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Model Year Start: 2024	Model: Land Cruiser	Prod Date Range: [02/2024 -]
Title: L580F (HYBRID TRANSMISSION / TRANSAXLE): HYBRID TRANSMISSION FLUID: ADJUSTMENT; 2024 MY Land Cruiser [02/2024 -]		

ADJUSTMENT

CAUTION / NOTICE / HINT

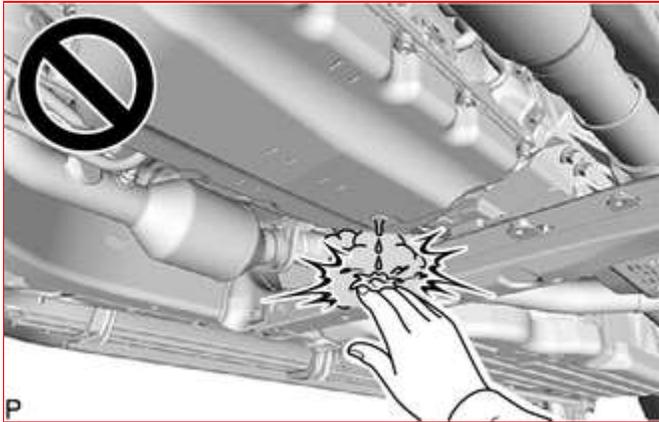
The necessary procedures (adjustment, initialization or registration) that must be performed after replacing the transmission fluid are shown below.

Necessary Procedures After Parts Removed/Installed/Replaced

REPLACEMENT PART OR PROCEDURE	NECESSARY PROCEDURE	EFFECT/INOPERATIVE FUNCTION WHEN NECESSARY PROCEDURES ARE NOT PERFORMED	LINK
Transmission fluid	ATF thermal degradation estimate reset	The value of the Data List item "ATF Thermal Degradation Estimate" is not estimated correctly.	#FDC

CAUTION:

- Be careful not to burn yourself when the transmission fluid temperature is high.



- To prevent injury due to contact with an operating V-ribbed belt or cooling fan, keep your hands and clothing away from the V-ribbed belt and cooling fans when working in the engine compartment with the ignition



switch ON (READY) or the ignition switch to ON.

- To prevent burns, do not touch the engine, exhaust pipe or other high temperature components while the



engine is hot.

PROCEDURE

1. PRECAUTIONS AND WORK DESCRIPTION

- (a) The L580F hybrid vehicle transmission assembly does not have an oil filler tube and oil level gauge. When adding transmission fluid, add transmission fluid through the refill hole on the automatic transmission case sub-assembly. The transmission fluid level can be adjusted by draining excess transmission fluid (allowing excess transmission fluid to overflow) through the drain (ATM) plug sub-assembly of the transmission housing.

HINT:

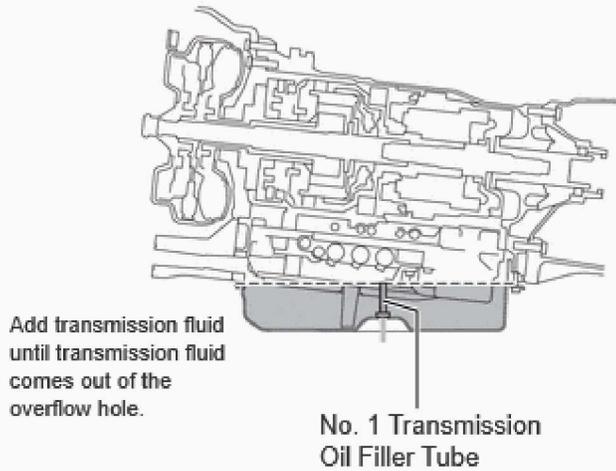
"Overflow" indicates the condition under which transmission fluid comes out of the overflow hole.

- (b) Before adjusting the transmission fluid level, add the specified amount of transmission fluid when the engine is cold and warm up the engine to circulate the transmission fluid in the hybrid vehicle transmission assembly. Ensure that the transmission fluid temperature is as specified and the engine is idling.

Transmission Fluid Filling Procedure:

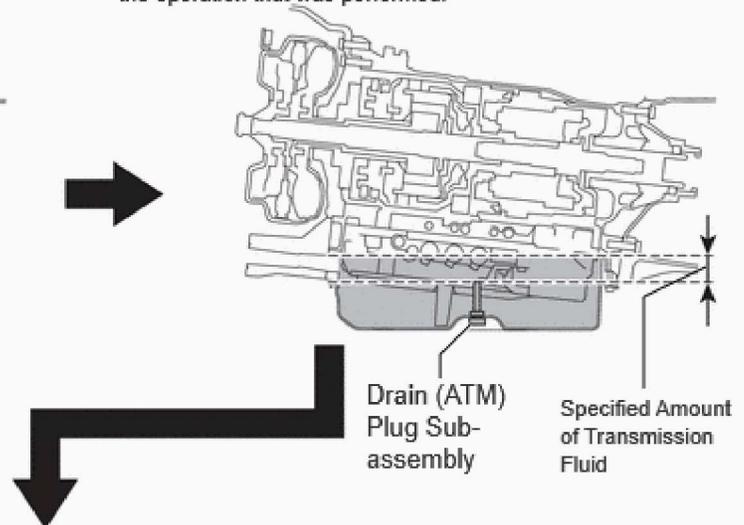
1. PERFORM INITIAL FILLING

Add transmission fluid to the hybrid vehicle transmission assembly to the specified level.



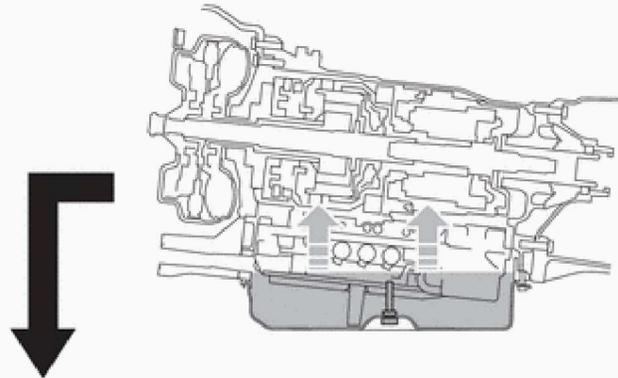
2. ADD SPECIFIED AMOUNT OF TRANSMISSION FLUID

Add the correct amount of transmission fluid specified for the operation that was performed.



3. ADJUST TRANSMISSION FLUID TEMPERATURE

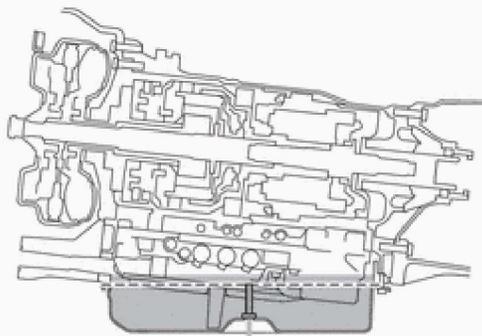
Start the engine to circulate the transmission fluid. Activate transmission fluid temperature detection mode and engine idle speed control mode, and adjust the transmission fluid temperature to the specified value.



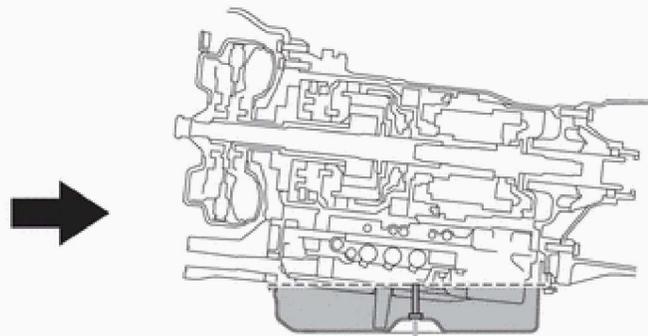
4. ADJUST TRANSMISSION FLUID LEVEL

Drain excess transmission fluid at the specified transmission fluid temperature.

If no transmission fluid comes out, add transmission fluid until transmission fluid comes out of the overflow hole.



Keep the overflow hole open until the fluid slows and the only drips come out.



