 1 FRONT SUSPENSION LOWER ARM RH** (See [INSTALLATION](#) )
34. **CONNECT TIE ROD ASSEMBLY LH** (See [INSTALLATION](#) )
35. **CONNECT TIE ROD ASSEMBLY RH** (See [INSTALLATION](#) )
36. **INSTALL FRONT SPEED SENSOR LH** (See [INSTALLATION](#) )
37. **INSTALL FRONT SPEED SENSOR RH** (See [INSTALLATION](#) )
38. **INSTALL FRONT AXLE HUB NUT LH** (See [INSTALLATION](#) )
39. **INSTALL FRONT AXLE HUB NUT RH** (See [INSTALLATION](#) )
40. **INSTALL FRONT STABILIZER LINK ASSEMBLY LH** (See [INSTALLATION](#) )
41. **INSTALL FRONT STABILIZER LINK ASSEMBLY RH** (See [INSTALLATION](#) )
42. **INSTALL FRONT EXHAUST PIPE ASSEMBLY** (See [INSTALLATION](#) )
43. **INSTALL NO. 3 FRONT EXHAUST PIPE SUB-ASSEMBLY** (See [INSTALLATION](#) )
44. **INSTALL CENTER EXHAUST PIPE ASSEMBLY** (See [INSTALLATION](#) )
45. **INSTALL TAIL EXHAUST PIPE ASSEMBLY** (See [INSTALLATION](#) )
46. **TEMPORARILY TIGHTEN PROPELLER WITH CENTER BEARING SHAFT ASSEMBLY** (See [INSTALLATION](#) )
47. **FULLY TIGHTEN PROPELLER WITH CENTER BEARING SHAFT ASSEMBLY** (See [INSTALLATION](#) )
48. **CONNECT ENGINE WIRE** (See [INSTALLATION](#) )
49. **CONNECT TRANSMISSION CONTROL CABLE ASSEMBLY** (See [INSTALLATION](#) )
50. **CONNECT FUEL TUBE SUB-ASSEMBLY** (See [INSTALLATION](#) )
51. **CONNECT OIL COOLER OUTLET HOSE** (See [INSTALLATION](#) )
52. **CONNECT OIL COOLER INLET HOSE** (See [INSTALLATION](#) )
53. **CONNECT HEATER WATER HOSE INLET B** (See [INSTALLATION](#) )
54. **CONNECT HEATER WATER HOSE OUTLET B** (See [INSTALLATION](#) )
55. **INSTALL NO. 1 RADIATOR HOSE** (See [INSTALLATION](#) )
56. **INSTALL NO. 2 RADIATOR HOSE** (See [INSTALLATION](#) )
57. **CONNECT UNION TO CHECK VALVE HOSE** (See [INSTALLATION](#) )
58. **CONNECT NO. 1 FUEL VAPOR FEED HOSE** (See [INSTALLATION](#) )
59. **INSTALL ENGINE MOVING CONTROL ROD** (See [INSTALLATION](#) )
60. **INSTALL NO. 2 ENGINE MOUNTING STAY RH** (See [INSTALLATION](#) )
61. **INSTALL RESERVOIR BRACKET** (See [INSTALLATION](#) )
62. **INSTALL BRAKE MASTER CYLINDER RESERVOIR ASSEMBLY** (See [INSTALLATION](#) )
63. **INSTALL AIR CLEANER BRACKET** (See [INSTALLATION](#) )
64. **INSTALL BATTERY** (See [INSTALLATION](#) )

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**65. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL**

**CAUTION:** Wait at least 90 seconds after disconnecting the cable from the negative (-) battery terminal to prevent airbag and seat belt pretensioner activation.

**NOTE:** When disconnecting the cable, some systems need to be initialized after the cable is reconnected (See INITIALIZATION ).

