
TRANSMISSION

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14.1 TRANSMISSION ASSEMBLY

1 Warnings and Precautions

1.1 Warning

In order to avoid possible property loss, personal injury or death, always follow the instructions below before repair.

- (1) Be sure to wear necessary safety equipment to prevent accidents when removing and repairing.
- (2) Appropriate force should be applied when removing transmission. Be careful not to operate roughly.

1.2 Precautions

In order to avoid dangerous operation and damage to the vehicle before repair in this section, always follow the instructions below before repair.

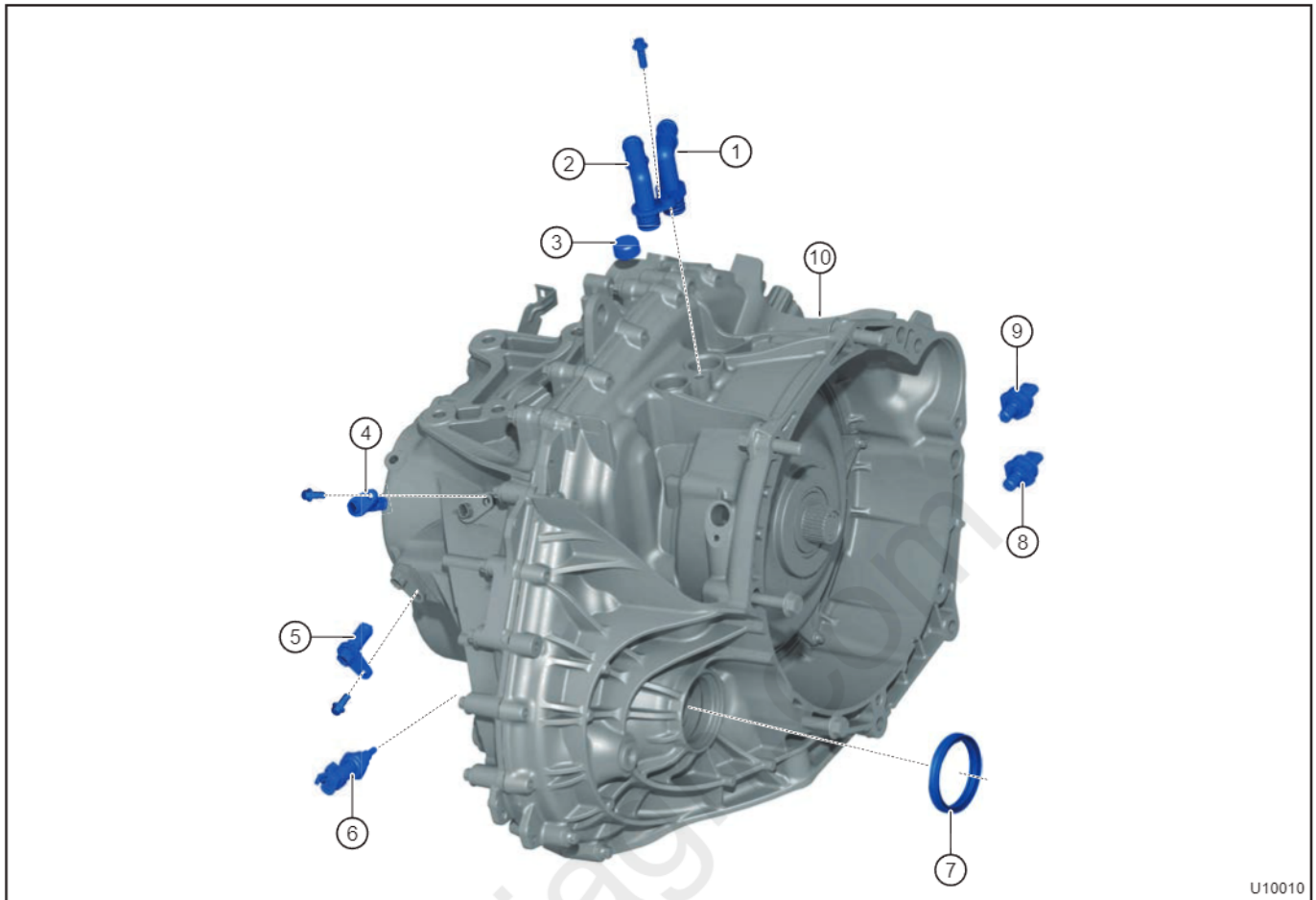
- (1) Drain bolt and oil inspection bolt are both non-reusable parts, and replace them with new ones after removal.
- (2) Transmission oil FFL-7A has a service life of 60000 km.
- (3) The vehicle must be kept level during refilling.
- (4) To avoid oil contamination, the container used to store transmission oil must be a special container for FFL-7A oil (the container must not be used to store other liquids or items), and the container must be kept clean.
- (5) In case of oil spillage, the transmission oil needs to be added depends on the actual situation, but it must be ensured that the filled oil can make the position of oil in transmission higher than that of oil inspection bolt before adjusting oil level.
- (6) Transmission oil FFL-7A should be stored under $20^{\circ}\text{C} \pm 10^{\circ}\text{C}$.
- (7) The oil is a part of 7DCT300 transmission system. It must be sent back to manufacturer together with transmission for further analysis if required.

2 System Overview

2.1 System Description

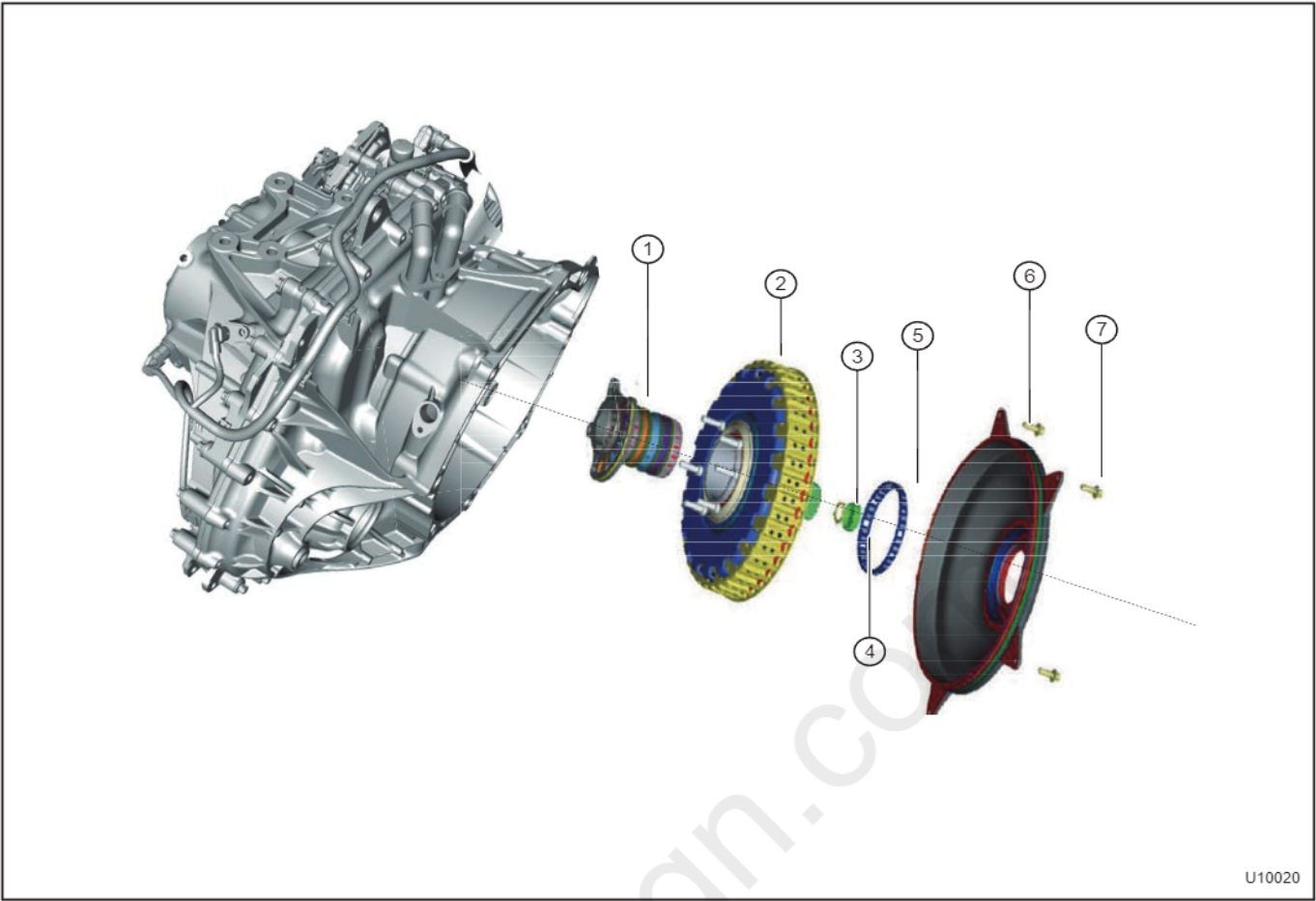
The automatic transmission system is composed of transmission control module, shift motor, electronic shift lever and shift paddle etc. Electronic shift lever and transmission are not connected in a traditional mechanical way, but a safer and faster electronic control mode, eliminating the traditional mechanical shift mode, and all using electronic signals for substitution. Its advantage is that the driver's wrong shift operation will be judged by the computer to see if it will cause damage to the transmission, so as to better protect the transmission and correct the bad shift habits. However, if there is a fault or short circuit, the electronic shifting mechanism will be unable to release the current gear, we can only rely on the trailer and rescue.

2.2 System Component Diagram



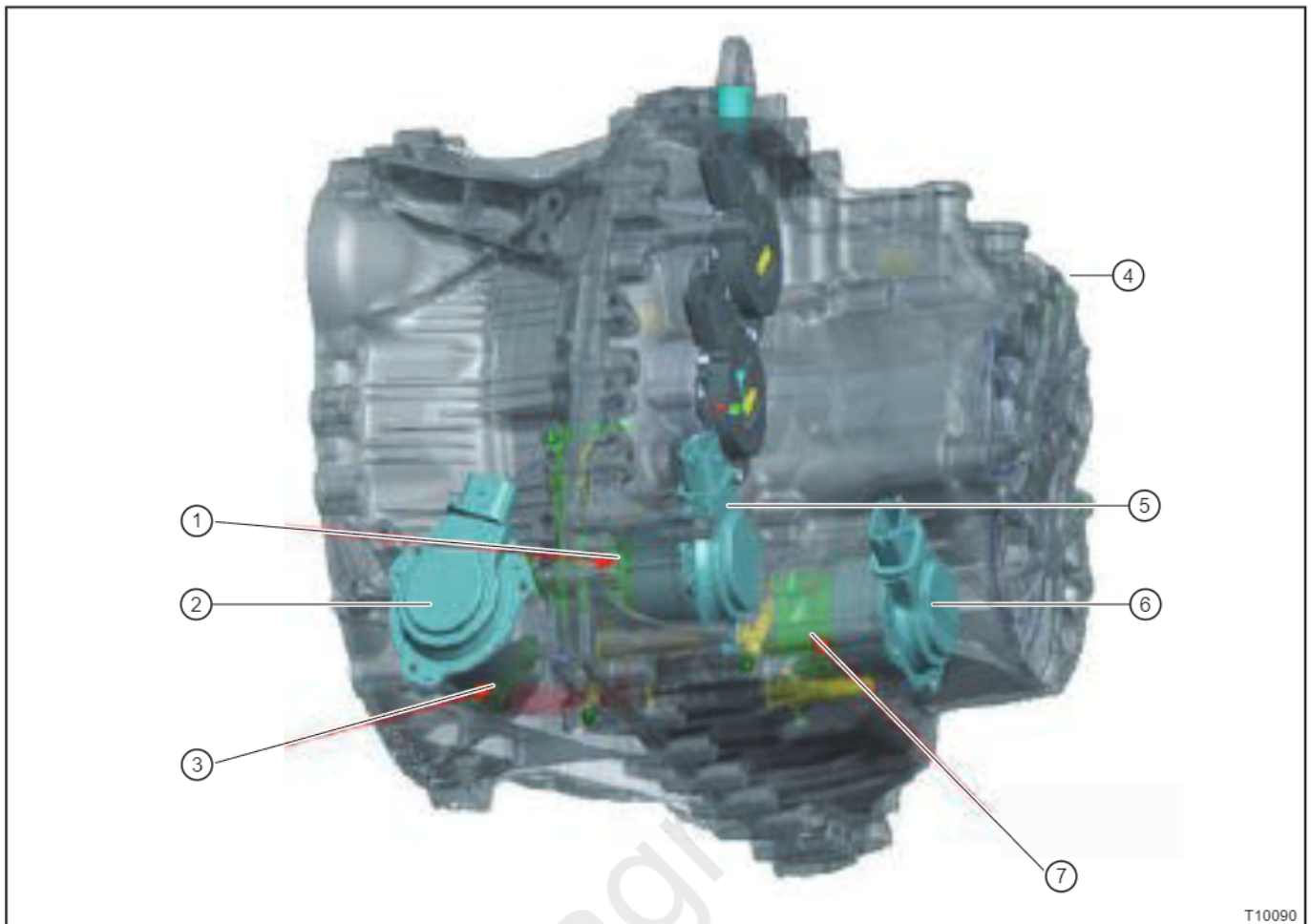
U10010

1	Transmission Outlet Pipe Joint	6	Temperature Sensor
2	Transmission Inlet Pipe Joint	7	Drive Shaft Oil Seal
3	Transmission Breather Cap	8	Pressure Sensor 1
4	Input Shaft Speed Sensor 1	9	Pressure Sensor 2
5	Input Shaft Speed Sensor 2	10	Transmission Assembly



