7DCT

7DCT

TRANSMISSION CONTROL SYSTEM

Warnings and precautions

Warnings

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

1. Be sure to read precautions for SRS airbag before removing steering wheel.

Precautions

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

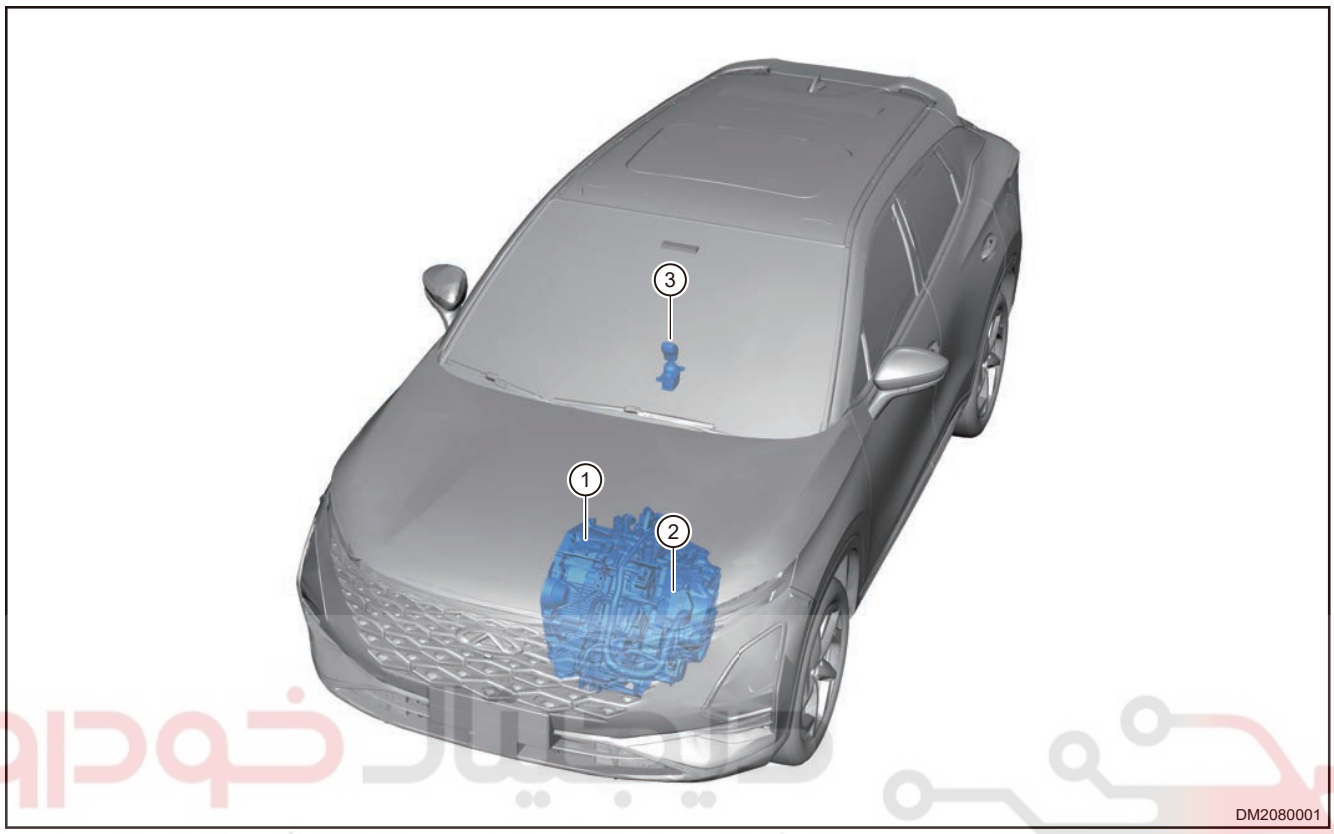
2. TCU bolts are non-reusable parts, which must be replaced after each removal.
3. TCU bolts are pre-coated parts. Residual sealant should be cleaned from threaded hole of housing before assembly.
4. If TCU is replaced with a new one, fresh correct TCU software with diagnostic tester.
5. During removal and installation of TCU, antistatic equipment should be worn to avoid damage to electronic components in TCU.

Overview

Description

The transmission control system (Dual Clutch Transmission (DCT)) is composed of Transmission Control Module (TCU), shift motor and electronic shift module, etc. Electronic shift module 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 is unable to release the current gear, we can only rely on the trailer and rescue.

System Components Diagram



1	Transmission Assembly	2	Transmission Control Module
3	Electronic Shift Control Mechanism		

B59	Body ground	Clutch motor 1 Hall sensor signal ground	Power supply “ON”	0 V
B60	Body ground	Cooling motor sensor power supply	Power supply “ON”	0 V
B61	Body ground	Shift motor 2 position signal	Power supply “ON”	2 V
B62	/	/	/	/
B63	/	/	/	/
B64	/	/	/	/
B65	Body ground	Electromagnetic shield	Power supply “ON”	-
B66	Body ground	Range sensor ground	Power supply “ON”	-
B67	Body ground	Range sensor 2 signal	Power supply “ON”	-

Circuit Diagram

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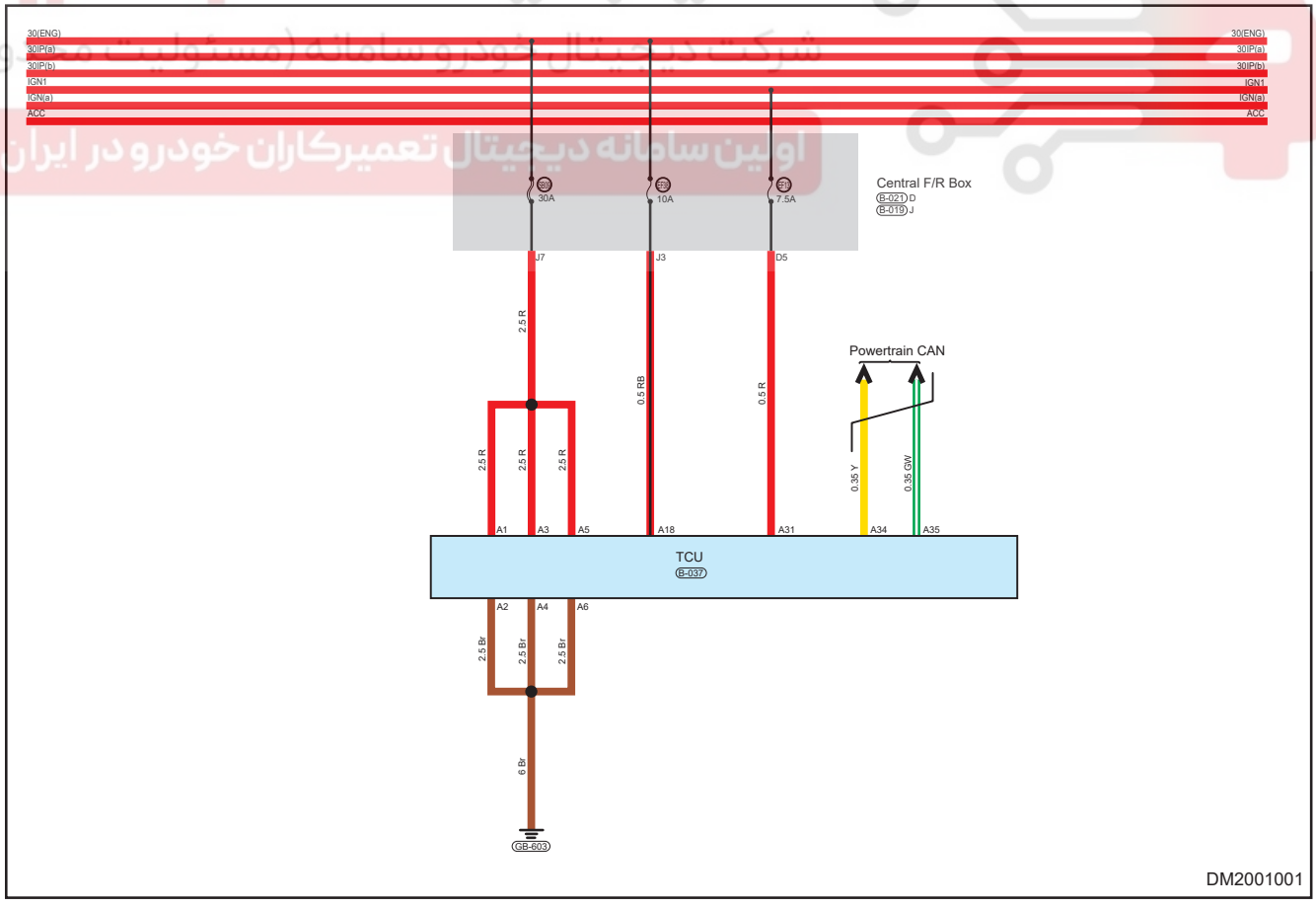

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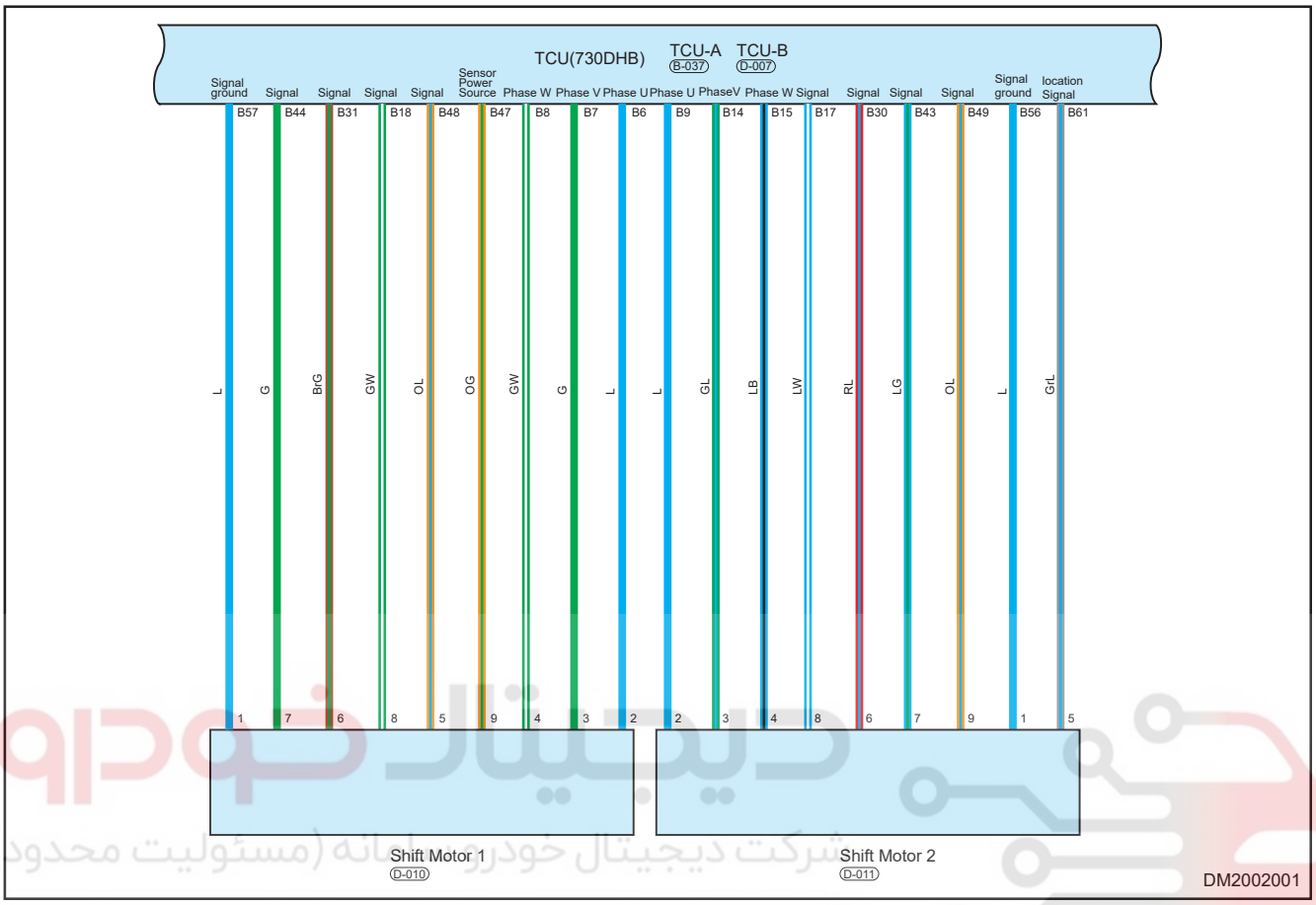

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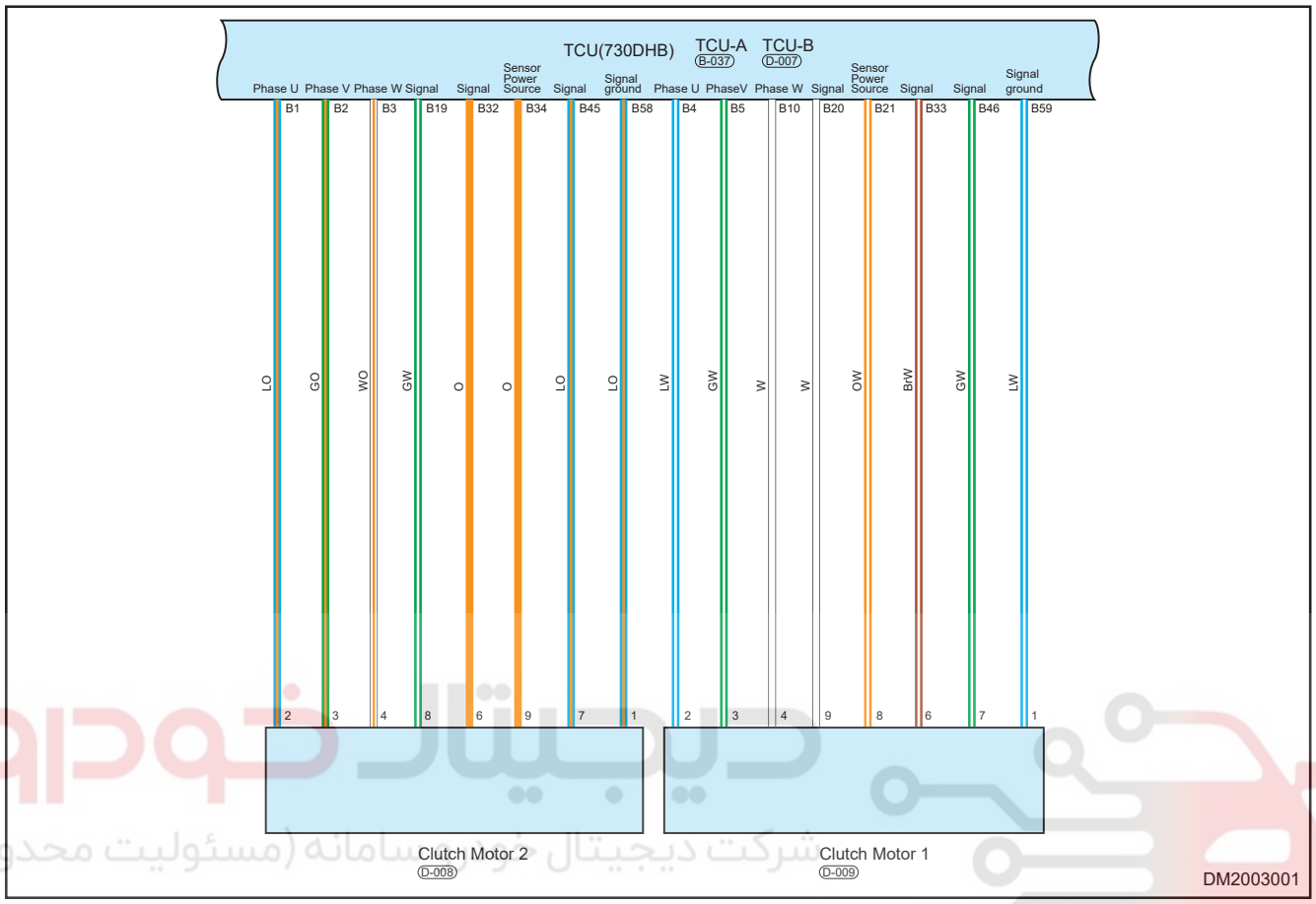

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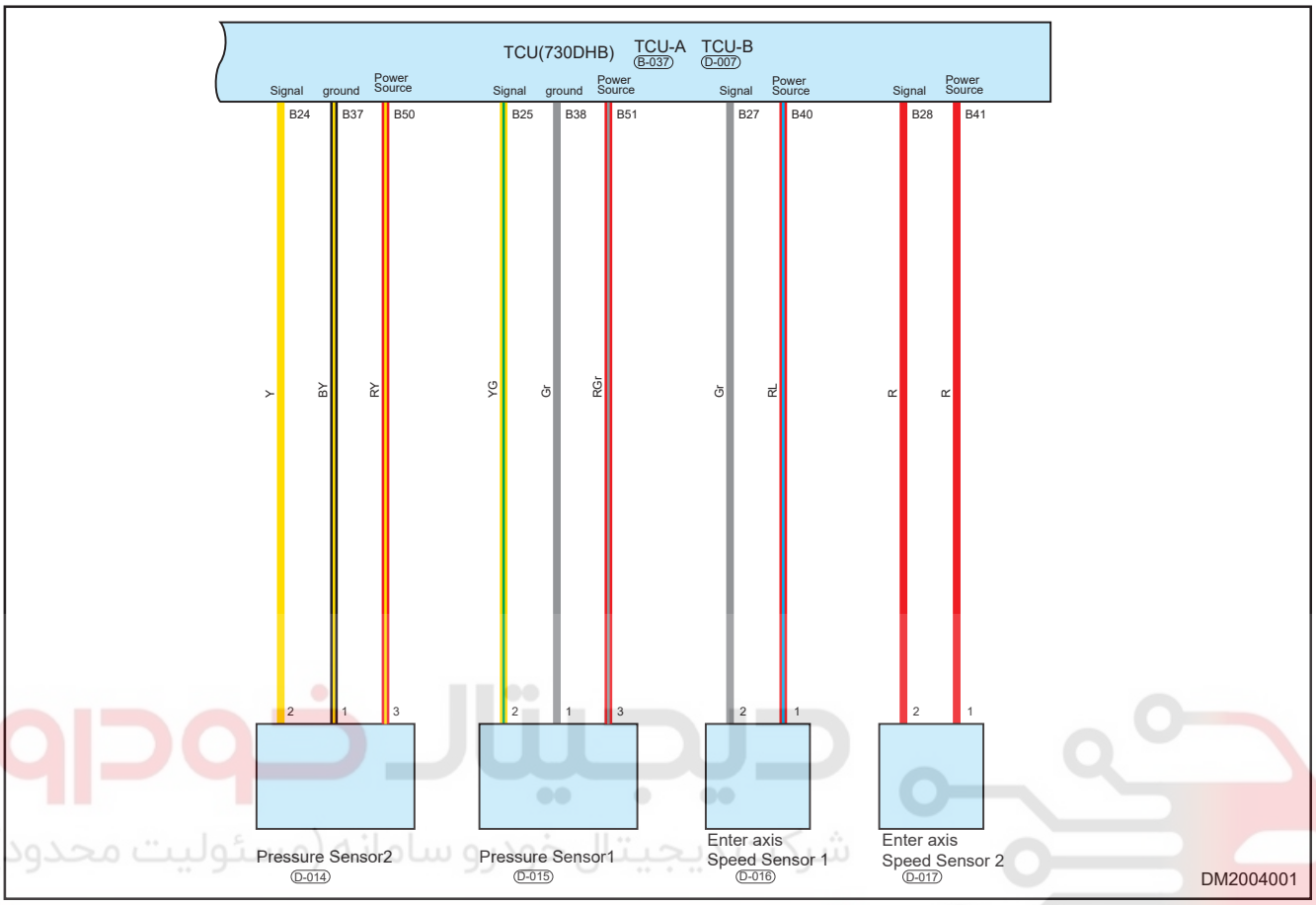
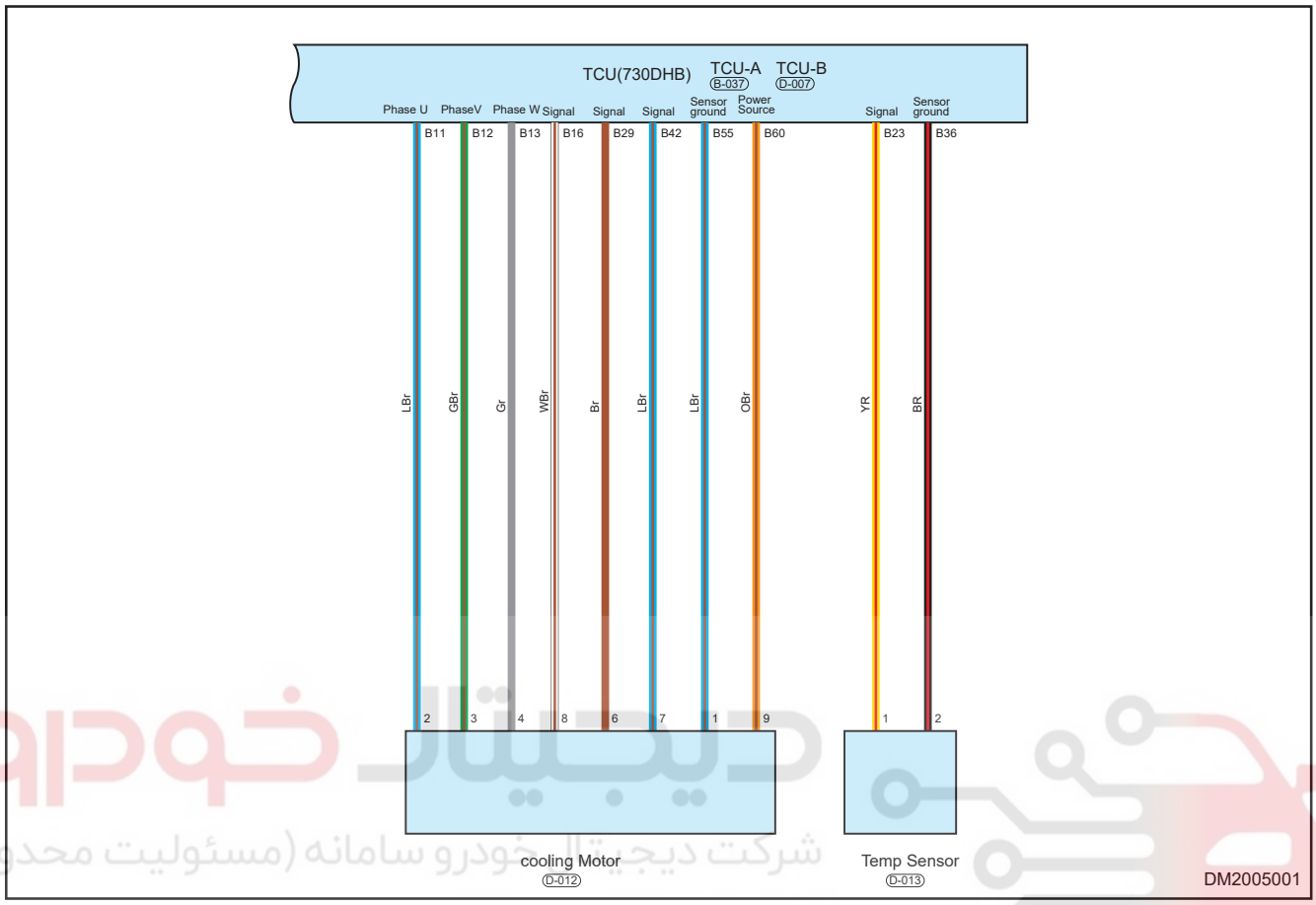


Transmission Management System (Page 5 of 5)



Diagnostic Information and Steps

DTC Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

- Turn ENGINE START STOP switch to OFF.
- Connect the diagnostic tester (the latest software).
- Turn ENGINE START STOP switch to ON.
- Use the diagnostic tester to record and clear DTCs stored in the system.
- Turn ENGINE START STOP switch to OFF and wait several seconds.
- Turn ENGINE START STOP switch to ON and check DTCs in the system again.
- If DTC is detected, it indicates current malfunction.
- If no DTC is detected, malfunction indicated by the DTC is intermittent.

Intermittent DTC Troubleshooting

If malfunction is intermittent, perform the followings:

- Check if connector is loose.
- Check if wire harness is worn, pierced, pinched or partially broken.
- Wiggle related wire harness and connector and observe if signal in related circuit is interrupted.
- If possible, try to duplicate conditions under which DTC was set.
- Look for data that has changed or DTC to reset during wiggling test.

- Check for broken, bent, protruded or corroded terminals.
- Check transmission control system components and mounting areas for damage, foreign matter, etc. that will cause incorrect signals.
- Check and clean all wire harness connectors and ground parts related to DTC.
- If multiple trouble codes were set, refer to circuit diagrams to look for any common ground circuit or power supply circuit applied to DTC.
- Refer to any Technical Bulletin that may apply to this malfunction.

Ground Inspection

Ground points are very important to normal operation of circuit, which are normal or not can seriously affect the entire circuit system. Ground points are often exposed to moisture, dirt and other corrosive environments. Corrosion (rust) may increase load resistance. In such cases, the circuit operation will be seriously affected. Circuit is very sensitive to proper grounding. A loose or corroded ground point can seriously affect control circuit. Check ground points as follows:

- Remove ground bolt or nut.
- Check all contact surfaces for tarnish, dirt and rust, etc.
- Clean as necessary to ensure that contact is in good condition.
- Reinstall ground bolt or nut securely.
- Check if any additional accessories interfere with ground circuit.
- If several wire harnesses are crimped into one ground terminal, check for proper crimp condition. Make sure that all wire harnesses are clean and securely fastened while providing a proper ground path.

Diagnosis Procedure

Hint:

- Use following procedures to troubleshoot the transmission system.

1	**Vehicle brought to workshop**

Next

2	**Check battery voltage**

Check if battery voltage is normal.
Standard Condition
Standard voltage: Not less than 12V.

NG → **Replace battery**

OK

3	**Customer problem analysis**

Next

4	**Read DTCs**

NG → **Perform repair according to problem symptoms table**

OK

5	Read DTCs (current DTC and history DTC)

NG → Troubleshoot according to Intermittent DTC malfunction procedures

OK

6	Repair according to Diagnostic Trouble Code (DTC) Chart

Next

7	Adjust, repair or replace

Next

8	Conduct test and confirm malfunction has been repaired

Next → End

Diagnostic Trouble Code (DTC) Chart

Hint:

- History trouble code cannot be reported, otherwise it will affect the use by customer.

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P180803h	PWM Monitoring ISS Odd Transmission Path: Pulse Width Failure	Detected longer or shorter pulses are invalid	• Wire harness or connector failure • Sensor failure • TCU failure	• Check wire harness or connector • Check whether battery input voltage, current consumption and appearance of TCU are stable • Check sensor • Check TCU
P181812h	Voltage Level Monitoring ISS Odd Transmission Path: Electrical Signal Short to Bat	Detected signal voltage is higher than threshold		
P180814h	Voltage Level Monitoring ISS Odd Transmission Path: Electrical Signal Short to Ground or Open Circuit	Detected signal voltage is lower than threshold		

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P18081Ch	Voltage Level Monitoring ISS Odd Transmission Path: Supply Voltage Out of Range High	Detected power supply voltage is higher than threshold		
P18081Dh	Voltage Level Monitoring ISS Odd Transmission Path: Supply Voltage Out of Range Low	Detected power supply voltage is lower than threshold		
P180837h	Frequency Monitoring ISS Odd Transmission Path: Frequency Failure	Signal frequency is too high		
P180894h	Jump Detection ISS Odd Transmission Path	First jump time is less than first timer threshold; If the timer is not currently running and the speed jump is detected, the start time value is stored. Input signal value must jump above calibration value, and maintain the new value for at least 20 ms or higher/lower than the first jump. It cannot effectively detect the peak of single signal	• Wire harness or connector failure • TCU power supply voltage failure • Sensor failure • TCU failure	
P180829h	Speed Monitoring ISS Odd Transmission Path	Wheel speed sensor and input shaft speed are unreasonable	• Wire harness or connector failure • Sensor failure	• Check wire harness or connector • Check sensor

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P180903h	PWM Monitoring ISS Even Transmission Path: Pulse Width Failure	Detected longer or shorter pulses are invalid	• Wire harness or connector failure • Sensor failure • TCU failure	• Check wire harness or connector • Check whether battery input voltage, current consumption and appearance of TCU are stable • Check sensor • Check TCU
P180911h	Voltage Level Monitoring ISS Even Transmission Path: Supply Voltage Short to Ground	Detected signal voltage is lower than threshold		
P180912h	Voltage Level Monitoring ISS Even Transmission Path: Supply Voltage Short to Bat	Detected signal voltage is higher than threshold		
P18091Ch	Voltage Level Monitoring ISS Even Transmission Path: Supply Voltage Out of Range High	Detected power supply voltage is higher than threshold		
P18091Dh	Voltage Level Monitoring ISS Even Transmission Path: Supply Voltage Out of Range Low	Detected power supply voltage is lower than threshold		
P181912h	Voltage Level Monitoring ISS Even Transmission Path: Supply Voltage Short to Bat	Detected power supply voltage is higher than threshold		
P180914h	Voltage Level Monitoring ISS Even Transmission Path: Supply Voltage Short To Ground	Detected power supply voltage is lower than threshold		
P180937h	Frequency Monitoring ISS	Signal frequency is too high		

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
	Even Path: Frequency Failure			
P180994h	Jump Detection ISS Even Transmission Path	First jump time is less than first timer threshold; If the timer is not currently running and the speed jump is detected, the start time value is stored. Input signal value must jump above calibration value, and maintain the new value for at least 20 ms or higher/lower than the first jump. It cannot effectively detect the peak of single signal		
P180929h	Speed Monitoring ISS Even Transmission Path	Wheel speed sensor and input shaft speed are unreasonable	• Wire harness or connector failure • Mechanical installation failure • Wheel speed sensor fault • TCU failure	• Check wire harness or connector • Check installation of sensor • Check TCU

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P180013h	Phases Monitoring Clutch Actuator 1: Open Circuit	Clutch motor threshold is lower than lower limit	• Wire harness or connector failure • Sensor failure • TCU failure	• Check wire harness or connector • Check sensor • Check TCU
P180012h	Phases Monitoring Clutch Actuator 1: Short to Bat	Clutch motor threshold is higher than upper limit		
P180015h	Phases Monitoring Clutch Actuator 1: Short to Battery or Open Circuit	Clutch motor threshold is higher than upper limit		
P180011h	Phases Monitoring Clutch Actuator 1: Short to Ground	Clutch motor threshold is lower than lower limit		

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P180113h	Phases Monitoring Clutch Actuator 2: Open Circuit	Clutch motor threshold is higher than upper limit	• Wire harness or connector failure • Clutch motor failure • TCU failure	• Check wire harness or connector • Check clutch motor • Check TCU
P180115h	Phases Monitoring Clutch Actuator 2: Short to Battery or Open Circuit	Clutch motor threshold is lower than lower limit		

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P180213h	Phases Monitoring Shift Actuator 1: Open Circuit	Clutch motor threshold is lower than lower limit	• Wire harness or connector failure • Shift motor failure • TCU failure	• Check wire harness or connector • Check shift motor • Check TCU
P180292h	Phases Monitoring Shift Actuator 1: Performance or Incorrect Operation	Power level driver reports that there is internal failure or regular power level has been turned off.		
P180212h	Phases Monitoring Shift Actuator 1: Short to Bat	Clutch motor threshold is higher than upper limit		
P180215h	Phases Monitoring Shift Actuator 1: Short to Battery or Open Circuit	/		
P180211h	Phases Monitoring Shift Actuator 1: Short to Ground	/		

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P182B62h	Clutch 1 Torque Too Low (GETRAG)	/	• Clutch slips	• Check clutch system
P182C62h	Clutch 2 Torque Too Low (GETRAG)	/		

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P181C2Ah	Pressure Sensor 1 Output Stuck at Certain Value	Pressure gradient of filtered clutch 1 s less than detected gradient threshold jammed by tps	• Wire harness or connector failure • Sensor failure • TCU failure • Transmission assembly failure	• Check wire harness or connector • Check sensor • Check TCU • Check transmission
P181C92h	Comparison Target to Current Pressure Sensor 1, Pressure too High	Current clutch pressure ＞ and desired pressure related pressure deviation threshold high and desired pressure dynamic related offset (- Deviation is calculated by pressure rate and delay factor)		
P181D92h	Comparison Target to Current Pressure Sensor 1, Pressure too Low	Current clutch pressure ＜ temperature and desired pressure related pressure deviation threshold high and desired pressure dynamic related offset (- Deviation is calculated by pressure rate and delay factor)		
P181C28h	Pressure Sensor 1 Offset too High	Clutch 1 pressure > clutch pressure offset maximum threshold or clutch 1 pressure < clutch pressure offset minimum threshold		
P181C27h	Pressure Sensor 1 Inplausible High Gradient	Clutch 1 pressure - clutch 1 original pressure > within the duration of clutch pressure failure gradient, the threshold of clutch pressure failure gradient is greater than clutch pressure failure gradient		

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P181E92h	Comparison Target to Current Pressure Sensor 2, Pressure too High	Pressure gradient of filtered clutch 2 s less than detected gradient threshold jammed by tps	• Wire harness or connector failure • Sensor failure • TCU failure	• Check wire harness or connector • Check pressure sensor • Check TCU
P181E2Ah	Pressure Sensor 2 Output Stuck at Certain Value	Current clutch pressure ＞ and desired pressure related pressure deviation threshold high and desired pressure dynamic related offset (- Deviation is calculated by pressure rate and delay factor)		
P181F92h	Comparison Target to Current Pressure Sensor 2, Pressure too Low	Current clutch pressure ＜ temperature and desired pressure related pressure deviation threshold high and desired pressure dynamic related offset (- Deviation is calculated by pressure rate and delay factor)		
P181E28h	Pressure Sensor 2 Offset too High	Clutch 2 pressure > clutch pressure offset maximum threshold or clutch 1 pressure < clutch pressure offset minimum threshold		
P181E27h	Pressure Sensor 2 Inplausible High Gradient	Clutch 2 pressure - clutch 1 original pressure > within the duration of clutch pressure failure gradient, the threshold of clutch pressure failure gradient is greater than clutch pressure failure gradient		

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P180411h	Phases Monitoring Cooling Actuator: Short to Ground	/	• Wire harness or connector failure • Cooling pump failure • TCU failure	• Check wire harness or connector • Check cooling pump • Check TCU
P180412h	Phases Monitoring Cooling Actuator: Short to Bat	/		
P180413h	Phases Monitoring Cooling Actuator: Open Circuit	Divert shunt resistor voltage < PWM threshold voltage		
P1805F0h	Clutch Cooling Pump Motor Speed Check (too High)	Difference between actual pump speed and expected pump speed > cooling pump speed difference threshold and expected pump speed * cooling pump speed factor		
P1805F1h	Clutch Cooling Pump Motor Speed Check (too Low)	Difference between actual pump speed and expected pump speed <- (cooling pump speed difference threshold and expected pump speed * cooling pump speed factor)		
P1805F2h	Clutch Cooling Pump Motor Speed Check (-Unexpected Zero or Negative)	Actual pump speed <= minimum pump speed threshold		
P18054Bh	Clutch Cooling Pump Motor Powerstage (Overtemperature)	Cooling water pump heat load index >= cooling water pump heat load threshold		
P180E11h	Voltage Level Monitoring Sensor Clutch Cooling Motor: Supply Voltage Short Circuit to Ground	The timer is zero when power supply is abnormal, and the power supply voltage level is lower than		

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
		maximum threshold of sensor power regulator, and the sensor power supply voltage is lower than SG threshold		
P180E1Ch	Voltage Level Monitoring Sensor Clutch Cooling Motor: Supply Voltage Out of Range High	Power supply voltage > motor power supply voltage upper limit threshold		
P180E1Dh	Voltage Level Monitoring Sensor Clutch Cooling Motor: Supply Voltage Out of Range Low	Power supply voltage < motor power supply voltage lower limit threshold		
P180415h	Phases Monitoring Cooling Actuator: Short to Battery or Open Circuit	Phase 1, phase 2 or phase 3 ground and phase voltage L3 is above 250 mV		
P180492h	Phases Monitoring Cooling Actuator: Performance or Incorrect Operation	Power level driver reports that there is internal failure or general power level has been turned off		

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
U041686h	Speed Monitoring (CAN) Wheel Speed FL Invalid	Corresponding signal == 0xFFFF (invalid) or corresponding sensor status signal == 0x1 (invalid)	• Wire harness or connector failure • Sensor failure • TCU failure	• Check wire harness or connector • Check sensor • Check TCU
U041686h	Speed Monitoring (CAN) Wheel Speed FR Invalid			
U041686h	Speed Monitoring (CAN) Wheel Speed RL Invalid			
U041686h	Speed Monitoring (CAN) Wheel Speed RR Invalid			

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
U040186h	Brake Pedal (CAN) Signal Invalid			
U040186h	Engine Idling (CAN) Signal Invalid			
U041786h	Hand Brake (CAN) Signal Invalid			
U040186h	Accelerator Pedal (CAN) Signal Invalid			
U042386h	Environment Temperature (CAN) Signal Invalid			
U040186h	Driver Torque Request (CAN) Signal Invalid			
U040186h	Engine Min. Torque (CAN) Signal Invalid			
U040186h	Engine Max. Torque (CAN) Signal Invalid			
U040186h	Engine Temperature (CAN) Signal Invalid			

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P181415h	Voltage Level Monitoring Oil Temperature Sensor: Signal Short-to-Battery or Open Load	Signal voltage > temperature sensor Scb threshold	• Wire harness or connector failure • TCU failure	• Check wire harness or connector • Check TCU
P181411h	Voltage Level Monitoring Oil Temperature Sensor: Signal Short-to-GND	Signal voltage < temperature sensor scg threshold		
P181311h	Voltage Level Monitoring Oil Temperature Sensor: Supply	The timer is zero when power supply is abnormal, and the power supply	• Wire harness or connector failure	• Check wire harness or connector • Check oil temperature sensor

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
	Voltage Short To Ground	voltage level is lower than maximum threshold of sensor power regulator, and the sensor power supply voltage is lower than SG threshold	• Oil Temperature Sensor Fault • TCU failure	• Check TCU
P181312h	Voltage Level Monitoring Oil Temperature Sensor: Supply Voltage Short To Battery	Power supply voltage level of sensor power regulator is lower than maximum threshold and the sensor power voltage is higher than SB threshold		
P181317h	Voltage Level Monitoring Oil Temperature Sensor: Supply Voltage Out Of Range High	Power supply voltage > temperature sensor power supply voltage upper limit		
P181316h	Voltage Level Monitoring Oil Temperature Sensor: Supply Voltage Out Of Range Low	Power supply voltage < Temperature sensor power supply voltage lower limit		

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P180092h	Phases Monitoring Clutch Actuator 1: Performance or Incorrect Operation	Power level driver reports that there is internal failure or general power level has been turned off	• Wire harness or connector failure • Clutch motor failure • TCU failure	• Check wire harness or connector • Check clutch motor • Check TCU
P180111h	Phases Monitoring Clutch Actuator 2: Short to Ground	/	• Wire harness or connector failure • Clutch motor failure • TCU failure	• Check wire harness or connector • Check clutch motor • Check TCU
P180112h	Phases Monitoring Clutch Actuator 2: Short Circuit to Battery	/		

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P180192h	Phases Monitoring Clutch Actuator 2: Performance or Incorrect Operation	Power level driver reports that there is internal failure or general power level has been turned off		

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P180229h	Shift Actuator 1 Motor Speed Check	Drum speed > drum speed threshold	• Wire harness or connector failure • TCU failure	• Check wire harness or connector • Check TCU
P18024Bh	Temperature Monitoring Shift Actuator 1 Powerstage (Overtemperatur-e)	Shift motor 1 heat load index >= Shift motor 1 heat load threshold	• Wire harness or connector failure • TCU failure	• Check wire harness or connector • Check TCU
P180262h	Signal Level Correlation Monitoring Shift Actuator 1	Incremental position signal calculated from Hall sensor - PWM position signal from absolute sensor > position difference error	• Wire harness or connector failure • TCU failure • Shift motor failure	• Check wire harness or connector • Check shift motor • Check TCU
P180311h	Phases Monitoring Shift Actuator 2: Short to Ground	/		

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P180313h	Phases Monitoring Shift Actuator 2: Open Circuit	Motor threshold is lower than lower limit	• Wire harness or connector failure • TCU failure • Shift motor failure	• Check wire harness or connector • Check shift motor • Check TCU
P180315h	Phases Monitoring Shift Actuator 2: Short to Battery or Open Circuit	Phase 1, phase 2 or phase 3 ground and phase voltage L3 is above 250 mV		
P180329h	Shift Actuator 2 Motor Speed Check	Drum speed > drum speed threshold		
P18034Bh	Temperature Monitoring Shift Actuator 2	Shift motor 2 heat load index >= Shift		

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
	Powerstage (Overtemperatur-e)	motor 2 heat load threshold		
P180362h	Signal Level Correlation Monitoring Shift Actuator 2	Incremental position signal calculated from Hall sensor - PWM position signal from absolute sensor > position difference error		
P180392h	Phases Monitoring Shift Actuator 2: Performance or Incorrect Operation	Power level driver reports that there is internal failure or regular power level has been turned off		
P180312h	Phases Monitoring Shift Actuator 2: Short to Bat	/		

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P18064Bh	Temperature Monitoring Clutch Actuator 1 Powerstage (Overtemperatur-e)	Motor heat load index >= Heat load threshold	• Wire harness or connector failure • Clutch motor failure • TCU failure	• Check wire harness or connector • Check clutch motor • Check TCU

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P1806F1h	Clutch 1 Motor Speed Check (too Low)	(Pressure sensor status is invalid and clutch 1 brake actual speed < clutch 1 theoretical brake minimum speed) or (- pressure sensor status is valid and clutch 1 brake actual speed = 0 and theoretical brake speed is required speed torque/pressure for starting > clutch pump speed threshold)		
P18074Bh	Temperature Monitoring Clutch Actuator 2 Powerstage (Overtemperatur-e)	Clutch 2 heat load index >= Clutch 2 heat load threshold		
P1807F1h	Clutch 2 Motor Speed Check (too Low)	(Pressure sensor status is invalid and clutch 1 brake actual speed < clutch 1 theoretical brake minimum speed) or (- pressure sensor status is valid and clutch 1 brake actual speed = 0 and theoretical brake speed is required speed torque/pressure for starting > clutch pump speed threshold)		

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P180811h	Voltage Level Monitoring ISS Odd Transmission Path: Supply Voltage Short to Ground	Power supply voltage < threshold	• Wire harness or connector failure • ISS sensor failure • TCU failure	• Check wire harness or connector • Check ISS sensor • Check TCU
P180812h	Voltage Level Monitoring ISS Odd Transmission Path: Supply Voltage Short to Bat	Power supply voltage > threshold		

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P180A11h	Voltage Level Monitoring of Actuator Sensor Clutch 2: Supply Voltage Short Circuit to Ground	The timer is zero when power supply is abnormal, power supply voltage level of sensor power regulator is lower than maximum threshold and the sensor power voltage is lower than SG threshold	• Wire harness or connector failure • Clutch motor 2 failure • TCU failure	• Check wire harness or connector • Check clutch motor 2 • Check TCU
P180A12h	Voltage Level Monitoring of Actuator Sensor Clutch 2: Supply Voltage Short Circuit to Battery	The timer is zero when power supply is abnormal, power supply voltage level of sensor power regulator is lower than maximum threshold and the sensor power voltage is higher than SB threshold		
P180A1Ch	Voltage Level Monitoring of Actuator Sensor Clutch 2: Supply Voltage Out of Range High	Power supply voltage > upper limit		

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P180A1Dh	Voltage Level Monitoring of Actuator Sensor Clutch 2: Supply Voltage Out of Range Low	Power supply voltage < upper limit		

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P180B11h	Voltage Level Monitoring of Actuator Sensor Clutch 1: Supply Voltage Short Circuit to Ground	The timer is zero when power supply is abnormal, power supply voltage level of sensor power regulator is lower than maximum threshold and the sensor power voltage is lower than SG threshold	• Wire harness or connector failure • Clutch motor 1 failure • TCU failure	• Check wire harness or connector • Check clutch motor • Check TCU
P180B12h	Voltage Level Monitoring of Actuator Sensor Clutch 1: Supply Voltage Short Circuit to Battery	The timer is zero when power supply is abnormal, power supply voltage level of sensor power regulator is lower than maximum threshold and the sensor power voltage is higher than SB threshold		
P180B1Ch	Voltage Level Monitoring of Actuator Sensor Clutch 1: Supply Voltage Out of Range High	Power supply voltage > upper limit		
P180B1Dh	Voltage Level Monitoring of Actuator Sensor Clutch 1: Supply Voltage Out of Range Low	Power supply voltage < upper limit		

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P180C11h	Voltage Level Monitoring Sensor Shift Motor 1: Supply Voltage Short Circuit to Ground	The timer is zero when power supply is abnormal, power supply voltage level of sensor power regulator is lower than maximum threshold and the sensor power voltage is lower than SG threshold	• Wire harness or connector failure • Sensor failure • TCU failure	• Check wire harness or connector • Check sensor • Check TCU
P180F11h	Voltage Level Monitoring Pressure Sensor 1: Supply Voltage Short to Ground			

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P180C12h	Voltage Level Monitoring Sensor Shift Motor 1: Supply Voltage Short Circuit to Battery	The timer is zero when power supply is abnormal, power supply voltage level of sensor power regulator is lower than maximum threshold and the sensor power voltage is higher than SB threshold	• Wire harness or connector failure • Sensor failure • TCU failure	• Check wire harness or connector • Check sensor • Check TCU
P180E12h	Voltage Level Monitoring Sensor Clutch Cooling Motor: Supply Voltage Short Circuit to Battery			
P180F12h	Voltage Level Monitoring Pressure Sensor 1: Supply Voltage Short to Battery			

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P180C1Ch	Voltage Level Monitoring Sensor Shift Motor 1: Supply Voltage Out of Range High	Power supply voltage > upper limit	• Wire harness or connector failure • Sensor failure • TCU failure	• Check wire harness or connector • Check sensor • Check TCU
P180F1Ch	Voltage Level Monitoring Pressure Sensor 1: Supply Voltage Out of Range High			

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P180C1Dh	Voltage Level Monitoring Sensor Shift Motor 1: Supply Voltage Out of Range Low	Power supply voltage < upper limit	• Wire harness or connector failure • Sensor failure • TCU failure	• Check wire harness or connector • Check sensor • Check TCU
P180F1Dh	Voltage Level Monitoring Pressure Sensor 1: Supply Voltage Out of Range Low			

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P180D11h	Voltage Level Monitoring Sensor Shift Motor 2: Supply Voltage Short Circuit to Ground	The timer is zero when power supply is abnormal, power supply voltage level of sensor power regulator is lower than maximum threshold and the sensor power voltage is lower than SG threshold	• Wire harness or connector failure • Sensor failure • TCU failure	• Check wire harness or connector • Check sensor • Check TCU
P181111h	Voltage Level Monitoring Pressure Sensor 2: Supply Voltage Short to Ground			

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P180D12h	Voltage Level Monitoring Sensor Shift Motor 2: Supply Voltage Short Circuit to Battery	The timer is zero when power supply is abnormal, power supply voltage level of sensor power regulator is lower than maximum threshold and the sensor power voltage is higher than SB threshold	• Wire harness or connector failure • Sensor failure • TCU failure	• Check wire harness or connector • Check sensor • Check TCU
P181112h	Voltage Level Monitoring Pressure Sensor 2: Supply Voltage Short to Battery			

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P180D1Ch	Voltage Level Monitoring Sensor Shift Motor 2: Supply Voltage Out of Range High	Power supply voltage > upper limit	• Wire harness or connector failure • Sensor failure • TCU failure	• Check wire harness or connector • Check sensor • Check TCU
P18111Ch	Voltage Level Monitoring Pressure Sensor 2: Supply Voltage Out of Range High			

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P180D1Dh	Voltage Level Monitoring Sensor Shift Motor 2: Supply Voltage Out of Range Low	Power supply voltage < upper limit	• Wire harness or connector failure • Sensor failure • TCU failure	• Check wire harness or connector • Check sensor • Check TCU
P18111Dh	Voltage Level Monitoring Pressure Sensor 2: Supply Voltage Out of Range Low			

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P181011h	Voltage Level Monitoring Pressure Sensor 1: Signal Short to Ground	Pressure sensor signal voltage < signal SCG percentage	• Wire harness or connector failure • Sensor failure • TCU failure	• Check wire harness or connector • Check sensor • Check TCU
P181211h	Voltage Level Monitoring Pressure Sensor 2: Signal Short to Ground			

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P181015h	Voltage Level Monitoring Pressure Sensor 1: Signal Short to Battery or Open Circuit	Pressure sensor signal voltage > TPS1 signal SCB percentage	• Wire harness or connector failure • Sensor failure • TCU failure	• Check wire harness or connector • Check sensor • Check TCU

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P181215h	Voltage Level Monitoring Pressure Sensor 2: Signal Short to Battery or Open Circuit			
P18101Ch	Voltage Level Monitoring Pressure Sensor 1: Signal Out Of Range High	Pressure sensor signal >= TPS signal upper limit or threshold		
P18121Ch	Voltage Level Monitoring Pressure Sensor 2: Signal Out Of Range High			
P18101Dh	Voltage Level Monitoring Pressure Sensor 1: Signal Out Of Range Low	Pressure sensor signal <= TPS signal upper limit or threshold		
P18121Dh	Voltage Level Monitoring Pressure Sensor 2: Signal Out Of Range Low			

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P181516h	TCU Internal PCB Temperature Sensor Level 1 Voltage Below Threshold	Signal voltage < sensor lower limit	• TCU failure	• Check TCU
P181616h	TCU Internal PCB Temperature Sensor Level 2 Voltage Below Threshold			
P181716h	TCU Internal PCB Temperature Sensor Level 3 Voltage Below Threshold			
P181517h	TCU Internal PCB Temperature Sensor Level 1 Voltage Above Threshold	Signal voltage < sensor upper limit		

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P181617h	TCU Internal PCB Temperature Sensor Level 2 Voltage Above Threshold			
P181717h	TCU Internal PCB Temperature Sensor Level 3 Voltage Above Threshold			

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P181892h	Target Position Not Reached in a Defined Time, Changed Position to N or P	During transmission in P, the driver requests transmission in R or N or D or M, or during transmission in R or N or D or M, the driver requests transmission in P, and this gear is not used after waiting	• Wire harness or connector failure • Shift module failure • TCU failure	• Check wire harness or connector • Check shift module • Check TCU

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P181992h	Clutch 1 Position Signal	Check valid Hall mode: Hall mode is 0 or 7 or Hall mode has sequence error	• Wire harness or connector failure • Motor failure • TCU failure	• Check wire harness or connector • Check motor • Check TCU
P181A92h	Clutch 2 Position Signal			
P182092h	Hall Plausi Shift Actuator 1			
P182192h	Hall Plausi Shift Actuator 2			
P182292h	Hall Plausi Cooling Actuator	Check valid Hall mode: Hall mode is 000 or 111 or Hall mode has sequence error		

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P181B22h	Jump Detection of Oil Temperature Value	Temperature gradient of oil pan > temperature gradient threshold of oil pan is greater than temperature gradient value of oil pan	• Wire harness or connector failure • Transmission oil loss • TCU failure	• Check wire harness or connector • Check transmission oil • Check TCU
P181B2Ah	Oil Temperature Value is Stuck	Comparison of actual oil temperature and oil temperature < minimum change of oil temperature is longer than the observation time of D45		
P181B64h	Offset Detection of Oil Temperature Value	Oil pan temperature - ambient temperature > D45 temperature offset error		

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P182035h	PWM Duty Monitoring Shift Actuator 1 Out of Range High	Signal duty ratio < minimum duty ratio of motor position sensor	• Wire harness or connector failure • Motor failure • TCU failure	• Check wire harness or connector • Check shift module • Check TCU
P182135h	PWM Duty Monitoring Shift Actuator 2 Out of Range High			
P182034h	PWM Duty Monitoring Shift Actuator 1 Out of Range Low	Signal duty ratio > maximum duty ratio of motor position sensor		
P182134h	PWM Duty Monitoring Shift Actuator 2 Out of Range Low			
P182037h	Carrier Frequency Monitoring Shift Actuator 1 Out of Range High	Signal carrier cycle time < minimum value of motor position sensor		

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P182137h	Carrier Frequency Monitoring Shift Actuator 2 Out of Range High			
P182036h	Carrier Frequency Monitoring Shift Actuator 1 Out of Range Low	Signal carrier cycle time > maximum value of motor position sensor		
P182136h	Carrier Frequency Monitoring Shift Actuator 2 Out of Range Low			

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P182372h	Engagement Failure Detection Odd Transmission Path	Timeout detection: The different stages of the participation process (until reaching the participating position) should be completed within the specified participation time (different time for each stage). Or block detection: At different stages of the engagement (- brake movement should be expected), the shift drum position should be monitored. If the position difference (10 ms) between two task calls is lower than the position difference threshold, the block debounce time should be used to eliminate the error. Number of meshing attempts > Meshing retry threshold (- depending on gear)	• Wire harness or connector failure • Shift drum motor failure • TCU failure	• Check wire harness or connector • Check shift drum motor • Check TCU
P182373h	Disengagement Failure Detection Odd Transmission Path			
P182472h	Engagement Failure Detection Even Transmission Path			
P182473h	Disengagement Failure Detection Even Transmission Path			

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P182394h	Gear Jump Detection Odd Transmission Path	ISS odd path-OSS * gear ratio of meshing gear > calibrated output speed difference 1 or (ISS odd path-OSS * gear ratio of meshing gear > calibrated output speed difference 2 and OSS > calibrated output speed) and exceeded single detection time or (- nominal gear cannot be reached, and the controller has been turned off (the gear mesh window has been reached) and the position difference exceeds the threshold (- depending on gear)), and the number of gear jumps > gear jump threshold (- depending on gear)	• Wire harness or connector failure • ISS1 sensor failure • TCU failure	• Check wire harness or connector • Check ISS1 sensor • Check TCU
P182494h	Gear Jump Detection Even Transmission Path	ISS2 even path-OSS * gear ratio of meshing gear > calibrated output speed difference 1 or (ISS odd path-OSS * gear ratio of meshing gear > calibrated output speed difference 2 and OSS > calibrated output speed) and exceeded single detection time or (- nominal gear cannot be reached, and the controller has been turned off	• Wire harness or connector failure • ISS2 sensor failure • TCU failure	• Check wire harness or connector • Check ISS2 sensor • Check TCU

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
		(the gear mesh window has been reached) and the position difference exceeds the threshold (- depending on gear)), and the number of gear jumps > gear jump threshold (- depending on gear)		

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P182577h	Shiftdrum 1 Movement Monitoring (- Unexpected Shiftdrum 1 Standstill)	Drum displacement is not detected (The ratio between theoretical displacement drum position change rate and actual displacement drum position change rate < minimum position ratio or > maximum position ratio) Note: The displacement drum position should be calculated from the position model	• Wire harness or connector failure • TCU failure	• Check wire harness or connector • Check TCU
P182677h	Shiftdrum 2 Movement Monitoring (- Unexpected Shiftdrum 2 Standstill)			

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P182707h	Synchronization Failure Odd Transmission Path	Shift drum position > Pos threshold (- depending on gear) and ABS (- input shaft speed - target input shaft speed) > speed threshold (- depending on gear) and number of gear meshing attempts > meshing retry threshold (- depending on gear)	• Wire harness or connector failure • Sensor failure • TCU failure	• Check wire harness or connector • Check sensor • Check TCU
P182807h	Synchronization Failure Even Transmission Path			

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P182929h	Continuous Monitoring of Mechanical End Stop Shifter Drum 1	Position difference between learned shift drum block and measured shift drum mechanical end > mechanical end	• Wire harness or connector failure • Shift drum failure • TCU failure	• Check wire harness or connector • Check shift drum • Check TCU
P182A29h	Continuous Monitoring of Mechanical End Stop Shifter Drum 2			

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P182D98h	Temperature Monitoring Clutch 1	Normalized clutch stress level >= (- clutch stress level threshold + clutch stress level hyst)	/	/
P182E98h	Temperature Monitoring Clutch 2			

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P182F98h	Oil Pan Oil Temperature Monitoring	Oil pan pressure >= (oil pan pressure level + oil pan pressure + oil pan pressure)	/	/

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P183098h	Temperature Monitoring Clutch1, Clutch2 and Sump Oil Temperature for 1st Warning Level / Functional Degradation Level	Clutch protection warning level 1 is set according to clutch temperature, oil temperature, vehicle speed, depressing pedal or not.		
P183198h	Temperature Monitoring Clutch1, Clutch2 and Sump Oil Temperature for 2nd Warning Level / Functional Degradation Level	Clutch protection warning level 2 is set according to clutch temperature, oil temperature, vehicle speed, depressing pedal or not.		