Add transmission fluid until transmission fluid comes out of the overflow hole.

(c) The L580F hybrid vehicle transmission assembly requires Toyota Genuine ATF WS.

Using transmission fluid other than the above type may cause abnormal noise or vibration, or ultimately damage the transmission.

(d) Always maintain the vehicle in a level position when adding, checking or adjusting the transmission fluid level.

(e) When performing the procedure, make sure to turn off all electrical loads, such as the air conditioning, headlights and cooling fan.

(f) The fluid temperature in the text indicates the fluid temperature (in Transmission valve body assembly) displayed on the GTS.

(g) The adjustment should be performed according to the procedures and notes.

2. WORK FLOW

(a) The adjustment should be performed according to the procedure referenced in the work flow below.

WORK FLOW:

START

Step 3. Before Filling
Transmission

Work before adjusting the transmission fluid

Step 4. Perform Initial Filling

Operations that require initial filling:

- Transmission fluid drain and refill
- Removal and installation of the hybrid module assembly
- Removal and installation of the automatic transmission oil pan sub-assembly (for Transmission Side)
- Removal and installation of the transmission valve body assembly (for Transmission Side and Motor Side)
- Removal and installation of the torque converter assembly

Operations that do not require initial filling:

- Disconnection of an oil cooler tube or oil cooler hose
- Repair of a transmission fluid leak, etc.

Step 5. Add Specified Amount of Transmission Fluid

Add specified amount of transmission fluid

Step 6, 7. Adjust Transmission Fluid Temperature

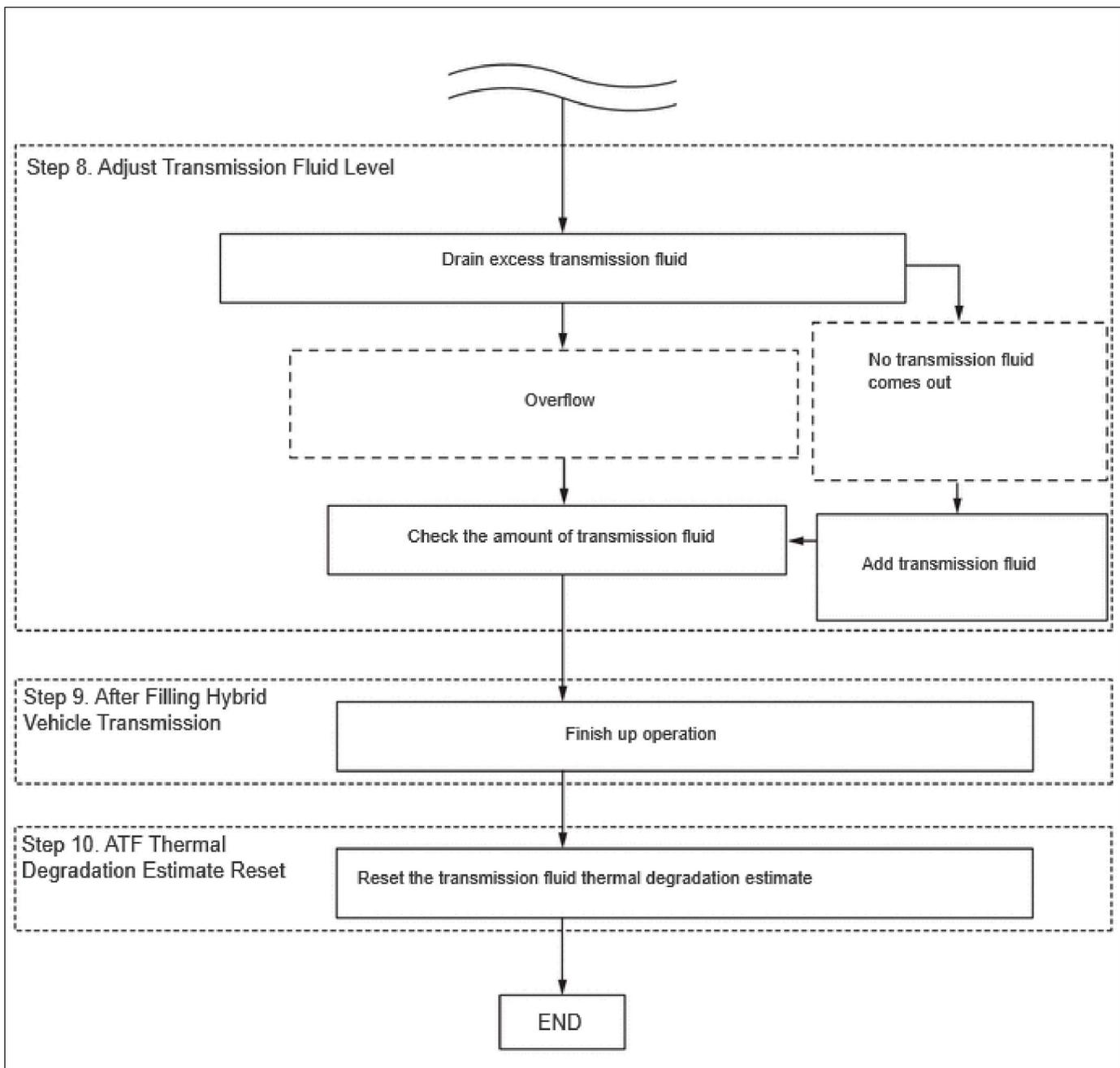
Activate transmission fluid temperature detection mode and engine idle speed control mode

Idling (Warm up the transmission fluid)

Above transmission fluid level
adjustment temperature

Transmission fluid level adjustment temperature





3. BEFORE FILLING TRANSMISSION

NOTICE:

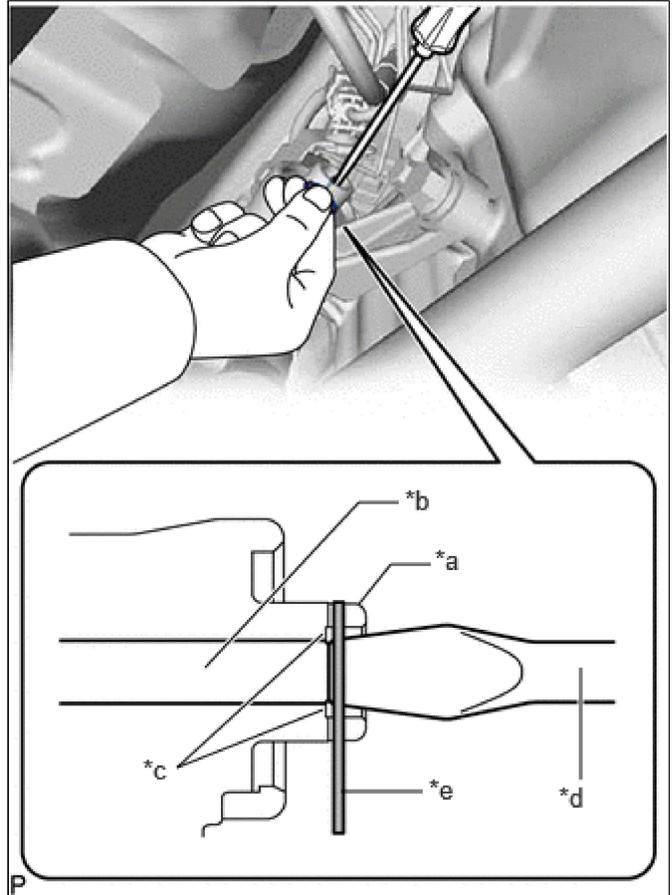
If the hybrid vehicle transmission assembly is hot (transmission fluid temperature is high), wait until the transmission fluid temperature becomes the same as the ambient temperature before starting the following procedure. (Recommended transmission fluid temperature: around 20°C (68°F))

- (a) Lift the vehicle.

NOTICE:

The transmission fluid level cannot be measured accurately if the vehicle is not level. Make sure it is held level.

- (b) Using compressed air, etc., blow dust off the thermostat cap to clean it.



*a	Cap
*b	Shaft
*c	Step
*d	Screwdriver
*e	Pin

(c) Using a screwdriver, push the shaft of the thermostat.