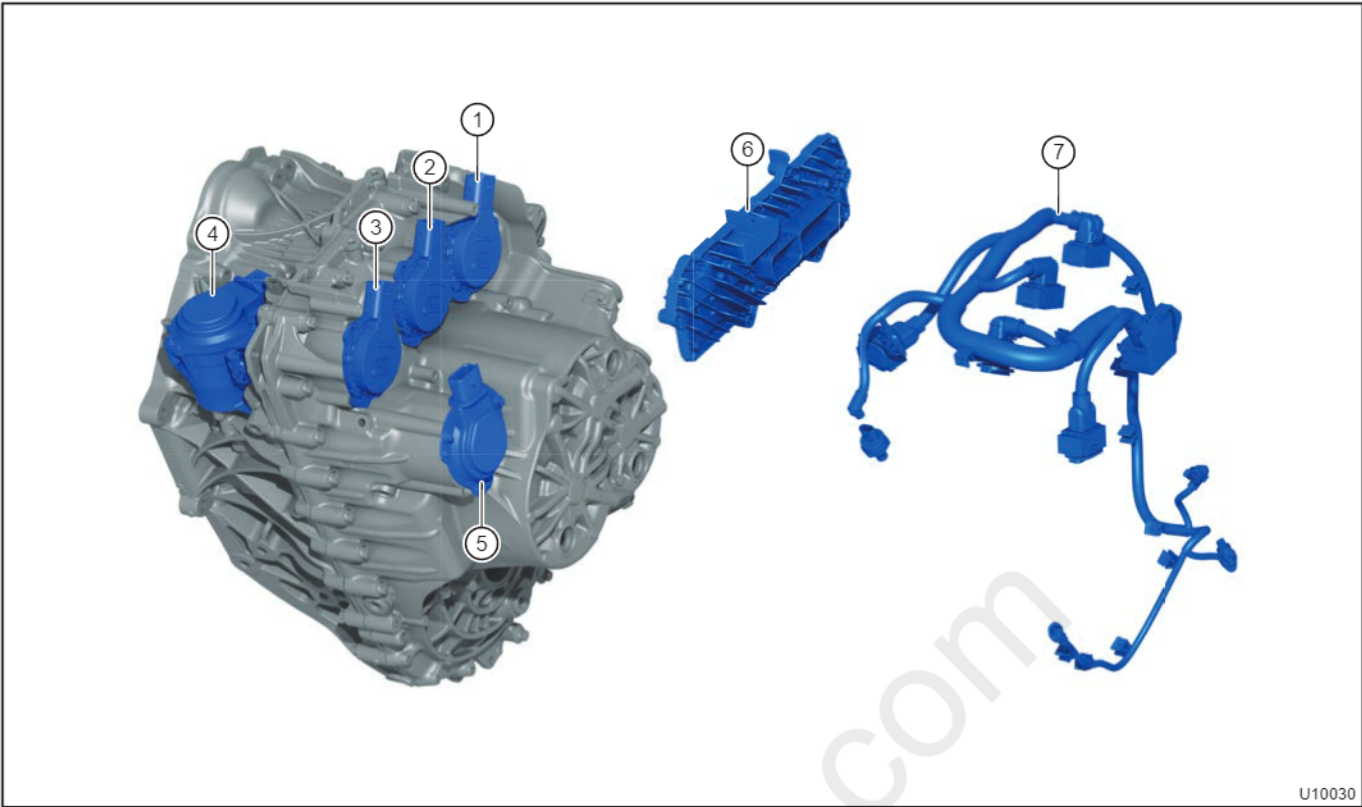
U10020

1	Clutch Support Set	5	Clutch Cover Cylindrical Roller Bearing
2	Wet Dual Clutch Assembly	6	Clutch Cover O-ring
3	Clutch Snap Ring	7	Clutch Cover Assembly
4	Seal Cover		



T10090

1	Clutch Actuator Pump 2 (CAP2)	5	Clutch Motor 2
2	Clutch Motor 1	6	Clutch Cooling Motor
3	Clutch Actuator Pump 1 (CAP1)	7	Clutch Cooling Pump (CCP)
4	Transmission Assembly		



U10030

1	Shift Motor 2	5	Cooling Motor
2	Shift Motor 1	6	Transmission Control Module
3	Clutch Motor 2	7	Transmission Wire Harness
4	Clutch Motor 1		

2.3 Parameters

Type		730DHB	730DHC
Gear Position	1st	4.462	
	2nd	2.824	
	3rd	1.594	
	4th	1.114	
	5th	0.851	
	6th	0.771	
	7th	0.638	
	Reverse	3.869	
	Final Drive Ratio 1	3.789	
	Final Drive Ratio 2	4.235	

2.4 Specifications

Torque specifications

Description	Torque (N·m)
Transmission Drain Plug	39 - 47
Fixing Screw Between Shift Paddle and Steering Wheel	0.8 ± 0.25
Transmission Control Unit Fixing Bolt	8.5 - 9.5
Fixing Bolt Between Upper of Transmission and Engine	95 ± 5
Fixing Bolt Between Lower of Transmission and Engine	50 ± 5
Fixing Bolt Between Transfer Case and Transmission	120 ± 10

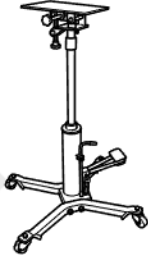
2.5 Repairable List

Transmission Control Unit	Transmission control unit fixing bolt is a non-reusable part, which must be replaced after each removal
Drive Shaft Oil Seal	Drive shaft oil seal is a non-reusable part, which must be replaced after each removal
Transmission Oil	Drain bolt and filler bolt are non-reusable parts, which must be replaced after each removal
Shift Motor	O-ring and shift motor are non-reusable parts, which must be replaced after each removal
Sensors (Pressure Sensor 1, Pressure Sensor 2, Temperature Sensor, Input Speed Sensor 1 and Input Speed Sensor 2)	Sensor and its bolts are non-reusable parts, which must be replaced after each removal
Wire harness	If wire harness clip, wire harness connector and wire harness itself are not damaged, the wire harness can be reused
Differential Inner Oil Seal	Differential inner oil seal is a non-reusable part, which must be replaced after each removal

3 On-vehicle Service

3.1 Tools

General Tool

Tool Name	Part No.	Tool Drawing
Engine Hoist	-	 RCH0043006
Transmission Carrier	-	 RCH0005006

Special Tools

Tool Name	Part No.	Tool Drawing
Differential Oil Seal Assembly Fixture	EPT-0013	 RCH0083006
4WD Clutch Case Side Outer Oil Seal Assembly Fixture	EPT-0014	 RCH0084006
4WD Clutch Case Inner Oil Seal Assembly Fixture	EPT-0015	 RCH0085006

3.2 Replacement of Transmission Oil

■ Draining/Refilling

⚠ Warning

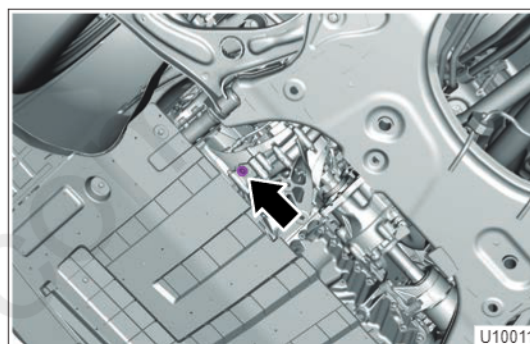
- **Be sure to wear necessary safety equipment to prevent accidents.**
- **Check if safety lock of lift is locked when repairing or inspecting the lifted vehicle.**

(1) The oil draining will begin within 5 minutes after the engine is shut down.

⚠ Caution

- **Transmission oil temperature 20 - 50 °C formula can be put oil, to prevent burns.**

- (2) Raise vehicle with a lift.
(3) Remove the transmission drain plug.



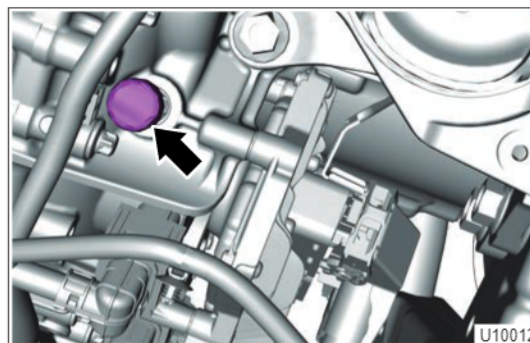
⚠ Caution

- **Drain plug and bolt washer are non-reusable components, and replace them after removal.**

- (4) Drain the transmission oil.
(5) Replace drain bolt with a new one and tighten it again.

Tightening torque: 39 - 47 N·m

- (6) Remove the air filter assembly.
(7) Remove the battery tray assembly.
(8) Pull out transmission breather cap and fill new transmission oil FFL - 7A from breather plug guide.



- (9) After waiting for 30 minutes, unscrew oil inspection bolt near differential on clutch case side and adjust oil level until no oil is spilled from oil inspection port.
(10) Replace oil inspection bolts with new ones.

Tightening torque: 39 - 47 N·m

⚠ Caution

- Drain bolt and oil inspection bolt are both non-reusable parts, and replace them with new ones after removal.
- Transmission oil FFL-7A has a service life of 60000 km.
- The vehicle must be kept level during refilling.
- To avoid oil contamination, the container used to store transmission oil must be a special container for FFL-7A oil (the container must not be used to store other liquids or items), and the container must be kept clean.
- In case of oil spillage, the transmission oil needs to be added depends on the actual situation, but it must be ensured that the filled oil can make the position of oil in transmission higher than that of oil inspection bolt before adjusting oil level.
- Transmission oil FFL-7A should be stored under $20^{\circ}\text{C} \pm 10^{\circ}\text{C}$.
- The oil, a part of 7DCT300 transmission system, must be sent back to manufacturer together with transmission for further analysis if required.

Transmission oil capacity and type are shown in the table below

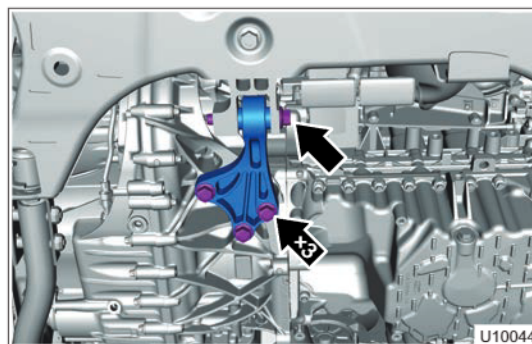
Type	Oil Type	Total Capacity (After-sales Maintenance Oil Capacity)
730 DHB	PentosinFFL - 7A	$4.25 \pm 0.2 \text{ L}$

3.3 Transmission Assembly**■ Removal****⚠ Caution**

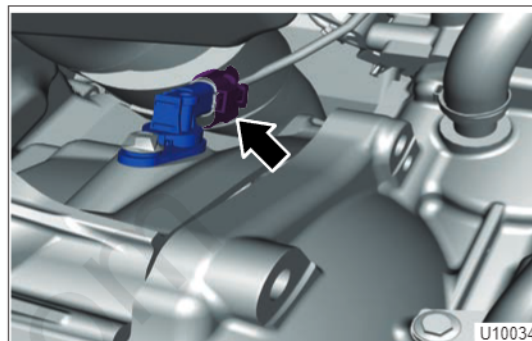
- Before removal of power assembly, first drain transmission oil.
- During separation of engine and transmission, pay attention not to damage the peripheral accessories of transmission, such as cooling hose, pressure sensor, etc. If there is any damage, it is necessary to replace it according to requirements.

