

2007 TRANSMISSION

P310 Hybrid Transmission / Transaxle - Highlander Hybrid

HYBRID TRANSAXLE SYSTEM

ON-VEHICLE INSPECTION

1. INSPECT OIL PRESSURE IN OIL PUMP

NOTE: Do the test at normal operating oil temperature 50 to 80°C (122 to 176°F).

- a. Lift up the vehicle.
- b. Remove the fluid pump cover plug and install SST.

SST 09992-00095 (09992-00112, 09992-00271)

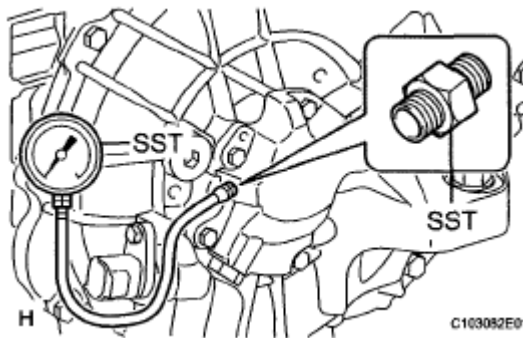


Fig. 1: Identifying Fluid Pump Cover Plug With SST
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Set the vehicle to 2WD inspection mode (See PRECAUTION).
- d. Measure the oil pressure.

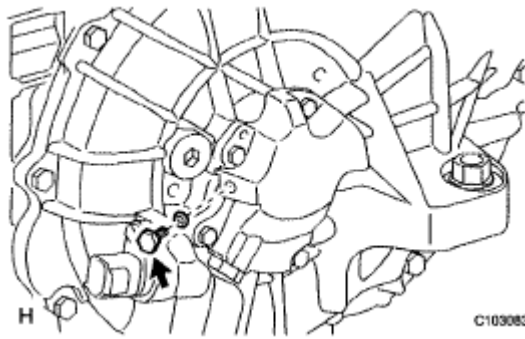
Oil pressure:

9.8 kPa (0.1 kgf/cm² , 1.4 psi) or more

NOTE: Be sure to cancel the inspection mode immediately after the oil pressure check is completed (See PRECAUTION).

- e. Install a new O-ring and fluid pump cover plug.

Torque: 8.0 N*m (82 kgf*cm, 71 in.*lbf)

**Fig. 2: Locating Fluid Pump Cover Plug**

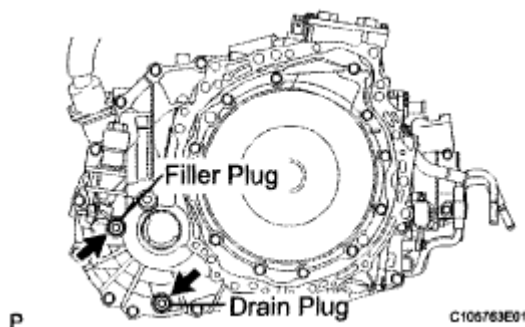
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HYBRID TRANSAXLE FLUID

REPLACEMENT

1. DRAIN HYBRID TRANSAXLE FLUID

- Using a socket hexagon wrench 10 mm, remove the filler plug and gasket.
- Using a socket hexagon wrench 10 mm, remove the drain plug and gasket.

**Fig. 3: Locating Drain Plug And Filler Plug**

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

- Using a socket hexagon wrench 10 mm, install the drain plug, and a new gasket.

Torque: 39 N*m (398 kgf*cm, 29 ft.*lbf)

2. ADD AND INSPECT HYBRID TRANSAXLE FLUID (w/o Oil Cooler)

- Fill oil.
- Check that the oil surface is within 5 mm (0.20 in.) from the lowest position of the inner surface of the differential filler plug opening.

NOTE:

- Stop the vehicle on a flat road.
- Recheck the transaxle oil level after driving when exchanging

oil.

- Insufficient or excessive amounts of transaxle oil may be the cause of some trouble.

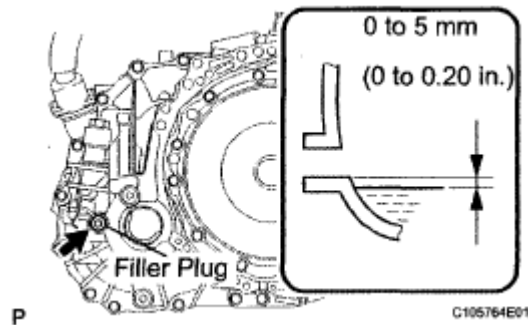


Fig. 4: Locating Oil Surface Level
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Check for leaks if the quantity of oil is low.
- d. Using a socket hexagon wrench 10 mm, install the filler plug, and a new gasket.

Torque: 39 N*m (398 kgf*cm, 29 ft.*lbf)

3. ADD AND INSPECT HYBRID TRANSAXLE FLUID (w/ Oil Cooler)

- a. Fill oil.
- b. Check that the oil surface is within 5 mm (0.20 in.) from the lowest position of the inner surface of the differential filler plug opening.

NOTE:

- Keep the oil temperature at 5°C (41 °F) or higher.
- Stop the vehicle on a flat road.
- Insufficient or excessive amounts of transaxle oil may be the cause of some trouble.

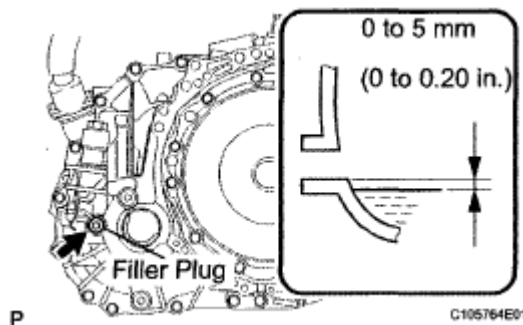
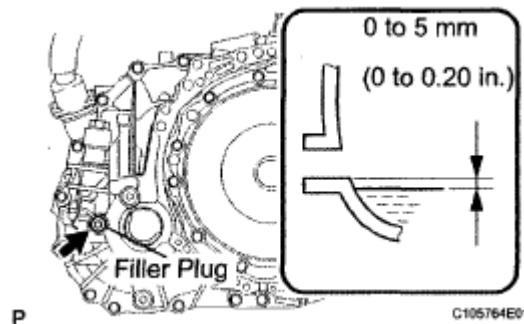


Fig. 5: Locating Oil Surface Level
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Using a socket hexagon wrench 10 mm, temporarily tighten the filler plug and gasket.
- d. Set the vehicle to 2WD inspection mode (See **PRECAUTION**).
- e. After waiting for 1 minute or more, stop the engine.
- f. Using a socket hexagon wrench 10 mm, remove the filler plug and gasket.
- g. Fill oil.
- h. Check that the oil surface is within 5 mm (0.20 in.) from the lowest position of the inner surface of the differential filler plug opening.

NOTE:

- **Keep the oil temperature at 5°C (41°F) or higher.**
- **Stop the vehicle on a flat road.**
- **Recheck the transaxle oil level after driving when exchanging oil.**
- **Insufficient or excessive amounts of transaxle oil may be the cause of some trouble.**

**Fig. 6: Locating Oil Surface Level****Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.**

- i. Check for leaks if the quantity of oil is low.
- j. Using a socket hexagon wrench 10 mm, install the filler plug, and a new gasket.

Torque: 39 N*m (398 kgf*cm, 29 ft.*lbf)**COOLANT****REPLACEMENT**

1. **REMOVE ENGINE UNDER COVER NO.1** (See **REMOVAL**)
2. **REMOVE ENGINE UNDER COVER NO.2** (See **REMOVAL**)
3. **REMOVE ENGINE ROOM SIDE LH COVER NO.2** (See **REMOVAL**)
4. **DRAIN COOLANT**
 - a. Remove the transaxle side reserve tank.

NOTE: Do not remove the reserve tank cap when the engine is hot.

- b. Loosen the bleeder plug shown in the illustration and drain the coolant.

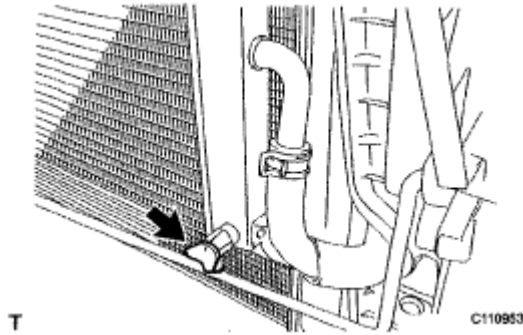


Fig. 7: Locating Bleeder Plug

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

- c. Close the bleeder plug.
d. Remove the plug and gasket shown in the illustration and drain the coolant.



Fig. 8: Locating Plug

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

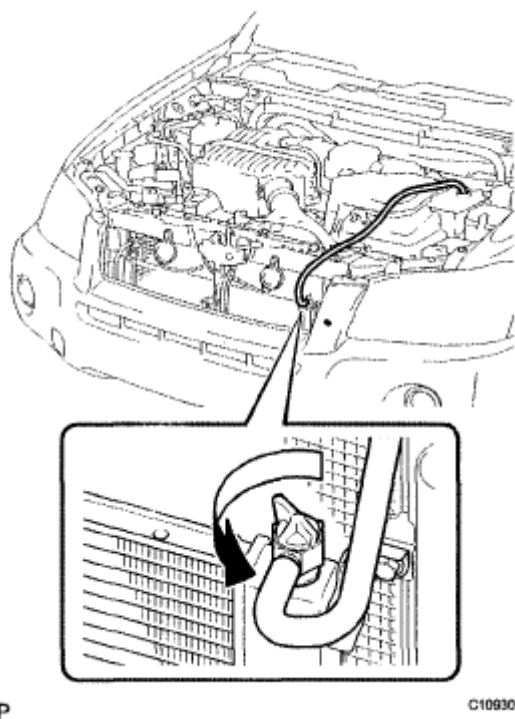
- e. Install the plug with a new gasket.

Torque: 39 N*m (398 kgf*cm, 29 ft.*lbf)

5. ADD COOLANT

- a. Loosen the bleeder plug shown in the illustration and connect a hose.

NOTE: Insert one end of the hose into the reserve tank.

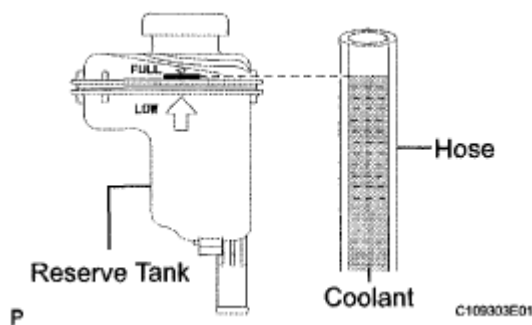
**Fig. 9: Identifying Bleeder Plug**

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

- b. Add coolant from the reserve tank.
- c. Add coolant until the level of coolant in the hose attached to the bleeder plug reaches the same level as the FULL line of the reserve tank.

Coolant quantity:

3.4 L (3.6 US qts, 3.0 Imp. qts.)

**Fig. 10: Identifying Coolant Level**

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

- d. When using the intelligent tester:
 - 1. Connect the intelligent tester to the DLC3.

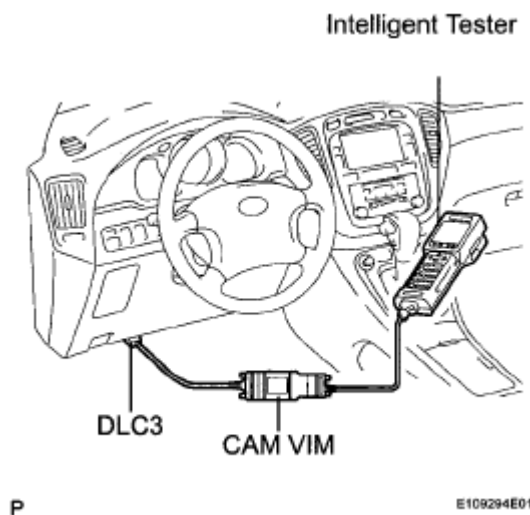


Fig. 11: Connecting Cable Of Intelligent Tester (With CAN VIM) To DLC3
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. Turn the ignition switch to the ON position.
3. On the tester, enter the following menus: DIAGNOSIS / OBD/MOBD / HV ECU / ACTIVE TEST / WATER PUMP.
4. Keep the coolant at the FULL level in the reserve tank to compensate for the drop in coolant level when the air bleeds.

Standard:

Air bleeding from the coolant system is completed when the noise made by the water pump becomes smaller and the circulation of coolant in the reserve tank improves.

HINT:

Loud noise made by the water pump and poor circulation of coolant in the reserve tank indicates that there is air in the coolant system.

- e. When not using the intelligent tester:
 1. Put the vehicle into the READY-on state. [*1]
 2. Turn the ignition switch off and add coolant to the FULL level because the coolant level drops as the air bleeds. [*2]

NOTE:

- **Be sure to turn the ignition switch off before adding SLLC.**
- **Do not work on the components in the engine compartment while the vehicle is in the READY-on state because the engine is in intermittent operation.**

3. Repeat steps [*1] and [*2] until air bleeding from the coolant system is completed.

Standard:

Air bleeding from the coolant system is completed when the noise made by the water pump becomes smaller and the circulation of coolant in the reserve tank improves.

HINT:

Loud noise made by the water pump and poor circulation of coolant in the reserve tank indicates that there is air in the coolant system.

- f. When the air is completely bled from the coolant system, tighten the plug.
- g. Add coolant to the FULL mark of the reserve tank.

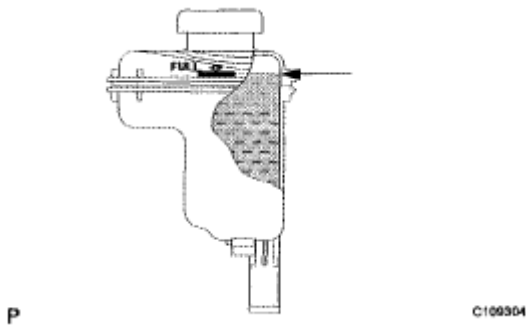


Fig. 12: Identifying Coolant Level At FULL Mark Of Reserve Tank
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- 6. **CHECK FOR COOLANT LEAKS**
- 7. **INSTALL ENGINE ROOM SIDE LH COVER NO.2** (See INSTALLATION)
- 8. **INSTALL ENGINE UNDER COVER NO.2** (See INSTALLATION)
- 9. **INSTALL ENGINE UNDER COVER NO.1** (See INSTALLATION)

SHIFT LEVER POSITION SENSOR

COMPONENTS

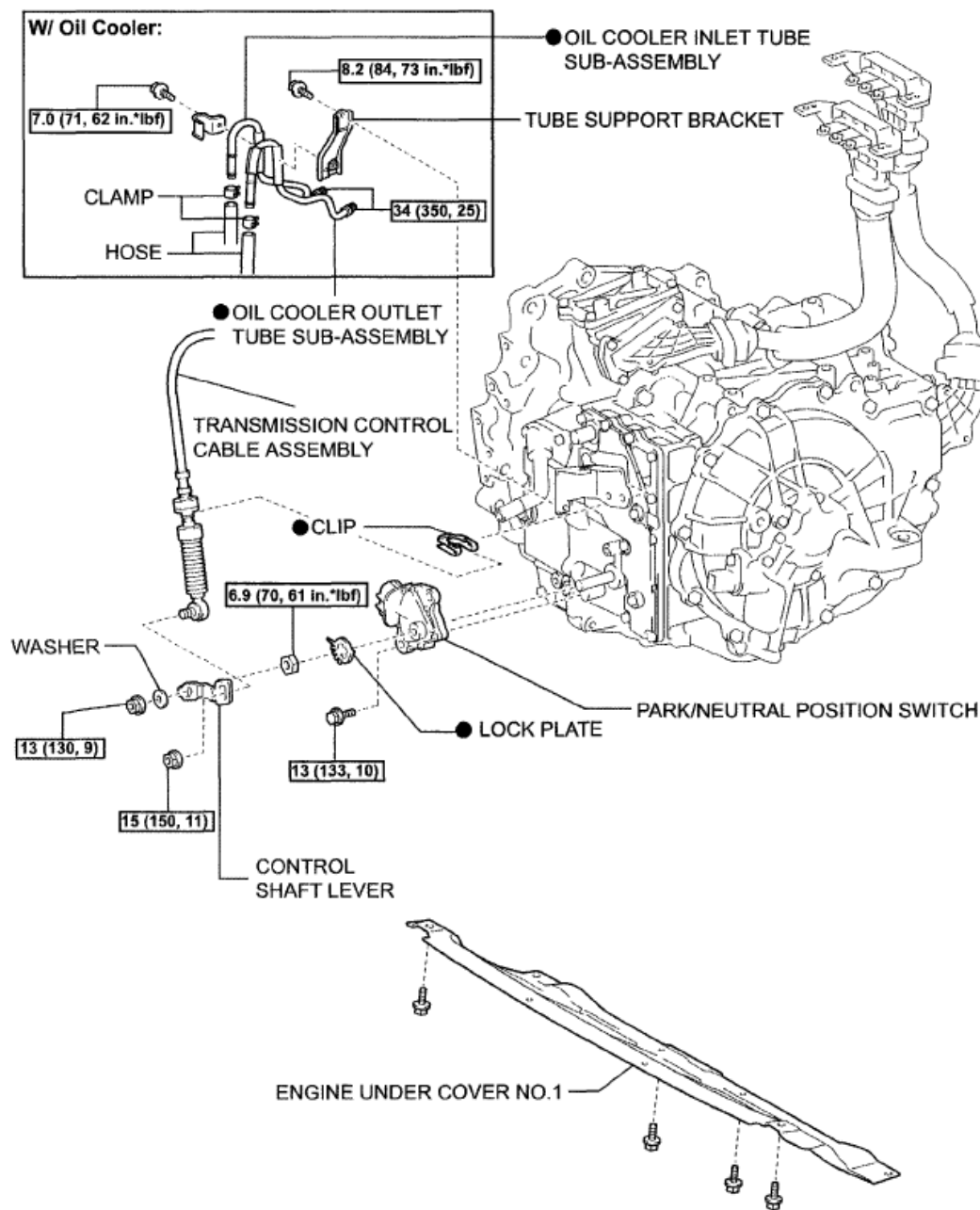


Fig. 13: Identifying Shift Lever Position Sensor Components With Torque Specifications
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

1. **DISCONNECT CABLE FROM BATTERY NEGATIVE TERMINAL**
2. **REMOVE ENGINE UNDER COVER NO.1** (See [REMOVAL](#))
3. **DRAIN HYBRID TRANSAXLE FLUID (w/ Oil Cooler)** (See [REPLACEMENT](#))

4. SEPARATE OIL COOLER TUBE SUB-ASSEMBLY (w/ Oil Cooler)

- a. Separate the 2 oil cooler hoses from the oil cooler tubes.

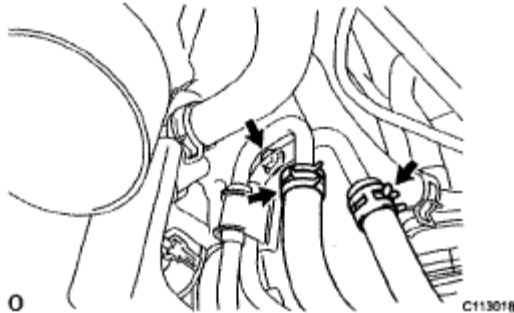


Fig. 14: Locating Oil Cooler Hoses To Oil Cooler Tubes
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Using SST and a wrench, separate the oil cooler tubes.

SST 09023-12701

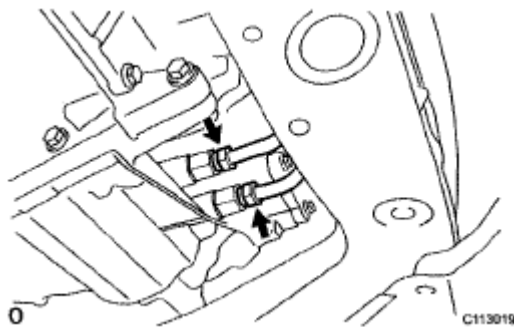


Fig. 15: Locating Oil Cooler Tube
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Remove the bolt and oil cooler tube w/ bracket.
 - d. Remove the bolt and clamp, separate the oil cooler tubes.
- 5. SEPARATE TRANSMISSION CONTROL CABLE ASSEMBLY**
- a. Remove the nut from the control shaft lever.

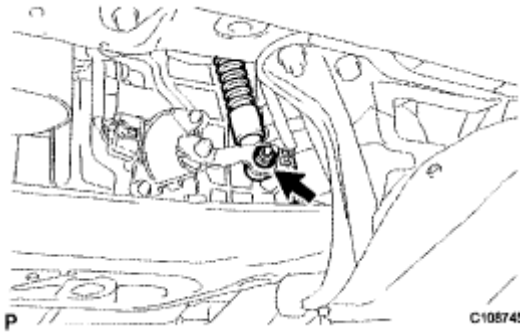


Fig. 16: Locating Control Cable To Control Shaft Lever
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Using a screwdriver, disengage the 2 claws, disconnect the control cable with clip from the control cable bracket.

HINT:

Tape up the screwdriver tip before use.

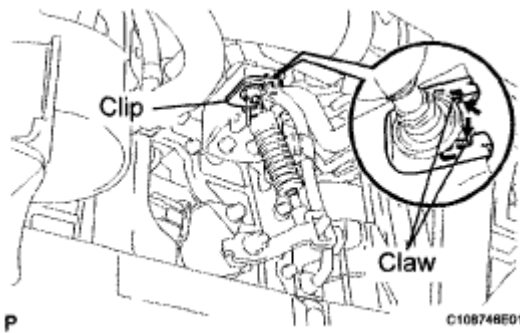


Fig. 17: Identifying Control Cable Clip
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Remove the clip.
6. **REMOVE PARK/NEUTRAL POSITION SWITCH**
 - a. Disconnect the park/neutral position switch connector.