HINT:

- Pushed Amount: 5.5 to 7.0 mm (0.217 to 0.276 in.)
- Push the shaft until the screwdriver contacts the step inside the cap.

(d) With the shaft of the thermostat pressed, push a pin into a hole on the side of the thermostat's cap. Insert the pin until it passes through the hole on the other side of the thermostat's cap to fix the shaft in place.

NOTICE:

While the pin is inserted, do not increase the transmission fluid temperature to 93 °C (199 °F) or higher.

HINT:

Pin diameter: 1.5 mm (0.0591 in.)

4. PERFORM INITIAL FILLING

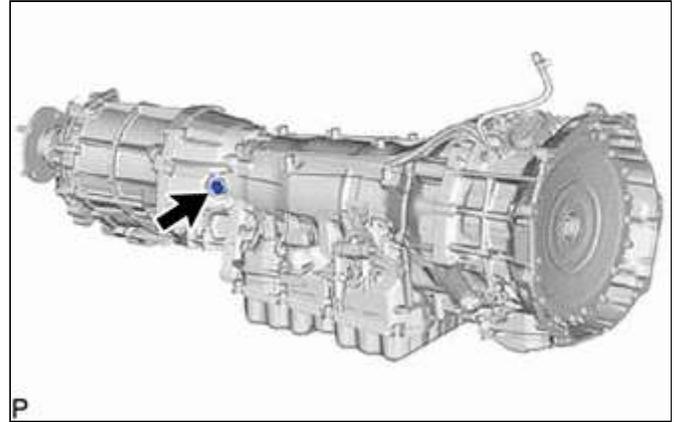
NOTICE:

After performing either of the following operations, it is not necessary to perform the fill transmission pan with fluid procedure. Proceed to the "Add Specified Amount of Transmission Fluid" procedure.

Operations that do not require initial filling

- Disconnection of an oil cooler tube or oil cooler hose
- Repair of a transmission fluid leak, etc.

(a) Remove the transmission case adapter refill plug and gasket from the hybrid vehicle transmission assembly.



(b) Using a 6 mm hexagon socket wrench, remove the drain (ATM) plug sub-assembly and gasket from the hybrid vehicle transmission assembly.

NOTICE:

- If transmission fluid comes out after removing the drain (ATM) plug sub-assembly, wait until the transmission fluid flow slows and only drips come out.
- If transmission fluid comes out, it is not necessary to perform the perform initial filling procedure. After checking the tightening torque of the No. 1 transmission oil filler tube, temporarily install the drain (ATM) plug sub-assembly and gasket.

HINT:

Gasket replacement and tightening of the drain (ATM) plug sub-assembly are performed after the transmission fluid level is adjusted.

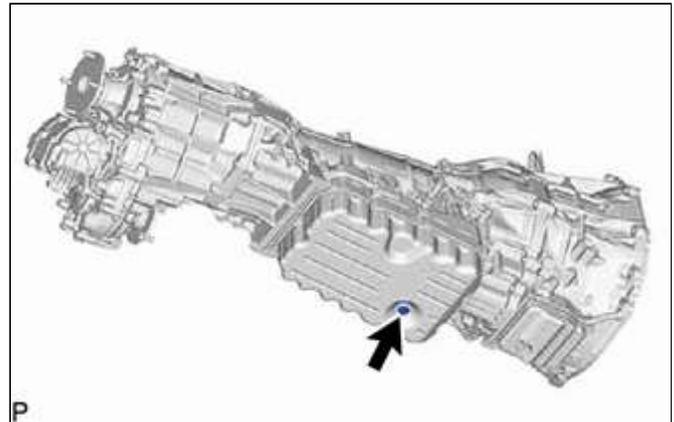
(c) Using a 6 mm hexagon socket wrench, check that the No. 1 transmission oil filler tube is tightened to the specified torque.

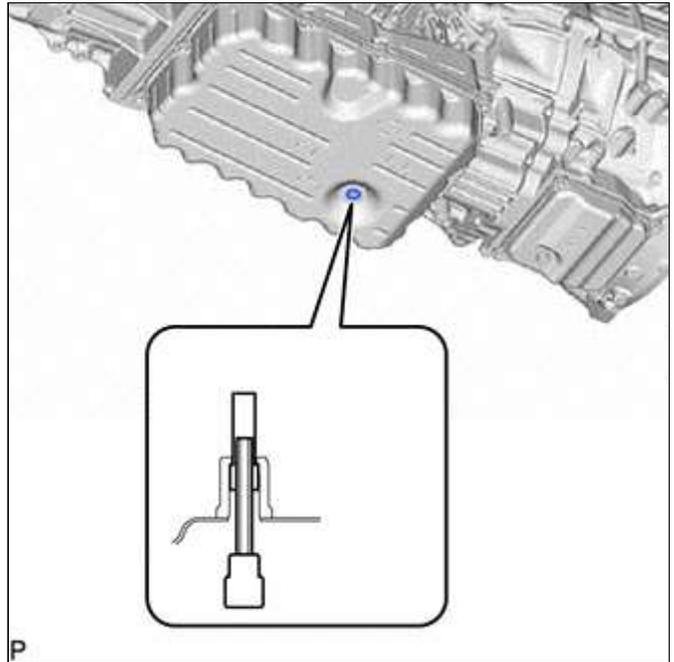
Torque:

1.7 N·m {17 kgf·cm, 15 in·lbf}

NOTICE:

If the No. 1 transmission oil filler tube is not tightened to the specified torque, the amount of transmission fluid cannot be precisely adjusted.





(d) Add transmission fluid to the refill hole until it flows out of the overflow hole.

NOTICE:

- Use Toyota Genuine ATF WS.

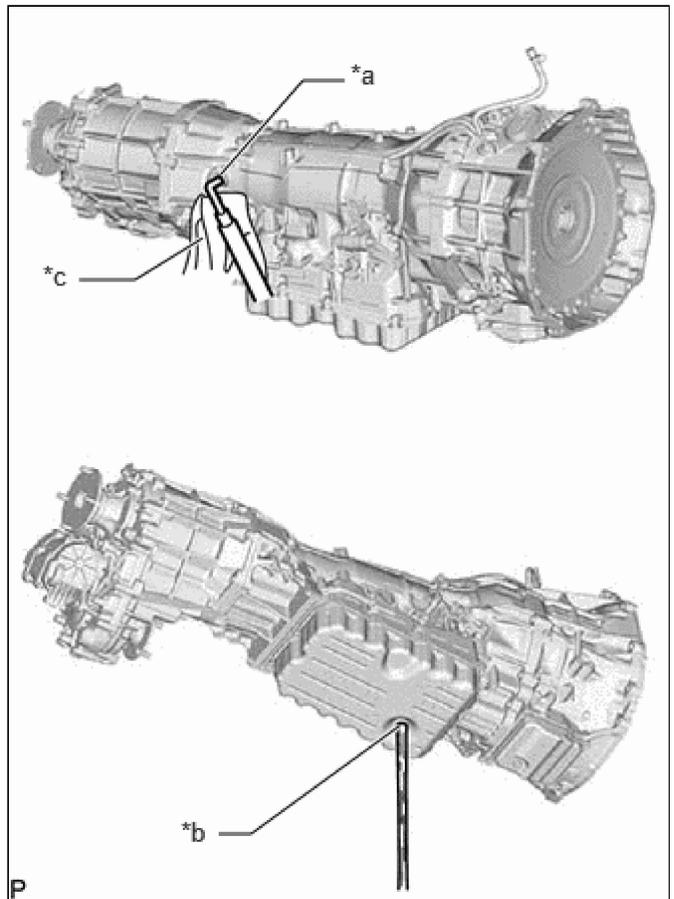
Using transmission fluid other than the above type may cause abnormal noise or vibration, or ultimately damage the transmission.

- Be sure to add transmission fluid slowly. If transmission fluid is added quickly, the transmission fluid may hit internal parts and bounce back, resulting in transmission fluid coming out of the refill hole.