- (1) Turn off all electrical equipment and the ENGINE START STOP switch.
- (2) Disconnect the negative battery cable.
- (3) Remove the left engine compartment trim cover assembly.
- (4) Remove the right engine compartment trim cover assembly.
- (5) Remove the engine trim cover assembly.
- (6) Remove the air filter assembly.
- (7) Drain the coolant.
- (8) Drain the transmission oil.
- (9) Remove the battery.
- (10) Remove the battery tray.
- (11) Remove the front left wheel.
- (12) Remove the front right wheel.
- (13) Remove the front left drive shaft assembly.
- (14) Remove the front right drive shaft with bearing bracket assembly.
- (15) Remove the front sub frame welding assembly.

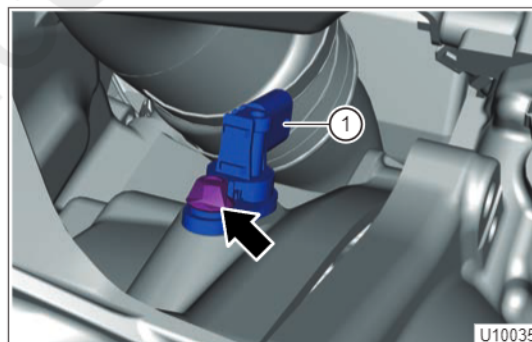
(16) Remove 4 fixing bolts from rear mounting upper body.



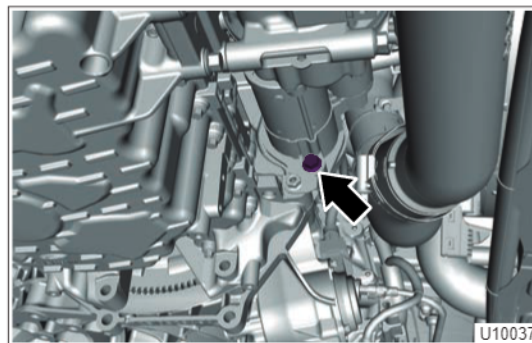
(17) Disconnect the engine speed sensor wire harness connector.



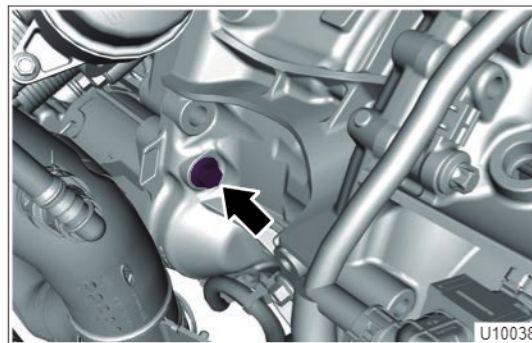
(18) Remove 1 fixing bolt from engine speed sensor, and remove the engine speed sensor 1.



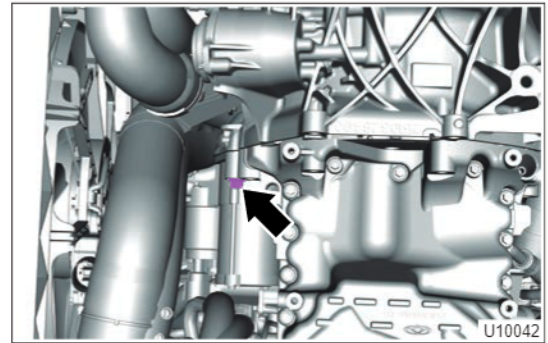
(19) Remove 1 fixing bolt from starter.



(20) Remove 1 fixing bolt from starter.

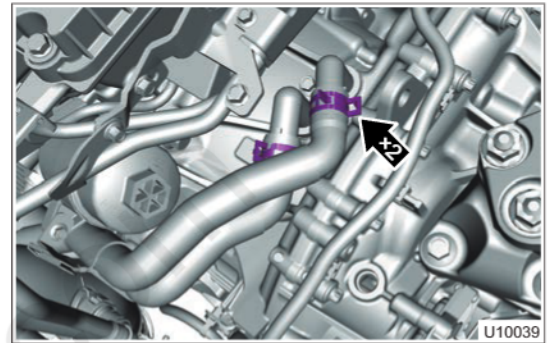


(21) Remove the transmission ground wire fixing bolt.

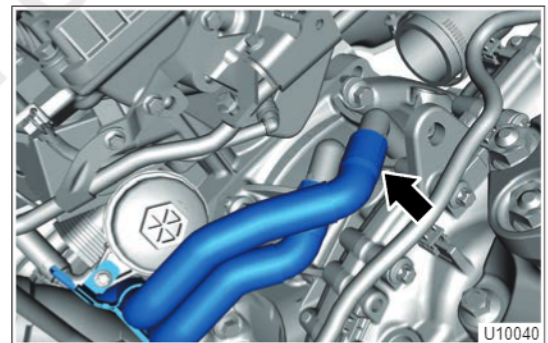


(22) Remove the intercooler inlet pipe assembly II .

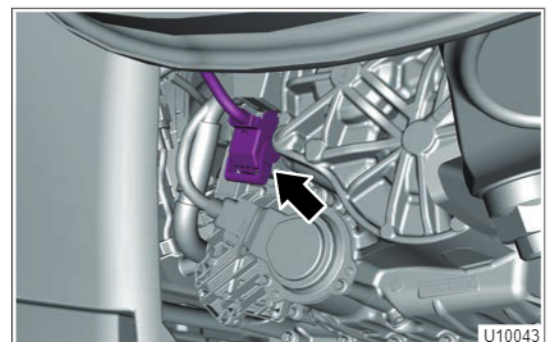
(23) Remove clamps from engine inlet pipe.



(24) Disengage the engine inlet pipe.



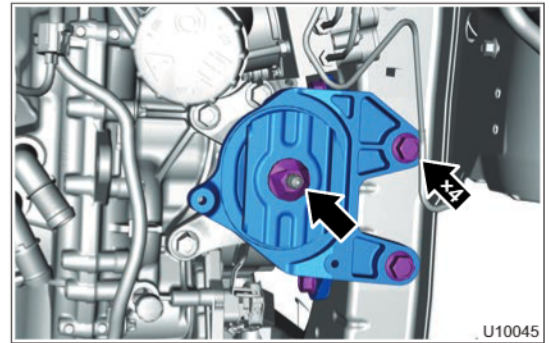
(25) Disconnect the transmission control unit connector.



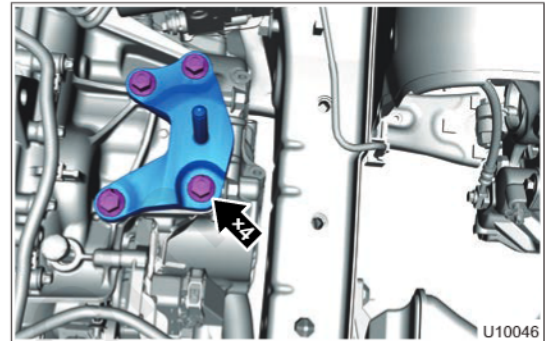
(26) Install the engine hoist.

(27) Install the transmission carrier.

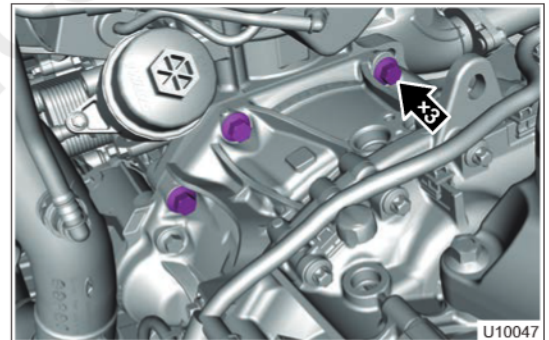
(28) Remove 1 fixing nut from left mounting cushion assembly.



(29) Remove 4 fixing bolts from left mounting bracket.



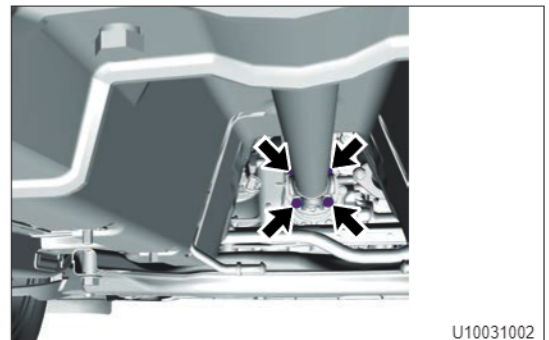
(30) Remove 3 fixing bolts between upper part of transmission and engine.



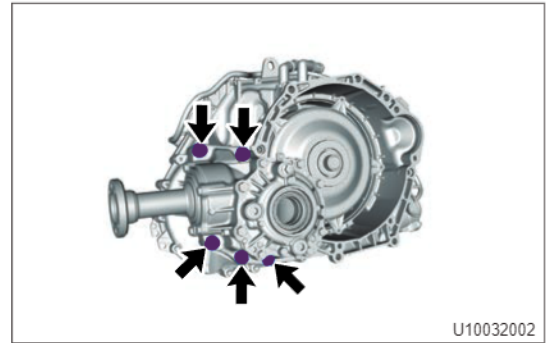
(31) Remove the pre-catalytic converter assembly (4WD).

(32) Remove the transfer assembly (4WD).

- 1) Remove 4 fixing bolts (arrow) between propeller shaft and PTU output flange surface.



- 2) Remove 5 fixing bolts (arrow) between transfer and transmission.

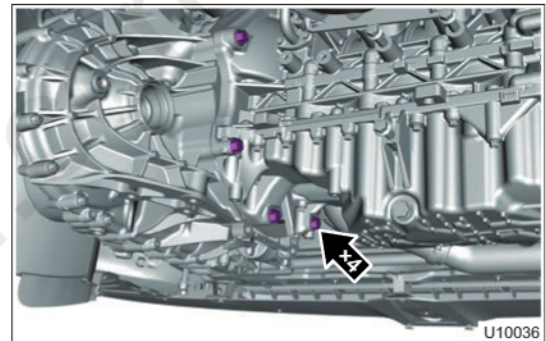


- 3) Remove the transfer assembly.

⚠ Warning

- When handling the transfer, please pay attention to the flange surface connected with intermediate shaft and spline connected with transmission differential. Please pay attention to whether O-ring is intact and whether the oil seal is intact to avoid touching the lip of oil seal. Please handle the transfer case with care during whole operation, and do not move the transfer case upside down.

- (33) Remove 4 fixing bolts between lower part of transmission and engine.



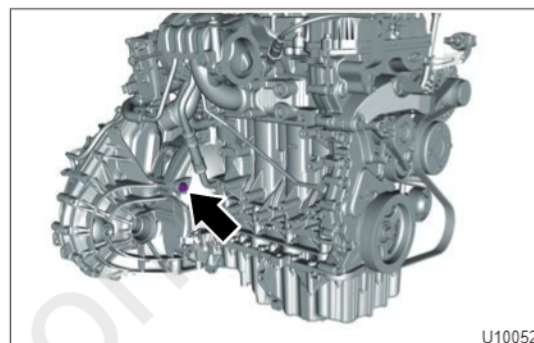
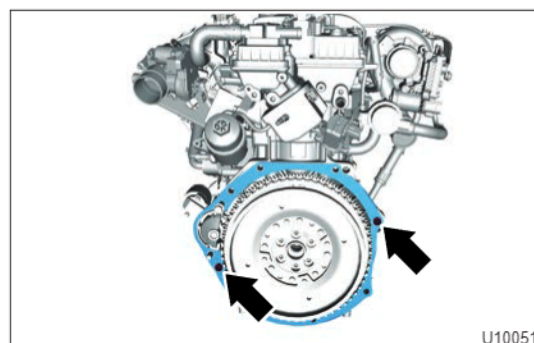
- (34) Use tool to separate transmission and engine assembly, and remove transmission assembly.