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P183277h	Monitoring Park Lock Position	Unreasonable position monitoring	• Wire harness or connector failure • Range sensor failure • TCU failure	• Check wire harness or connector • Check range sensor • Check TCU
P183307h	Clutch 1 Drag Torque Detection	The odd path of input shaft speed is more than the engine speed, and the calculated torque is more than the resistance tq threshold ins gt eng, the odd path of input shaft speed is less than the engine speed , and the calculated torque is more than the resistance tq threshold ins lt eng	• Unlearned clutch • Clutch malfunction • TCU failure	• Check clutch self-learning • Check clutch • Check TCU
P183407h	Clutch 2 Drag Torque Detection			

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P183592h	Shifter Drum 1 Teach-in Failure	The actuator cannot be moved; Because the actuator is in the wrong direction, the measured shift drum length is outside the specified window, the shift drum signal is invalid or the learning was suspended 3 times as the power level was turned off	• Wire harness or connector failure • Transmission range sensor failure • TCU failure • Shift drum motor failure	• Check for wire harness or connector failure • Check transmission range sensor • Check TCU • Check shift drum motor
P183692h	Shifter Drum 2 Teach-in Failure			

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P183796h	Welding Fracture Monitoring	(Drive shaft speed / non-drive shaft > standardized shaft speed difference). (The gradient of driven shaft speed < speed gradient threshold) and (the sum of gears meshed on two gears of transmission (- external clutch torque)) > (- depending on tq offset of gear combination + maximum (engine static torque, torque required by driver) + tq factor depending on gear combination* max (engine static torque, torque required by driver)) and (internal clutch torque < internal clutch torque = one third)	Clutch malfunction	Check clutch

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P183816h	Voltage Level Monitoring High Power Supply Undervoltage 1st Threshold	High power battery voltage <= vbatt under voltage threshold	• Battery failure • Alternator failure • Wire harness or connector failure • TCU failure	• Check battery • Check for alternator failure • Check wire harness or connector • Check TCU
P183916h	Voltage Level Monitoring High Power Supply Undervoltage 2nd Threshold	Low power battery voltage > (vperm over voltage threshold + vperm over voltage lag)		
P183817h	Voltage Level Monitoring High Power Supply Overvoltage 1st Threshold	High power battery voltage >= (vbatt over voltage threshold + vperm over voltage lag)		
P183A16h	Voltage Level Monitoring Low Power Supply Undervoltage	Low power battery voltage <= vperm under voltage threshold		
P183917h	Voltage Level Monitoring High Power Supply Overvoltage 2nd Threshold	High power battery voltage >= (vbatt over voltage threshold 2 + vbatt over voltage lag 2)		
P183A17h	Voltage Level Monitoring Low Power Supply Overvoltage	Low power battery voltage > (vperm over voltage threshold + vperm over voltage lag)		

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P183B4Bh	Temperature Monitoring TCU (Overtemperatur-e)	Temperature exceeds the maximum temperature of PCB	TCU temperature is abnormal	Check TCU

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P183C47h	Base SW Test Result of the Initial Cut Off Incomplete	The IPT status of Mot A is abnormal, the IPT status of Mot B is abnormal, the IPT status of Mot C is abnormal, the IPT status of Mot D is abnormal or the IPT status of Mot E is abnormal	• Wire harness or connector failure • TCU failure	• Check wire harness or connector • Check TCU
P183D42h	Internal Control Module EEPROM Error	The EEPROM check will be performed on the hardware supplier side. Handling procedure for EEPROM reports an error		
P330047h	Level 2 Safety Goal SZ1: Unwanted Engine Torque Increase	/	• Wire harness or connector failure • TCU failure	
P330147h	Level 2 Safety Goal SZ2: Unwanted Launch in Wrong Direction	/	• Wire harness or connector failure • TCU failure	
P330247h	Level 2 Safety Goal SZ3: Unwanted Shifting to R While Driving	/	• Wire harness or connector failure • TCU failure	
P330347h	Level 2 Safety Goal SZ4: Unwanted Launch	/	• Wire harness or connector failure • TCU failure	
P330447h	Level 2 Safety Goal SZ6a: Unwanted Downshift (Inside Allowed Input Shaft Speed Range)	/	• Wire harness or connector failure • TCU failure	
P330547h	Level 2 Safety Goal SZ6b: Unwanted Downshift (- Outside Allowed	/	• Wire harness or connector failure • TCU failure	

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
	Input Shaft Speed Range)			
P330647h	Level 2 Safety Goal SZ7: Clutch Tie-up	/	• Wire harness or connector failure • TCU failure	
P330747h	Level 2 Safety Goal SZ8: Clutch Overspeed	/	• Wire harness or connector failure • TCU failure	
P330847h	Level 2 Safety Goal SZ13: Unwanted Disengaging of P	/	• Wire harness or connector failure • TCU failure	
P330947h	Level 2 Safety Goal SZ14: P Not Engaging	/	• Wire harness or connector failure • TCU failure	
P330A47h	Level 2 Safety Goal SZ16: Unwanted Engaging of P	/	• Wire harness or connector failure • TCU failure	
P330B47h	Level 2 Safety Goal SZ19a: Wrong Display Position P	/	• Wire harness or connector failure • TCU failure	
P330C47h	Level 2 Safety Goal SZ19b: Wrong Display Position D/R	/	• Wire harness or connector failure • TCU failure	
P330D47h	Level 2 Safety Goal SZ19c: Wrong Display Position N/P	/	• Wire harness or connector failure • TCU failure	
P331047h	level 2 Safety Goal Memory Protection	/	• Wire harness or connector failure • TCU failure	

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
P331147h	level 2 Safety Goal Calibration Pointer Protection	/	• Wire harness or connector failure • TCU failure	
P332047h	Level 3 Safety Function Has Become Active	/	• Wire harness or connector failure • TCU failure	

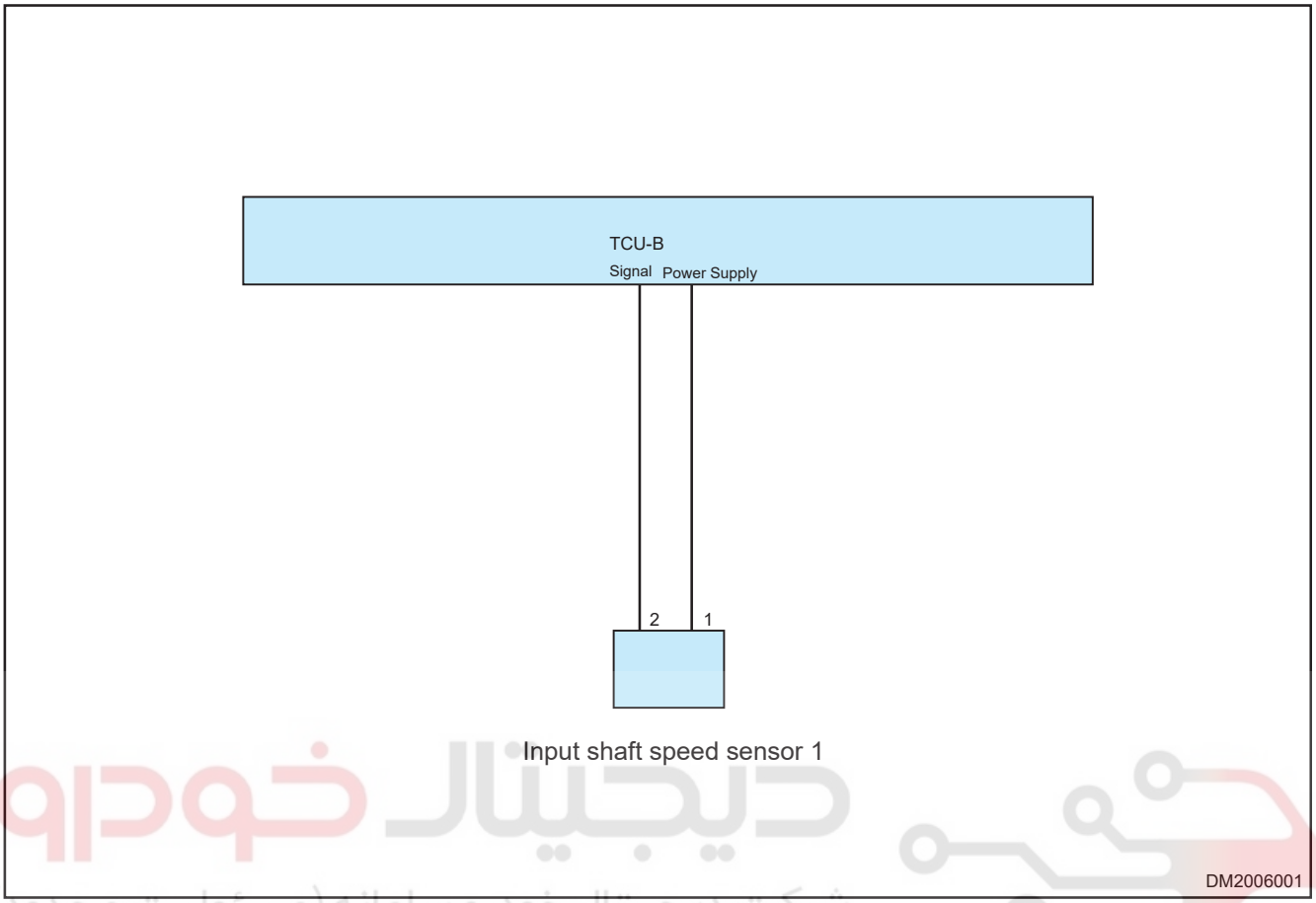
DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
U010000h	Engine Node 1 (EMS_1/2/3/4/5/7/9 Included) Lost	/	CAN network failure	Check CAN network
U040182h	Engine Node 1 (EMS_1/2/3/4/5/7/9 Included) alivecounter Authentication Fails	/		
U040183h	Engine Node 1 (EMS_1/2/3/4/5/7/9 Included) CRC Authentication Fails	/		
U015100h	Brake System Node 1 (ACM_1/2 Included) Lost	/		
U011400h	AWD_1 Lost	/		
U014000h	BCM_1 Lost	/		
U042282h	BCM_1 Alive Counter Authentication Fails	/		
U042283h	BCM_1 CRC Authentication Fails	/		
U012800h	EPB_1 Lost	/		
U041782h	EPB_1 Alive Counter Authentication Fails	/		
U041783h	EPB_1 CRC Authentication Fails	/		

DTC	DTC Definition	Detection Condition	Possible Cause	Maintenance Advice
U012200h	ESC_2 Lost	/		
U041682h	Brake System Node 5 (ESC_2/3/4/6/7 Included) Alive Counter Authentication Fails	/		
U041683h	Brake System Node 5 (ESC_2/3/4/6/7 Included) CRC Authentication Fails	/		
U015500h	Instrument Cluster Node 1 (IPC_3/5/7 Included) CAN Lost	/		
U024800h	Instrument Cluster Node 2 (PEPS_4 Included) CAN Lost	/		
U010300h	EGS_1 Lost	/		
U040482h	EGS_1 Alive Counter Authentication Fails	/		
U040483h	EGS_1 CRC Authentication Fails	/		
U240500h	MFS_2 Lost	/		
U240582h	MFS_2 Alive Counter Authentication Fails	/		
U240583h	MFS_2 CRC Authentication Fails	/		
U021200h	SCM_1 Lost	/		

DTC Trouble Diagnosis Procedure

DTC	P180803h	PWM Monitoring ISS Odd Transmission Path: Pulse Width Failure
DTC	P180811h	Voltage Level Monitoring ISS Odd Transmission Path: Supply Voltage Short to Ground
DTC	P180812h	Voltage Level Monitoring ISS Odd Transmission Path: Supply Voltage Short to Bat
DTC	P181812h	Voltage Level Monitoring ISS Odd Transmission Path: Electrical Signal Short to Bat
DTC	P180814h	Voltage Level Monitoring ISS Odd Transmission Path: Electrical Signal Short to Ground or Open Circuit
DTC	P18081Ch	Voltage Level Monitoring ISS Odd Transmission Path: Supply Voltage Out of Range High
DTC	P18081Dh	Voltage Level Monitoring ISS Odd Transmission Path: Supply Voltage Out of Range Low
DTC	P180837h	Frequency Monitoring ISS Odd Transmission Path: Frequency Failure
DTC	P180894h	Jump Detection ISS Odd Transmission Path
DTC	P180829h	Speed Monitoring ISS Odd Transmission Path

Circuit Diagram



Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to ON.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
4. If Diagnostic Trouble Code (DTC) cannot be cleared, it indicates that there is a current malfunction.
5. Only use a digital multimeter to measure voltage of electronic system.
6. Refer to any Technical Bulletin that may apply to this malfunction.
7. Visually check the related wire harness.
8. Check and clean all Transmission Control Unit (TCU) ground related to latest DTC.
9. If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

⚠ Caution
• When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	**Check battery**

(a) Turn ENGINE START STOP switch to OFF.

(b) Using a multimeter, measure voltage between positive and negative battery terminals.

NG	**Replace battery**

OK

2	Checking Alternator

(a) Check generating capacity of alternator.

NG → **Replace alternator**

OK

3	Check odd input shaft speed sensor connector

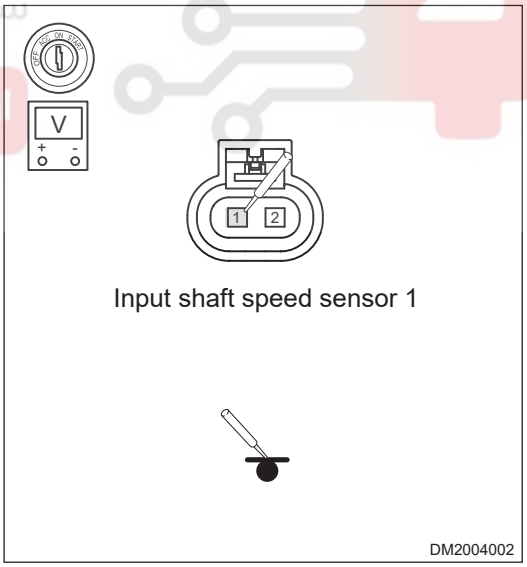
(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect odd input shaft speed sensor connector and TCU connector.
(d) Check connector for poor connection or contact.

NG → **Reinstall or repair, replace connector**

OK

4	Check odd input shaft speed sensor power supply voltage

(a) Turn ENGINE START STOP switch to ON.
(b) Using a digital multimeter (online detection) measure voltage between terminal 1 of odd input shaft speed sensor connector and body ground, and the measured voltage should not be lower than 12 V.



NG → **Check and repair wire harness or connector between odd input shaft speed sensor and TCU**

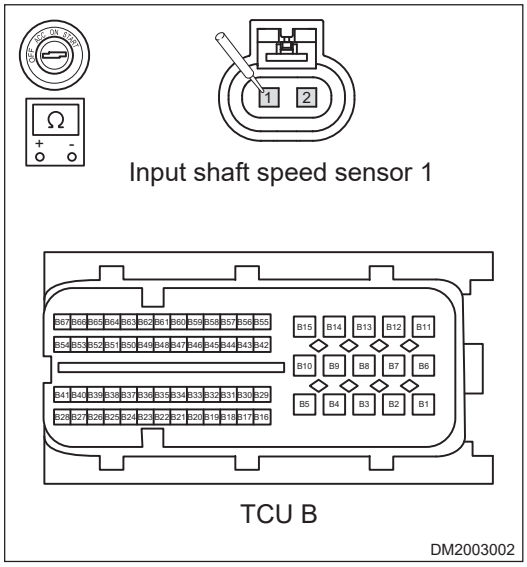
OK

5	Check odd input shaft speed sensor circuit

(a) Turn ENGINE START STOP switch to OFF, disconnect the negative battery cable.

(b) Disconnect the TCU B connector.

(c) Using ohm band of multimeter, measure resistance of wire harness between terminals (1, 2) of input shaft speed sensor 1 and TCU B (corresponding terminal) to check wire harness for open.



NG → **Replace or repair wire harness or connector (Input shaft sensor - TCU)**

OK →

6	**Check odd input shaft speed sensor**

(a) Replace input shaft speed sensor to compare and verify. Use diagnostic tester to check if a same DTC is output.

No → **Replace odd input shaft speed sensor.**

Yes →

7	**Reconfirm DTCs**

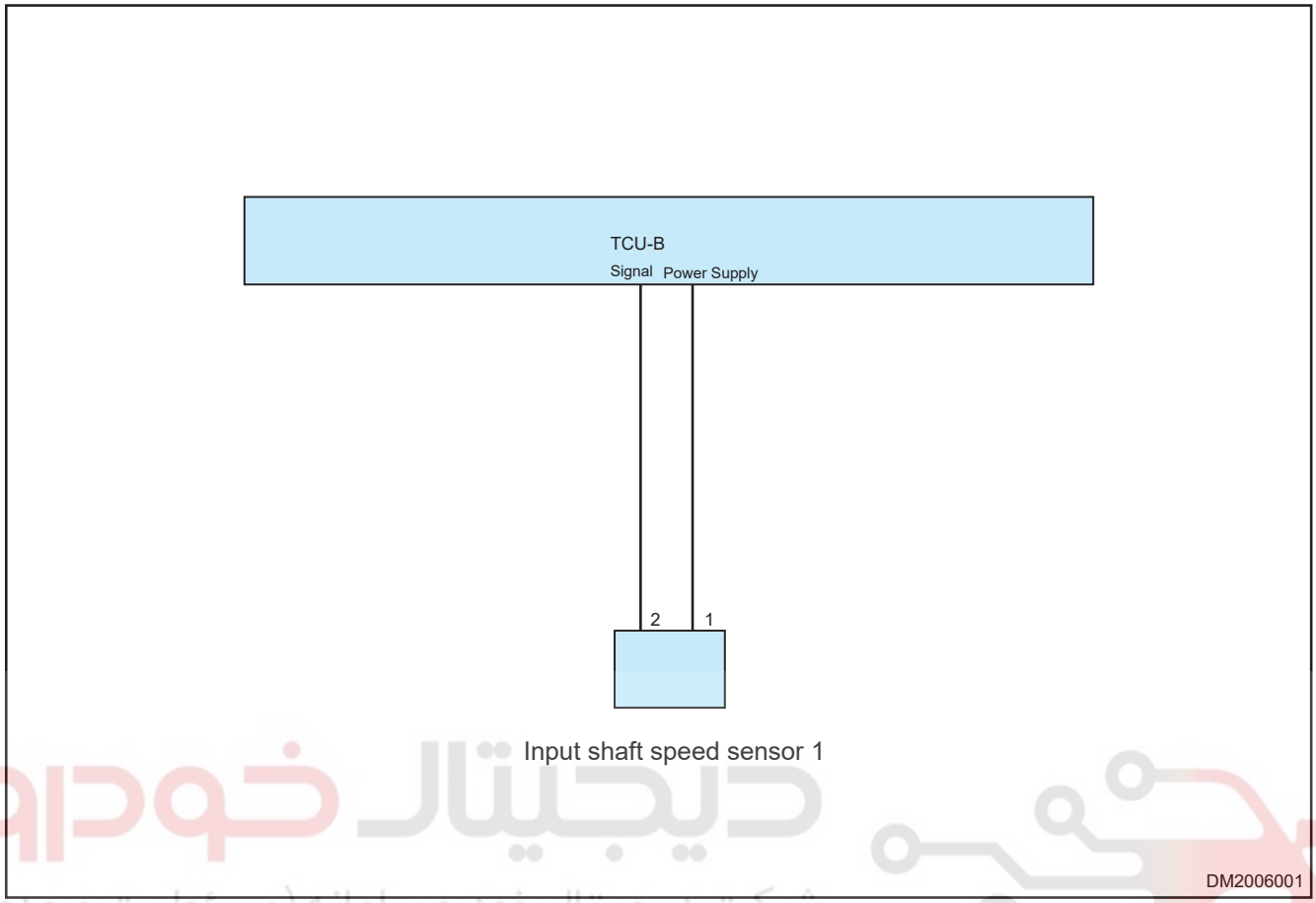
(a) Connect the negative battery cable.
(b) Use diagnostic tester to clear DTC.
(c) Start the engine.
(d) Check if the same DTCs are output.

OK → **System operates normally**

NG → **Replace TCU control module assembly and perform self-learning**

DTC	**P182394h**	**Gear Jump Detection Odd Transmission Path**
DTC	**P182494h**	**Gear Jump Detection Even Transmission Path**
DTC	**P182707h**	**Synchronization Failure Odd Transmission Path**
DTC	**P182807h**	**Synchronization Failure Even Transmission Path**

Circuit Diagram



Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to ON.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
4. If Diagnostic Trouble Code (DTC) cannot be cleared, it indicates that there is a current malfunction.
5. Only use a digital multimeter to measure voltage of electronic system.
6. Refer to any Technical Bulletin that may apply to this malfunction.
7. Visually check the related wire harness.
8. Check and clean all Transmission Control Unit (TCU) ground related to latest DTC.
9. If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

⚠ Caution
• When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	**Check input shaft speed sensor connector**

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect input shaft speed sensor connector and TCU connector.
(d) Check connector for poor connection or contact.

NG → **Reinstall or repair, replace connector**

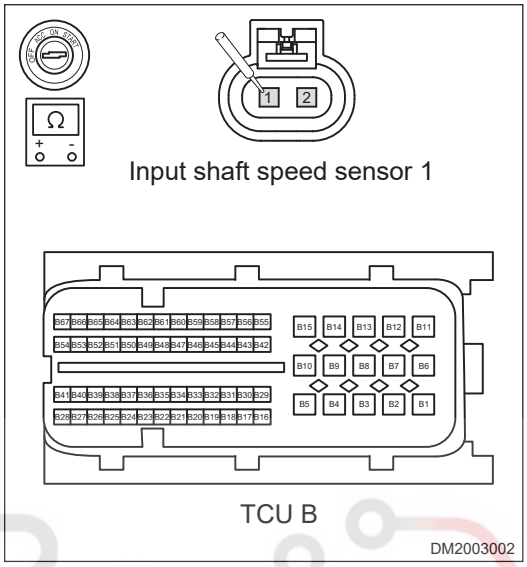
OK

2	Check input shaft speed sensor circuit

(a) Turn ENGINE START STOP switch to OFF, disconnect the negative battery cable.

(b) Disconnect the TCU B connector.

(c) Using ohm band of multimeter, measure resistance of wire harness between terminals (1, 2) of input shaft speed sensor 1 and TCU B (corresponding terminal) to check wire harness for open.



NG → **Replace or repair wire harness or connector (Input shaft sensor - TCU)**

OK

3	Check input shaft speed sensor

(a) Replace shaft speed sensor to compare and verify. Use diagnostic tester to check if a same DTC is output.

No → **Replace odd input shaft speed sensor.**

Yes

4	Check TCU

(a) Replace TCU to compare and verify. Use diagnostic tester to check if a same DTC is output.

No → **Replace TCU**

Yes

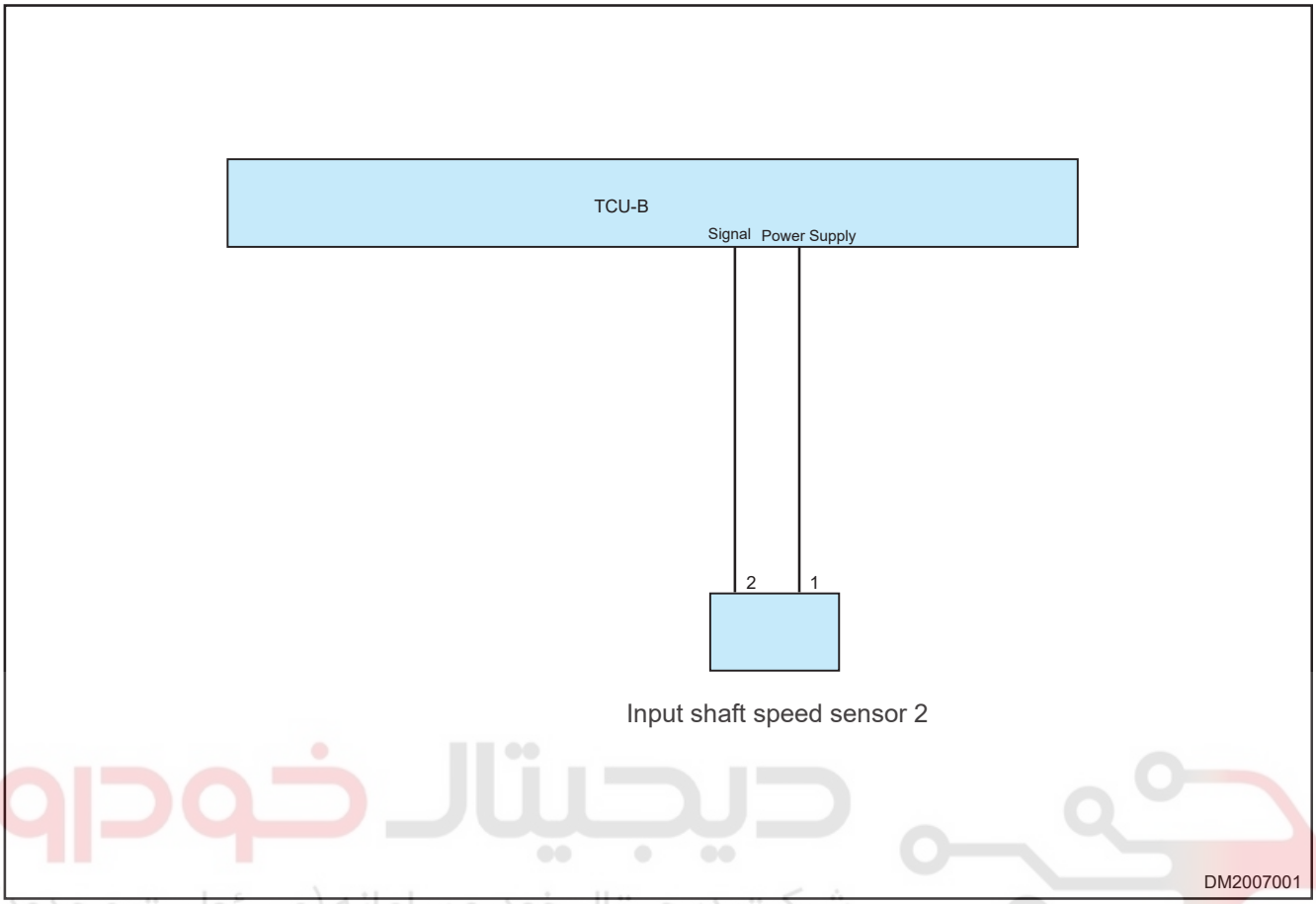
5	Reconfirm DTCs

(a) Connect the negative battery cable.
(b) Use diagnostic tester to clear DTC.
(c) Start the engine.
(d) Check if the same DTCs are output.

OK	**System operates normally**
NG	**Replace transmission assembly**

DTC	**P180903h**	**PWM Monitoring ISS Even Transmission Path: Pulse Width Failure**
DTC	**P180911h**	**Voltage Level Monitoring ISS Even Transmission Path: Electrical Signal Short to Ground or Open Circuit**
DTC	**P180912h**	**Voltage Level Monitoring ISS Even Transmission Path: Supply Voltage Short to Bat**
DTC	**P18091Ch**	**Voltage Level Monitoring ISS Even Transmission Path: Supply Voltage Out of Range High**
DTC	**P18091Dh**	**Voltage Level Monitoring ISS Even Transmission Path: Supply Voltage Out of Range Low**
DTC	**P181912h**	**Voltage Level Monitoring ISS Even Transmission Path: Electrical Signal Short to Bat**
DTC	**P180914h**	**Voltage Level Monitoring ISS Even Transmission Path: Electrical Signal Short to Ground or Open Circuit**
DTC	**P180937h**	**Frequency Monitoring ISS Even Path: Frequency Failure**
DTC	**P180994h**	**Jump Detection ISS Even Transmission Path**
DTC	**P180929h**	**Speed Monitoring ISS Even Transmission Path**

Circuit Diagram



Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to ON.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
4. If Diagnostic Trouble Code (DTC) cannot be cleared, it indicates that there is a current malfunction.
5. Only use a digital multimeter to measure voltage of electronic system.
6. Refer to any Technical Bulletin that may apply to this malfunction.
7. Visually check the related wire harness.
8. Check and clean all Transmission Control Unit (TCU) ground related to latest DTC.
9. If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

⚠ Caution
• When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	**Check battery**

(a) Turn ENGINE START STOP switch to OFF.

(b) Using a multimeter, measure voltage between positive and negative battery terminals.

NG	**Replace battery**

OK

2	Checking Alternator

(a) Check generating capacity of alternator.

NG → **Replace alternator**

OK

3	Check even input shaft speed sensor connector

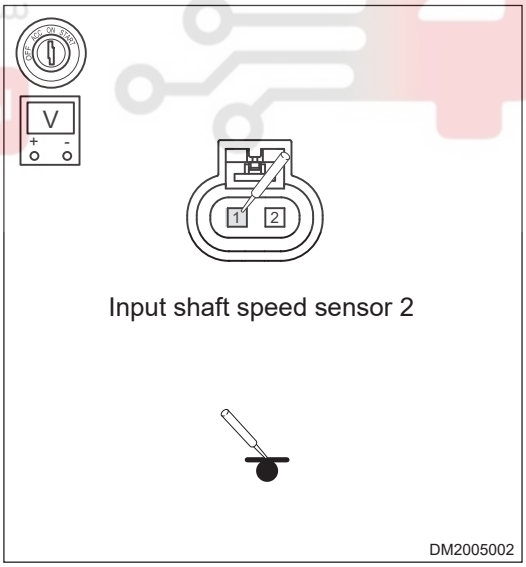
(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect even input shaft speed sensor connector and TCU connector.
(d) Check connector for poor connection or contact.

NG → **Reinstall or repair, replace connector**

OK

4	Check power supply voltage of even input shaft speed sensor

(a) Turn ENGINE START STOP switch to ON.
(b) Using a digital multimeter (online detection) measure voltage between terminal 1 of even input shaft speed sensor connector and body ground, and the measured voltage should not be lower than 12 V.



NG → **Check and repair wire harness between even input shaft speed sensor and TCU**

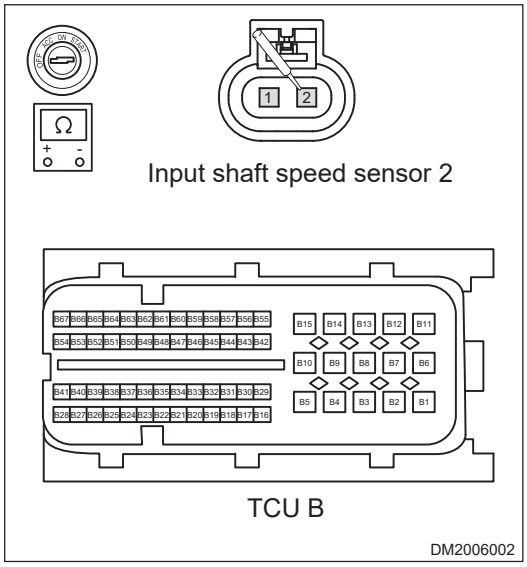
OK

5	Check even input shaft speed sensor signal circuit

(a) Turn ENGINE START STOP switch to OFF, disconnect the negative battery cable.

(b) Disconnect the TCU B connector.

(c) Using ohm band of multimeter, measure resistance of wire harness between terminals (1, 2) of input shaft speed sensor 2 and TCU B (corresponding terminal) to check wire harness for open.



NG → **Replace wire harness or connector (Input shaft sensor - TCU)**

OK

6	**Check even input shaft speed sensor**

(a) Replace input shaft speed sensor to compare and verify. Use diagnostic tester to check if a same DTC is output.

No → **Replace even input shaft speed sensor**

Yes

7	**Reconfirm DTCs**

(a) Connect the negative battery cable.
(b) Use diagnostic tester to clear DTC.
(c) Start the engine.
(d) Check if the same DTCs are output.

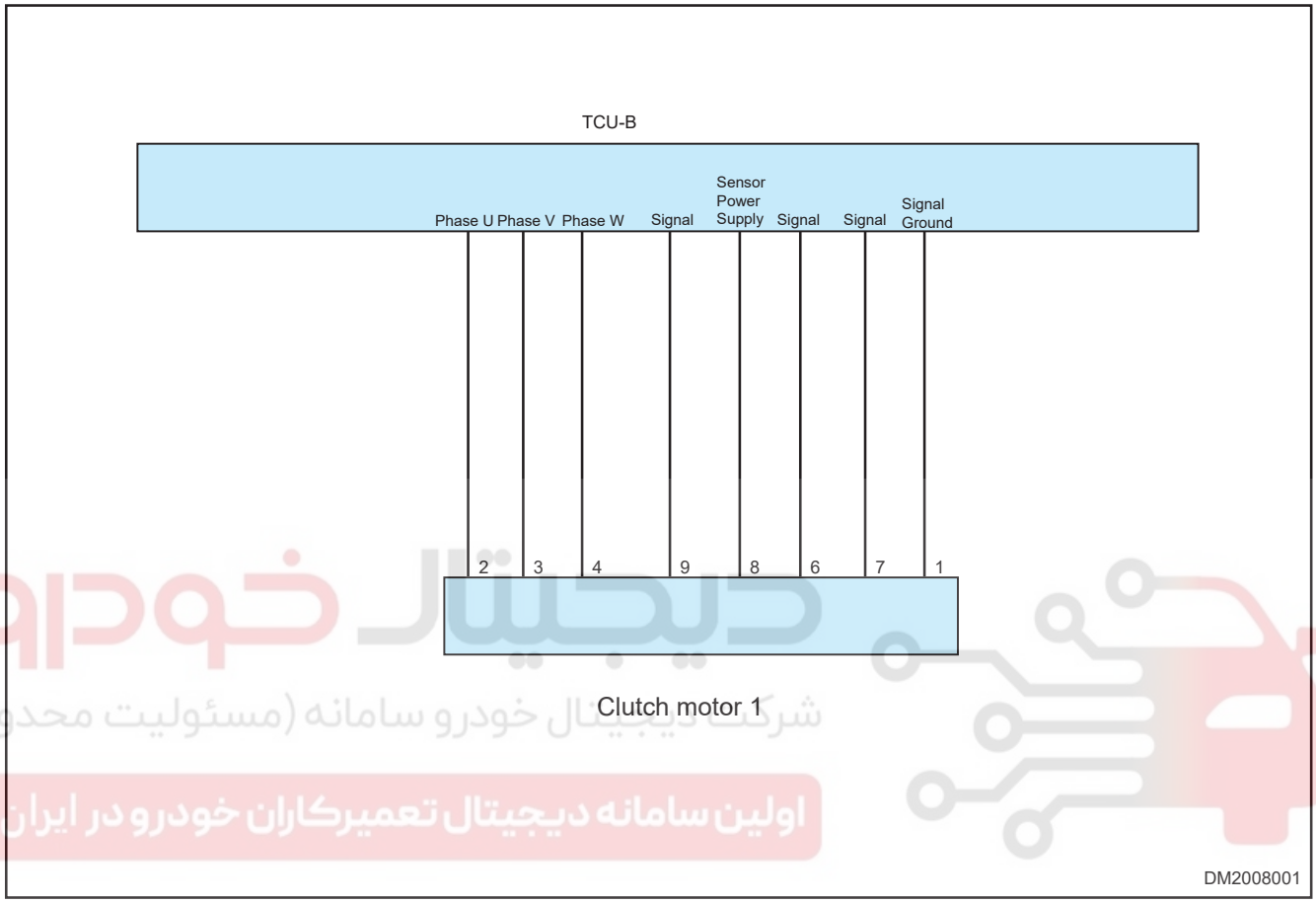
OK → **System operates normally**

NG → **Replace TCU control module assembly and perform self-learning**

DTC	**P180011h**	**Phases Monitoring Clutch Actuator 1: Short to Ground**
DTC	**P180012h**	**Phases Monitoring Clutch Actuator 1: Short to Bat**
DTC	**P180013h**	**Phases Monitoring Clutch Actuator 1: Open Circuit**
DTC	**P180015h**	**Phases Monitoring Clutch Actuator 1: Short to Battery or Open Circuit**

DTC	**P180092h**	**Phases Monitoring Clutch Actuator 1: Performance or Incorrect Operation**
DTC	**P181992h**	**Clutch 1 Position Signal**

Circuit Diagram



Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to ON.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
4. If Diagnostic Trouble Code (DTC) cannot be cleared, it indicates that there is a current malfunction.
5. Only use a digital multimeter to measure voltage of electronic system.
6. Refer to any Technical Bulletin that may apply to this malfunction.
7. Visually check the related wire harness.
8. Check and clean all Transmission Control Unit (TCU) ground related to latest DTC.
9. If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

⚠ Caution
• When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	**Check clutch actuator motor 1 connector**

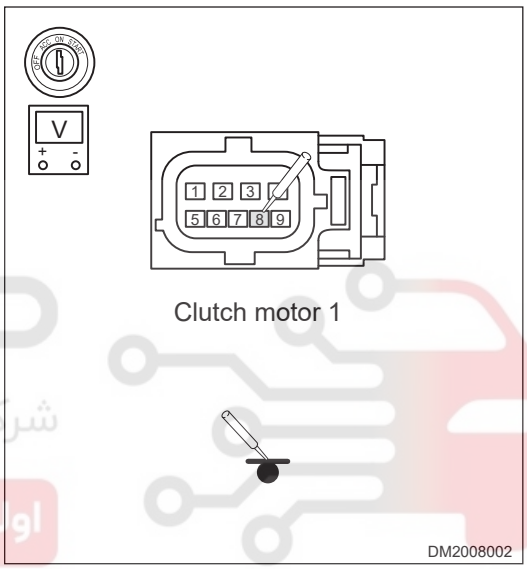
(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the clutch motor 1 connector.
(d) Disconnect the TCU B connector.
(e) Check connector for poor connection, poor contact, cracks or damage.

NG → **Repair or replace connector**

OK

2	**Check clutch actuator motor 1 power supply voltage**

(a) Connect TCU B connector.
(b) Turn ENGINE START STOP switch to ON.
(c) Using voltage band of multimeter, measure voltage between clutch actuator motor 1 connector terminal (8) and body ground, and standard voltage should be 5 V.

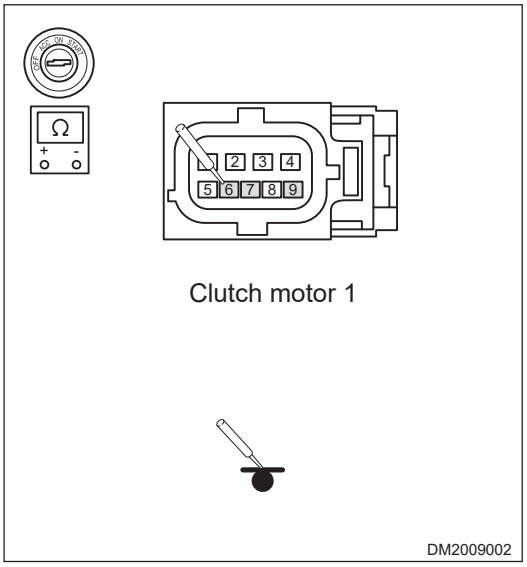


NG → **Repair or replace power supply circuit between clutch actuator motor 1 and TCU**

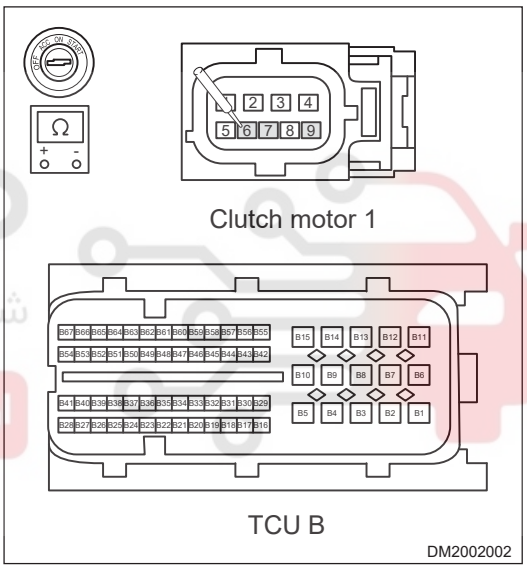
OK

3	**Check clutch actuator motor 1 circuit**

(a) Using ohm band of multimeter, measure resistance between terminals (6, 7, 9) of clutch actuator motor 1 connector and body ground to check circuit for short to ground.



(b) Using ohm band of multimeter, measure resistance between terminals (6, 7, 9) of clutch actuator motor 1 connector and TCU B (corresponding terminal) to check for open circuit.



NG → **Repair or replace wire harness or connector (Clutch actuator motor 1 - TCU)**

OK ↓

4	**Check clutch actuator motor 1**

(a) Replace clutch actuator motor 1 to compare and verify. Use diagnostic tester to check if a same DTC is output.

No → **Replace clutch actuator motor 1**

Yes ↓

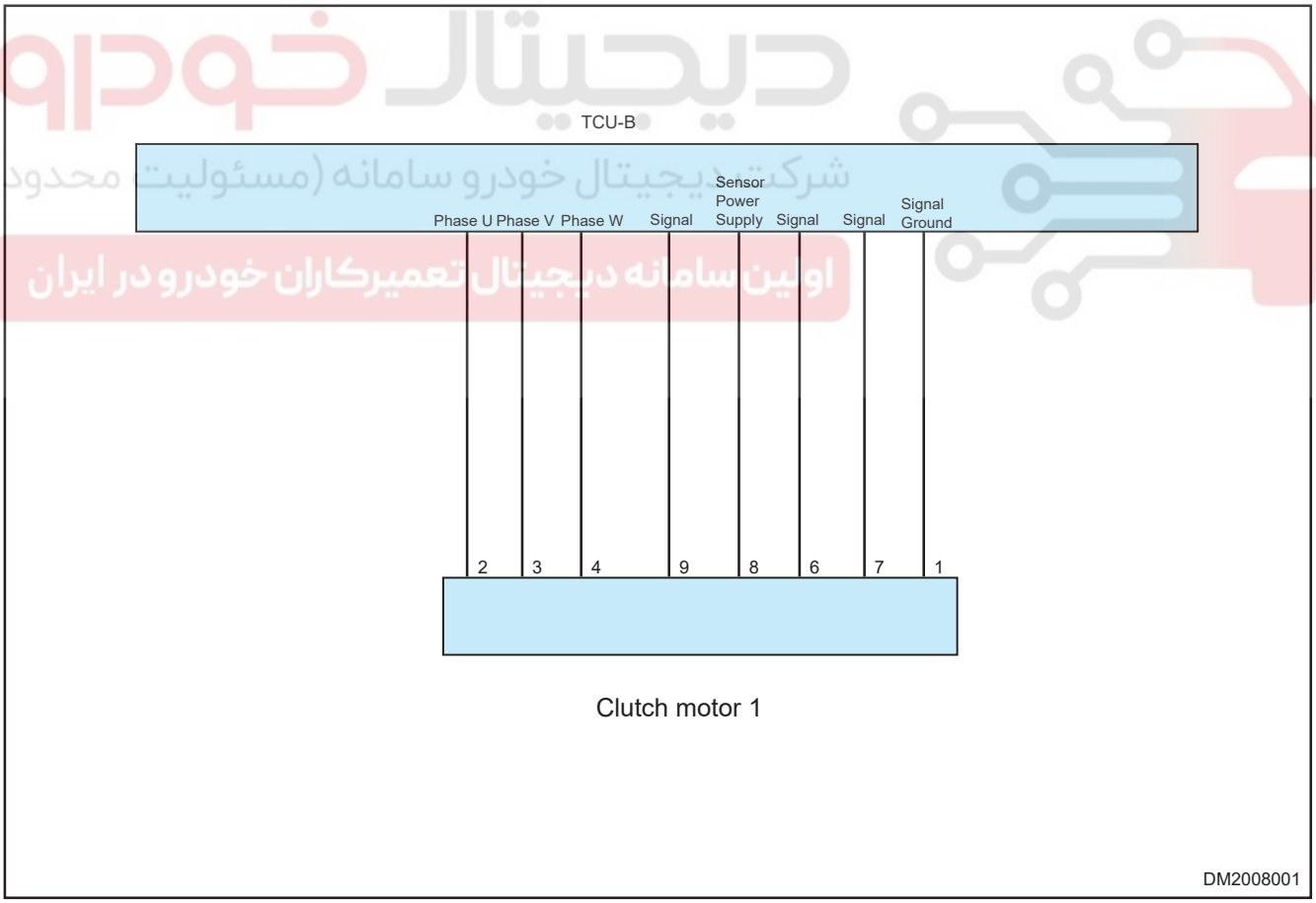
5	**Reconfirm DTCs**

(a) Connect the negative battery cable.
(b) Use diagnostic tester to clear DTC.
(c) Start the engine.
(d) Check if the same DTCs are output.

OK	**System operates normally**
NG	**Replace TCU control module assembly and perform self-learning**

DTC	**P180B11h**	**Voltage Level Monitoring of Actuator Sensor Clutch 1: Supply Voltage Short Circuit to Ground**
DTC	**P180B12h**	**Voltage Level Monitoring of Actuator Sensor Clutch 1: Supply Voltage Short Circuit to Battery**
DTC	**P180B1Ch**	**Voltage Level Monitoring of Actuator Sensor Clutch 1: Supply Voltage Out of Range High**
DTC	**P180B1Dh**	**Voltage Level Monitoring of Actuator Sensor Clutch 1: Supply Voltage Out of Range Low**

Circuit Diagram



Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to ON.
2. Connect diagnostic tester (the latest software) to data link connector.

3. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
4. If Diagnostic Trouble Code (DTC) cannot be cleared, it indicates that there is a current malfunction.
5. Only use a digital multimeter to measure voltage of electronic system.
6. Refer to any Technical Bulletin that may apply to this malfunction.
7. Visually check the related wire harness.
8. Check and clean all Transmission Control Unit (TCU) ground related to latest DTC.
9. If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

⚠ Caution

- When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	**Check battery**

(a) Check if battery voltage is normal.

NG → **Check and repair battery**

OK ↓

2	**Check TCU fuse**

(a) Check if TCU fuse in engine compartment fuse and relay box is normal.

NG → **Replace fuse**

OK ↓

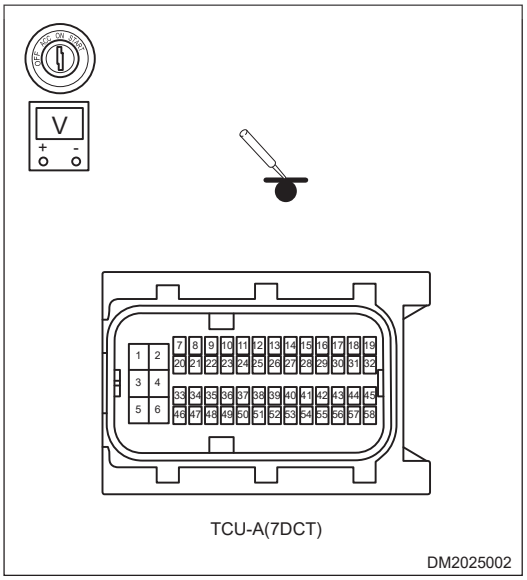
3	**Check TCU power supply circuit**

(a) Turn ignition switch to OFF.

(b) Disconnect the TCU connector.

(c) Turn ignition switch to ON.

(d) Using a multimeter, measure voltage between TCU connector (power supply terminal) and body ground. (-
Standard voltage should be the battery voltage)



TCU-A(7DCT)

DM2025002

NG → **Check and repair TCU power supply circuit**

OK

4	Check clutch actuator motor 1 connector

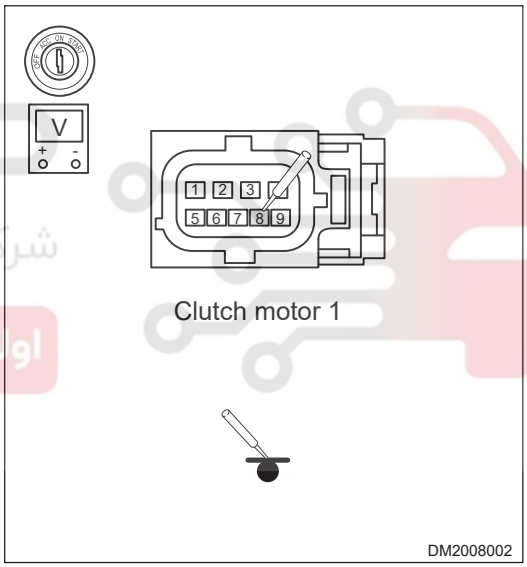
(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the clutch motor 1 connector.
(d) Disconnect the TCU B connector.
(e) Check connector for poor connection, poor contact, cracks or damage.

NG → **Repair or replace connector**

OK

5	Check clutch actuator motor 1 power supply voltage

(a) Connect TCU B connector.
(b) Turn ENGINE START STOP switch to ON.
(c) Using voltage band of multimeter, measure voltage between clutch actuator motor 1 connector terminal (8) and body ground, and standard voltage should be 5 V.

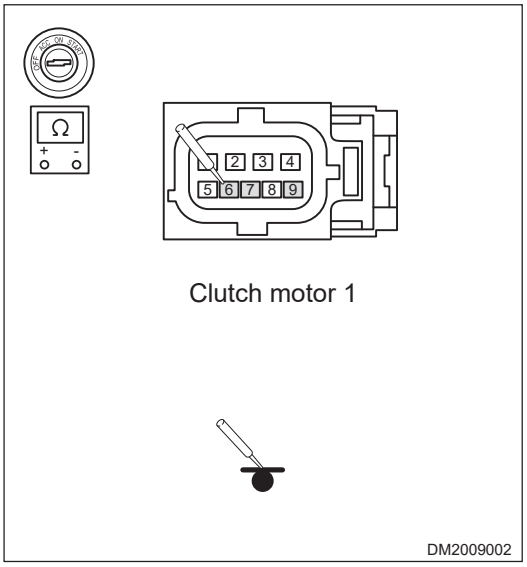


NG → **Repair or replace power supply wire harness between clutch actuator motor 1 and TCU**

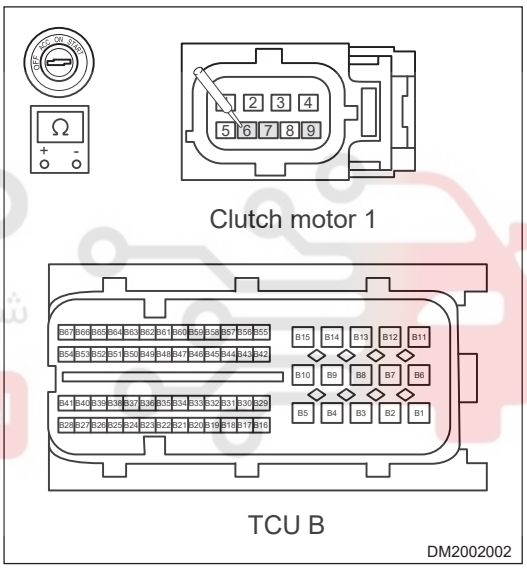
OK

6	Check clutch actuator motor 1 circuit

(a) Using ohm band of multimeter, measure resistance between terminals (6, 7, 9) of clutch actuator motor 1 connector and body ground to check circuit for short to ground.



(b) Using ohm band of multimeter, measure resistance between terminals (6, 7, 9) of clutch actuator motor 1 connector and TCU B (corresponding terminal) to check for open circuit.



NG → **Repair or replace wire harness or connector (Clutch actuator motor 1 - TCU)**

OK ↓

7	**Check clutch actuator motor 1**

(a) Replace clutch actuator motor 1 to compare and verify. Use diagnostic tester to check if a same DTC is output.

No → **Replace clutch actuator motor 1**

Yes ↓

8	**Reconfirm DTCs**

(a) Connect the negative battery cable.
(b) Use diagnostic tester to clear DTC.
(c) Start the engine.
(d) Check if the same DTCs are output.

OK	**System operates normally**
NG	**Replace TCU control module assembly and perform self-learning**

DTC	P1806F1h	Clutch 1 Motor Speed Check (too Low)

Confirmation Procedure
Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to ON.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
4. If Diagnostic Trouble Code (DTC) cannot be cleared, it indicates that there is a current malfunction.
5. Only use a digital multimeter to measure voltage of electronic system.
6. Refer to any Technical Bulletin that may apply to this malfunction.
7. Visually check the related wire harness.
8. Check and clean all Transmission Control Unit (TCU) ground related to latest DTC.
9. If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

⚠ Caution

- When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	Check clutch actuator motor 1 connector

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the clutch motor 1 connector.
(d) Disconnect the TCU B connector.
(e) Check connector for poor connection, poor contact, cracks or damage.

NG	**Repair or replace connector or wire harness**

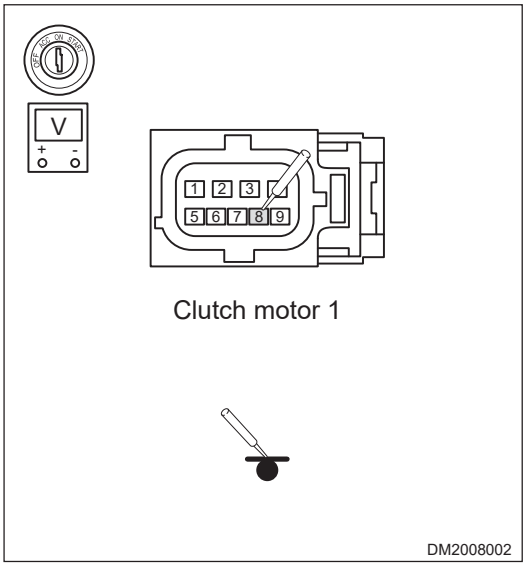
OK

2	Check clutch actuator motor 1 power supply voltage

(a) Connect TCU B connector.

(b) Turn ENGINE START STOP switch to ON.

(c) Using voltage band of multimeter, measure voltage between clutch actuator motor 1 connector terminal (8) and body ground, and standard voltage should be 5 V.

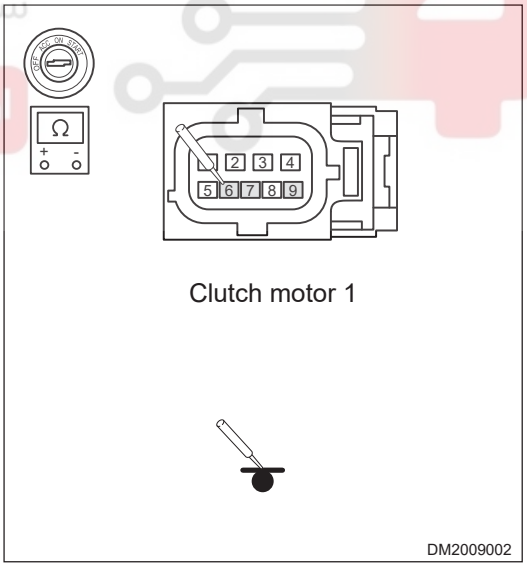


NG → **Repair or replace power supply wire harness between clutch actuator motor 1 and TCU**

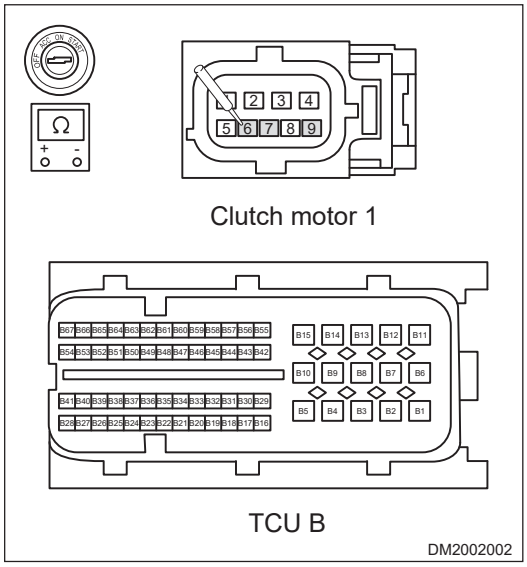
OK

3	**Check clutch actuator motor 1 circuit**

(a) Using ohm band of multimeter, measure resistance between terminals (6, 7, 9) of clutch actuator motor 1 connector and body ground to check circuit for short to ground.



(b) Using ohm band of multimeter, measure resistance between terminals (6, 7, 9) of clutch actuator motor 1 connector and TCU B (corresponding terminal) to check for open circuit.



NG → **Repair or replace wire harness or connector (Clutch actuator motor 1 - TCU)**

OK ↓

4	**Check clutch actuator motor 1**

(a) Replace clutch actuator motor 1 to compare and verify.
Use diagnostic tester to check if a same DTC is output.

No → **Replace clutch actuator motor 1**

Yes ↓

5	**Check pressure sensor 1 connector**

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the pressure sensor 1 connector.
(d) Disconnect the TCU B connector.
(e) Check connector for poor connection, poor contact, cracks or damage.

NG → **Reinstall or repair, replace connector or wire harness**

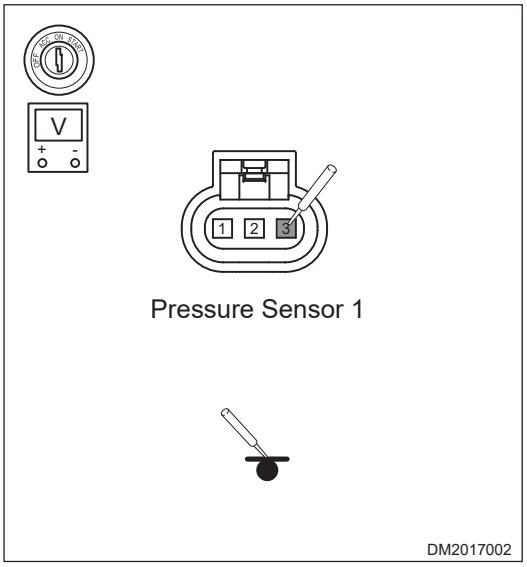
OK ↓

6	**Check pressure sensor 1 power supply voltage**

(a) Connect TCU B connector.

(b) Turn ENGINE START STOP switch to ON.

(c) Using voltage band of multimeter, measure voltage between pressure sensor 1 connector terminal (3) and body ground, and the voltage should not be lower than 5 V.

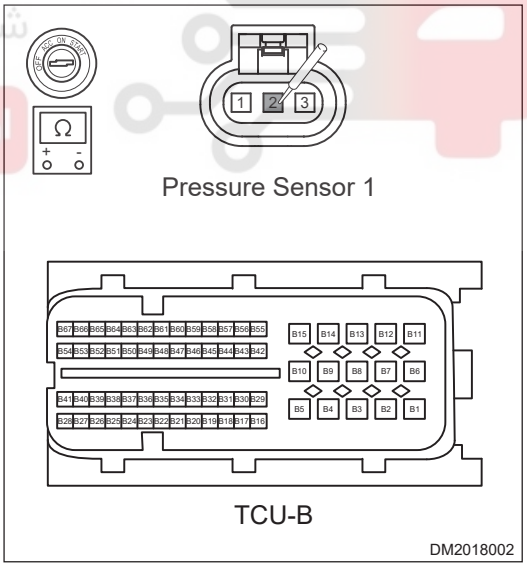


NG → **Replace or repair pressure sensor power supply circuit**

OK

7	**Check pressure sensor 1 signal circuit**

(a) Using ohm band of multimeter, measure resistance between pressure sensor 1 connector terminal (2) and TCU B (corresponding terminal) to check for open circuit.



NG → **Replace wire harness or connector (- Pressure sensor 1 - TCU)**

OK

8	**Check pressure sensor 1**

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Check sensor connection part for debris, ice, oil and damage.
(d) Replace pressure sensor with a new one to compare and verify. Use diagnostic tester to check if a same DTC is output.

NG → **Replace pressure sensor 1**

OK ↓

9	**Replace TCU**

(a) Replace TCU to compare and verify. Use diagnostic tester to check if a same DTC is output.

No → **Replace TCU**

Yes ↓

10	**Check clutch**

(a) Disassemble the transmission, and check clutch for abnormal wear or damage.

NG → **Replace clutch**

OK ↓

11	**Reconfirm DTCs**

(a) Connect the negative battery cable.
(b) Use diagnostic tester to clear DTC.
(c) Start the engine.
(d) Check if the same DTCs are output.

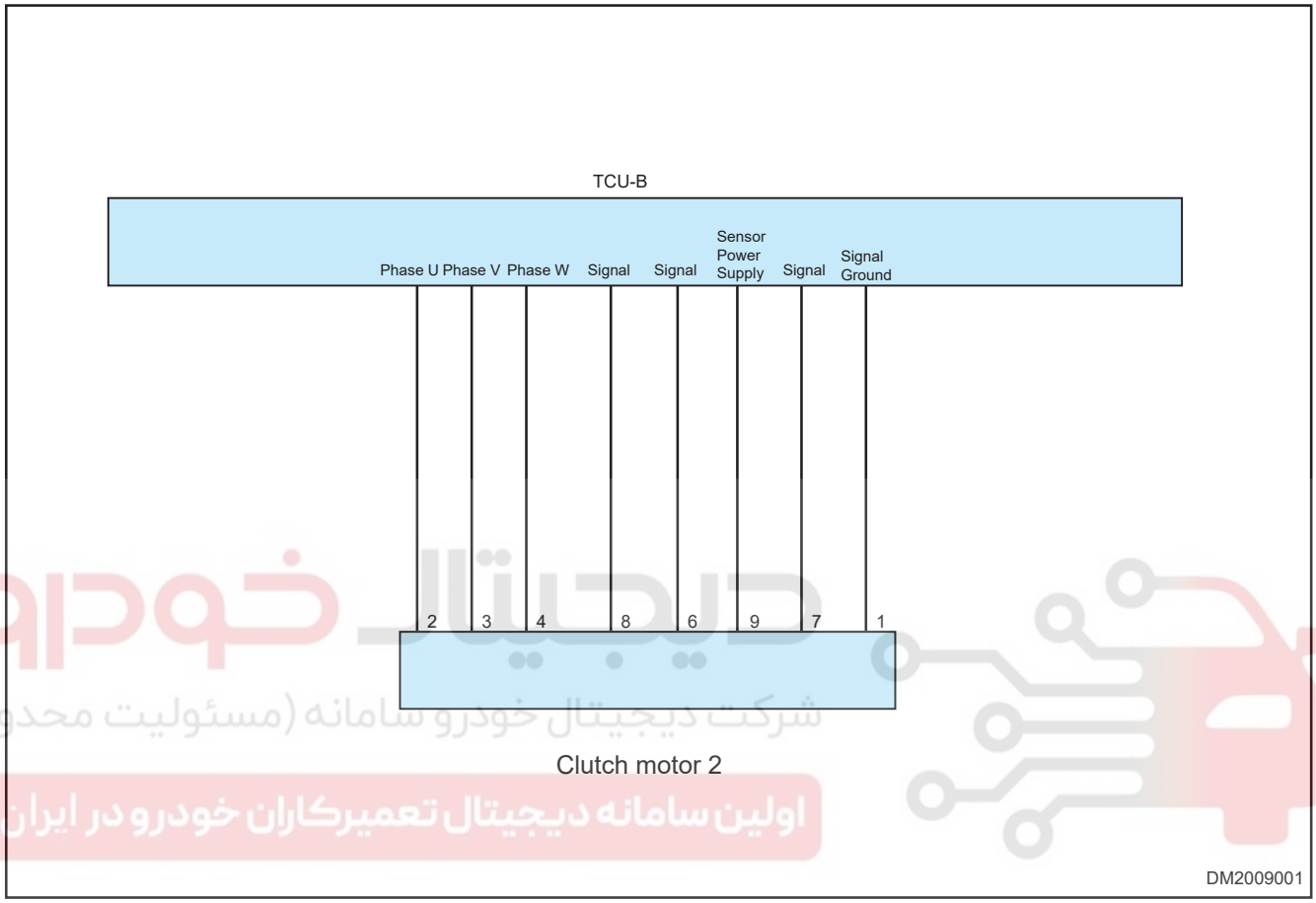
OK → **System operates normally**

NG → **Replace transmission assembly**

DTC	**P180111h**	**Phases Monitoring Clutch Actuator 2: Short to Ground**
DTC	**P180112h**	**Phases Monitoring Clutch Actuator 2: Short Circuit to Battery**
DTC	**P180113h**	**Phases Monitoring Clutch Actuator 2: Open Circuit**
DTC	**P180115h**	**Phases Monitoring Clutch Actuator 2: Short to Battery or Open Circuit**

DTC	**P180192h**	**Phases Monitoring Clutch Actuator 2: Performance or Incorrect Operation**
DTC	**P181A92h**	**Clutch 2 Position Signal**

Circuit Diagram



Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to ON.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
4. If Diagnostic Trouble Code (DTC) cannot be cleared, it indicates that there is a current malfunction.
5. Only use a digital multimeter to measure voltage of electronic system.
6. Refer to any Technical Bulletin that may apply to this malfunction.
7. Visually check the related wire harness.
8. Check and clean all Transmission Control Unit (TCU) ground related to latest DTC.
9. If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

⚠ Caution
• When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	**Check clutch actuator motor 2 connector**

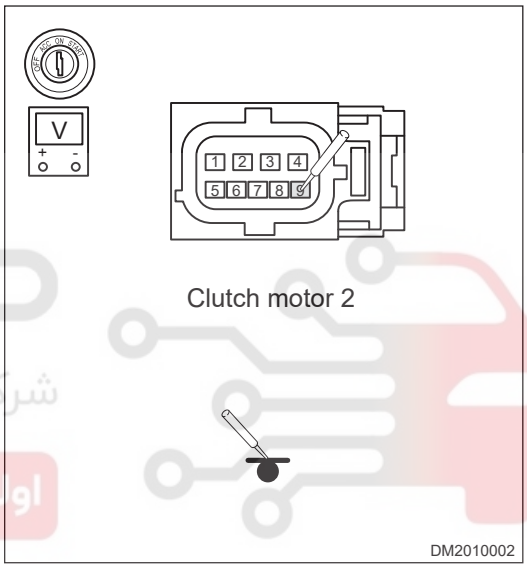
(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the clutch motor 2 connector.
(d) Disconnect the TCU B connector.
(e) Check connector for poor connection, poor contact, cracks or damage.