HINT:

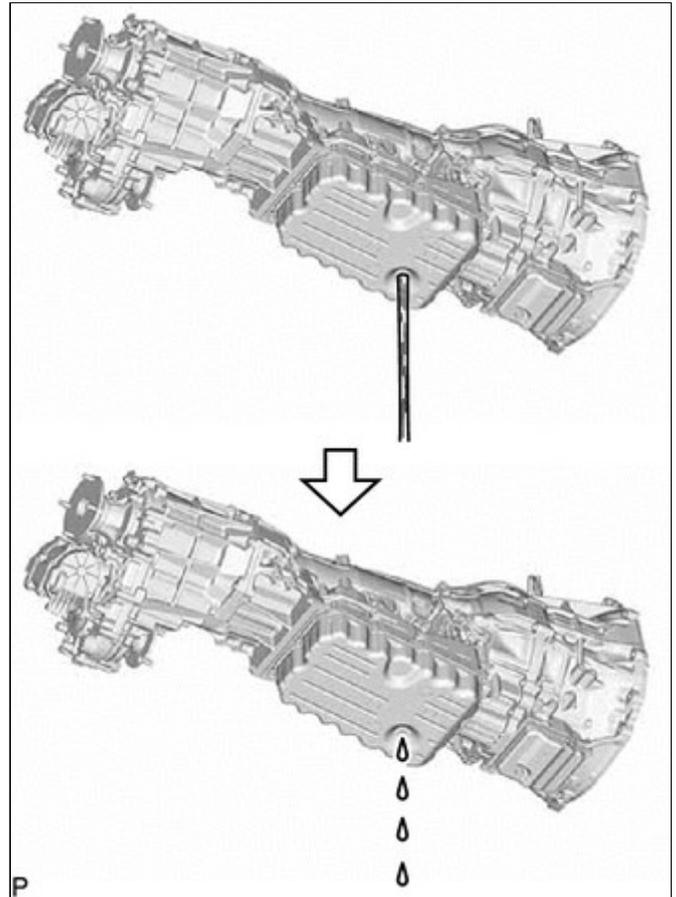
When pouring transmission fluid into the refill hole, cover the area surrounding the refill hole with a cloth.

If transmission fluid adheres to the automatic transmission oil pan sub-assembly, it may be mistaken for a transmission fluid leak.



*a	Refill Hole
*b	Overflow Hole
*c	Cloth

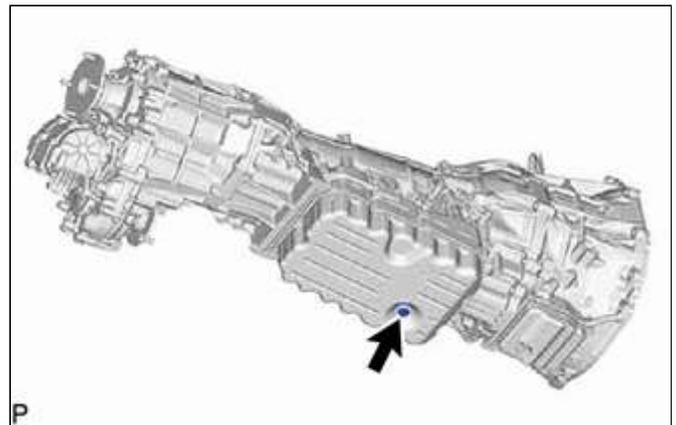
(e) Wait until the transmission fluid flow slows and only drips come out.



(f) Using a 6 mm hexagon socket wrench, temporarily install the drain (ATM) plug sub-assembly and gasket to the hybrid vehicle transmission assembly.

HINT:

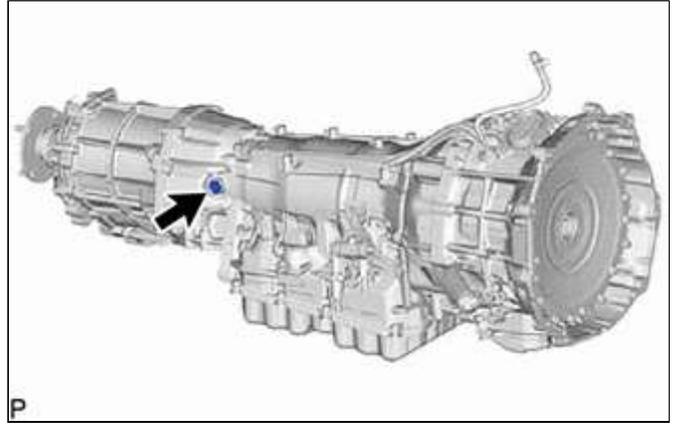
Gasket replacement and tightening of the drain (ATM) plug sub-assembly are performed after the transmission fluid level is adjusted.



(g) Temporarily install the gasket and transmission case adapter refill plug to the hybrid vehicle transmission assembly.

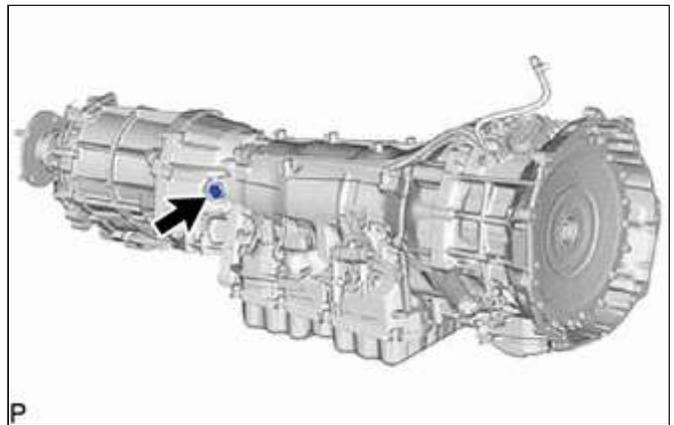
HINT:

Gasket replacement and tightening of the transmission case adapter refill plug are performed after the transmission fluid level is adjusted.



5. ADD SPECIFIED AMOUNT OF TRANSMISSION FLUID

- (a) Remove the transmission case adapter refill plug and gasket from the hybrid vehicle transmission assembly.



- (b) Fill the hybrid vehicle transmission assembly with the correct amount of transmission fluid as listed in the table below.

Standard Capacity:

PERFORMED REPAIR	FILL AMOUNT
Transmission fluid drain and refill	3.9 liters (4.1 US qts, 3.4 Imp. qts)
Removal and installation of the hybrid module assembly	6.5 liters (6.9 US qts, 5.7 Imp. qts)
for Transmission Side: Removal and installation of the automatic transmission oil pan sub-assembly	7.4 liters (7.8 US qts, 6.5 Imp. qts)
for Transmission Side: Removal and installation of the transmission valve body assembly	7.9 liters (8.3 US qts, 7.0 Imp. qts)
for Motor Side: Removal and installation of the transmission valve body assembly	6.6 liters (6.9 US qts, 5.8 Imp. qts)
Removal and installation of the torque converter assembly	2.6 liters (2.7 US qts, 2.3 Imp. qts)

NOTICE:

- Use Toyota Genuine ATF WS.

Using transmission fluid other than the above type may cause abnormal noise or vibration, or ultimately damage the transmission.

- Be sure to add transmission fluid slowly. If transmission fluid is added quickly, the transmission fluid may hit internal parts and bounce back, resulting in transmission fluid coming out of the refill hole.

HINT:

- The amount of transmission fluid to be added differs depending on the performed repair.
- When pouring transmission fluid into the refill hole, cover the area surrounding the refill hole with a cloth.

If transmission fluid adheres to the automatic transmission oil pan sub-assembly, it may be mistaken for a transmission fluid leak.

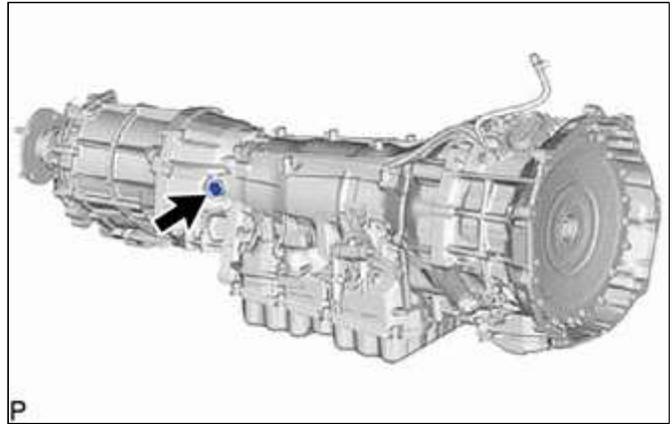
- When pouring transmission fluid into the refill hole, it may not be possible to pour the specified amount of transmission fluid because of overflow from the refill hole. In this case, perform the steps below to circulate the transmission fluid through the oil lines in the hybrid vehicle transmission assembly and the torque converter assembly.