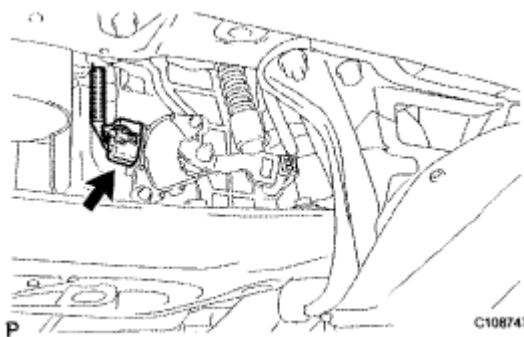


Fig. 18: Locating Park/Neutral Position Switch Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the nut, washer and control shaft lever.

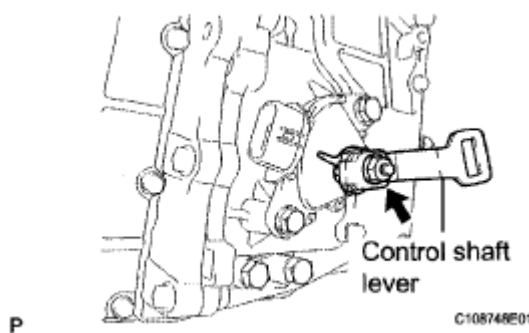


Fig. 19: Locating Control Shaft Lever
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Using a screwdriver, pry out the lock plate.

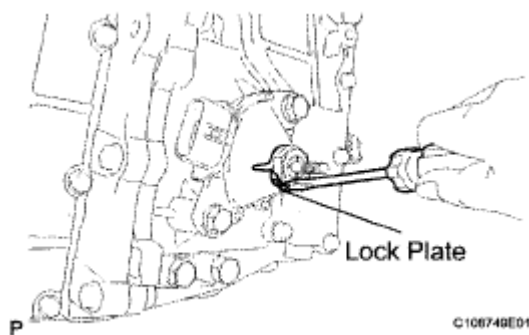


Fig. 20: Prying Out Lock Plate
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Remove the lock nut and lock plate.

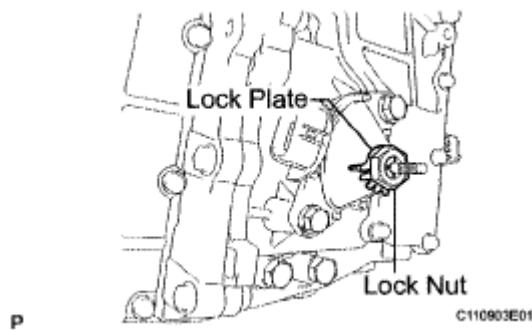


Fig. 21: Identifying Lock Plate And Lock Nut
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- e. Remove the 2 bolts and pull out the park/neutral position switch.

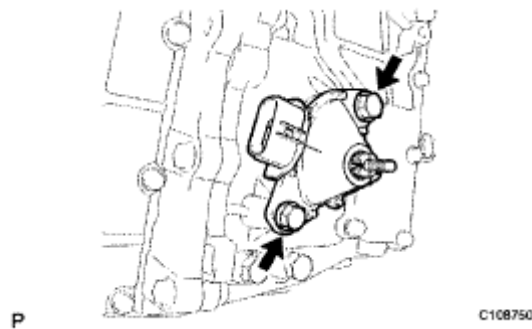


Fig. 22: Locating Park/Neutral Position Switch To Manual Valve Shaft
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION

1. INSPECT PARK/NEUTRAL POSITION SWITCH

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

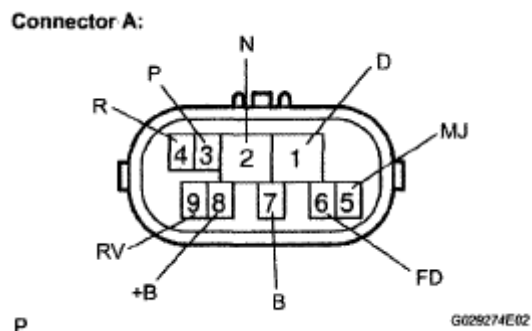


Fig. 23: Identifying Park/Neutral Position Switch Connector Terminal
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard resistance

PARK/NEUTRAL POSITION SWITCH

	A8 (+B)- A1 (D)	A8 (+B)- A2 (N)	A8 (+B)- A3 (P)	A8 (+B)- A4 (R)	A8 (+B)- A5 (MJ)	A8 (+B)- A6 (FD)	A8 (+B)- A7 (B)	A8 (+B)- A9 (RV)
P position	10 kohms or higher	4.2 to 5.1 kohms	Below 1 ohms	10 kohms or higher	Below 1 ohms	10 kohms or higher	10 kohms or higher	10 kohms or higher
R position	10 kohms or higher	4.2 to 5.1 kohms	10 kohms or higher	Below 1 ohms	Below 1 ohms	10 kohms or higher	10 kohms or higher	Below 1 ohms
N position	10 kohms or higher	Below 1 ohms	10 kohms or higher	10 kohms or higher	Below 1 ohms	10 kohms or higher	10 kohms or higher	10 kohms or higher
D position	Below 1 ohms	4.2 to 5.1 kohms	10 kohms or higher	10 kohms or higher	Below 1 ohms	Below 1 ohms	10 kohms or higher	10 kohms or higher
B position	10 kohms or higher	4.2 to 5.1 kohms	10 kohms or higher	10 kohms or higher	Below 1 ohms	Below 1 ohms	Below 1 ohms	10 kohms or higher

ADJUSTMENT

1. ADJUST PARK/NEUTRAL POSITION SWITCH

- Loosen the 2 bolts of park/neutral position switch and set the shift lever to the N position.

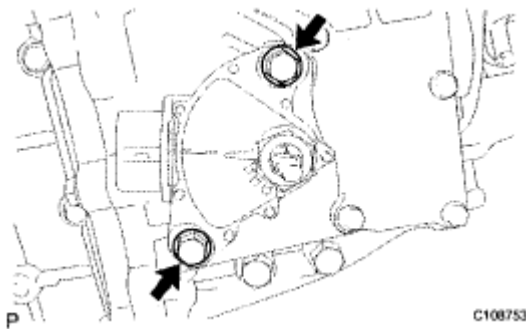


Fig. 24: Locating Park/Neutral Position Switch
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- Align the protruding part and neutral basic line.

NOTE: There is play on the nut stopper side (protruding part). Align the center point of the range of the play with the neutral basic line.

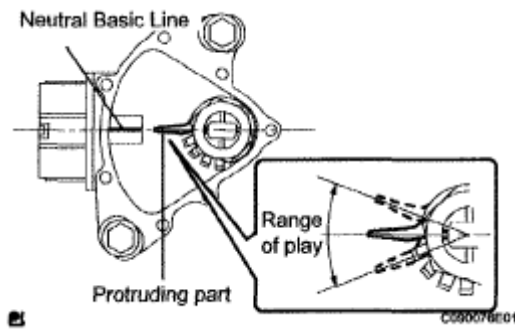


Fig. 25: Identifying Park/Neutral Position Switch
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Tighten the 2 bolts in the order shown in the illustration.

Torque: 13 N*m (133 kgf*cm, 10 ft.*lbf)

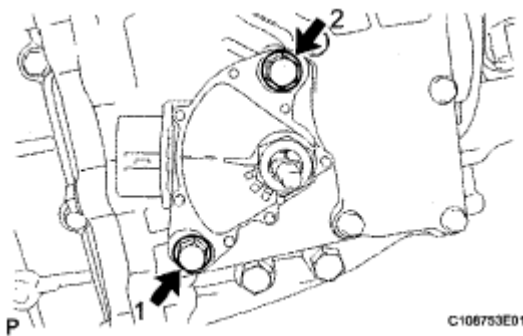


Fig. 26: Locating Park Neutral Position Switch And Bolt
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. INSPECT PARK/NEUTRAL POSITION SWITCH (See INSPECTION)

INSTALLATION

1. INSTALL PARK/NEUTRAL POSITION SWITCH

- a. Install the park/neutral position switch to the manual valve shaft.
- b. Temporarily install the 2 bolts.

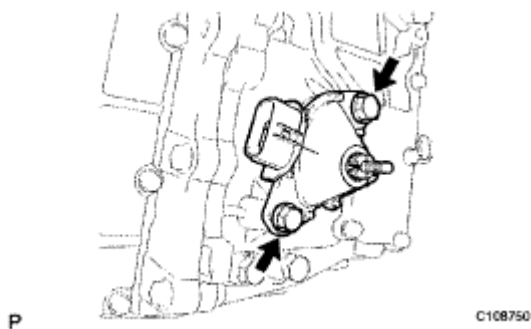


Fig. 27: Locating Park/Neutral Position Switch To Manual Valve Shaft
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Place new lock plate and tighten the nut.

Torque: 6.9 N*m (70 kgf*cm, 61 in.*lbf)

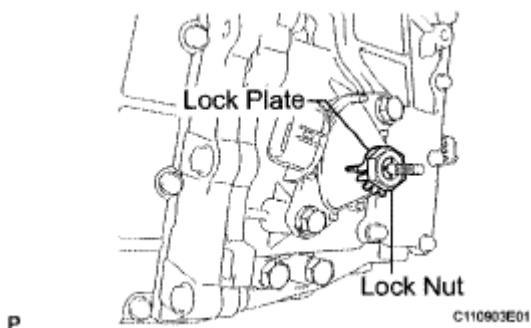


Fig. 28: Identifying Lock Plate And Lock Nut
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Temporarily install the control shaft lever.
e. Turn the lever counterclockwise until it stops, then turn it clockwise 2 notches.
f. Remove the control shaft lever.

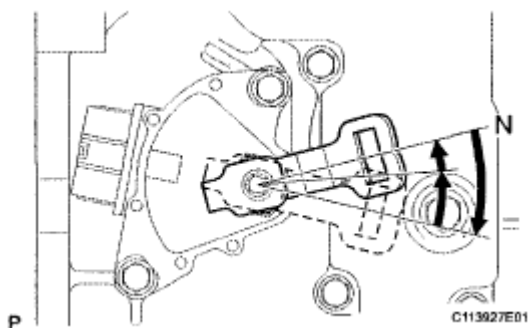


Fig. 29: Identifying Control Shaft Lever
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- g. Align the protruding part with the neutral basic line.

NOTE: There is play on the nut stopper side (protruding part). Align the center point of the range of the play with the neutral basic line.

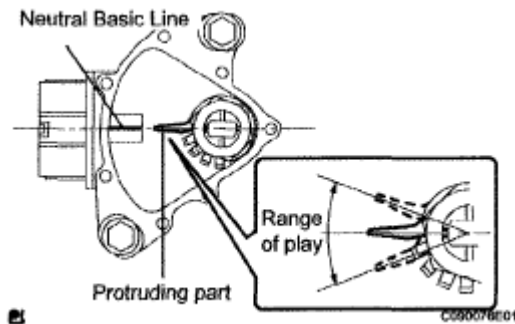


Fig. 30: Identifying Park/Neutral Position Switch
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- h. Tighten the 2 bolts in the order shown in the illustration.

Torque: 13 N*m (133 kgf*cm, 10 ft.*lbf)

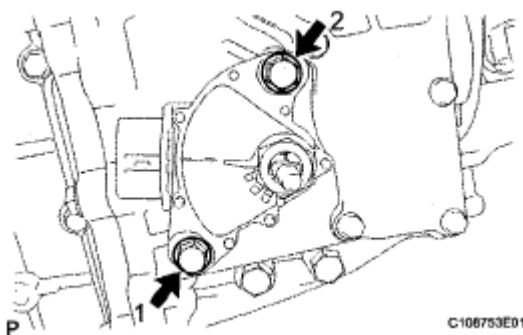


Fig. 31: Locating Park Neutral Position Switch And Bolt
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- i. Using a screwdriver, stake the nut with the lock plate.

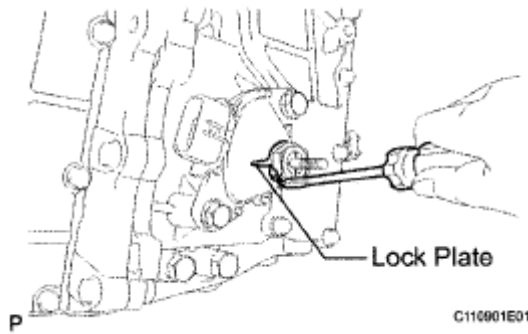


Fig. 32: Staking Nut With Lock Plate

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

- j. Install the control shaft lever, washer and nut.

Torque: 6.9 N*m (70 kgf*cm, 61 in.*lbf)

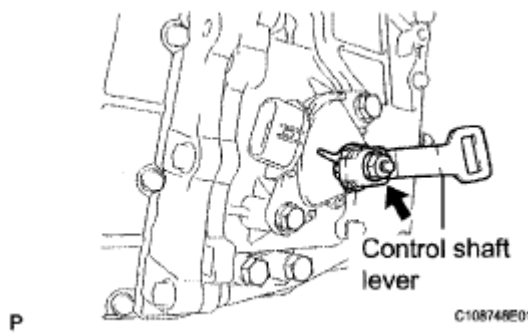


Fig. 33: Identifying Control Shaft Lever

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

2. CONNECT TRANSMISSION CONTROL CABLE ASSEMBLY

- a. Move the shift lever to the N position.
- b. Install a new clip to the control bracket.

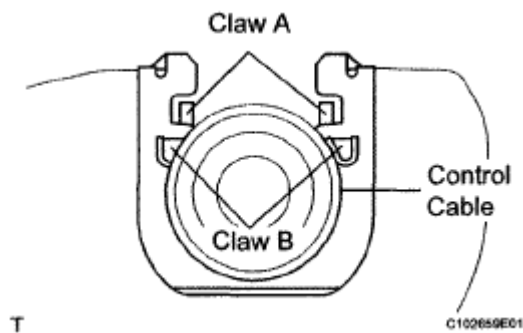


Fig. 34: Identifying Clip To Control Bracket

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

- c. Install the control cable to the control bracket.

NOTE:

- Make sure that the A claws on the clip are securely fit into the bracket holes.
- Make sure that the cable is securely installed inside of the B claws of the clip.

- d. Connect the park/neutral position switch connector.

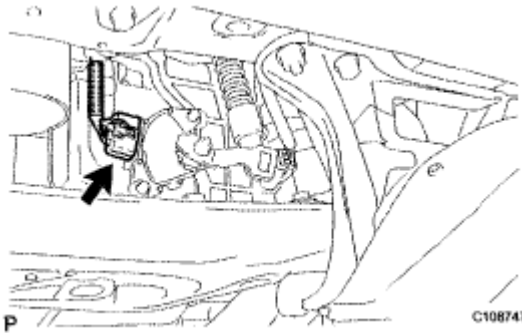


Fig. 35: Identifying Park/Neutral Position Switch Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- e. Move the control shaft lever to the N position.
f. Temporarily install the control cable to the control shaft lever with the nut.

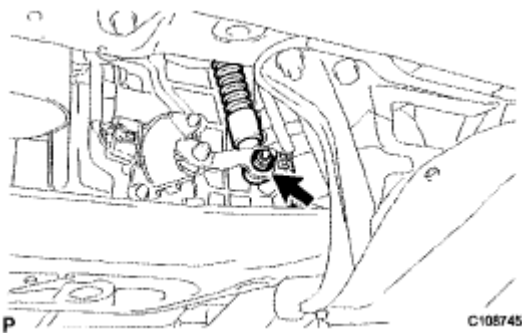


Fig. 36: Locating Control Cable To Control Shaft Lever
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

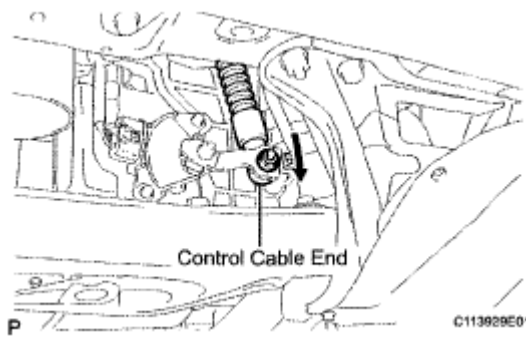
- g. Lightly pull down the control cable end.

NOTE:

Do not pull the control cable end excessively.

- h. Release your hand from the control cable end and then fully tighten the nut.

Torque: 15 N*m (150 kgf*cm, 11 ft.*lbf)

**Fig. 37: Identifying Control Cable Nut**

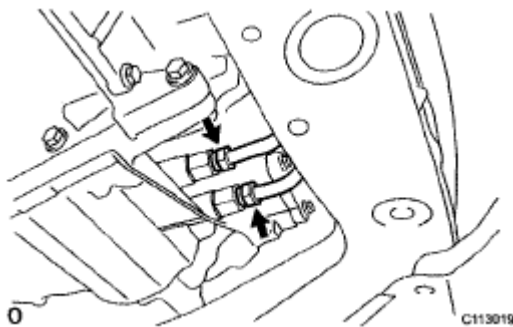
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. INSTALL OIL COOLER TUBE SUB-ASSEMBLY (w/ Oil Cooler)

- a. Using SST and a wrench, tighten the 2 new oil cooler tubes.

SST 09023-12701

Torque: 34 N*m (350 kgf*cm, 25 ft.*lbf)

**Fig. 38: Locating Oil Cooler Tube**

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

- b. Install the tube support bracket to the control cable bracket with the bolt.

Torque: 8.2 N*m (84 kgf*cm, 73 in.*lbf)

- c. Install the clamp to the tube support bracket with the bolt.

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

- d. Install the oil cooler hoses to the oil cooler tubes.

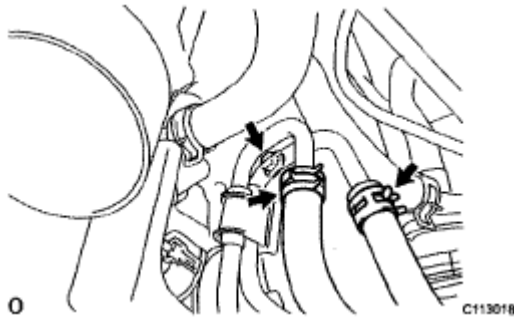


Fig. 39: Locating Oil Cooler Hoses To Oil Cooler Tubes

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

4. **ADD AND INSPECT HYBRID TRANSAXLE FLUID (w/ Oil Cooler) (See REPLACEMENT)**
5. **INSPECT SHIFT LEVER POSITION (See ADJUSTMENT)**
6. **ADJUST SHIFT LEVER POSITION (See ADJUSTMENT)**
7. **INSPECT SHIFT LEVER OPERATION (See ADJUSTMENT)**
8. **INSTALL ENGINE UNDER COVER NO.1 (See INSTALLATION)**
9. **CONNECT CABLE TO NEGATIVE BATTERY TERMINAL**
10. **PERFORM INITIALIZATION**

(See INITIALIZATION)

OIL PUMP ASSEMBLY

COMPONENTS

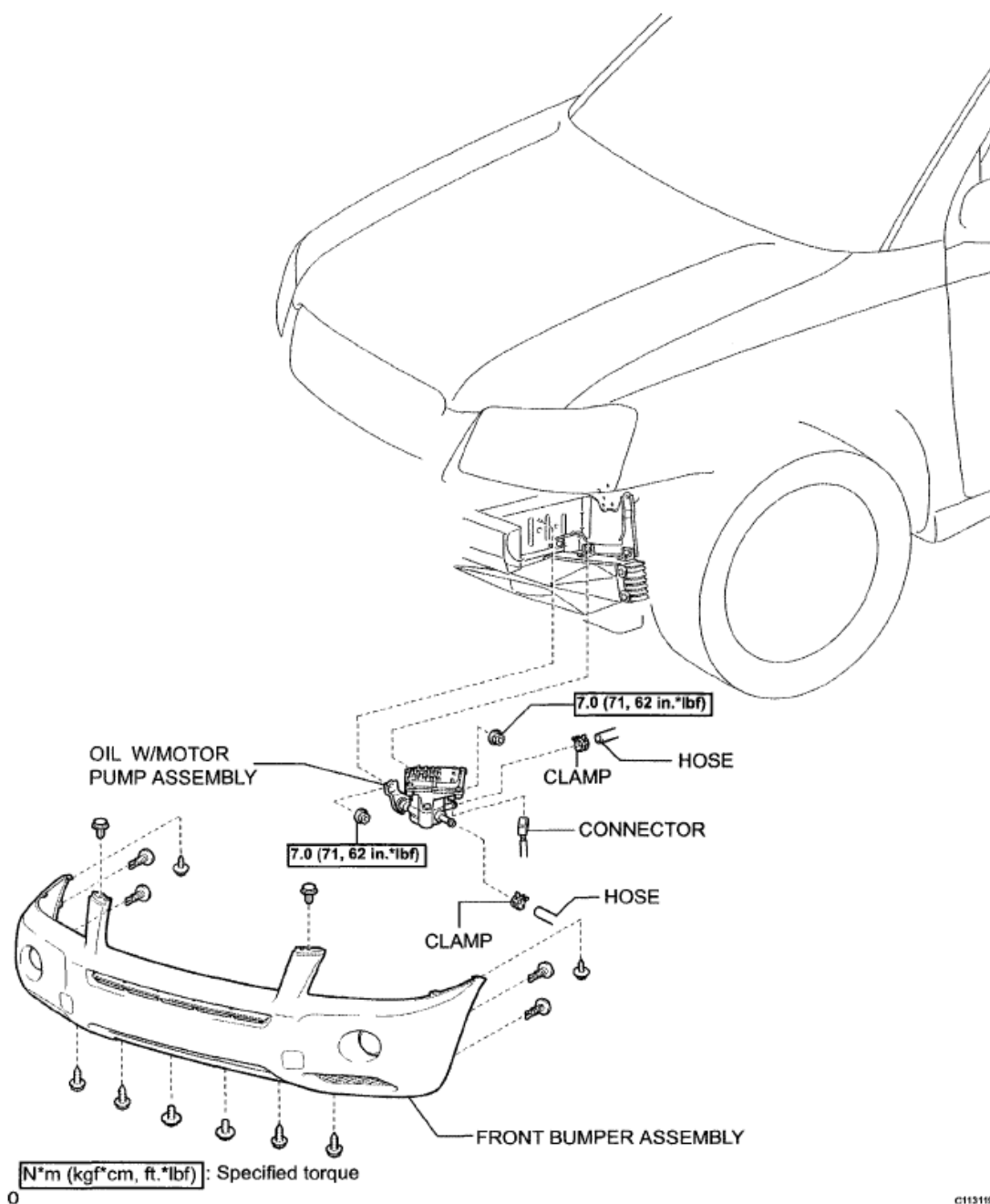


Fig. 40: Identifying Oil Pump Assembly Components With Torque Specifications
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

1. REMOVE FRONT BUMPER ASSEMBLY

(See REMOVAL)

2. DRAIN HYBRID TRANSAXLE FLUID (See REPLACEMENT)

3. REMOVE OIL PUMP ASSEMBLY

- a. Disconnect the oil pump connector.
- b. Disconnect the 2 oil cooler hoses.
- c. Remove the 2 nuts and oil pump assembly.