■ Installation

⚠ Caution

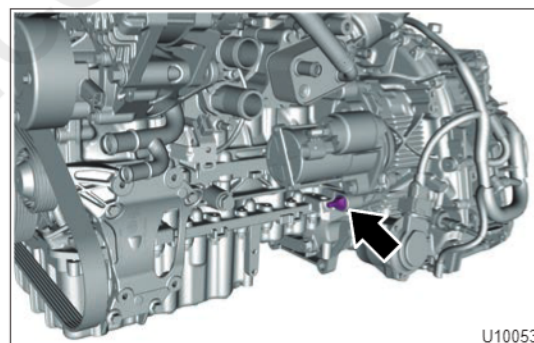
- Before assembly, the engine cannot be missed to install or sealing plate cannot be bent.
- When assembling transmission and engine, the joint surfaces between transmission and engine must be fully contacted before installing coupling bolts between transmission and engine, and then tighten them diagonally and alternately, otherwise it is easy to loose thread of bolt hole on the transmission clutch case.
- Teeth-to-teeth (dual clutch spline teeth and dual mass flywheel spline teeth) will occur when transmission and engine are assembled. It can not install assembling bolts or manually press to assemble forcibly. The transmission must be completely disengaged and re-assembled, otherwise it will easily cause the clutch adjusting spring position to deviate, clutch half-clutch point value does not match the joint point value stored in the transmission control unit, and also, vehicle is moved when shifting to driving position, vehicle does not move when depressing accelerator pedal, vehicle jitter will occur when reversing or engine stall will occur when releasing brake pedal in reverse gear.

- (1) As shown in the illustration below, install sealing plate to engine and ensure that dowel pin holes on engine are inserted into the corresponding holes of the sealing plate.



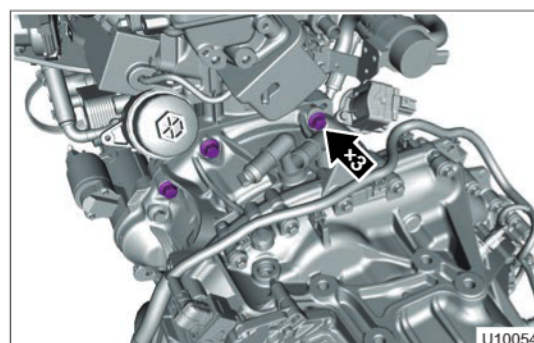
- (2) Align the dowel pin hole of transmission with the dowel pin hole of engine, push the transmission so that the joint surfaces between engine and transmission can be contacted well, and install 2 coupling bolts to engine side as shown in the illustration.

Tightening torque: 50 ± 5 N·m



- (3) Install 3 coupling bolts to transmission side.

Tightening torque: 95 ± 5 N·m



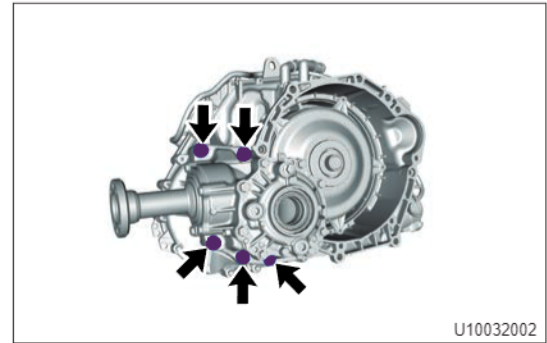
- (4) Install the transfer assembly (4WD).

⚠ Warning

- Install transfer spline to differential by turning it left and right, and align the transfer case dowel pin with positioning hole of differential case simultaneously.
- When installing 5 tightening bolts between transfer and transmission, follow the order of up, down, left and right and tighten diagonally.

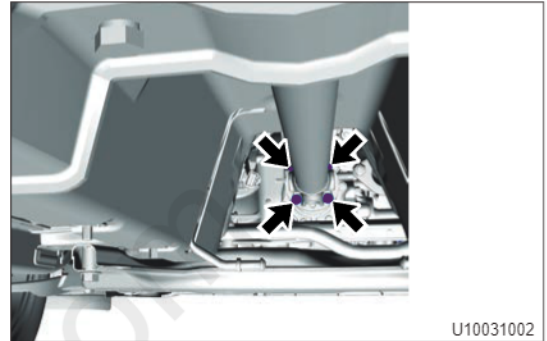
- 1) Install 5 fixing bolts between transfer and transmission.

Tightening torque: $120 \pm 10 \text{ N}\cdot\text{m}$



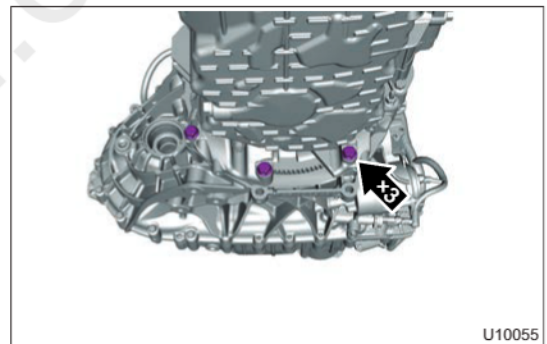
- 2) Install 4 fixing bolts between propeller shaft and PTU output flange.

Tightening torque: $33 \pm 3 \text{ N}\cdot\text{m}$



- (5) Install the precatalytic converter assembly (4WD).
- (6) Install 3 coupling bolts to lower part of transmission.

Tightening torque: $50 \pm 5 \text{ N}\cdot\text{m}$



- (7) Install 4 fixing bolts to left mounting bracket.

Tightening torque: 110 ± 15 N·m

- (8) Install 1 fixing nut to left mounting cushion assembly.

Tightening torque: 110 ± 15 N·m

- (9) Install 4 fixing bolts to left mounting bracket.

Tightening torque: 110 ± 15 N·m

- (10) Connect the transmission control unit connector.

- (11) Install 2 fixing bolts to bracket.

Tightening torque: 9 ± 1 N·m

Tightening torque: 5 ± 1 N·m

- (12) Install the engine inlet pipe.

- (13) Install clamps to engine inlet pipe.

- (14) Install the intercooler inlet pipe assembly II.

- (15) Install the transmission ground wire fixing bolt.

- (16) Install 1 fixing bolt to starter.

- (17) Install 1 fixing bolt to starter.

- (18) Install engine speed sensor and 1 fixing bolt.

- (19) Connect the engine speed sensor wire harness connector.

- (20) Install 4 fixing bolts to rear mounting upper body.

- (21) Install the front sub frame welding assembly.

- (22) Install the front right drive shaft with bearing bracket assembly.

- (23) Install the front left drive shaft assembly.

- (24) Install the front right wheel.

- (25) Install the front left wheel.

- (26) Fill the transmission oil.

- (27) Install the battery tray.

- (28) Install the battery.

- (29) Install the air filter assembly.

- (30) Add the coolant.

- (31) Install the engine trim cover assembly.

- (32) Install the left and right engine compartment trim cover assembly.

- (33) Connect the negative battery cable.

3.4 Replacement of Transmission Breather Cap

■ Removal

Warning

- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal.

- (1) Turn off all electrical equipment and the ENGINE START STOP switch.

- (2) Disconnect the negative battery cable.

- (3) Remove the air filter assembly.

- (4) Remove the transmission breather cap.

■ Installation

- (1) Install breather cap to a proper position on transmission.
- (2) Install the air filter assembly.
- (3) Connect the negative battery cable.

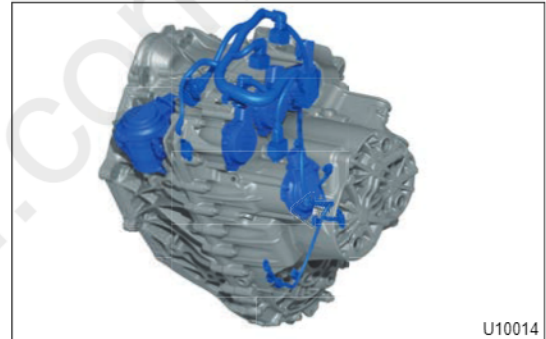
3.5 Replacement of Transmission Wire Harness Assembly

■ Removal

⚠ Warning

- **Be sure to wear necessary safety equipment to prevent accidents when repairing.**
- **During replacement, it is necessary to wear anti-static equipment.**

- (1) Turn off all electrical equipment and the ENGINE START STOP switch.
- (2) Disconnect the negative battery cable.
- (3) Remove the air filter assembly.
- (4) Remove the battery.
- (5) Remove the battery tray.
- (6) Remove the engine compartment lower protector assembly.
- (7) Disconnect each connector and clip from transmission wire harness, and remove transmission wire harness assembly.



⚠ Caution

- **When removing the clip, be careful not to use too much force to cause the clip to be deformed and not to be tightened.**

■ Installation

⚠ Caution

- **If wire harness clip, wire harness connector and wire harness itself are not damaged, the wire harness can be reused.**

- (1) Connect each connector and clip to transmission wire harness, and install transmission wire harness assembly.
- (2) Install the engine compartment lower protector assembly.
- (3) Install the battery tray.
- (4) Install the battery.
- (5) Install the air filter assembly.
- (6) Connect the negative battery cable.

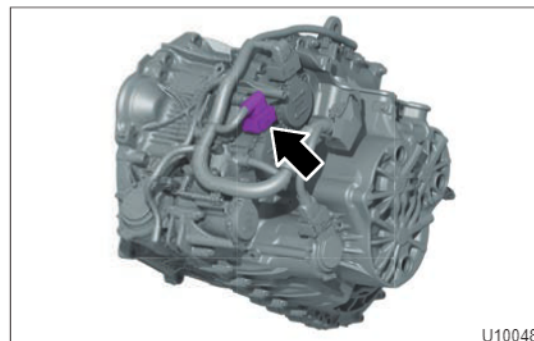
3.6 Replacement of Shift Motor

■ Removal

⚠ Warning

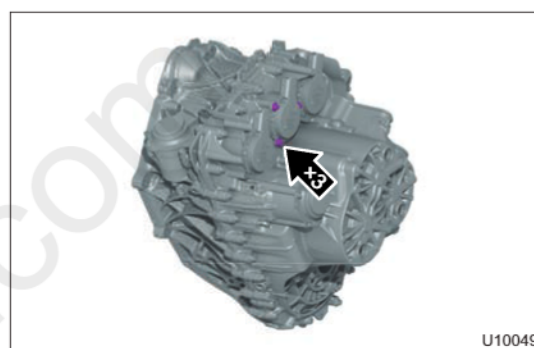
- **Be sure to wear necessary safety equipment to prevent accidents when repairing.**
- **During replacement of shift motor, it is necessary to wear anti-static equipment.**

- (1) Turn off all electrical equipment and the ENGINE START STOP switch.
- (2) Drain the transmission oil.
- (3) Remove the engine compartment lower protector assembly.
- (4) Remove the transmission control unit.
- (5) Disconnect the shift motor wire harness connector.



U10048

- (6) Remove 3 fixing screws from shift motor.



U10049

- (7) Remove the shift motor.

■ Installation

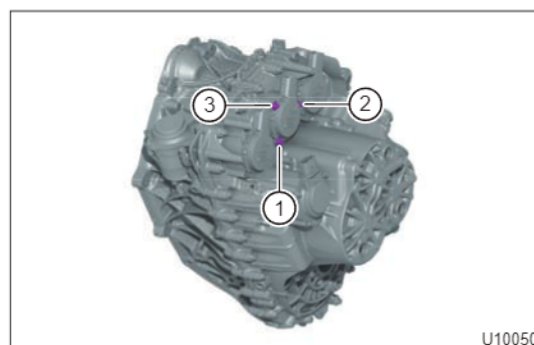
⚠ Caution

- O-ring and shift motor bolts are both non-reusable parts, which must be replaced after each removal.
- It is necessary to remove TCU before shift motor is replaced (drain bolt, oil inspection bolt and TCU bolt must be replaced after removal).

- (1) Install O-ring into grooves of shift motor housing.
- (2) Install shift motor to a proper position on transmission. Shift motor needs to be installed from transmission case side. When installing, it is necessary to ensure that motor spline shaft is inserted vertically into gear.
- (3) Tighten 3 bolts on shift motor in sequence ①②③ as shown in the illustration below.

First torque: 1.5 - 2 N·m

Second torque: 5 - 6 N·m



U10050

- (4) Connect the shift motor wire harness connector.
- (5) Install the transmission control unit.
- (6) Install the engine compartment lower protector assembly.
- (7) Fill the transmission oil.

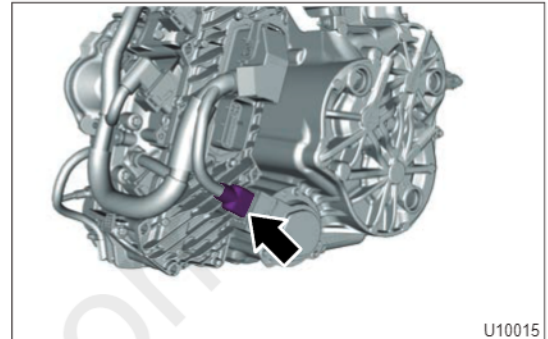
3.7 Replacement of Cooling Motor

■ Removal

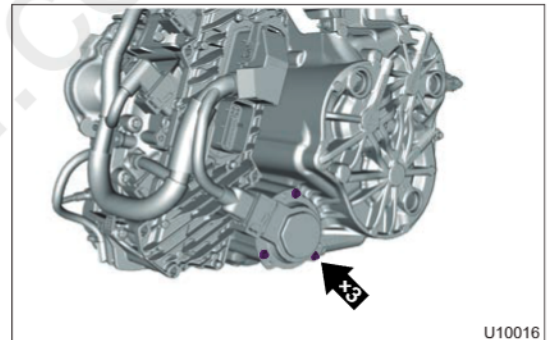
Warning

- **Be sure to wear necessary safety equipment to prevent accidents when repairing.**
- **During replacement of cooling motor, it is necessary to wear anti-static equipment.**

- (1) Turn off all electrical equipment and the ENGINE START STOP switch.
- (2) Drain the transmission oil.
- (3) Remove the engine compartment lower protector assembly.
- (4) Disconnect the cooling motor wire harness connector.