(c) If the specified amount of transmission fluid cannot be added, perform the following:

- (1) Temporarily install the gasket and transmission case adapter refill plug to the hybrid vehicle transmission assembly.

HINT:

Gasket replacement and tightening of the transmission case adapter refill plug are performed after the transmission fluid level is adjusted.



- (2) Lower the vehicle.
- (3) Depress and hold the brake pedal.
- (4) Turn the ignition switch to ON (READY).

NOTICE:

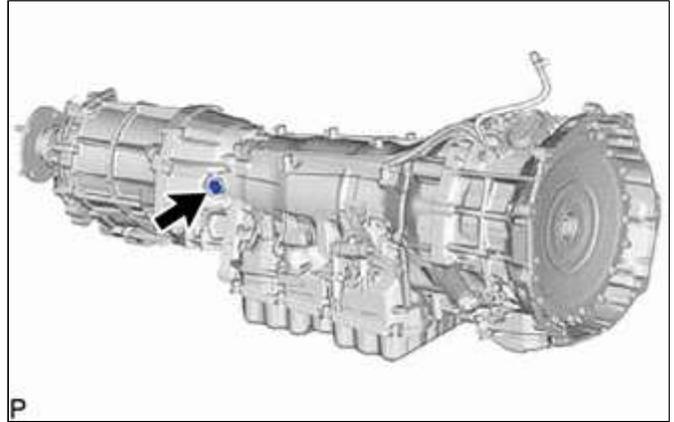
To reduce load, make sure that all electrical systems, such as the air conditioning, electric fan and audio system, are off.

- (5) Slowly move the shift position from P to D in the order of P → R → N → D, and then move the shift position back to P.

HINT:

Keep the shift position in each position for approximately 3 seconds.

- (6) Allow the engine to idle for 30 seconds to warm it up.
- (7) Turn the ignition switch off.
- (8) Remove the transmission case adapter refill plug and gasket from the hybrid vehicle transmission assembly.



(9) Fill the hybrid vehicle transmission assembly with the correct amount of transmission fluid as listed in the table above.

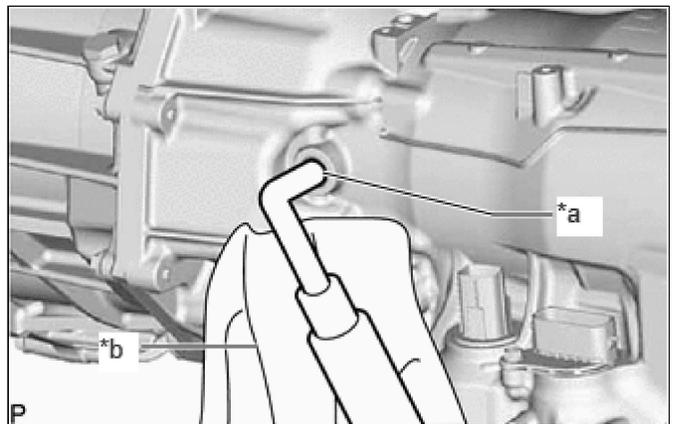
NOTICE:

- Use Toyota Genuine ATF WS.
Using transmission fluid other than the above type may cause abnormal noise or vibration, or ultimately damage the transmission.
- Be sure to add transmission fluid slowly. If transmission fluid is added quickly, the transmission fluid may hit internal parts and bounce back, resulting in transmission fluid coming out of the refill hole.

HINT:

When pouring transmission fluid into the refill hole, cover the area surrounding the refill hole with a cloth.

If transmission fluid adheres to the automatic transmission oil pan sub-assembly, it may be mistaken for a transmission fluid leak.

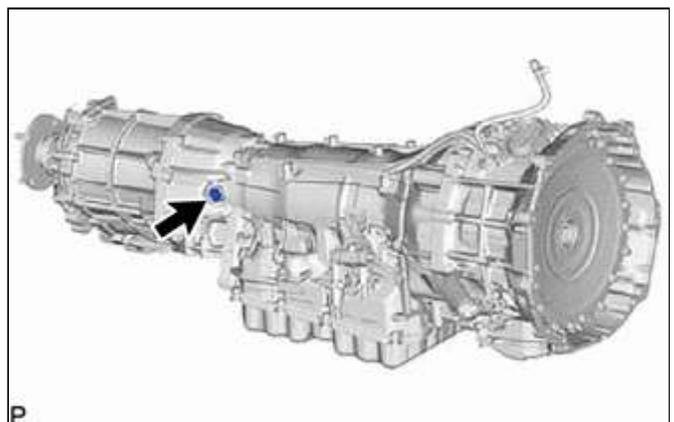


*a	Refill Hole
*b	Cloth

(d) Temporarily install the gasket and transmission case adapter refill plug to the hybrid vehicle transmission assembly.

HINT:

Gasket replacement and tightening of the transmission case adapter refill plug are performed after the transmission fluid level is adjusted.



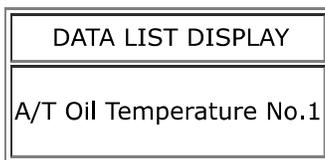
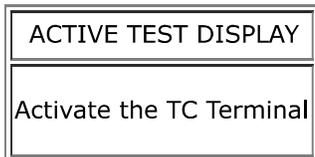
6. ADJUST TRANSMISSION FLUID TEMPERATURE (when Using the GTS)

NOTICE:

Use the shift position indicator light in the vehicle combination meter or the GTS to check whether the fluid temperature is appropriate for checking the fluid level. Even when using the GTS, it is necessary to switch to fluid temperature detection mode to activate engine idling speed control.

- (a) Activate the TC Terminal.
- (b) In order to check the transmission fluid temperature, perform the Active Test "Activate the TC Terminal" with the Data List item "A/T Oil Temperature No. 1" displayed. [#1]

Powertrain > Transmission > Active Test



- (c) Before beginning work, be sure to check that the transmission fluid temperature is below the lower limit of the permissible temperature range for adjusting fluid levels.

The Permissible Temperature Range for Adjusting Transmission Fluid:
35 to 41 °C (95 to 106 °F)

NOTICE:

If the transmission fluid temperature is higher than permissible temperature range for adjusting fluid levels, suspend work immediately. Lower the temperature to the lower limit of the permissible temperature range or less by moving the vehicle to a cooler location, etc.

- (d) Depress and hold the brake pedal.
- (e) Turn the ignition switch to ON (READY).

NOTICE:

To reduce load, make sure that all electrical systems, such as the air conditioning, electric fan and audio system, are off.

- (f) Slowly move the shift position from P to D in the order of P → R → N → D to circulate the transmission fluid through each part of transmission, and then move the shift position back to P.

HINT:

Keep the shift position in each position for approximately 3 seconds.

- (g) From the shift position in D, move the shift lever between N and D within 1.5 seconds for 6 seconds or more continuously to switch to fluid temperature detection mode.

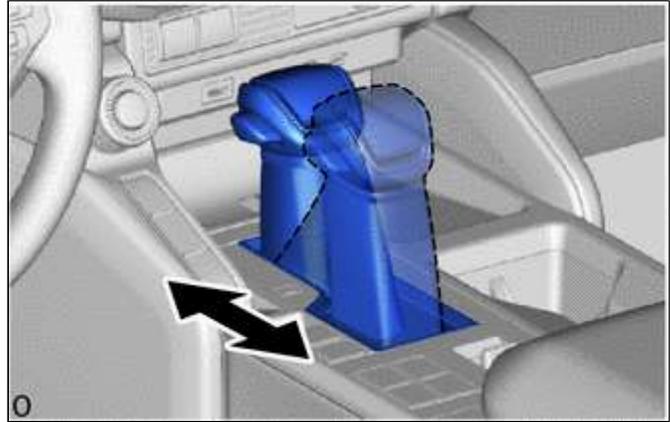
NOTICE:

Do not pause for more than 1.5 seconds.