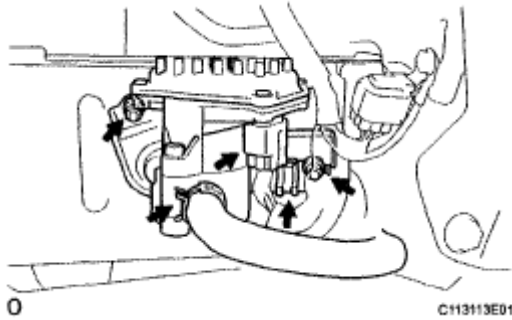


Fig. 41: Locating Oil Pump Assembly And Nuts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSTALLATION**1. INSTALL OIL PUMP ASSEMBLY**

- a. Install the oil pump assembly with the 2 nuts.

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

- b. Connect the 2 oil cooler hoses.
- c. Connect the oil cooler connector.

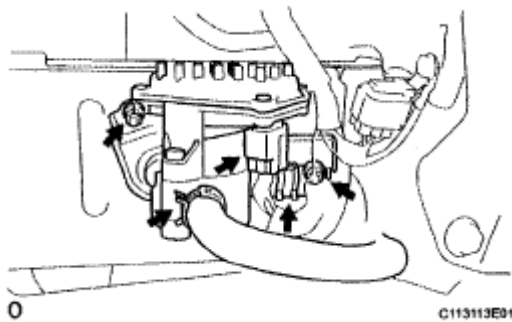


Fig. 42: Locating Oil Cooler Hoses
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. INSTALL FRONT BUMPER ASSEMBLY

(See **REASSEMBLY**)

3. ADD AND INSPECT HYBRID TRANSAXLE FLUID

(See **REPLACEMENT**)

OIL COOLER ASSEMBLY

COMPONENTS

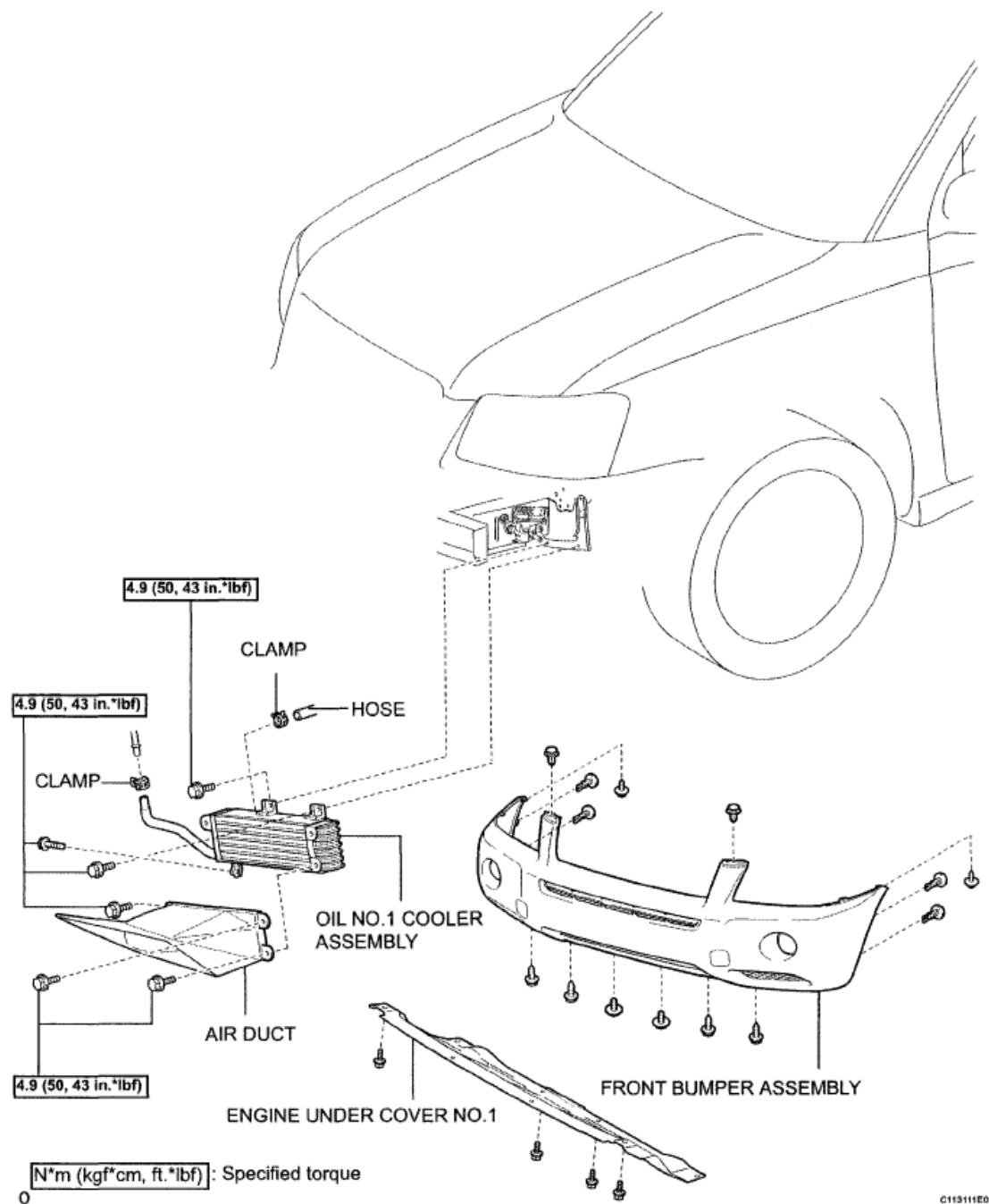


Fig. 43: Identifying Oil Cooler Assembly Components With Torque Specifications
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

1. **REMOVE ENGINE UNDER COVER NO.1** (See **REMOVAL**)
2. **DRAIN HYBRID TRANSAXLE FLUID** (See **REPLACEMENT**)
3. **REMOVE FRONT BUMPER ASSEMBLY**

(See **REMOVAL**)

4. **REMOVE OIL NO.1 COOLER ASSEMBLY**

- a. Disconnect the 2 oil cooler hoses.

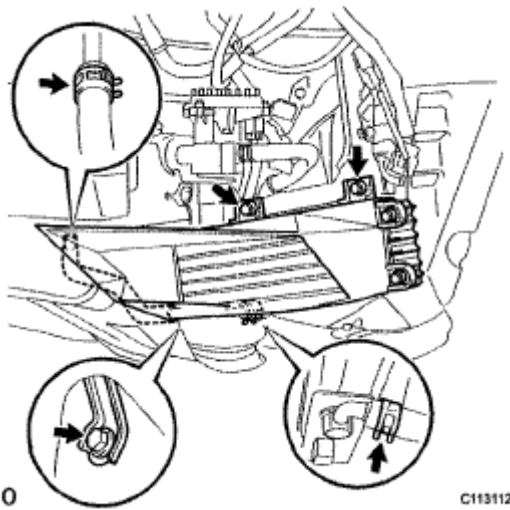


Fig. 44: Locating Oil Cooler Hoses

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

- b. Remove the 3 bolts, and oil cooler assembly.
 - c. Remove the 3 bolts and air duct.

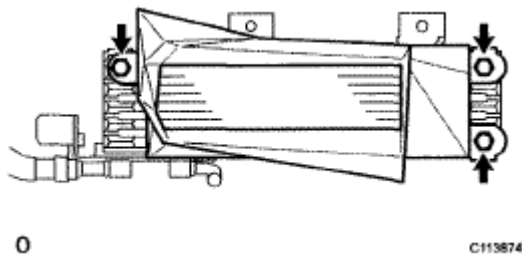


Fig. 45: Locating Air Duct

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

INSTALLATION

1. **INSTALL OIL NO.1 COOLER ASSEMBLY**

- a. Install the air duct with the 3 bolts.

Torque: 4.9 N*m (50 kgf*cm, 43 in.*lbf)

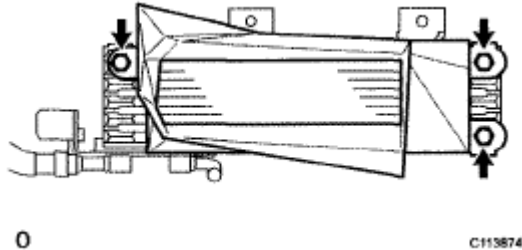


Fig. 46: Locating Air Duct

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

- b. Install the oil cooler assembly with the 3 bolts.

Torque: 4.9 N*m (50 kgf*cm, 43 in.*lbf)

- c. Connect the 2 oil cooler hoses.

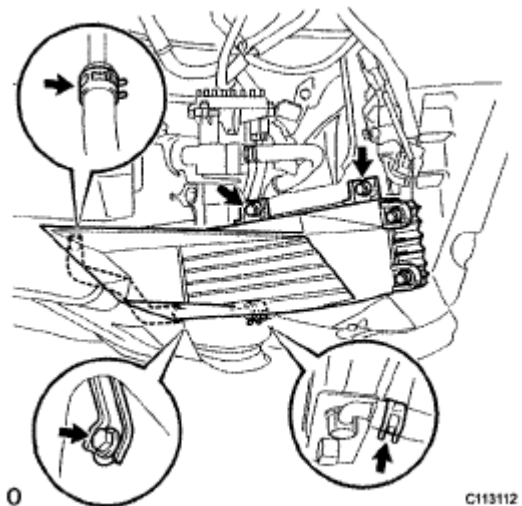


Fig. 47: Locating Oil Cooler Hoses

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

2. INSTALL FRONT BUMPER ASSEMBLY

(See **REASSEMBLY**)

3. ADD AND INSPECT HYBRID TRANSAXLE FLUID (See **REPLACEMENT)**

4. INSTALL ENGINE UNDER COVER NO.1 (See **INSTALLATION)**

COMPONENTS

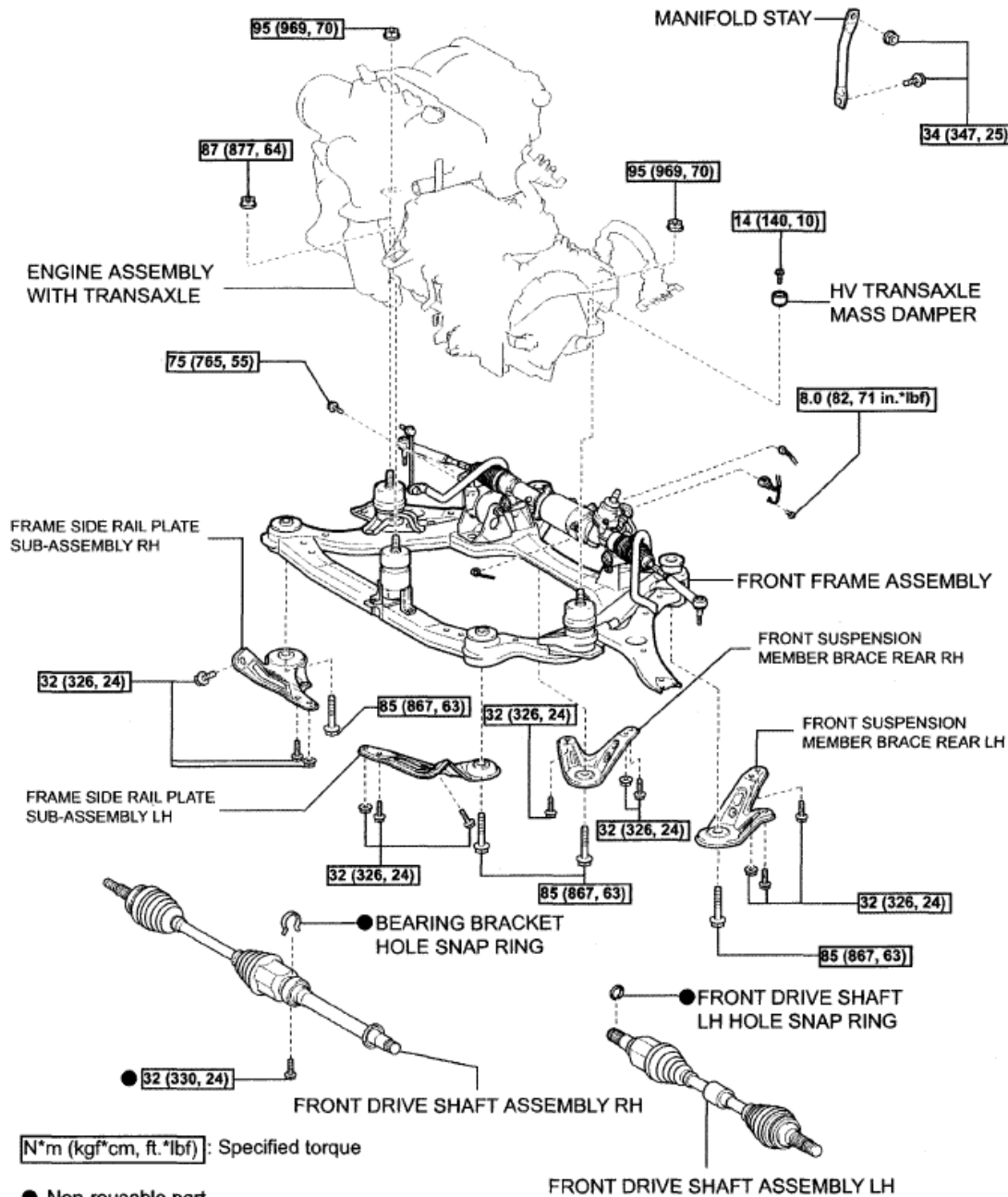


Fig. 48: Identifying Hybrid Vehicle Transaxle Assembly Components With Torque Specifications (1 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

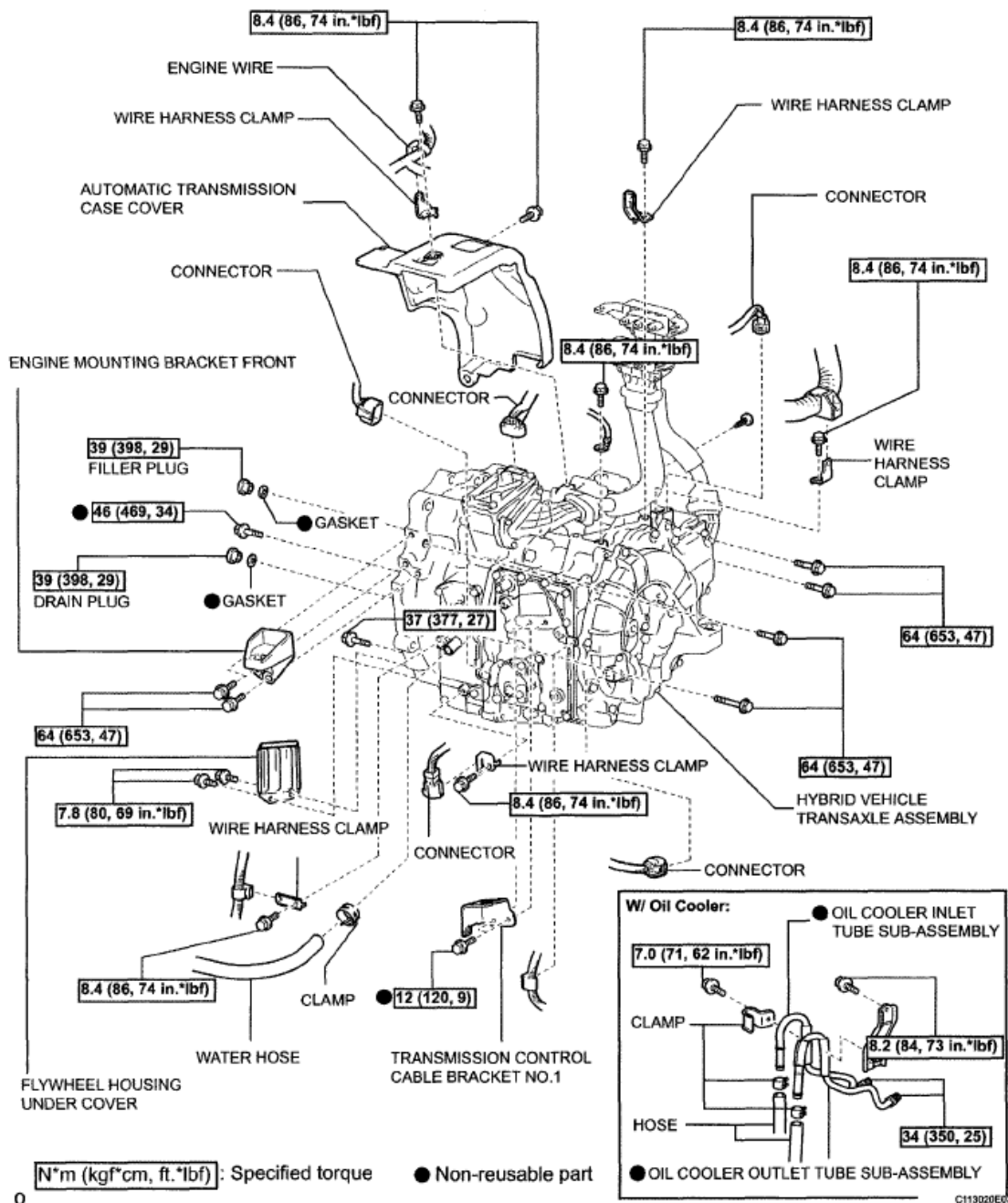


Fig. 49: Identifying Hybrid Vehicle Transaxle Assembly Components With Torque Specifications (2 Of 2)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

1. REMOVE ENGINE ASSEMBLY WITH TRANSAXLE

(See **REMOVAL**)

2. REMOVE MANIFOLD STAY (See **REMOVAL**)

3. **REMOVE HV TRANSAXLE MASS DAMPER** (See REMOVAL)
4. **REMOVE FRONT FRAME ASSEMBLY** (See REMOVAL)
5. **REMOVE FRONT DRIVE SHAFT ASSEMBLY LH** (See REMOVAL)
6. **REMOVE FRONT DRIVE SHAFT ASSEMBLY RH** (See REMOVAL)
7. **REMOVE FLYWHEEL HOUSING UNDER COVER**
 - a. Remove the 2 bolts and flywheel housing under cover.

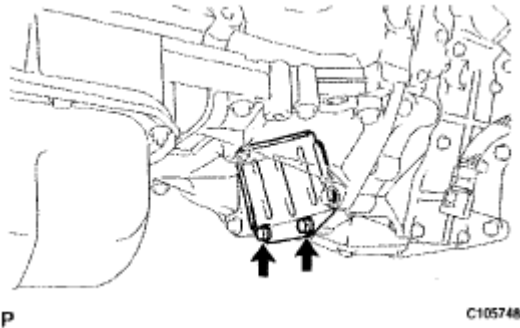


Fig. 50: Locating Bolts And Flywheel Housing Under Cover
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

8. **SEPARATE ENGINE WIRE**
 - a. Remove the bolt and ground wire.
 - b. Disconnect the wire harnesses from the clamps.
 - c. Disconnect the connectors.

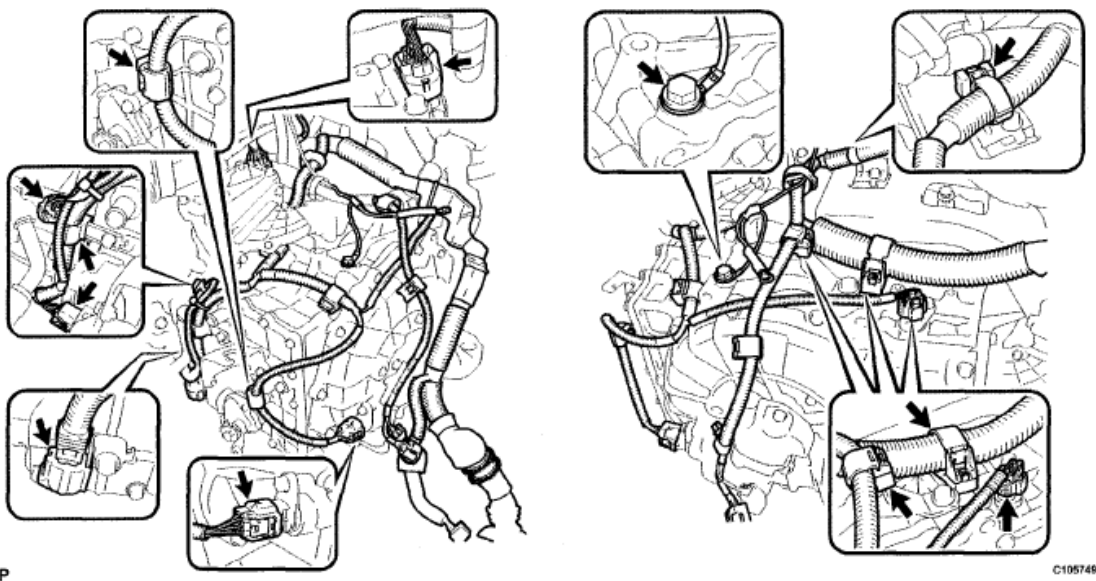


Fig. 51: Locating Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Remove the 4 bolts and 4 clamps.