NG → **Repair or replace connector or wire harness**

OK

2	**Check clutch actuator motor 2 power supply voltage**

(a) Connect TCU B connector.
(b) Turn ENGINE START STOP switch to ON.
(c) Using voltage band of multimeter, measure voltage between clutch actuator motor 2 connector power supply terminal (9) and body ground, and standard voltage should be 5 V.

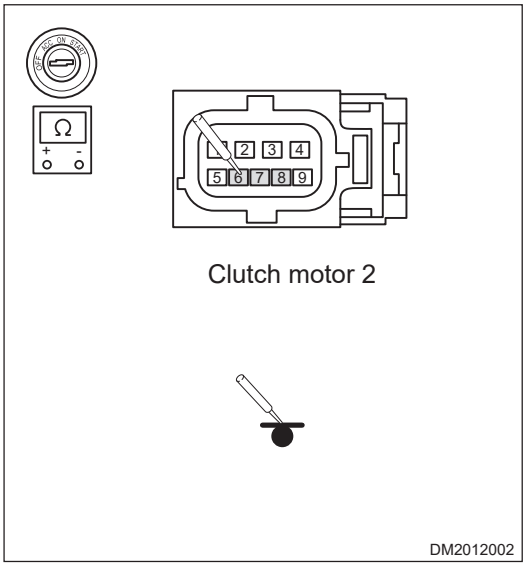


NG → **Repair or replace power supply circuit between clutch actuator motor 2 and TCU**

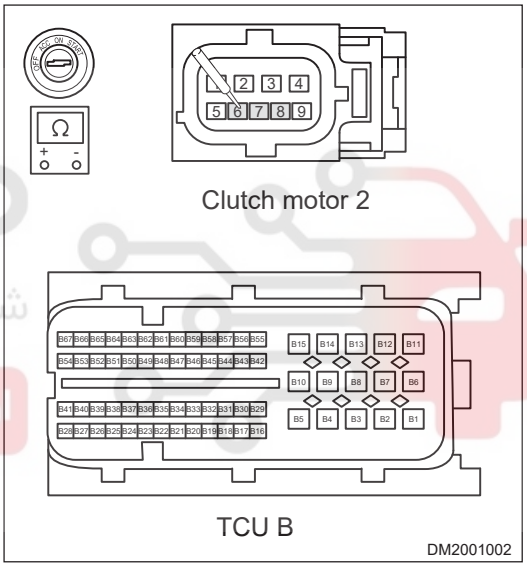
OK

3	**Check clutch actuator motor 2 circuit**

(a) Using ohm band of multimeter, measure resistance between terminals (6, 7, 8) of clutch actuator motor 2 connector and body ground to check circuit for short to ground.



(b) Using ohm band of multimeter, measure resistance between terminals (6, 7, 8) of clutch actuator motor 1 connector and TCU B (corresponding terminal) to check for open circuit.



NG → **Repair or replace wire harness or connector (Clutch actuator motor 2 - TCU)**

OK ↓

4	**Check clutch actuator motor 2**

(a) Replace clutch actuator motor 2, and shift multiple times while driving a certain distance. Read diagnosis information again, and check if a same DTC is output.

No DTC → **Replace clutch actuator motor 2**

DTC occurs ↓

5	Reconfirm DTCs

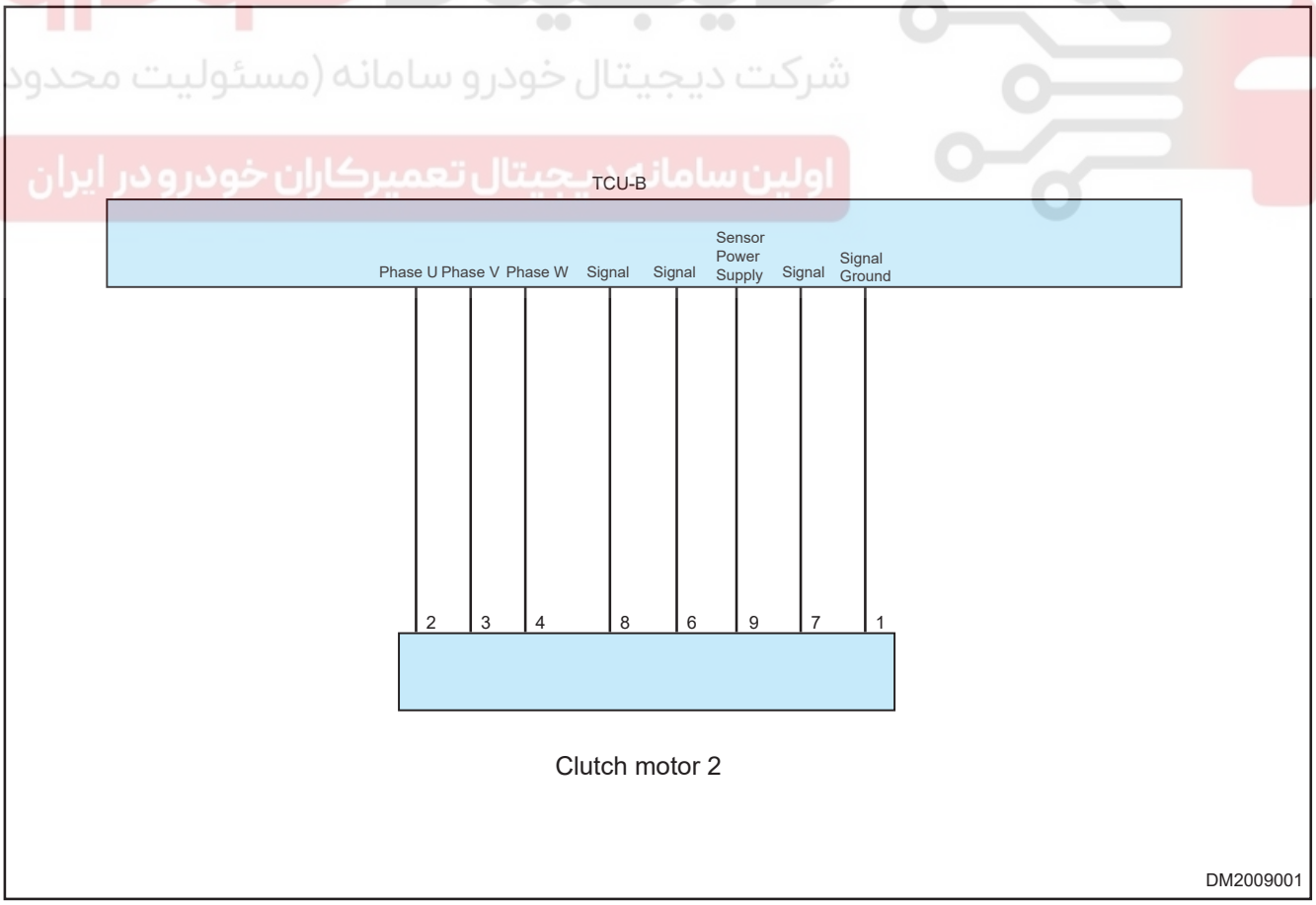
(a) Connect the negative battery cable.
(b) Use diagnostic tester to clear DTC.
(c) Start the engine.
(d) Check if the same DTCs are output.

OK → **System operates normally**

NG → **Replace TCU control module assembly and perform self-learning**

DTC	**P180A11h**	**Voltage Level Monitoring of Actuator Sensor Clutch 2: Supply Voltage Short Circuit to Ground**
DTC	**P180A12h**	**Voltage Level Monitoring of Actuator Sensor Clutch 2: Supply Voltage Short Circuit to Battery**
DTC	**P180A1Ch**	**Voltage Level Monitoring of Actuator Sensor Clutch 2: Supply Voltage Out of Range High**
DTC	**P180A1Dh**	**Voltage Level Monitoring of Actuator Sensor Clutch 2: Supply Voltage Out of Range Low**

Circuit Diagram



Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to ON.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
4. If Diagnostic Trouble Code (DTC) cannot be cleared, it indicates that there is a current malfunction.
5. Only use a digital multimeter to measure voltage of electronic system.
6. Refer to any Technical Bulletin that may apply to this malfunction.
7. Visually check the related wire harness.
8. Check and clean all Transmission Control Unit (TCU) ground related to latest DTC.
9. If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

⚠ Caution
• When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	Check battery

(a) Check if battery voltage is normal.

NG → **Check and repair battery**

OK ↓

2	Check TCU fuse

(a) Check if TCU fuse in engine compartment fuse and relay box is normal.

NG → **Replace fuse**

OK ↓

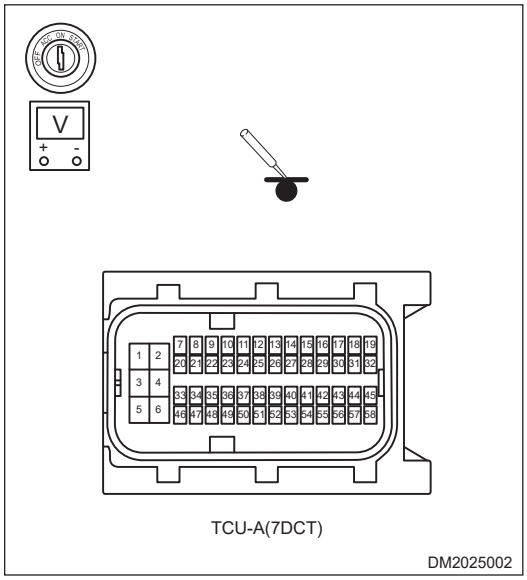
3	Check TCU power supply circuit

(a) Turn ignition switch to OFF.

(b) Disconnect the TCU connector.

(c) Turn ignition switch to ON.

(d) Using a multimeter, measure voltage between TCU connector (power supply terminal) and body ground. (- Standard voltage should be the battery voltage)



NG → **Check and repair TCU power supply circuit**

OK

4	**Check clutch actuator motor 2 connector**

(a) Turn ENGINE START STOP switch to OFF.

(b) Disconnect the negative battery cable.

(c) Disconnect the clutch motor 2 connector.

(d) Disconnect the TCU B connector.

(e) Check connector for poor connection, poor contact, cracks or damage.

NG → **Repair or replace connector or wire harness**

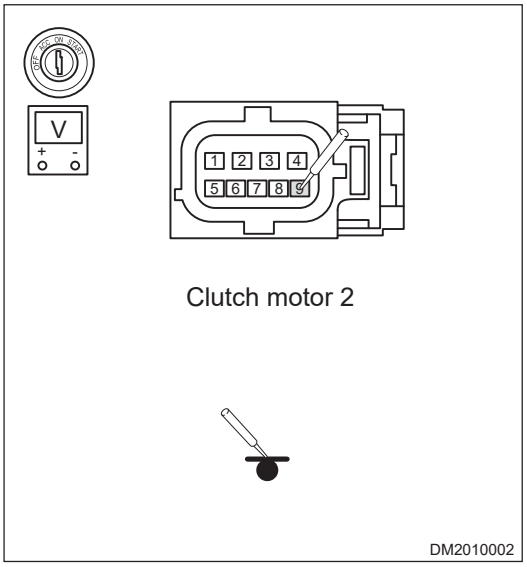
OK

5	**Check clutch actuator motor 2 power supply voltage**

(a) Connect TCU B connector.

(b) Turn ENGINE START STOP switch to ON.

(c) Using voltage band of multimeter, measure voltage between clutch actuator motor 2 connector terminal (9) and body ground, and standard voltage should be 5 V.

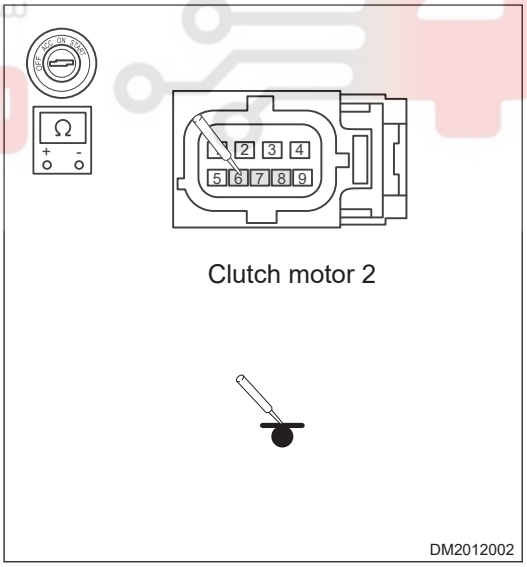


NG → **Repair or replace power supply wire harness between clutch actuator motor 2 and TCU**

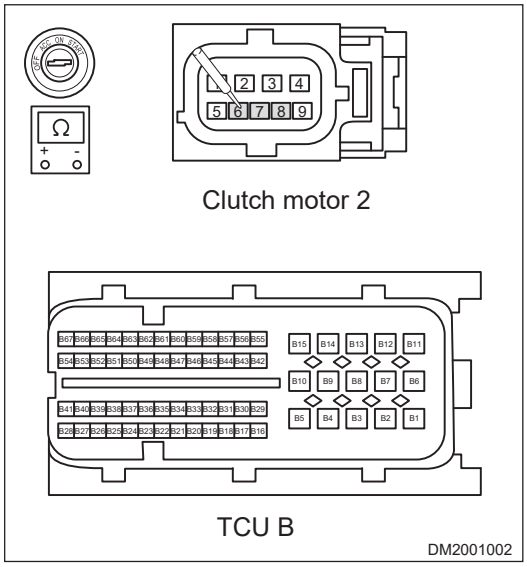
OK ↓

6	**Check clutch actuator motor 2 circuit**

(a) Using ohm band of multimeter, measure resistance between terminals (6, 7, 8) of clutch actuator motor 2 connector and body ground to check circuit for short to ground.



(b) Using ohm band of multimeter, measure resistance between terminals (6, 7, 8) of clutch actuator motor 1 connector and TCU B (corresponding terminal) to check for open circuit.



NG → **Repair or replace wire harness or connector (Clutch actuator motor 2 - TCU)**

OK

7	Check clutch actuator motor 2

(a) Replace clutch actuator motor 2, and shift multiple times while driving a certain distance. Read diagnosis information again, and check if a same DTC is output.

No DTC → **Replace clutch actuator motor 2**

DTC occurs

8	Reconfirm DTCs

(a) Connect the negative battery cable.
(b) Use diagnostic tester to clear DTC.
(c) Start the engine.
(d) Check if the same DTCs are output.

OK → **System operates normally**

NG → **Replace TCU control module assembly and perform self-learning**

DTC	P1807F1h	Clutch 2 Motor Speed Check (too Low)

Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to ON.
2. Connect diagnostic tester (the latest software) to data link connector.

3. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
4. If Diagnostic Trouble Code (DTC) cannot be cleared, it indicates that there is a current malfunction.
5. Only use a digital multimeter to measure voltage of electronic system.
6. Refer to any Technical Bulletin that may apply to this malfunction.
7. Visually check the related wire harness.
8. Check and clean all Transmission Control Unit (TCU) ground related to latest DTC.
9. If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

⚠ Caution

- When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	**Check clutch actuator motor 2 connector**

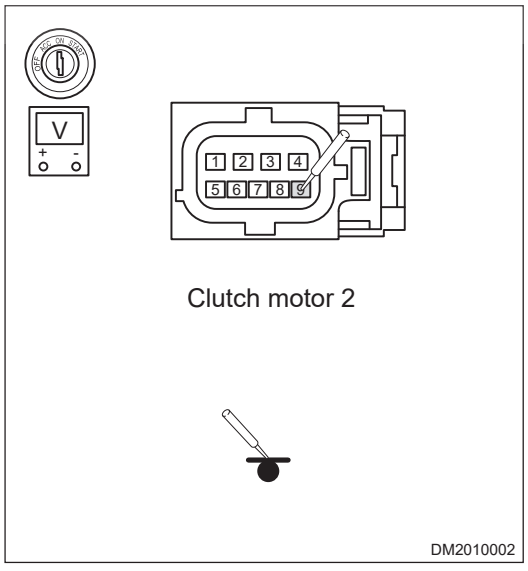
(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the clutch motor 2 connector.
(d) Disconnect the TCU B connector.
(e) Check connector for poor connection, poor contact, cracks or damage.

NG → **Repair or replace connector or wire harness**

OK

2	**Check clutch actuator motor 2 power supply voltage**

(a) Connect TCU B connector.
(b) Turn ENGINE START STOP switch to ON.
(c) Using voltage band of multimeter, measure voltage between clutch actuator motor 2 connector terminal (9) and body ground, and standard voltage should be 5 V.

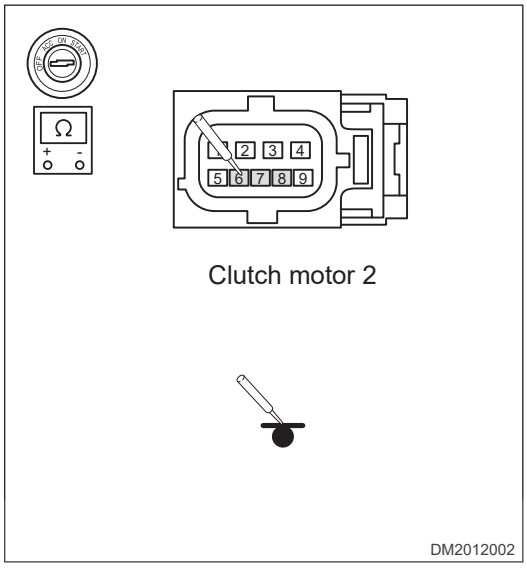


NG → **Repair or replace power supply wire harness between clutch actuator motor 2 and TCU**

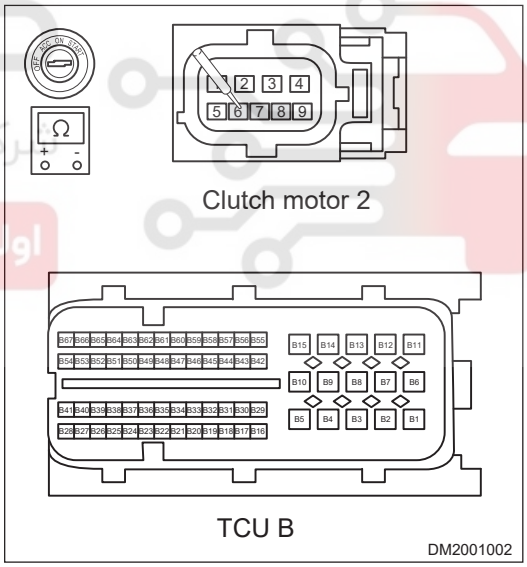
OK

3	Check clutch actuator motor 2 circuit

(a) Using ohm band of multimeter, measure resistance between terminals (6, 7, 8) of clutch actuator motor 2 connector and body ground to check circuit for short to ground.



(b) Using ohm band of multimeter, measure resistance between terminals (6, 7, 8) of clutch actuator motor 1 connector and TCU B (corresponding terminal) to check for open circuit.



NG → **Repair or replace wire harness or connector (Clutch actuator motor 2 - TCU)**

OK

4	Check clutch actuator motor 2

(a) Replace clutch actuator motor 2, and shift multiple times while driving a certain distance. Read diagnosis information again, and check if a same DTC is output.

No DTC → **Replace clutch actuator motor 2**

DTC occurs

5	Check pressure sensor 2 connector

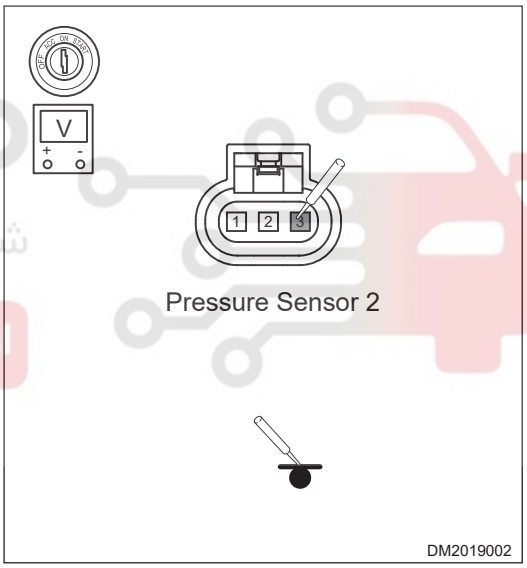
(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the pressure sensor 2 connector.
(d) Disconnect the TCU B connector.
(e) Check connector for poor connection, poor contact, cracks or damage.

NG → **Reinstall or repair, replace connector**

OK

6	Check pressure sensor 2 power supply voltage

(a) Connect TCU B connector.
(b) Turn ENGINE START STOP switch to ON.
(c) Using voltage band of multimeter, measure voltage between pressure sensor 2 connector terminal (3) and body ground, and the voltage should not be lower than 5 V.

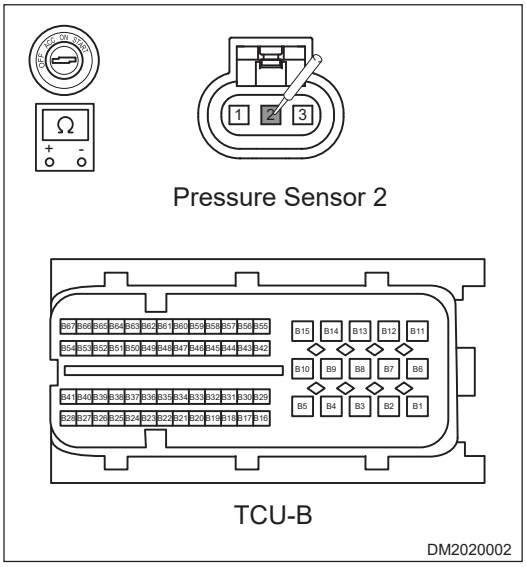


NG → **Replace or repair pressure sensor power supply line circuit**

OK

7	Check pressure sensor 2 signal circuit

(a) Using ohm band of multimeter, measure resistance between pressure sensor 2 connector terminal (2) and TCU B (corresponding terminal) to check for open circuit.



NG → **Replace wire harness or connector (- Pressure sensor 2 - TCU)**

OK

8	**Check pressure sensor 2**

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Check sensor connection part for debris, ice, oil and damage.
(d) Replace pressure sensor to compare and verify. Use diagnostic tester to check if a same DTC is output.

NG → **Replace pressure sensor 2**

OK

9	**Replace TCU**

(a) Replace TCU to compare and verify. Use diagnostic tester to check if a same DTC is output.

No → **Replace TCU**

Yes

10	**Check clutch**

(a) Disassemble the transmission, and check clutch for abnormal wear or damage.

NG → **Replace clutch**

OK

11	Reconfirm DTCs

(a) Connect the negative battery cable.
(b) Use diagnostic tester to clear DTC.
(c) Start the engine.
(d) Check if the same DTCs are output.

OK → **System operates normally**

NG → **Replace transmission assembly**

DTC	**P182092h**	**Hall Plausi Shift Actuator 1**
DTC	**P182035h**	**PWM Duty Monitoring Shift Actuator 1 Out of Range High**
DTC	**P182034h**	**PWM Duty Monitoring Shift Actuator 1 Out of Range Low**
DTC	**P182036h**	**Carrier Frequency Monitoring Shift Actuator 1 Out of Range Low**
DTC	**P182037h**	**Carrier Frequency Monitoring Shift Actuator 1 Out of Range High**

Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to ON.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
4. If Diagnostic Trouble Code (DTC) cannot be cleared, it indicates that there is a current malfunction.
5. Only use a digital multimeter to measure voltage of electronic system.
6. Refer to any Technical Bulletin that may apply to this malfunction.
7. Visually check the related wire harness.
8. Check and clean all Transmission Control Unit (TCU) ground related to latest DTC.
9. If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

⚠ Caution

- When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	Power-off and reset

(a) After the vehicle is stopped, the engine is stopped, and the ignition switch is turned off for 10 minutes, disconnect the battery power supply, then power on again and continue to depress brake pedal for 15 seconds. Read DTCs using diagnostic tester to see if the fault still exists.

No DTC → **System is normal and there is no fault**

DTC is output

2	Check shift motor 1

(a) Replace shift motor 1, and shift multiple times. Read diagnosis information again, and check if a same DTC is output.

No DTC → **Replace shift motor 1**

DTC occurs

3	Reconfirm DTCs

(a) Connect the negative battery cable.
(b) Use diagnostic tester to clear DTC.
(c) Start the engine.
(d) Check if the same DTCs are output.

OK → **System operates normally**

NG → **Replace TCU control module assembly and perform self-learning**

DTC	P182192h	Hall Plausi Shift Actuator 2
DTC	P182135h	PWM Duty Monitoring Shift Actuator 2 Out of Range High
DTC	P182134h	PWM Duty Monitoring Shift Actuator 2 Out of Range Low
DTC	P182136h	Carrier Frequency Monitoring Shift Actuator 2 Out of Range Low
DTC	P182137h	Carrier Frequency Monitoring Shift Actuator 2 Out of Range High

Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to ON.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
4. If Diagnostic Trouble Code (DTC) cannot be cleared, it indicates that there is a current malfunction.
5. Only use a digital multimeter to measure voltage of electronic system.
6. Refer to any Technical Bulletin that may apply to this malfunction.
7. Visually check the related wire harness.
8. Check and clean all Transmission Control Unit (TCU) ground related to latest DTC.
9. If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

⚠ Caution

- When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	Power-off and reset

(a) After the vehicle is stopped, the engine is stopped, and the ignition switch is turned off for 10 minutes, disconnect the battery power supply, then power on again and continue to depress brake pedal for 15 seconds. Read DTCs using diagnostic tester to see if the fault still exists.

No DTC → **System is normal and there is no fault**

DTC is output

2	**Check shift motor 2**

(a) Replace shift motor 2, and shift multiple times. Read diagnosis information again, and check if a same DTC is output.

No DTC → **Replace shift motor 2**

DTC occurs

3	**Reconfirm DTCs**

(a) Connect the negative battery cable.
(b) Use diagnostic tester to clear DTC.
(c) Start the engine.
(d) Check if the same DTCs are output.

OK → **System operates normally**

NG → **Replace TCU control module assembly and perform self-learning**

DTC	P182292h	Hall Plausi Cooling Actuator

Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to ON.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
4. If Diagnostic Trouble Code (DTC) cannot be cleared, it indicates that there is a current malfunction.
5. Only use a digital multimeter to measure voltage of electronic system.
6. Refer to any Technical Bulletin that may apply to this malfunction.
7. Visually check the related wire harness.
8. Check and clean all Transmission Control Unit (TCU) ground related to latest DTC.
9. If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

⚠ Caution

- When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	**Power-off and reset**

(a) After the vehicle is stopped, the engine is stopped, and the ignition switch is turned off for 10 minutes, disconnect the battery power supply, then power on again and continue to depress brake pedal for 15 seconds. Read DTCs using diagnostic tester to see if the fault still exists.

No DTC → **System is normal and there is no fault**

DTC is output

2	Check cooling motor

(a) Replace cooling motor, and shift multiple times. Read diagnosis information again, and check if a same DTC is output.

No DTC → **Replace cooling motor**

DTC occurs

3	Reconfirm DTCs

(a) Connect the negative battery cable.
(b) Use diagnostic tester to clear DTC.
(c) Start the engine.
(d) Check if the same DTCs are output.

OK → **System operates normally**

NG → **Replace TCU control module assembly and perform self-learning**

DTC	**P181B22h**	**Jump Detection of Oil Temperature Value**
DTC	**P181B2Ah**	**Oil Temperature Value is Stuck**
DTC	**P181B64h**	**Offset Detection of Oil Temperature Value**

Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to ON.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
4. If Diagnostic Trouble Code (DTC) cannot be cleared, it indicates that there is a current malfunction.
5. Only use a digital multimeter to measure voltage of electronic system.
6. Refer to any Technical Bulletin that may apply to this malfunction.
7. Visually check the related wire harness.
8. Check and clean all Transmission Control Unit (TCU) ground related to latest DTC.
9. If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

⚠ Caution
• When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	Power-off and reset

(a) After the vehicle is stopped, the engine is stopped, and the ignition switch is turned off for 10 minutes, disconnect the battery power supply, then power on again and continue to depress brake pedal for 15 seconds. Read DTCs using diagnostic tester to see if the fault still exists.

No DTC → **System is normal and there is no fault**

DTC is output

2	Check oil temperature sensor

(a) Check oil temperature sensor connection part for debris, ice, oil and damage.
(b) Replace oil temperature sensor to compare and verify.

NG → **Replace oil temperature sensor**

OK

3	Reconfirm DTCs

(a) Connect the negative battery cable.
(b) Use diagnostic tester to clear DTC.
(c) Start the engine.
(d) Check if the same DTCs are output.

OK → **System operates normally**

NG → **Replace TCU control module assembly and perform self-learning**

DTC	P180229h	Shift Actuator 1 Motor Speed Check

⚠ Caution
• When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

Confirmation Procedure
Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to OFF.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
4. If Diagnostic Trouble Code (DTC) cannot be cleared, it indicates that there is a current malfunction.
5. Only use a digital multimeter to measure voltage of electronic system.

6. Refer to any Technical Bulletin that may apply to this malfunction.
7. Visually check the related wire harness.
8. Check and clean all Transmission Control Unit (TCU) ground related to latest DTC.
9. If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

⚠ Caution

- When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	**Check shift motor 1 connector**

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the shift motor 1 connector.
(d) Disconnect the TCU B connector.
(e) Check connector for poor connection, poor contact, cracks or damage.

NG → **Repair or replace connector or wire harness**

OK

2	**Check shift motor 1**

(a) Replace shift motor 1 to compare and verify. Use diagnostic tester to check if a same DTC is output.

No DTC → **Replace shift motor 1**

DTC occurs

3	**Replace TCU**

(a) Replace TCU to compare and verify. Use diagnostic tester to check if a same DTC is output.

No DTC → **Replace TCU**

DTC occurs

4	**Reconfirm DTCs**

(a) Connect the negative battery cable.
(b) Use diagnostic tester to clear DTC.
(c) Start the engine.
(d) Check if the same DTCs are output.

OK → **System operates normally**

NG → **Replace transmission assembly**

DTC	**P18024Bh**	**Temperature Monitoring Shift Actuator 1 Powerstage (Overtemperature)**
DTC	**P18034Bh**	**Temperature Monitoring Shift Actuator 2 Powerstage (Overtemperature)**
DTC	**P183B4Bh**	**Temperature Monitoring TCU (Overtemperature)**
DTC	**P18054Bh**	**Clutch Cooling Pump Motor Powerstage (Overtemperature)**
DTC	**P18064Bh**	**Temperature Monitoring Clutch Actuator 1 Powerstage (Overtemperature)**
DTC	**P18074Bh**	**Temperature Monitoring Clutch Actuator 2 Powerstage (Overtemperature)**

⚠ Caution

- When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to OFF.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
4. If Diagnostic Trouble Code (DTC) cannot be cleared, it indicates that there is a current malfunction.
5. Only use a digital multimeter to measure voltage of electronic system.
6. Refer to any Technical Bulletin that may apply to this malfunction.
7. Visually check the related wire harness.
8. Check and clean all Transmission Control Unit (TCU) ground related to latest DTC.
9. If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

⚠ Caution

- When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	**Check battery**

(a) Using a multimeter, check if battery voltage is normal.

NG → **Check and repair battery**

OK

2	**Check TCU fuse**

(a) Check if TCU fuse in engine compartment fuse and relay box is normal.

NG → **Replace fuse**

OK

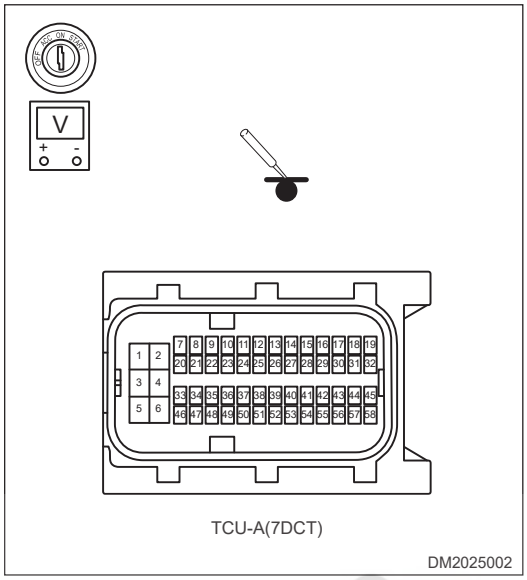
3	Check TCU power supply circuit

(a) Turn ignition switch to OFF.

(b) Disconnect the TCU connector.

(c) Turn ignition switch to ON.

(d) Using a multimeter, measure voltage between TCU connector (power supply terminal) and body ground. (-
Standard voltage should be the battery voltage)



NG → **Check and repair TCU power supply circuit**

OK

4	Reconfirm DTCs

(a) Connect the negative battery cable.

(b) Use diagnostic tester to clear DTC.

(c) Start the engine.

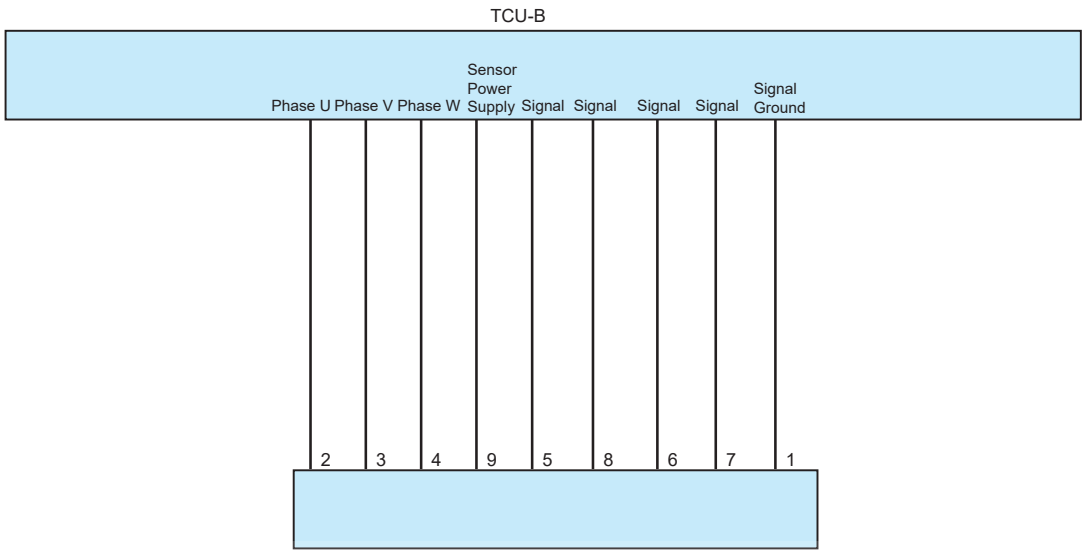
(d) Check if the same DTCs are output.

OK → **System operates normally**

NG → **Replace TCU control module assembly and perform self-learning**

DTC	**P180C11h**	**Voltage Level Monitoring Sensor Shift Motor 1: Supply Voltage Short Circuit to Ground**
DTC	**P180C12h**	**Voltage Level Monitoring Sensor Shift Motor 1: Supply Voltage Short Circuit to Battery**
DTC	**P180C1Ch**	**Voltage Level Monitoring Sensor Shift Motor 1: Supply Voltage Out of Range High**
DTC	**P180C1Dh**	**Voltage Level Monitoring Sensor Shift Motor 1: Supply Voltage Out of Range Low**

Circuit Diagram



Shift Motor 1

DM2019001

⚠ Caution

- When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to OFF.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
4. If Diagnostic Trouble Code (DTC) cannot be cleared, it indicates that there is a current malfunction.
5. Only use a digital multimeter to measure voltage of electronic system.
6. Refer to any Technical Bulletin that may apply to this malfunction.
7. Visually check the related wire harness.
8. Check and clean all Transmission Control Unit (TCU) ground related to latest DTC.
9. If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

⚠ Caution

- When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	**Check shift motor 1 connector**

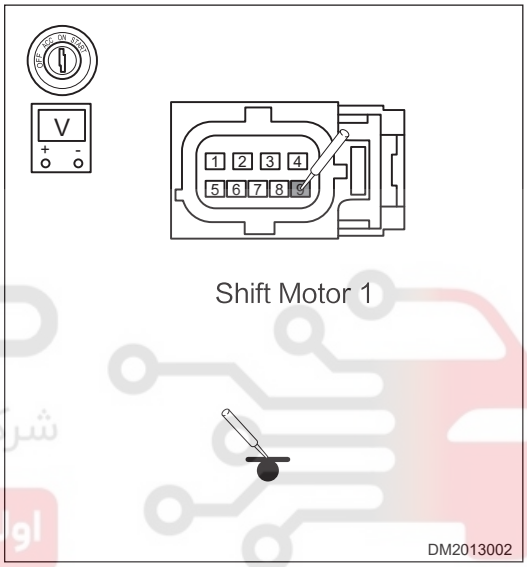
(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the shift motor 1 connector.
(d) Disconnect the TCU B connector.
(e) Check connector for poor connection, poor contact, cracks or damage.

NG → **Repair or replace connector or wire harness**

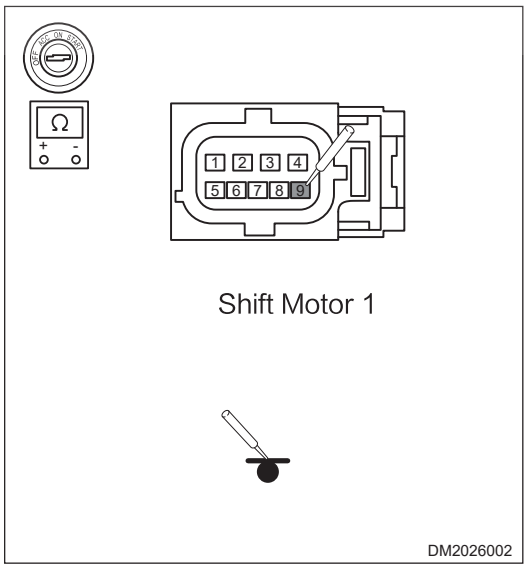
OK

2	**Check shift motor 1 circuit**

(a) Connect TCU B connector.
(b) Turn ENGINE START STOP switch to ON.
(c) Using voltage band of multimeter, measure voltage between shift motor 1 connector terminal (9) and body ground, and standard voltage should be 5 V.



(d) Using ohm band of multimeter, measure resistance (- standard resistance should be ∞) between shift motor 1 connector terminal (9) and body ground to check power supply circuit for short to ground.



NG → **Repair or replace circuit between shift motor 1 and TCU**

OK

3	Check shift motor 1

(a) Replace shift motor 1, and shift multiple times while driving a certain distance. Read diagnosis information again, and check if a same DTC is output.

NG → **Replace shift motor 1**

OK

4	Reconfirm DTCs

(a) Connect the negative battery cable.
(b) Use diagnostic tester to clear DTC.
(c) Start the engine.
(d) Check if the same DTCs are output.

OK → **System operates normally**

NG → **Replace TCU control module assembly and perform self-learning**

DTC	P180329h	Shift Actuator 2 Motor Speed Check

⚠ Caution

- When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to OFF.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
4. If Diagnostic Trouble Code (DTC) cannot be cleared, it indicates that there is a current malfunction.
5. Only use a digital multimeter to measure voltage of electronic system.
6. Refer to any Technical Bulletin that may apply to this malfunction.
7. Visually check the related wire harness.
8. Check and clean all Transmission Control Unit (TCU) ground related to latest DTC.
9. If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

⚠ Caution

- When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	Check shift motor 2 connector

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the shift motor 2 connector.
(d) Disconnect the TCU B connector.
(e) Check connector for poor connection, poor contact, cracks or damage.

NG → **Repair or replace connector or wire harness**

OK

2	**Check shift motor 2**

(a) Replace shift motor 2, and shift multiple times while driving a certain distance. Read diagnosis information again, and check if a same DTC is output.

No → **Replace shift motor 2**

Yes

3	**Replace TCU**

(a) Replace TCU to compare and verify. Use diagnostic tester to check if a same DTC is output.

No → **Replace TCU**

Yes

4	**Reconfirm DTCs**

(a) Connect the negative battery cable.
(b) Use diagnostic tester to clear DTC.
(c) Start the engine.
(d) Check if the same DTCs are output.

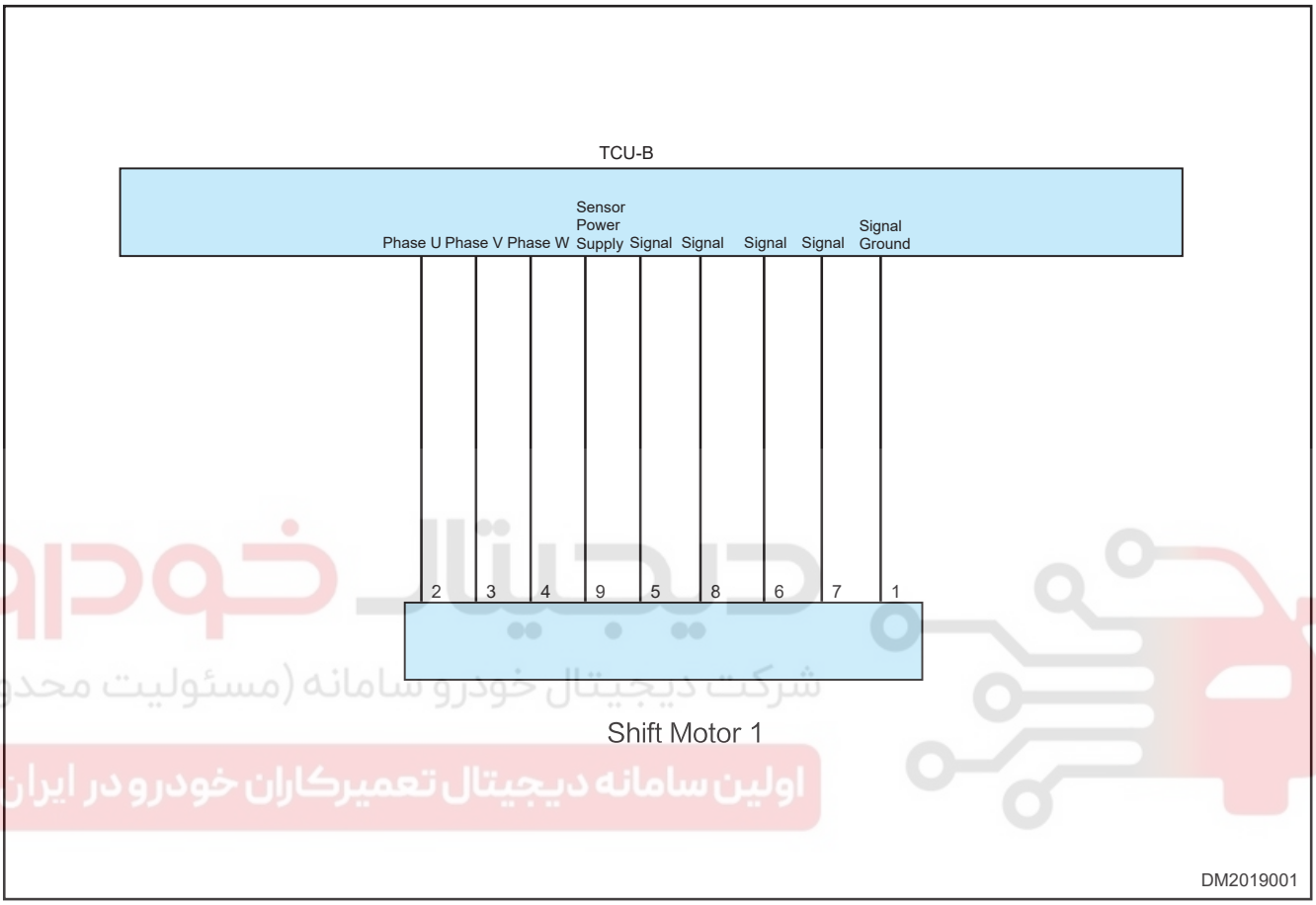
OK → **System operates normally**

NG → **Replace transmission assembly**

DTC	**P180213h**	**Phases Monitoring Shift Actuator 1: Open Circuit**
DTC	**P180262h**	**Signal Level Correlation Monitoring Shift Actuator 1**
DTC	**P180292h**	**Phases Monitoring Shift Actuator 1: Performance or Incorrect Operation**
DTC	**P180212h**	**Phases Monitoring Shift Actuator 1: Short to Bat**

DTC	**P180215h**	**Phases Monitoring Shift Actuator 1: Short to Battery or Open Circuit**
DTC	**P180211h**	**Phases Monitoring Shift Actuator 1: Short to Ground**

Circuit Diagram



⚠ Caution

- When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to OFF.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
4. If Diagnostic Trouble Code (DTC) cannot be cleared, it indicates that there is a current malfunction.
5. Only use a digital multimeter to measure voltage of electronic system.
6. Refer to any Technical Bulletin that may apply to this malfunction.
7. Visually check the related wire harness.
8. Check and clean all Transmission Control Unit (TCU) ground related to latest DTC.
9. If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

⚠ Caution

- When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	Check shift motor 1 connector

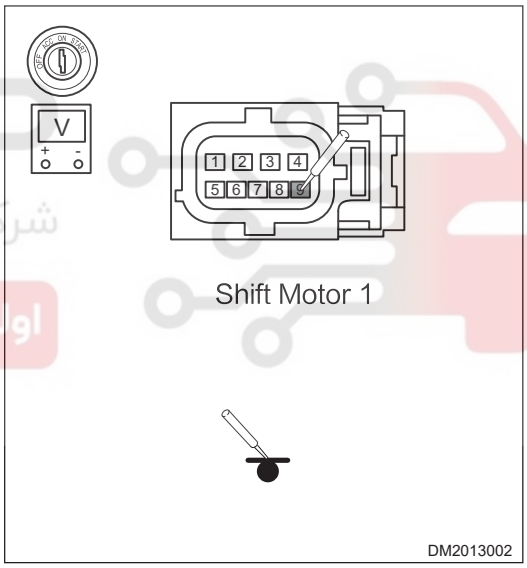
(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the shift motor 1 connector.
(d) Disconnect the TCU B connector.
(e) Check connector for poor connection, poor contact, cracks or damage.

NG → **Repair or replace connector**

OK

2	Check shift motor 1 power supply voltage

(a) Connect TCU B connector.
(b) Turn ENGINE START STOP switch to ON.
(c) Using voltage band of multimeter, measure voltage between shift motor 1 connector terminal (9) and body ground, and standard voltage should be 5 V.

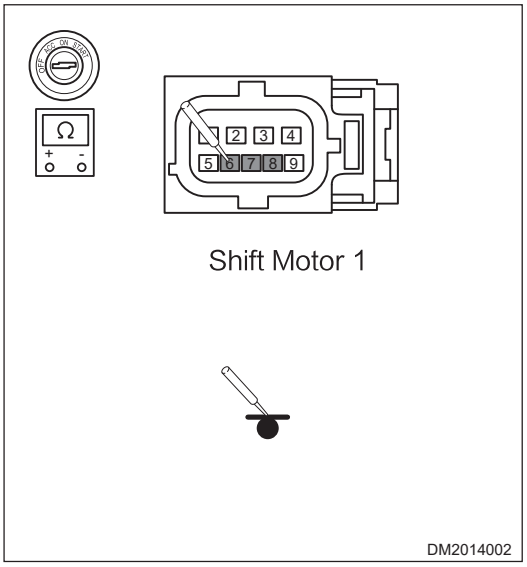


NG → **Repair or replace power supply circuit between shift motor 1 and TCU**

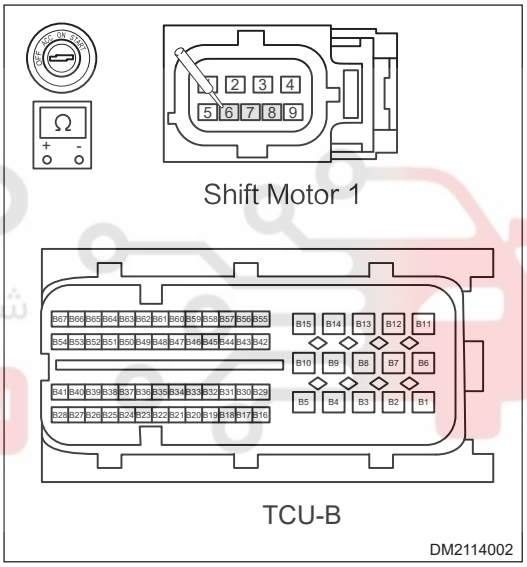
OK

3	Check shift motor 1 circuit

(a) Using ohm band of multimeter, measure resistance between terminals (6, 7, 8) of shift motor 1 connector and body ground to check circuit for short to ground.



(b) Using ohm band of multimeter, measure resistance between terminals (6, 7, 8) of shift motor 1 connector and TCU B (corresponding terminal) to check for open circuit.



NG → **Repair or replace wire harness or connector (Shift motor 1 - TCU)**

OK ↓

4	**Check shift motor 1**

(a) Replace shift motor 1, and shift multiple times while driving a certain distance. Read diagnosis information again, and check if a same DTC is output.

No → **Replace shift motor 1**

Yes ↓

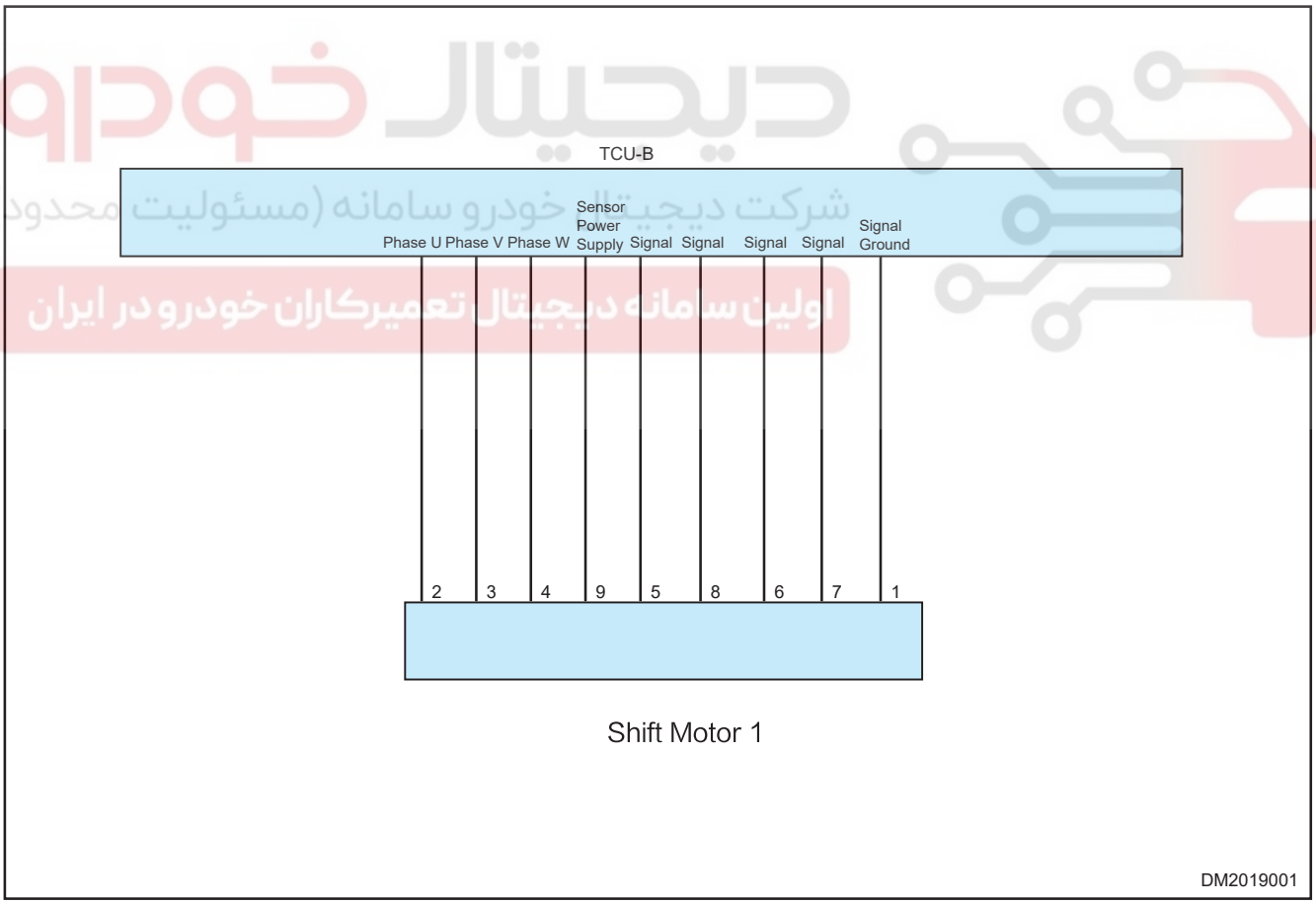
5	**Reconfirm DTCs**

(a) Connect the negative battery cable.
(b) Use diagnostic tester to clear DTC.
(c) Start the engine.
(d) Check if the same DTCs are output.

OK	**System operates normally**
NG	**Replace TCU control module assembly and perform self-learning**

DTC	**P182372h**	**Engagement Failure Detection Odd Transmission Path**
DTC	**P182373h**	**Disengagement Failure Detection Odd Transmission Path**
DTC	**P182577h**	**Shiftdrum 1 Movement Monitoring (Unexpected Shiftdrum 1 Standstill)**
DTC	**P182929h**	**Continuous Monitoring of Mechanical End Stop Shifter Drum 1**

Circuit Diagram



⚠ Caution

- When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to OFF.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
4. If Diagnostic Trouble Code (DTC) cannot be cleared, it indicates that there is a current malfunction.
5. Only use a digital multimeter to measure voltage of electronic system.
6. Refer to any Technical Bulletin that may apply to this malfunction.
7. Visually check the related wire harness.
8. Check and clean all Transmission Control Unit (TCU) ground related to latest DTC.
9. If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

⚠ Caution
• When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	Perform shifter drum self-learning

(a) Perform shifter drum self-learning using diagnostic tester.
After the learning is completed, use diagnostic tester to check if a same DTC is output.

No DTC → **System is normal and there is no fault**

DTC is output

2	Check shift motor 1 connector

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the shift motor 1 connector.
(d) Disconnect the TCU B connector.
(e) Check connector for poor connection, poor contact, cracks or damage.

NG → **Repair or replace connector**

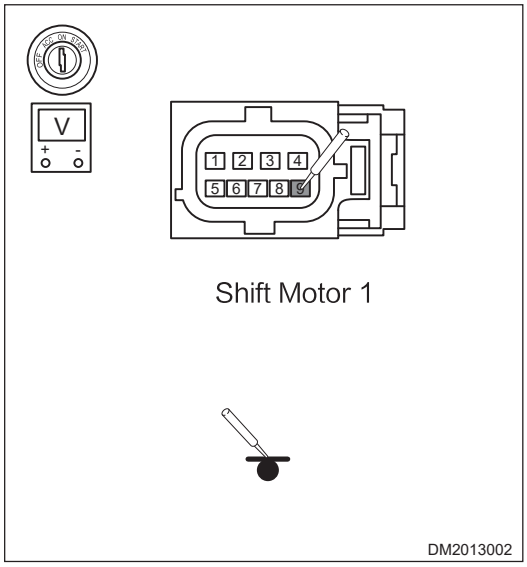
OK

3	Check shift motor 1 power supply voltage

(a) Connect TCU B connector.

(b) Turn ENGINE START STOP switch to ON.

(c) Using voltage band of multimeter, measure voltage between shift motor 1 connector terminal (9) and body ground, and standard voltage should be 5 V.

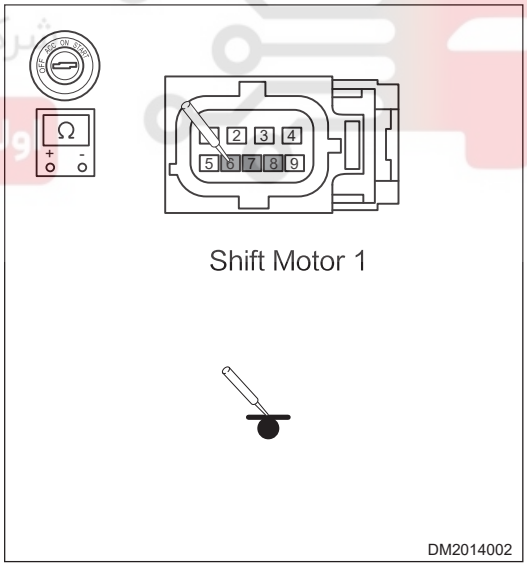


NG → **Repair or replace power supply circuit between shift motor 1 and TCU**

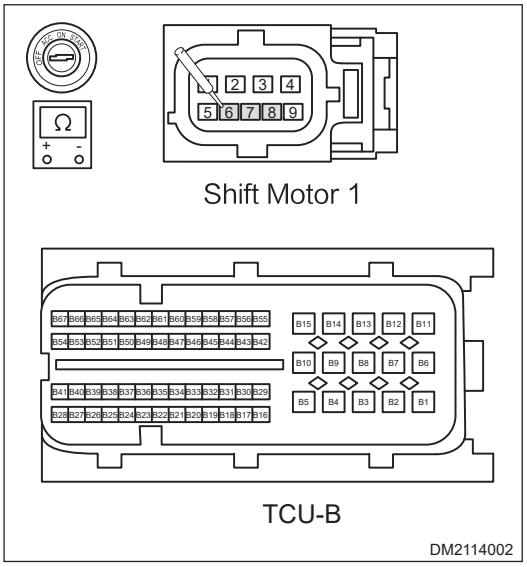
OK →

4	**Check shift motor 1 circuit**

(a) Using ohm band of multimeter, measure resistance between terminals (6, 7, 8) of shift motor 1 connector and body ground to check circuit for short to ground.



(b) Using ohm band of multimeter, measure resistance between terminals (6, 7, 8) of shift motor 1 connector and TCU B (corresponding terminal) to check for open circuit.



NG → **Repair or replace wire harness or connector (Shift motor 1 - TCU)**

OK

5	Check shift motor 1

(a) Replace shift motor 1, and shift multiple times while driving a certain distance. Read diagnosis information again, and check if a same DTC is output.

No → **Replace shift motor 1**

Yes

6	Check TCU

(a) Replace TCU to compare and verify. Use diagnostic tester to check if a same DTC is output.

No → **Replace TCU**

Yes

7	Reconfirm DTCs

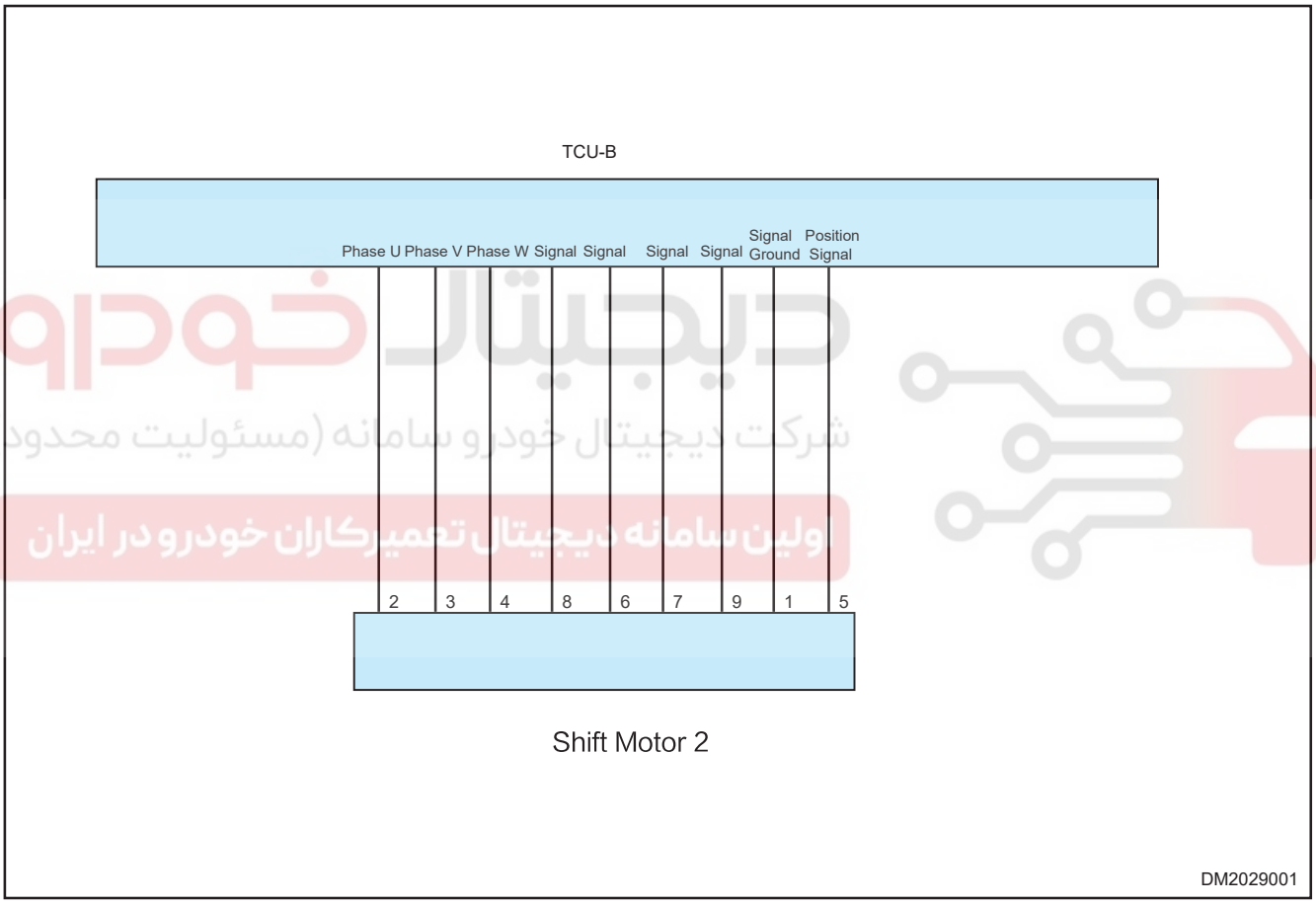
(a) Connect the negative battery cable.
(b) Use diagnostic tester to clear DTC.
(c) Start the engine.
(d) Check if the same DTCs are output.