- 66. **INSTALL AIR CLEANER CASE SUB-ASSEMBLY** (See ON-VEHICLE INSPECTION )
- 67. **INSTALL AIR CLEANER FILTER ELEMENT SUB-ASSEMBLY** (See INSTALLATION )
- 68. **INSTALL AIR CLEANER CAP SUB-ASSEMBLY** (See INTAKE MANIFOLD )
- 69. **INSTALL NO. 1 AIR CLEANER INLET** (See INTAKE MANIFOLD )
- 70. **INSTALL NO. 2 AIR CLEANER INLET** (See COMPONENTS )
- 71. **CONNECT VACUUM HOSES** (See INSTALLATION )
- 72. **INSTALL V-RIBBED BELT** (See INSTALLATION )
- 73. **INSTALL OUTER COWL TOP PANEL SUB-ASSEMBLY** (See INSTALLATION )
- 74. **INSTALL WINDSHIELD WIPER MOTOR AND LINK ASSEMBLY** (See INSTALLATION )
- 75. **INSTALL COWL TOP VENTILATOR LOUVER SUB-ASSEMBLY** (See INSTALLATION )
- 76. **INSTALL FRONT WIPER ARM AND BLADE ASSEMBLY LH** (See INSTALLATION )
- 77. **INSTALL FRONT WIPER ARM AND BLADE ASSEMBLY RH** (See INSTALLATION )
- 78. **REMOVE FRONT WHEELS** (See INSTALLATION )
- 79. **ADD ENGINE OIL** (See OIL PRESSURE SWITCH )
- 80. **ADD ENGINE COOLANT** (See REMOVAL )
- 81. **INSTALL TRANSFER DRAIN PLUG** (See TRANSFER CASE OIL SEAL )
- 82. **INSTALL NO.2 TRANSFER CASE PLUG** (See TRANSFER CASE OIL SEAL )
- 83. **INSTALL NO.1 TRANSFER CASE PLUG** (See TRANSFER CASE OIL SEAL )
- 84. **ADD AUTOMATIC TRANSAXLE FLUID**
- 85. **CHECK AUTOMATIC TRANSAXLE FLUID** (See AUTOMATIC TRANSAXLE FLUID )
- 86. **INSPECT FOR FUEL LEAK** (See PARTS LOCATION )
- 87. **INSPECT FOR ENGINE OIL LEAK** (See OIL PRESSURE SWITCH )
- 88. **INSPECT FOR COOLANT LEAK** (See COOLING SYSTEM )
- 89. **INSPECT FOR EXHAUST GAS LEAK** (See INSTALLATION )
- 90. **CHECK SHIFT LEVER POSITION** (See ON-VEHICLE INSPECTION )
- 91. **CHECK AND ADJUST FRONT WHEEL ALIGNMENT** (See INSTALLATION )
- 92. **CHECK IGNITION TIMING** (See ENGINE )
- 93. **CHECK ENGINE IDLE SPEED** (See ON-VEHICLE INSPECTION )
- 94. **CHECK CO/HC** (See ON-VEHICLE INSPECTION )
- 95. **CHECK FUNCTION OF THROTTLE BODY ASSEMBLY** (See INSPECTION PROCEDURE )

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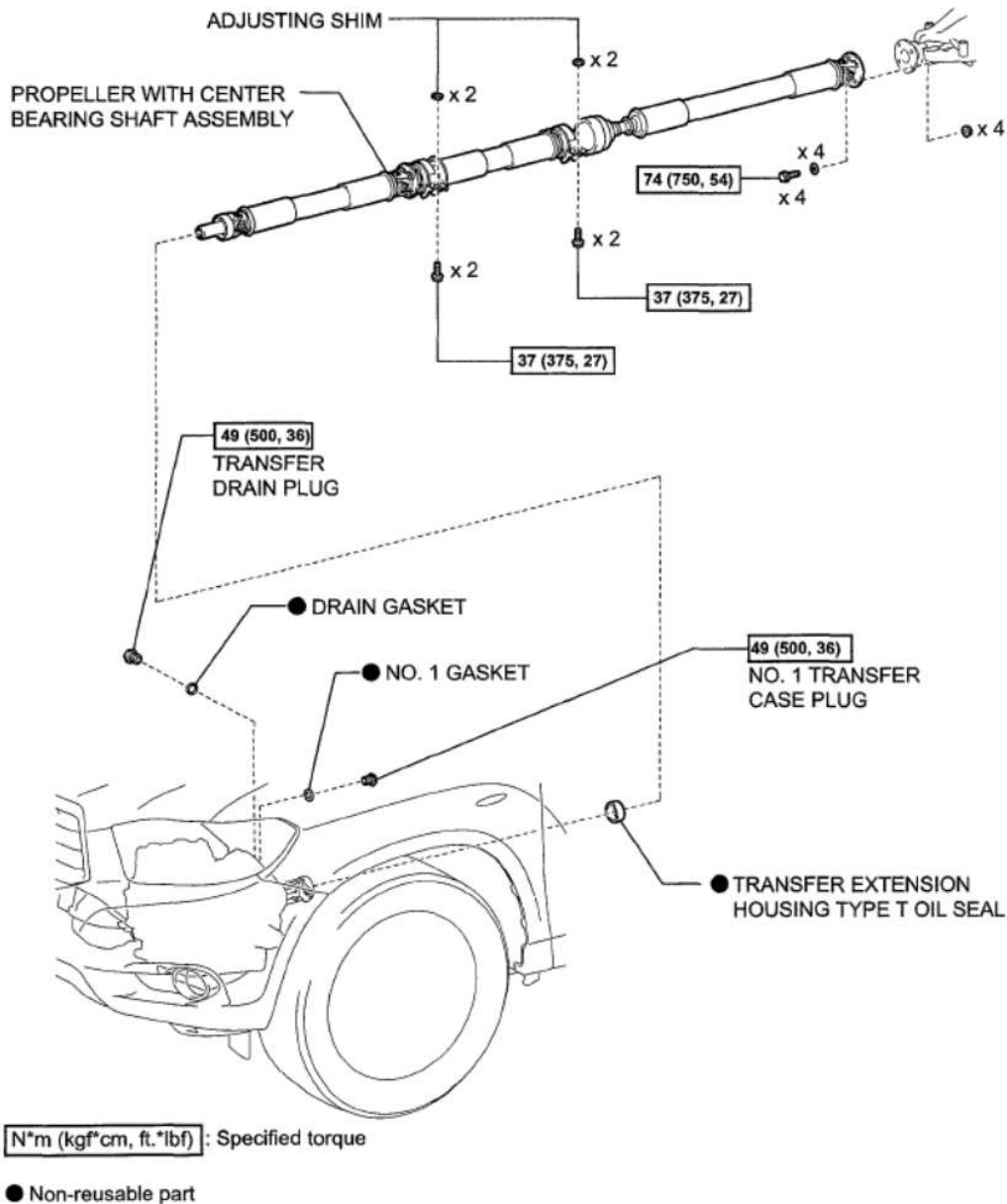
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- 96. **INSTALL FRONT FENDER APRON SEAL LH** (See [INSTALLATION](#) )
- 97. **INSTALL FRONT FENDER APRON SEAL RH** (See [INSTALLATION](#) )
- 98. **INSTALL FRONT FENDER LINER LH** (See [INSTALLATION](#) )
- 99. **INSTALL FRONT FENDER LINER RH** (See [INSTALLATION](#) )
- 100. **INSTALL FRONT FENDER MOULDING SUB-ASSEMBLY LH** (See [INSTALLATION](#) )
- 101. **INSTALL FRONT FENDER MOULDING SUB-ASSEMBLY RH** (See [INSTALLATION](#) )
- 102. **INSTALL FLOOR UNDER COVER LH**
- 103. **INSTALL NO. 2 ENGINE UNDER COVER** (See [INSTALLATION](#) )
- 104. **INSTALL NO. 1 ENGINE UNDER COVER** (See [INSTALLATION](#) )
- 105. **INSTALL ENGINE UNDER COVER ASSEMBLY** (See [INSTALLATION](#) )
- 106. **INSTALL V-BANK COVER SUB-ASSEMBLY** (See [INSTALLATION](#) )
- 107. **CHECK ABS SPEED SENSOR SIGNAL** (See [INSTALLATION](#) )
- 108. **RESET MEMORY** (See [INSTALLATION](#) )