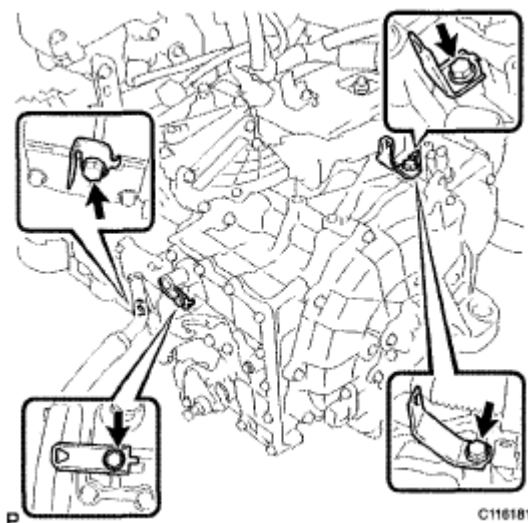


Fig. 52: Locating Clamps And Bolts

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

9. REMOVE AUTOMATIC TRANSMISSION CASE COVER

- a. Remove the bolt and clamp.
- b. Remove the bolt, clip and case cover from the hybrid transaxle.

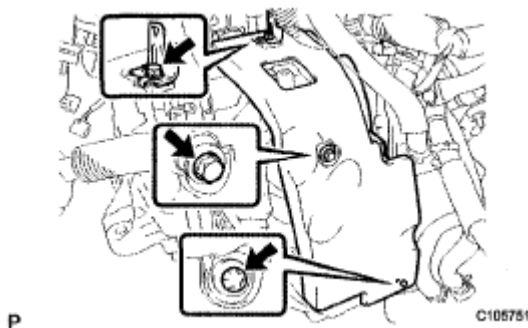


Fig. 53: Locating Automatic Transmission Case Cover

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

10. REMOVE WATER HOSE

- a. Disconnect the water hose from the hybrid transaxle.

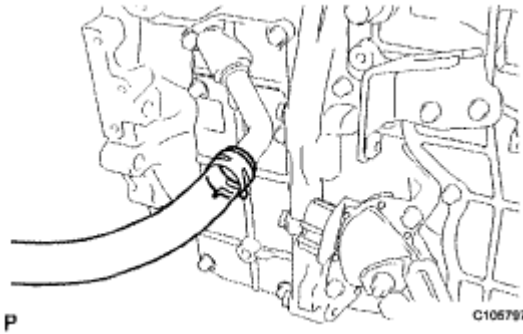


Fig. 54: Locating Water Hose From Hybrid Transaxle
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

11. REMOVE ENGINE MOUNTING BRACKET FRONT

- a. Remove the 3 bolts and engine mounting bracket.

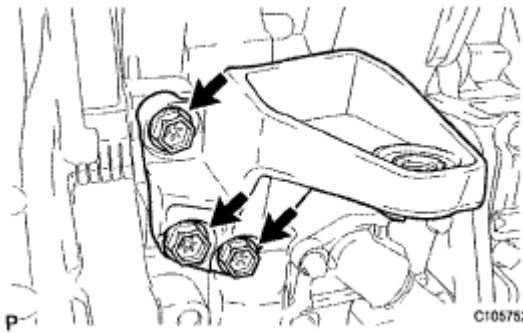


Fig. 55: Locating Engine Mounting Bracket Front
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

12. REMOVE OIL COOLER INLET TUBE SUB-ASSEMBLY (w/ Oil Cooler)

- a. Remove the bolt and oil cooler tube clamp.
- b. Using SST and a wrench, disconnect the oil cooler inlet tube.

SST 09023-12701

13. REMOVE OIL COOLER OUTLET TUBE SUB-ASSEMBLY (w/ Oil Cooler)

- a. Using SST and a wrench, disconnect the oil cooler outlet tube.

SST 09023-12701

- b. Remove the bolt and oil cooler tube bracket.

14. REMOVE TRANSMISSION CONTROL CABLE BRACKET NO.1

- a. Remove the 2 bolts and transmission control cable bracket No. 1.

15. REMOVE HYBRID VEHICLE TRANSAXLE ASSEMBLY

- a. Remove the 8 bolts.

- b. Separate and remove the hybrid vehicle transaxle.

NOTE: Do not pry out the connection between the transaxle assembly and engine more than necessary to prevent the knock pin from being damaged.

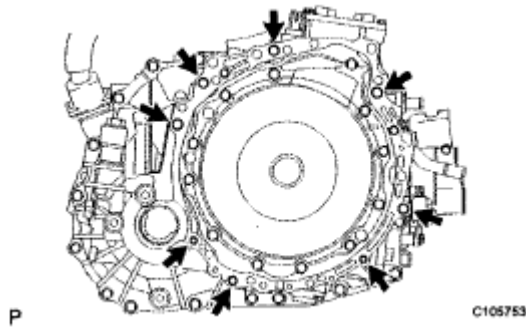


Fig. 56: Locating Hybrid Vehicle Transaxle
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSTALLATION

1. INSTALL HYBRID VEHICLE TRANSAXLE ASSEMBLY

- Make sure that the knock pins are installed on the engine.
- Install the hybrid vehicle transaxle and the 8 bolts shown in the illustration to the engine.

Torque: Bolt A

64 N*m (653 kgf*cm, 47 ft.*lbf)

Torque: Bolt B

46 N*m (469 kgf*cm, 34 ft.*lbf)

Torque: Bolt C

64 N*m (653 kgf*cm, 47 ft.*lbf)

Torque: Bolt D

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

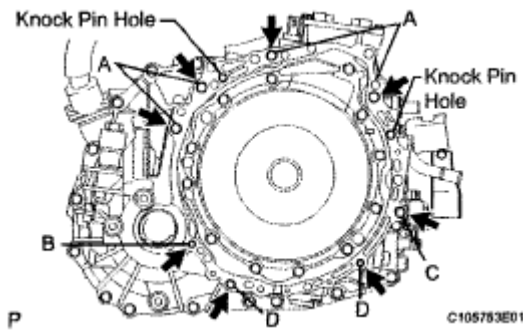


Fig. 57: Locating Hybrid Vehicle Transaxle
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE:

- Do not reuse bolt B.
- Do not forcibly pry out the hybrid vehicle transaxle assembly
- Do not apply the grease either to the spline or to the input shaft.

BOLT LENGTH DIMENSION

Bolt	Installation direction	Diameter	Bolt length
A	From transaxle to engine	12 mm (0.47 in.)	55 mm (2.17 in.)
B	From engine to transaxle	10 mm (0.39 in.)	55 mm (2.17 in.)
C	From transaxle to engine	12 mm (0.47 in.)	55 mm (2.17 in.)
D	From engine to transaxle	10 mm (0.39 in.)	33 mm (1.30 in.)

2. INSTALL TRANSMISSION CONTROL CABLE BRACKET NO.1

- a. Install the control cable bracket No.1 and 2 new bolts.

Torque: 12 N*m (120 kgf*cm, 9 ft.*lbf)

3. INSTALL OIL COOLER INLET TUBE SUB-ASSEMBLY (w/Oil Cooler)

- a. Install the oil cooler tube bracket and bolt.

Torque: 8.2 N*m (84 kgf*cm, 73 in.*lbf)

- b. Using SST and a wrench, tighten the new oil cooler inlet tube.

Torque: 34 N*m (350 kgf*cm, 25 ft.*lbf)

SST 09023-12701

4. INSTALL OIL COOLER OUTLET TUBE SUB-ASSEMBLY (w/ Oil Cooler)

- a. Using SST and a wrench, tighten the new oil cooler outlet tube.

Torque: 34 N*m (350 kgf*cm, 25 ft.*lbf)

SST 09023-12701

- b. Install the oil cooler tube clamp and bolt.

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

5. INSTALL ENGINE MOUNTING BRACKET FRONT

- a. Install the engine mounting bracket front with the 3 bolts.

Torque: 64 N*m (653 kgf*cm, 47 ft.*lbf)

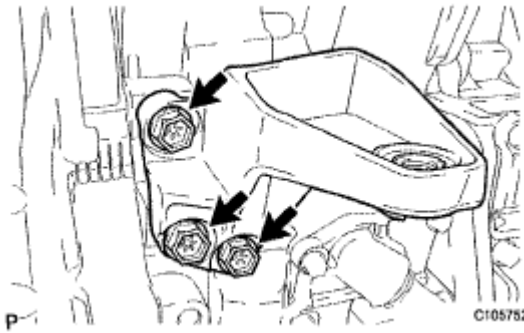


Fig. 58: Locating Engine Mounting Bracket Front
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

6. INSTALL WATER HOSE

- a. Install the water hose with the clamp.

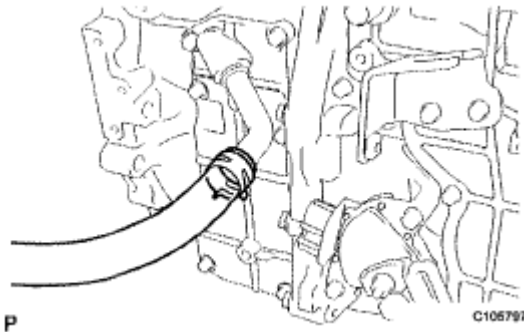


Fig. 59: Identifying Water Hose From Hybrid Transaxle
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

7. INSTALL AUTOMATIC TRANSMISSION CASE COVER

- a. Install the case cover with the bolt and clip.
- b. Install the wire harness bracket with the bolt.

Torque: 8.4 N*m (86 kgf*cm, 74 in.*lbf)

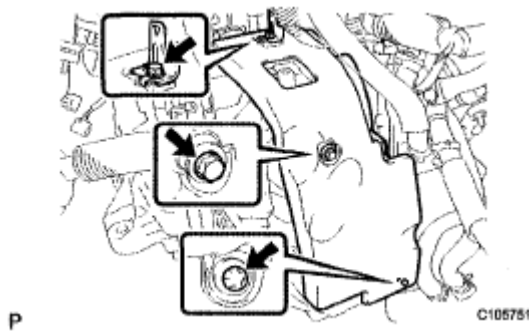


Fig. 60: Locating Automatic Transmission Case Cover
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

8. CONNECT ENGINE WIRE

- a. Install the 4 wire harness brackets with the bolts.

Torque: 8.4 N*m (86 kgf*cm, 74 in.*lbf)

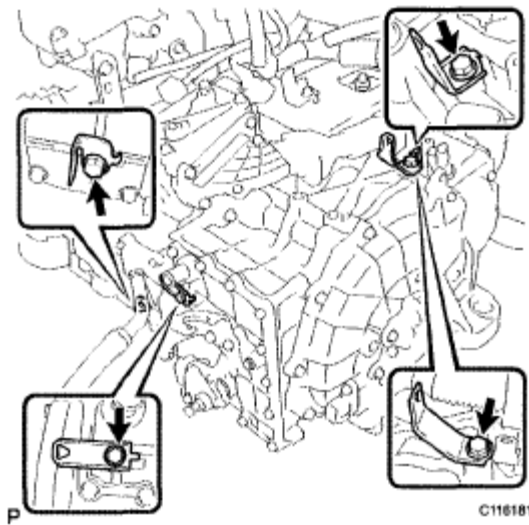


Fig. 61: Locating Wire Harness Brackets
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Connect the connector.

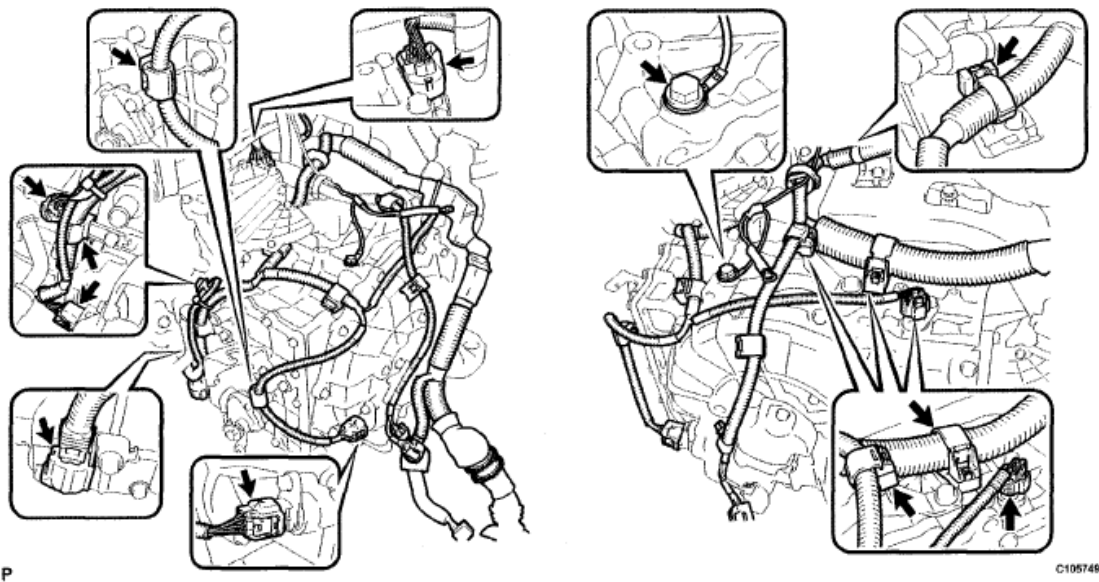


Fig. 62: Locating Connector

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

- c. Connect the wire harnesses to the wire harness clamp.
- d. Install the ground wire with the bolt.

Torque: 8.4 N*m (86 kgf*cm, 74 in.*lbf)

9. INSTALL FLYWHEEL HOUSING UNDER COVER

- a. Install the 2 bolts and flywheel housing under cover.

Torque: 7.8 N*m (80 kgf*cm, 69 in.*lbf)

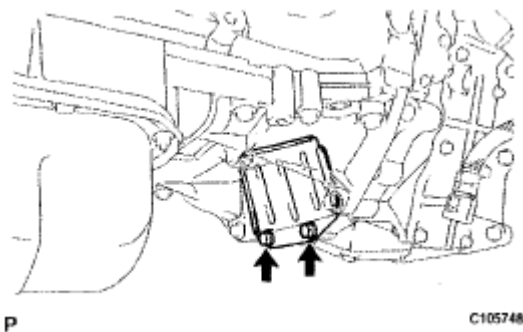


Fig. 63: Locating Bolts And Flywheel Housing Under Cover

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

- 10. **INSTALL FRONT DRIVE SHAFT ASSEMBLY LH** (See INSTALLATION)
- 11. **INSTALL FRONT DRIVE SHAFT ASSEMBLY RH** (See INSTALLATION)
- 12. **INSTALL FRONT FRAME ASSEMBLY** (See INSTALLATION)

13. **INSTALL HV TRANSAXLE MASS DAMPER** (See INSTALLATION)
14. **INSTALL MANIFOLD STAY** (See INSTALLATION)
15. **INSTALL ENGINE ASSEMBLY WITH TRANSAXLE**

(See INSTALLATION)

SHIFT LEVER

COMPONENTS

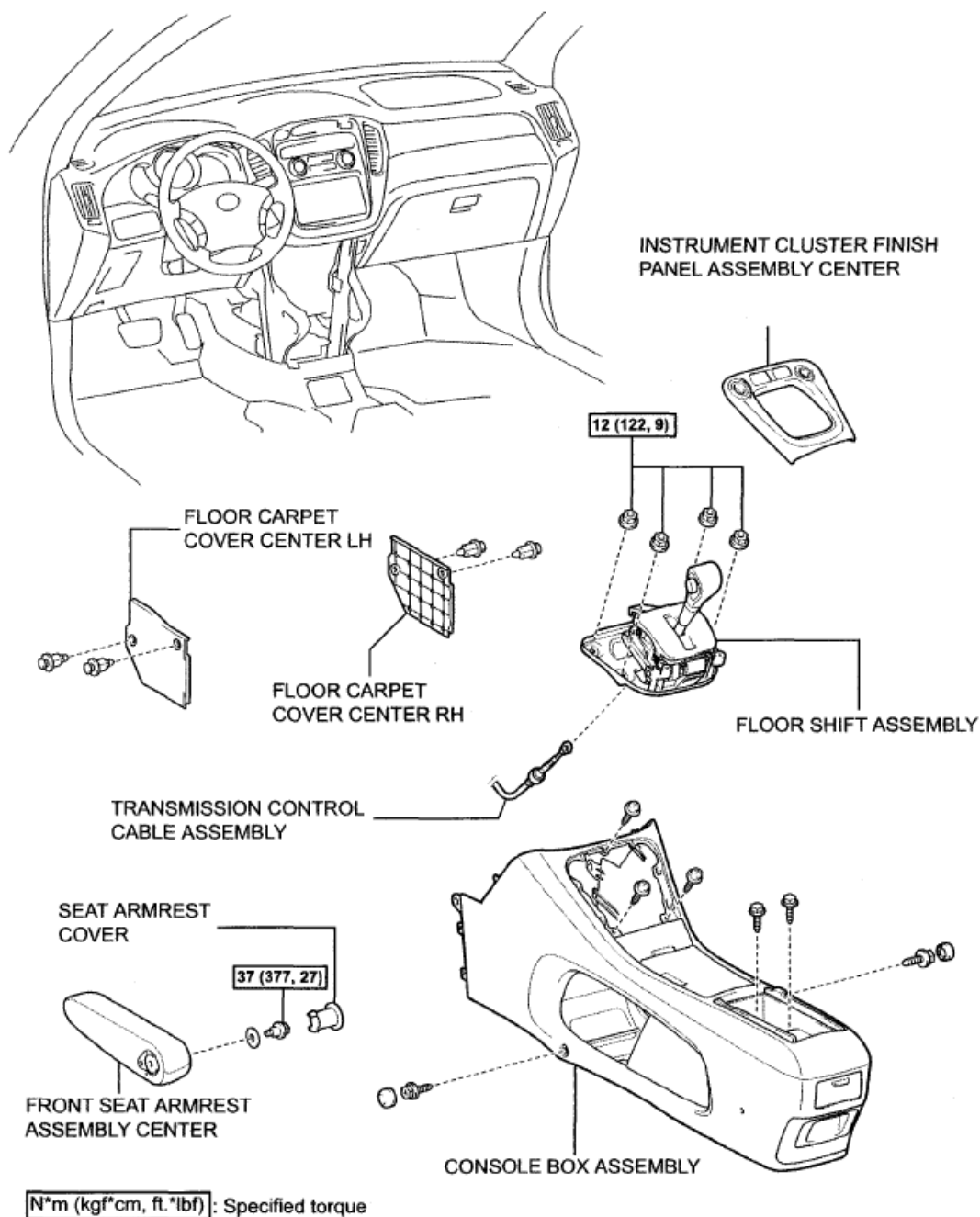
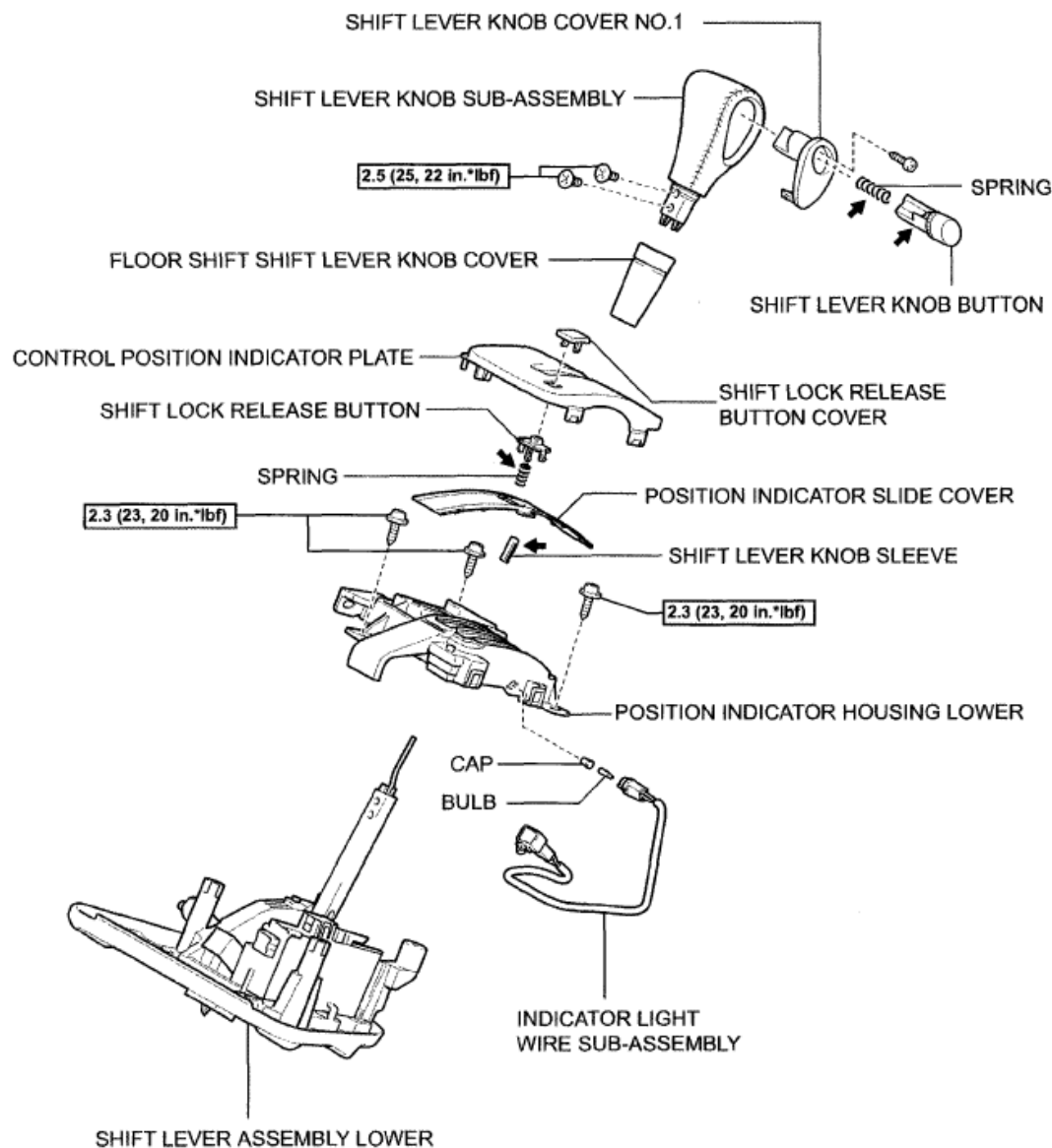


Fig. 64: Identifying Shift Lever Components With Torque Specifications (1 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



← Apply MP grease

C113067E03

Fig. 65: Identifying Shift Lever Components With Torque Specifications (2 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ON-VEHICLE INSPECTION

1. CHECK SHIFT LOCK OPERATION

- Shift the shift lever to P position.
- Turn the ignition switch to LOCK.
- Check that the shift lever cannot be shifted to any other positions than P.