- (5) Remove 3 fixing screws from cooling motor.



- (6) Remove the cooling motor.

■ Installation

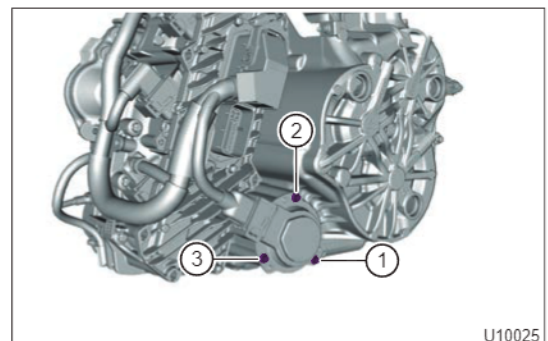
Caution

- **O-ring and cooling motor bolts are both non-reusable parts, which must be replaced after each removal.**

- (1) Install O-ring into grooves of cooling motor housing.
- (2) Install cooling motor to a proper position on transmission. Cooling motor needs to be installed from transmission case side. When installing, it is necessary to ensure that motor spline shaft is inserted vertically into gear.
- (3) Tighten 3 bolts on shift motor in sequence ①②③ as shown in the illustration below.

First torque: 1.5 - 2 N·m

Second torque: 5 - 6 N·m



- (4) Connect the cooling motor wire harness connector.
- (5) Install the engine compartment lower protector assembly.
- (6) Fill the transmission oil.

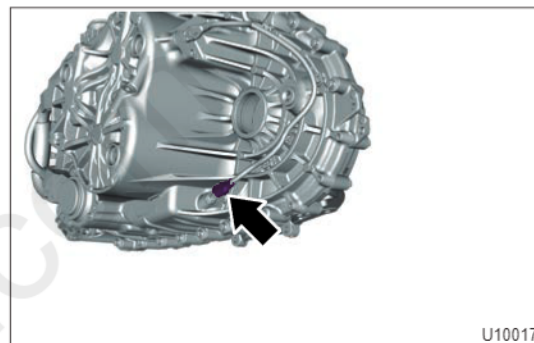
3.8 Replacement of Temperature Sensor

■ Removal

⚠ Warning

- **Be sure to wear necessary safety equipment to prevent accidents when repairing.**
- **During replacement of sensor, it is necessary to wear anti-static equipment.**

- (1) Turn off all electrical equipment and the ENGINE START STOP switch.
- (2) Disconnect the negative battery cable.
- (3) Drain the transmission oil.
- (4) Disconnect the temperature sensor connector.



- (5) Remove temperature sensor from housing with a torque wrench.

■ Installation

⚠ Caution

- **Sensor and its bolts are non-reusable parts, which must be replaced after each removal.**
- **Drain the transmission oil and remove wire harness before replacing the sensor (drain bolt and oil inspection bolt must be replaced).**

- (1) Install temperature sensor to a proper position on transmission.

Tightening torque: 14.5 - 16 N·m

- (2) Connect the temperature sensor connector.
- (3) Add the specified transmission oil.
- (4) Connect the negative battery cable.

3.9 Replacement of Pressure Sensor

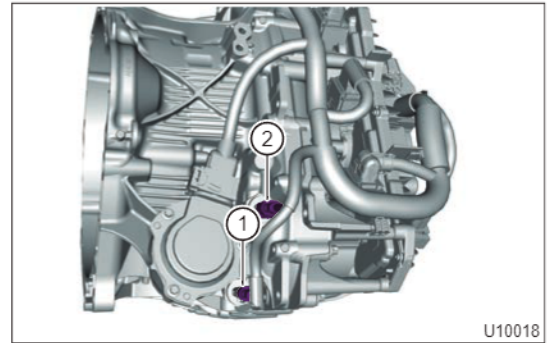
■ Removal

⚠ Warning

- **Be sure to wear necessary safety equipment to prevent accidents when repairing.**
- **During replacement of sensor, it is necessary to wear anti-static equipment.**

- (1) Turn off all electrical equipment and the ENGINE START STOP switch.
- (2) Disconnect the negative battery cable.
- (3) Remove the engine compartment lower protector assembly.
- (4) Drain the transmission oil.

- (5) Disconnect the pressure sensor connector.



- (6) Remove pressure sensor 1 and pressure sensor 2 from housing with a torque wrench.

■ Installation

⚠ Caution

- **Sensor and its bolts are non-reusable parts, which must be replaced after each removal.**
- **Drain the transmission oil and remove wire harness before replacing the sensor (drain bolt and oil inspection bolt must be replaced).**

- (1) Install pressure sensor to a proper position on transmission.

Tightening torque: 20 - 24 N·m

- (2) Connect the pressure sensor connector.
 (3) Add the specified transmission oil.
 (4) Install the engine compartment lower protector assembly.
 (5) Connect the negative battery cable.

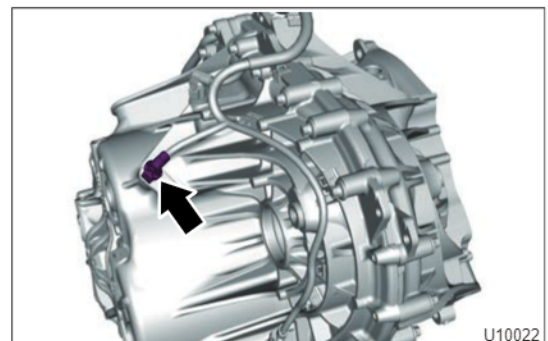
3.10 Replacement of Input Speed Sensor 1

■ Removal

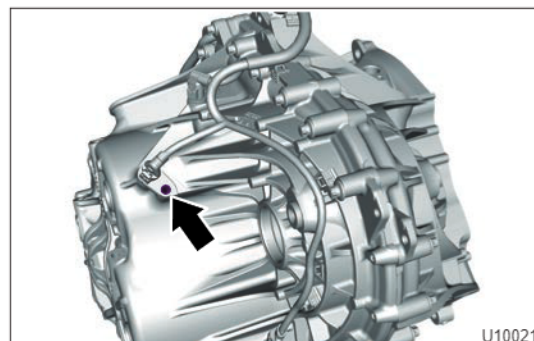
⚠ Warning

- **Be sure to wear necessary safety equipment to prevent accidents when repairing.**
- **During replacement of sensor, it is necessary to wear anti-static equipment.**

- (1) Turn off all electrical equipment and the ENGINE START STOP switch.
 (2) Disconnect the negative battery cable.
 (3) Remove the air filter assembly.
 (4) Remove the battery.
 (5) Remove the battery tray.
 (6) Drain the transmission oil.
 (7) Disconnect the input speed sensor 1 connector.



- (8) Remove fixing bolt from input speed sensor 1.



- (9) Remove the input speed sensor 1.

■ Installation

⚠ Caution

- **Sensor and its bolts are non-reusable parts, which must be replaced after each removal.**
- **Drain the transmission oil and remove wire harness before replacing the sensor (drain bolt and oil inspection bolt must be replaced).**

- (1) Install input speed sensor 1 to a proper position on transmission.
- (2) Install fixing bolt to input speed sensor 1.

Tightening torque: 9 - 11 N·m

- (3) Connect the input speed sensor 1 connector.
- (4) Fill the transmission oil.
- (5) Install the battery tray.
- (6) Install the battery.
- (7) Install the air filter assembly.
- (8) Connect the negative battery cable.

3.11 Replacement of Input Speed Sensor 2

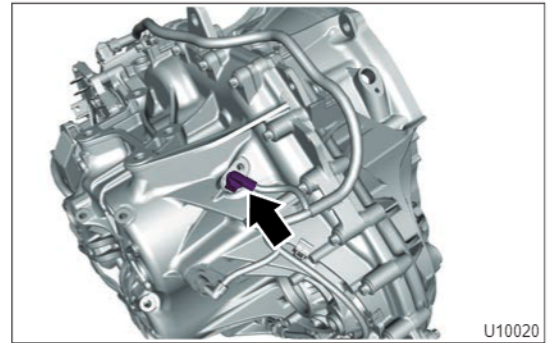
■ Removal

⚠ Warning

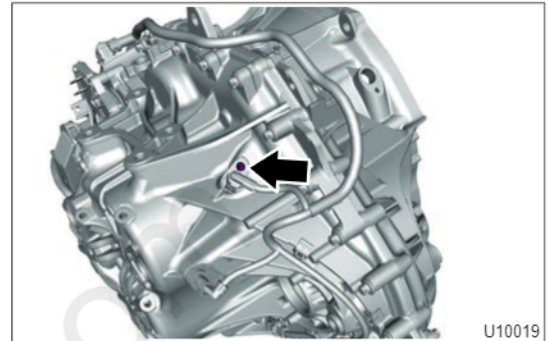
- **Be sure to wear necessary safety equipment to prevent accidents when repairing.**
- **During replacement of sensor, it is necessary to wear anti-static equipment.**

- (1) Turn off all electrical equipment and the ENGINE START STOP switch.
- (2) Disconnect the negative battery cable.
- (3) Remove the air filter assembly.
- (4) Remove the battery.
- (5) Remove the battery tray.
- (6) Drain the transmission oil.

- (7) Disconnect the input speed sensor 2 connector.



- (8) Remove fixing bolt from input speed sensor 2.



- (9) Remove the input speed sensor 2.

■ Installation

⚠ Caution

- Sensor and its bolts are non-reusable parts, which must be replaced after each removal.
- Drain the transmission oil and remove wire harness before replacing the sensor (drain bolt and oil inspection bolt must be replaced).

- (1) Install input speed sensor 2 to a proper position on transmission.
- (2) Install fixing bolt to input speed sensor 2.

Tightening torque: 9 - 11 N·m

- (3) Connect the input speed sensor 2 connector.
- (4) Fill the transmission oil.
- (5) Install the battery tray.
- (6) Install the battery.
- (7) Install the air filter assembly.
- (8) Connect the negative battery cable.

3.12 Replacement of Drive Shaft Oil Seal

■ Removal

⚠ Warning

- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal.
- Use same procedures for right and left sides, procedures listed below are for left side.

- (1) Turn off all electrical equipment and the ENGINE START STOP switch.
- (2) Disconnect the negative battery cable.
- (3) Remove the air filter assembly.
- (4) Remove the battery.
- (5) Remove the battery tray.
- (6) Drain the transmission oil.
- (7) Remove the front left wheel.
- (8) Remove the front left drive shaft assembly.
- (9) Remove left drive shaft oil seal from transmission assembly.

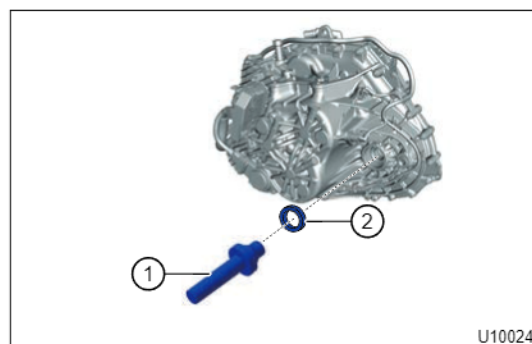


■ Installation

⚠ Caution

- Ensure that the transmission oil has been drained before removing oil seal.
- Be sure to avoid scratching the mating surface between transmission case and clutch housing during removal of drive shaft oil seal.
- Drive shaft oil seal is a non-reusable part, which must be replaced after each removal.

- (1) Using a special tool (1), install drive shaft oil seal (2) into place.



⚠ Caution

- Apply a proper amount of MP grease to new oil seal lip.
- Do not damage oil seal lip during installation.

- (2) Install the front left drive shaft assembly.
- (3) Install the front left wheel.
- (4) Fill the transmission oil.
- (5) Install the battery tray.
- (6) Install the battery.
- (7) Install the air filter assembly.
- (8) Connect the negative battery cable.