HINT:

The fluid temperature detection mode will be activated by moving the shift lever between N and

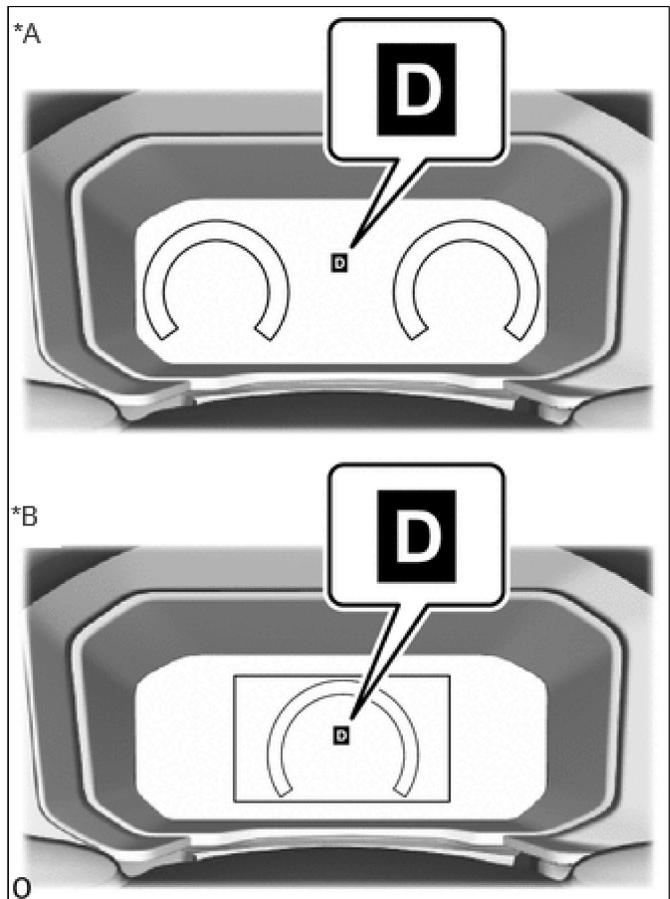
D within 1.5 seconds for 6 seconds or more continuously.



(h) Check that the D shift indicator comes on for 2 seconds and then turns off.

HINT:

- When transmission fluid temperature detection mode is activated, the D shift indicator on the combination meter comes on for 2 seconds.
- If the D shift indicator does not come on for 2 seconds, perform the steps from [#1] again.



*A	for Type A
*B	for Type B

(i) Return the shift position to P and turn off the Active Test "Activate the TC Terminal" on the GTS. (Disconnect the TC terminal)

NOTICE:

Make sure that the TC terminal is disconnected. If the TC terminal is connected, the transmission fluid level cannot be precisely adjusted due to fluctuations in engine speed.

HINT:

Even after the TC terminal is disconnected, fluid temperature detection mode is active until the ignition switch off.

- (j) Warm up the engine with the engine idling until the transmission fluid temperature reaches the appropriate fluid temperature (35°C (95°F) or higher and below 41°C (106°F)).

D Shift Indicator:

Below Transmission Fluid Level Adjustment Temperature	Transmission Fluid Level Adjustment Temperature	Above Transmission Fluid Level Adjustment Temperature
35°C or less (95°F or less)	35 to 41°C (95 to 106°F)	41°C or more (106°F or more)

1. If the transmission fluid temperature is within the appropriate fluid temperature range:

Immediately proceed to ADJUST TRANSMISSION FLUID LEVEL.

2. If the transmission fluid temperature is 41°C (106°F) or higher:

Stop the engine to cool the transmission fluid. Check that the transmission fluid temperature is below 41°C (106°F), and then perform the transmission fluid temperature adjusting procedure again.

NOTICE:

Perform the transmission fluid filling procedure at the appropriate fluid temperature (35°C (95°F) or higher and below 41°C (106°F)).

HINT:

In transmission fluid temperature detection mode, the D shift indicator comes on, turns off or blinks depending on the transmission fluid temperature.

D Shift Indicator:

	Below Transmission Fluid Level Adjustment Temperature	Transmission Fluid Level Adjustment Temperature	Above Transmission Fluid Level Adjustment Temperature
Transmission Fluid Temperature (GTS Display Temperature)	35°C or less (95°F or less)	35 to 41°C (95 to 106°F)	41°C or more (106°F or more)
D Shift Indicator	OFF	ON	Blinks

7. ADJUST TRANSMISSION FLUID TEMPERATURE (when Not Using the GTS)

NOTICE:

- Make sure to switch to fluid temperature detection mode within 60 seconds after starting the engine.
- At the fluid temperature detection mode, the shift position indicator D illuminates for 5 seconds before it flashes when moving the shift lever to P or N if it is an appropriate temperature or higher.

Shift position indicator D at fluid temperature detection mode

	Below Transmission Fluid Level Adjustment Temperature	Transmission Fluid Level Adjustment Temperature	Above Transmission Fluid Level Adjustment Temperature
Transmission Fluid Temperature (GTS Display Temperature)	35°C or less (95°F or less)	35 to 41°C (95 to 106°F)	41°C or more (106°F or more)
D Shift Indicator	OFF	ON	Blinks

- (a) Turn the ignition switch off. [#2]
- (b) Depress and hold the brake pedal.
- (c) Turn the ignition switch to ON (READY).

NOTICE:

To reduce load, make sure that all electrical systems, such as the air conditioning and audio system are off.

- (d) Slowly move the shift position from P to D in the order of P → R → N → D to circulate the transmission fluid through each part of the transmission, and then move the shift position back to P.

HINT:

Keep the shift position in each position for approximately 3 seconds.

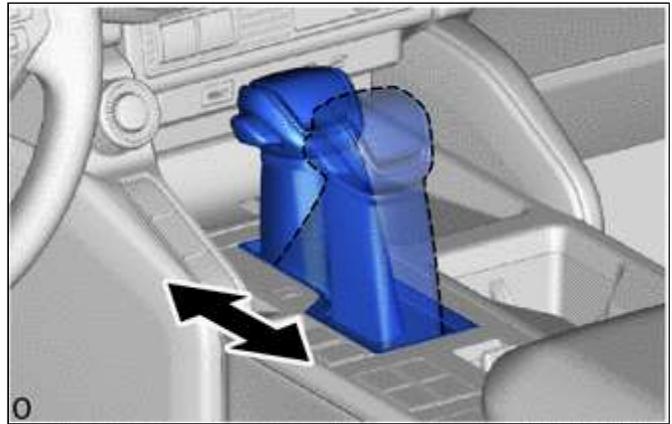
- (e) From the shift position in D, move the shift lever between N and D within 1.5 seconds for 12 seconds or more continuously to switch to fluid temperature detection mode.

NOTICE:

Do not pause for more than 1.5 seconds.

HINT:

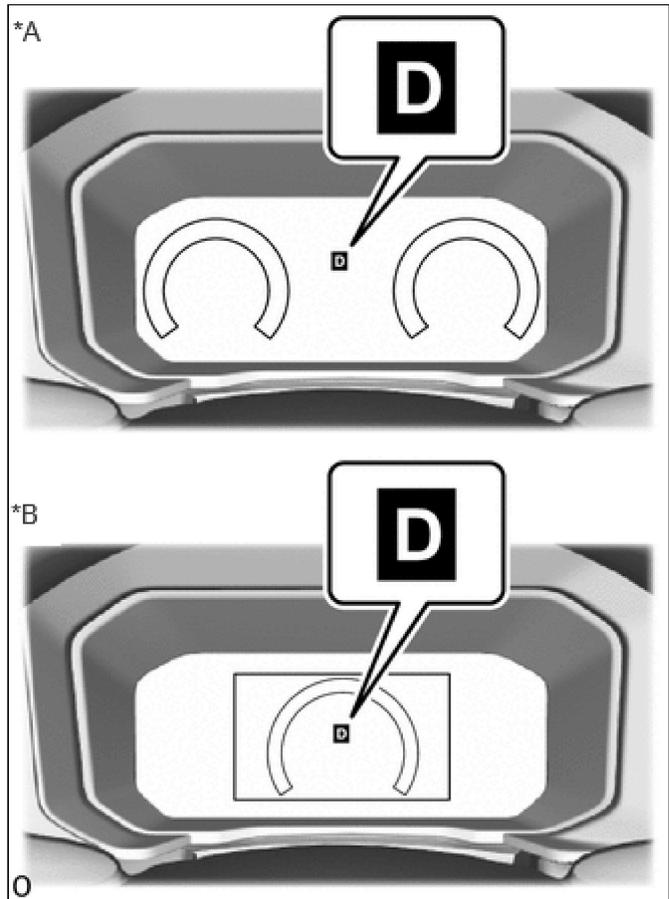
The fluid temperature detection mode will be activated by moving the shift lever between N and D within 1.5 seconds for 12 seconds or more continuously.