- d. Turn the ignition switch ON, depress the brake pedal and check that the shift lever can be shifted to any other positions.

2. CHECK SHIFT LOCK RELEASE BUTTON OPERATION

- a. Using screwdriver, remove the shift lock release cover.
- b. When operating the shift lever with the shift lock release button pressed, check that the lever can be shifted to any position other than P.

3. CHECK KEY INTERLOCK OPERATION

- a. Turn the ignition switch ON.
- b. Depress the brake pedal and shift the shift lever to any other position than P.
- c. Check that the ignition key cannot be turned to LOCK.
- d. Shift the shift lever to P position, turn the ignition key to LOCK and check that the ignition key can be removed.

4. INSPECT SHIFT LOCK CONTROL UNIT ASSEMBLY

- a. Using a voltmeter, measure the voltage at each terminal.

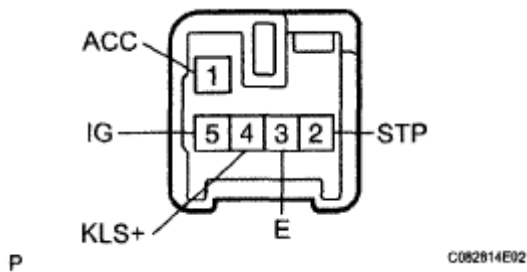


Fig. 66: Measuring Voltage Of Shift Lock Control Unit
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Voltage

SHIFT LOCK CONTROL UNIT VOLTAGE

Terminal	Measuring Condition	Voltage (V)
1 (ACC) - 3 (E)	Ignition switch ACC	10 to 14
1 (ACC) - 3 (E)	Ignition switch OFF	0
2 (STP) - 3 (E)	Depress brake pedal	10 to 14
2 (SIP) - 3 (E)	Release brake pedal	0
4 (KLS+) - 3 (E)	1. Ignition switch ACC and shift lever P position 2. Ignition switch ACC and shift lever except P position 3. Ignition switch ACC and shift lever except P position (After approx. 1 second)	1.0 2. 7.5 to 11 3. 6 to 9
5 (IG) - 3 (E)	Ignition switch ON	10 to 14

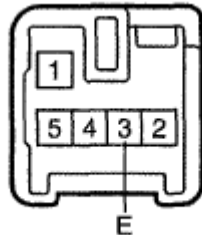
5 (IG) - 3 (E) | Ignition switch OFF

0

HINT:

Do not disconnect the shift lock control unit assembly connector.

- b. Using an ohmmeter, measure the resistance at terminal E (3) and body ground.



P

C082814E01

Fig. 67: Measuring Resistance Of Shift Lock Control Unit
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Resistance

SHIFT LOCK CONTROL UNIT RESISTANCE

Terminal	Measuring Condition	Specified Value
3 (E) - Body ground	Always	Below 1 ohms

HINT:

Do not disconnect the shift lock control unit assembly connector.

REMOVAL

1. SEPARATE CABLE FROM NEGATIVE BATTERY TERMINAL

(See **PRECAUTION**)

2. REMOVE INSTRUMENT CLUSTER FINISH PANEL ASSEMBLY CENTER (See **REMOVAL**)

3. REMOVE FLOOR CARPET COVER CENTER LH (See **REMOVAL**)

4. REMOVE FLOOR CARPET COVER CENTER RH (See **REMOVAL**)

5. REMOVE FRONT SEAT ARMREST ASSEMBLY CENTER (See **REMOVAL**)

6. REMOVE CONSOLE BOX ASSEMBLY (See **REMOVAL**)

7. DISCONNECT TRANSMISSION CONTROL CABLE ASSEMBLY

- a. Disconnect the floor shift transmission control cable assembly end from the floor shift assembly.

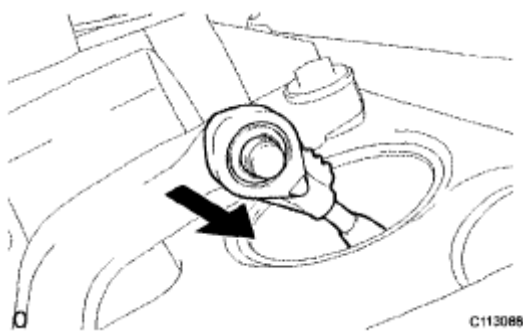


Fig. 68: Locating Floor Shift Transmission Control Cable
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

8. REMOVE FLOOR SHIFT ASSEMBLY

- a. Disconnect the 2 wire harness clamp from the floor shift assembly.

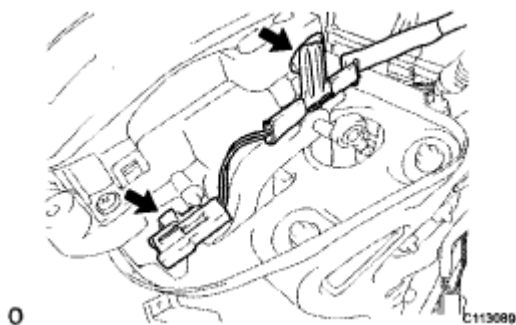


Fig. 69: Locating Wire Harness Clamp From Floor Shift Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Disconnect the 2 connectors.

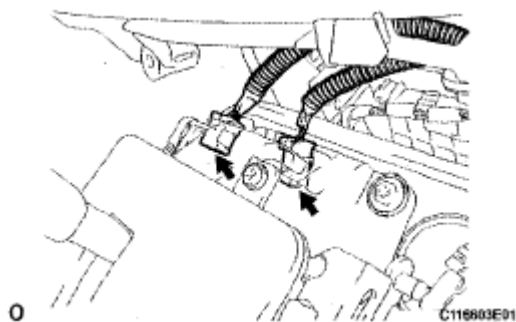


Fig. 70: Locating Connectors
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Remove the 4 nuts and dismount the floor shift assembly from the vehicle.

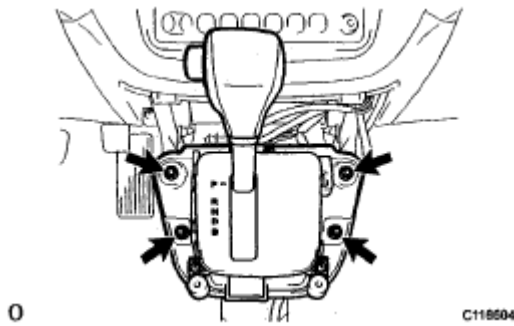


Fig. 71: Locating Nuts And Floor Shift Assembly From Vehicle
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

DISASSEMBLY

1. REMOVE INDICATOR LIGHT WIRE SUB-ASSEMBLY

- a. Releasing the lock by pressing the click, disconnect the indicator light wire connector from the shift lever plate.

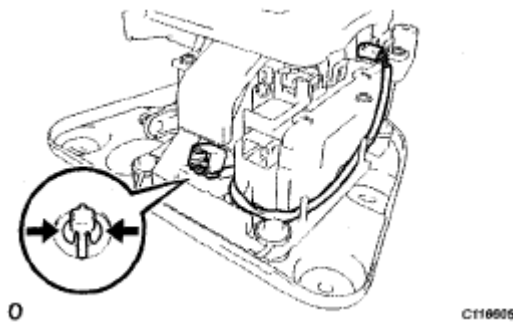


Fig. 72: Identifying Indicator Light Wire Connector From Shift Lever Plate
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Turn the socket counterclockwise and remove the indicator light wire sub-assembly.

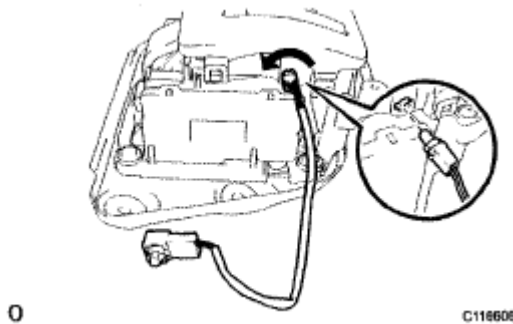


Fig. 73: Turning Socket Counterclockwise
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Remove the light cap and light bulb from the floor shift.

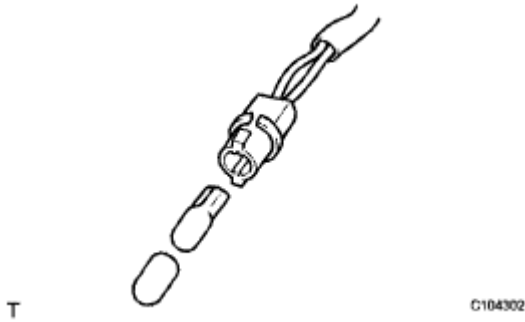


Fig. 74: Identifying Indicator Light Bulb And Cap To Indicator Light Wire Sub-Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. REMOVE SHIFT LEVER KNOB SUB-ASSEMBLY

- a. Lower the shift lever knob cover.

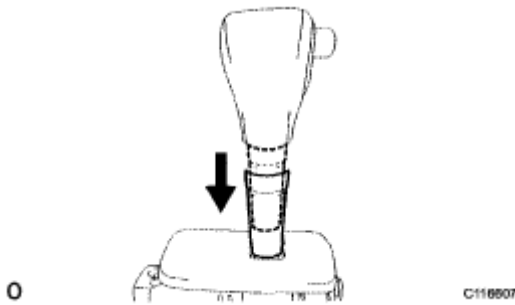


Fig. 75: Locating Shift Lever Knob Cover
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the 2 screws and shift lever knob from the shift lever.

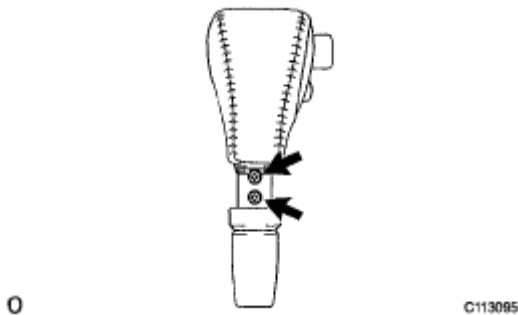


Fig. 76: Locating Shift Lever Knob To Shift Lever With Screws
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. REMOVE FLOOR SHIFT SHIFT LEVER KNOB COVER

- a. Remove the shift lever knob cover from the shift lever.

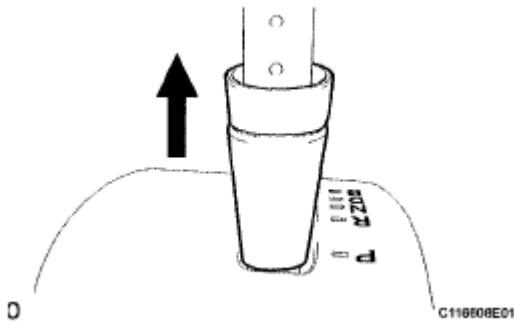


Fig. 77: Locating Shift Lever Knob Cover
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. REMOVE SHIFT LEVER KNOB BUTTON

- a. Using a screwdriver with vinyl tape wound around its tip, release the claw and remove the shift lever knob button and spring from the shift lever knob.

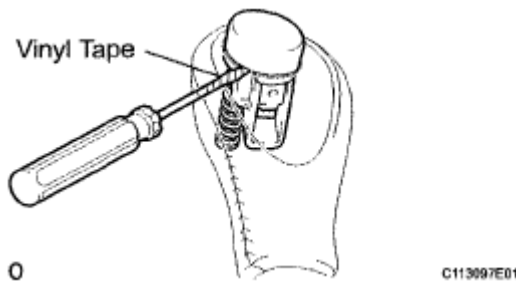


Fig. 78: Locating Shift Lever Knob Button
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. REMOVE SHIFT LEVER KNOB COVER NO.1

- a. Remove the screw and shift lever knob cover No.1 from the shift lever knob.

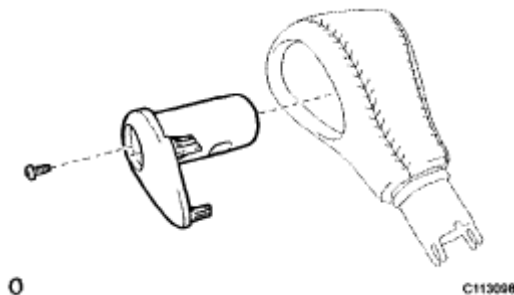


Fig. 79: Identifying Shift Lever Knob Cover No.1 To Shift Lever Knob With Screw
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

6. REMOVE SHIFT LOCK RELEASE BUTTON COVER

- a. Using a screwdriver, remove the shift lock release cover from the control position indicator plate.

7. REMOVE CONTROL POSITION INDICATOR PLATE

- a. Using a screwdriver, release the 4 claws and remove the control position indicator plate from the position indicator housing lower.

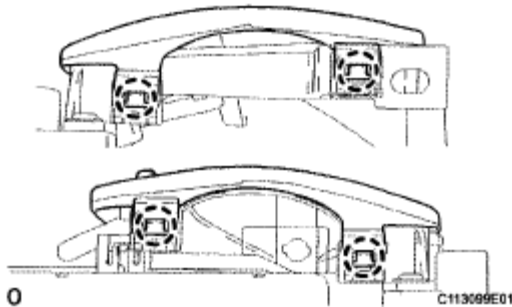


Fig. 80: Identifying Control Position Indicator Plate
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

8. REMOVE POSITION INDICATOR HOUSING LOWER

- a. Remove the 3 screws, detach the position indicator housing lower from the shift lever plate.

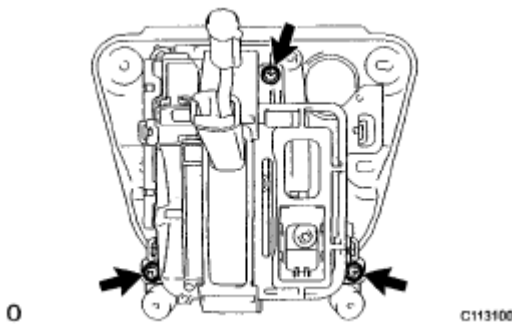


Fig. 81: Locating Position Indicator Housing Lower
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

9. REMOVE SHIFT LOCK RELEASE BUTTON

- a. While pressing the 2 claws, remove the shift lock release button and spring from the position indicator housing lower.

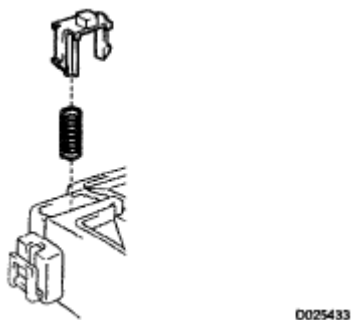


Fig. 82: Identifying Shift Lock Release Button

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

10. REMOVE POSITION INDICATOR SLIDE COVER

- a. Remove the position indicator slide cover from the position indicator housing lower.

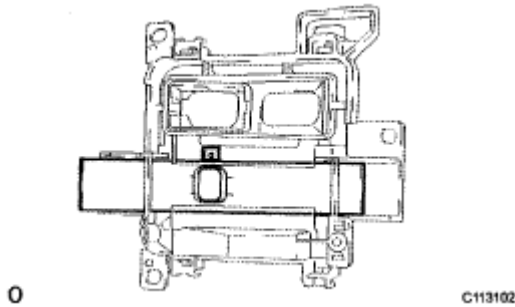


Fig. 83: Identifying Indicator Housing Lower

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

11. REMOVE SHIFT LEVER KNOB SLEEVE

- a. Remove the shift lever knob sleeve from the shift lever.

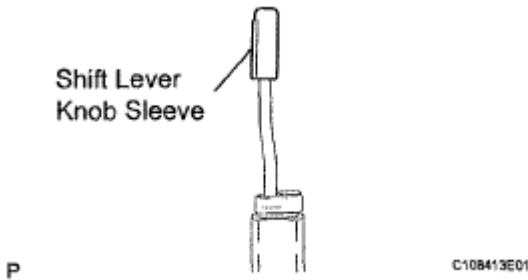


Fig. 84: Identifying Shift Lever Knob Sleeve

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

ADJUSTMENT

1. INSPECT SHIFT LEVER POSITION

- a. Apply the parking brake.
- b. Lock the wheels with chocks to secure the vehicle.
- c. Put the vehicle into the READY-on state.
- d. Move the shift lever to the D position and release the brake pedal.

NOTE: Be sure to apply the parking brake and lock the wheels with chocks to secure the vehicle.

- e. Slowly move the shift lever to the N position and measure moving distance (a) of the shift lever from the original point to the gear activation point.

NOTE: Be sure to move the shift lever slowly.

- f. Move the shift lever to the R position and release the brake pedal.

NOTE: Be sure to apply the parking brake and lock the wheels with chocks to secure the vehicle.

- g. Slowly move the shift lever to the N position and measure moving distance (b) of the shift lever from the original point to the vehicle activation point.

NOTE: Be sure to move the shift lever slowly.

- h. Check that moving distances (a) and (b) shown in the illustration are almost the same.

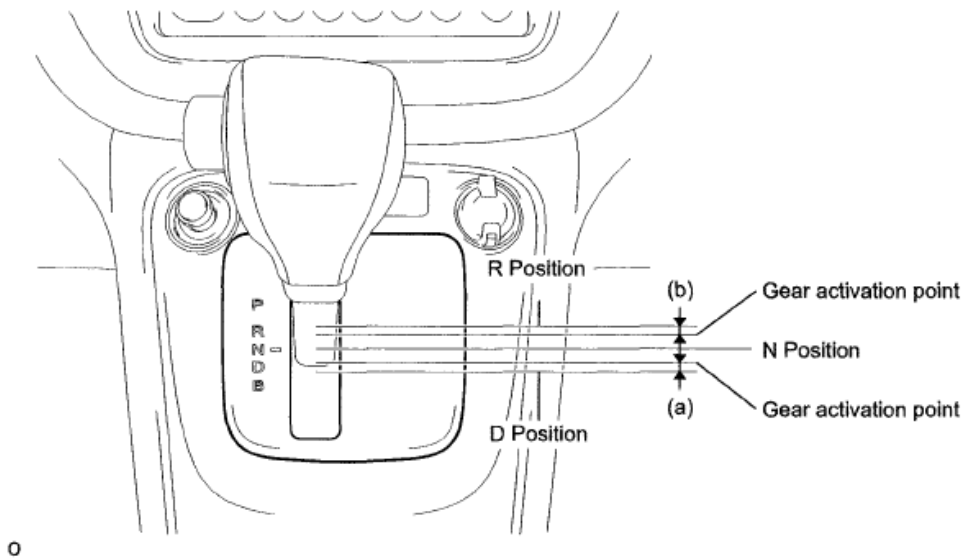


Fig. 85: Identifying Distance Of Shift Lever From Original Point To Gear Activation Point
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

- If moving distances (a) and (b) are almost the same, adjustment of the shift lever position is not necessary.
- If moving distance (a) is shorter than (b), perform adjustment of the shift lever position [*1].
- If moving distance (b) is shorter than (a), perform adjustment of the shift lever position [*2].

2. ADJUST SHIFT LEVER POSITION

- a. If moving distance (a) is shorter than (b) [*1]:

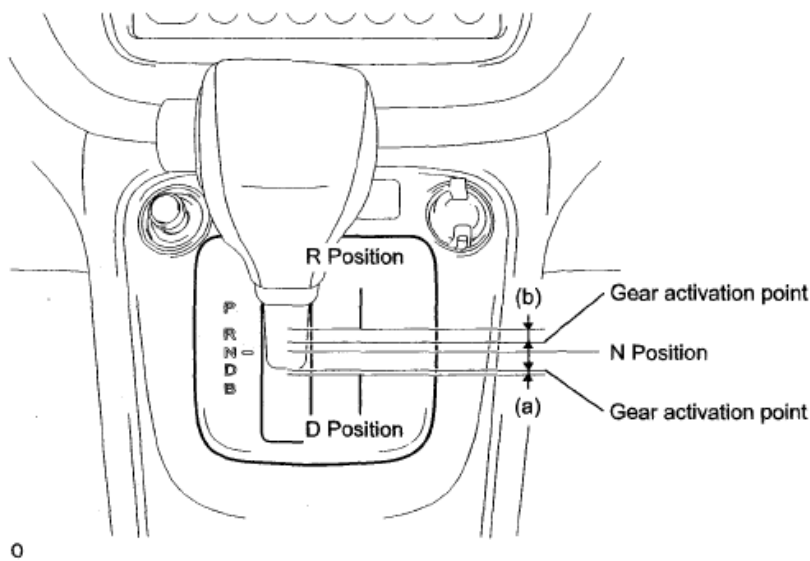


Fig. 86: Identifying Distance Of Shift Lever From Original Point To Gear Activation Point
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

If the shift lever is moved from the R to N position, the moving distance of the shift lever from the original point to the gear activation point becomes longer.

1. Move the shift lever to the N position.
2. Loosen the 2 bolts.

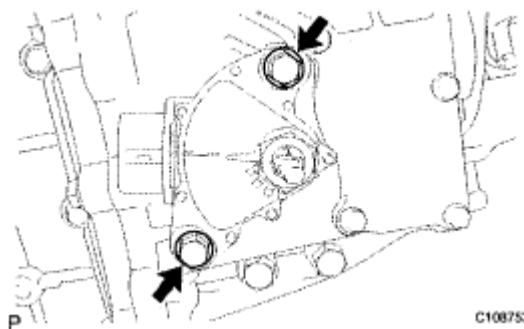


Fig. 87: Locating Bolts
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. Slightly turn the shift lever position sensor counterclockwise.