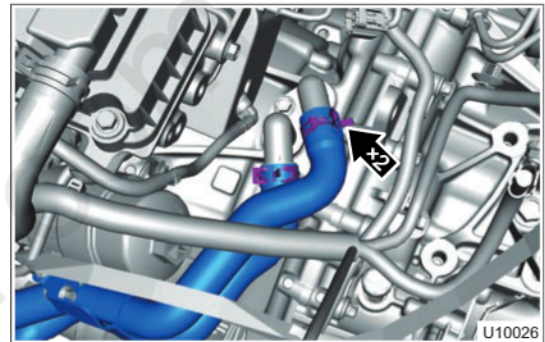
3.13 Replacement of Coolant Connecting Pipe Assembly (Inlet and Outlet Pipes)

■ Removal

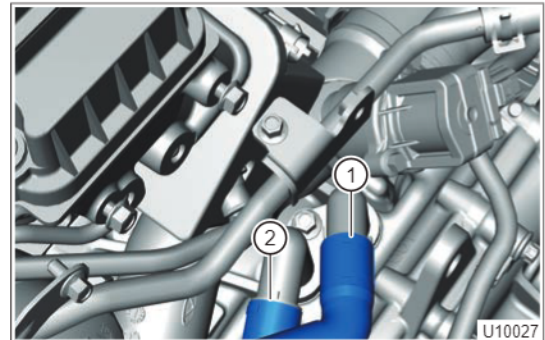
Warning

- **Be sure to wear necessary safety equipment to prevent accidents when repairing.**
- **When removing coolant pipe from coolant connecting pipe assembly, be careful not to splash the coolant on electronic parts and the inside of transmission to contaminate transmission oil.**

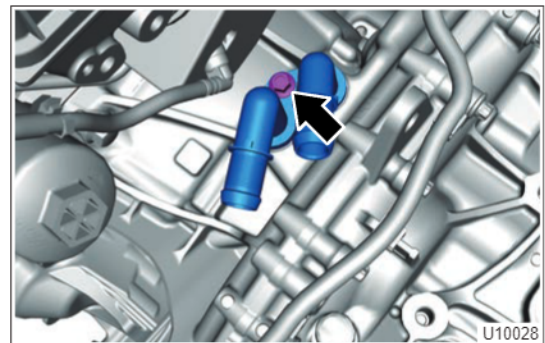
- (1) Turn off all electrical equipment and the ENGINE START STOP switch.
- (2) Disconnect the negative battery cable.
- (3) Remove the air filter assembly.
- (4) Remove the battery.
- (5) Remove the battery tray.
- (6) Remove the intercooler inlet pipe assembly II.
- (7) Drain the coolant.
- (8) Remove clamps from engine inlet pipe.



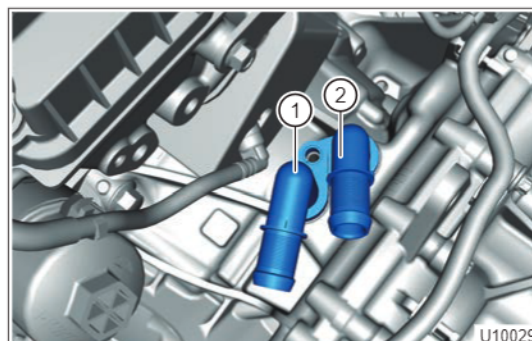
- (9) Disengage the engine inlet pipes ①②.



- (10) Remove fixing bolt from coolant connecting pipe assembly.



- (11) Remove inlet pipe ① and outlet pipe ② from coolant connecting pipe.



■ Installation

⚠ Caution

- **Bolts are non-reusable parts, which must be replaced after each removal.**

- (1) Install coolant connecting pipe into hole, align bolt holes of coolant connecting pipe, and tighten bolts.

Tightening torque: 18 - 20 N·m

- (2) Install the engine inlet pipes ①②.
 (3) Install clamps to engine inlet pipe.
 (4) Add the coolant.
 (5) Install the intercooler inlet pipe assembly II.
 (6) Install the battery tray.
 (7) Install the battery.
 (8) Install the air filter assembly.
 (9) Connect the negative battery cable.

3.14 Replacement of Clutch Motor 1

■ Removal

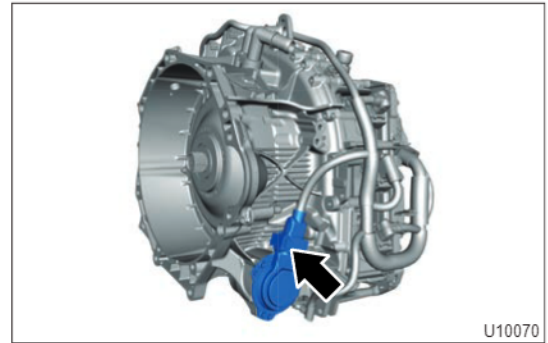
⚠ Caution

- **Be sure to wear necessary safety equipment to prevent accidents when repairing.**
- **During replacement of sensor, it is necessary to wear anti-static equipment.**
- **When replacing parts, it must be performed in the clean environment.**
- **It can be only use original parts when it is necessary to replace parts.**

- (1) Turn off all electrical equipment and the ENGINE START STOP switch.
 (2) Lift the vehicle and thoroughly clean the outside of transmission, especially the area around clutch motor 1. Remove loose particles in these areas and clean them with dust-free cloth and cleaner to prevent dirt from entering the transmission.
 (3) Remove drain plug to drain transmission oil (approximately 3.25 L), and contain it in a clean and dry container for reuse.
 (4) Retighten the new drain plug.

Tightening torque: 43 ± 4 N·m

- (5) Disconnect the clutch motor 1 wire harness connector.



- (6) Remove 3 fixing bolts from clutch motor 1.



- (7) Remove motor from housing gently.

■ Installation

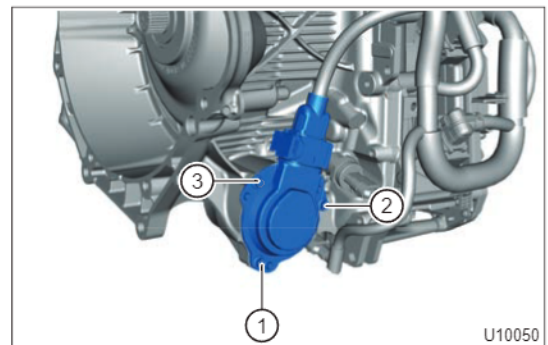
⚠ Caution

- O-ring and motor bolts are both non-reusable parts, which must be replaced after each removal.
- Carefully remove remaining oil in motor cavity to avoid oil leakage after replacing motor with a new one.
- Install new O-ring to new motor. Make sure that the O-ring is installed at the bottom of motor wall and there is no distortion.

- (1) Clean the wall of housing motor cavity with a dust-free cloth, and gently install new motor into housing clutch motor cavity, ensuring that the motor spline shaft is installed in place.
- (2) Tighten 3 bolts on shift motor in sequence ①②③ as shown in the illustration below.

First torque: 1.5 - 2 N·m

Second torque: 5 - 6 N·m



- (3) Connect the shift motor wire harness connector.
- (4) Install the transmission control unit.
- (5) Fill transmission oil (oil judging standard: unscrew the filler plug next to differential, and leave it for 30 minutes after filling until the oil overflows).
- (6) Install the engine compartment lower protector assembly.

■ Test

Driving performance test: Drive the vehicle for 10 minutes, raise the temperature of transmission, and then test the following items.

- (1) When moving slowing, the accelerator pedal opening is less than 5%, and the vehicle has no jitter.

(2) When driving, depress and hold brake pedal and the vehicle has no jitter.

(3) Check forward and reverse gear conditions.

■ Clutch Self-learning

Refer to clutch self-learning method for clutch self-learning.

3.15 Replacement of Clutch Motor 2

■ Removal

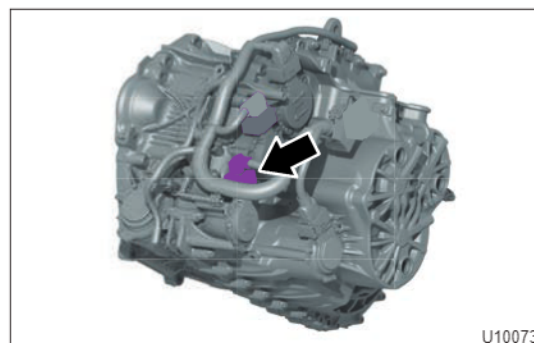
⚠ Warning

- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- During replacement of shift motor, it is necessary to wear anti-static equipment.
- When replacing parts, it must be performed in the clean environment.
- It can be only use original parts when it is necessary to replace parts.

- (1) Turn off all electrical equipment and the ENGINE START STOP switch.
- (2) Lift the vehicle and thoroughly clean the periphery of transmission, especially the area around clutch motor 2. In these areas, remove loose particles and clean them with dust-free cloth and cleaner to prevent dirt from entering the transmission.
- (3) Remove drain plug to drain transmission oil (approximately 3.25 L), and contain it in a clean and dry container for reuse.
- (4) Retighten the new drain plug.

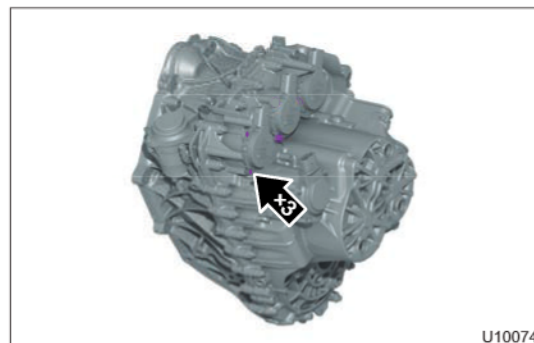
Tightening torque: 43 ± 4 N·m

- (5) Remove the transmission control unit.
- (6) Disconnect the clutch motor 2 wire harness connector.



U10073

- (7) Remove 3 fixing bolts from clutch motor 2.



U10074

- (8) Remove motor from housing gently.

■ Installation

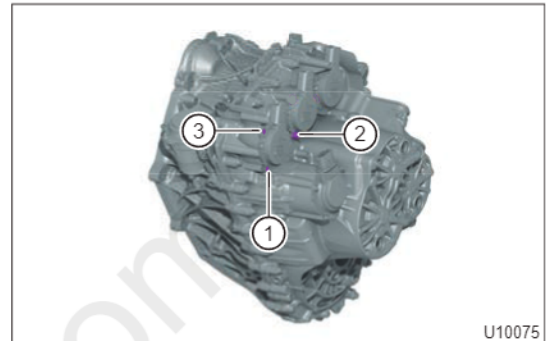
⚠ Caution

- **O-ring and motor bolts are both non-reusable parts, which must be replaced after each removal.**
- **Carefully remove remaining oil in motor cavity to avoid oil leakage after replacing motor with a new one.**
- **Install new O-ring to new motor. Make sure that the O-ring is installed at the bottom of motor wall and there is no distortion.**

- (1) Clean the wall of housing motor cavity with a dust-free cloth, and gently install new motor into housing clutch motor cavity, ensuring that the motor spline shaft is installed in place.
- (2) Tighten 3 bolts on shift motor in sequence ①②③ as shown in the illustration below.

First torque: 1.5 - 2 N·m

Second torque: 5 - 6 N·m



U10075

- (3) Connect the shift motor wire harness connector.
- (4) Install the transmission control unit.
- (5) Fill transmission oil (oil judging standard: unscrew the filler plug next to differential, and leave it for 30 minutes after filling until the oil overflows).
- (6) Install the engine compartment lower protector assembly.

■ Test

Driving performance test: Drive the vehicle for 10 minutes, raise the temperature of transmission, and then test the following items.

- (1) When moving slowing, the accelerator pedal opening is less than 5%, and the vehicle has no jitter.
- (2) When driving, depress and hold brake pedal and the vehicle has no jitter.
- (3) Check forward and reverse gear conditions.

■ Clutch Self-learning

Refer to clutch self-learning method for clutch self-learning.

3.16 Replacement of Clutch

■ Removal

⚠ Warning

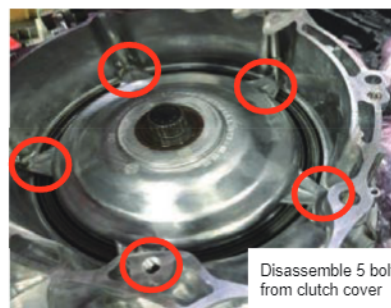
- **Be sure to wear necessary safety equipment to prevent accidents when repairing.**
- **When replacing parts, it must be performed in the clean environment.**
- **It can be only use original parts when it is necessary to replace parts.**

- (1) Turn off all electrical equipment and the ENGINE START STOP switch.
- (2) Remove drain plug to drain transmission oil (approximately 4 L), and contain it in a clean and dry container for reuse.
- (3) Retighten the new drain plug.