- (f) Check that the D shift indicator comes on for 2 seconds and then turns off.

HINT:

- When transmission fluid temperature detection mode is activated, the D shift indicator on the combination meter comes on for 2 seconds.
- If the D shift indicator does not come on for 2 seconds, perform the steps from [#2] again.
- Fluid temperature detection mode is active until the ignition switch off.



*A	for Type A
*B	for Type B

(g) Return the shift position to P.

(h) Allow the engine to idle until the D shift indicator comes on again.

D Shift Indicator:

	Below Transmission Fluid Level Adjustment Temperature	Transmission Fluid Level Adjustment Temperature	Above Transmission Fluid Level Adjustment Temperature
Transmission Fluid Temperature (GTS Display Temperature)	35°C or less (95°F or less)	35 to 41°C (95 to 106°F)	41°C or more (106°F or more)
D Shift Indicator	OFF	ON	Blinks

1. If the D shift indicator on the combination meter comes on:

Immediately proceed to ADJUST TRANSMISSION FLUID LEVEL.

2. If the D shift indicator on the combination meter blinks:

Stop the engine to cool the transmission fluid. Wait for the D shift indicator to turn off, and then perform the transmission fluid temperature adjusting procedure again.

NOTICE:

Perform the transmission fluid filling procedure when the D shift indicator on the combination meter comes on.

HINT:

In transmission fluid temperature detection mode, the D shift indicator comes on, turns off or blinks depending on the transmission fluid temperature.

8. ADJUST TRANSMISSION FLUID LEVEL

CAUTION:

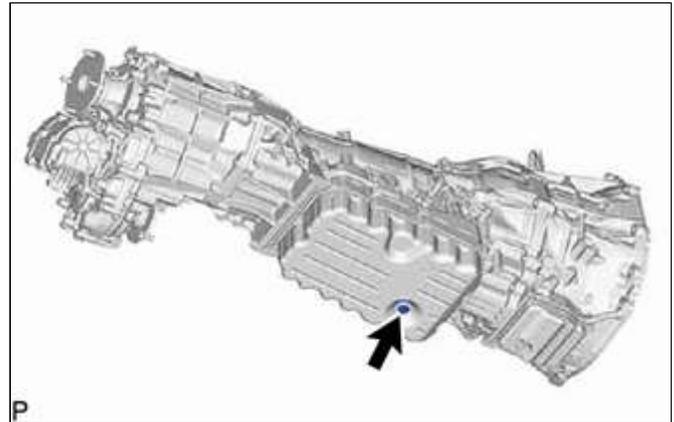
Use caution while the engine is idling and the radiator fans are operating.

(a) Lift the vehicle.

NOTICE:

The transmission fluid level cannot be measured accurately if the vehicle is not level. Make sure it is held level.

(b) Using a 6 mm hexagon socket wrench, remove the drain (ATM) plug sub-assembly and gasket from the hybrid vehicle transmission assembly, and check the fluid level when the fluid temperature is appropriate for checking the fluid level.



CAUTION:

Be careful as the transmission fluid that comes out is hot.

(c) Check that the condition of the transmission fluid coming out of the overflow hole.

NOTICE:

- Check the transmission fluid level with the engine running. Therefore, make sure not to touch the high temperature parts such as the exhaust pipe, etc.
- If only a small amount of transmission fluid (approximately 5.0 cc (0.3 cu.in.)) comes out of the overflow hole, it is possible that only the transmission fluid remaining in the No. 1 transmission oil filler tube has come out. This is not considered to be overflow and the transmission fluid must be refilled.

HINT:

Overflow refers to when transmission fluid is discharged from the No. 1 transmission oil filler tube.

(1) When transmission fluid comes out. (Go to "When transmission fluid comes out")

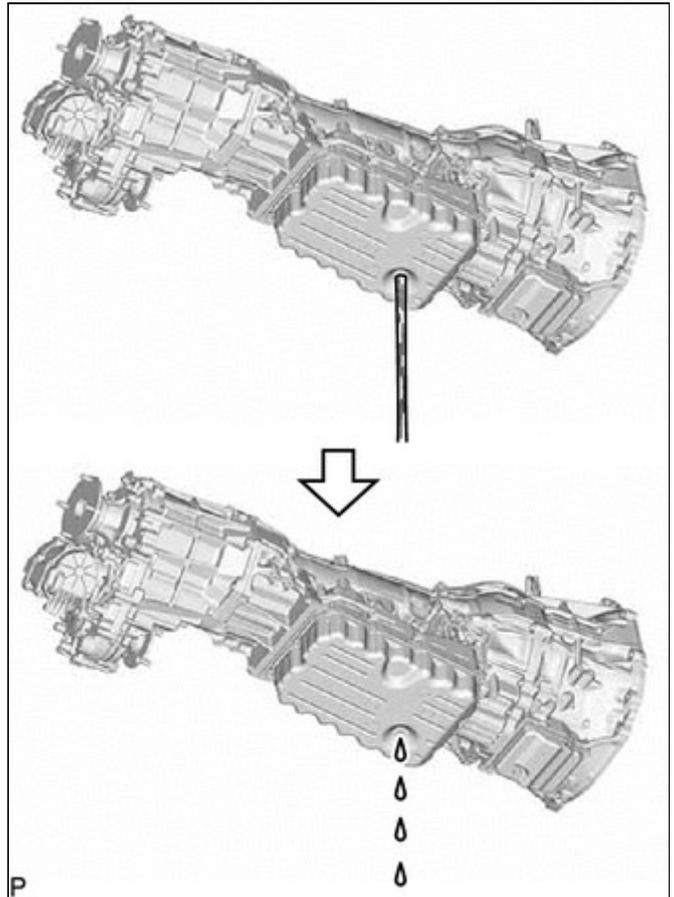
(2) When transmission fluid does not come out. (Go to "When transmission fluid does not come out")

(d) When transmission fluid comes out:

- (1) If the amount of transmission fluid that flows out is large, wait until the transmission fluid flow slows and only drops come out.

HINT:

The transmission fluid flow will not stop completely because the transmission fluid continues to expand as its temperature increases.



(e) When transmission fluid does not come out:

- (1) If no transmission fluid comes out, remove the transmission case adapter refill plug and gasket. Pour transmission fluid into the refill hole until transmission fluid comes out of the overflow hole.

NOTICE:

- Use Toyota Genuine ATF WS.