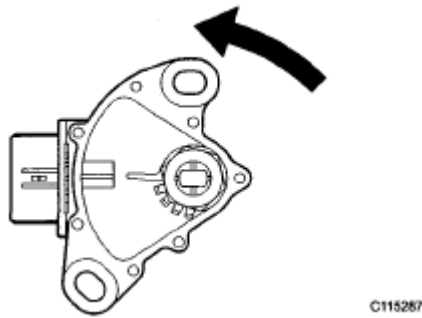


Fig. 88: Locating Shift Lever Position Sensor Counterclockwise
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. Tighten the 2 bolts in the order shown in the illustration.

Torque: 13 N*m (133 kgf*cm, 10 ft.*lbf)

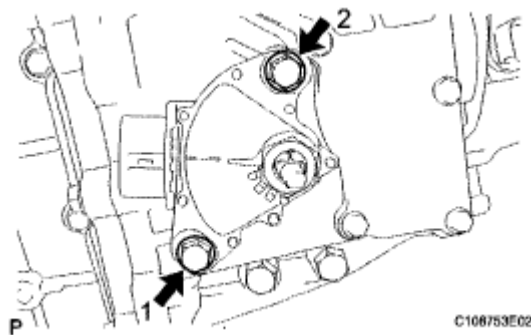


Fig. 89: Locating Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. Recheck the shift lever position.
 - b. If moving distance (b) is shorter than (a) [*2]:

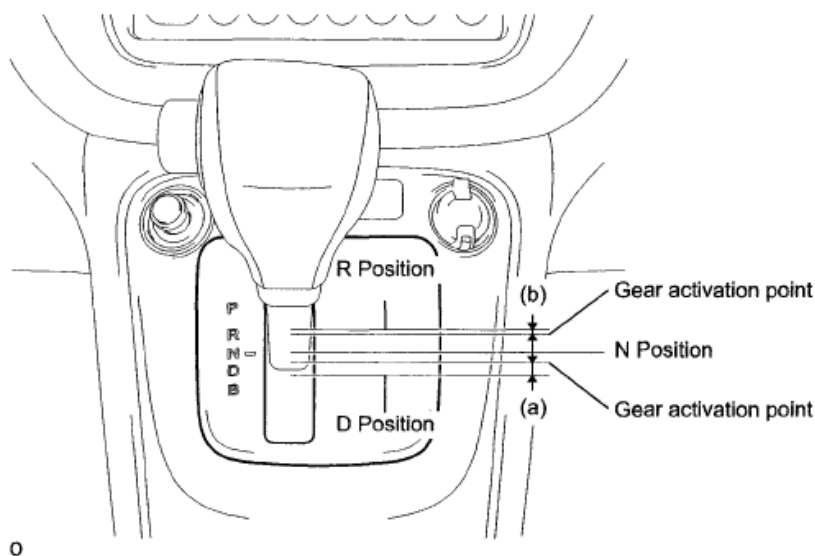


Fig. 90: Identifying Distance Between (b) And (a)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

If the shift lever is moved from the D to N position, the moving distance of the shift lever from the original point to the gear activation point becomes longer.

1. Move the shift lever to the N position.
2. Loosen the 2 bolts.

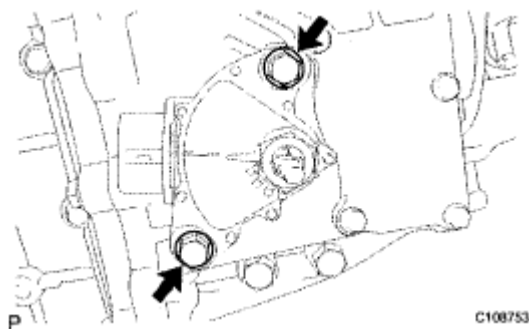


Fig. 91: Locating Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. Slightly turn the shift lever position sensor clockwise.

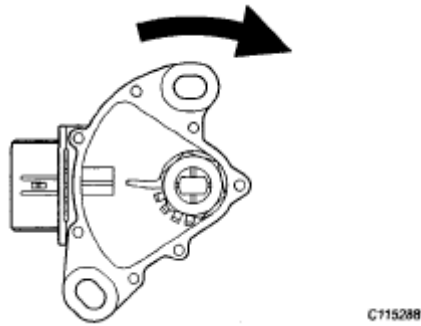


Fig. 92: Locating Park/Neutral Position Switch Clockwise
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. Tighten the 2 bolts in the order shown in the illustration.

Torque: 13 N*m (133 kgf*cm, 10 ft.*lbf)

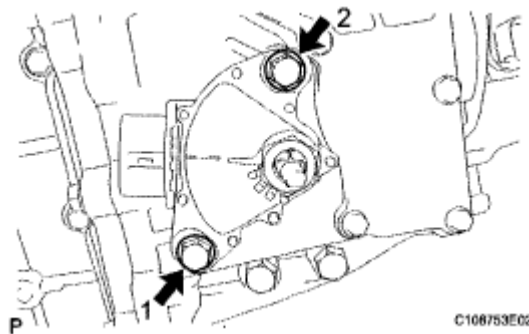


Fig. 93: Locating Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. Recheck the shift lever position.

3. INSPECT SHIFT LEVER OPERATION

- a. While moving the shift lever from the N to each position, check that the lever moves smoothly and that the shift position indicator comes on properly according to the shift lever position.
- b. Put the vehicle into the READY-on state and check the following:
 1. When the shift lever is moved to the D position, the vehicle moves forward.
 2. When the shift lever is moved to the R position, the buzzer sounds and the vehicle moves in reverse.

NOTE: The vehicle should not move when the shift position indicator is off.

REASSEMBLY

1. INSTALL SHIFT LEVER KNOB SLEEVE

- a. Apply MP grease to the shown part of the shift lever knob sleeve and install it to the shift lever.

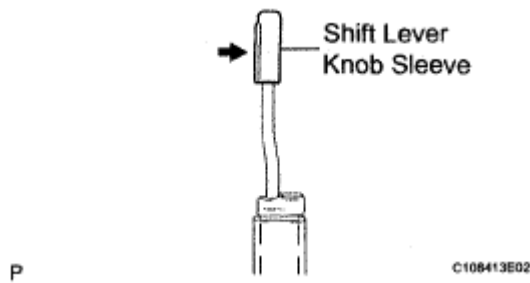


Fig. 94: Locating Shift Lever Knob Sleeve
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. INSTALL POSITION INDICATOR SLIDE COVER

- a. Install the position indicator slide cover to the position indicator housing lower.

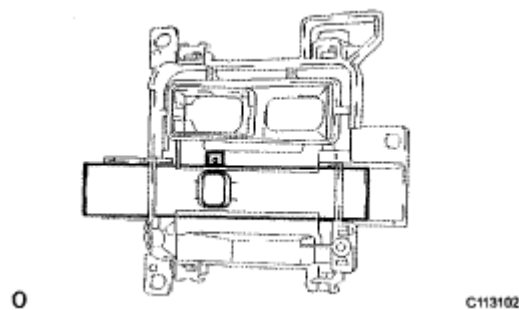


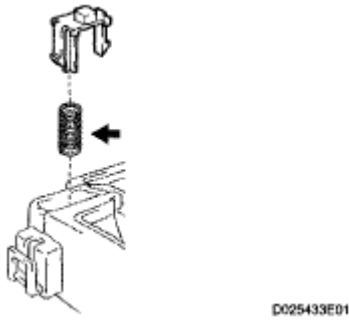
Fig. 95: Sliding Cover From Position Indicator Housing Lower
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. INSTALL SHIFT LOCK RELEASE BUTTON

- a. Apply grease to the shown part of the spring.
- b. Install the shift lock release button and spring to the position indicator housing lower.

HINT:

Fit the claws securely.

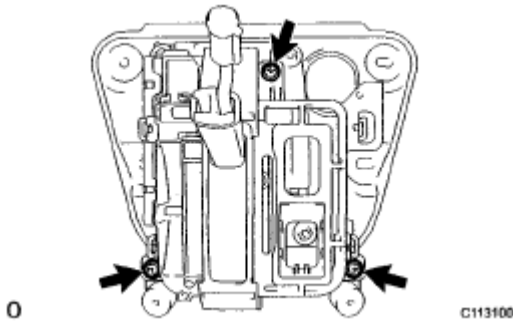
**Fig. 96: Removing Button And Spring**

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

4. INSTALL POSITION INDICATOR HOUSING LOWER

- a. Install the position indicator housing lower to the shift lever plate with 3 screws.

Torque: 2.3 N*m (23 kgf*cm, 20 in.*lbf)

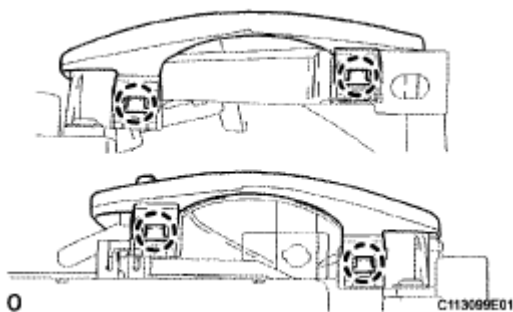
**Fig. 97: Locating Position Indicator Housing Lower**

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

5. INSTALL CONTROL POSITION INDICATOR PLATE

- a. Install the control position indicator plate to the position indicator housing lower.

NOTE: Fit the claws securely.

**Fig. 98: Locating Control Position Indicator Plate**

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

6. REMOVE SHIFT LOCK RELEASE BUTTON COVER

- a. Install the shift lock release button cover to the control position indicator plate.

7. INSTALL SHIFT LEVER KNOB COVER NO.1

- a. Install the shift lever knob cover No.1 to the shift lever knob with a screw.

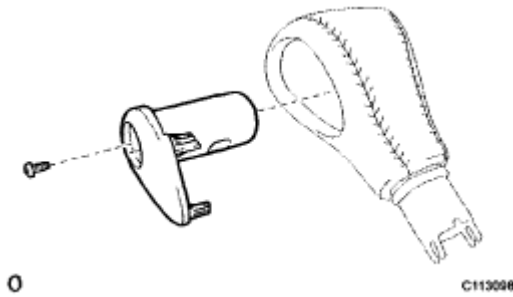


Fig. 99: Locating Shift Lever Knob Cover No.1 To Shift Lever Knob With Screw
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

8. INSTALL SHIFT LEVER KNOB BUTTON

- a. Apply MP grease to the shift lever knob button and spring and install them to the shift lever knob.

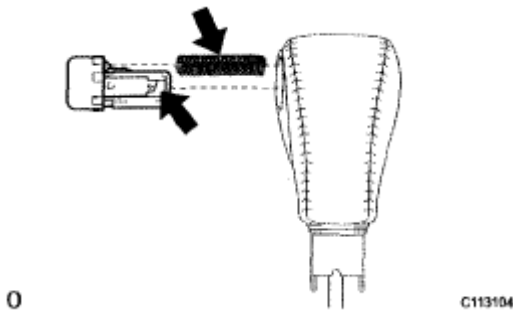


Fig. 100: Locating Shift Lever Knob Button
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

9. INSTALL FLOOR SHIFT SHIFT LEVER KNOB COVER

- a. Install the shift lever knob cover to the shift lever.

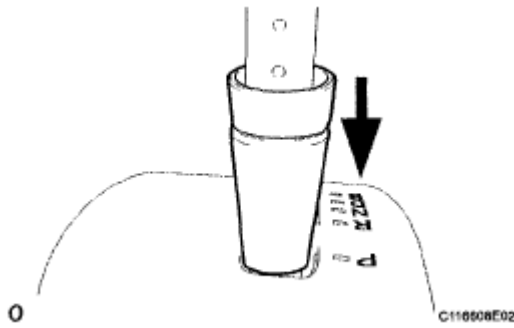


Fig. 101: Locating Shift Lever Knob Cover To Shift Lever
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

10. INSTALL SHIFT LEVER KNOB SUB-ASSEMBLY

- a. Install the shift lever knob to the shift lever with 2 screws.

Torque: 2.5 N*m (25 kgf*cm, 22 in.*lbf)

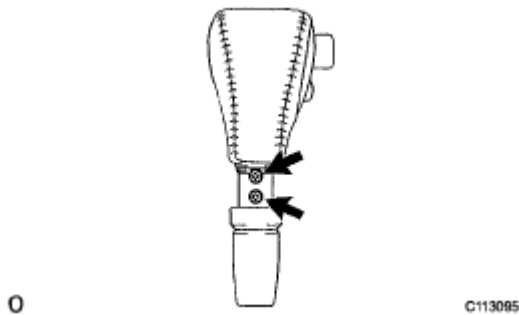


Fig. 102: Locating Shift Lever Knob To Shift Lever With Screws
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Install the shift lever knob cover to shift lever knob.

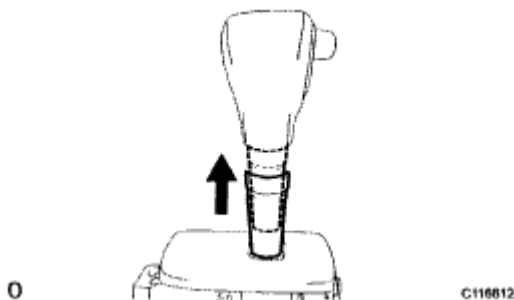


Fig. 103: Locating Shift Lever Knob Cover To Shift Lever Knob
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

11. INSTALL INDICATOR LIGHT WIRE SUB-ASSEMBLY

- a. Install the indicator light bulb and cap to the indicator light wire sub-assembly.

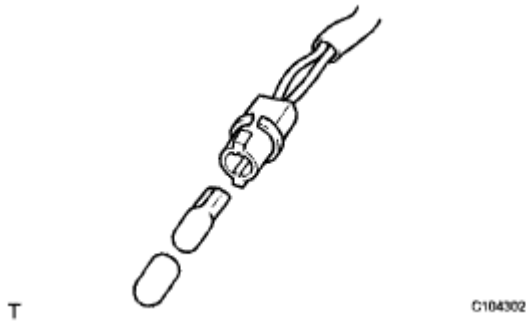


Fig. 104: Identifying Indicator Light Bulb And Cap To Indicator Light Wire Sub-Assembly
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Turn the socket clockwise and install the indicator light wire sub-assembly.

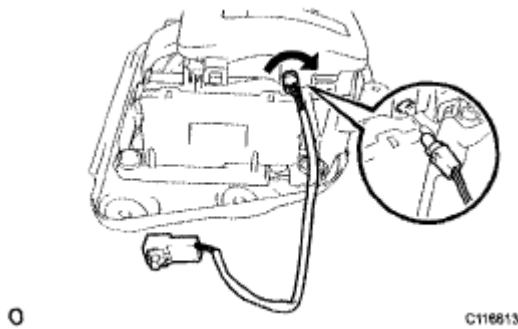


Fig. 105: Locating Socket Clockwise
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Install the indicator lamp wire harness and connector as shown in the illustration.

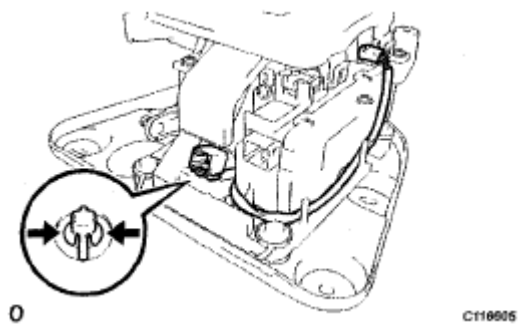


Fig. 106: Locating Indicator Light Wire Connector From Shift Lever Plate
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSTALLATION

1. INSTALL FLOOR SHIFT ASSEMBLY

- a. Install the floor shift assembly to the vehicle with the 4 nuts.

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

NOTE: Tighten them in the order, 1, 2, 3 and 4.

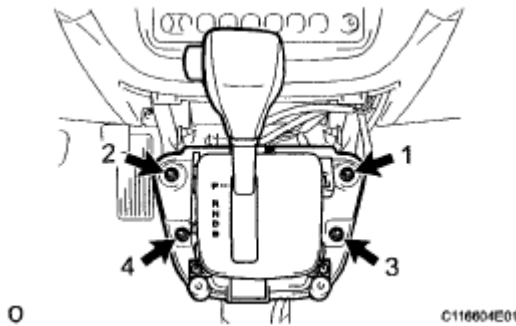


Fig. 107: Locating Floor Shift Assembly To Vehicle With Nuts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Connect the 2 connectors.

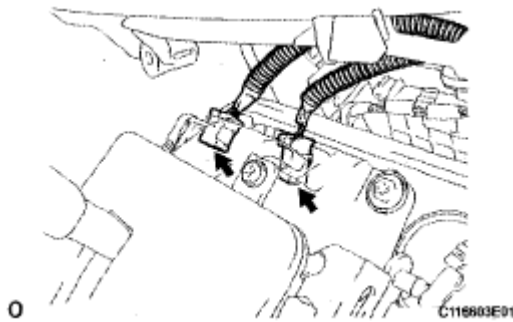


Fig. 108: Locating Connectors
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Install the 2 wire harness clamps.

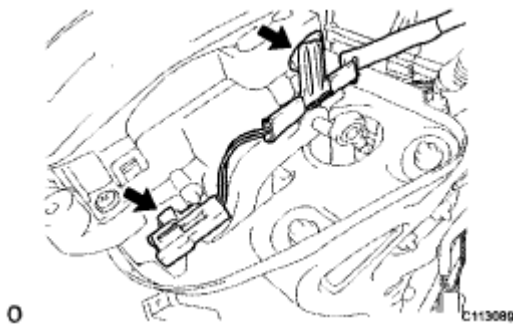


Fig. 109: Locating Wire Harness Clamp From Floor Shift Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. CONNECT TRANSMISSION CONTROL CABLE ASSEMBLY

- a. Connect the floor shift transmission control cable end to the floor shift assembly.

NOTE: Install the transmission control cable assembly with the graduated cuts to face upward to prevent torsion of the inner cable.

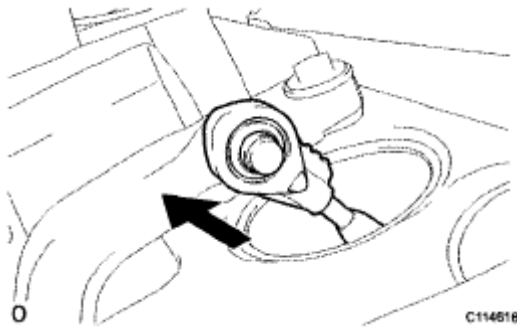
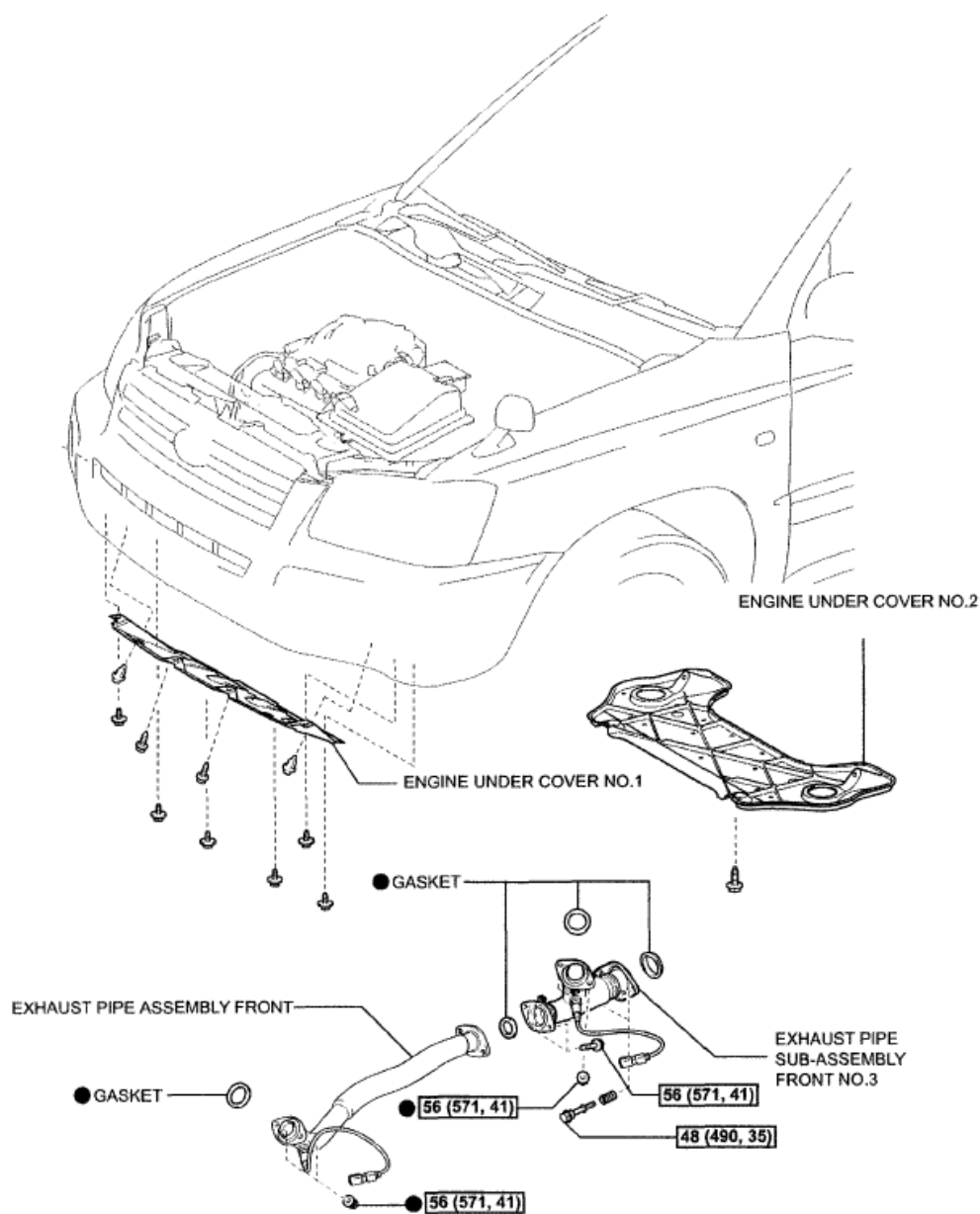


Fig. 110: Locating Transmission Control Cable Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. **INSTALL CONSOLE BOX ASSEMBLY** (See INSTALLATION)
4. **INSTALL FRONT SEAT ARMREST ASSEMBLY CENTER** (See INSTALLATION)
5. **INSTALL FLOOR CARPET COVER CENTER LH** (See INSTALLATION)
6. **INSTALL FLOOR CARPET COVER CENTER RH** (See INSTALLATION)
7. **INSTALL INSTRUMENT CLUSTER FINISH PANEL ASSEMBLY CENTER** (See INSTALLATION)
8. **CONNECT CABLE TO NEGATIVE BATTERY TERMINAL**
9. **PERFORM INITIALIZATION**

(See INITIALIZATION)

HYBRID TRANSAXLE OIL SEAL**COMPONENTS**



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

● Non-reusable part

C117488E01

Fig. 111: Identifying Hybrid Transaxle Oil Seal Components With Torque Specifications (1 Of 2)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2007 TRANSMISSION P310 Hybrid Transmission / Transaxle - Highlander Hybrid



1. REMOVE ENGINE UNDER COVER NO.1 (See REMOVAL)

2. **REMOVE ENGINE UNDER COVER NO.2** (See REMOVAL)
3. **DRAIN HYBRID TRANSAXLE FLUID** (See REPLACEMENT)
4. **REMOVE FRONT WHEEL**
5. **REMOVE FRONT AXLE HUB NUT** (See INSTALLATION)
6. **SEPARATE SPEED SENSOR FRONT** (See REMOVAL)
7. **SEPARATE FRONT DISC BRAKE CALIPER ASSEMBLY** (See REMOVAL)
8. **REMOVE FRONT DISC** (See DISASSEMBLY)
9. **SEPARATE FRONT STABILIZER LINK ASSEMBLY** (See REMOVAL)
10. **SEPARATE TIE ROD ASSEMBLY** (See REMOVAL)
11. **SEPARATE FRONT SUSPENSION ARM SUB-ASSEMBLY LOWER NO.1** (See REMOVAL)
12. **REMOVE FRONT AXLE ASSEMBLY** (See REMOVAL)
13. **REMOVE FRONT SHOCK ABSORBER WITH COIL SPRING** (See REMOVAL)
14. **REMOVE FRONT DRIVE SHAFT ASSEMBLY LH** (See REMOVAL)
15. **REMOVE FRONT DRIVE SHAFT ASSEMBLY RH** (See REMOVAL)
16. **REMOVE EXHAUST PIPE ASSEMBLY FRONT** (See REMOVAL)
17. **REMOVE EXHAUST PIPE SUB-ASSEMBLY FRONT NO.3** (See REMOVAL)
18. **REMOVE HYBRID TRANSAXLE OIL SEAL**

- a. Remove the oil seal LH side.