**EXTENSION HOUSING OIL SEAL****COMPONENTS**

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C168349E02

**Fig. 133: Identifying Extension Housing Oil Seal Components And Torque Specification**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

#### REMOVAL

1. REMOVE NO. 1 TRANSFER CASE PLUG (See DISASSEMBLY)
2. REMOVE TRANSFER DRAIN PLUG (See DISASSEMBLY)
3. REMOVE PROPELLER WITH CENTER BEARING SHAFT ASSEMBLY (See REMOVAL)
4. REMOVE TRANSFER EXTENSION HOUSING TYPE T OIL SEAL
  - a. Using SST, remove the transfer extension housing type T oil seal from the transfer extension

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housing sub-assembly.

SST 09308-00010

**NOTE:** Be careful not to damage the oil-seal-fitted surface and the inside surface of the bush.

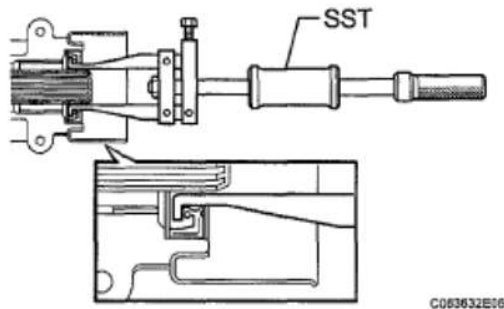


**Fig. 134: Removing Transfer Extension Housing Type T Oil Seal**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

### INSTALLATION

#### 1. INSTALL TRANSFER EXTENSION HOUSING TYPE T OIL SEAL

- Using SST, install a new transfer extension housing type T oil seal to the transfer extension housing sub-assembly at the position shown in the illustration.

SST 09325-20010

**NOTE:**

- Do not install the oil seal obliquely.
- Do not damage the oil seal lip.

- Apply small amount of MP grease to the oil seal lip.

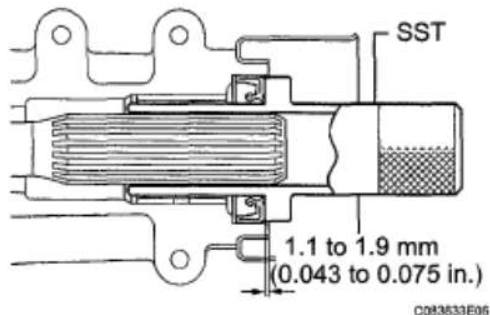


**Fig. 135: Installing Transfer Extension Housing Type T Oil Seal**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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2. **TEMPORARILY TIGHTEN PROPELLER WITH CENTER BEARING SHAFT ASSEMBLY** (See INSTALLATION )
3. **FULLY TIGHTEN PROPELLER WITH CENTER BEARING SHAFT ASSEMBLY** (See INSTALLATION )
4. **INSTALL TRANSFER DRAIN PLUG** (See TRANSFER CASE OIL SEAL)
5. **INSTALL NO. 1 TRANSFER CASE PLUG** (See TRANSFER CASE OIL SEAL)