Tightening torque: 43 ± 4 N·m

- (4) Remove transmission assembly from vehicle.

- (5) Use TORX socket B8 to disassemble 5 bolts on clutch cover and dispose them.



Disassemble 5 bolts from clutch cover

U10076

- (6) Use 5mm inner hexagon wrench, gradually pry off it around connection blocks of 5 bolts for clutch cover to remove clutch cover. Make sure that clutch cover and clutch cover oil seal are not damaged or twisted, and dispose them if so.



U10077

■ Disassembly

- (1) Disassemble the sealing plug (quick-wear part, it must be disposed if removed), insert screw into upward hole in the middle, and then remove sealing plug.



Remove sealing plug

U10078

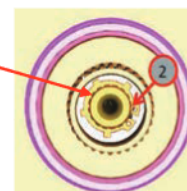
⚠ Caution

- Please use a dust-free cloth to prevent screw from scratching inner hole and contact end surface.

- (2) Disassemble snap ring ② with straight outer snap ring plier for shaft.



Remove clutch snap ring



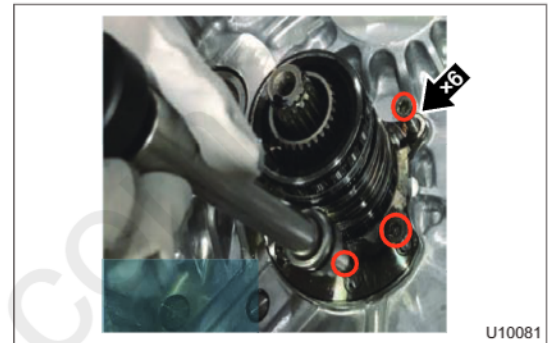
U10079

- (3) Remove the clutch manually.



■ Disassembly of Clutch Support

- (1) Use inner TORX screws T30 to disassemble 6 bolts on support and dispose them.



⚠ Caution

- Prevent screws from falling into the case during removal and installation.

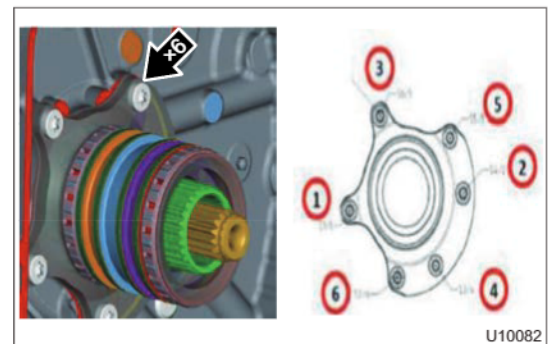
■ Installation

Installation of Support

- (1) Tighten 6 bolts on support in sequence 1 - 6 as shown in the illustration below.

First torque: 5 N·m

Second torque: 11 ± 0.5 N·m

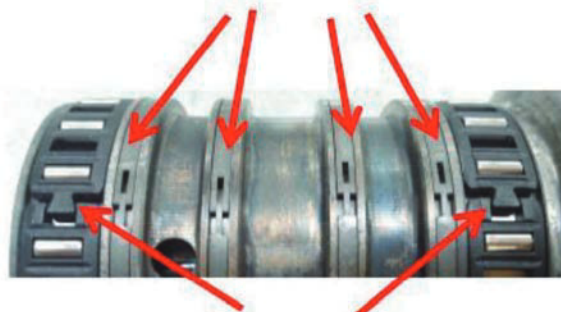


- (2)

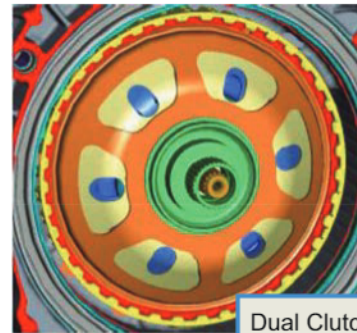
Installation of Dual Clutch

- (1) Before installing clutch on support, please check as follows: ensure that bearing and sealing ring are not damaged.

4× Sealing Rings Combination



2× Bearings Combination



U10083

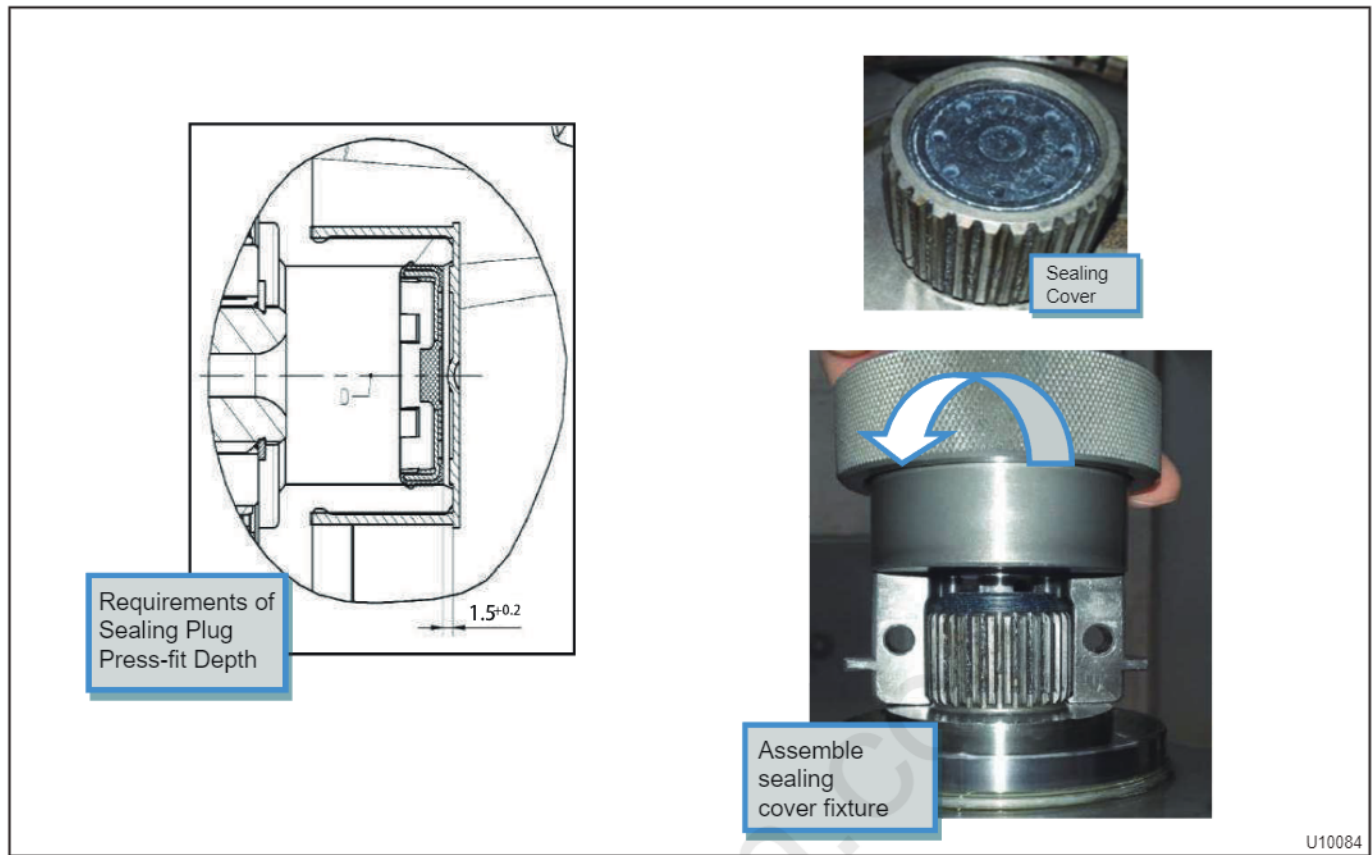
- (2) When installing clutch, gently rotate it.
- (3) Using snap spring calipers, install snap ring to shaft groove.

⚠ Caution

- Check whether the snap ring is installed in place, flip snap ring to confirm whether it can be rotated, if not, it means that the snap ring is not installed in place.

Installation of Clutch Cover

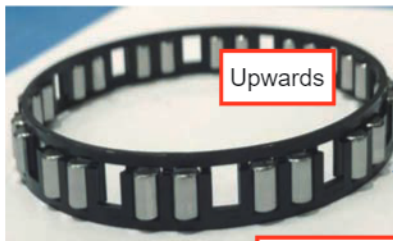
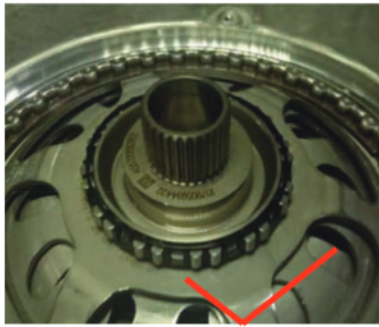
- (1) Replace the clutch cover O-ring.
 - Use clutch shaft sealing cover assembly fixture DCT300TP922-45 to install new sealing plug.
Pressing depth: 1.5 ~ 1.7 mm



- (2) Apply grease MJ-setral-M3 to drive disc or manually turn bearing rolling body to the center of cage, prevent bearing rolling body from damage when clutch cover is pressed.

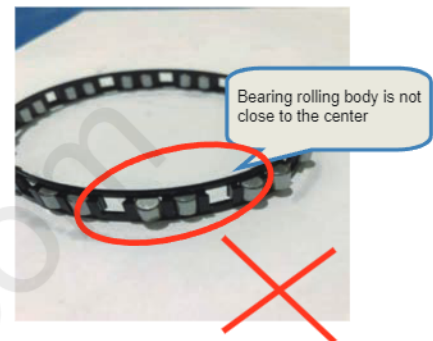
⚠ Caution

- **Bearing orientation.**



Keep the side with the larger outside diameter of cage facing down when assembling

The side with the larger outside diameter of cage faces down

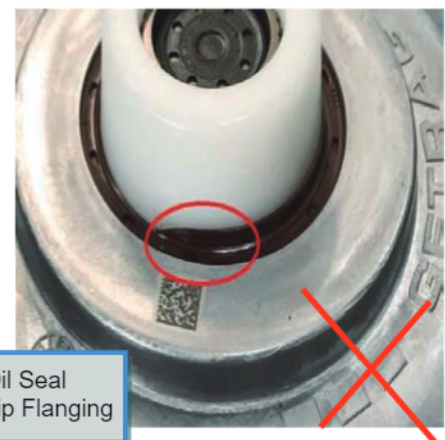
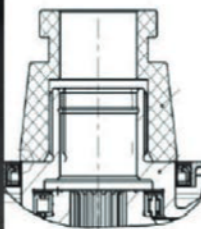


U10085

- (3) Insert oil seal protective sleeve fixture DCT300-TP-922-43 into drive plate to prevent oil seal lip from flanging.



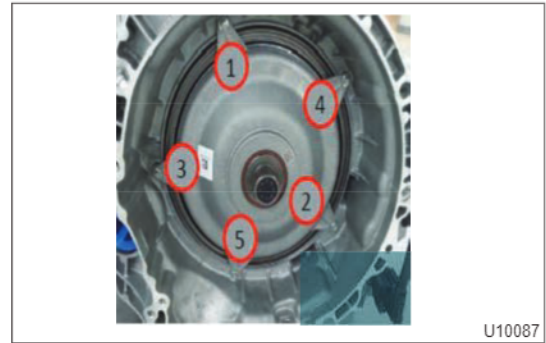
Oil Seal
Installation
Protective
Sleeve



Oil Seal
Lip Flanging

U10086

- (4) Replace the clutch cover O-ring.



Caution

- In the process of tightening, pay attention to ensure that clutch cover is in horizontal direction to avoid crushing inner needle bearing due to imbalanced bolt tightening force.
- Pay attention to whether the process of tightening bolts is not smooth due to the interference of roller bearings.

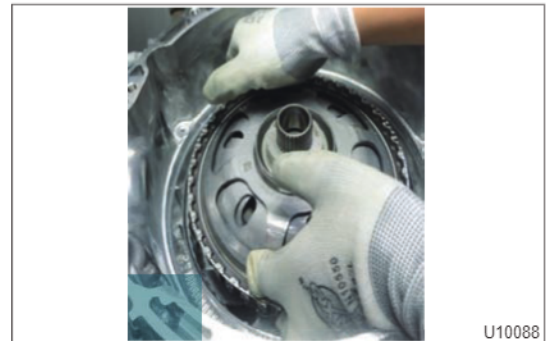
Warning

- During and after the installation of clutch cover, ensure that the oil seal lip is not flanged. If the oil seal lip is damaged, it will definitely cause oil leakage.
- Ensure that the O-ring is not damaged, otherwise, it may cause oil leakage.