1. Using SST, remove the oil seal.

SST 09514-35011

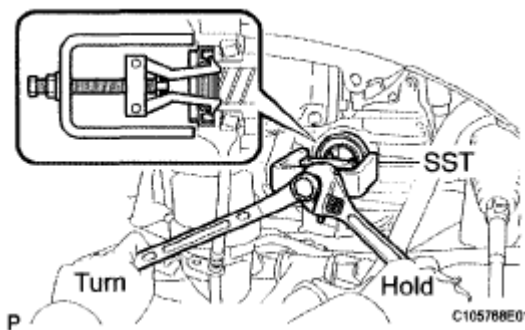


Fig. 113: Identifying Hybrid Transaxle Oil Seal LH Side
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the oil seal RH side.

1. Using SST, remove the oil seal.

SST 09612-30012

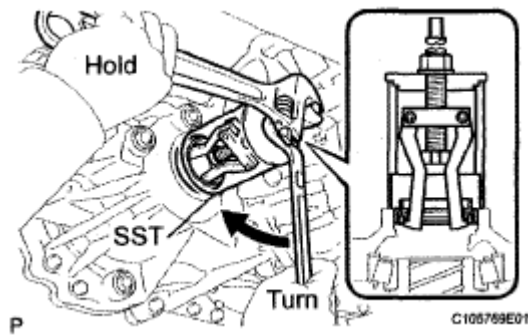


Fig. 114: Locating Oil Seal RH Side
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSTALLATION

1. INSTALL HYBRID TRANSAXLE OIL SEAL

- a. Install the oil seal LH side.
 1. Using SST and a hammer, tap in a new oil seal until its surface is flush with the case edge.
SST 09223-15020, 09950-70010 (09951-07100)
 2. Coat the lip of the oil seal with MP grease.

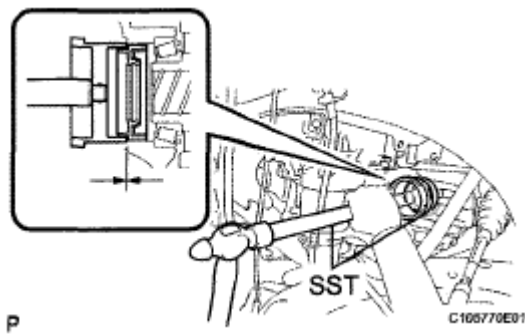


Fig. 115: Identifying Hybrid Transaxle Oil Seal LH Side
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Install the oil seal RH side.
 1. Using SST and a hammer, tap in a new oil seal until its surface is flush with the case edge.
SST 09387-00010, 09950-70010 (09951-07100)

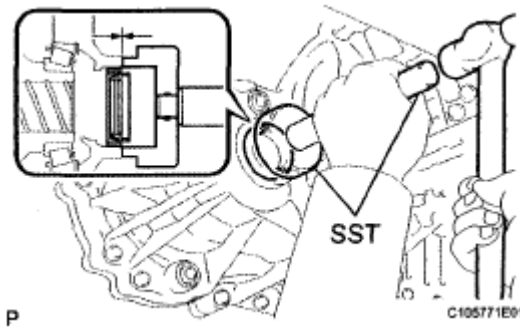


Fig. 116: Identifying Hybrid Transaxle Oil Seal RH Side
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. Coat the lip of the oil seal with MP grease.
2. **INSTALL EXHAUST PIPE SUB-ASSEMBLY FRONT NO.3** (See INSTALLATION)
3. **INSTALL EXHAUST PIPE ASSEMBLY FRONT** (See INSTALLATION)
4. **INSTALL FRONT DRIVE SHAFT ASSEMBLY LH** (See INSTALLATION)
5. **INSTALL FRONT DRIVE SHAFT ASSEMBLY RH** (See INSTALLATION)
6. **INSTALL FRONT SHOCK ABSORBER WITH COIL SPRING** (See INSTALLATION)
7. **INSTALL FRONT STABILIZER LINK ASSEMBLY** (See INSTALLATION)
8. **INSTALL FRONT AXLE ASSEMBLY** (See INSTALLATION)
9. **CONNECT FRONT SUSPENSION ARM SUB-ASSEMBLY LOWER NO.1** (See INSTALLATION)
10. **CONNECT TIE ROD ASSEMBLY** (See INSTALLATION)
11. **INSTALL FRONT DISC** (See REASSEMBLY)
12. **INSTALL FRONT DISC BRAKE CALIPER ASSEMBLY LH** (See INSTALLATION)
13. **INSTALL FRONT AXLE HUB NUT** (See INSTALLATION)
14. **INSTALL SPEED SENSOR FRONT** (See INSTALLATION)
15. **ADD AND INSPECT HYBRID TRANSAXLE FLUID**

(See REPLACEMENT)

16. **INSTALL FRONT WHEEL**
17. **INSPECT AND ADJUST FRONT WHEEL ALIGNMENT**

(See FRONT WHEEL ALIGNMENT)

18. **INSTALL ENGINE UNDER COVER NO.2** (See INSTALLATION)
19. **INSTALL ENGINE UNDER COVER NO.1** (See INSTALLATION)
20. **CHECK ABS SPEED SENSOR SIGNAL**

(See TEST MODE PROCEDURE)

INPUT SHAFT OIL SEAL

COMPONENTS

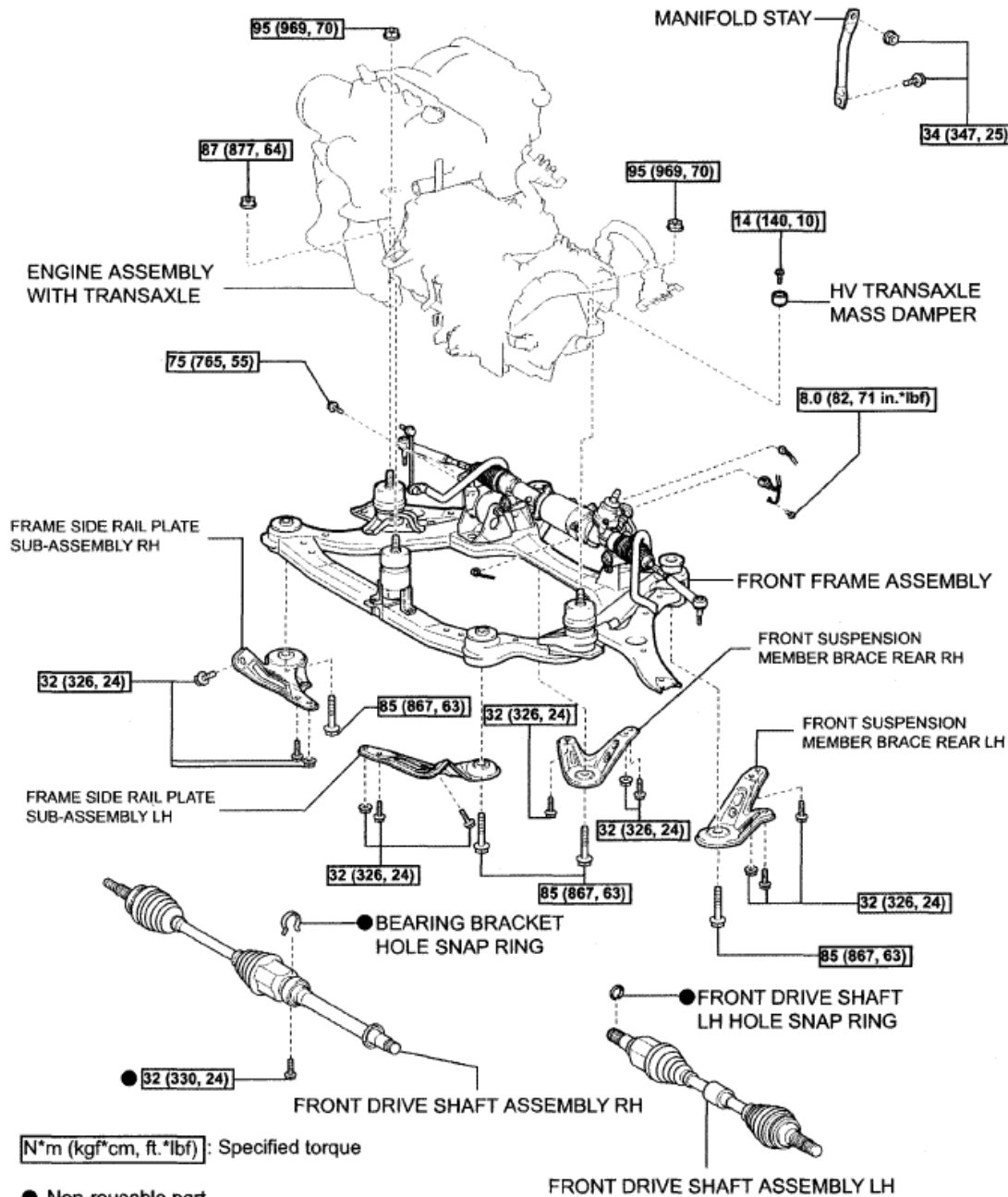
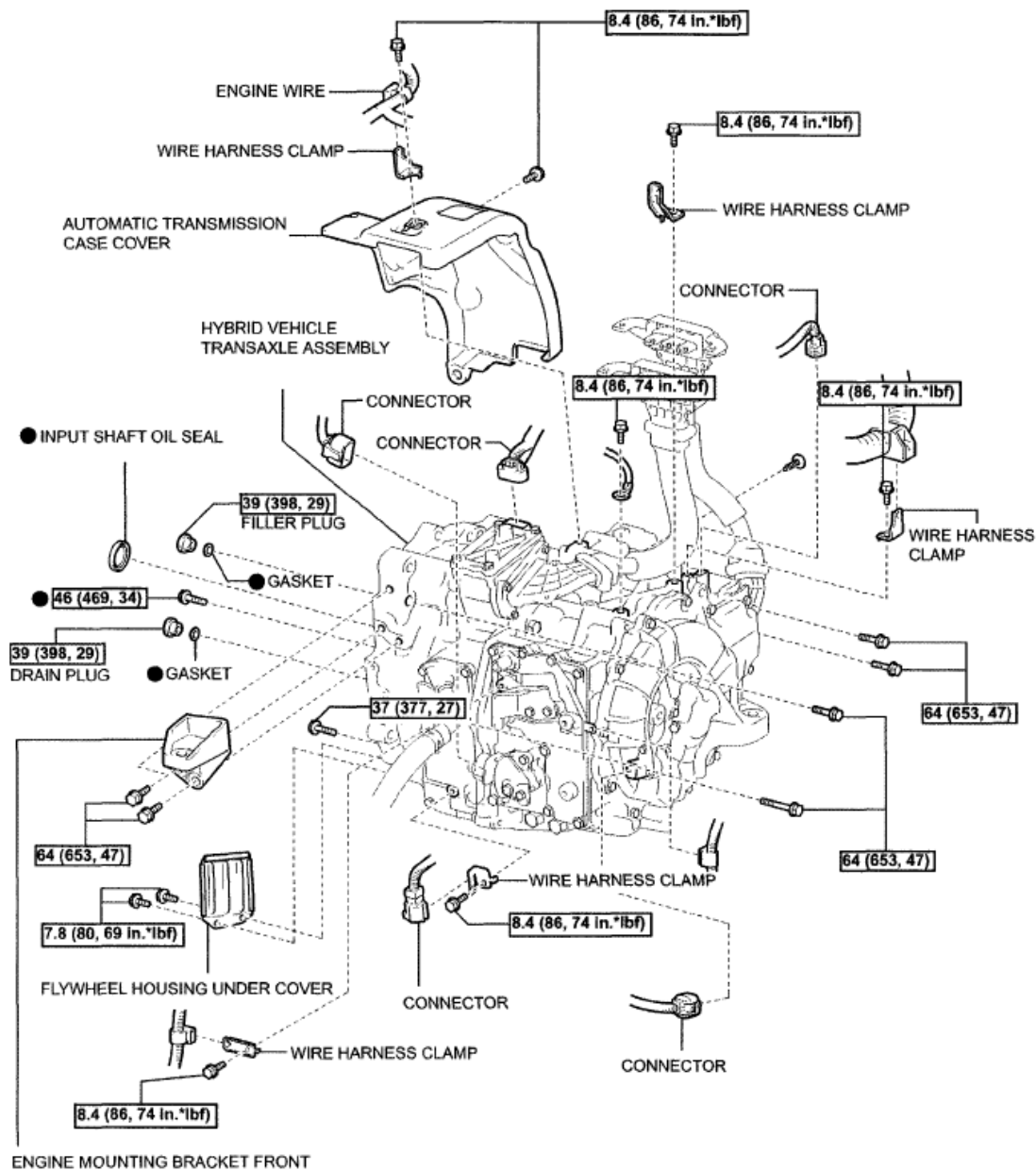


Fig. 117: Identifying Input Shaft Oil Seal Components With Torque Specifications (1 Of 2)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



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

C114718E01

Fig. 118: Identifying Input Shaft Oil Seal Components With Torque Specifications (2 Of 2)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

1. REMOVE ENGINE ASSEMBLY WITH TRANSAXLE

(See **REMOVAL**)

2. **REMOVE MANIFOLD STAY** (See **REMOVAL**)
3. **REMOVE HV TRANSAXLE MASS DAMPER** (See **REMOVAL**)
4. **REMOVE FRONT FRAME ASSEMBLY** (See **REMOVAL**)
5. **REMOVE FRONT DRIVE SHAFT ASSEMBLY LH** (See **REMOVAL**)
6. **REMOVE FRONT DRIVE SHAFT ASSEMBLY RH** (See **REMOVAL**)
7. **REMOVE FLYWHEEL HOUSING UNDER COVER** (See **REMOVAL**)
8. **SEPARATE ENGINE WIRE** (See **REMOVAL**)
9. **REMOVE AUTOMATIC TRANSMISSION CASE COVER** (See **REMOVAL**)
10. **REMOVE ENGINE MOUNTING BRACKET FRONT** (See **REMOVAL**)
11. **REMOVE HYBRID VEHICLE TRANSAXLE ASSEMBLY** (See **REMOVAL**)
12. **REMOVE INPUT SHAFT OIL SEAL**
 - a. Using a screwdriver with the tip taped, remove the oil seal.

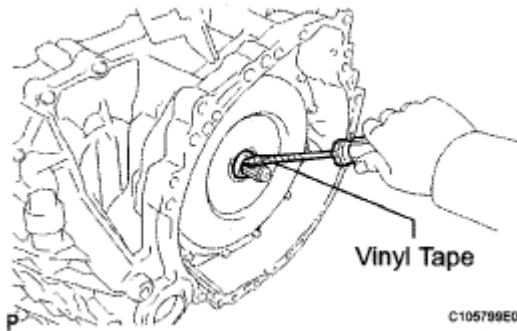


Fig. 119: Removing Input Shaft Oil Seal

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

INSTALLATION

1. **INSTALL INPUT SHAFT OIL SEAL**
 - a. Using SST and a hammer, drive in a new oil seal.

SST 09388-40010

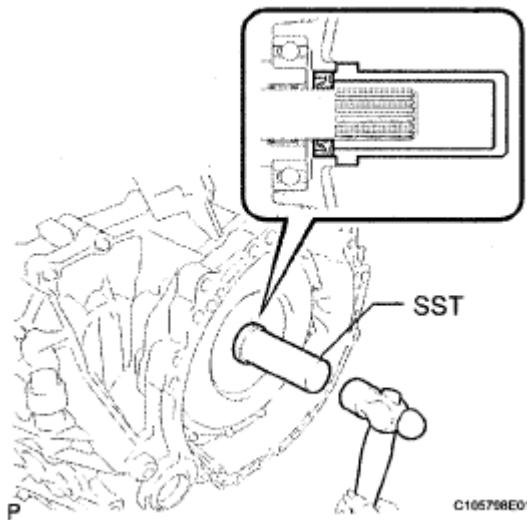


Fig. 120: Identifying Input Shaft Oil Seal

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

2. **INSTALL HYBRID VEHICLE TRANSAXLE ASSEMBLY** (See INSTALLATION)
3. **INSTALL ENGINE MOUNTING BRACKET FRONT** (See INSTALLATION)
4. **INSTALL AUTOMATIC TRANSMISSION CASE COVER** (See INSTALLATION)
5. **CONNECT ENGINE WIRE** (See INSTALLATION)
6. **INSTALL FLYWHEEL HOUSING UNDER COVER** (See INSTALLATION)
7. **INSTALL FRONT DRIVE SHAFT ASSEMBLY LH** (See INSTALLATION)
8. **INSTALL FRONT DRIVE SHAFT ASSEMBLY RH** (See INSTALLATION)
9. **INSTALL FRONT FRAME ASSEMBLY** (See INSTALLATION)
10. **INSTALL HV TRANSAXLE MASS DAMPER** (See INSTALLATION)
11. **INSTALL MANIFOLD STAY** (See INSTALLATION)
12. **INSTALL ENGINE ASSEMBLY WITH TRANSAXLE**

(See INSTALLATION)

TRANSAXLE CONTROL CABLE ASSEMBLY

COMPONENTS

2007 TRANSMISSION P310 Hybrid Transmission / Transaxle - Highlander Hybrid



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

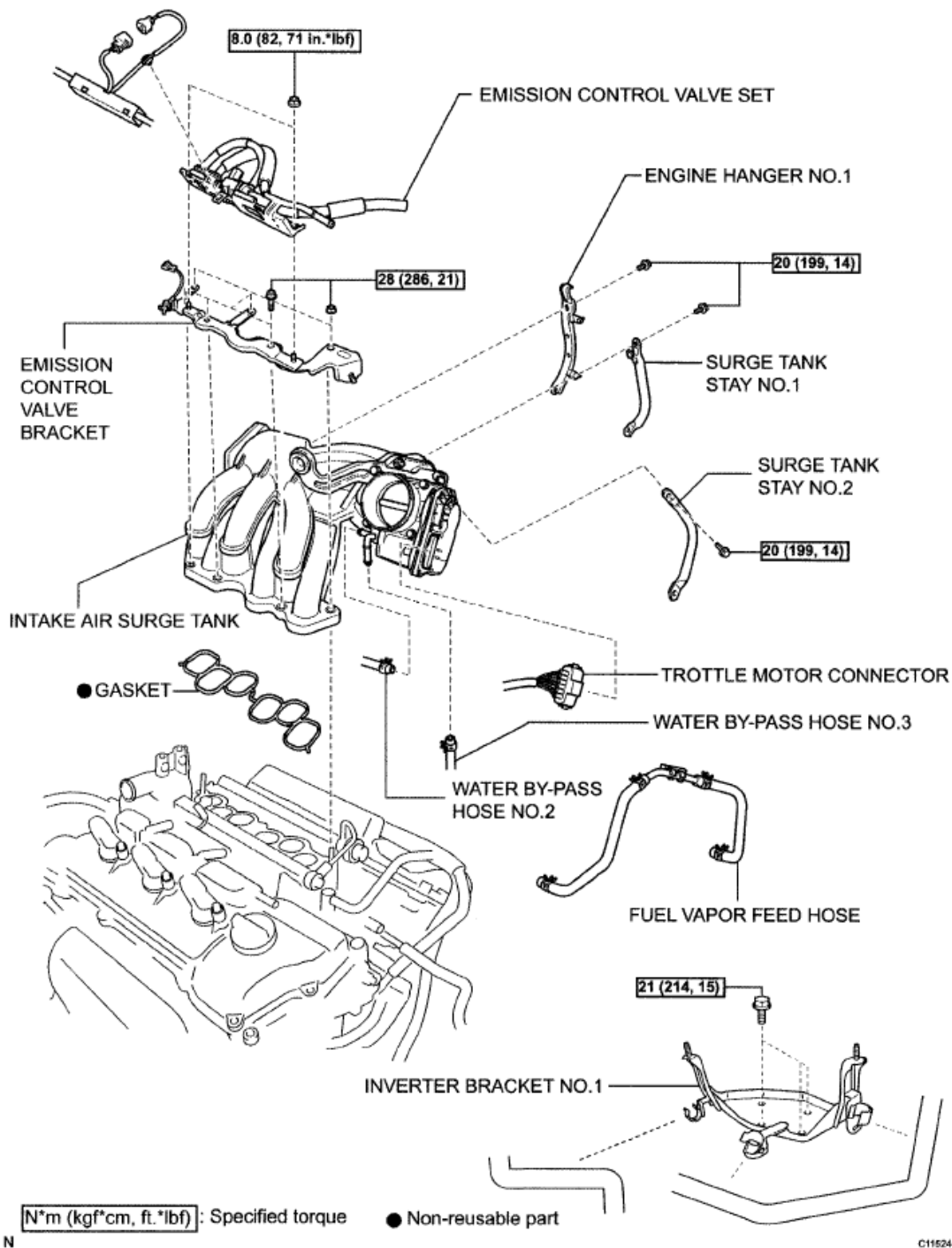


Fig. 122: Identifying Transaxle Control Cable Assembly Components With Torque Specifications (2 Of 4)