OK → **System operates normally**

NG → **Replace transmission assembly**

DTC	**P180313h**	**Phases Monitoring Shift Actuator 2: Open Circuit**
DTC	**P180362h**	**Signal Level Correlation Monitoring Shift Actuator 2**
DTC	**P180392h**	**Phases Monitoring Shift Actuator 2: Performance or Incorrect Operation**
DTC	**P180312h**	**Phases Monitoring Shift Actuator 2: Short to Bat**
DTC	**P180315h**	**Phases Monitoring Shift Actuator 2: Short to Battery or Open Circuit**
DTC	**P180311h**	**Phases Monitoring Shift Actuator 2: Short to Ground**

Circuit Diagram



⚠ Caution

- When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to OFF.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
4. If Diagnostic Trouble Code (DTC) cannot be cleared, it indicates that there is a current malfunction.

5. Only use a digital multimeter to measure voltage of electronic system.
6. Refer to any Technical Bulletin that may apply to this malfunction.
7. Visually check the related wire harness.
8. Check and clean all Transmission Control Unit (TCU) ground related to latest DTC.
9. If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

⚠ Caution

- When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	**Check shift motor 2 connector**

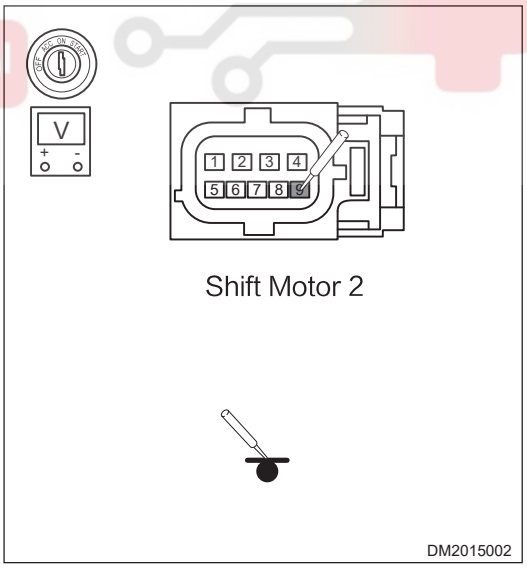
(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the shift motor 2 connector.
(d) Disconnect the TCU B connector.
(e) Check connector for poor connection, poor contact, cracks or damage.

NG → **Repair or replace connector**

OK

2	**Check shift motor 2 circuit**

(a) Connect TCU B connector.
(b) Turn ENGINE START STOP switch to ON.
(c) Using voltage band of multimeter, measure voltage between shift motor 2 connector terminal (9) and body ground, and standard voltage should be 5 V.

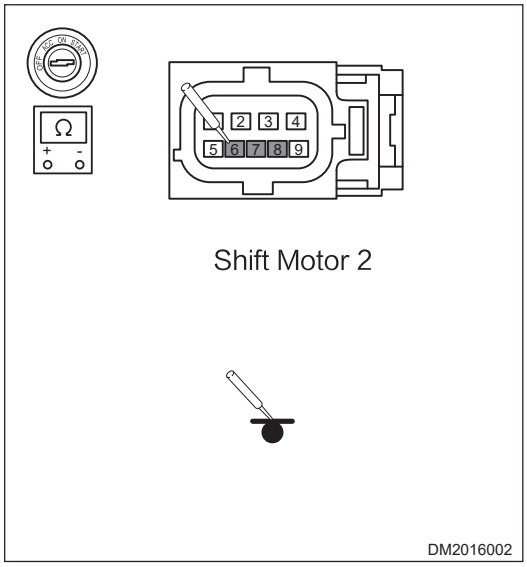


NG → **Repair or replace power supply circuit between shift motor 2 and TCU**

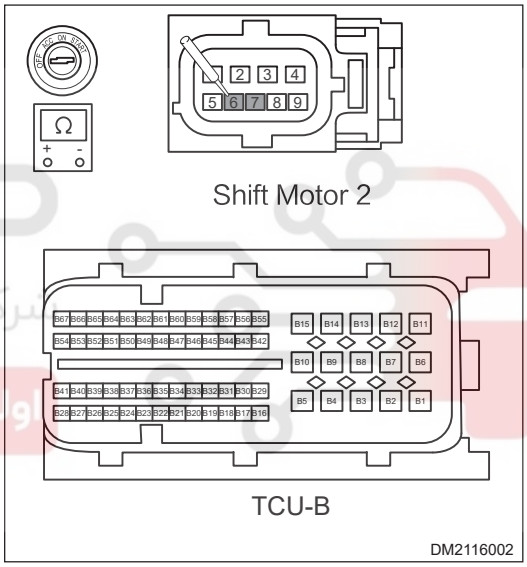
OK

3	**Check shift motor 2 circuit**

(a) Using ohm band of multimeter, measure resistance between terminals (6, 7, 8) of shift motor 2 connector and body ground to check circuit for short to ground.



(b) Using ohm band of multimeter, measure resistance between terminals (6, 7, 8) of shift motor 2 connector and TCU B (corresponding terminal) to check for open circuit.



NG → **Repair or replace wire harness or connector (Shift motor 2 - TCU)**

OK ↓

4	**Check shift motor 2**

(a) Replace shift motor 2, and shift multiple times while driving a certain distance. Read diagnosis information again, and check if a same DTC is output.

No → **Replace shift motor 2**

Yes ↓

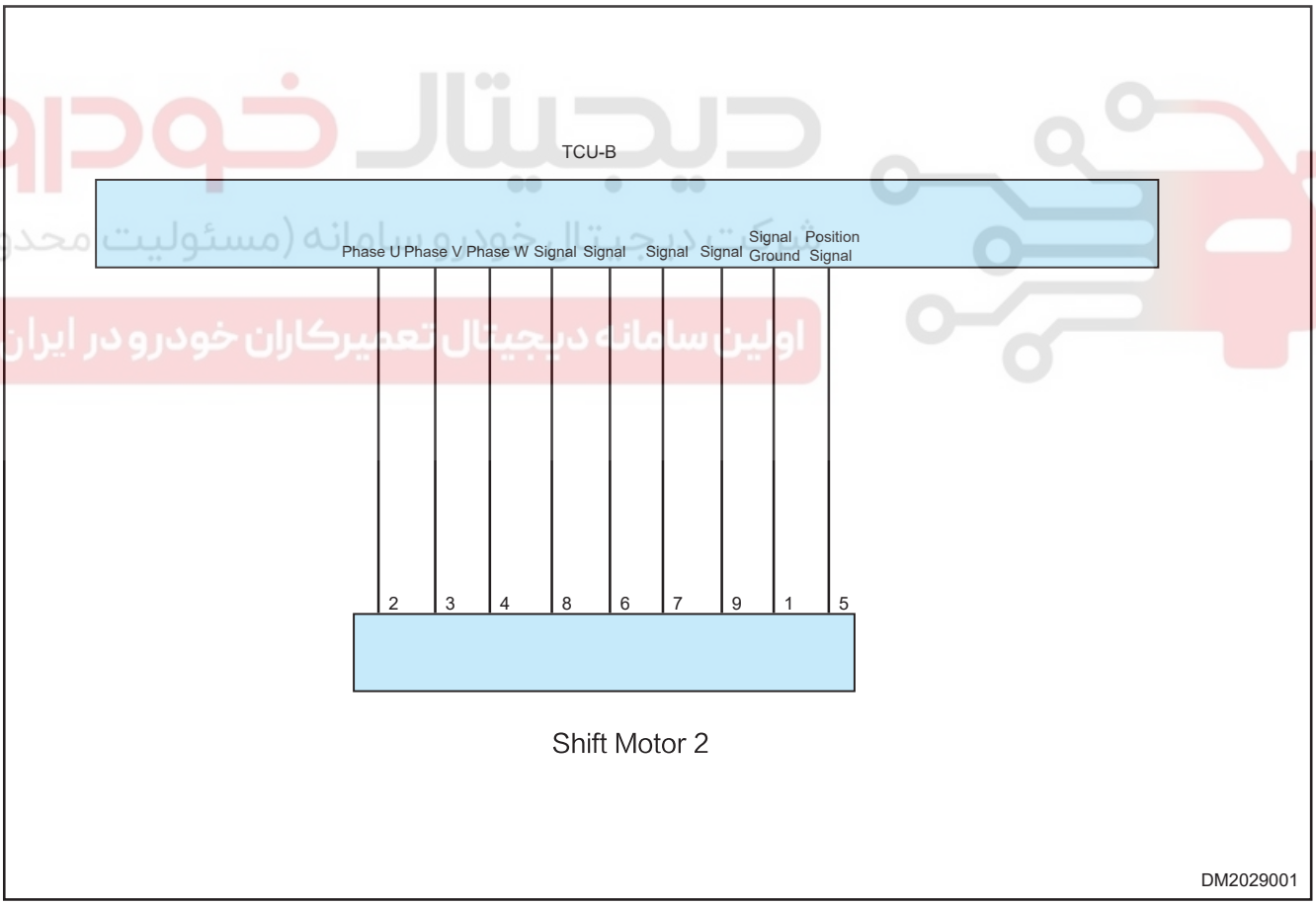
5	**Reconfirm DTCs**

(a) Connect the negative battery cable.
(b) Use diagnostic tester to clear DTC.
(c) Start the engine.
(d) Check if the same DTCs are output.

OK	**System operates normally**
NG	**Replace TCU control module assembly and perform self-learning**

DTC	**P182472h**	**Engagement Failure Detection Even Transmission Path**
DTC	**P182473h**	**Disengagement Failure Detection Even Transmission Path**
DTC	**P182677h**	**Shiftdrum 2 Movement Monitoring (Unexpected Shiftdrum 2 Standstill)**
DTC	**P182A29h**	**Continuous Monitoring of Mechanical End Stop Shifter Drum 2**

Circuit Diagram



⚠ Caution

- When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to OFF.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
4. If Diagnostic Trouble Code (DTC) cannot be cleared, it indicates that there is a current malfunction.
5. Only use a digital multimeter to measure voltage of electronic system.
6. Refer to any Technical Bulletin that may apply to this malfunction.
7. Visually check the related wire harness.
8. Check and clean all Transmission Control Unit (TCU) ground related to latest DTC.
9. If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

⚠ Caution
• When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	Perform shifter drum self-learning

(a) Perform shifter drum self-learning using diagnostic tester.
After the learning is completed, use diagnostic tester to check if a same DTC is output.

No DTC → **System is normal and there is no fault**

DTC is output

2	Check shift motor 2 connector

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the shift motor 2 connector.
(d) Disconnect the TCU B connector.
(e) Check connector for poor connection, poor contact, cracks or damage.

NG → **Repair or replace connector**

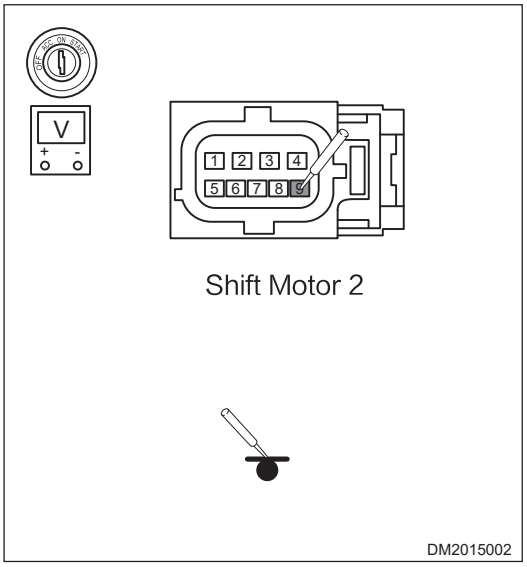
OK

3	Check shift motor 2 circuit

(a) Connect TCU B connector.

(b) Turn ENGINE START STOP switch to ON.

(c) Using voltage band of multimeter, measure voltage between shift motor 2 connector terminal (9) and body ground, and standard voltage should be 5 V.

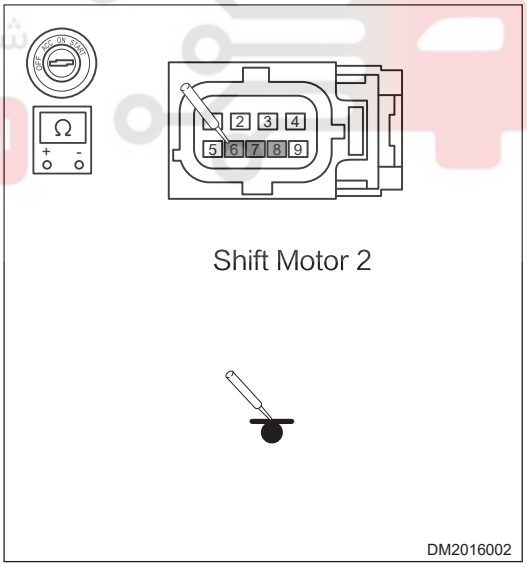


NG → **Repair or replace power supply circuit between shift motor 2 and TCU**

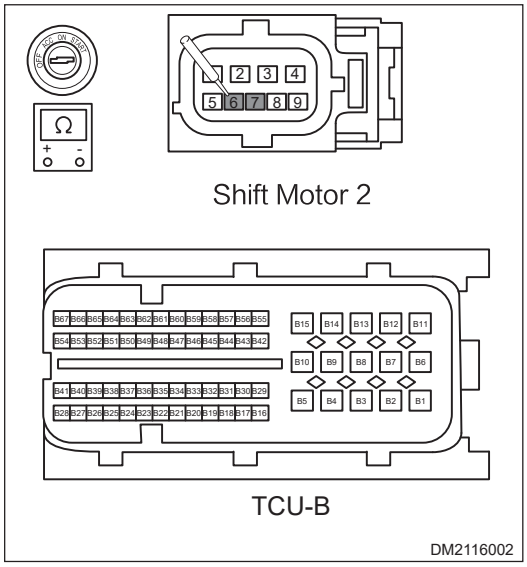
OK

4	**Check shift motor 2 circuit**

(a) Using ohm band of multimeter, measure resistance between terminals (6, 7, 8) of shift motor 2 connector and body ground to check circuit for short to ground.



(b) Using ohm band of multimeter, measure resistance between terminals (6, 7, 8) of shift motor 2 connector and TCU B (corresponding terminal) to check for open circuit.



NG → **Repair or replace wire harness or connector (Shift motor 2 - TCU)**

OK

5	Check shift motor 2

(a) Replace shift motor 2, and shift multiple times while driving a certain distance. Read diagnosis information again, and check if a same DTC is output.

No → **Replace shift motor 2**

Yes

6	Check TCU

(a) Replace TCU to compare and verify. Use diagnostic tester to check if a same DTC is output.

No → **Replace TCU**

Yes

7	Reconfirm DTCs

(a) Connect the negative battery cable.
(b) Use diagnostic tester to clear DTC.
(c) Start the engine.
(d) Check if the same DTCs are output.

OK → **System operates normally**

NG → **Replace transmission assembly**

DTC	P182D98h	Temperature Monitoring Clutch 1
DTC	P182E98h	Temperature Monitoring Clutch 2
DTC	P182F98h	Oil Pan Oil Temperature Monitoring
DTC	P183098h	Temperature Monitoring Clutch1, Clutch2 and Sump Oil Temperature for 1st Warning Level / Functional Degradation Level
DTC	P183198h	Temperature Monitoring Clutch1, Clutch2 and Sump Oil Temperature for 2nd Warning Level / Functional Degradation Level

⚠ Caution

- When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to OFF.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
4. If Diagnostic Trouble Code (DTC) cannot be cleared, it indicates that there is a current malfunction.
5. Only use a digital multimeter to measure voltage of electronic system.
6. Refer to any Technical Bulletin that may apply to this malfunction.
7. Visually check the related wire harness.
8. Check and clean all Transmission Control Unit (TCU) ground related to latest DTC.
9. If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

⚠ Caution

- When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	**Check the vehicle cooling system**

(a) Check if coolant is insufficient and leaked, and if vehicle cooling system is normal.

NG → **Repair or replace faulty area as needed**

OK ↓

2	**Check transmission oil**

(a) Check whether there are any abnormal conditions such as insufficient and dirty transmission oil.

NG → **Refill or replace transmission oil as needed**

OK

3	Check clutch cooling motor

(a) Replace clutch cooling motor to compare and verify. Use diagnostic tester to check if a same DTC is output.

No → **Replace clutch cooling motor**

Yes

4	Check clutch cooling pump

(a) Replace clutch cooling pump to compare and verify. Use diagnostic tester to check if a same DTC is output.

No → **Replace clutch cooling pump**

Yes

5	Check TCU

(a) Replace TCU to compare and verify. Use diagnostic tester to check if a same DTC is output.

No → **Replace TCU**

Yes

6	Reconfirm DTCs

(a) Connect the negative battery cable.
(b) Use diagnostic tester to clear DTC.
(c) Start the engine.
(d) Check if the same DTCs are output.

OK → **System operates normally**

NG → **Replace transmission assembly**

DTC	P183277h	Monitoring Park Lock Position

⚠ Caution

- When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to OFF.

2. Connect diagnostic tester (the latest software) to data link connector.
3. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
4. If Diagnostic Trouble Code (DTC) cannot be cleared, it indicates that there is a current malfunction.
5. Only use a digital multimeter to measure voltage of electronic system.
6. Refer to any Technical Bulletin that may apply to this malfunction.
7. Visually check the related wire harness.
8. Check and clean all Transmission Control Unit (TCU) ground related to latest DTC.
9. If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

⚠ Caution
• When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	Check shifter drum self-learning

(a) Use diagnostic tester to check shifter drum self-learning, and perform shifter drum self-learning again.
(b) After shifter drum self-learning is completed, use diagnostic tester to check if DTC exists.

No → **System is normal and there is no fault**

Yes

2	Check shift motor wire harness and connector

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the shift motor connector.
(d) Disconnect the TCU B connector.
(e) Check connector for poor connection, poor contact, cracks or damage.

NG → **Repair or replace wire harness or connector as needed**

OK

3	Check shift motor

(a) Replace shift motor to compare and verify. Use diagnostic tester to check if a same DTC is output.

No → **Replace shift motor**

Yes

4	Check TCU

(a) Replace TCU to compare and verify. Use diagnostic tester to check if a same DTC is output.

No → **Replace TCU**

Yes

5	Reconfirm DTCs

(a) Connect the negative battery cable.
(b) Use diagnostic tester to clear DTC.
(c) Start the engine.
(d) Check if the same DTCs are output.

OK → **System operates normally**

NG → **Replace transmission assembly**

DTC	**P183592h**	**Shifter Drum 1 Teach-in Failure**
DTC	**P183692h**	**Shifter Drum 2 Teach-in Failure**

⚠ Caution

- When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to OFF.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
4. If Diagnostic Trouble Code (DTC) cannot be cleared, it indicates that there is a current malfunction.
5. Only use a digital multimeter to measure voltage of electronic system.
6. Refer to any Technical Bulletin that may apply to this malfunction.
7. Visually check the related wire harness.
8. Check and clean all Transmission Control Unit (TCU) ground related to latest DTC.
9. If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

⚠ Caution

- When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	Check shifter drum self-learning

(a) Use diagnostic tester to check shifter drum self-learning, and perform shifter drum self-learning again.
(b) After shifter drum self-learning is completed, use diagnostic tester to check if DTC exists.

No → **System is normal and there is no fault**

Yes

2	Check shift motor wire harness and connector

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the shift motor connector.
(d) Disconnect the TCU B connector.
(e) Check connector for poor connection, poor contact, cracks or damage.

NG → **Repair or replace wire harness or connector as needed**

OK ↓

3	Check shift motor

(a) Replace shift motor to compare and verify. Use diagnostic tester to check if a same DTC is output.

No → **Replace shift motor**

Yes ↓

4	Check TCU

(a) Replace TCU to compare and verify. Use diagnostic tester to check if a same DTC is output.

No → **Replace TCU**

Yes ↓

5	Reconfirm DTCs

(a) Connect the negative battery cable.
(b) Use diagnostic tester to clear DTC.
(c) Start the engine.
(d) Check if the same DTCs are output.

OK → **System operates normally**

NG → **Replace transmission assembly**

DTC	**P183307h**	**Clutch 1 Drag Torque Detection**
DTC	**P183407h**	**Clutch 2 Drag Torque Detection**

⚠ Caution

- When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to OFF.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
4. If Diagnostic Trouble Code (DTC) cannot be cleared, it indicates that there is a current malfunction.
5. Only use a digital multimeter to measure voltage of electronic system.
6. Refer to any Technical Bulletin that may apply to this malfunction.
7. Visually check the related wire harness.
8. Check and clean all Transmission Control Unit (TCU) ground related to latest DTC.
9. If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

⚠ Caution
• When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	**Check clutch self-learning**

(a) Use diagnostic tester to check clutch self-learning, and perform clutch self-learning again.
(b) After clutch self-learning is completed, use diagnostic tester to check if DTC exists.

No → **System is normal and there is no fault**

Yes

2	**Check TCU**

(a) Replace TCU to compare and verify. Use diagnostic tester to check if a same DTC is output.

No → **Replace TCU**

Yes

3	**Reconfirm DTCs**

(a) Connect the negative battery cable.
(b) Use diagnostic tester to clear DTC.
(c) Start the engine.
(d) Check if the same DTCs are output.

OK → **System operates normally**

NG → **Replace clutch assembly**

DTC	P183796h	Welding Fracture Monitoring

⚠ Caution
• When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to OFF.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
4. If Diagnostic Trouble Code (DTC) cannot be cleared, it indicates that there is a current malfunction.
5. Only use a digital multimeter to measure voltage of electronic system.
6. Refer to any Technical Bulletin that may apply to this malfunction.
7. Visually check the related wire harness.
8. Check and clean all Transmission Control Unit (TCU) ground related to latest DTC.
9. If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

⚠ Caution
• When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

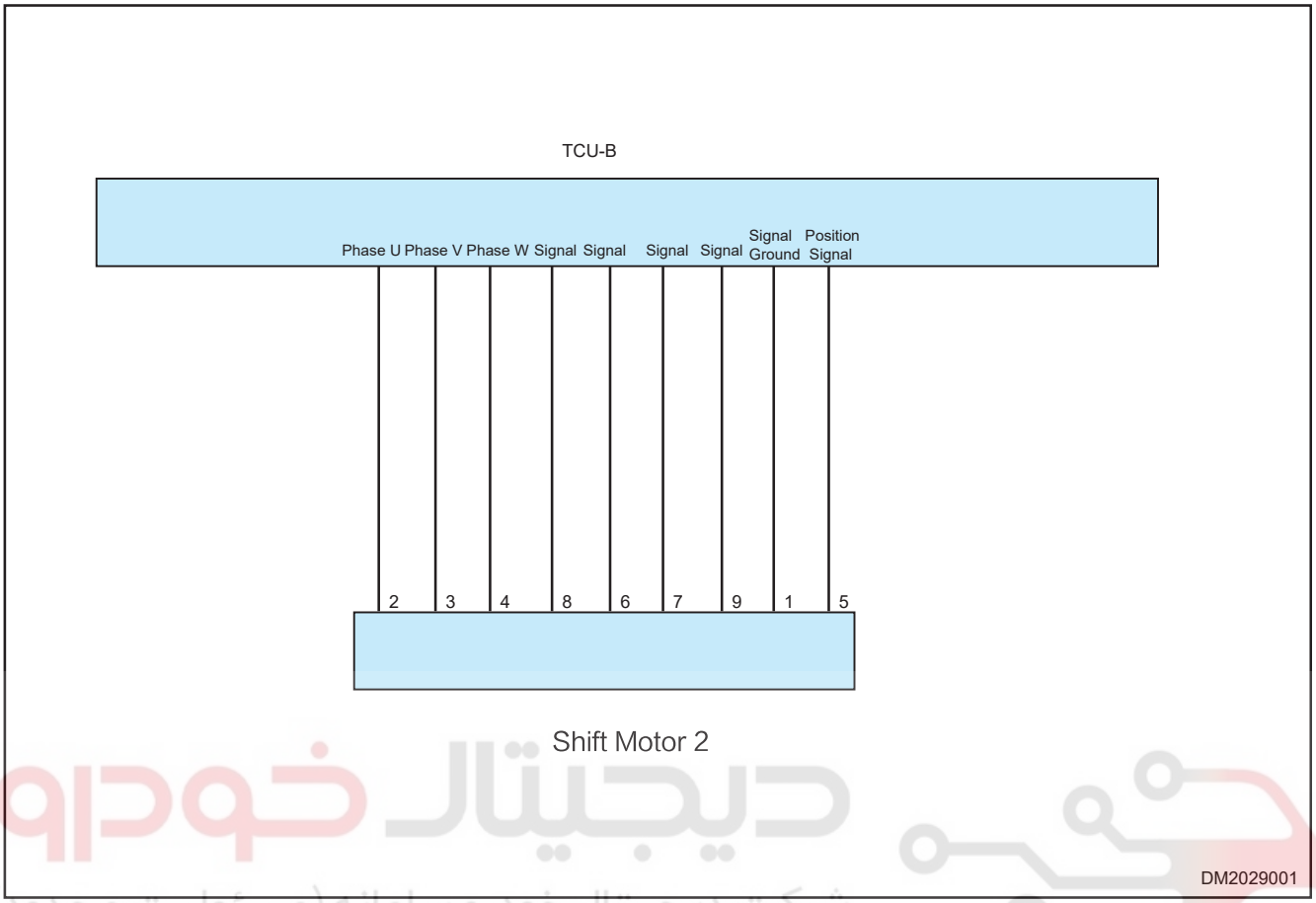
1	Reconfirm DTCs

(a) Connect the negative battery cable.
(b) Use diagnostic tester to clear DTC.
(c) Start the engine.
(d) Check if the same DTCs are output.

OK	System operates normally and there is no fault
NG	Replace clutch assembly

DTC	P180D11h	Voltage Level Monitoring Sensor Shift Motor 2: Supply Voltage Short Circuit to Ground
DTC	P180D12h	Voltage Level Monitoring Sensor Shift Motor 2: Supply Voltage Short Circuit to Battery
DTC	P180D1Ch	Voltage Level Monitoring Sensor Shift Motor 2: Supply Voltage Out of Range High
DTC	P180D1Dh	Voltage Level Monitoring Sensor Shift Motor 2: Supply Voltage Out of Range Low

Circuit Diagram



⚠ Caution

- When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to OFF.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
4. If Diagnostic Trouble Code (DTC) cannot be cleared, it indicates that there is a current malfunction.
5. Only use a digital multimeter to measure voltage of electronic system.
6. Refer to any Technical Bulletin that may apply to this malfunction.
7. Visually check the related wire harness.
8. Check and clean all Transmission Control Unit (TCU) ground related to latest DTC.
9. If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

⚠ Caution

- When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	**Check shift motor 2 connector**

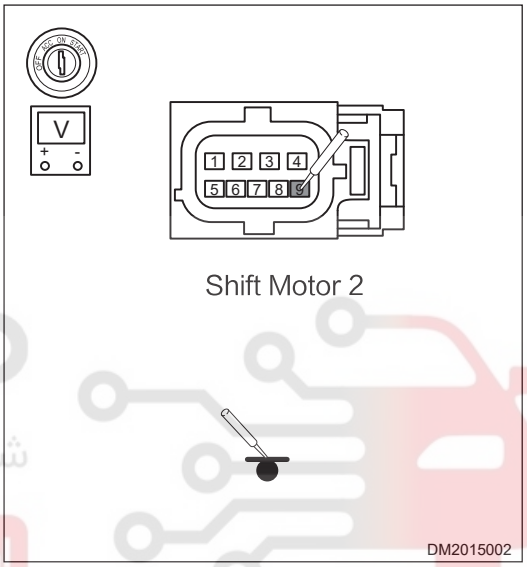
(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the shift motor 2 connector.
(d) Disconnect the TCU B connector.
(e) Check connector for poor connection, poor contact, cracks or damage.

NG → **Repair or replace connector**

OK

2	**Check shift motor 2 circuit**

(a) Connect TCU B connector.
(b) Turn ENGINE START STOP switch to ON.
(c) Using voltage band of multimeter, measure voltage between shift motor 2 connector terminal (9) and body ground, and standard voltage should be 5 V.



NG → **Repair or replace power supply circuit between shift motor 2 and TCU**

OK

3	**Check shift motor 2**

(a) Replace shift motor 2, and shift multiple times while driving a certain distance. Read diagnosis information again, and check if a same DTC is output.

No → **Replace shift motor 2**

Yes

4	**Reconfirm DTCs**

(a) Connect the negative battery cable.
(b) Use diagnostic tester to clear DTC.
(c) Start the engine.
(d) Check if the same DTCs are output.

OK	**System operates normally**
NG	**Replace TCU control module assembly and perform self-learning**

DTC	**P183816h**	**Voltage Level Monitoring High Power Supply Undervoltage 1st Threshold**
DTC	**P183817h**	**Voltage Level Monitoring High Power Supply Overvoltage 1st Threshold**
DTC	**P183916h**	**Voltage Level Monitoring High Power Supply Undervoltage 2nd Threshold**
DTC	**P183917h**	**Voltage Level Monitoring High Power Supply Overvoltage 2nd Threshold**
DTC	**P183A16h**	**Voltage Level Monitoring Low Power Supply Undervoltage**
DTC	**P183A17h**	**Voltage Level Monitoring Low Power Supply Overvoltage**

Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to ON.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
4. If Diagnostic Trouble Code (DTC) cannot be cleared, it indicates that there is a current malfunction.
5. Only use a digital multimeter to measure voltage of electronic system.
6. Refer to any Technical Bulletin that may apply to this malfunction.
7. Visually check the related wire harness.
8. Check and clean all Transmission Control Unit (TCU) ground related to latest DTC.
9. If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

⚠ Caution

- When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	**Check battery**

(a) Turn ENGINE START STOP switch to OFF.

(b) Using a multimeter, measure voltage between positive and negative battery terminals.

NG	**Replace battery**

OK

2	**Check fuse**

(a) Check if TCU fuse in engine compartment fuse and relay box is normal.

NG	**Replace fuse**

OK

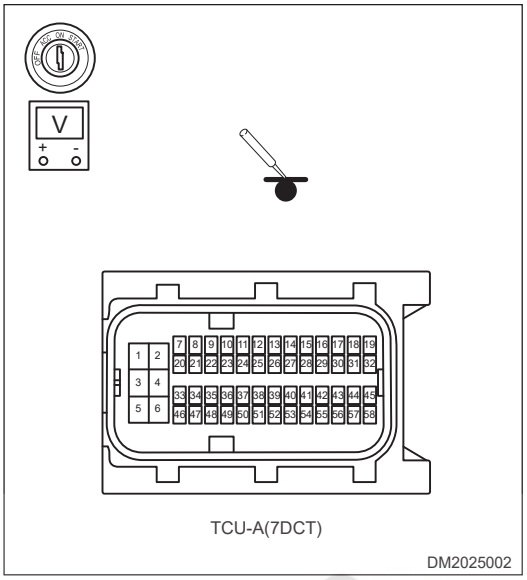
3	Check TCU power supply circuit

(a) Turn ignition switch to OFF.

(b) Disconnect the TCU connector.

(c) Turn ignition switch to ON.

(d) Using a multimeter, measure voltage between TCU connector (power supply terminal) and body ground. (-
Standard voltage should be the battery voltage)



NG → **Check and repair TCU power supply circuit**

OK

4	Reconfirm DTCs

(a) Connect the negative battery cable.

(b) Use diagnostic tester to clear DTC.

(c) Start the engine.

(d) Check if the same DTCs are output.

OK → **System operates normally**

NG → **Replace TCU control module assembly and perform self-learning**

DTC	**P183C47h**	**Base SW Test Result of the Initial Cut Off Incomplete**
DTC	**P183D42h**	**Internal Control Module EEPROM Error**

Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to ON.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
4. If Diagnostic Trouble Code (DTC) cannot be cleared, it indicates that there is a current malfunction.
5. Only use a digital multimeter to measure voltage of electronic system.
6. Refer to any Technical Bulletin that may apply to this malfunction.

7. Visually check the related wire harness.
8. Check and clean all Transmission Control Unit (TCU) ground related to latest DTC.
9. If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

⚠ Caution
• When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	Check TCU wire harness and connector

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the TCU connector.
(d) Check connector for poor connection, poor contact, cracks or damage.

NG → **Repair or replace wire harness as necessary**

OK

2	Reconfirm DTCs

(a) Connect the negative battery cable.
(b) Use diagnostic tester to clear DTC.
(c) Start the engine.
(d) Check if the same DTCs are output.

OK → **System operates normally**

NG → **Replace TCU control module assembly and perform self-learning**

DTC	P330047h	Level 2 Safety Goal SZ1: Unwanted Engine Torque Increase
DTC	P330147h	Level 2 Safety Goal SZ2: Unwanted Launch in Wrong Direction
DTC	P330247h	Level 2 Safety Goal SZ3: Unwanted Shifting to R While Driving
DTC	P330347h	Level 2 Safety Goal SZ4: Unwanted Launch
DTC	P330447h	Level 2 Safety Goal SZ6a: Unwanted Downshift (Outside Allowed Input Shaft Speed Range)
DTC	P330547h	Level 2 Safety Goal SZ6b: Unwanted Downshift (Outside Allowed Input Shaft Speed Range)
DTC	P330647h	Level 2 Safety Goal SZ7: Clutch Stuck
DTC	P330747h	Level 2 Safety Goal SZ8: Clutch Overspeed
DTC	P330847h	Level 2 Safety Goal SZ13: Unwanted Disengaging of P

DTC	P330947h	Level 2 Safety Goal SZ14: P Not Engaging
DTC	P330A47h	Level 2 Safety Goal SZ16: Unwanted Engaging of P
DTC	P330B47h	Level 2 Safety Goal SZ19a: Wrong Display Position P
DTC	P330C47h	Level 2 Safety Goal SZ19b: Wrong Display Position D/R
DTC	P330D47h	Level 2 Safety Goal SZ19c: Wrong Display Position N/P
DTC	P331047h	level 2 Safety Goal Memory Protection
DTC	P331147h	level 2 Safety Goal Calibration Pointer Protection
DTC	P332047h	Level 3 Safety Function Has Become Active

Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to ON.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
4. If Diagnostic Trouble Code (DTC) cannot be cleared, it indicates that there is a current malfunction.
5. Only use a digital multimeter to measure voltage of electronic system.
6. Refer to any Technical Bulletin that may apply to this malfunction.
7. Visually check the related wire harness.
8. Check and clean all Transmission Control Unit (TCU) ground related to latest DTC.
9. If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

⚠ Caution

- When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	**Check TCU wire harness and connector**

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the TCU connector.
(d) Check connector for poor connection, poor contact, cracks or damage.

NG → **Repair or replace wire harness as necessary**

OK

2	**Reconfirm DTCs**

(a) Connect the negative battery cable.
(b) Use diagnostic tester to clear DTC.
(c) Start the engine.
(d) Check if the same DTCs are output.

OK → **System operates normally**

NG → **Replace TCU control module assembly and perform self-learning**

DTC	**P182B62h**	**Clutch 1 Torque Too Low (GETRAG)**
DTC	**P182C62h**	**Clutch 2 Torque Too Low (GETRAG)**

⚠ Caution

- When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to OFF.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
4. If Diagnostic Trouble Code (DTC) cannot be cleared, it indicates that there is a current malfunction.
5. Only use a digital multimeter to measure voltage of electronic system.
6. Refer to any Technical Bulletin that may apply to this malfunction.
7. Visually check the related wire harness.
8. Check and clean all Transmission Control Unit (TCU) ground related to latest DTC.
9. If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

⚠ Caution

- When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	**Check clutch system**

(a) Check the clutch system.

NG → **Replace clutch assembly**

OK

2	**Reconfirm DTCs**

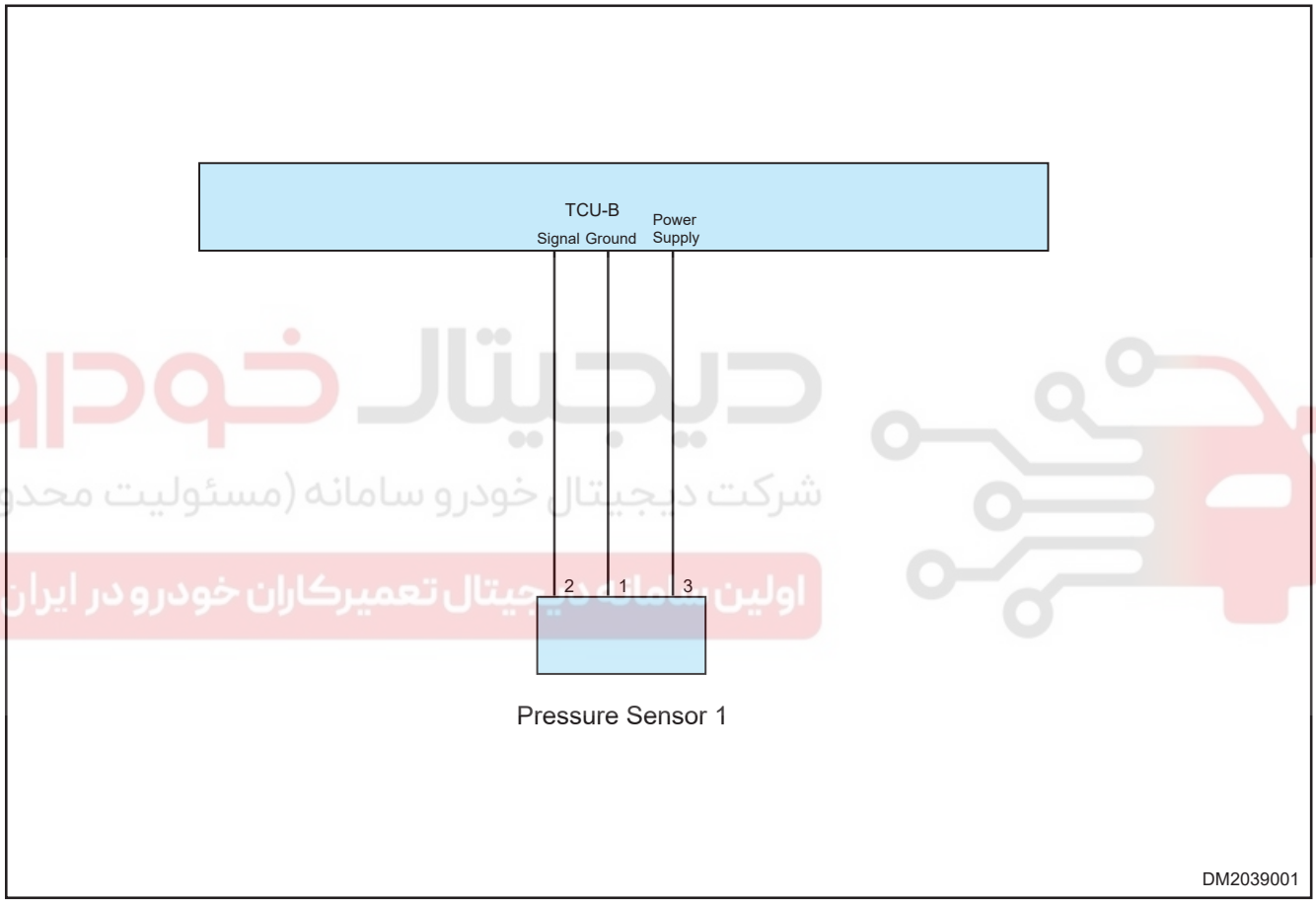
(a) Turn ENGINE START STOP switch to ON.
(b) Use diagnostic tester to clear DTC.
(c) Start the engine.
(d) Check if the same DTCs are output.

OK → **System operates normally**

NG → **Replace TCU control module assembly and perform self-learning**

DTC	P181C2Ah	Pressure Sensor 1 Output Stuck at Certain Value
DTC	P181C92h	Comparison Target to Current Pressure Sensor 1, Pressure too High
DTC	P181D92h	Comparison Target to Current Pressure Sensor 1, Pressure too Low
DTC	P181C28h	Pressure Sensor 1 Offset too High
DTC	P181C27h	Pressure Sensor 1 Inplausible High Gradient

Circuit Diagram



Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to OFF.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Turn ENGINE START STOP switch to ON.
4. Using a diagnostic tester, record and clear DTCs.
5. Start engine and warm it up to normal operating temperature, and then select Read DTC.
6. Start engine and warm it up, and then read DTC again. If DTC is detected, malfunction is current.
7. If DTC is not detected, malfunction is intermittent.

⚠ Caution

- When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	Check pressure sensor 1 connector

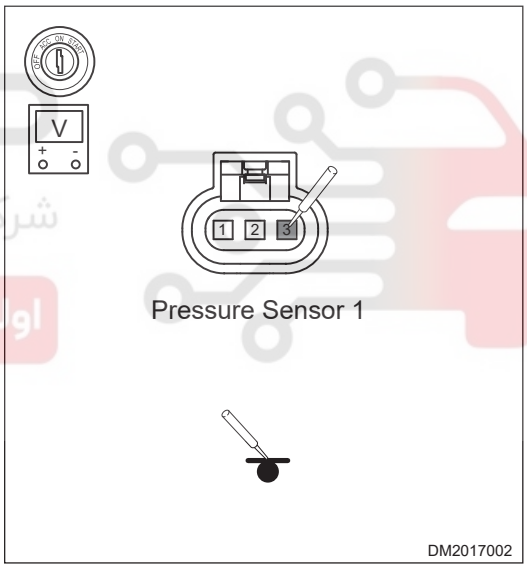
(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the pressure sensor 1 connector.
(d) Disconnect the TCU B connector.
(e) Check connector for poor connection, poor contact, cracks or damage.

NG → **Reinstall or repair, replace connector**

OK

2	Check pressure sensor 1 power supply voltage

(a) Connect TCU B connector.
(b) Turn ENGINE START STOP switch to ON.
(c) Using voltage band of multimeter, measure voltage between pressure sensor 1 connector terminal (3) and body ground, and the voltage should not be lower than 5 V.

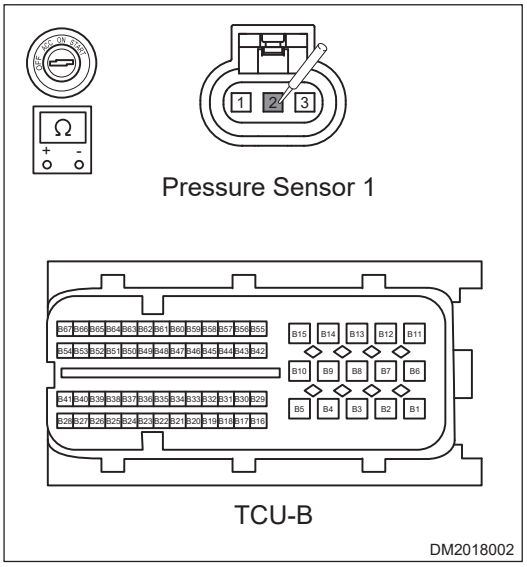


NG → **Replace or repair pressure sensor power supply wire harness**

OK

3	Check pressure sensor 1 signal circuit

(a) Using ohm band of multimeter, measure resistance between pressure sensor 1 connector terminal (2) and TCU B (corresponding terminal) to check for open circuit.



NG → **Replace wire harness or connector (- Pressure sensor 1 - TCU)**

OK →

4	**Check pressure sensor 1**

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Check sensor connection part for debris, ice, oil and damage.
(d) Replace pressure sensor to verify. Use diagnostic tester to check if a same DTC is output.

NG → **Replace pressure sensor 1**

OK →

5	**Reconfirm DTCs**

(a) Connect the negative battery cable.
(b) Turn ENGINE START STOP switch to ON.
(c) Using a diagnostic tester, read system DTC.
(d) Check if DTC still exists.

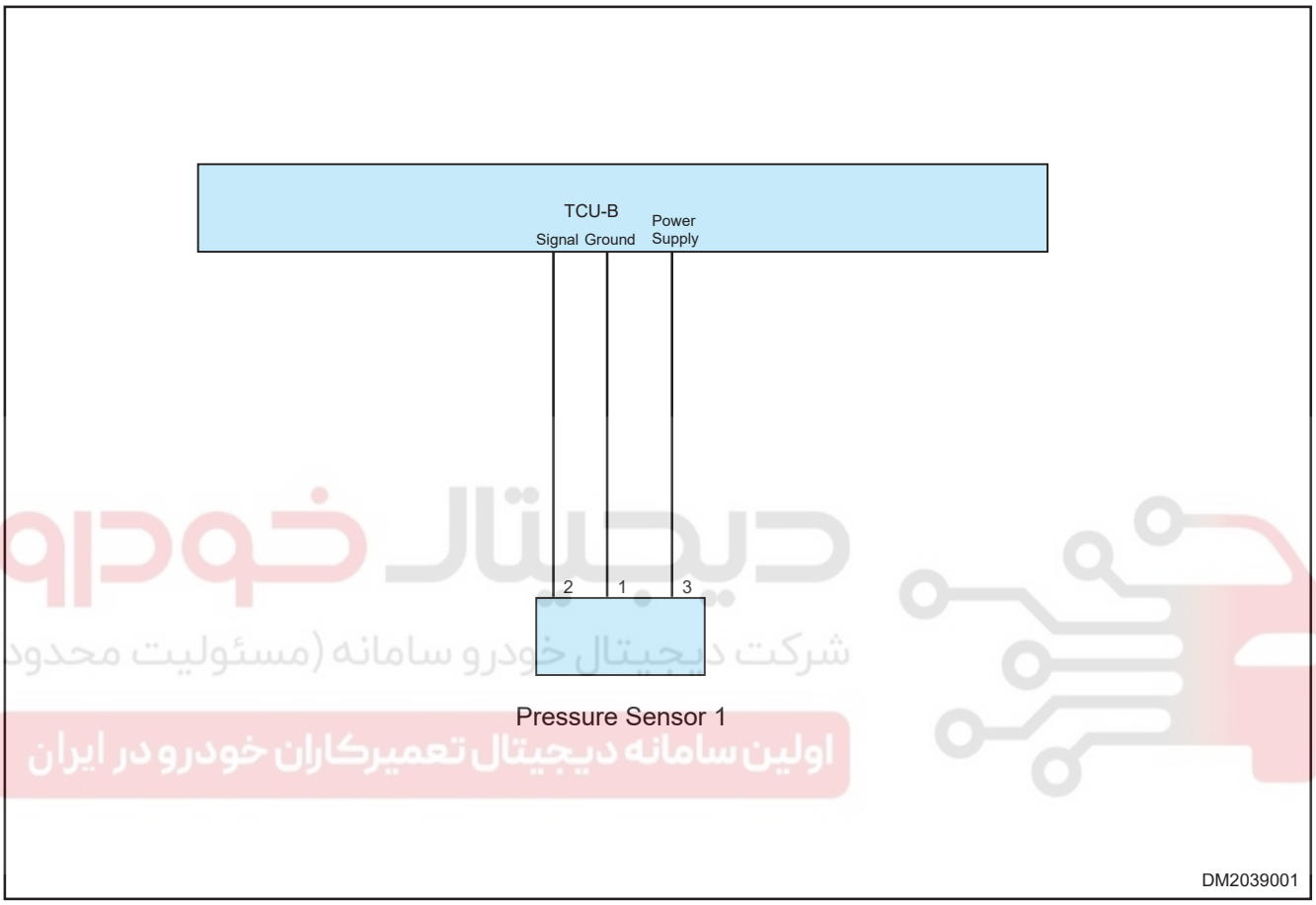
OK → **System operates normally**

NG → **Replace TCU control module assembly and perform self-learning**

DTC	**P180F11h**	**Voltage Level Monitoring Pressure Sensor 1: Supply Voltage Short to Ground**
DTC	**P180F12h**	**Voltage Level Monitoring Pressure Sensor 1: Supply Voltage Short to Battery**

DTC	**P180F1Ch**	**Voltage Level Monitoring Pressure Sensor 1: Supply Voltage Out of Range High**
DTC	**P180F1Dh**	**Voltage Level Monitoring Pressure Sensor 1: Supply Voltage Out of Range Low**

Circuit Diagram



Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to OFF.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Turn ENGINE START STOP switch to ON.
4. Using a diagnostic tester, record and clear DTCs.
5. Start engine and warm it up to normal operating temperature, and then select Read DTC.
6. Start engine and warm it up, and then read DTC again. If DTC is detected, malfunction is current.
7. If DTC is not detected, malfunction is intermittent.

⚠ Caution
• When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	**Check pressure sensor 1 connector**

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the pressure sensor 1 connector.
(d) Disconnect the TCU B connector.
(e) Check connector for poor connection, poor contact, cracks or damage.

NG → **Reinstall or repair, replace connector**

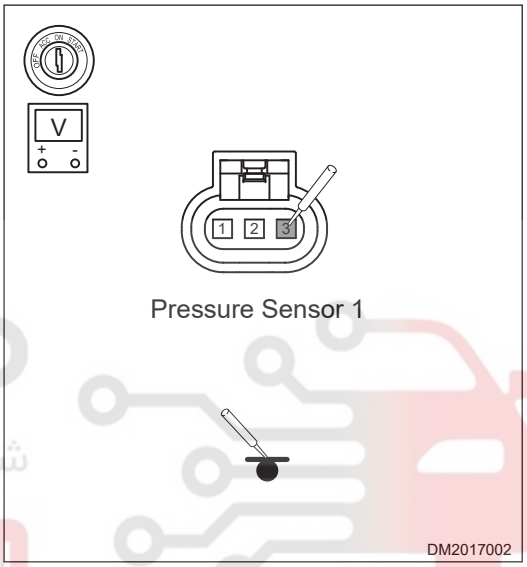
OK →

2	**Check pressure sensor 1 circuit**

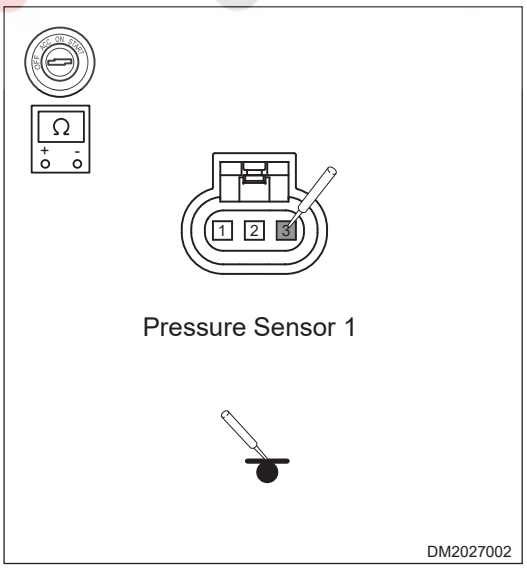
(a) Connect TCU B connector.

(b) Turn ENGINE START STOP switch to ON.

(c) Using voltage band of multimeter, measure voltage between pressure sensor 1 connector terminal (3) and body ground, and the voltage should be about 5 V.



(d) Using ohm band of multimeter, measure resistance (- standard resistance should be ∞) between pressure sensor 1 connector terminal (3) and body ground to check power supply circuit for short to ground.



NG → **Replace or repair pressure sensor circuit**

OK →

3	Check pressure sensor 1

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Check sensor connection part for debris, ice, oil and damage.
(d) Replace pressure sensor with a new one to compare and verify.

NG → **Replace pressure sensor 1**

OK

4	Reconfirm DTCs

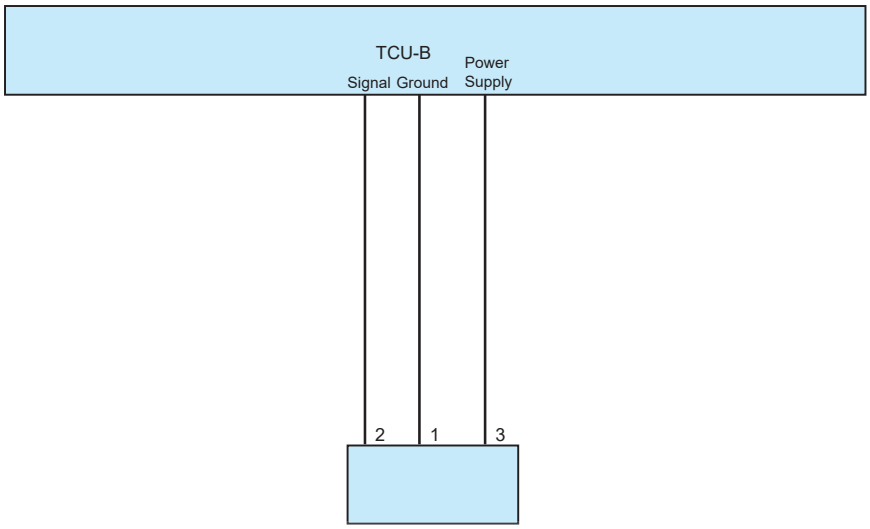
(a) Connect the negative battery cable.
(b) Turn ENGINE START STOP switch to ON.
(c) Using a diagnostic tester, read system DTC.
(d) Check if DTC still exists.

OK → **System operates normally**

NG → **Replace TCU control module assembly and perform self-learning**

DTC	P181011h	Voltage Level Monitoring Pressure Sensor 1: Signal Short to Ground
DTC	P181015h	Voltage Level Monitoring Pressure Sensor 1: Signal Short to Battery or Open Circuit
DTC	P18101Ch	Voltage Level Monitoring Pressure Sensor 1: Signal Out Of Range High
DTC	P18101Dh	Voltage Level Monitoring Pressure Sensor 1: Signal Out Of Range Low

Circuit Diagram



Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to OFF.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Turn ENGINE START STOP switch to ON.
4. Using a diagnostic tester, record and clear DTCs.
5. Start engine and warm it up to normal operating temperature, and then select Read DTC.
6. Start engine and warm it up, and then read DTC again. If DTC is detected, malfunction is current.
7. If DTC is not detected, malfunction is intermittent.

⚠ Caution
• When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	**Check pressure sensor 1 connector**

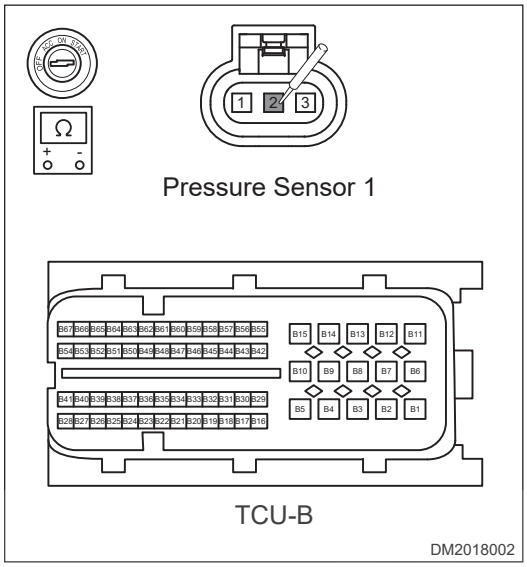
(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the pressure sensor 1 connector.
(d) Disconnect the TCU B connector.
(e) Check connector for poor connection, poor contact, cracks or damage.

NG → **Reinstall or repair, replace connector or wire harness**

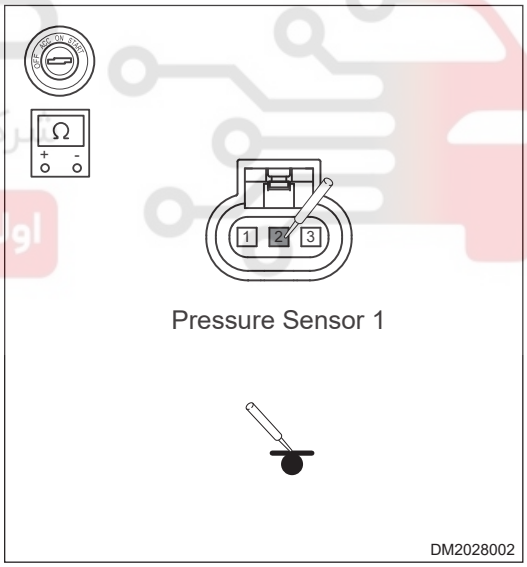
OK

2	Check pressure sensor 1 signal circuit

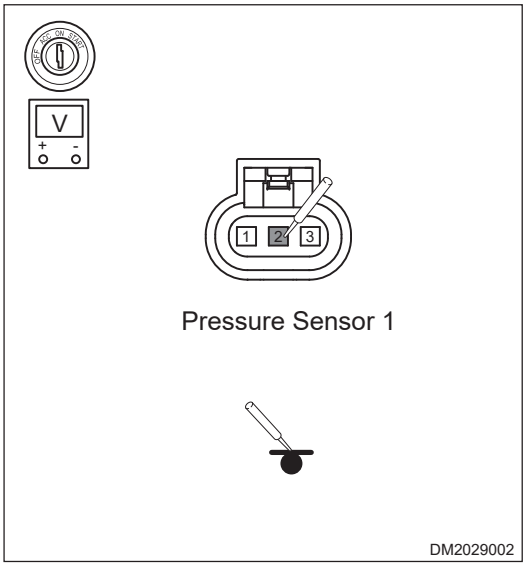
(a) Using ohm band of multimeter, measure resistance between pressure sensor 1 connector terminal (2) and TCU B (corresponding terminal) to check for open circuit.



(b) Using ohm band of multimeter, measure resistance (-standard resistance should be ∞) between pressure sensor 1 connector terminal (2) and body ground to check circuit for short to ground.



(c) Using voltage band of multimeter, measure voltage (- standard voltage should be 0 V) between pressure sensor 1 connector terminal (2) and body ground to check circuit for short to power supply.



NG → **Replace wire harness or connector (- Pressure sensor 1 - TCU)**

OK →

3	**Check pressure sensor 1**

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Check sensor connection part for debris, ice, oil and damage.
(d) Replace pressure sensor with a new one to compare and verify.

NG → **Replace pressure sensor 1**

OK →

4	**Reconfirm DTCs**

(a) Connect the negative battery cable.
(b) Turn ENGINE START STOP switch to ON.
(c) Using a diagnostic tester, read system DTC.
(d) Check if DTC still exists.

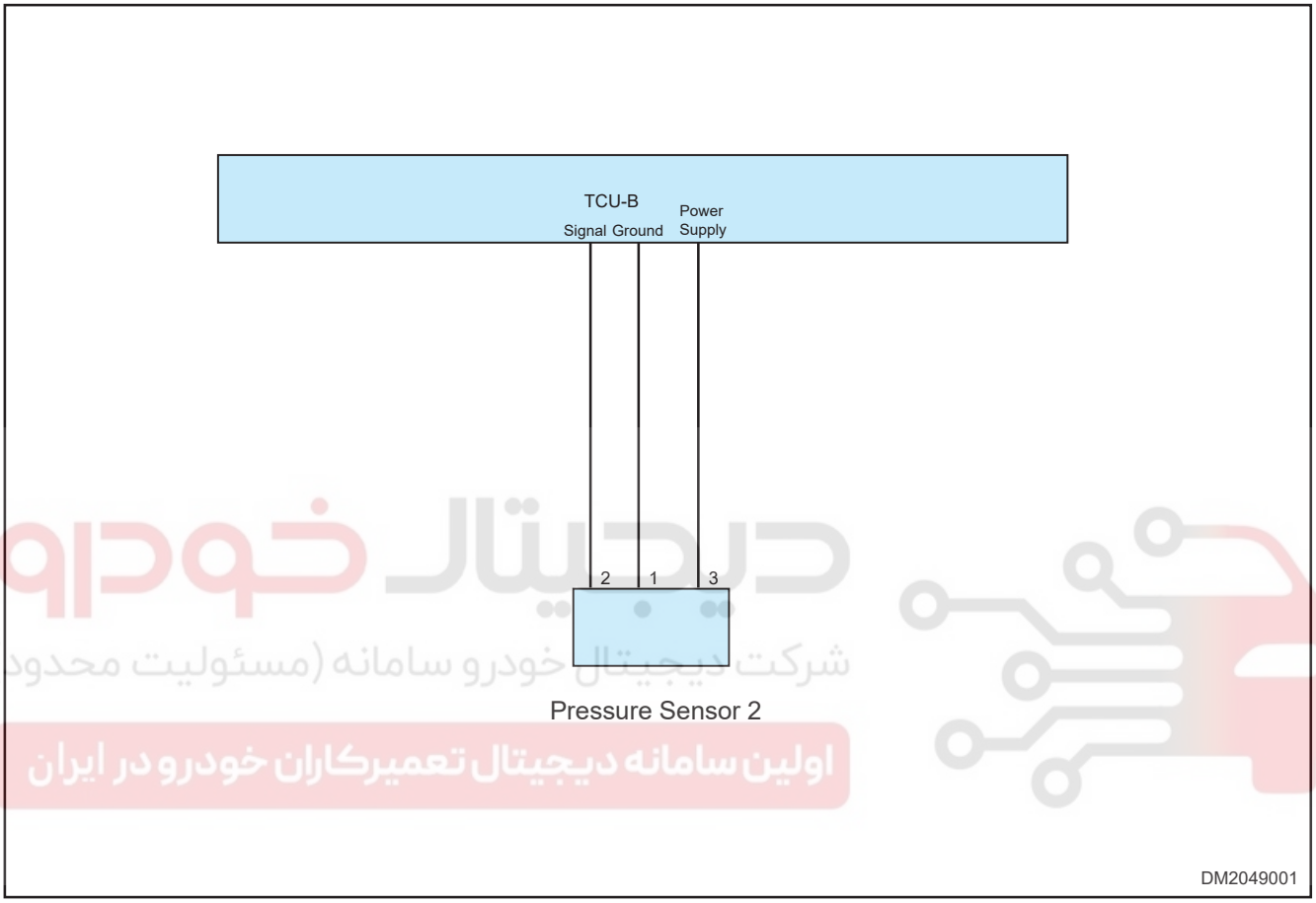
OK → **System operates normally**

NG → **Replace TCU control module assembly and perform self-learning**

DTC	**P181E92h**	**Comparison Target to Current Pressure Sensor 2, Pressure too High**
DTC	**P181E2Ah**	**Pressure Sensor 2 Output Stuck at Certain Value**

DTC	**P181F92h**	**Comparison Target to Current Pressure Sensor 2, Pressure too Low**
DTC	**P181E28h**	**Pressure Sensor 2 Offset too High**
DTC	**P181E27h**	**Pressure Sensor 2 Inplausible High Gradient**

Circuit Diagram



Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to OFF.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Turn ENGINE START STOP switch to ON.
4. Using a diagnostic tester, record and clear DTCs.
5. Start engine and warm it up to normal operating temperature, and then select Read DTC.
6. Start engine and warm it up, and then read DTC again. If DTC is detected, malfunction is current.
7. If DTC is not detected, malfunction is intermittent.