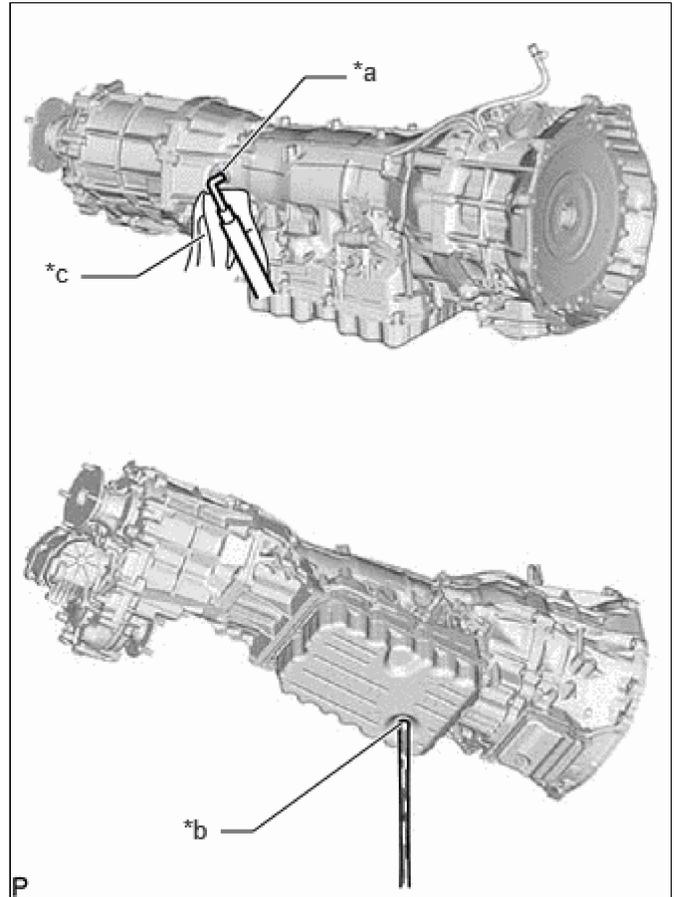
Using transmission fluid other than the above type may cause abnormal noise or vibration, or ultimately damage the transmission.

- Be sure to add transmission fluid slowly. If transmission fluid is added quickly, the transmission fluid may hit internal parts and bounce back, resulting in transmission fluid coming out of the refill hole.

HINT:

When pouring transmission fluid into the refill hole, cover the area surrounding the refill hole with a cloth.

If transmission fluid adheres to the automatic transmission oil pan sub-assembly, it may be mistaken for a transmission fluid leak.

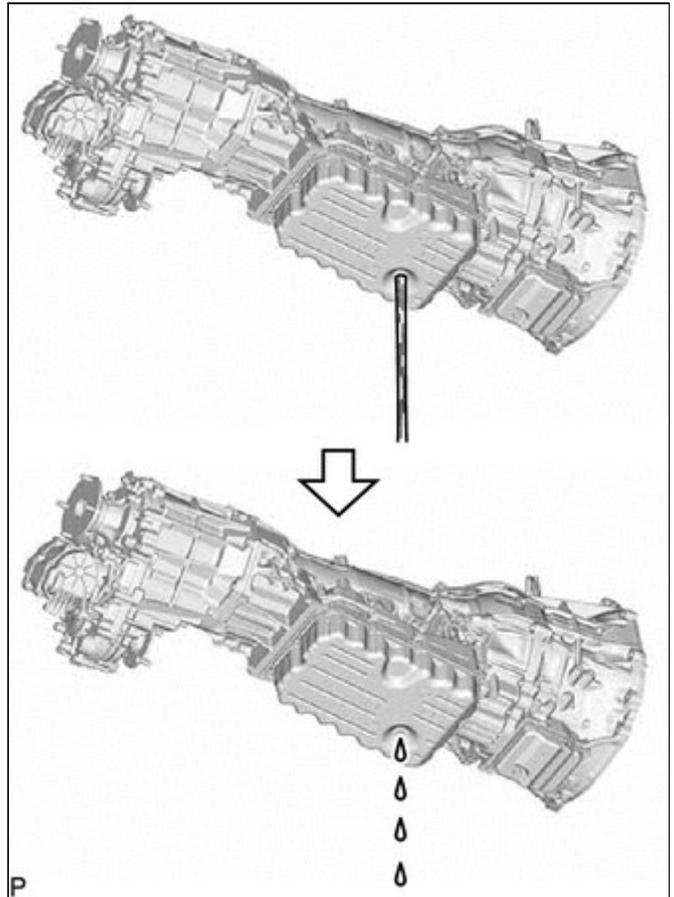


*a	Refill Hole
*b	Overflow Hole
*c	Cloth

(2) Wait until the transmission fluid flow slows and only drips come out.

HINT:

The transmission fluid flow will not stop completely because the transmission fluid continues to expand as its temperature increases.



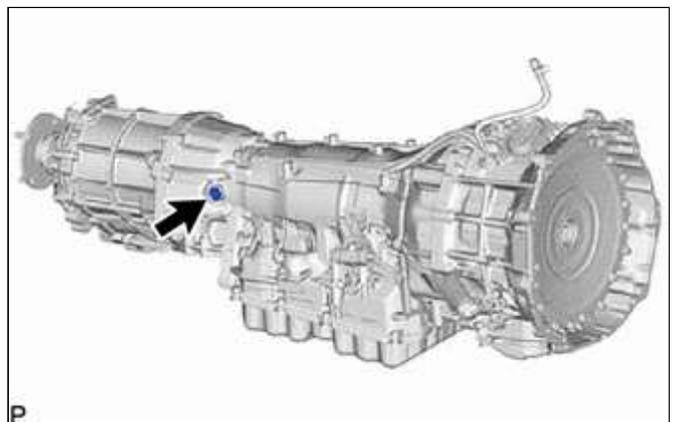
(f) Coat a new gasket with ATF.

(g) Using a 6 mm hexagon socket wrench, install the drain (ATM) plug sub-assembly and gasket to the hybrid vehicle transmission assembly.

Torque:

40 N·m {408 kgf·cm, 30 ft·lbf}

(h) Coat a new gasket with ATF.



(i) Install the gasket and transmission case adapter refill plug to the hybrid vehicle transmission assembly.

Torque:

39.2 N·m {400 kgf·cm, 29 ft·lbf}

(j) Lower the vehicle.

9. AFTER FILLING HYBRID VEHICLE TRANSMISSION

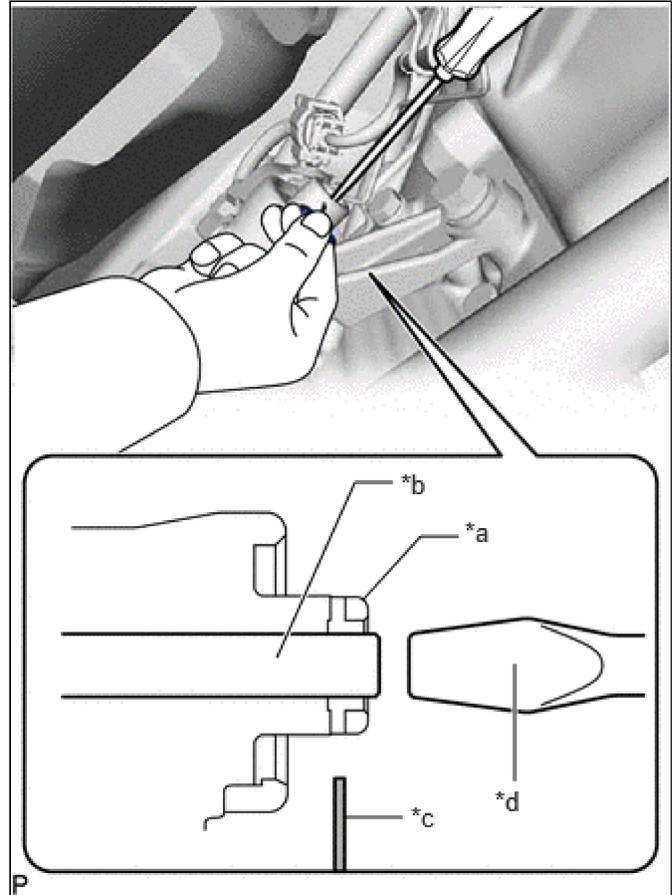
(a) Lift the vehicle.

(b) Clean each part and check for transmission fluid leaks.

(c) Remove the pin by pushing the shaft with a screwdriver.

NOTICE:

Make sure the shaft of the thermostat is protruding from the hole on the cap.



*a	Cap
*b	Shaft
*c	Pin
*d	Screwdriver

(d) Lower the vehicle.

(e) Operation complete.

10. ATF THERMAL DEGRADATION ESTIMATE RESET

NOTICE:

Approximately 50% or more of the ATF has been replaced during a repair of the transmission or a similar operation.

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