■ Test

Test Function After Assembly

- (1) Manually rotate the clutch drive disc shaft to ensure smooth rotation.

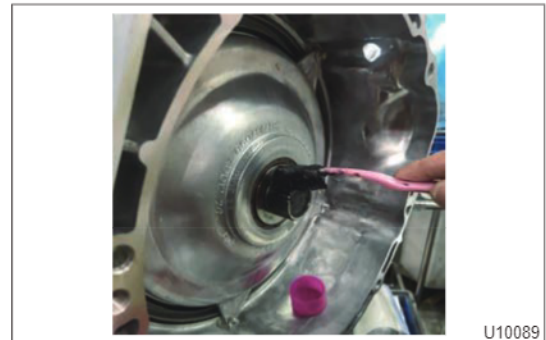


Inspection of Differential Oil Seal

- (1) After the clutch is installed, please check the differential oil seal carefully. When disassembling clutch from vehicle, if any damage is found, please replace oil seal with differential oil seal assembly fixture.

Applying Grease to Shaft Spline

- (1) Apply M- setra1-43N grease to drive disc spline.



■ Clutch Self-learning

Refer to clutch self-learning method for clutch self-learning.

⚠ Caution

- During clutch self-learning, the transmission oil temperature is 40 - 60 °C.

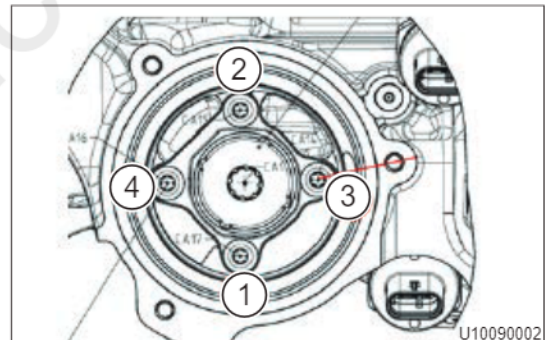
3.17 Replacement of Clutch Actuator Pump 1

⚠ Warning

- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- When replacing parts, it must be performed in the clean environment to prevent any liquid or foreign matters from entering the transmission.
- It can be only use original parts when it is necessary to replace parts.

■ Removal

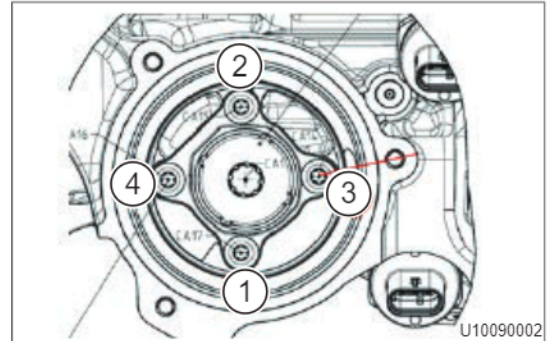
- (1) Turn off all electrical equipment and the ENGINE START STOP switch.
- (2) Thoroughly clean the outside of transmission, especially filler plug and drain plug areas. Remove loose particles in these areas and clean them with dust-free cloth and cleaner.
- (3) Remove drain plug to drain transmission oil (approximately 4 L), and contain it in a clean and dry container for reuse.
- (4) Retighten the new drain plug.
- (5) Remove the clutch motor 1.
- (6) Disassemble 4 bolts from actuator pump 1 and remove pump, washer and bolts.



■ Installation

- (1) Connect actuator pump 1 and washer with 4 bolts in series (washer hole is aligned with pump hole), and then install them to transmission. Tightening sequence of bolts is as follows:

Step	Bolt No.	Torque (N·m)	Note
1	1	1.5 - 2	Pre-tightening
2	2	5 - 6	Final tightening
3	1	5 - 6	Final tightening
4	3	5 - 6	Final tightening
5	4	5 - 6	Final tightening



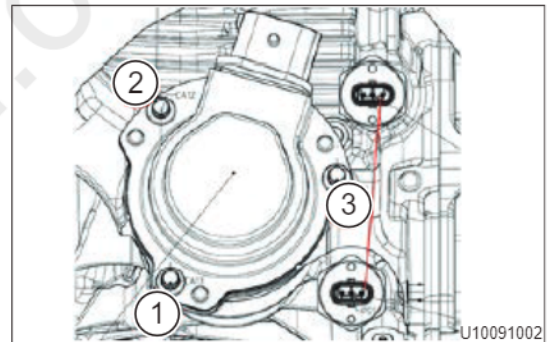
U10090002

⚠ Caution

- No. 3 bolt on right side of pump is close to motor bolt.

- (2) Install the clutch motor 1. Tightening sequence of motor 1 bolts is as follows:

Step	Bolt No.	Torque (N·m)	Note
1	1	1.5 - 2	Pre-tightening
2	2	1.5 - 2	Pre-tightening
3	3	1.5 - 2	Pre-tightening
4	1	5 - 6	Final tightening
5	2	5 - 6	Final tightening
6	3	5 - 6	Final tightening



U10091002

⚠ Caution

- No. 3 motor bolt is between two pressure sensors.

- (3) After installation, perform test in different oil temperature as required.

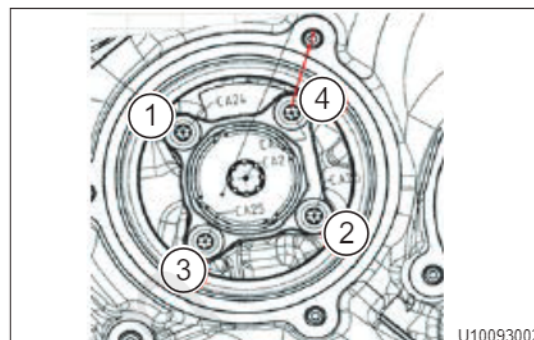
3.18 Replacement of Clutch Actuator Pump 2

⚠ Warning

- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- When replacing parts, it must be performed in the clean environment to prevent any liquid or foreign matters from entering the transmission.
- It can be only use original parts when it is necessary to replace parts.

■ Removal

- (1) Turn off all electrical equipment and the ENGINE START STOP switch.
- (2) Thoroughly clean the outside of transmission, especially filler plug and drain plug areas. Remove loose particles in these areas and clean them with dust-free cloth and cleaner.
- (3) Remove drain plug to drain transmission oil (approximately 4 L), and contain it in a clean and dry container for reuse.
- (4) Retighten the new drain plug.
- (5) Remove the clutch motor 2.
- (6) Disassemble 4 bolts from actuator pump 1 and remove pump, washer and bolts.



U10093002

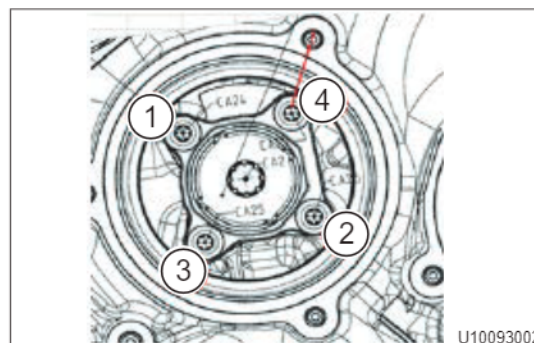


U10092002

■ Installation

- (1) Connect actuator pump 1 and washer with 4 bolts in series (washer hole is aligned with pump hole), and then install them to transmission. Tightening sequence of bolts is as follows:

Step	Bolt No.	Torque (N·m)	Note
1	1	1.5 - 2	Pre-tightening
2	2	5 - 6	Final tightening
3	1	5 - 6	Final tightening
4	3	5 - 6	Final tightening
5	4	5 - 6	Final tightening



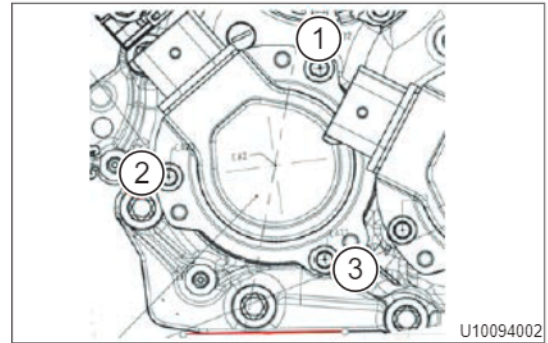
U10093002

⚠ Caution

- No. 4 bolt on right side of pump is close to motor bolt.

- (2) Install the clutch motor 2. Tightening sequence of motor 2 bolts is as follows:

Step	Bolt No.	Torque (N·m)	Note
1	1	1.5 - 2	Pre-tightening
2	2	1.5 - 2	Pre-tightening
3	3	1.5 - 2	Pre-tightening
4	1	5 - 6	Final tightening
5	2	5 - 6	Final tightening
6	3	5 - 6	Final tightening



- (3) After installation, perform test in different oil temperature as required.

3.19 Replacement of Clutch Cooling Pump

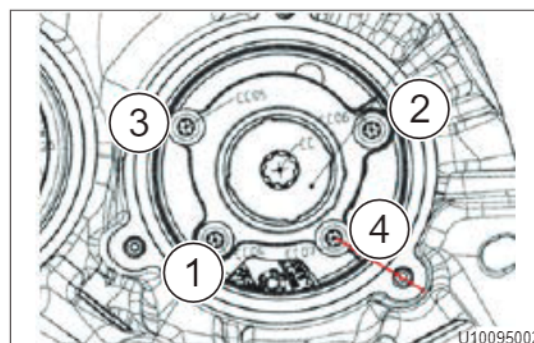
Warning

- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- When replacing parts, it must be performed in the clean environment to prevent any liquid or foreign matters from entering the transmission.
- It can be only use original parts when it is necessary to replace parts.

■ Removal

- (1) Turn off all electrical equipment and the ENGINE START STOP switch.
- (2) Thoroughly clean the outside of transmission, especially filler plug and drain plug areas. Remove loose particles in these areas and clean them with dust-free cloth and cleaner.
- (3) Remove drain plug to drain transmission oil (approximately 4 L), and contain it in a clean and dry container for reuse.
- (4) Retighten the new drain plug.
- (5) Remove the clutch cooling motor.

- (6) Disassemble 4 bolts from actuator pump 1 and remove pump, washer and bolts.



U10095002

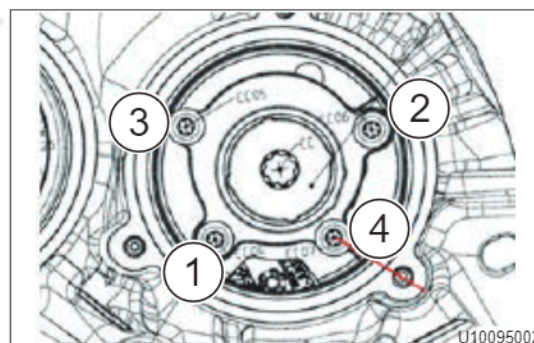


U10096002

■ Installation

- (1) Connect cooling pump with 4 bolts in series, and then install it to transmission. Tightening sequence of bolts is as follows:

Step	Bolt No.	Torque (N·m)	Note
1	1	1.5 - 2	Pre-tightening
2	2	5 - 6	Final tightening
3	1	5 - 6	Final tightening
4	3	5 - 6	Final tightening
5	4	5 - 6	Final tightening



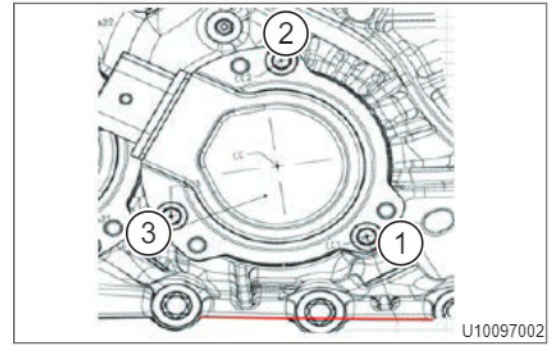
U10095002

⚠ Caution

- Align No. 4 bolt on right lower side of cooling pump with motor bolt.

- (2) Install the cooling motor. Tightening sequence of motor bolts is as follows:

Step	Bolt No.	Torque (N·m)	Note
1	1	1.5 - 2	Pre-tightening
2	2	1.5 - 2	Pre-tightening
3	3	1.5 - 2	Pre-tightening
4	1	5 - 6	Final tightening
5	2	5 - 6	Final tightening
6	3	5 - 6	Final tightening



- (3) After installation, perform test in different oil temperature as required.