⚠ Caution
• When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	**Check pressure sensor 2 connector**

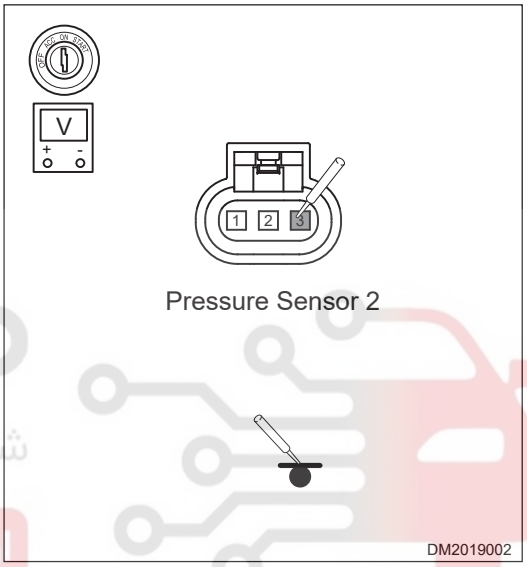
(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the pressure sensor 2 connector.
(d) Disconnect the TCU B connector.
(e) Check connector for poor connection, poor contact, cracks or damage.

NG → **Reinstall or repair, replace connector**

OK

2	**Check pressure sensor 2 power supply voltage**

(a) Connect TCU B connector.
(b) Turn ENGINE START STOP switch to ON.
(c) Using voltage band of multimeter, measure if voltage between pressure sensor 2 connector terminal (3) and body ground is normal (standard voltage should be about 5 V).

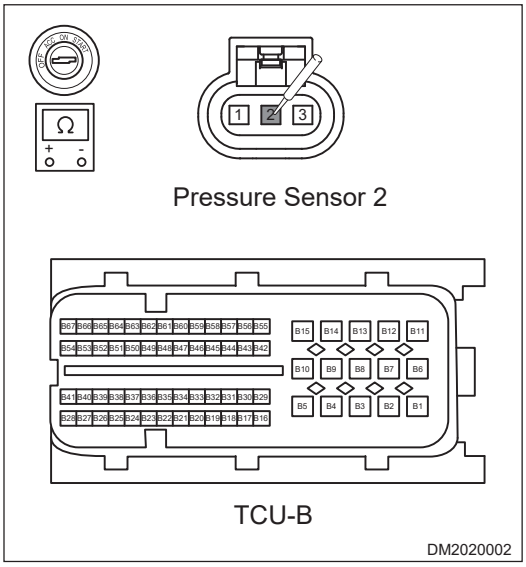


NG → **Replace or repair pressure sensor power supply circuit**

OK

3	**Check pressure sensor 2 signal circuit**

(a) Using ohm band of multimeter, measure resistance between pressure sensor 2 connector terminal (2) and TCU B (corresponding terminal) to check for open circuit.



NG → **Replace wire harness or connector (- Pressure sensor 2 - TCU)**

OK

4	**Check pressure sensor 2**

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Check sensor connection part for debris, ice, oil and damage.

NG → **Replace pressure sensor 2**

OK

5	**Reconfirm DTCs**

(a) Connect the negative battery cable.
(b) Turn ENGINE START STOP switch to ON.
(c) Using a diagnostic tester, read system DTC.
(d) Check if DTC still exists.

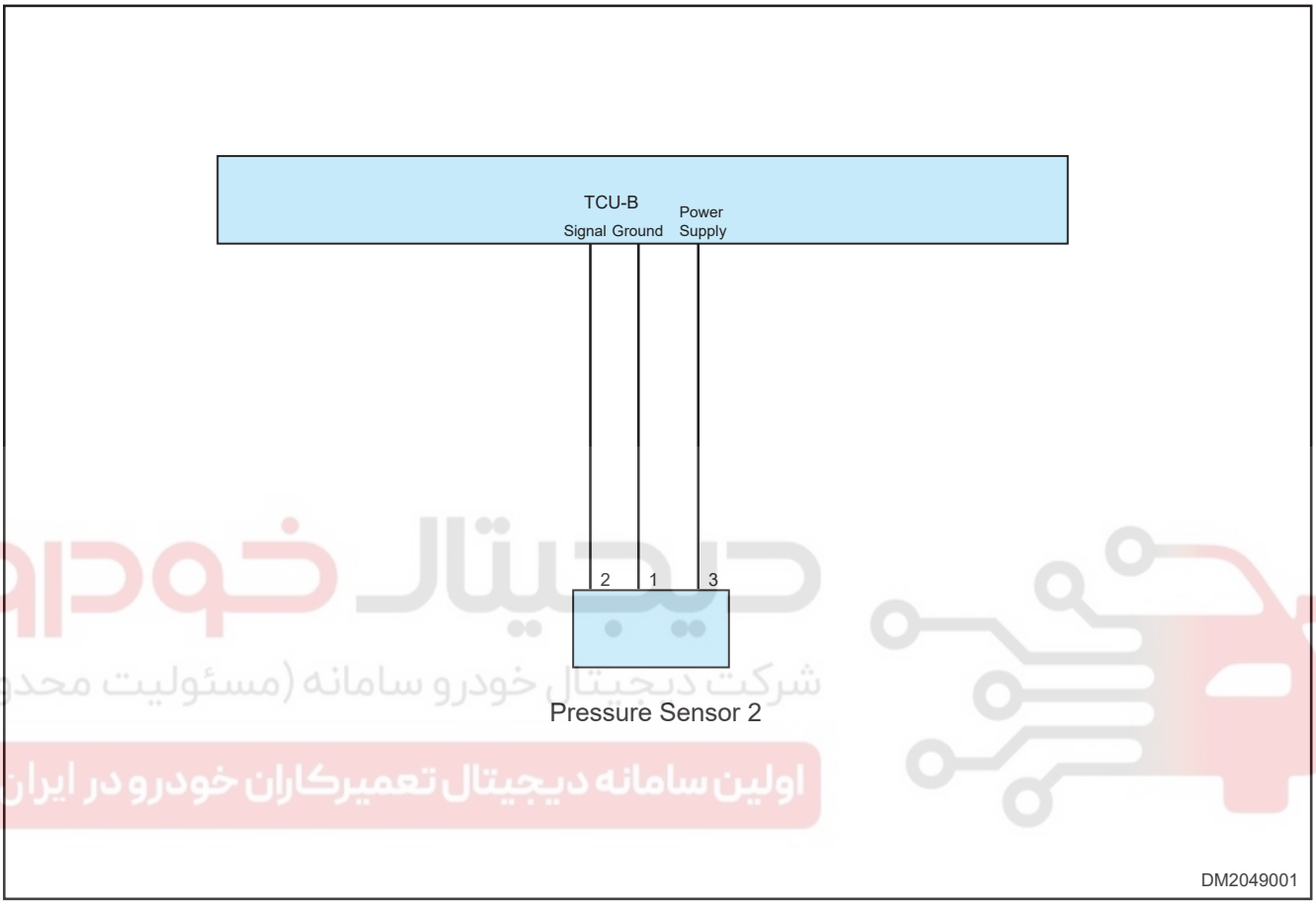
OK → **System operates normally**

NG → **Replace TCU control module assembly and perform self-learning**

DTC	**P181111h**	**Voltage Level Monitoring Pressure Sensor 2: Supply Voltage Short to Ground**
DTC	**P181112h**	**Voltage Level Monitoring Pressure Sensor 2: Supply Voltage Short to Battery**

DTC	P18111Ch	Voltage Level Monitoring Pressure Sensor 2: Supply Voltage Out of Range High
DTC	P18111Dh	Voltage Level Monitoring Pressure Sensor 2: Supply Voltage Out of Range Low

Circuit Diagram



Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to OFF.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Turn ENGINE START STOP switch to ON.
4. Using a diagnostic tester, record and clear DTCs.
5. Start engine and warm it up to normal operating temperature, and then select Read DTC.
6. Start engine and warm it up, and then read DTC again. If DTC is detected, malfunction is current.
7. If DTC is not detected, malfunction is intermittent.

⚠ Caution

- When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	**Check pressure sensor 2 connector**

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the pressure sensor 2 connector.
(d) Disconnect the TCU B connector.
(e) Check connector for poor connection, poor contact, cracks or damage.

NG → **Reinstall or repair, replace connector**

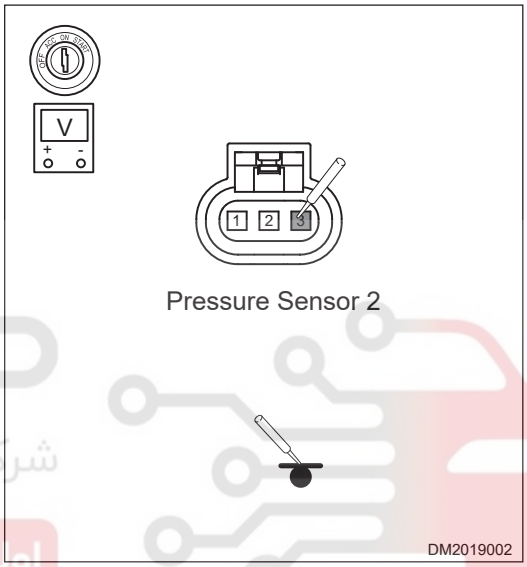
OK →

2	**Check pressure sensor 2 circuit**

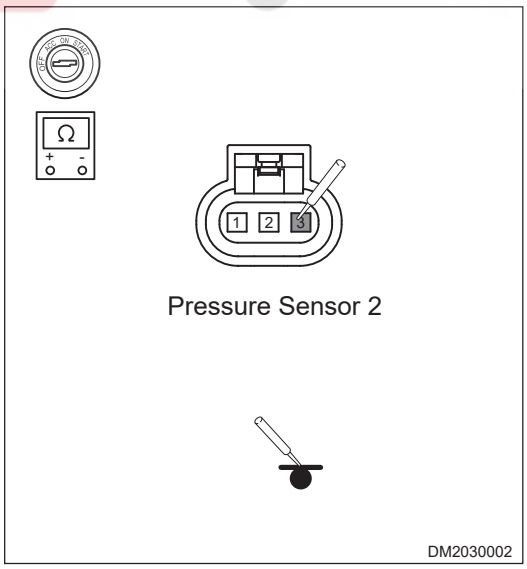
(a) Connect TCU B connector.

(b) Turn ENGINE START STOP switch to ON.

(c) Using voltage band of multimeter, measure if voltage between pressure sensor 2 connector power supply terminal (3) and body ground is normal (standard voltage should be about 5 V).



(d) Using ohm band of multimeter, measure resistance between pressure sensor 2 connector power supply terminal (3) and body ground to check power supply circuit for short to ground.



NG → **Replace or repair pressure sensor circuit**

OK →

3	Check pressure sensor 2

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Check sensor connection part for debris, ice, oil and damage.
(d) Replace pressure sensor with a new one to compare and verify.

NG → **Replace pressure sensor 2**

OK

4	Reconfirm DTCs

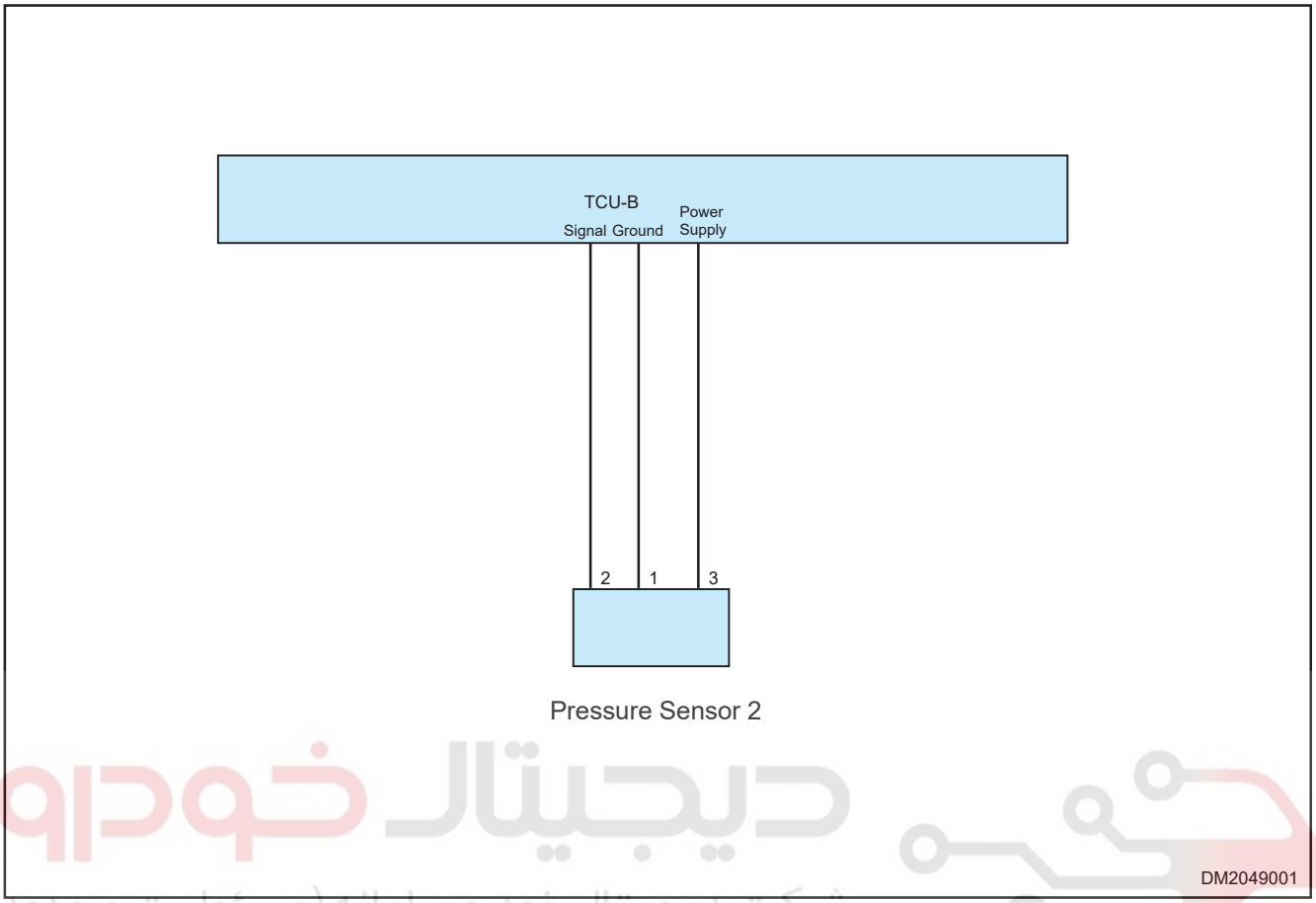
(a) Connect the negative battery cable.
(b) Turn ENGINE START STOP switch to ON.
(c) Using a diagnostic tester, read system DTC.
(d) Check if DTC still exists.

OK → **System operates normally**

NG → **Replace TCU control module assembly and perform self-learning**

DTC	P181211h	Voltage Level Monitoring Pressure Sensor 2: Signal Short to Ground
DTC	P181215h	Voltage Level Monitoring Pressure Sensor 2: Signal Short to Battery or Open Circuit
DTC	P18121Ch	Voltage Level Monitoring Pressure Sensor 2: Signal Out Of Range High
DTC	P18121Dh	Voltage Level Monitoring Pressure Sensor 2: Signal Out Of Range Low

Circuit Diagram



Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to OFF.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Turn ENGINE START STOP switch to ON.
4. Using a diagnostic tester, record and clear DTCs.
5. Start engine and warm it up to normal operating temperature, and then select Read DTC.
6. Start engine and warm it up, and then read DTC again. If DTC is detected, malfunction is current.
7. If DTC is not detected, malfunction is intermittent.

⚠ Caution
• When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	**Check pressure sensor 2 connector**

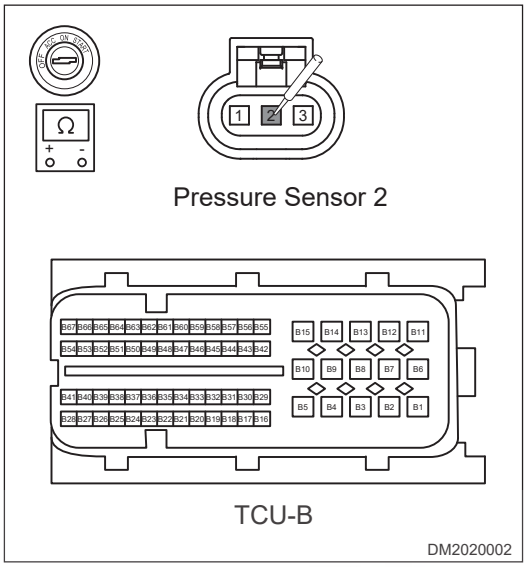
(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the pressure sensor 2 connector.
(d) Disconnect the TCU B connector.
(e) Check connector for poor connection, poor contact, cracks or damage.

NG	**Reinstall or repair, replace connector**

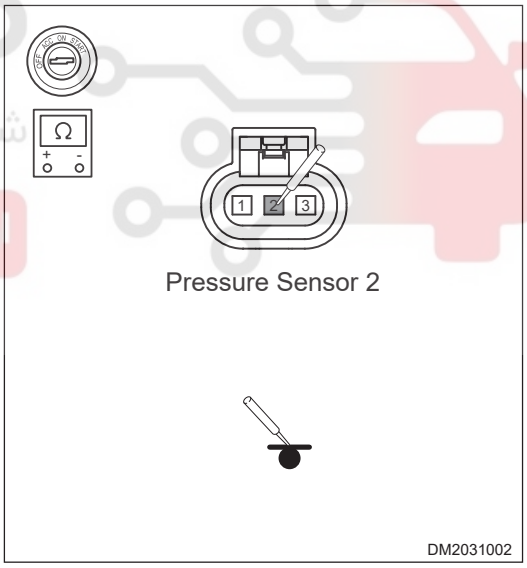
OK

2	Check pressure sensor 2 signal circuit

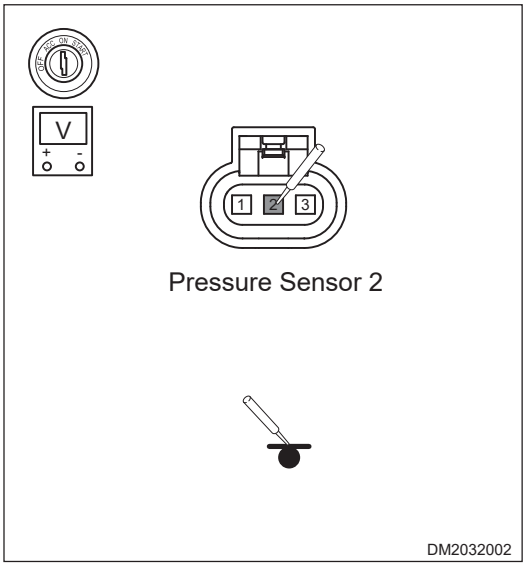
(a) Using ohm band of multimeter, measure resistance between pressure sensor 2 connector signal terminal (2) and TCU B (corresponding terminal) to check for open circuit.



(b) Using ohm band of multimeter, measure resistance between pressure sensor 2 connector signal terminal (2) and body ground to check circuit for short to ground.



(c) Using voltage band of multimeter, measure voltage between pressure sensor 2 connector signal terminal (2) and TCU B (corresponding terminal) to check circuit for short to power supply.



NG → **Replace wire harness or connector (- Pressure sensor 2 - TCU)**

OK →

3	**Check pressure sensor 2**

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Check sensor connection part for debris, ice, oil and damage.
(d) Replace pressure sensor with a new one to compare and verify.

NG → **Replace pressure sensor 2**

OK →

4	**Reconfirm DTCs**

(a) Connect the negative battery cable.
(b) Turn ENGINE START STOP switch to ON.
(c) Using a diagnostic tester, read system DTC.
(d) Check if DTC still exists.

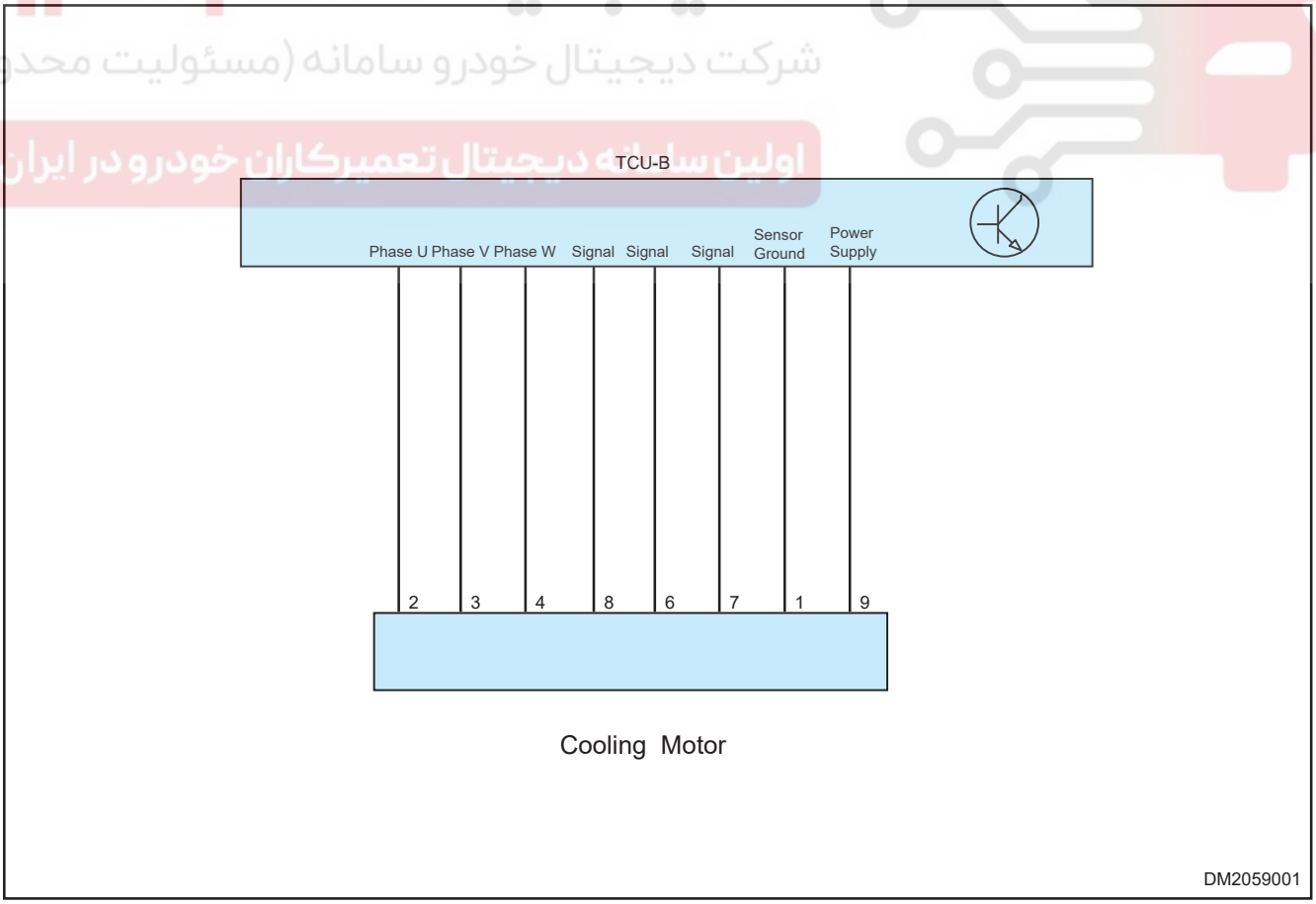
OK → **System operates normally**

NG → **Replace TCU control module assembly and perform self-learning**

DTC	**P180411h**	**Phases Monitoring Cooling Actuator: Short to Ground**
DTC	**P180412h**	**Phases Monitoring Cooling Actuator: Short to Bat**
DTC	**P180413h**	**Phases Monitoring Cooling Actuator: Open Circuit**

DTC	P1805F0h	Clutch Cooling Pump Motor Speed Check (too High)
DTC	P1805F1h	Clutch Cooling Pump Motor Speed Check (too Low)
DTC	P1805F2h	Clutch Cooling Pump Motor Speed Check (Unexpected Zero or Negative)
DTC	P18054Bh	Temperature Monitoring Cooling Actuator Powerstage (Overtemperature)
DTC	P180E11h	Voltage Level Monitoring Sensor Clutch Cooling Motor: Supply Voltage Short Circuit to Ground
DTC	P180E12h	Voltage Level Monitoring Sensor Clutch Cooling Motor: Supply Voltage Short Circuit to Battery
DTC	P180E1Ch	Voltage Level Monitoring Sensor Clutch Cooling Motor: Supply Voltage Out of Range High
DTC	P180E1Dh	Voltage Level Monitoring Sensor Clutch Cooling Motor: Supply Voltage Out of Range Low
DTC	P180415h	Phases Monitoring Cooling Actuator: Short to Battery or Open Circuit
DTC	P180492h	Phases Monitoring Cooling Actuator: Performance or Incorrect Operation

Circuit Diagram



Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to OFF.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Turn ENGINE START STOP switch to ON.
4. Using a diagnostic tester, record and clear DTCs.
5. Start engine and warm it up to normal operating temperature, and then select Read DTC.
6. Start engine and warm it up, and then read DTC again. If DTC is detected, malfunction is current.
7. If DTC is not detected, malfunction is intermittent.

⚠ Caution

- When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	**Check cooling motor connector**

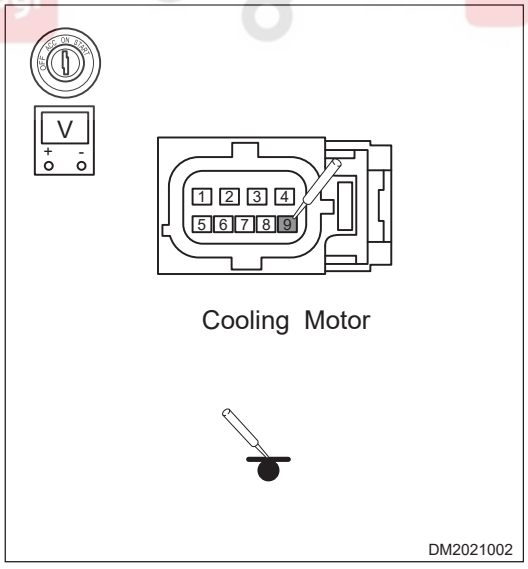
(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the cooling motor connector.
(d) Disconnect the TCU B connector.
(e) Check connector for poor connection, poor contact, cracks or damage.

NG → **Repair or replace wire harness or connector**

OK →

2	**Check cooling motor power supply voltage**

(a) Connect TCU B connector.
(b) Turn ENGINE START STOP switch to ON.
(c) Using voltage band of multimeter, measure voltage between cooling motor connector terminal (9) and body ground, and voltage should be 5 V.

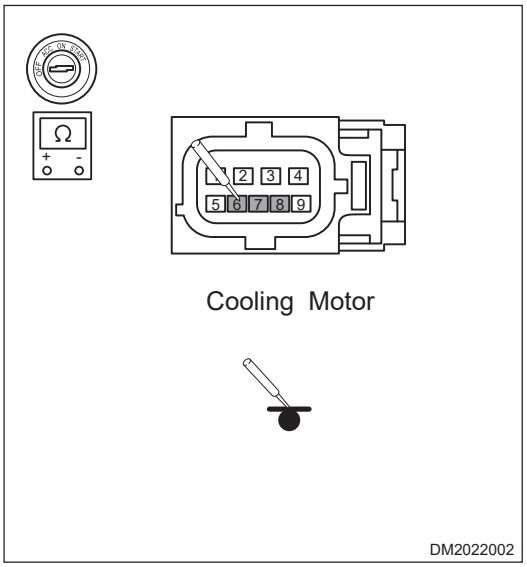


NG → **Repair or replace power supply circuit between cooling motor and TCU**

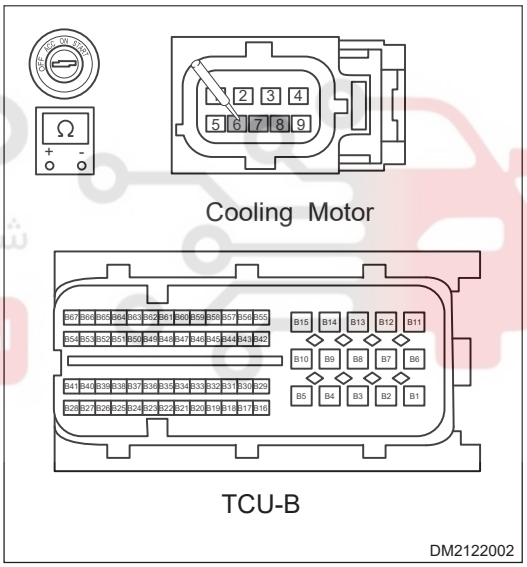
OK →

3	Check cooling motor signal circuit

(a) Using ohm band of multimeter, measure resistance between terminals (6, 7, 8) of cooling motor connector and body ground to check circuit for short to ground.



(b) Using ohm band of multimeter, measure resistance between terminals (6, 7, 8) of cooling motor connector and TCU B (corresponding terminal) to check for open circuit.



NG → **Repair or replace wire harness or connector (Cooling motor - TCU)**

OK

4	Check cooling motor

(a) Check the cooling motor.

NG → **Replace cooling motor**

OK

5	Reconfirm DTCs

(a) Connect the negative battery cable.
(b) Use diagnostic tester to clear DTC.
(c) Start the engine.
(d) Check if the same DTCs are output.

OK	System operates normally
NG	Replace TCU control module assembly and perform self-learning

DTC	U041686h	Speed Monitoring (CAN) Wheel Speed FL Invalid
DTC	U041686h	Speed Monitoring (CAN) Wheel Speed FR Invalid
DTC	U041686h	Speed Monitoring (CAN) Wheel Speed RL Invalid
DTC	U041686h	Speed Monitoring (CAN) Wheel Speed RR Invalid
DTC	U040186h	Brake Pedal (CAN) Signal Invalid
DTC	U040186h	Engine Idling (CAN) Signal Invalid
DTC	U041786h	Hand Brake (CAN) Signal Invalid
DTC	U040186h	Accelerator Pedal (CAN) Signal Invalid
DTC	U042386h	Environment Temperature (CAN) Signal Invalid
DTC	U040186h	Driver Torque Request (CAN) Signal Invalid
DTC	U040186h	Engine Min. Torque (CAN) Signal Invalid
DTC	U040186h	Engine Max. Torque (CAN) Signal Invalid
DTC	U040186h	Engine Temperature (CAN) Signal Invalid

Confirmation Procedure
Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to OFF.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Turn ENGINE START STOP switch to ON.
4. Using a diagnostic tester, record and clear DTCs.
5. Start engine and warm it up to normal operating temperature, and then select Read DTC.
6. Start engine and warm it up, and then read DTC again. If DTC is detected, malfunction is current.
7. If DTC is not detected, malfunction is intermittent.

⚠ Caution
• When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	Read DTCs

(a) Connect the DTC decoding tester.
(b) Read all DTCs.

DTC occurs → **Check the fault causes indicated by DTCs and repair faulty area.**

No DTC

2	Check TCU ground point

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Check TCU ground point

NG → **Repair or replace ground wire harness or ground point**

OK

3	Check TCU wire harness connector

(a) Disconnect the TCU wire harness connector.
(b) Check the TCU wire harness connector.

NG → **Repair or replace connector**

OK

4	Reconfirm DTCs

(a) Connect the negative battery cable.
(b) Use diagnostic tester to clear DTC.
(c) Start the engine.
(d) Check if the same DTCs are output.

OK → **If system operates normally, replace TCU and perform self-learning**

NG → **If DTC still exists, replace transmission and perform self-learning**

DTC	**P181311h**	**Voltage Level Monitoring Oil Temperature Sensor: Supply Voltage Short To Ground**
DTC	**P181312h**	**Voltage Level Monitoring Oil Temperature Sensor: Supply Voltage Short To Battery**
DTC	**P181317h**	**Voltage Level Monitoring Oil Temperature Sensor: Supply Voltage Out Of Range High**
DTC	**P181316h**	**Voltage Level Monitoring Oil Temperature Sensor: Supply Voltage Out Of Range Low**

Confirmation Procedure
Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to OFF.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Turn ENGINE START STOP switch to ON.
4. Using a diagnostic tester, record and clear DTCs.
5. Start engine and warm it up to normal operating temperature, and then select Read DTC.
6. Start engine and warm it up, and then read DTC again. If DTC is detected, malfunction is current.
7. If DTC is not detected, malfunction is intermittent.

⚠ Caution

- When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	**Power off to confirm the fault**

(a) After the vehicle is stopped, the engine is stopped, and the ignition switch is turned off for 10 minutes, disconnect the battery power supply, then power on again and continue to depress brake pedal for 15 seconds. Read DTCs using diagnostic tester to see if the fault still exists.

Not exist → **System is normal and there is no DTC**

Exist

2	**Check oil temperature sensor**

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Replace oil temperature sensor to compare and verify.

OK → **Replace oil temperature sensor**

NG

3	**Reconfirm DTCs**

(a) Connect the negative battery cable.
(b) Turn ENGINE START STOP switch to ON.
(c) Using a diagnostic tester, read DTC.
(d) Check if DTC still exists.

OK → **System operates normally**

NG → **Replace TCU control module assembly and perform self-learning**

DTC	**P181516h**	**TCU Internal PCB Temperature Sensor Level 1 Voltage Below Threshold**
DTC	**P181517h**	**TCU Internal PCB Temperature Sensor Level 1 Voltage Above Threshold**
DTC	**P181616h**	**TCU Internal PCB Temperature Sensor Level 2 Voltage Below Threshold**

DTC	P181617h	TCU Internal PCB Temperature Sensor Level 2 Voltage Above Threshold
DTC	P181716h	TCU Internal PCB Temperature Sensor Level 3 Voltage Below Threshold
DTC	P181717h	TCU Internal PCB Temperature Sensor Level 3 Voltage Above Threshold

Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to OFF.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Turn ENGINE START STOP switch to ON.
4. Using a diagnostic tester, record and clear DTCs.
5. Start engine and warm it up to normal operating temperature, and then select Read DTC.
6. Start engine and warm it up, and then read DTC again. If DTC is detected, malfunction is current.
7. If DTC is not detected, malfunction is intermittent.

⚠ Caution

- When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	**Power off to confirm the fault**

(a) After the vehicle is stopped, the engine is stopped, and the ignition switch is turned off for 10 minutes, disconnect the battery power supply, then power on again and continue to depress brake pedal for 15 seconds. Read DTCs using diagnostic tester to see if the fault still exists.

Not exist → **System is normal and there is no DTC**

Exist

2	**Reconfirm DTCs**

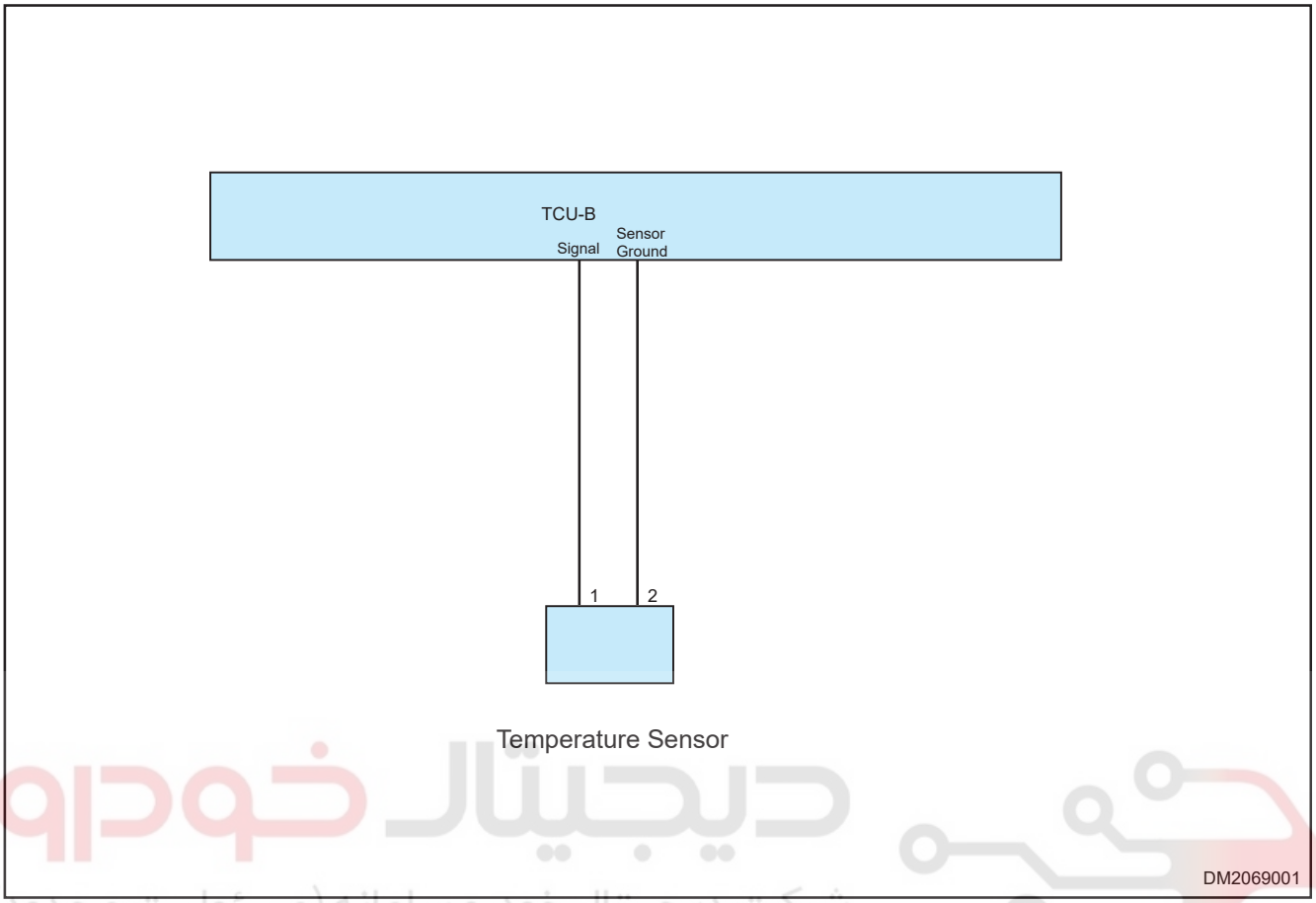
(a) Connect the negative battery cable.
(b) Turn ENGINE START STOP switch to ON.
(c) Using a diagnostic tester, read DTC.
(d) Check if DTC still exists.

OK → **System operates normally**

NG → **Replace TCU control module assembly and perform self-learning**

DTC	P181415h	Voltage Level Monitoring Oil Temperature Sensor: Signal Short-to-Battery or Open Load
DTC	P181411h	Voltage Level Monitoring Oil Temperature Sensor: Signal Short-to-GND

Circuit Diagram



Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to OFF.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Turn ENGINE START STOP switch to ON.
4. Using a diagnostic tester, record and clear DTCs.
5. Start engine and warm it up to normal operating temperature, and then select Read DTC.
6. Start engine and warm it up, and then read DTC again. If DTC is detected, malfunction is current.
7. If DTC is not detected, malfunction is intermittent.

⚠ Caution
• When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	Check oil temperature sensor connector

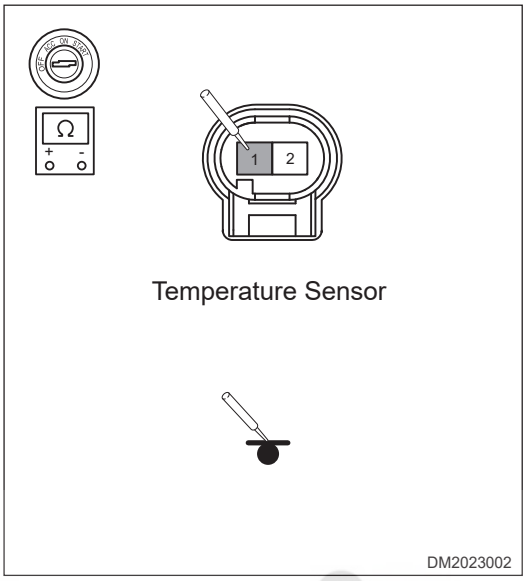
(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the oil temperature sensor connector.
(d) Disconnect the TCU B connector.
(e) Check connector for poor connection, poor contact, cracks or damage.

NG	Reinstall or repair, replace connector

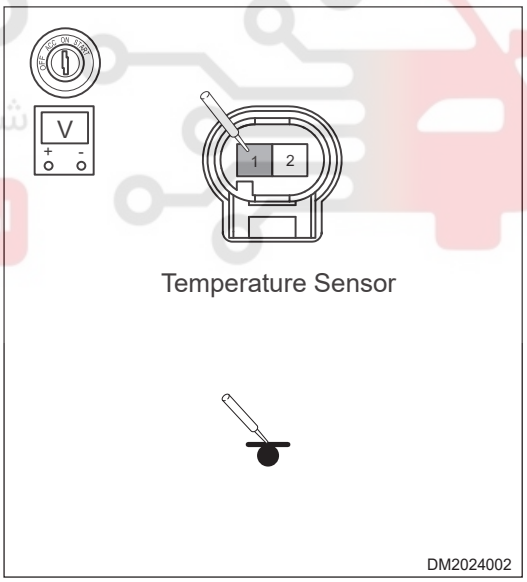
OK

2	Check oil temperature sensor signal circuit

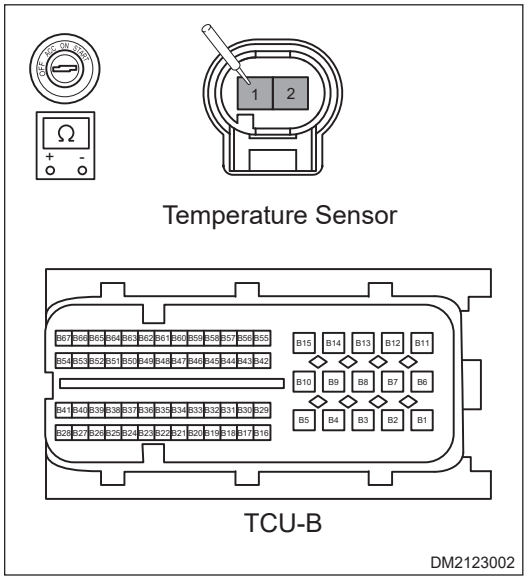
(a) Using ohm band of multimeter, measure resistance between oil temperature sensor connector terminal (1) and body ground to check circuit for short to ground.



(b) Using voltage band of multimeter, measure voltage between oil temperature sensor connector terminal (1) and body ground to check circuit for short to power supply.



(c) Using ohm band of multimeter, measure resistance between oil temperature sensor connector terminals (1, 2) and TCU B (corresponding terminal) to check for open circuit.



NG → **Replace wire harness or connector (Oil temperature sensor - TCU)**

OK →

3	**Check oil temperature sensor**

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Check oil temperature sensor connection part for debris, ice, oil and damage.

NG → **Replace oil temperature sensor**

OK →

4	**Reconfirm DTCs**

(a) Connect the negative battery cable.
(b) Turn ENGINE START STOP switch to ON.
(c) Using a diagnostic tester, read system DTC.
(d) Check if DTC still exists.

OK → **System operates normally**

NG → **Replace TCU control module assembly and perform self-learning**

DTC	**P181892h**	**Target Position Not Reached in a Defined Time, Changed Position to N or P**

Confirmation Procedure
Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to OFF.

2. Connect diagnostic tester (the latest software) to data link connector.
3. Turn ENGINE START STOP switch to ON.
4. Using a diagnostic tester, record and clear DTCs.
5. Start engine and warm it up to normal operating temperature, and then select Read DTC.
6. Start engine and warm it up, and then read DTC again. If DTC is detected, malfunction is current.
7. If DTC is not detected, malfunction is intermittent.

⚠ Caution

- When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	**Check the related wire harness connector**

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the shift module connector.
(d) Disconnect the TCU B connector.
(e) Check connector for poor connection, poor contact, cracks or damage.

NG → **Reinstall or repair, replace connector or wire harness**

OK ↓

2	**Check shift module**

(a) Replace shift module to compare and verify. Use diagnostic tester to check if a same DTC is output.

No → **Replace shift module**

Yes ↓

3	**Reconfirm DTCs**

(a) Connect the negative battery cable.
(b) Turn ENGINE START STOP switch to ON.
(c) Using a diagnostic tester, read system DTC.
(d) Check if DTC still exists.

OK → **System operates normally**

NG → **Replace TCU control module assembly and perform self-learning**

DTC	**U010000h**	**Engine Node 1 (EMS_1/2/3/4/5/7/9 Included) Lost**
DTC	**U040182h**	**Engine Node 1 (EMS_1/2/3/4/5/7/9 Included) alivecounter Authentication Fails**
DTC	**U040183h**	**Engine Node 1 (EMS_1/2/3/4/5/7/9 Included) CRC Authentication Fails**

DTC	U015100h	Brake System Node 1 (ACM_1/2 Included) Lost
DTC	U011400h	AWD_1 Lost
DTC	U014000h	BCM_1 Lost
DTC	U042282h	BCM_1 Alive Counter Authentication Fails
DTC	U042283h	BCM_1 CRC Authentication Fails
DTC	U012800h	EPB_1 Lost
DTC	U041782h	EPB_1 Alive Counter Authentication Fails
DTC	U041783h	EPB_1 CRC Authentication Fails
DTC	U012200h	ESC_2 Lost
DTC	U041682h	Brake System Node 5 (ESC_2/3/4/6/7 Included) Alive Counter Authentication Fails
DTC	U041683h	Brake System Node 5 (ESC_2/3/4/6/7 Included) CRC Authentication Fails
DTC	U015500h	Instrument Cluster Node 1 (IPC_3/5/7 Included) CAN Lost
DTC	U024800h	Instrument Cluster Node 2 (PEPS_4 Included) CAN Lost
DTC	U010300h	EGS_1 Lost
DTC	U040482h	EGS_1 Alive Counter Authentication Fails
DTC	U040483h	EGS_1 CRC Authentication Fails
DTC	U240500h	MFS_2 Lost
DTC	U240582h	MFS_2 Alive Counter Authentication Fails
DTC	U240583h	MFS_2 CRC Authentication Fails
DTC	U021200h	SCM_1 Lost

Confirmation Procedure

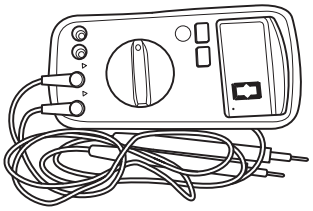
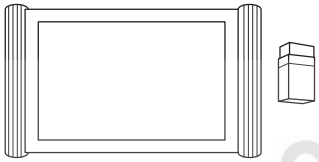
Confirm that battery voltage is not less than 12 V before performing following procedures.

1. Turn ENGINE START STOP switch to OFF.
2. Connect diagnostic tester (the latest software) to data link connector.
3. Turn ENGINE START STOP switch to ON.
4. Using a diagnostic tester, record and clear DTCs.
5. Start engine and warm it up to normal operating temperature, and then select Read DTC.
6. Start engine and warm it up, and then read DTC again. If DTC is detected, malfunction is current.
7. If DTC is not detected, malfunction is intermittent.

1	(Refer to CAN system)

On-vehicle Service

Tools

Tool Name	Tool Drawing
Digital Multimeter	 S00002
Diagnostic tester	 S00001

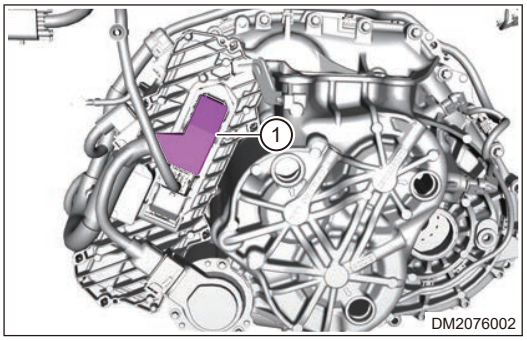
Replacement of Transmission Control Unit

Removal

⚠ Warning

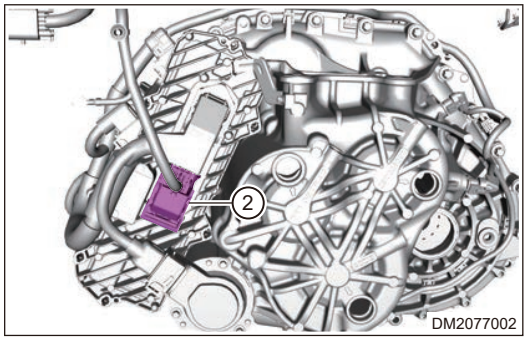
- During removal and installation of TCU, antistatic equipment should be worn to avoid damage to electronic components in TCU.

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

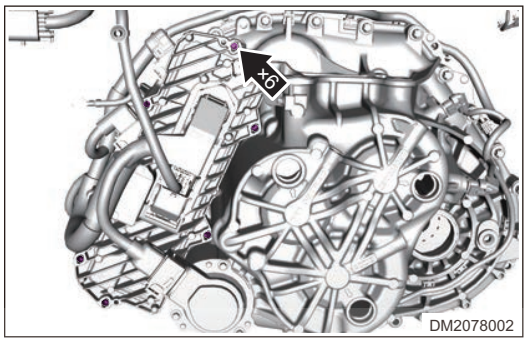


DM2076002

5. Disconnect the transmission control unit connector (2).



6. Remove 6 fixing bolts from transmission control unit.



7. Remove the transmission control unit.

Installation

⚠ Caution

- TCU bolts are pre-coated parts. Residual sealant should be cleaned from threaded hole of housing before assembly.
- TCU bolts are non-reusable parts, which must be replaced after each removal.
- If TCU is replaced with a new one, fresh correct TCU software with diagnostic tester.

1. Install the transmission control unit.
2. Install 6 fixing bolts to transmission control unit.

   Tightening torque: 8.5 - 9.5 N·m

3. Connect the transmission control unit connector (1).
4. Connect the transmission control unit connector (2).
5. Install the engine compartment lower protector assembly.
6. Connect the negative battery cable.
7. Connect diagnostic tester, read and clear DTCs.

TCU Transmission Replacement Self-Learning

1. The self-learning trigger conditions shall meet the followings: Vehicle is powered on; engine shuts down; shift lever is in P; brake pedal is depressed; vehicle is stationary; clutch is disengaged; battery voltage is sufficient (at least over 10 V).
2. When P position is lost, vehicle is powered off abnormally, transmission software (large software version span) updates, it is necessary to perform shift drum learning. Self-learning process: Generally speaking, after transmission software is written, keep vehicle in power ON status and depress brake pedal to complete the shift drum self-learning automatically. In addition, the self-learning process can also be completed by using transmission shift drum self-learning in diagnostic tester and depressing and holding brake pedal.

Transmission Self-Learning

If battery is disconnected immediately after ENGINE START STOP switch is switched to OFF mode, the gear may be lost after connecting the battery. At this time, it is necessary to perform self-learning of shift drum and clutch position until the vehicle can run normally.

Transmission self-learning operation steps:

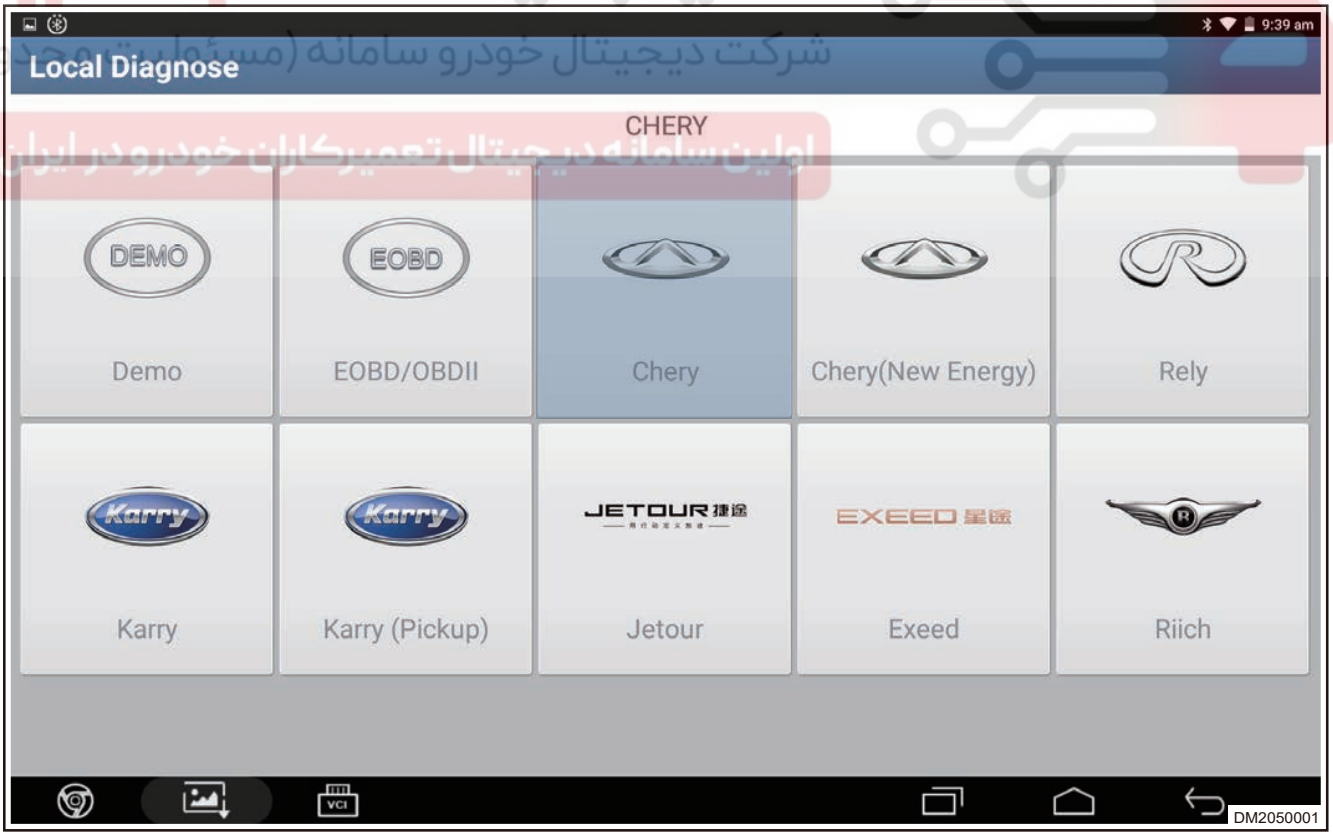
1. Connect battery, and turn ENGINE START STOP switch to ON mode.
2. Press the brake pedal firmly and keep it for more than 30 seconds until the instrument cluster shows the P gear. At this time, the transmission will complete the self-learning operation.
3. If P gear is not displayed, disconnect the negative battery cable, repeat operation steps 1 and 2 until the instrument cluster shows the P gear.

If it still cannot drive normally after carrying out above operations continuously, it is necessary to confirm if the vehicle self-learning meets the following conditions:

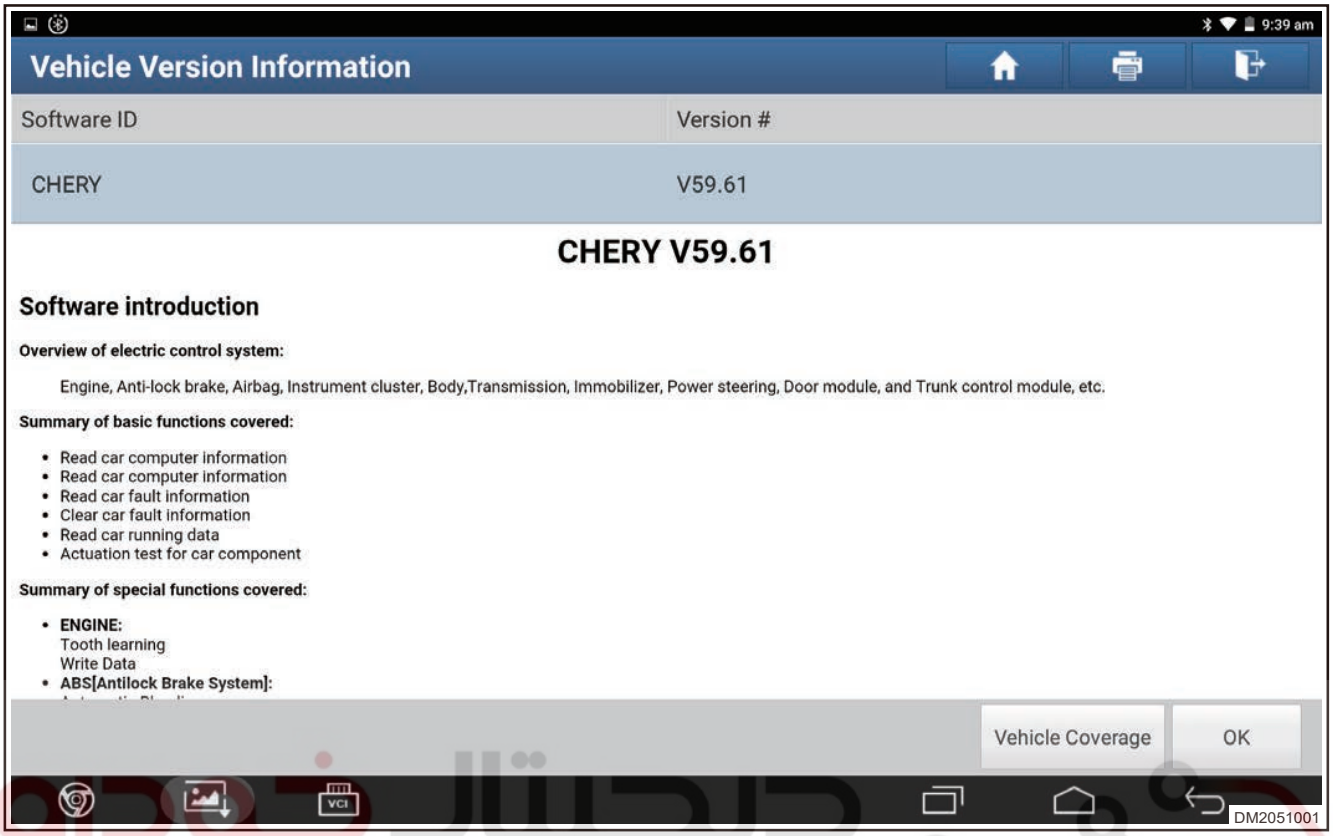
1. Battery voltage is higher than 10 V;
2. Four wheel speed sensors are normal without any fault;
3. Brakes pedal is normal without any fault;
4. Transmission power supply is normal, transmission wire harness and sensor and actuator are connected properly.