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

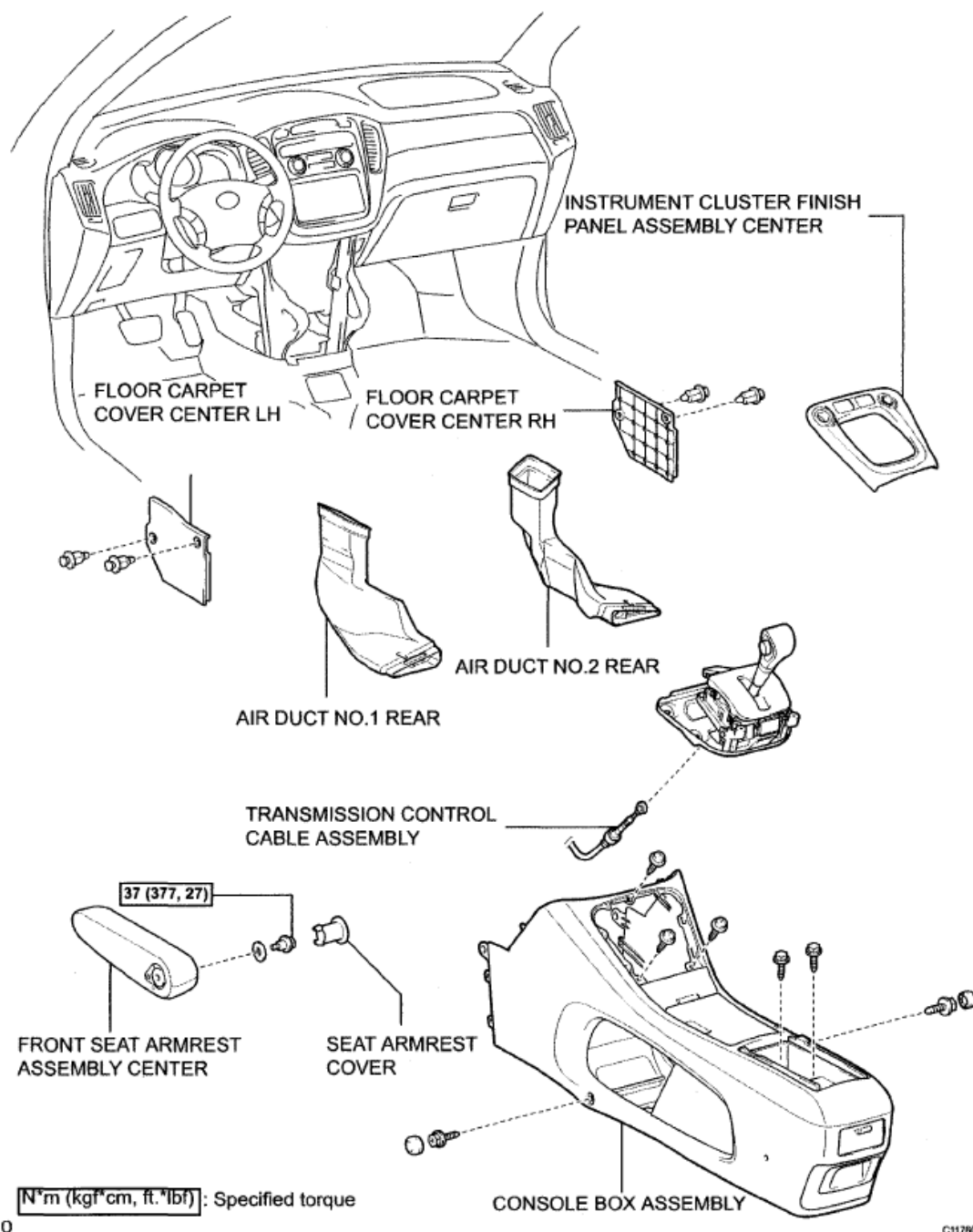


Fig. 123: Identifying Transaxle Control Cable Assembly Components With Torque Specification (3 Of 4)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

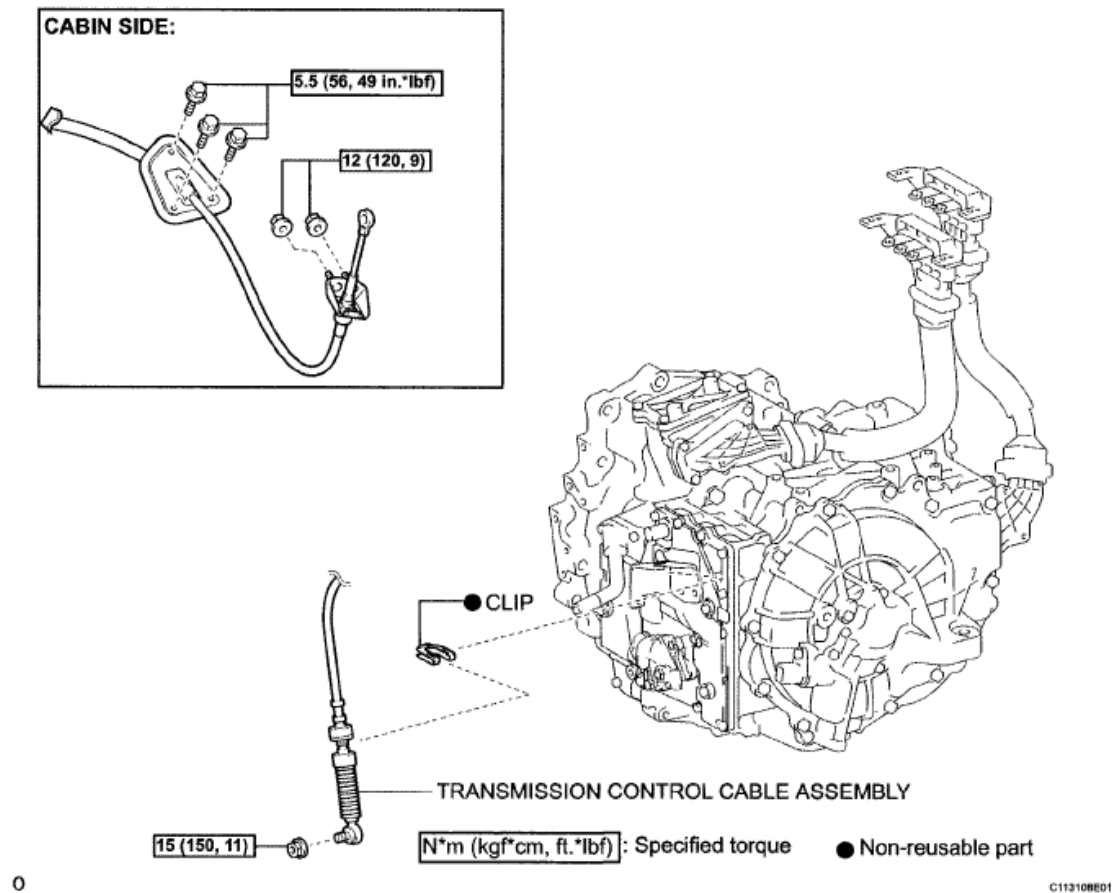


Fig. 124: Identifying Transaxle Control Cable Assembly Components With Torque Specifications (4 Of 4)

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

REMOVAL

1. PRECAUTION

(See PRECAUTION)

2. REMOVE ENGINE UNDER COVER NO.1 (See REMOVAL)

3. DRAIN COOLANT (Engine side) (See COOLANT)

4. DRAIN COOLANT (Hybrid side) (See REPLACEMENT)

5. REMOVE W/CONVERTER INVERTER ASSEMBLY

(See REMOVAL)

6. REMOVE INVERTER BRACKET NO.1 (See REMOVAL)

7. REMOVE EMISSION CONTROL VALVE SET (See REMOVAL)

8. REMOVE INTAKE AIR SURGE TANK (See REMOVAL)

9. **REMOVE INSTRUMENT CLUSTER FINISH PANEL ASSEMBLY CENTER** (See **REMOVAL**)
10. **REMOVE FLOOR CARPET COVER CENTER RH** (See **REMOVAL**)
11. **REMOVE FLOOR CARPET COVER CENTER LH** (See **REMOVAL**)
12. **REMOVE FRONT SEAT ARMREST ASSEMBLY CENTER** (See **REMOVAL**)
13. **REMOVE CONSOLE BOX ASSEMBLY** (See **REMOVAL**)
14. **REMOVE AIR DUCT NO.2 REAR** (See **REMOVAL**)
15. **REMOVE AIR DUCT NO.1 REAR** (See **REMOVAL**)
16. **SEPARATE TRANSMISSION CONTROL CABLE ASSEMBLY**
 - a. In the engine compartment
 1. Remove the nut from the control shaft lever.

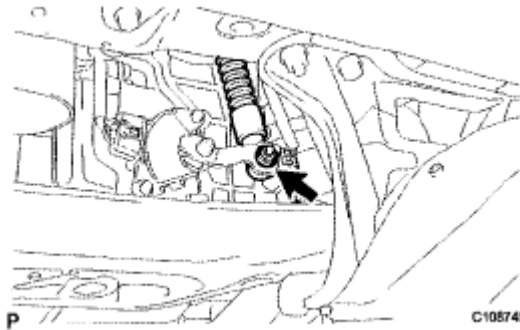


Fig. 125: Locating Control Cable To Control Shaft Lever
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. Remove the clip and disconnect the control cable from the control cable bracket.

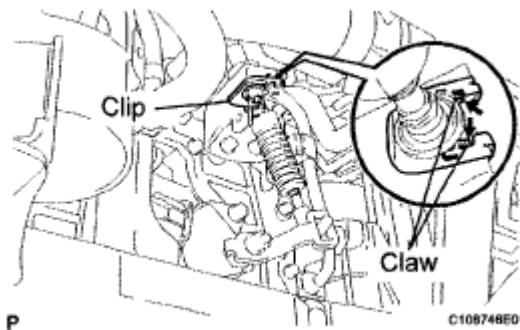


Fig. 126: Locating Control Cable
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Disconnect the control cable from the control cable bracket No.2.

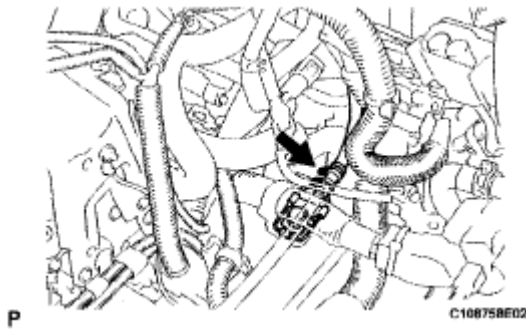


Fig. 127: Locating Control Cable To Control Cable Clamp
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

c. In the cabin

1. Disconnect the floor shift transmission control cable assembly end from the floor shift assembly.

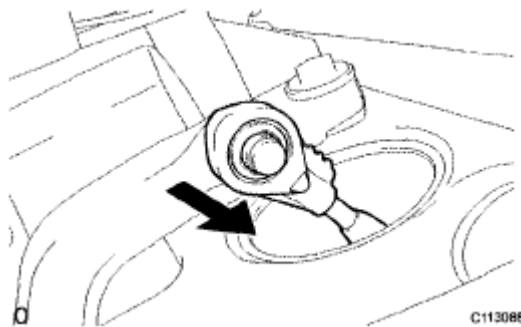


Fig. 128: Locating Floor Shift Transmission Control Cable
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. Remove the 2 nuts.

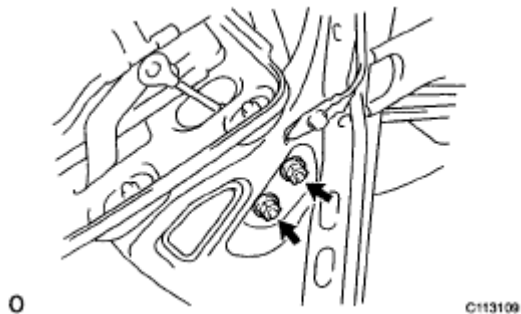


Fig. 129: Locating Control Cable And Nuts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

17. REMOVE TRANSMISSION CONTROL CABLE ASSEMBLY

- a. Remove the 3 bolts.

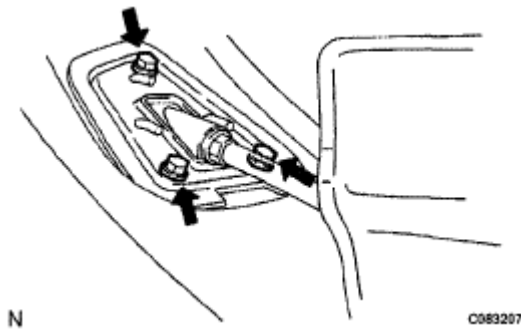


Fig. 130: Locating Transmission Control Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Pull out the control cable from the body.

INSTALLATION

1. INSTALL TRANSMISSION CONTROL CABLE ASSEMBLY

- a. Pull in the control cable to the body.
- b. Install the 3 bolts.

Torque: 5.5 N*m (56 kgf*cm, 49 in.*lbf)

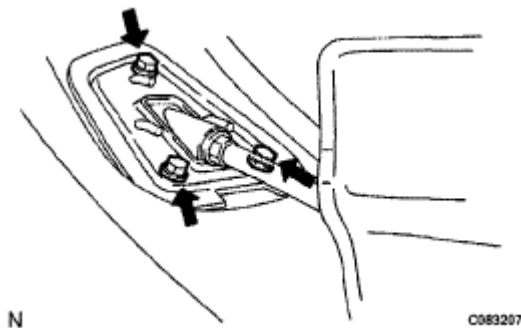
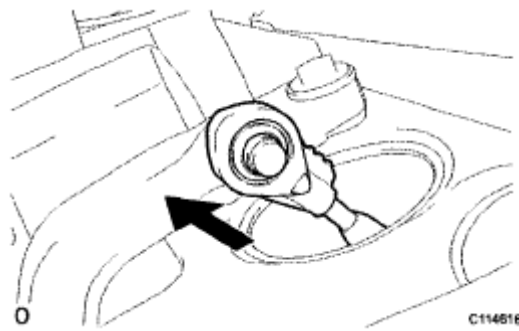


Fig. 131: Locating Transmission Control Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. CONNECT TRANSMISSION CONTROL CABLE ASSEMBLY

- a. In the cabin
 1. Install the cable end, as shown in the illustration.

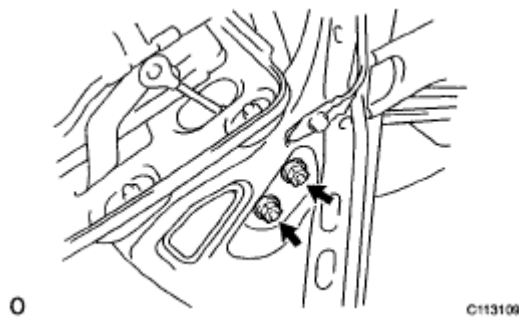
NOTE: Install the transmission control cable assembly with the graduated cuts to face upward to prevent torsion of the inner cable.

**Fig. 132: Locating Cable End**

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

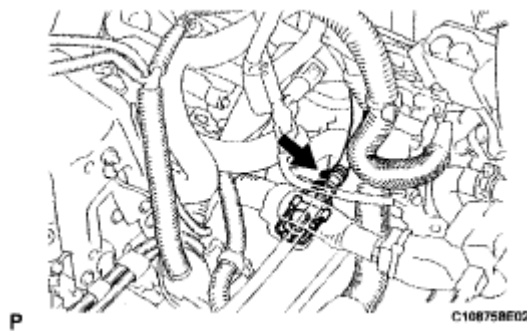
2. Install the control cable and 2 nuts.

Torque: 12 N*m (120 kgf*cm, 9 ft.*lbf)

**Fig. 133: Locating Control Cable And Nuts**

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

- b. Move the shift lever to the N position.
- c. In the engine compartment
 1. Connect the control cable to the control cable clamp.

**Fig. 134: Locating Control Cable To Control Cable Clamp**

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

- d. Move the control shaft lever to the N position.
- e. Install a new clip to the control bracket.
- f. Install the control cable to the control bracket.

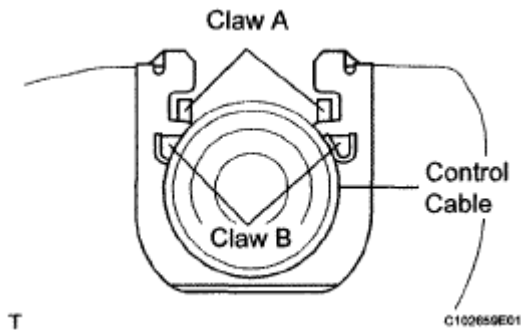


Fig. 135: Identifying Clip To Control Bracket

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

NOTE:

- Make sure that the A claws on the clip are securely fit into the bracket holes.
- Make sure that the cable is securely installed inside of the B claws of the clip.

- g. Temporarily install the control cable to the control shaft lever with the nut.

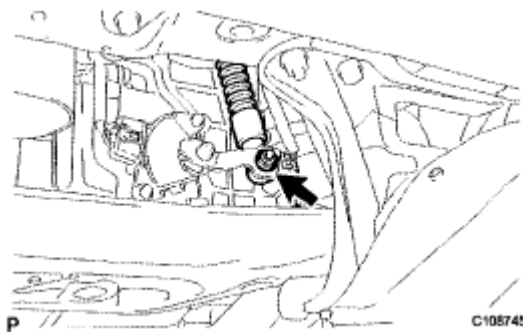


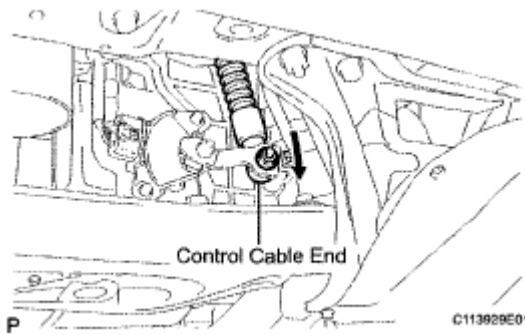
Fig. 136: Locating Control Cable To Control Shaft Lever

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

- h. Lightly pull down the control cable end.

NOTE:

Do not push the control cable end excessively.

**Fig. 137: Locating Control Cable Nut**

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

- i. Release your hand from the control cable end and then fully tighten the nut.

Torque: 15 N*m (150 kgf*cm, 11 ft.*lbf)

3. **INSTALL AIR DUCT NO.2 REAR** (See INSTALLATION)
4. **INSTALL AIR DUCT NO.1 REAR**
5. **INSTALL CONSOLE BOX ASSEMBLY** (See INSTALLATION)
6. **INSTALL FRONT SEAT ARMREST ASSEMBLY CENTER** (See INSTALLATION)
7. **INSTALL FLOOR CARPET COVER CENTER LH** (See INSTALLATION)
8. **INSTALL FLOOR CARPET COVER CENTER RH** (See INSTALLATION)
9. **INSTALL INSTRUMENT CLUSTER FINISH PANEL ASSEMBLY CENTER** (See INSTALLATION)
10. **INSTALL INTAKE AIR SURGE TANK** (See INSTALLATION)
11. **INSTALL EMISSION CONTROL VALVE SET** (See INSTALLATION)
12. **INSTALL INVERTER BRACKET NO.1** (See INSTALLATION)
13. **INSTALL W/CONVERTER INVERTER ASSEMBLY**

(See INSTALLATION)

14. **ADD COOLANT (Hybrid side)** (See REPLACEMENT)
15. **ADD COOLANT (Engine side)** (See COOLANT)
16. **CHECK FOR COOLANT LEAKS (Hybrid side)**
17. **CHECK FOR COOLANT LEAKS (Engine side)** (See COOLING SYSTEM)
18. **INSPECT SHIFT LEVER POSITION** (See ADJUSTMENT)
19. **ADJUST SHIFT LEVER POSITION** (See ADJUSTMENT)
20. **INSPECT SHIFT LEVER OPERATION** (See ADJUSTMENT)
21. **INSTALL ENGINE UNDER COVER NO.1** (See INSTALLATION)
22. **PERFORM INITIALIZATION**

(See INITIALIZATION)