Writing VIN Code

1. Connect diagnostic tester, turn ENGINE START STOP switch to ON.
2. Select “CHERY”.

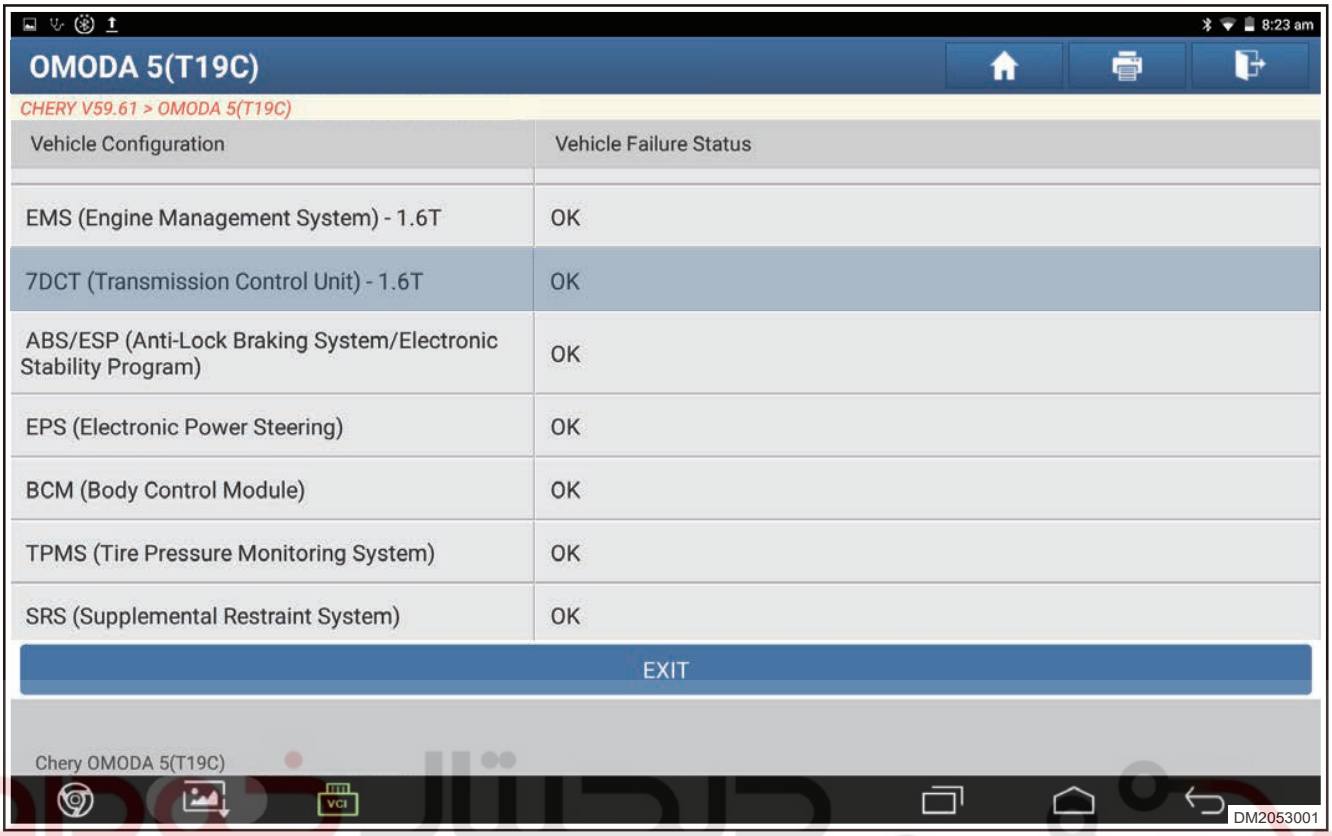


3. Select “Version Information”.

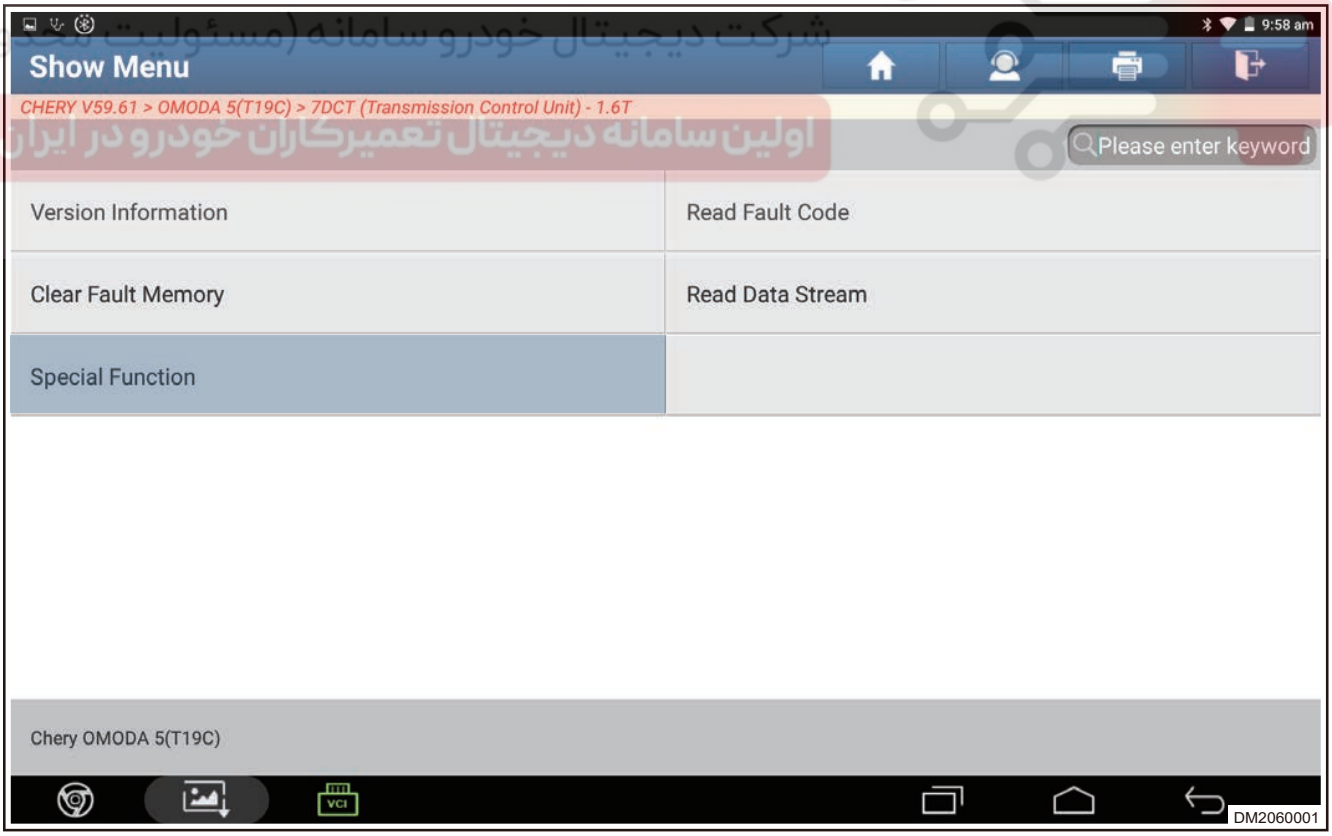


4. Select “OMODA 5 (T19C)” model.

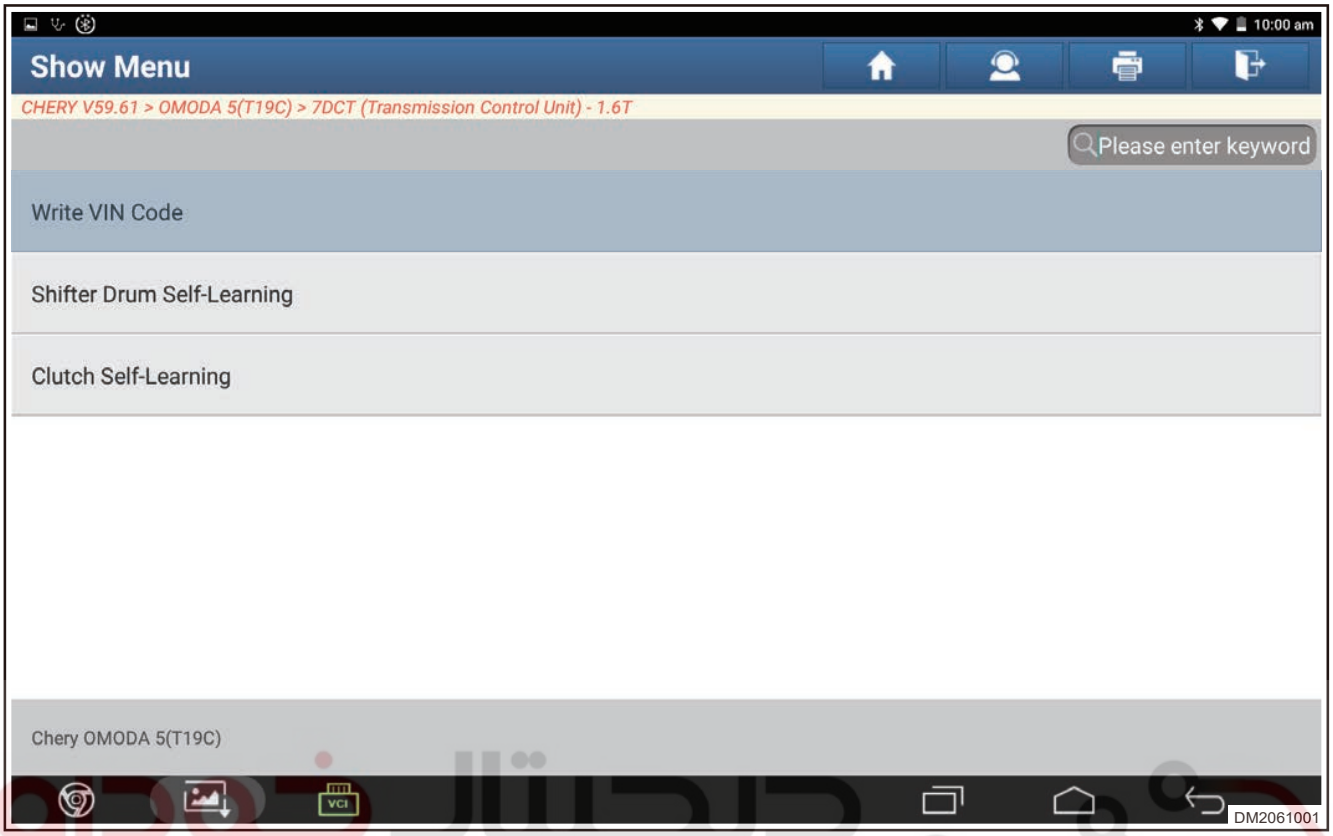
5. Enter next screen and click “7DCT (Transmission Control Unit) - 1.6T”.



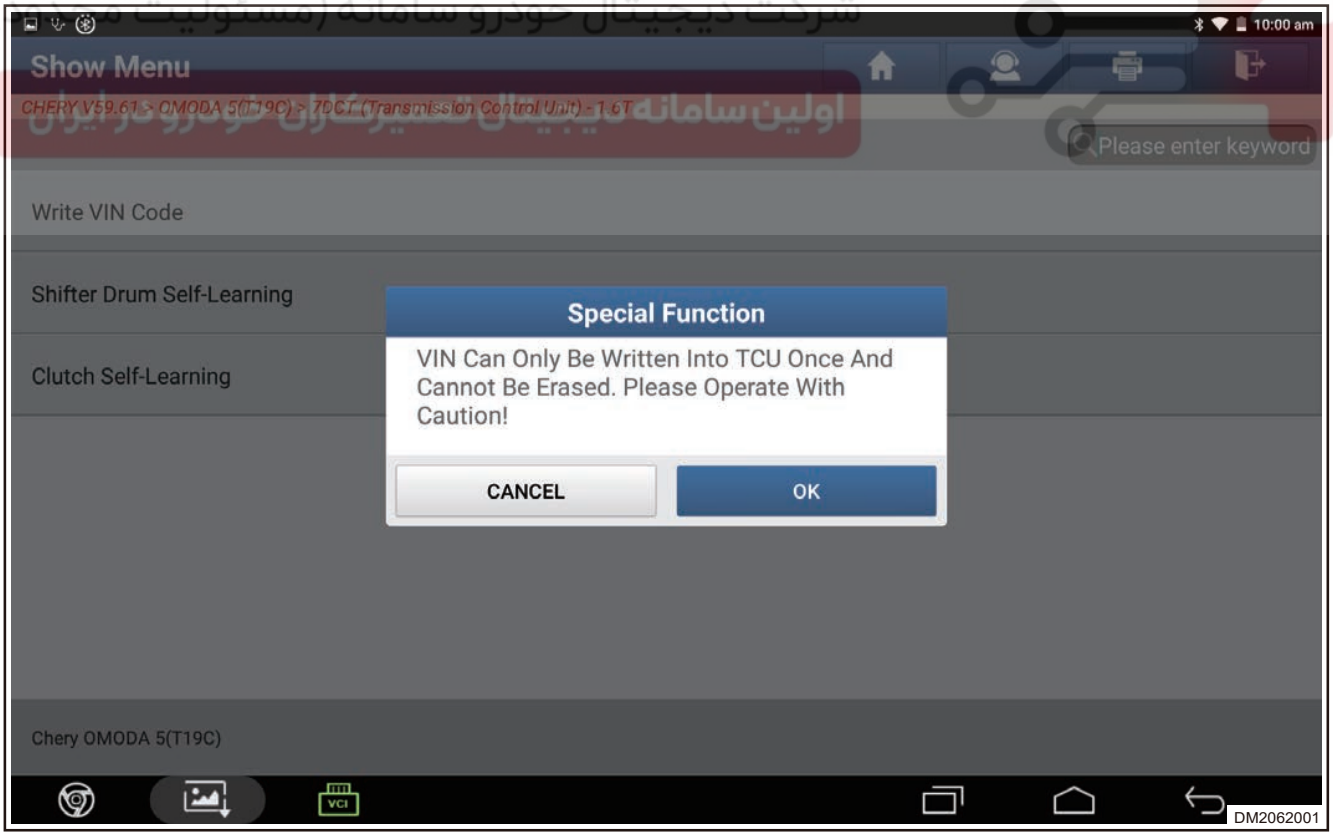
6. Enter next screen and click “Special Function”.



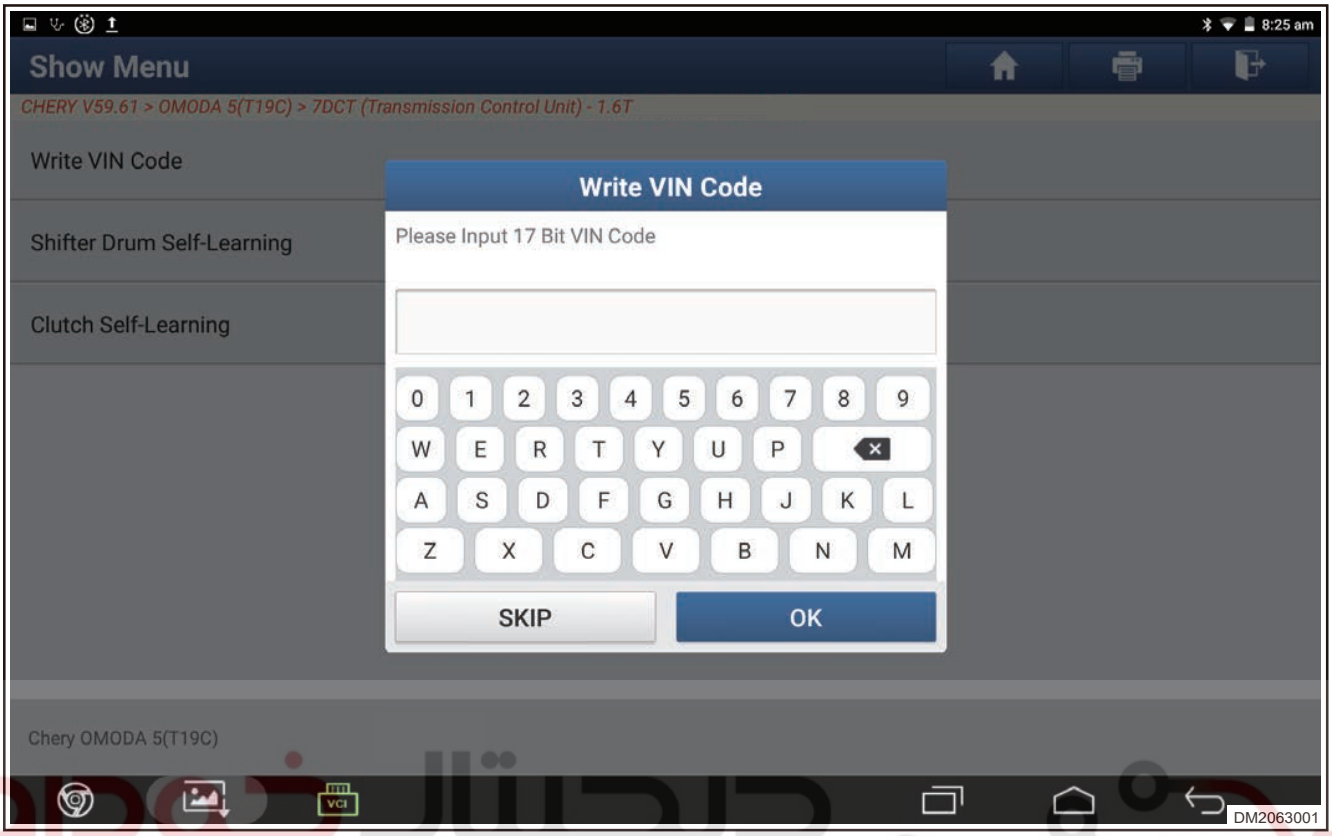
7. Enter next screen and click “Write VIN Code”.



8. Note that “VIN Can Only Be Written Into TCU Once And Cannot Be Erased. Please Operate With Caution!”.

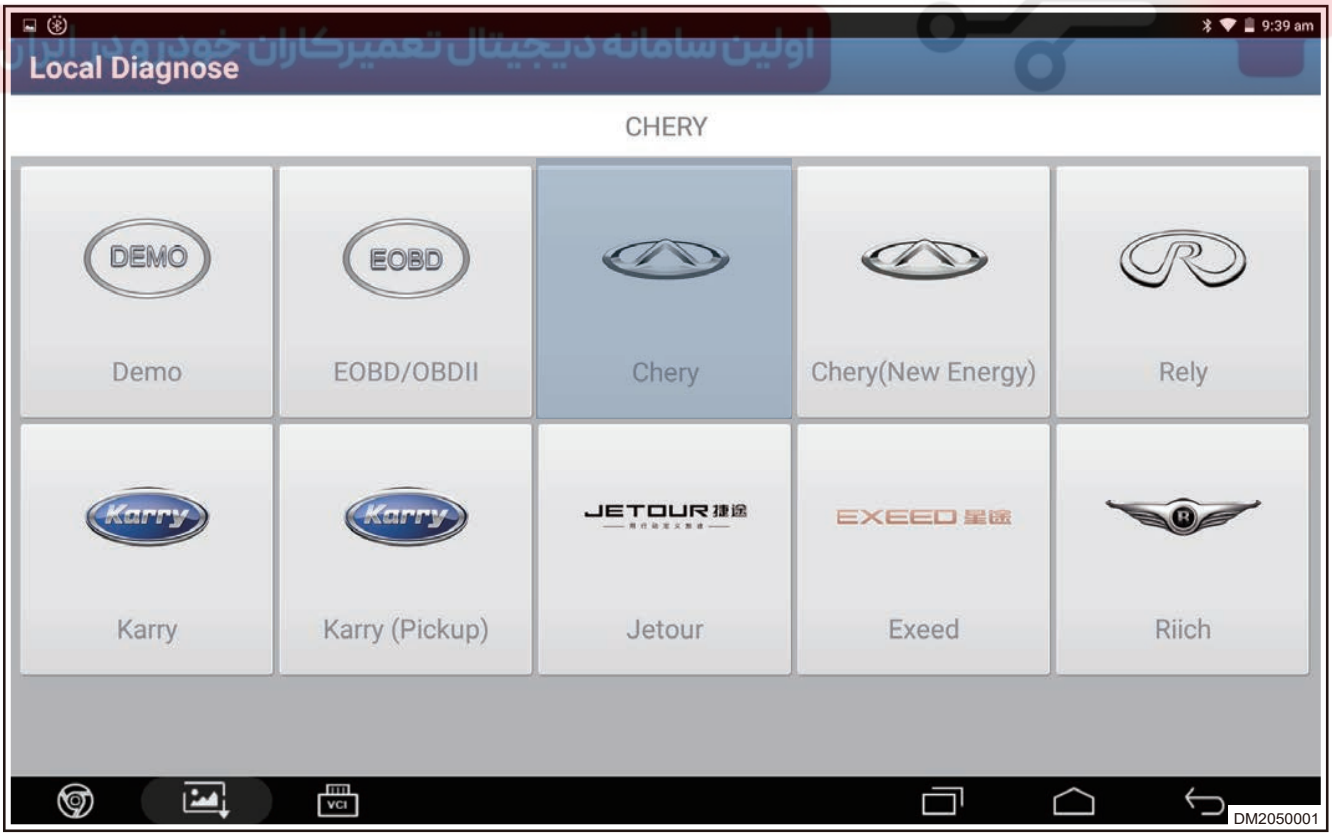


9. Input a 17-digit VIN code.

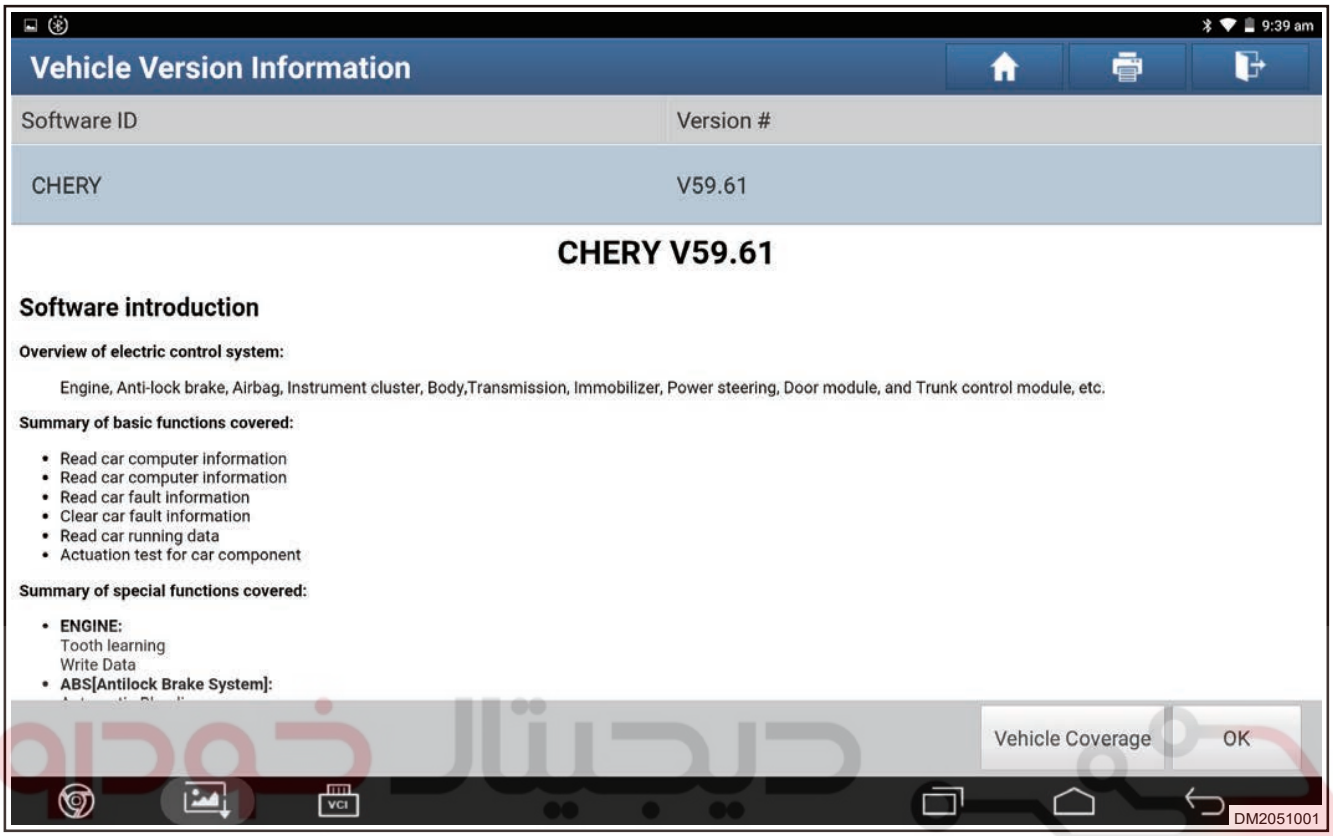


Shifter Drum Self-learning

1. Connect diagnostic tester, turn ENGINE START STOP switch to ON.
2. Select “CHERY”.

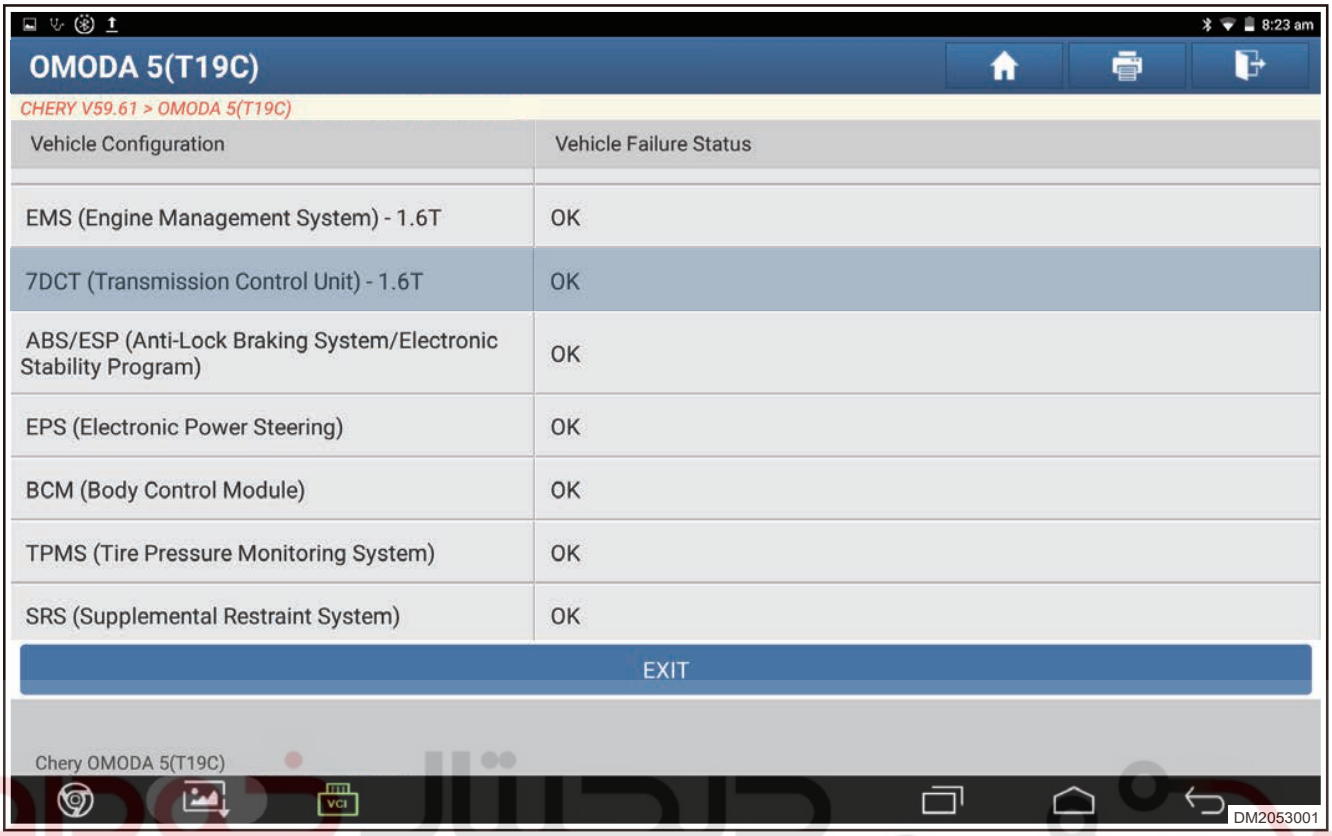


3. Select “Version Information”.

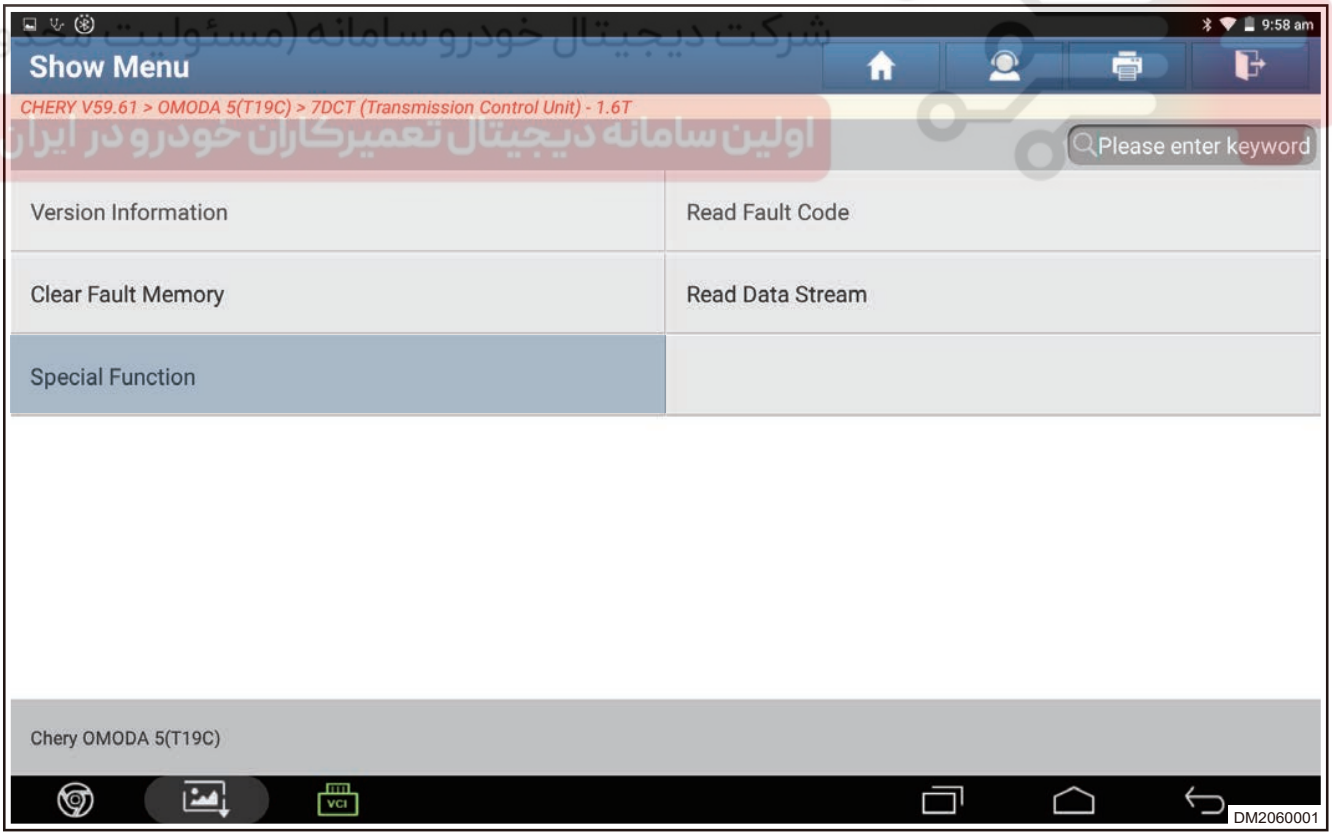


4. Select “OMODA 5 (T19C)” model.

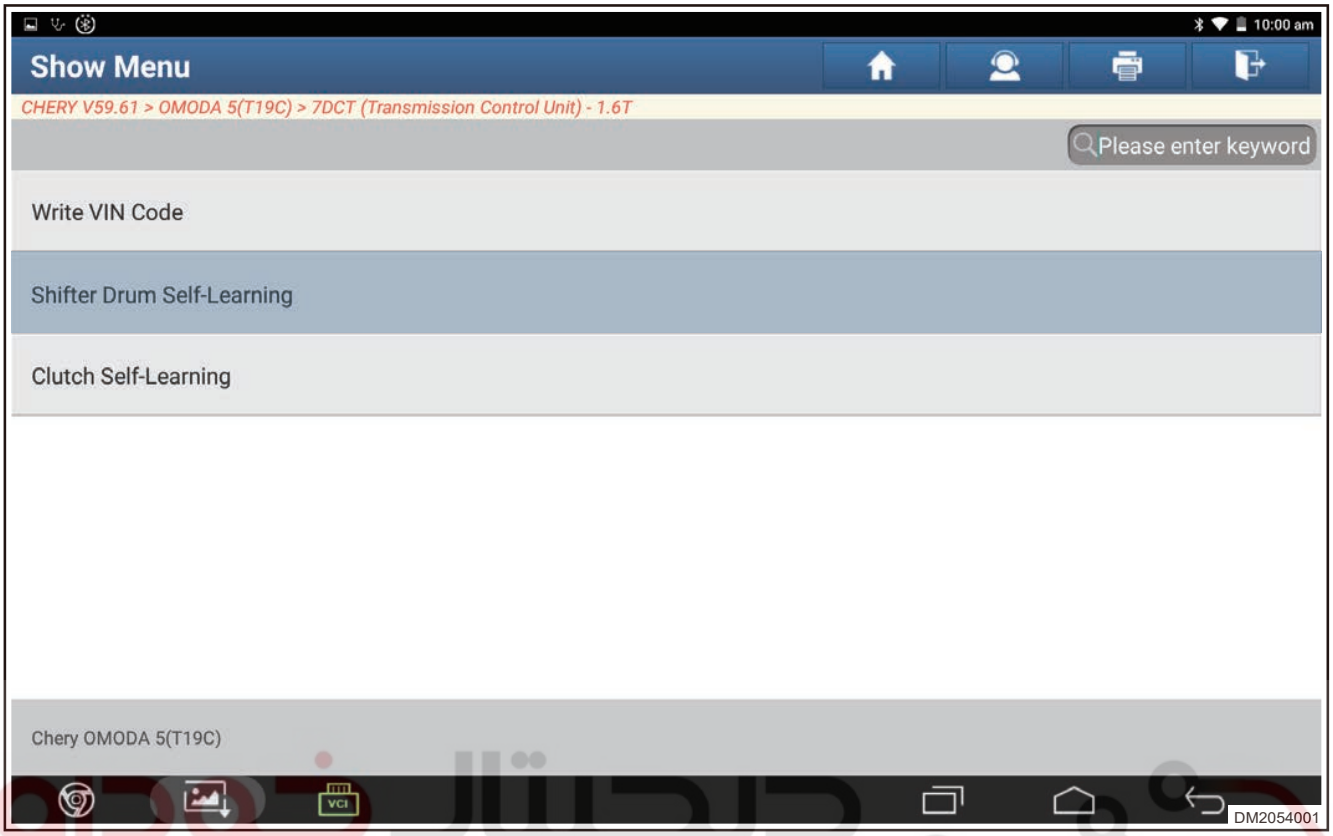
5. Enter next screen and click “7DCT (Transmission Control Unit) - 1.6T”.



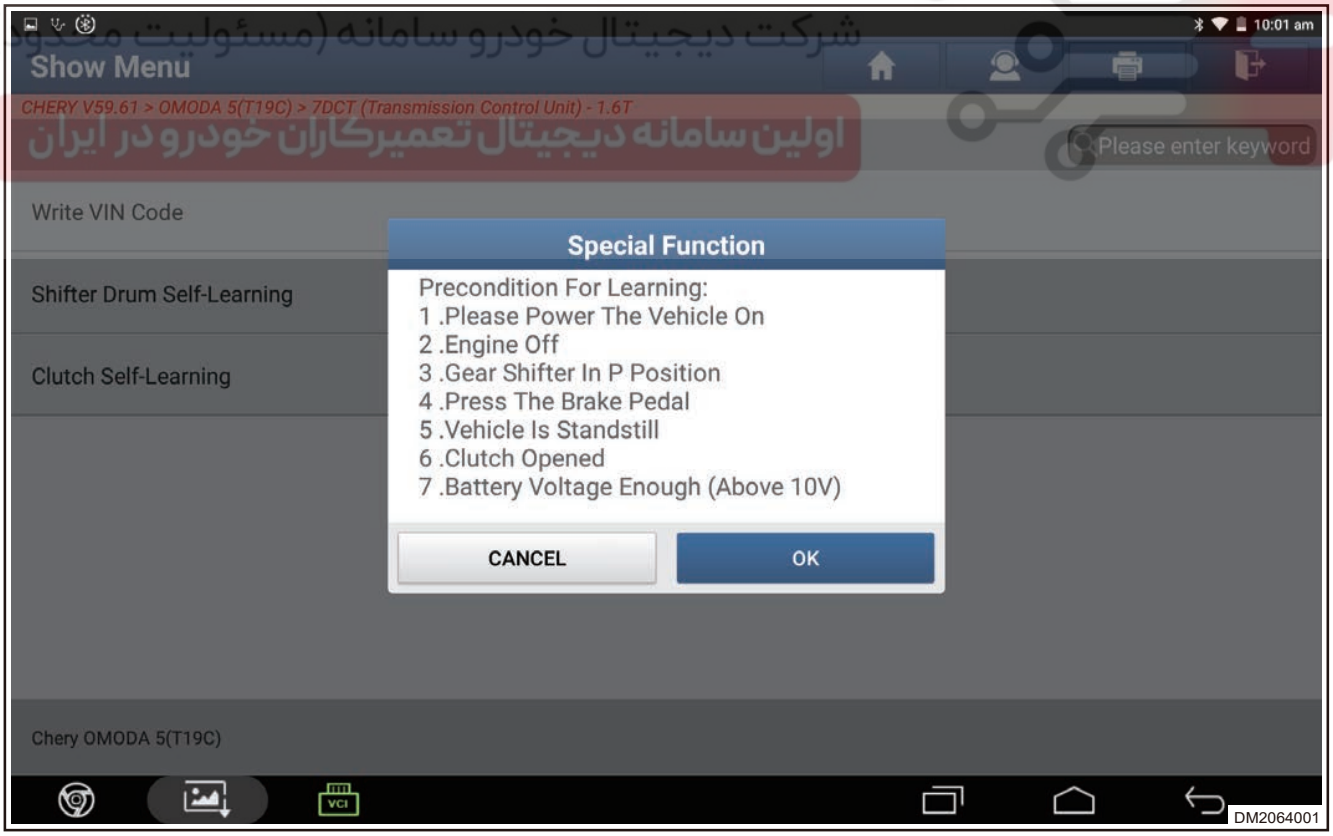
6. Enter next screen and click “Special Function”.



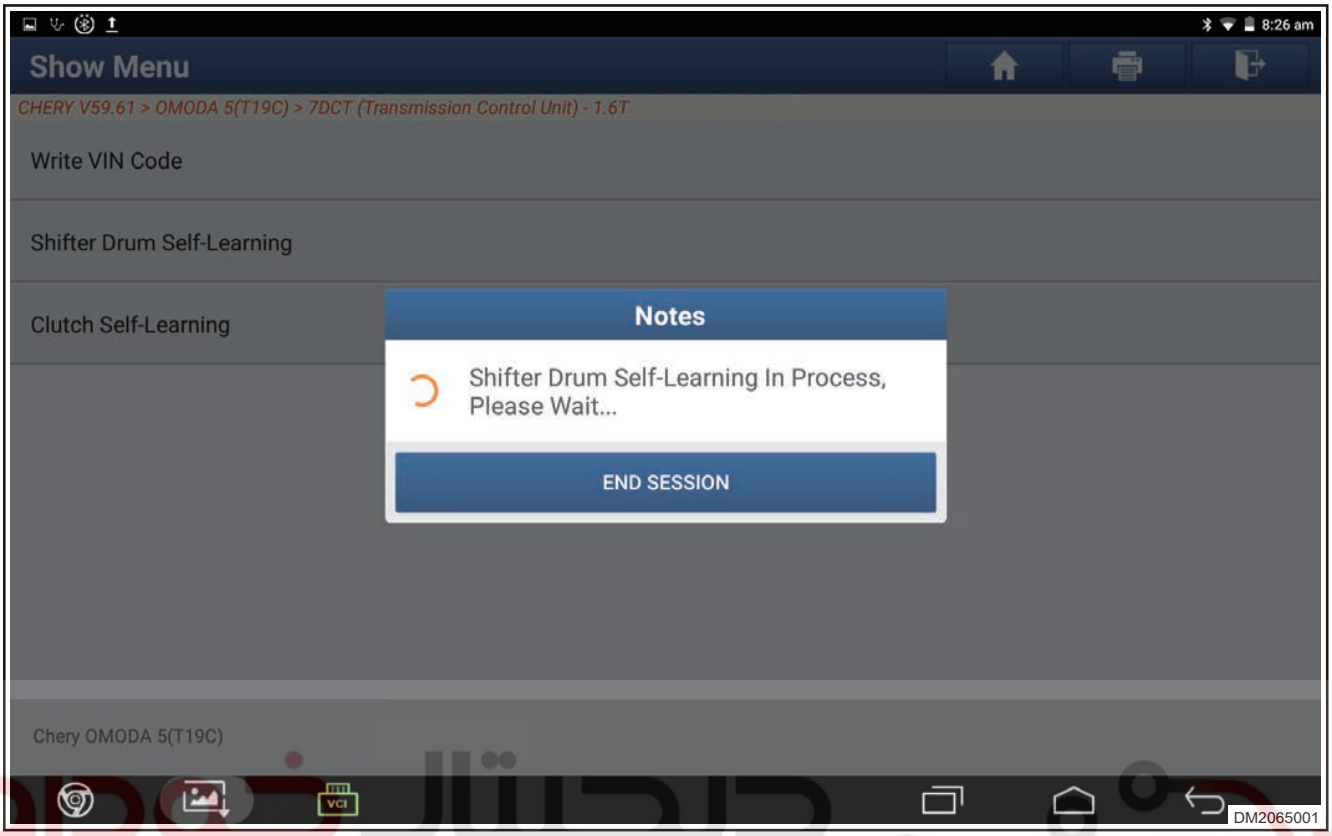
7. Enter next screen and click “Shifter Drum Self-learning”.



8. Conditions of learning.

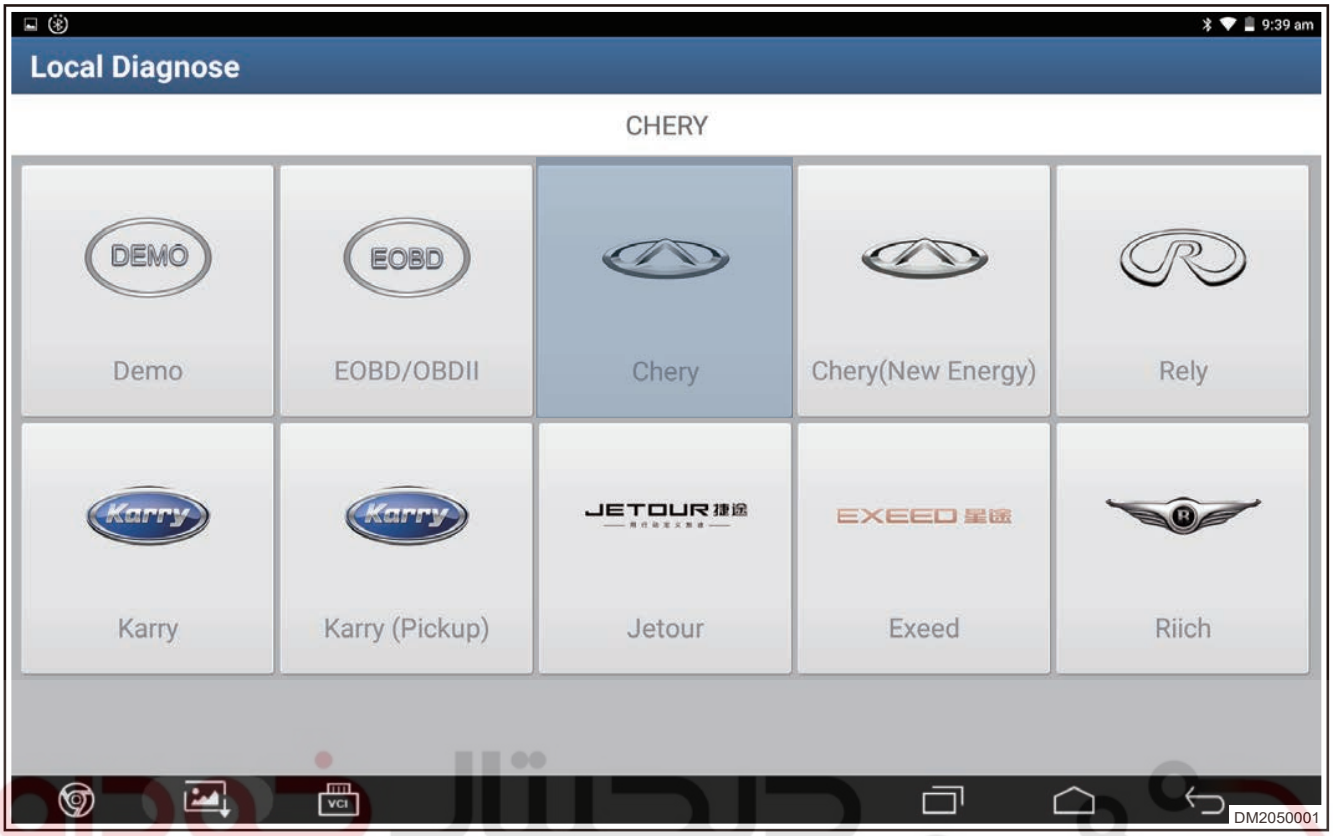


9. Click “OK” to perform shifter drum self-learning.

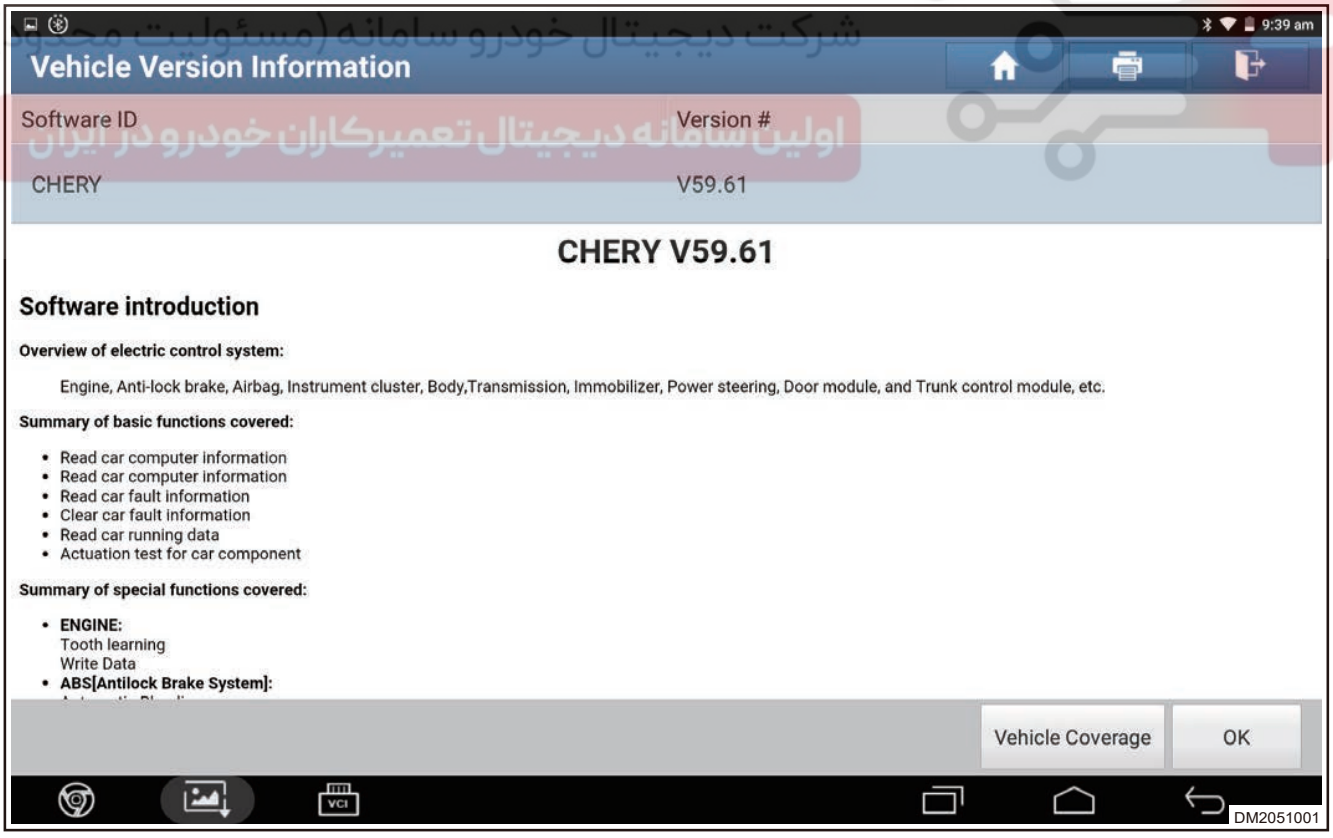


Clutch Self-learning 1

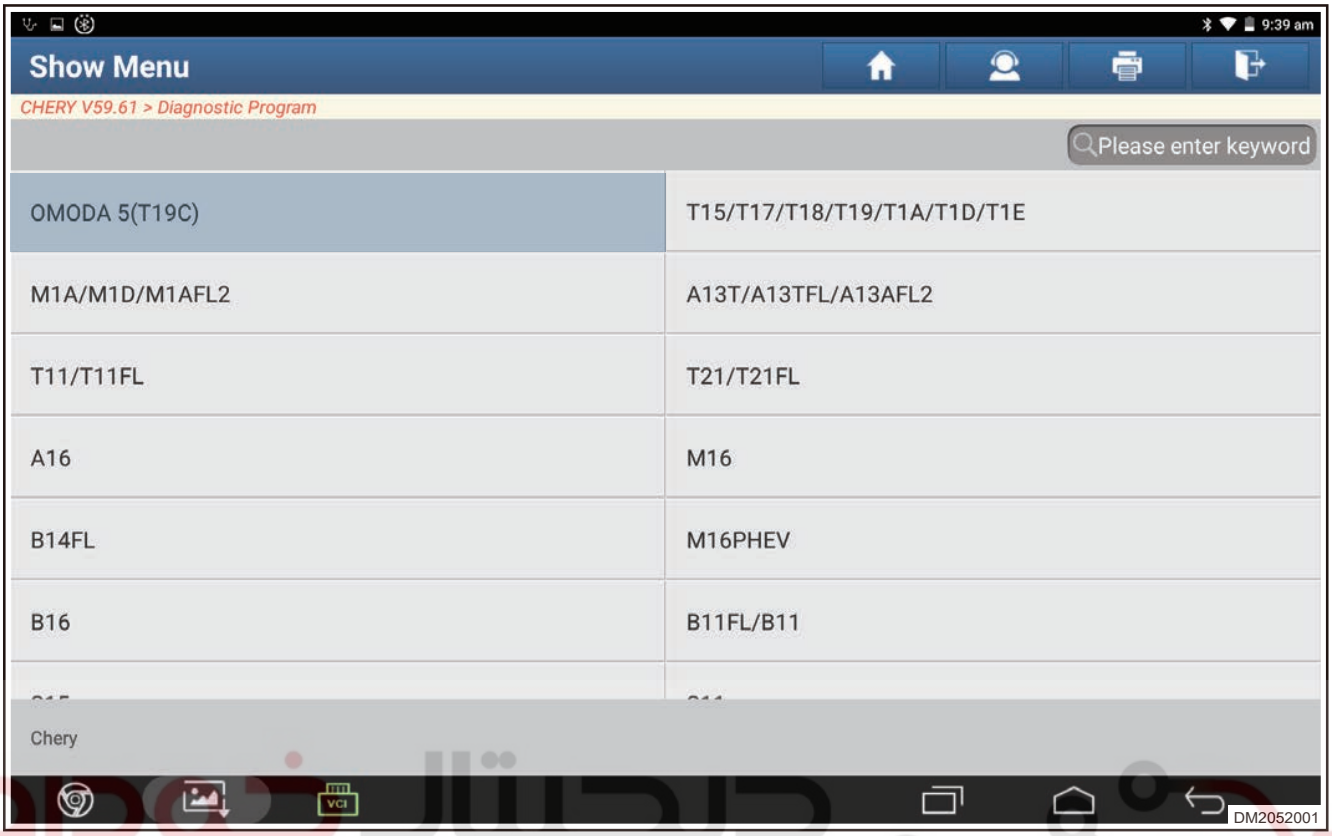
1. Connect diagnostic tester, turn ENGINE START STOP switch to ON.
2. Select “CHERY”.



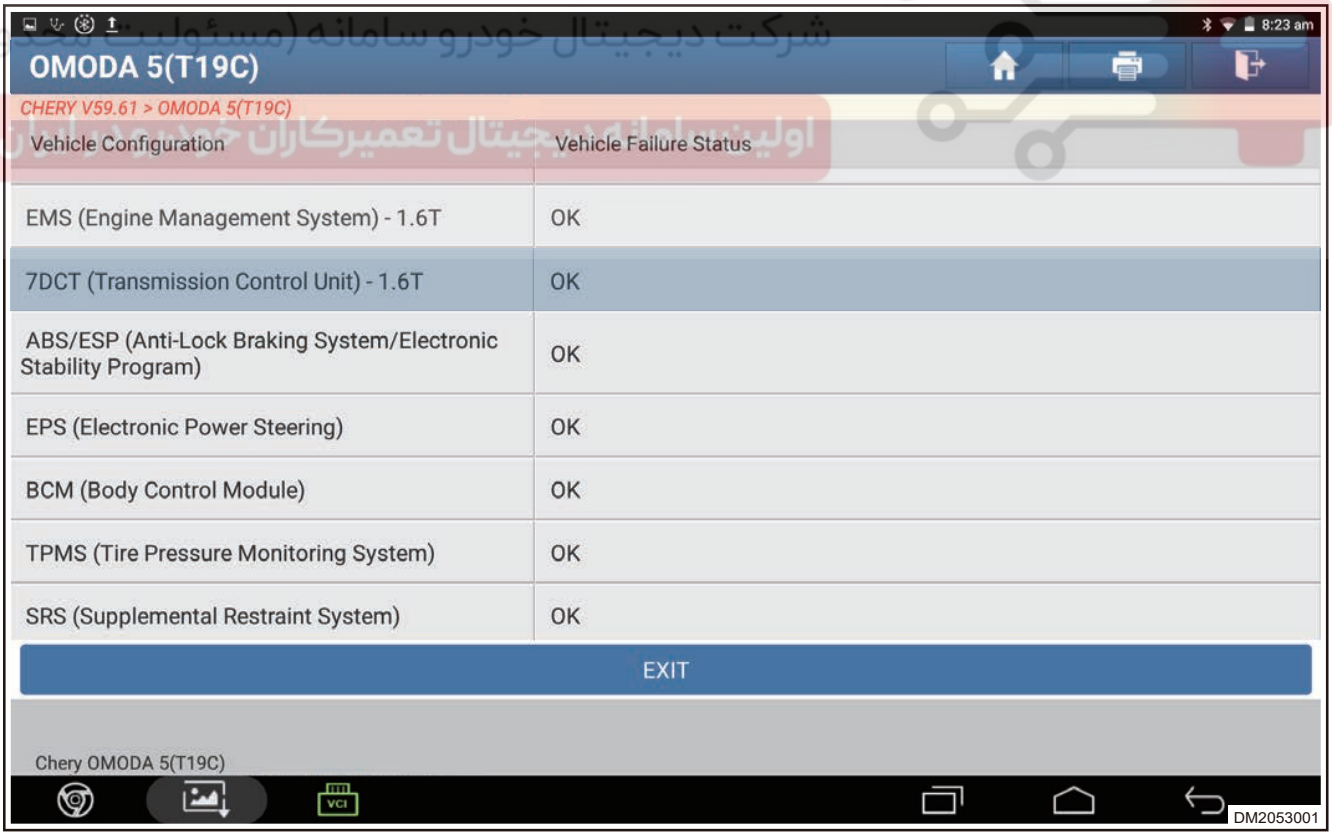
3. Select “Version Information”.



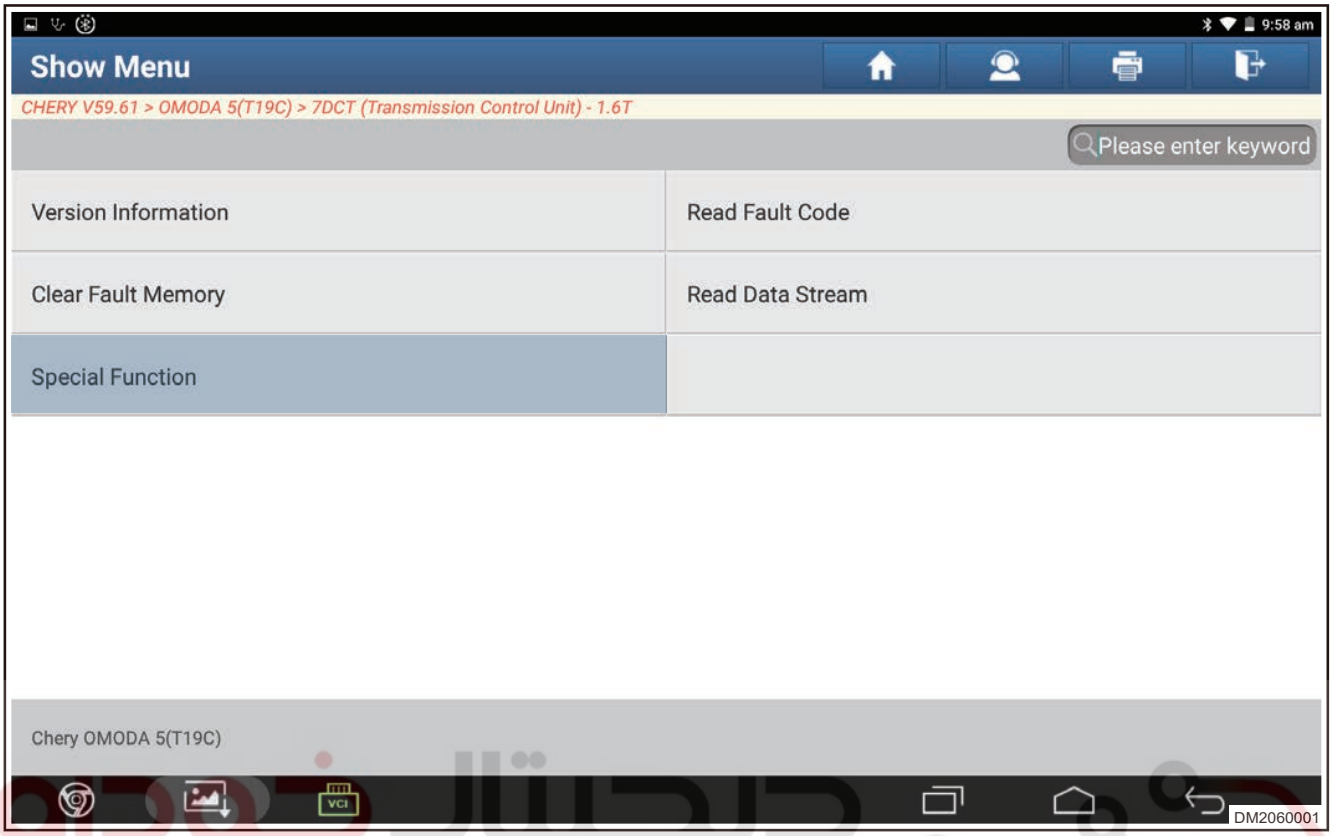
4. Select “OMODA 5 (T19C)” model.



5. Enter next screen and click “7DCT (Transmission Control Unit) - 1.6T”.

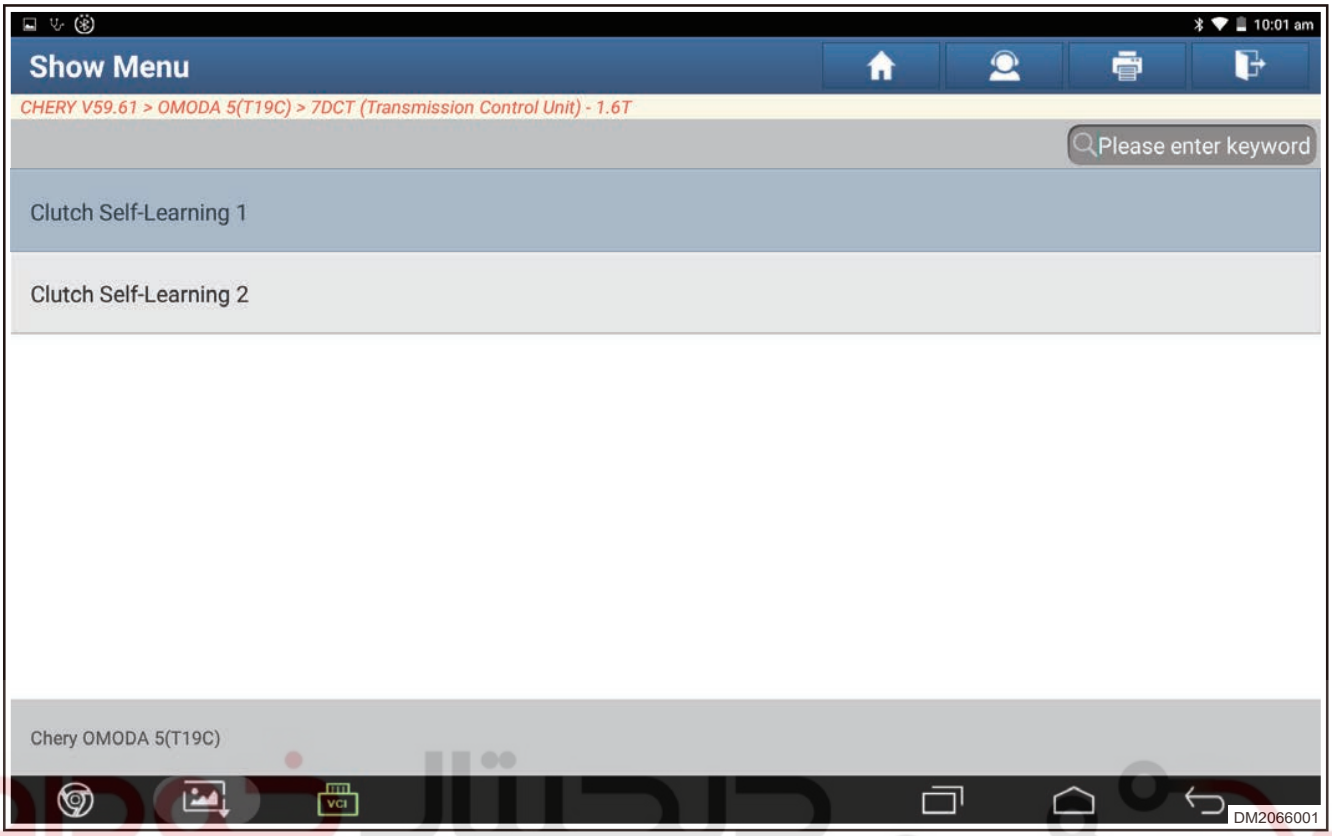


6. Enter next screen and click “Special Function”.



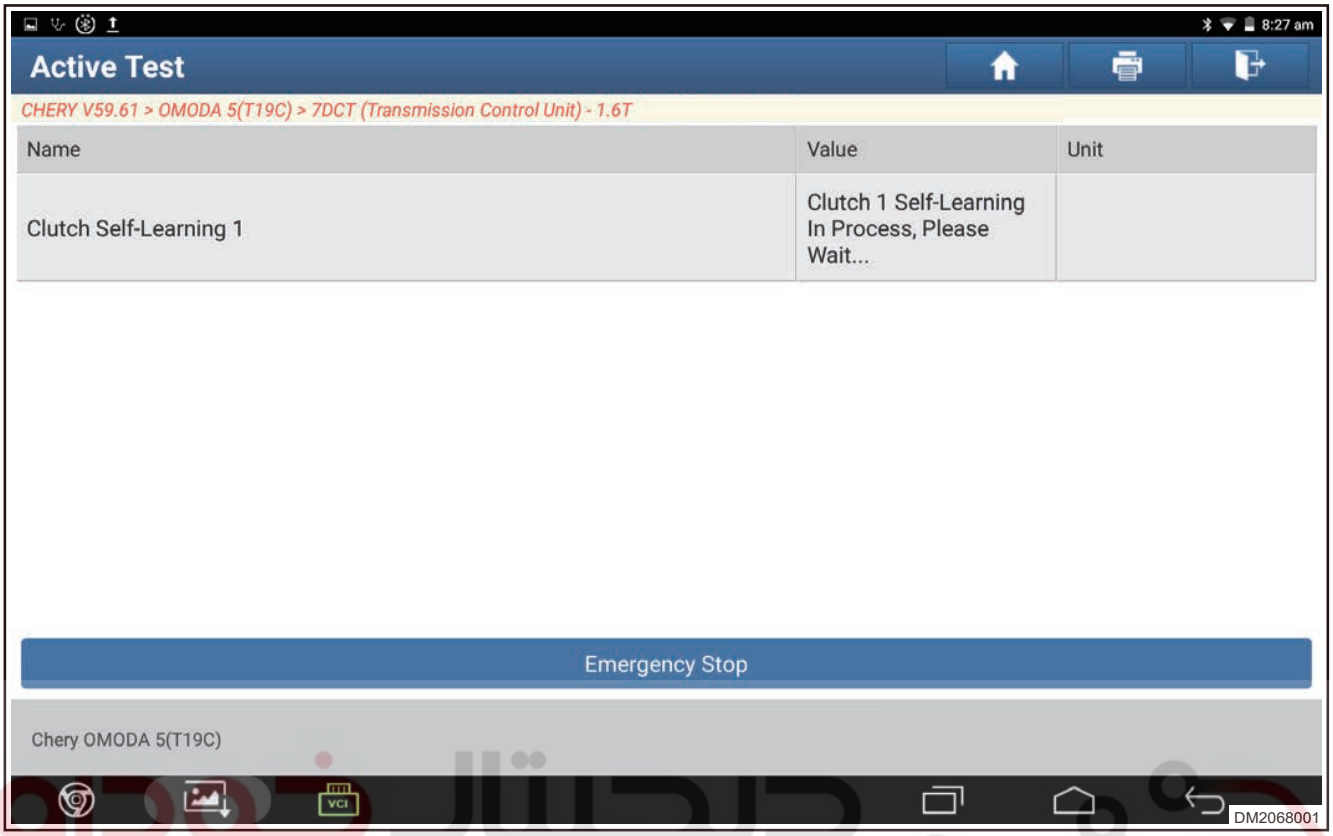
7. Enter next screen and click “Clutch Self-learning”.

8. Click “Clutch Self-learning 1”.



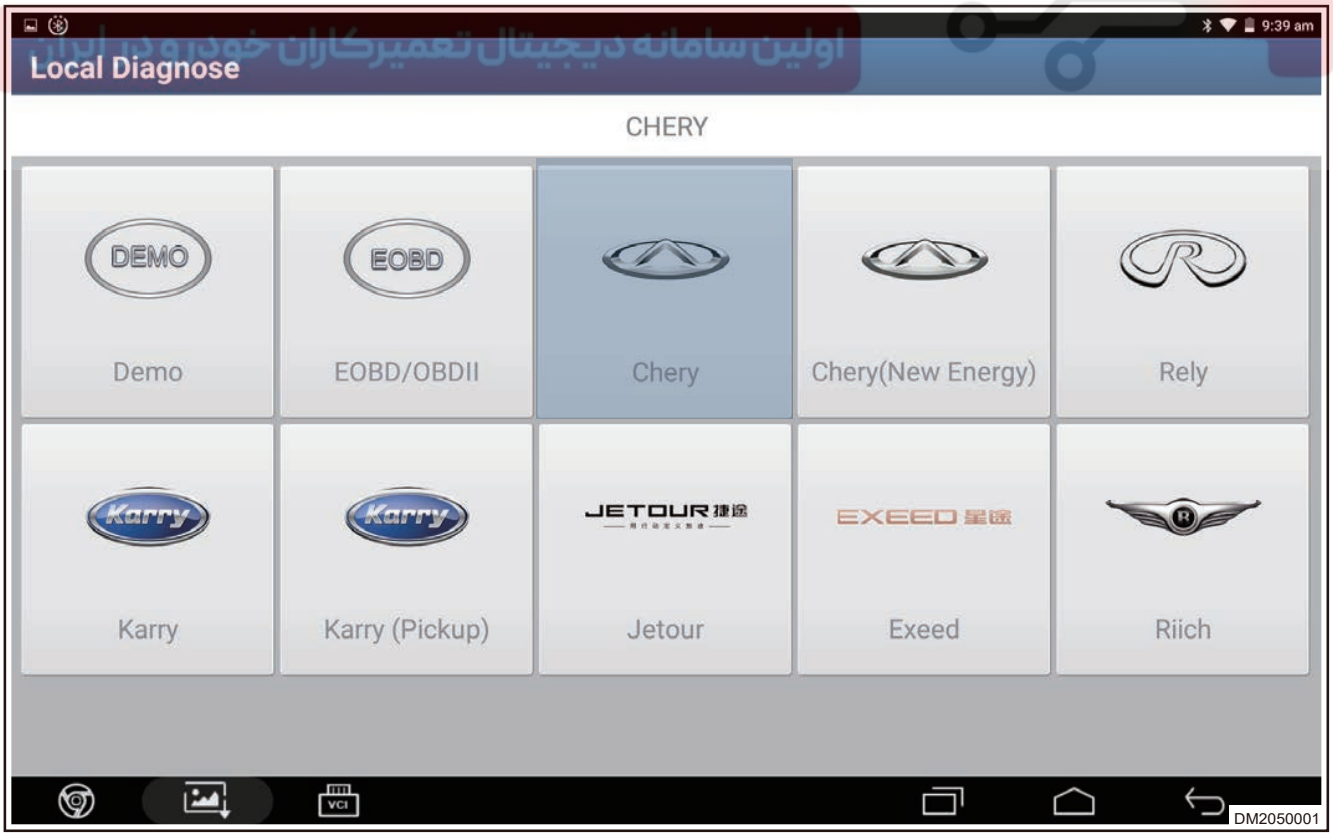
9. Conditions of learning.

10. Click “OK” to perform clutch self-learning 1.

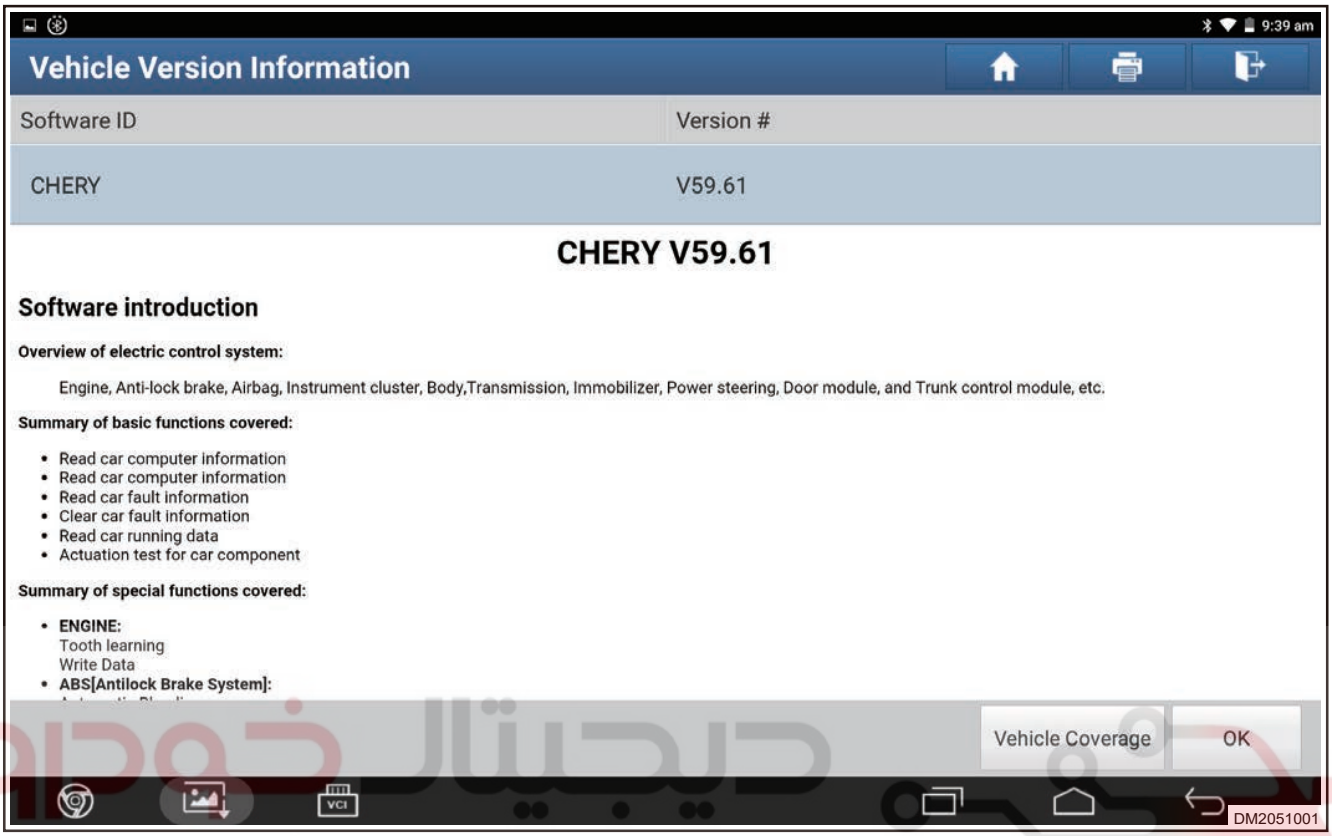


Clutch Self-learning 2

1. Connect diagnostic tester, turn ENGINE START STOP switch to ON.
2. Select “CHERY”.

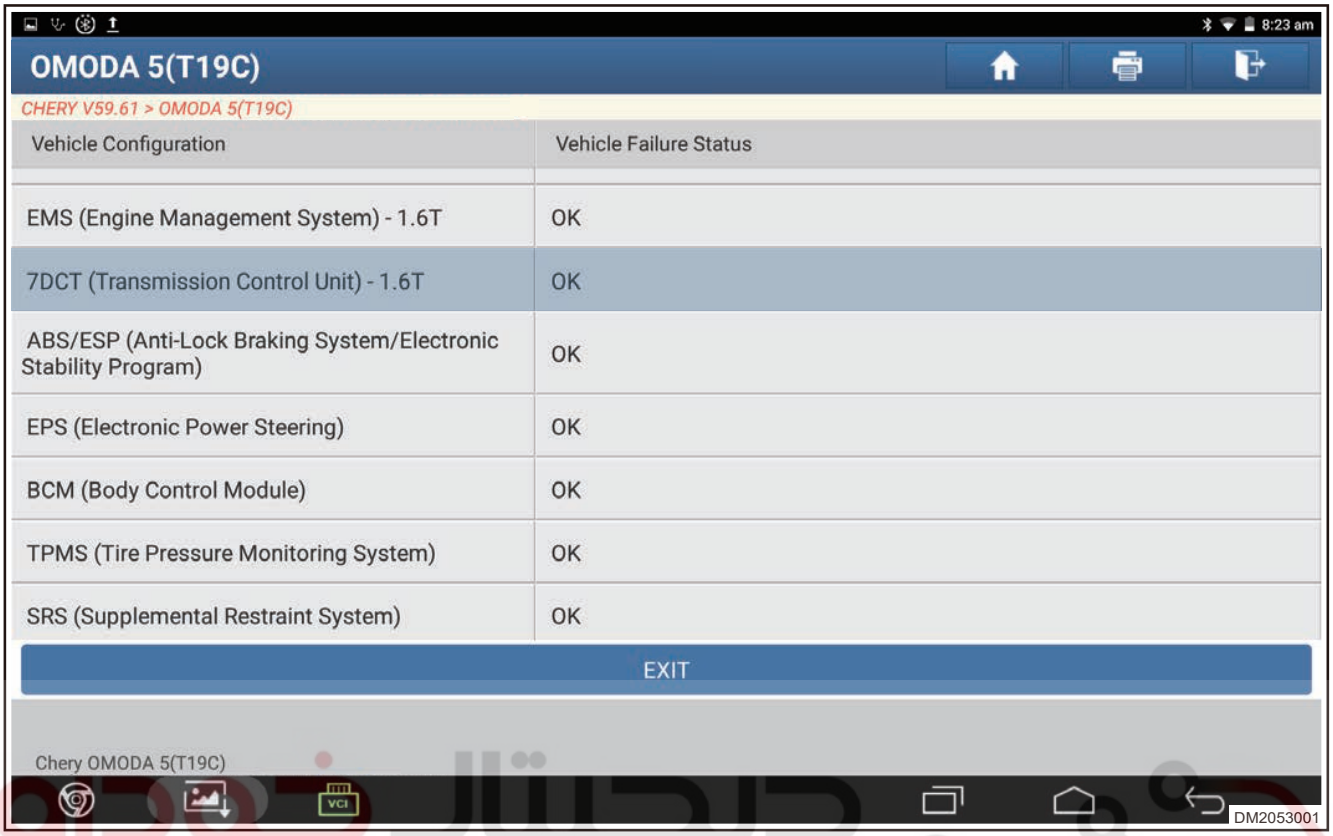


3. Select “Version Information”.



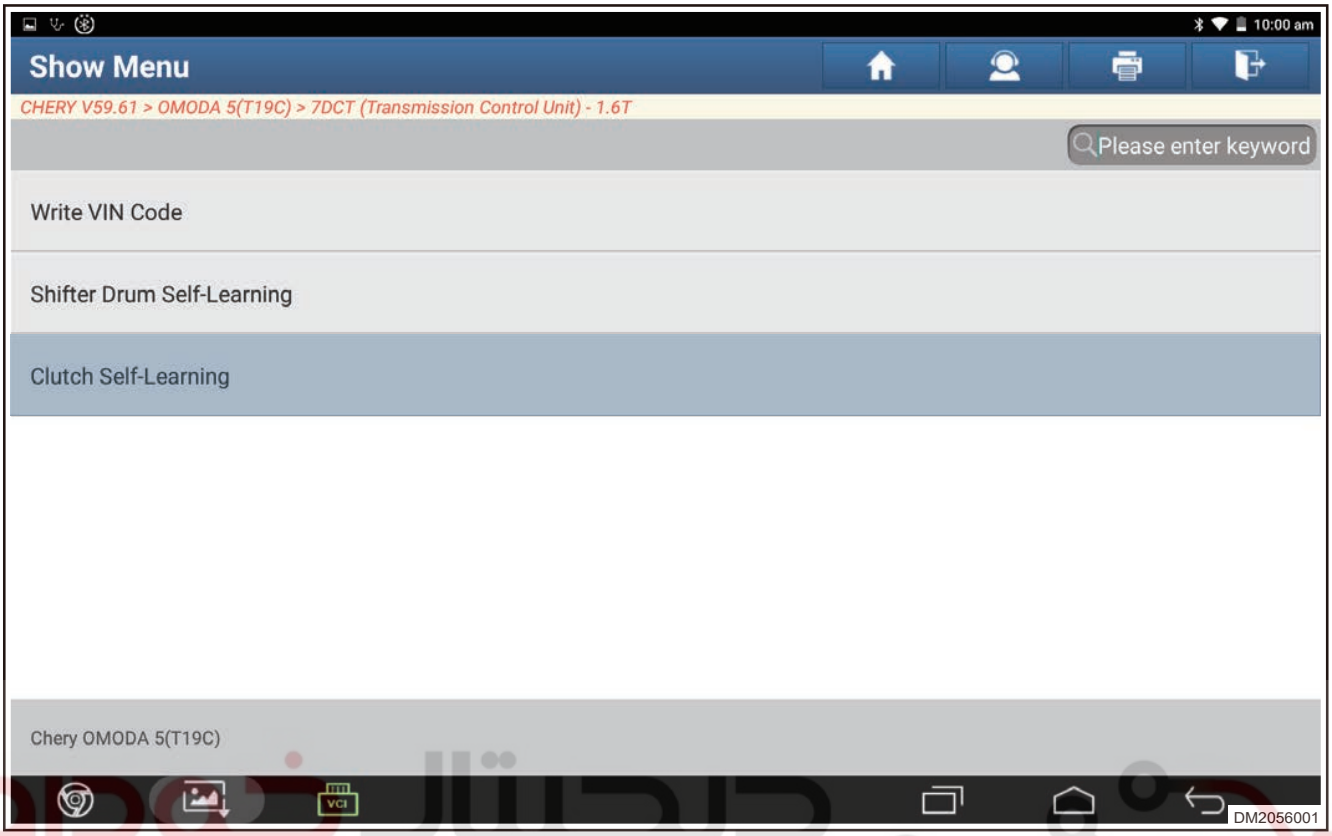
4. Select “OMODA 5 (T19C)” model.

5. Enter next screen and click “7DCT (Transmission Control Unit) - 1.6T”.

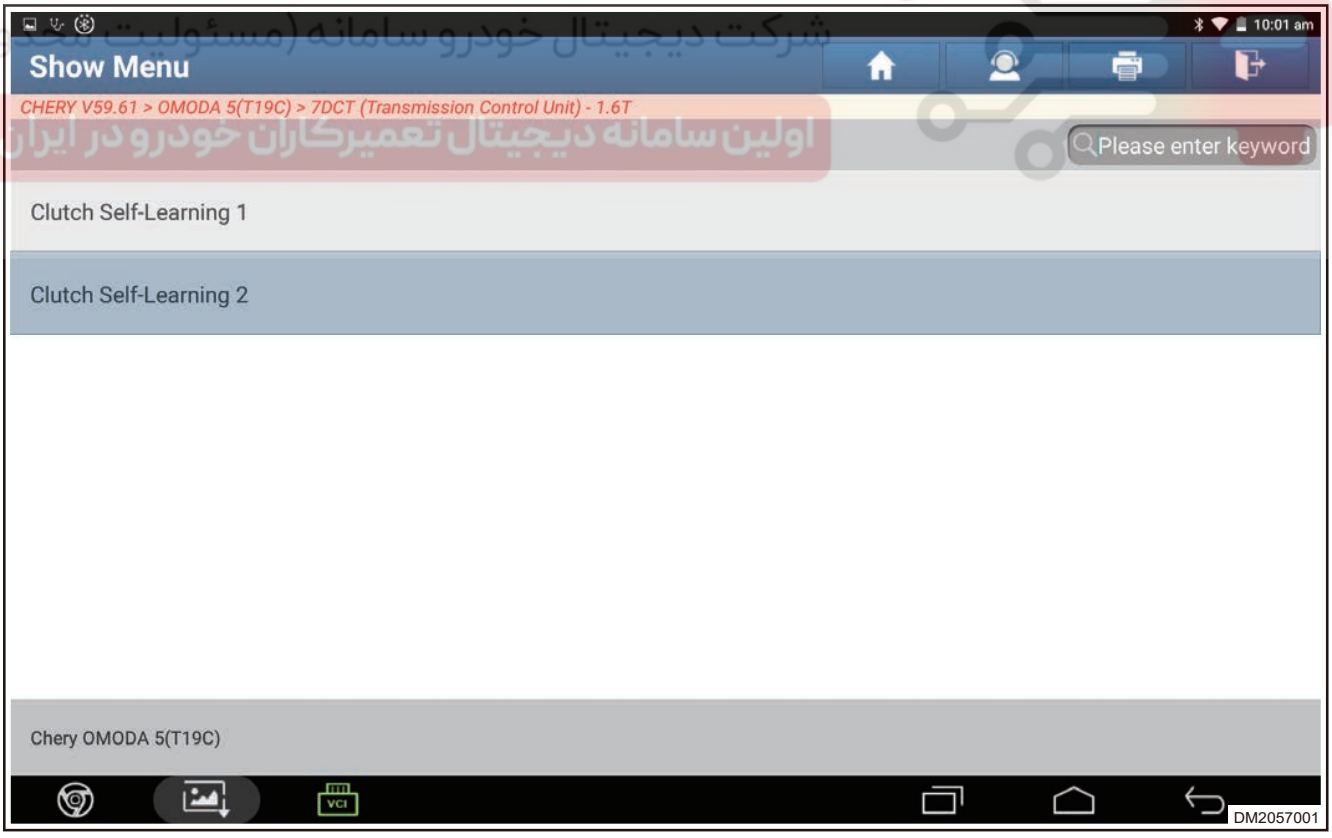


6. Enter next screen and click “Special Function”.

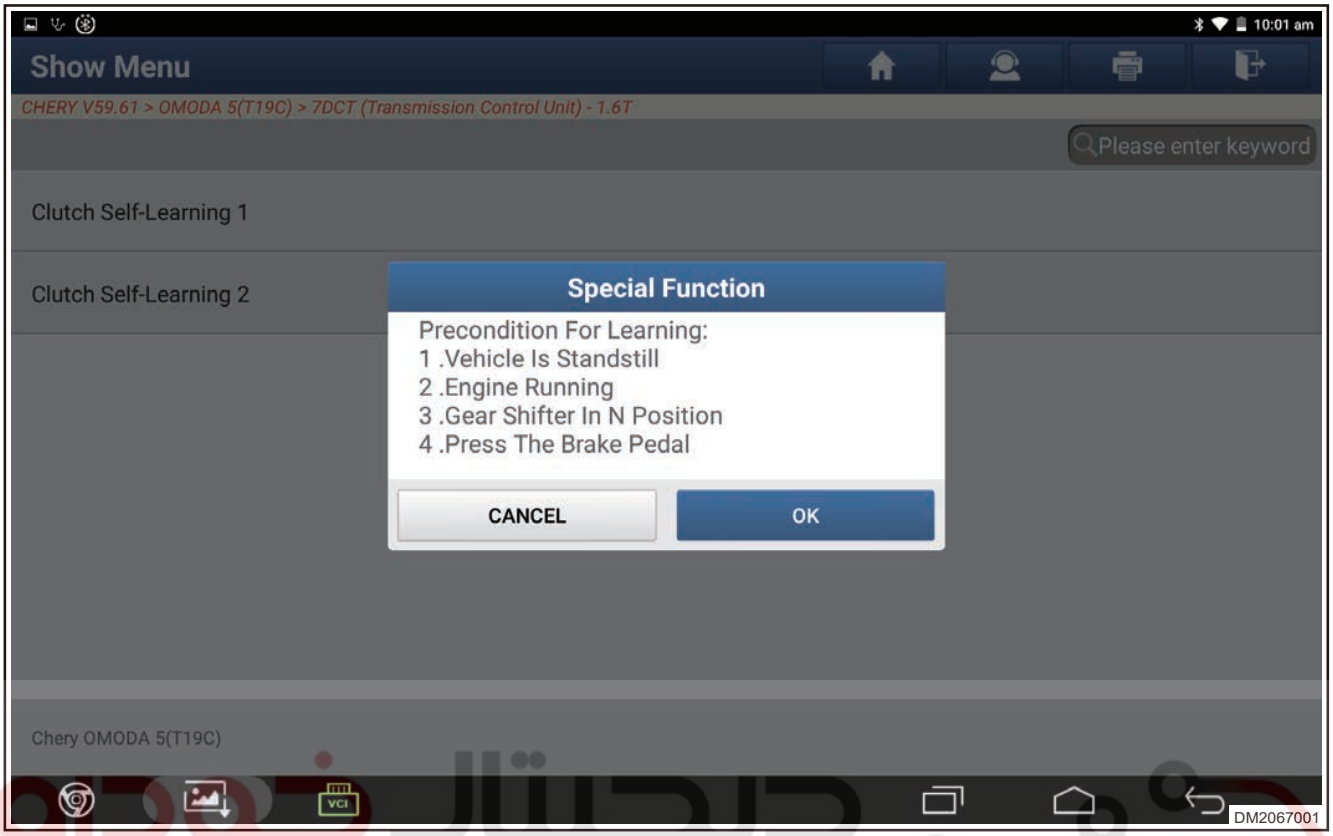
7. Enter next screen and click “Clutch Self-learning”.



8. Click “Clutch Self-learning 2”.



9. Conditions of learning.



10. Click “OK” to perform clutch self-learning 2.

TRANSMISSION ASSEMBLY

Warnings and precautions

Warnings

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.

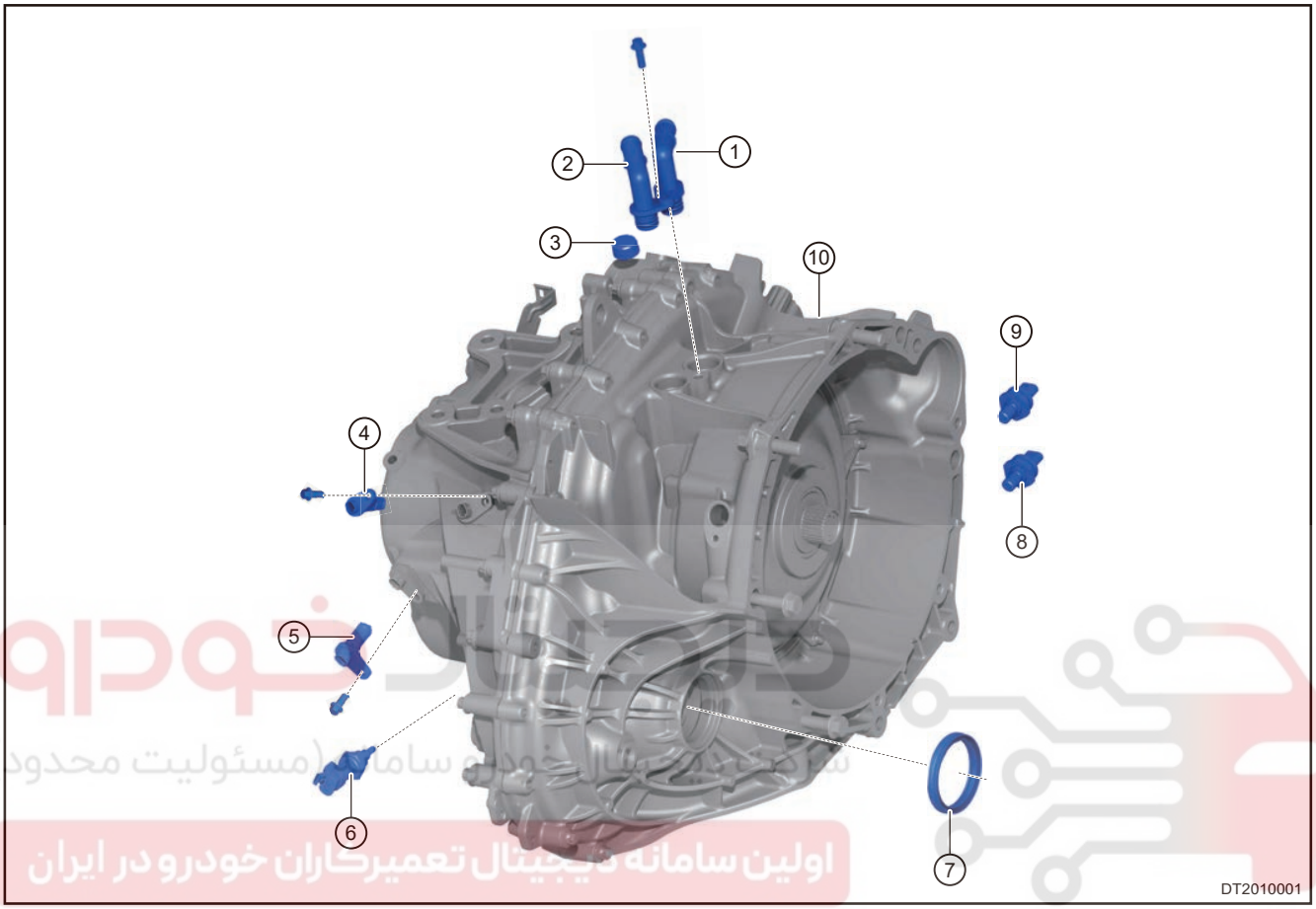
Precautions

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

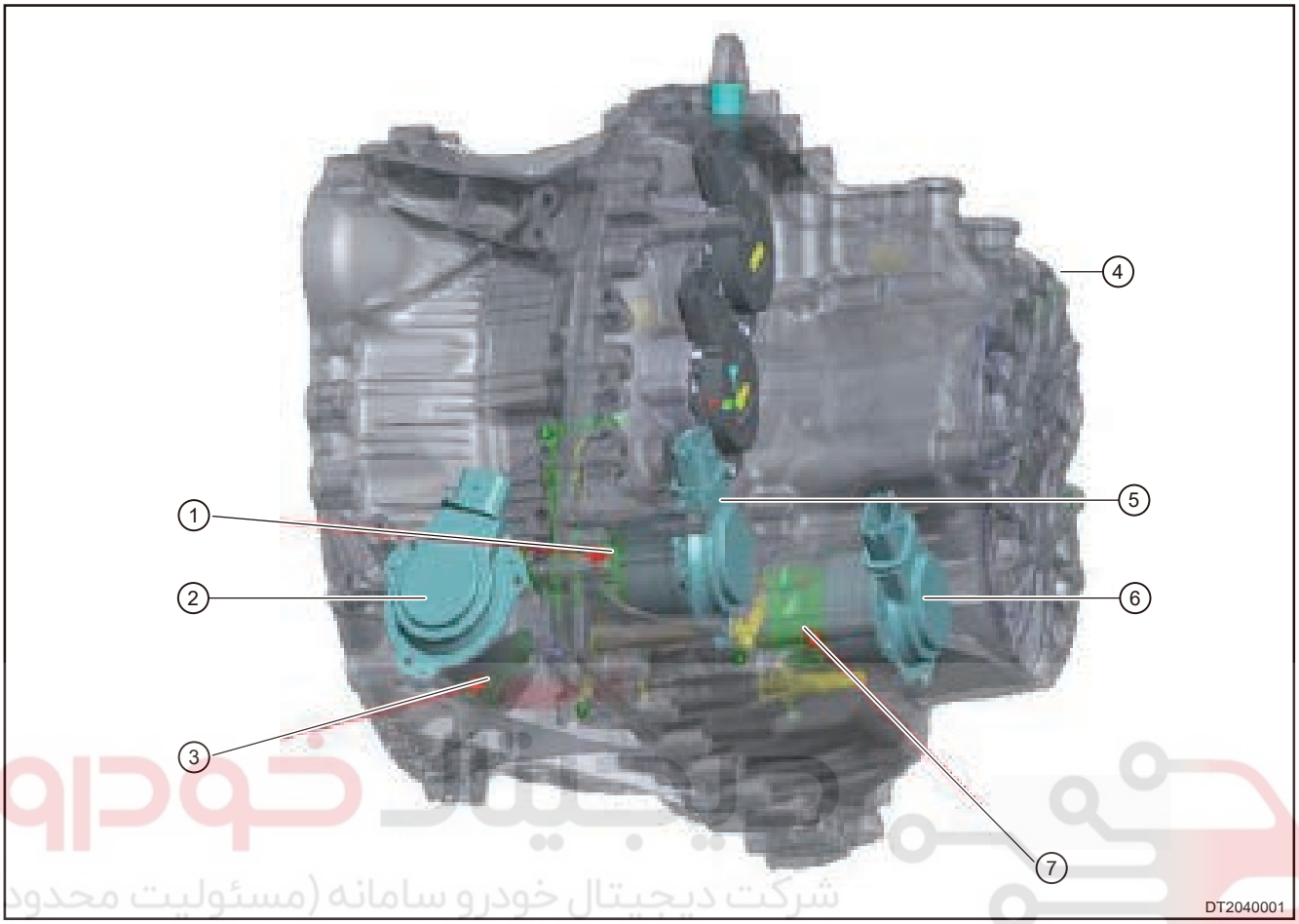
1. Drain bolt and oil inspection bolt are both non-reusable parts, and replace them with new ones after removal.
2. Transmission oil has a service life of 60,000 km.
3. The vehicle must be kept level during refilling.
4. To avoid oil contamination, the container used to store transmission oil must be a special container for 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 should be stored under 20°C ± 10°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.

System Overview

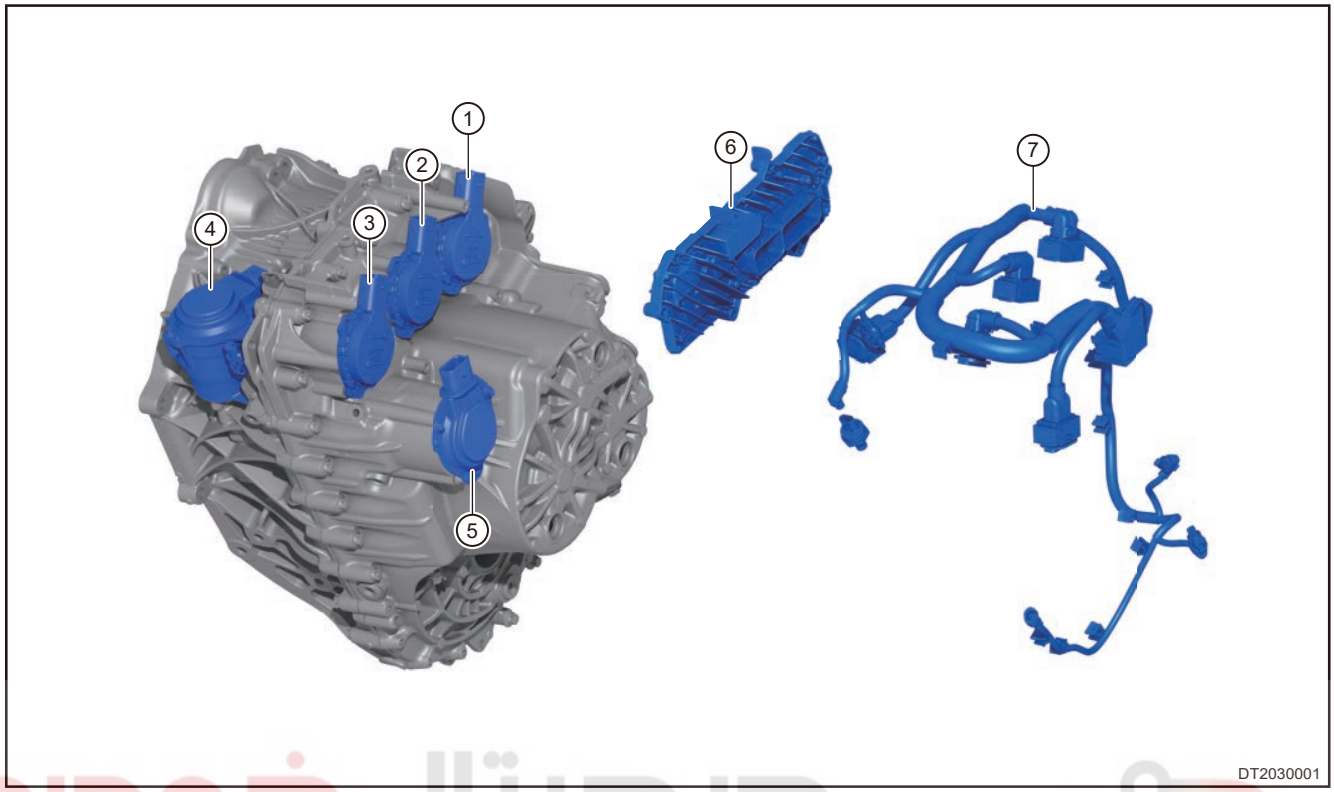
System Components Diagram



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



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		



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		

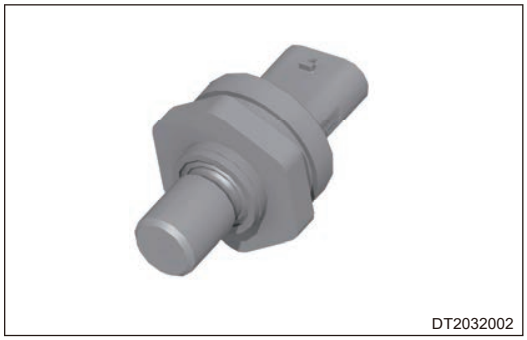
Component Operation Description

Input Shaft Speed Sensor

1. The sensor is a Hall sensor that can identify the actual speed of two input shafts. It is one of the data to judge whether the clutch slips.

Pressure Sensor

1. It is used to detect the clutch pressing force, which is one of feedback data. It is a varistor type sensor, the greater the pressure, the greater the deformation of the varistor diaphragm, the higher the voltage output.


DT2032002

Temperature Sensor

1. It is used to detect the transmission oil temperature, and it will enter fail-safe mode when temperature is too high. This is a negative temperature coefficient resistor. The resistance becomes smaller as the temperature increases.


DT2033002

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

On-vehicle Service

Specifications

Parameter

Type		730 DHB
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

Torque Specifications

Description	Torque (N·m)
Transmission Drain Plug	39 - 47
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

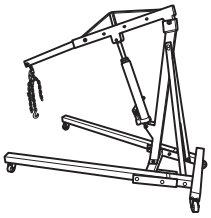
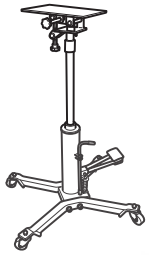
Transmission Oil Specifications

Transmission Model	Oil Type	Total Capacity (After-sales Maintenance Oil Capacity)
730 DHB	Sinopec DCTF-GS	4.25 ± 0.2 L

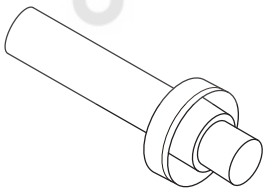
Transmission oil has a service life of 60,000 km.

Tools

General Tools

Tool Name	Tool Drawing
Engine Hoist	 RCH0043006
Transmission Carrier	 RCH0005006

Special Tool

Tool Name	Part No.	Tool Drawing
Differential Oil Seal Assembly Fixture	EPT-0013	 S00096

Transmission Oil Replacement

Draining/Refilling

⚠ Warning

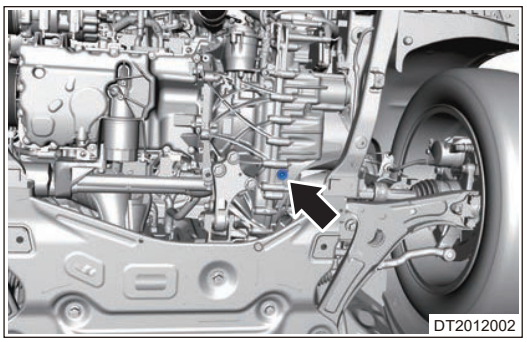
- Be sure to wear necessary safety equipment to prevent accidents.
- Check if safety lock of lift is locked when repairing or inspecting the lifted vehicle.

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

⚠ Caution

- Transmission oil temperature 20 - 50℃ formula can be put oil, to prevent burns.

2. Raise vehicle with a lift.
3. Remove the engine lower protector assembly.
4. Remove the transmission drain plug (arrow).



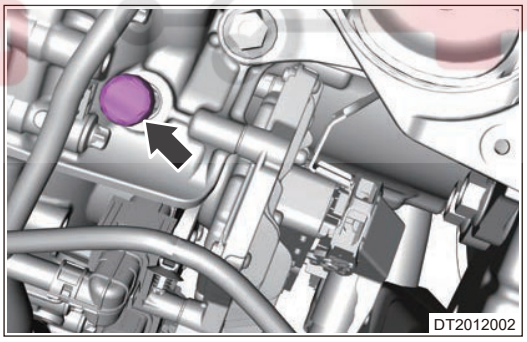
⚠ Caution

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

5. Drain the transmission oil.
6. Replace drain bolt with a new one and tighten it again.

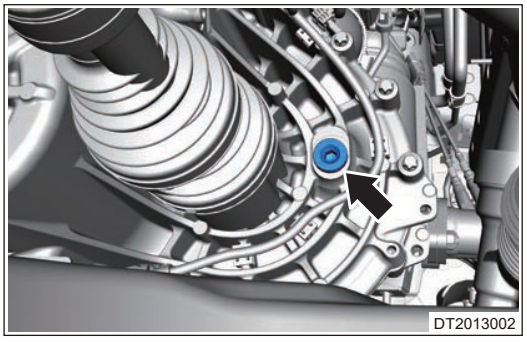
   Tightening torque: 39 - 47 N·m

7. Remove the air filter assembly.
8. Remove the battery and tray assembly.
9. Pull out the transmission breather cap and refill the breather plug tube with new transmission oil.



10. 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.
11. Replace oil inspection bolts with new ones.

    Tightening torque: 39 - 47 N·m



12. Install the engine lower protector.
13. Install the battery and tray assembly.
14. Install the air filter assembly.

⚠ Caution

- Drain bolt and oil inspection bolt are both non-reusable parts, and replace them with new ones after removal.
- Transmission oil has a service life of 60,000 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 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 should be stored under 20 ℃ ± 10 ℃.
- 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	Sinopec DCTF-GS	4.25 ± 0.2 L

Transmission Assembly

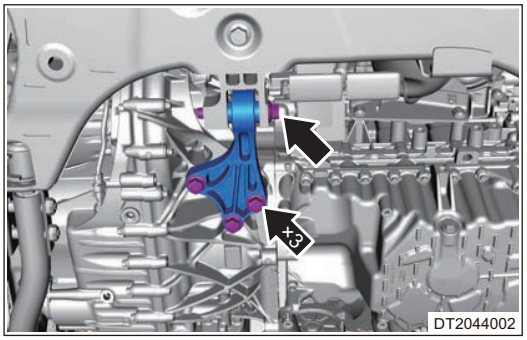
Removal

⚠ Caution

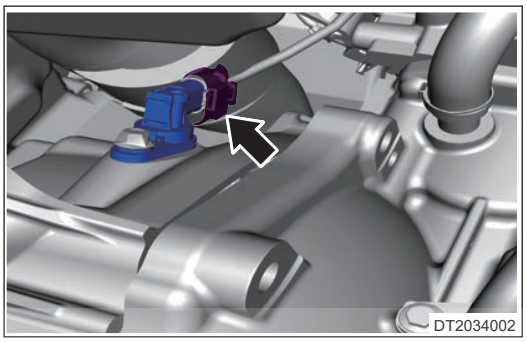
- Before removal of power assembly, first drain transmission oil.
- During separation of engine and transmission, pay attention not to damage the peripheral accessories of transmission, such as cooling hose, pressure sensor, etc. If there is any damage, it is necessary to replace it according to requirements.

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

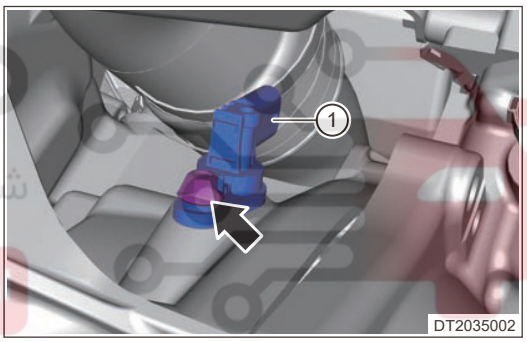
15. Remove 4 fixing bolts (arrow) and rear mounting upper body.



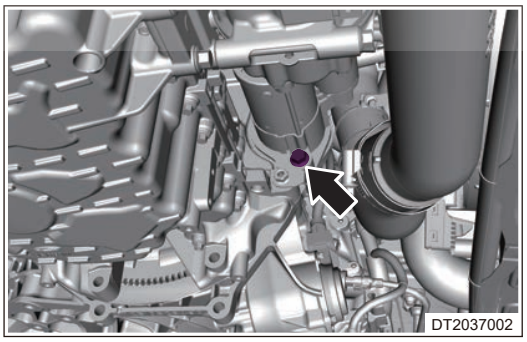
16. Disconnect the engine speed sensor wire harness connector.



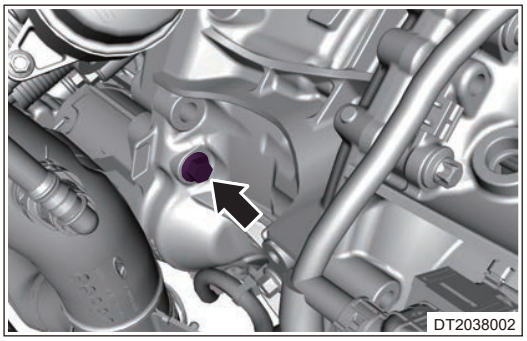
17. Remove 1 fixing bolt from engine speed sensor, and remove the engine speed sensor (1).



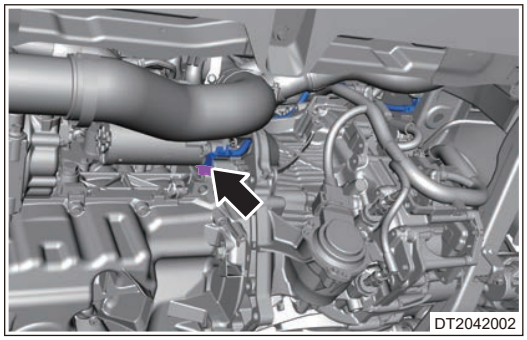
18. Remove 1 fixing bolt from starter.



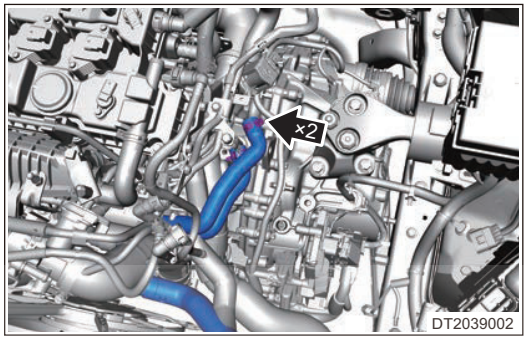
19. Remove 1 fixing bolt from starter.



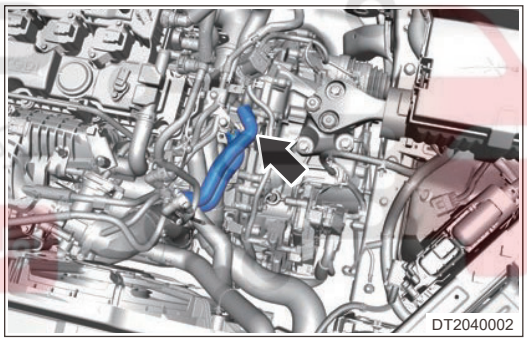
20. Remove the transmission ground wire fixing bolt.



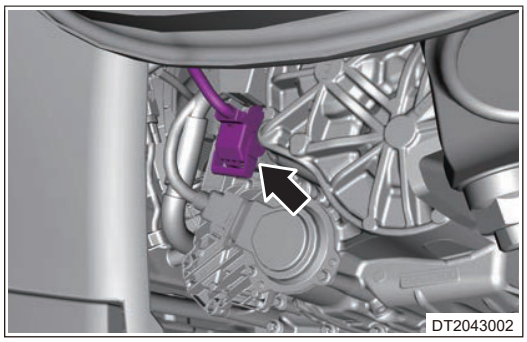
21. Remove the intercooler inlet pipe assembly Ⅱ.
22. Remove clamps from engine inlet pipe.



23. Disengage the engine inlet pipe.

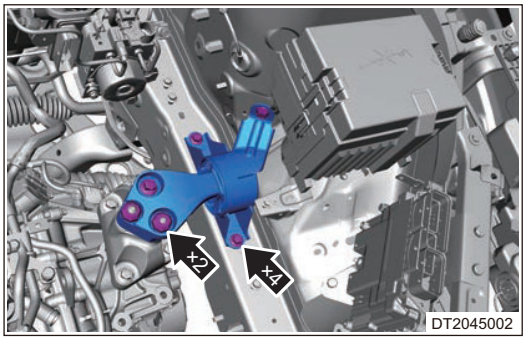


24. Disconnect the transmission control unit connector.

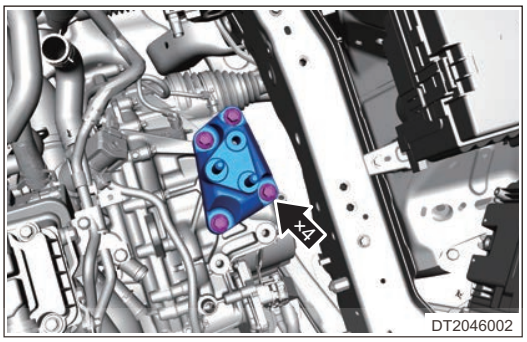


25. Install the engine hoist.
26. Install the transmission carrier.

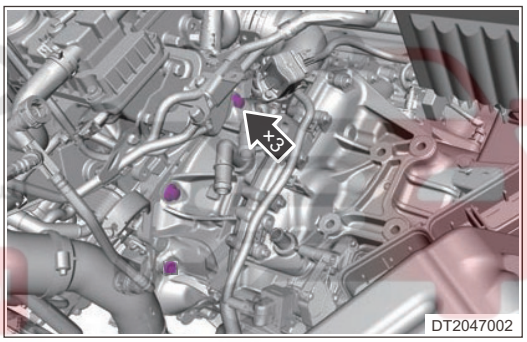
27. Remove 2 fixing nuts and 4 fixing bolts from left mounting cushion assembly, and remove left mounting cushion.



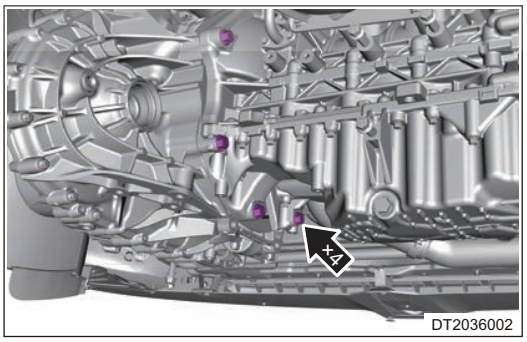
28. Remove 4 fixing bolts from left mounting bracket and remove left mounting bracket.



29. Remove 3 fixing bolts between upper part of transmission and engine.



30. Remove 4 fixing bolts between lower part of transmission and engine.



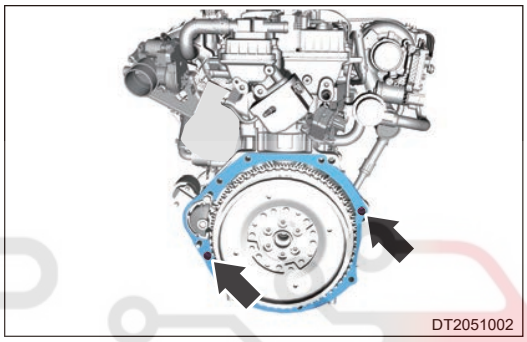
31. Use tool to separate transmission and engine assembly, and remove transmission assembly.

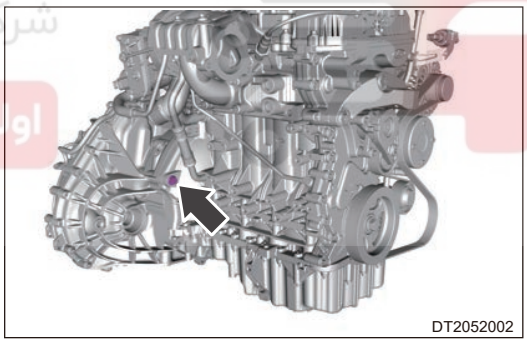
Installation

⚠ 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.

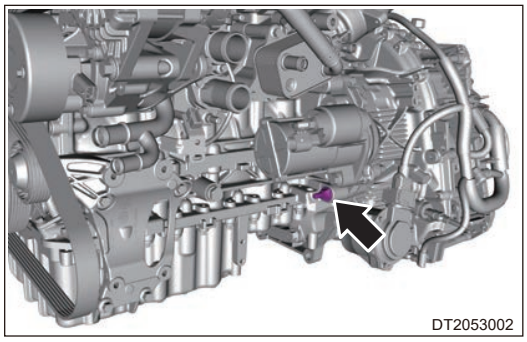
1. As shown in the illustration below, install sealing plate to engine and ensure that dowel pin holes on engine are inserted into the corresponding holes of the sealing plate.


DT2051002

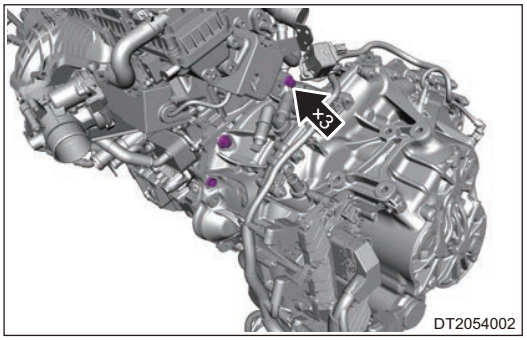

DT2052002

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.

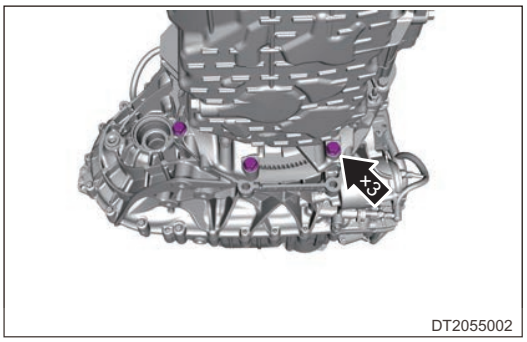
   Tightening torque: 50 ± 5 N·m


DT2053002

3. Install 3 coupling bolts to transmission side.
   Tightening torque: 95 ± 5 N·m



4. Install 3 coupling bolts to lower part of transmission.
   Tightening torque: 50 ± 5 N·m



5. Install 4 fixing bolts to left mounting bracket.
   Tightening torque: 110 ± 15 N·m

6. Install 2 fixing nuts and 4 fixing bolt to left mounting cushion assembly.
   Tightening torque: 110 ± 15 N·m

7. Install 4 fixing bolts to rear mounting upper body.
   Tightening torque: 110 ± 15 N·m

8. Connect the transmission control unit connector.
9. Install 2 fixing bolts to bracket.
   Tightening torque: 9 ± 1 N·m

   Tightening torque: 5 ± 1 N·m

10. Install the engine inlet pipe.
11. Install clamps to engine inlet pipe.
12. Install the intercooler inlet pipe assembly II.
13. Install the transmission ground wire fixing bolt.
14. Install 1 fixing bolt to starter.
15. Install 1 fixing bolt to starter.
16. Install engine speed sensor and 1 fixing bolt.
17. Connect the engine speed sensor wire harness connector.
18. Install the front sub frame welding assembly.
19. Install the front right drive shaft with bearing bracket assembly.
20. Install the front left drive shaft assembly.
21. Install the front right wheel.
22. Install the front left wheel.
23. Fill the transmission oil.
24. Install the battery tray.
25. Install the battery.
26. Install the air filter assembly.
27. Add the coolant.
28. Install the engine trim cover assembly.
29. Install the engine lower protector.
30. Connect the negative battery cable.

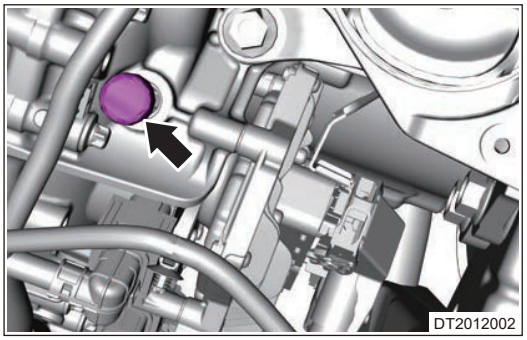
Transmission Breather Cap Replacement

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 ignition 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.

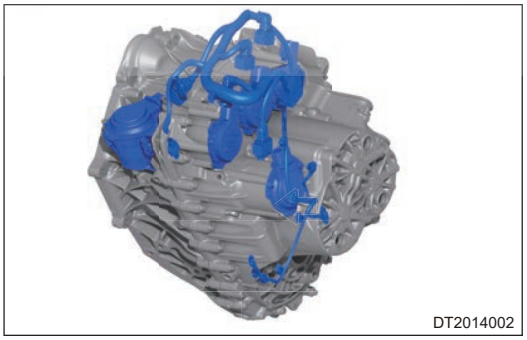
Replacement of Transmission Wire Harness Assembly

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 ignition 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 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 lower protector assembly.
3. Install the battery tray.
4. Install the battery.
5. Install the air filter assembly.
6. Connect the negative battery cable.

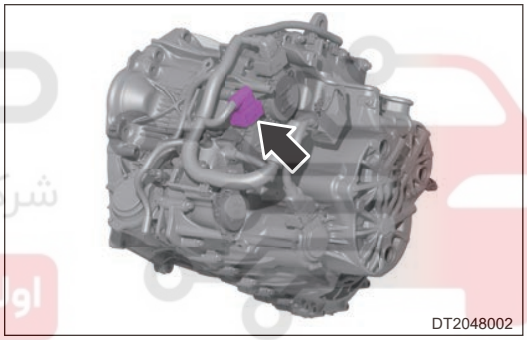
Replacement of Shift Motor

Removal

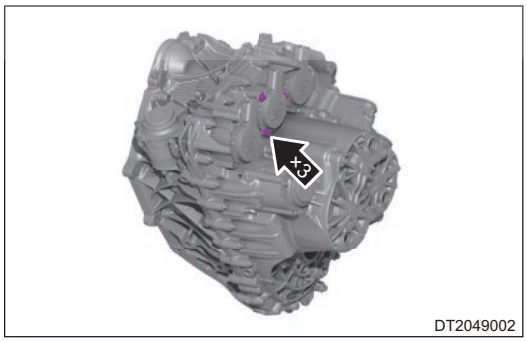
⚠ Warning

- 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 ignition switch.
2. Drain the transmission oil.
3. Remove the engine lower protector assembly.
4. Remove the transmission control unit.
5. Disconnect the shift motor wire harness connector.


DT2048002

6. Remove 3 fixing screws from shift motor.


DT2049002

7. Remove the shift motor.

Installation

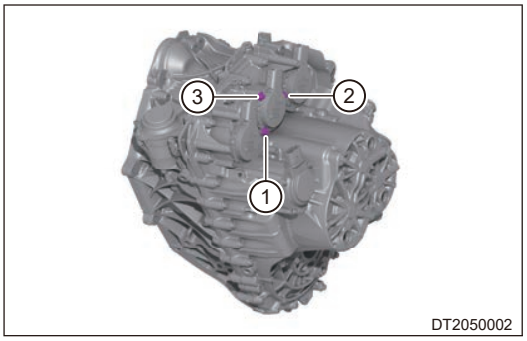
⚠ Caution

- 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



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

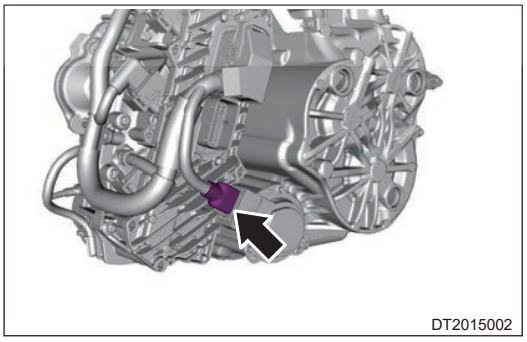
Replacement of Cooling Motor

Removal

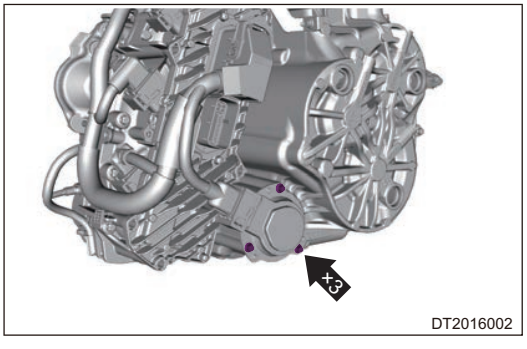
⚠ Warning

- 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 ignition switch.
2. Drain the transmission oil.
3. Remove the engine 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

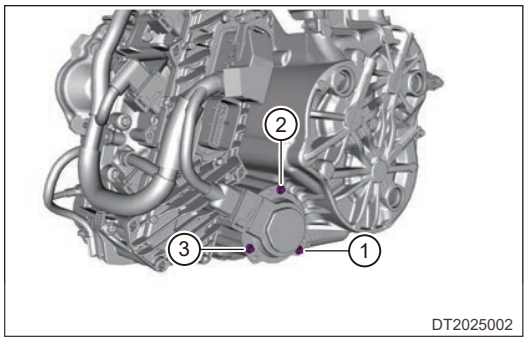
⚠ Caution

- 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 lower protector assembly.
6. Fill the transmission oil.

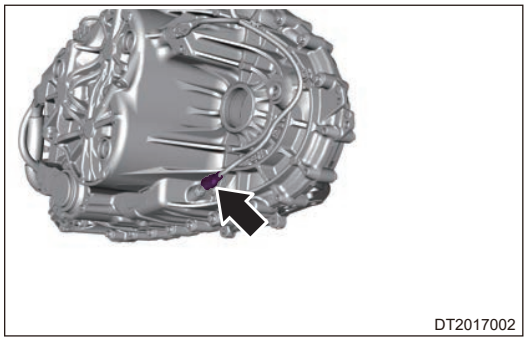
Replacement of Temperature Sensor

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 ignition 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.

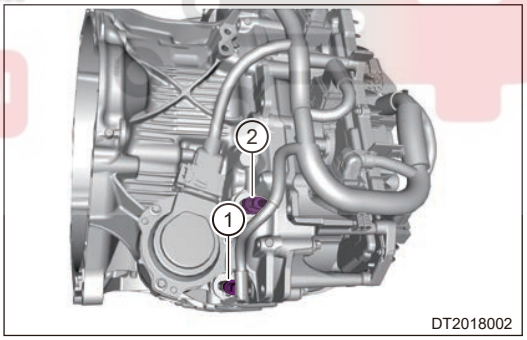
Replacement of Pressure Sensor

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 ignition switch.
2. Disconnect the negative battery cable.
3. Remove the engine 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 lower protector assembly.
5. Connect the negative battery cable.

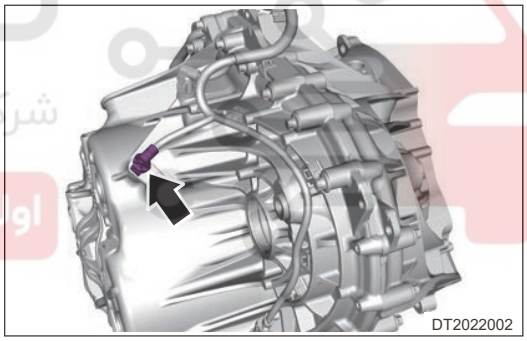
Replacement of Input Speed Sensor 1

Removal

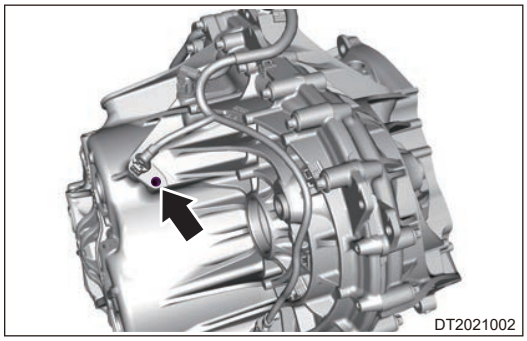
⚠ Warning

- 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 ignition 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.


DT2022002

8. Remove fixing bolt from input speed sensor 1.


DT2021002

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.

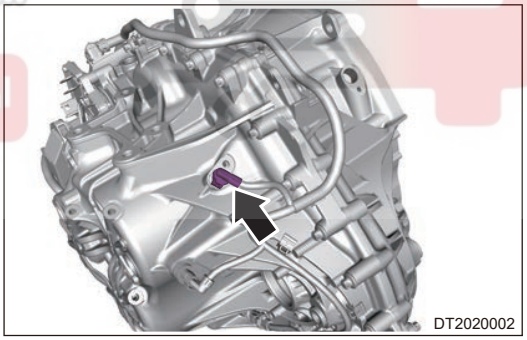
Replacement of Input Speed Sensor 2

Removal

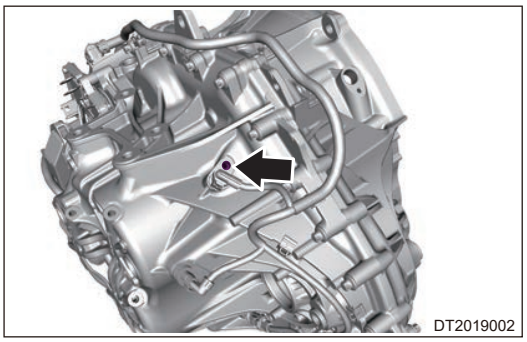
⚠ Warning

- 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 ignition 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.


DT2020002

8. Remove fixing bolt from input speed sensor 2.


DT2019002

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.

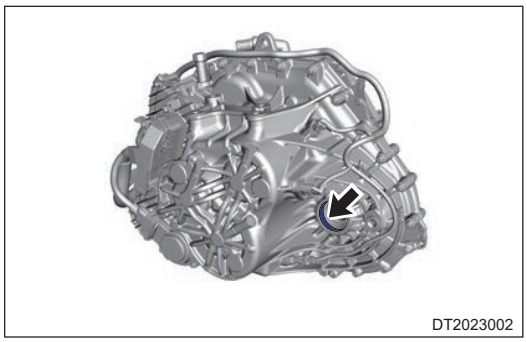
Drive Shaft Oil Seal Replacement

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.

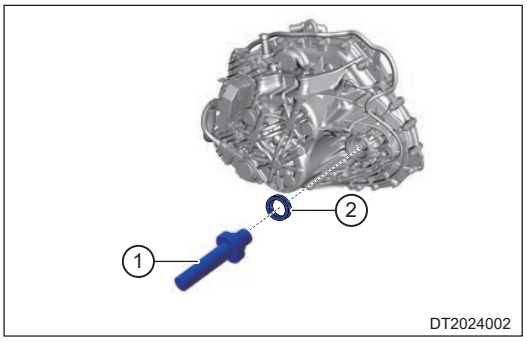
1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove the air filter assembly.
4. Remove the battery.
5. Remove the battery tray.
6. Drain the transmission oil.
7. Remove the front left wheel.
8. Remove the front left drive shaft assembly.
9.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


DT2023002

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.

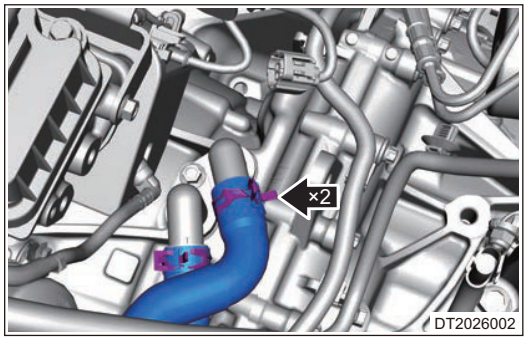
Coolant Connecting Pipe Assembly (Inlet and Outlet Pipes) Replacement

Removal

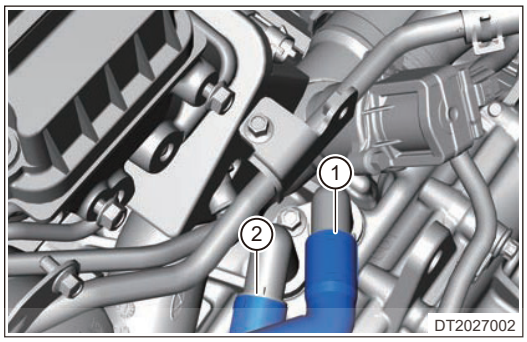
> **⚠ Warning**
>
> - Be sure to wear necessary safety equipment to prevent accidents when repairing.
> - When removing coolant pipe from coolant connecting pipe assembly, be careful not to splash the coolant on electronic parts and the inside of transmission to contaminate transmission oil.

1. Turn off all electrical equipment and the ignition 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.

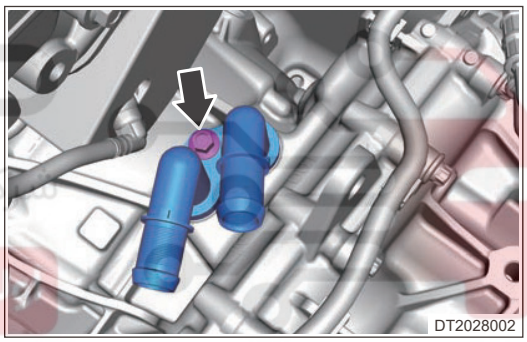
8. Remove clamps from engine inlet pipe.



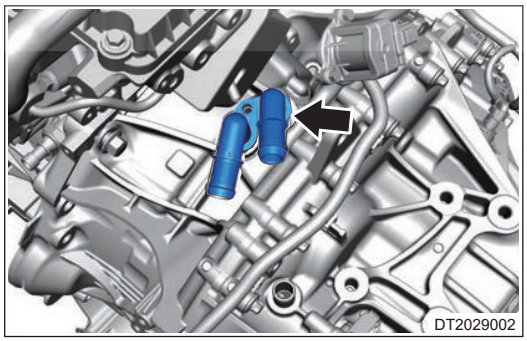
9. Disengage the engine inlet pipes ① and ②.



10. Remove fixing bolt from coolant connecting pipe assembly.



11. Remove inlet and outlet pipes 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. Connect engine water inlet and outlet pipes.
3. Install clamps to engine inlet and outlet pipes.
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.

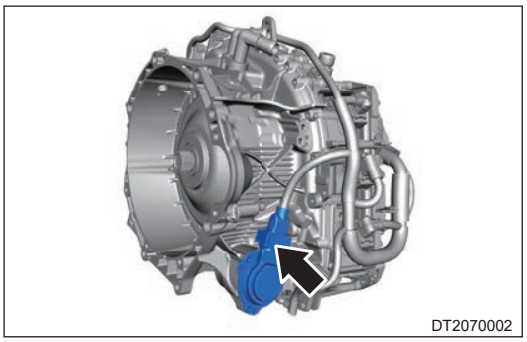
Replacement of Clutch Motor 1

Removal

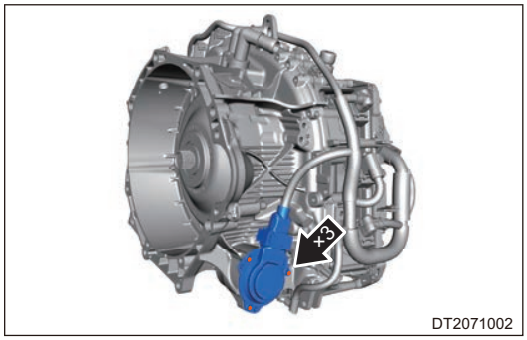
⚠ Caution

- 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 ignition switch.
2. Lift the vehicle, and remove the engine lower protector assembly.
3. 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.
4. Remove drain plug to drain transmission oil (approximately 3.25 L), and contain it in a clean and dry container for reuse.
5. Retighten the new drain plug.
   Tightening torque: 43 ± 4 N·m
6. Disconnect the clutch motor 1 wire harness connector.


DT2070002

7. Remove 3 fixing bolts from clutch motor 1.


DT2071002

8. Remove motor from housing gently.

Installation

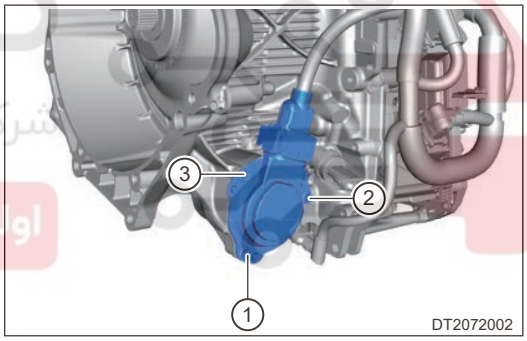
⚠ Caution

- 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



DT2072002

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 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 slowly, 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.

Replacement of Clutch Motor 2

Removal

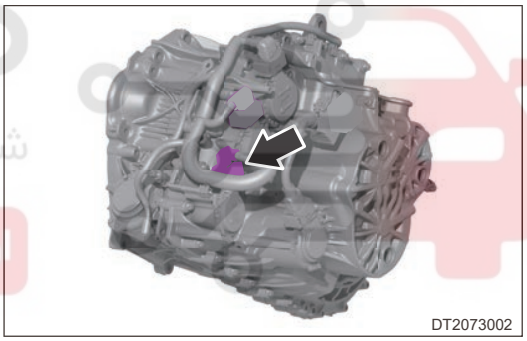
Warning

- 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.

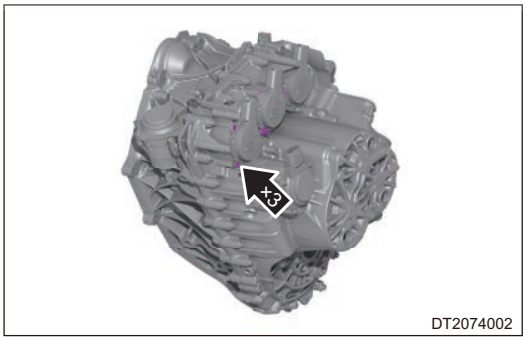
1. Turn off all electrical equipment and the ignition switch.
2. Lift the vehicle, and remove the engine lower protector assembly.
3. Thoroughly clean the outside of transmission, especially the area around clutch motor 2. Remove loose particles in these areas and clean them with dust-free cloth and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

   Tightening torque: 43 ± 4 N·m

6. Remove the transmission control unit.
7. Disconnect the clutch motor 2 wire harness connector.


DT2073002

8. Remove 3 fixing bolts from clutch motor 2.



DT2074002

9. Remove motor from housing gently.

Installation

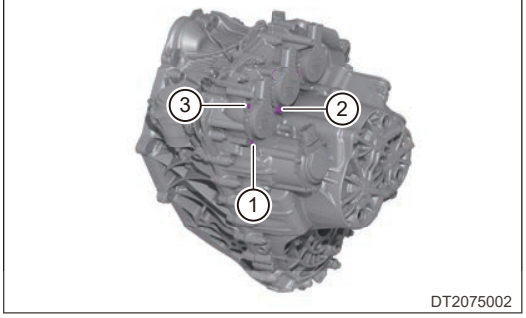
⚠ Caution

- 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



DT2075002

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 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 slowly, 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.

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 ignition 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.

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

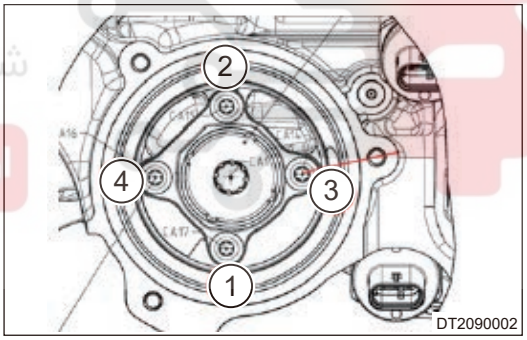
> **⚠ Caution**
>
> - During clutch self-learning, the transmission oil temperature is 40 - 60 ℃.

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.

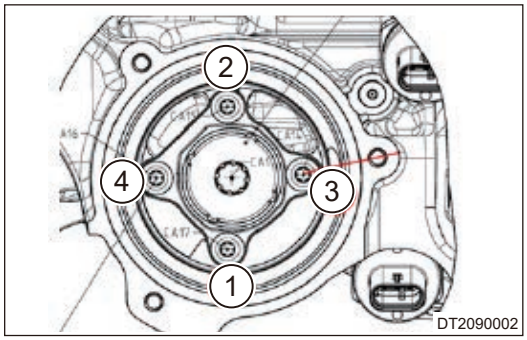
Removal

1. Turn off all electrical equipment and the ignition 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:

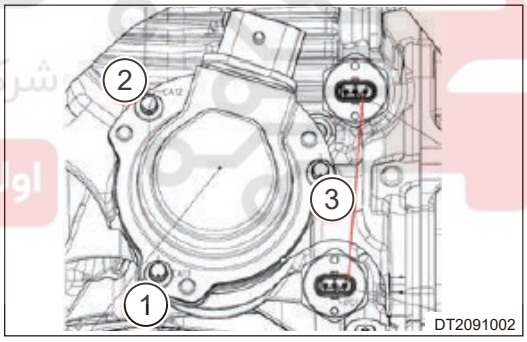


Step	Bolt No.	Torque (N·m)	Note
1	1	1.5 - 2	Pre-tightening
2	2	5 - 6	Final tightening
3	1	5 - 6	Final tightening
4	3	5 - 6	Final tightening
5	4	5 - 6	Final tightening

⚠ 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

⚠ Caution

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

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

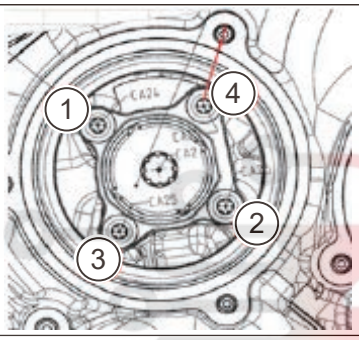
Replacement of Clutch Actuator Pump 2

⚠ 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 ignition 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.

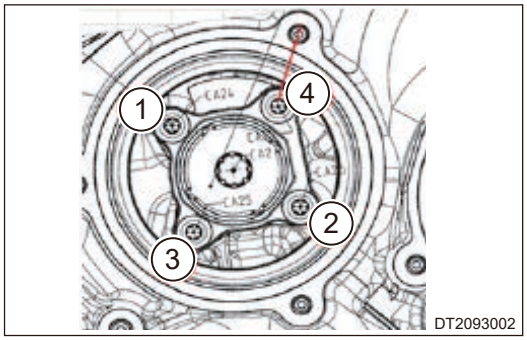


DT2093002


DT2092002

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:

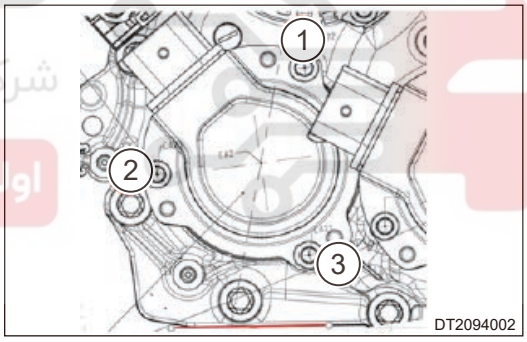


Step	Bolt No.	Torque (N·m)	Note
1	1	1.5 - 2	Pre-tightening
2	2	5 - 6	Final tightening
3	1	5 - 6	Final tightening
4	3	5 - 6	Final tightening
5	4	5 - 6	Final tightening

⚠ 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.

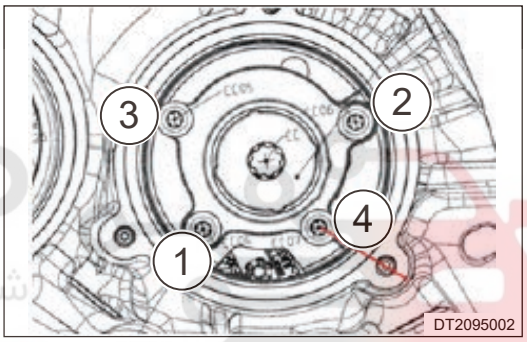
Replacement of Clutch Cooling Pump

⚠ 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.

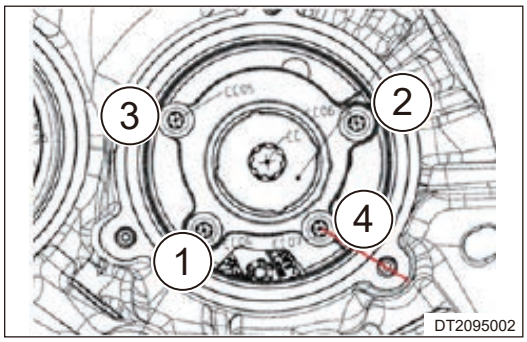
Removal

1. Turn off all electrical equipment and the ignition 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.



Installation

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

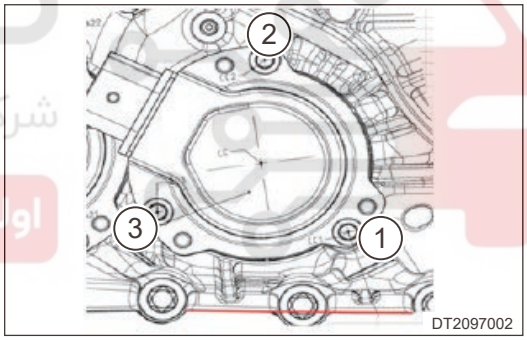


Step	Bolt No.	Torque (N·m)	Note
1	1	1.5 - 2	Pre-tightening
2	2	5 - 6	Final tightening
3	1	5 - 6	Final tightening
4	3	5 - 6	Final tightening
5	4	5 - 6	Final tightening

⚠ 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.

ELECTRONIC SHIFTING

Warnings and precautions

Warnings

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

1. When removing electronic shift module assembly, be sure to wear safety equipment to prevent accidents.

Precautions

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

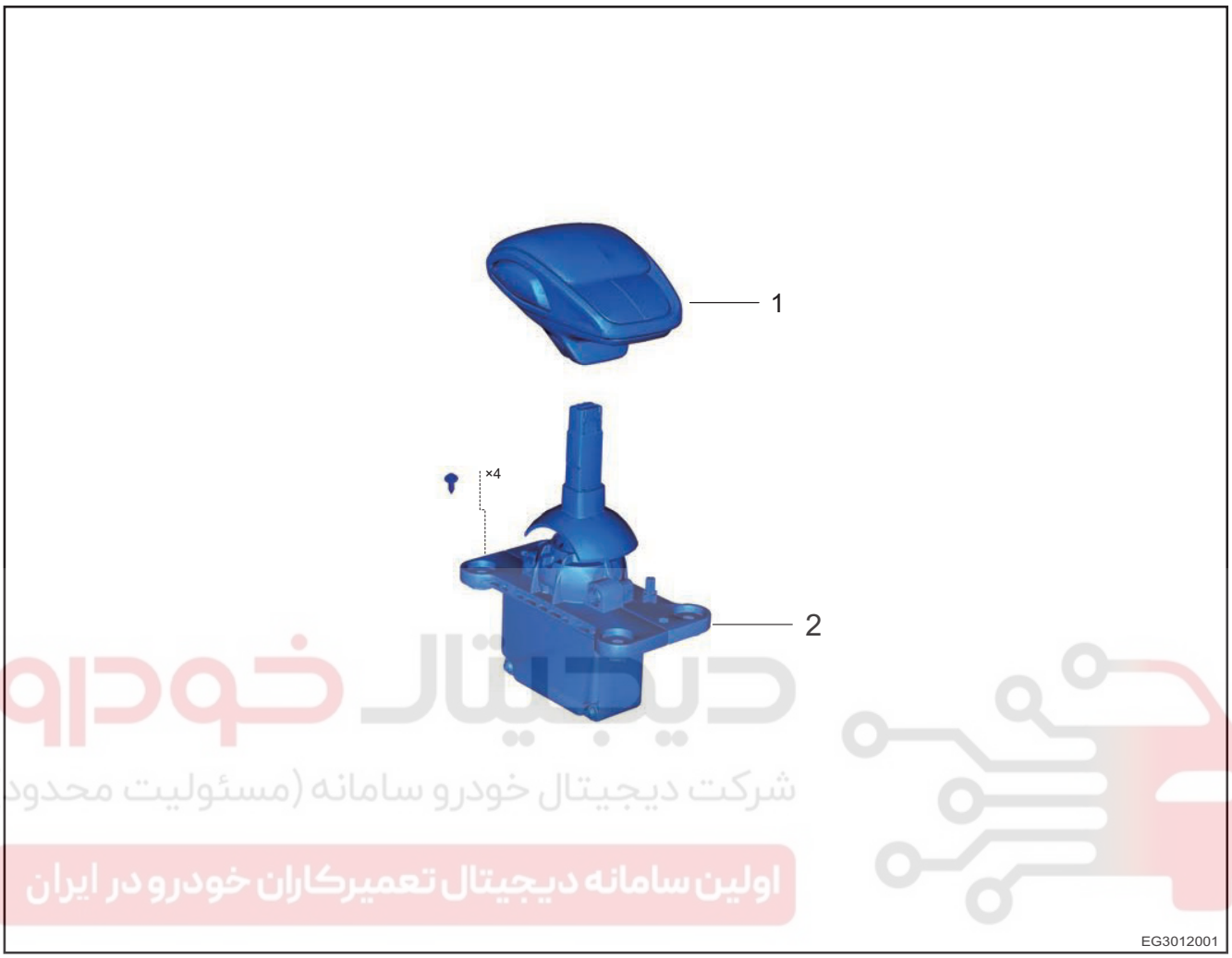
1. Appropriate force should be applied, when removing auxiliary fascia console control panel assembly and auxiliary fascia console finish assembly. Be careful not to operate roughly.

System Overview

System Description

Electronic shift module (EGS) and the transmission is not the traditional mechanical way, but a safer and faster electronic control mode, eliminating the traditional mechanical shift mode, all using electronic signals to substitute. 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. As a luxurious, high-technology configuration, electronic shift lever eliminates the traditional mechanical shifting mechanism and provides us with a more convenient operation.

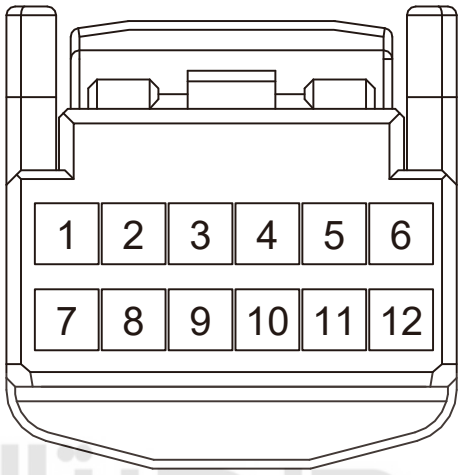
System Diagram



1	Shift Lever Assembly	2	Electronic Shift Control Mechanism Assembly

System Circuit Diagram

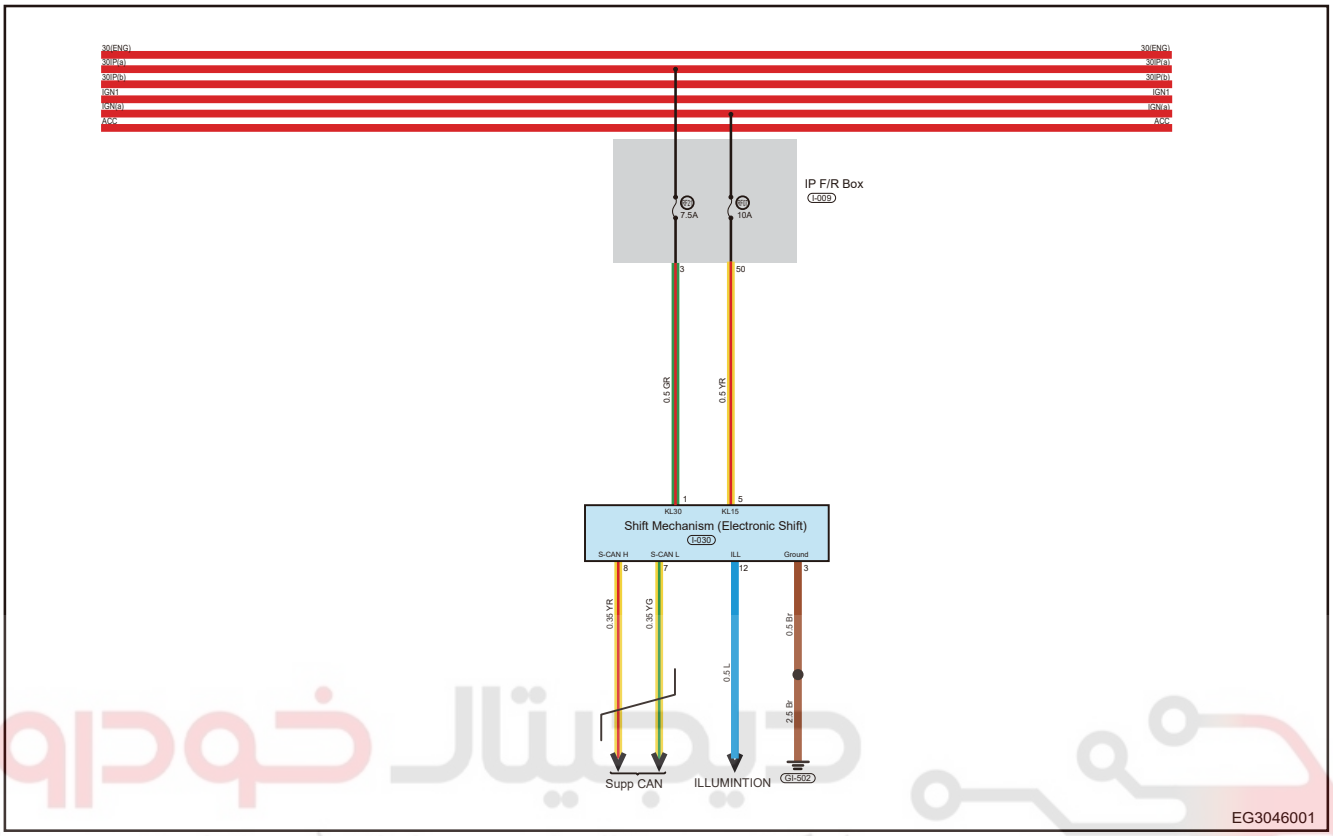
Shift Control Mechanism Terminal Definition



EG3045001

Terminal No.	Description	Terminal No.	Description
1	KL30	7	S-CAN L
2	-	8	S-CAN H
3	Ground	9	-
4	-	10	-
5	KL15	11	-
6	-	12	ILL

Circuit Diagram



Diagnosis & Testing

Problem Symptoms Table

Hint:

- Use symptoms table below to help determine cause of problem. Check each suspected area in sequence. Repair, replace or adjust faulty components as necessary.

Problem	Suspected Area
• Automatic Shift Control Mechanism Lost Communication With EMS • Automatic Shift Control Mechanism Lost Communication With TCU • Automatic Shift Control Mechanism Lost Communication With BSM • Automatic Shift Control Mechanism Lost Communication With ICM • Automatic Shift Control Mechanism Lost Communication With BCM	Wire harness or connector is damaged
	CAN bus hardware circuit malfunction
	Damaged electronic shift lever
	EGS module
	It is possible that associated module had been replaced when battery is not removed

DTC Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

- Turn ENGINE START STOP switch to OFF.

- Connect the diagnostic tester (the latest software).
- Turn ENGINE START STOP switch to ON.
- Use the diagnostic tester to record and clear DTCs stored in the system.
- Turn ENGINE START STOP switch to OFF and wait several seconds.
- Turn ENGINE START STOP switch to ON and check DTCs in the system again.
- If DTC is detected, it indicates current malfunction.
- If no DTC is detected, malfunction indicated by the DTC is intermittent.

Intermittent DTC Troubleshooting

If malfunction is intermittent, perform the followings:

- Check if connector is loose.
- Check if wire harness is worn, pierced, pinched or partially broken.
- Wiggle related wire harness and connector and observe if signal in related circuit is interrupted.
- If possible, try to duplicate conditions under which DTC was set.
- Look for data that has changed or DTC to reset during wiggling test.
- Check for broken, bent, protruded or corroded terminals.
- Check electronic shift control system components and mounting areas for damage, foreign matter, etc. that will cause incorrect signals.
- Check and clean all wire harness connectors and ground parts related to DTC.
- If multiple trouble codes were set, refer to circuit diagrams to look for any common ground circuit or power supply circuit applied to DTC.
- Refer to any Technical Bulletin that may apply to this malfunction.

Ground Inspection

Ground points are very important to the proper operation of circuits. Ground points are often exposed to moisture, dirt and other corrosive environments. Corrosion (rust) may increase load resistance. This situation may change the way in which a circuit operates. Circuits are very sensitive to proper grounding. A loose or corroded ground can seriously affect the control circuit. Check the ground points as follows:

- Remove ground bolt or nut.
- Check all contact surfaces for tarnish, dirt and rust, etc.
- Clean as necessary to ensure that contact is in good condition.
- Reinstall ground bolt or nut securely.
- Check if any additional accessories interfere with ground circuit.
- If several wire harnesses are crimped into one ground terminal, check for proper crimp condition. Make sure that all wire harnesses are clean and securely fastened while providing a proper ground path.

Diagnosis Procedure

Hint:

- Use following procedures to troubleshoot the electronic shift system.

1	**Vehicle brought to workshop**

Next

2	**Check battery voltage**

Check if battery voltage is normal.
Standard Condition
Standard voltage: Not less than 12V.

NG → **Replace battery**

OK ↓

3	**Customer problem analysis**

Next ↓

4	**Read DTCs**

NG → **Perform repair according to problem symptoms table**

OK ↓

5	**Read DTCs (current DTC and history DTC)**

NG → **Troubleshoot according to Intermittent DTC malfunction procedures**

OK ↓

6	**Repair according to Diagnostic Trouble Code (DTC) Chart**

Next ↓

7	**Adjust, repair or replace**

Next ↓

8	**Conduct test and confirm malfunction has been repaired**

Next → **End**

Diagnostic Trouble Code (DTC) Chart

DTC	DTC Definition	Fault Detection Condition	Possible cause	Maintenance Advice
C1950-16	Battery Voltage Low Detection	The voltage is less than 7.5 V for 5s, which is stored as current fault	• Power supply system malfunction • Wire harness or connector damaged • EGS fault	• Check and repair power supply system • Check wire harness or connector • Replace EGS
C1951-17	Battery Voltage High Detection	The voltage is more than 16.5 V for 5s, which is stored as current fault		
C196B-00	F1 Stuck	If the shift position (-shift device with signal in EGS_1 (0x1B2)) is always in F1 position in the past 60 seconds, the fault is established	• Wire harness or connector failure • EGS fault	• Check wire harness or connector • Replace EGS
C196C-00	F2 Stuck	If the shift position (-shift device with signal in EGS_1 (0x1B2)) is always in F2 position in the past 60 seconds, the fault is established		
C196D-00	B1 Stuck	If the shift position (-shift device with signal in EGS_1 (0x1B2)) is always in B1 position in the past 60 seconds, the fault is established		
C196E-00	B2 Stuck	If the shift position (-shift device with signal in EGS_1 (0x1B2)) is always in B2 position in the past 60 seconds, the fault is established		
C196F-00	M+ Stuck	If the shift position (-shift device with signal in EGS_1 (0x1B2)) is always in M+ position in the past 60 seconds, the fault is established		

DTC	DTC Definition	Fault Detection Condition	Possible cause	Maintenance Advice
C1970-00	M- Stuck	If the shift position (- shift device with signal in EGS_1 (0x1B2)) is always in M- position in the past 60 seconds, the fault is established		
C1956-49	Light Detection Fault	One MLX sensor channel is faulty	• EGS fault	• Replace EGS
C1957-49	Heavy Detection Fault	Two MLX sensor channels are faulty		
C1959-13	Park Button 1 Open Circuit	When park button 1 circuit is open for 3s, the fault is established	• Wire harness or connector failure • EGS fault	• Check wire harness or connector • Replace EGS
C195A-11	Park Button 1 Short to GND	When park button 1 is short to ground for 3s, the fault is established		
C195B-12	Park Button 1 Short to VCC	When park button 1 is short to power supply for 3s, the fault is established		
C195C-92	Park Button 1 Pressed for 60s	When park button 1 is pressed for 60s, the fault is established		
C195D-13	Park Button 2 Open Circuit	When park button 2 circuit is open for 3s, the fault is established		
C195E-11	Park Button 2 Short to GND	When park button 2 is short to ground for 3s, the fault is established		
C195F-12	Park Button 2 Short to VCC	When park button 2 is short to power supply for 3s, the fault is established		
C1960-92	Park Button 2 Pressed for 60s	When park button 2 is pressed for 60s, the fault is established		
C1961-13	M Button Open Circuit	When M button circuit is open for 3s, the fault is established		

DTC	DTC Definition	Fault Detection Condition	Possible cause	Maintenance Advice
C1962-11	M Button Short to GND	When M button is short to ground for 3s, the fault is established		
C1963-12	M Button Short to VCC	When M button is short to power supply for 3s, the fault is established		
C1964-92	M Button Pressed for 60s	When M button is pressed for 60s, the fault is established		
C1971-46	Calibration Parameters Be Corrupted	When KL15 is powered on and calibration parameters is detected to be tampered with, DTCs will generated immediately	• Calibration parameters be corrupted • EGS fault	• Perform recalibration • Replace EGS
C1972-92	Torque Missing Check	When button is missing for 60s, the fault is established	• EGS fault	• Replace EGS
U0073-88	CAN Bus Off	CAN Bus Off	• CAN network failure • EGS fault	• Check and repair CAN network • Replace EGS
U0100-87	Lost Communication with EMS	Lost Communication with EMS		
U0101-87	Lost Communication with TCU	Lost Communication with TCU		
U0129-87	Lost Communication with BSM	Lost Communication with BSM		
U0155-87	Lost Communication with ICM	Lost Communication with ICM		
U0401-81	Invalid Data Received From EMS	Invalid Data Received From EMS		
U0402-81	Invalid Data Received from TCU	Invalid Data Received from TCU		
U0418-81	Invalid Data Received from BSM	Invalid Data Received from BSM		
U0423-81	Invalid Data Received from ICM	Invalid Data Received from ICM		
U0140-87	Lost Communication with BCM	Lost Communication with BCM		

DTC Diagnosis Procedure

DTC	**C1950-16**	**Battery Voltage Low Detection**
DTC	**C1951-17**	**Battery Voltage High Detection**

DTC Confirmation Procedure

- Turn ENGINE START STOP switch to OFF.
- Connect the diagnostic tester (the latest software).
- Start engine and warm it up, and then read DTC again. If DTC is detected, malfunction is current.
- If DTC is not detected, malfunction is intermittent.

Hint:
When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	**Check battery voltage**

(a) Using multimeter, check if battery voltage is normal.

NG → **Repair or replace battery as needed**

OK ↓

2	**Check EGS module power supply fuse**

(a) Check if “EGS” power supply fuse in instrument panel fuse and relay box is blown.

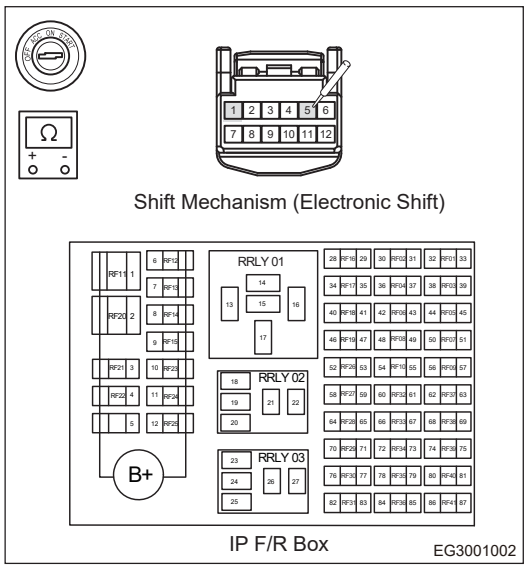
NG → **Replace fuse**

OK ↓

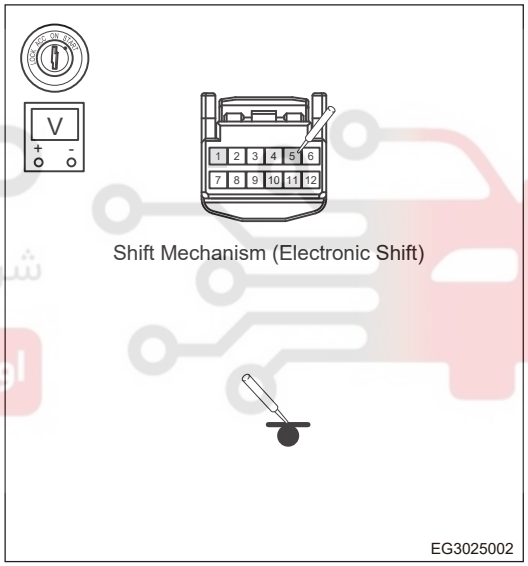
3	**Check supply circuit**

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the electronic shift module connector.

(d) Using voltage band of multimeter to measure resistance between terminals 1, 5 of electronic shift module and instrument panel fuse and relay box (connected terminals) to check circuit for open.



(e) Use a multimeter to measure voltage between terminals 1, 5 of electronic shift module and body ground, it should be not less than 12 V.



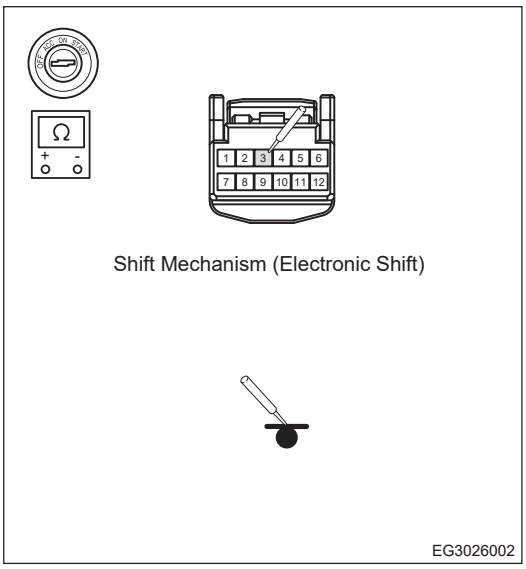
NG → **Repair or replace wire harness or connector as needed**

OK

4	**Check EGS shift module ground**

(a) Turn ENGINE START STOP switch to ON.

(b) Use a multimeter to measure resistance between terminal 3 of electronic shift module and body ground to check ground wire for open.



NG → **Check wire harness or handle ground point**

OK →

5	**Reconfirm DTCs**

(a) Connect all the connectors.
(b) Connect the negative battery cable.
(c) Turn ENGINE START STOP switch to ON.
(d) Check if DTC exists.

OK → **Confirm that system is normal**

NG → **Replace EGS shift module assembly**

DTC	**C196B-00**	**F1 Stuck**
DTC	**C196C-00**	**F2 Stuck**
DTC	**C196D-00**	**B1 Stuck**
DTC	**C196E-00**	**B2 Stuck**
DTC	**C196F-00**	**M+ Stuck**
DTC	**C1970-00**	**M- Stuck**
DTC	**C1956-49**	**Light Detection Fault**
DTC	**C1957-49**	**Heavy Detection Fault**
DTC	**C1959-13**	**Park Button 1 Open Circuit**

DTC	C195A-11	Park Button 1 Short to GND
DTC	C195B-12	Park Button 1 Short to VCC
DTC	C195C-92	Park Button 1 Pressed for 60s
DTC	C195D-13	Park Button 2 Open Circuit
DTC	C195E-11	Park Button 2 Short to GND
DTC	C195F-12	Park Button 2 Short to VCC
DTC	C1960-92	Park Button 2 Pressed for 60s
DTC	C1961-13	M Button Open Circuit
DTC	C1962-11	M Button Short to GND
DTC	C1963-12	M Button Short to VCC
DTC	C1964-92	M Button Pressed for 60s

DTC Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing the following procedures.

- Turn ENGINE START STOP switch to OFF.
- Connect the diagnostic tester (the latest software).
- Turn ENGINE START STOP switch to ON.
- Use the diagnostic tester to record and clear DTCs stored in the system.
- Turn ENGINE START STOP switch to OFF and wait several seconds.
- Turn ENGINE START STOP switch to ON and check DTCs in the system again.
- If DTC is detected, it indicates current malfunction.
- If no DTC is detected, malfunction indicated by the DTC is intermittent.

⚠ Caution

- When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

Hint:

When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	**Check wire harness and connector**

(a) Turn off all electrical equipment and ENGINE START STOP switch.
(b) Disconnect the negative battery cable.
(c) Disconnect the shift module connector.
(d) Check if wire harnesses are worn, pierced, pinched or partially broken.
(e) Check for broken, bent, protruded or corroded terminals.

NG → **Repair or replace wire harness or connector**

OK →

2	**Check EGS module power supply fuse**

(a) Check if “EGS module” power supply fuse in instrument panel fuse and relay box is blown.

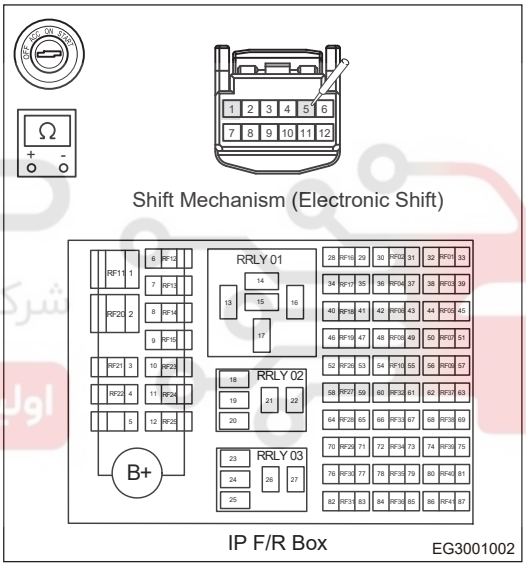
NG → **Replace fuse**

OK

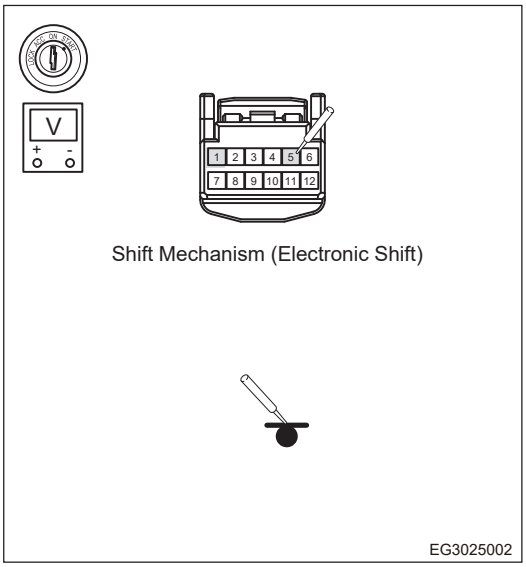
3	**Check supply circuit**

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the electronic shift module connector.

(d) Using voltage band of multimeter to measure resistance between terminals 1, 5 of electronic shift module and instrument panel fuse and relay box (connected terminals) to check circuit for open.



(e) Use a multimeter to measure voltage between terminals 1, 5 of electronic shift module and body ground, it should be not less than 12 V.



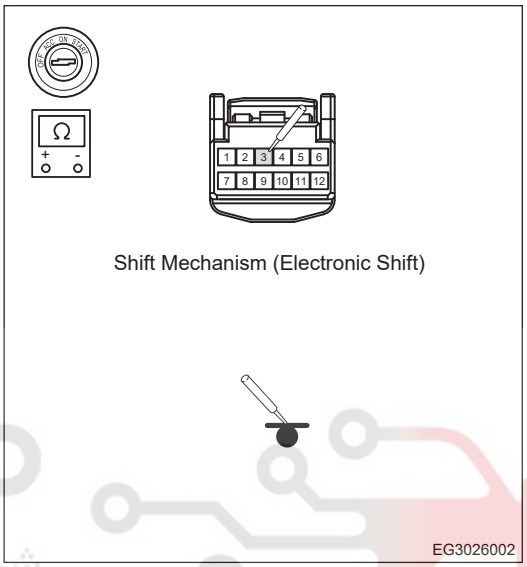
NG → **Repair or replace wire harness or connector as needed**

OK

4	Check EGS shift module ground

(a) Turn ENGINE START STOP switch to ON.

(b) Use a multimeter to measure resistance between terminal 3 of electronic shift module and body ground to check ground wire for open.



NG → **Check wire harness or handle ground point**

OK

5	Reconfirm DTCs

(a) Connect all the connectors.
(b) Connect the negative battery cable.
(c) Turn ENGINE START STOP switch to ON.
(d) Check if DTC exists.

OK → **Confirm that system is normal**

NG → **Replace EGS shift module assembly**

DTC	**C1971-46**	**Calibration Parameters Be Corrupted**
DTC	**C1972-92**	**Torque Missing Check**

DTC Confirmation Procedure
Confirm that battery voltage is not less than 12 V before performing the following procedures.

- Turn ENGINE START STOP switch to OFF.
- Connect the diagnostic tester (the latest software).
- Turn ENGINE START STOP switch to ON.
- Use the diagnostic tester to record and clear DTCs stored in the system.
- Turn ENGINE START STOP switch to OFF and wait several seconds.
- Turn ENGINE START STOP switch to ON and check DTCs in the system again.
- If DTC is detected, it indicates current malfunction.
- If no DTC is detected, malfunction indicated by the DTC is intermittent.

⚠ Caution
• When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

Hint:
When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	**Check wire harness and connector**

(a) Turn off all electrical equipment and ENGINE START STOP switch.
(b) Disconnect the negative battery cable.
(c) Disconnect the shift module connector.
(d) Check if wire harnesses are worn, pierced, pinched or partially broken.
(e) Check for broken, bent, protruded or corroded terminals.

NG → **Repair or replace wire harness or connector**

OK

2	**Reconfirm DTCs**

(a) Connect all the connectors.
(b) Connect the negative battery cable.
(c) Turn ENGINE START STOP switch to ON.
(d) Check if DTC exists.

OK → **Confirm that system is normal**

NG → **Replace EGS shift module assembly**

DTC	**U0073-88**	**CAN Bus Off**
DTC	**U0100-87**	**Lost Communication with EMS**

DTC	**U0101-87**	**Lost Communication with TCU**
DTC	**U0129-87**	**Lost Communication with BSM**
DTC	**U0155-87**	**Lost Communication with ICM**
DTC	**U0140-87**	**Lost Communication with BCM**
DTC	**U0401-81**	**Invalid Data Received From EMS**
DTC	**U0402-81**	**Invalid Data Received from TCU**
DTC	**U0418-81**	**Invalid Data Received from BSM**
DTC	**U0423-81**	**Invalid Data Received from ICM**

DTC Confirmation Procedure

- Turn ENGINE START STOP switch to OFF.
- Connect the diagnostic tester (the latest software).
- Turn ENGINE START STOP switch to ON.
- Use the diagnostic tester to record and clear DTCs stored in the system.
- Turn ENGINE START STOP switch to OFF and wait several seconds.
- Turn ENGINE START STOP switch to ON and check DTCs in the system again.
- If DTC is detected, it indicates current malfunction.
- If no DTC is detected, malfunction indicated by the DTC is intermittent.

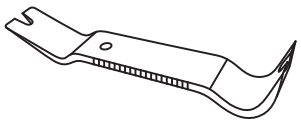
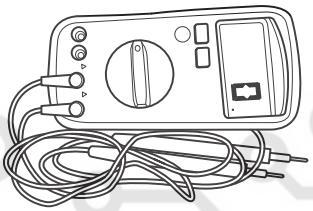
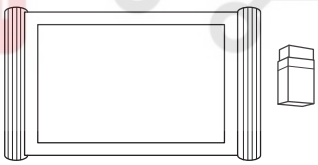
Hint:
When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

1	**(Refer to CAN system)**

On-vehicle Service

Tools

General Tools

Tool Name	Tool Drawing
Interior Crow Plate	 S00020
Digital Multimeter	 S00002
X-431 PAD Diagnostic Tester	 S00001

Specifications

Torque Specifications

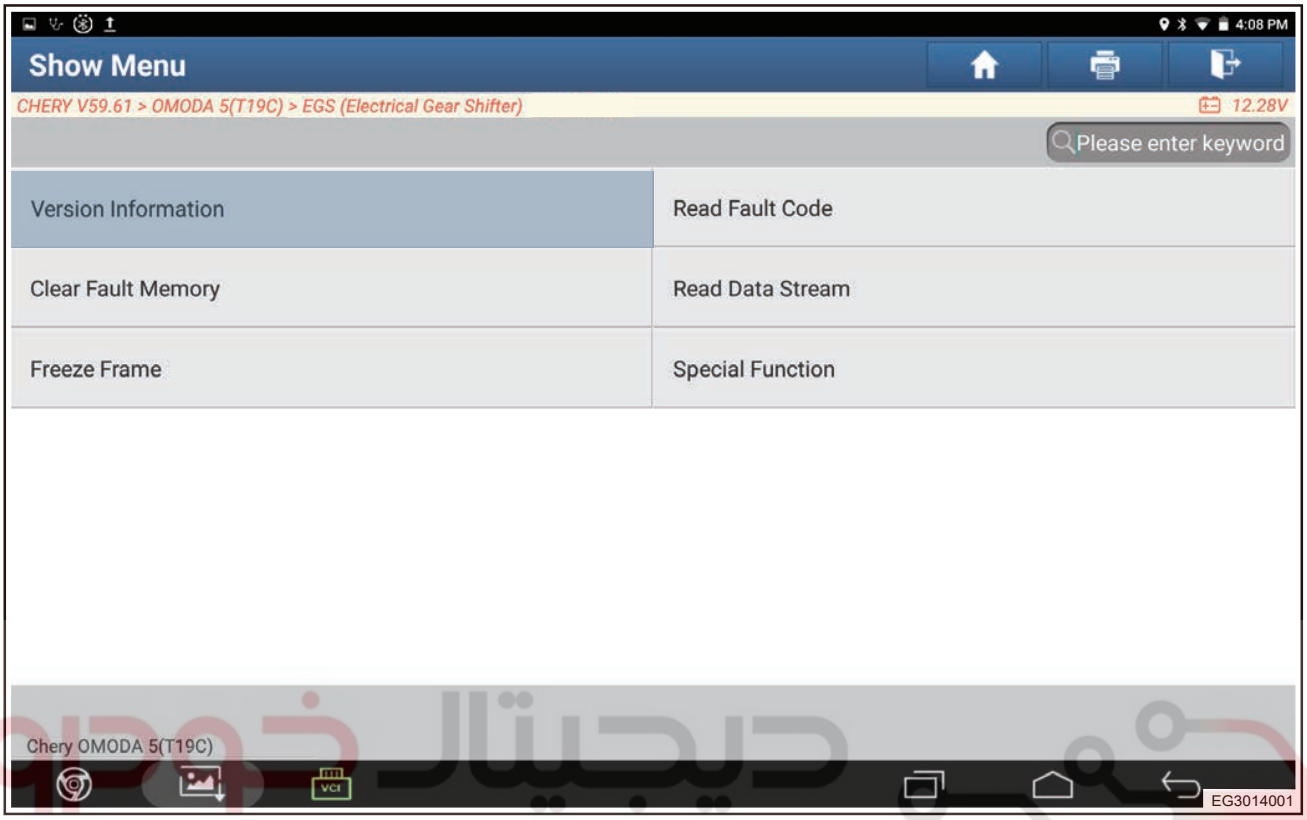
Position	Torque Specifications (N·m)
Automatic Gearshift Control Mechanism Fixing Screw	1.5 ± 0.5
Electronic Shift Control Mechanism Fixing Bolt	5 ± 1

Method for Distinguishing Manufactures of Electronic Shift Lever

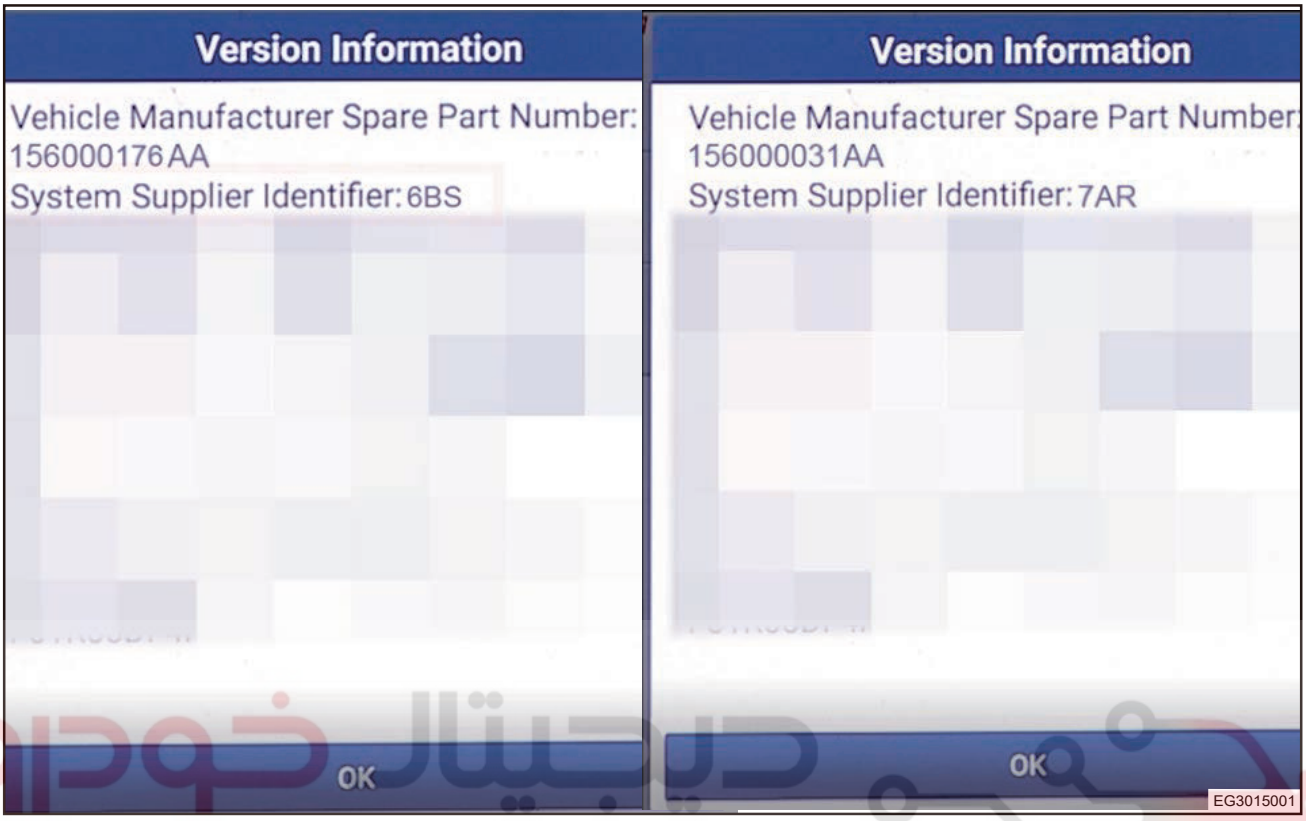
Warning
• When removing shift lever assembly, be sure to wear safety equipment to prevent accidents. • Appropriate force should be applied, when removing shift lever assembly. Be careful not to operate roughly.

1. Connect the diagnostic tester.
2. Turn ENGINE START STOP switch to ON.
3. Operate diagnostic tester to enter EGS system.

4. Click “Version Information”.



5. Read manufacturer code.



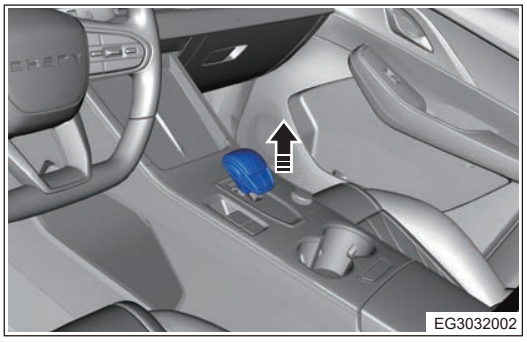
a.6BS belongs to Wuhu Qifeng, and 7AR belongs to Ficosa.

Shift Lever Assembly

Removal

Warning
• When removing shift lever assembly, be sure to wear safety equipment to prevent accidents. • Appropriate force should be applied, when removing shift lever assembly. Be careful not to operate roughly.

1. Disconnect the negative battery cable.
2. Remove the shift lever assembly (6BS).
   a. Remove shift lever assembly in direction of arrow.



Installation

⚠ Caution

- Insert shift lever assembly along the direction of shift lever of shift control mechanism, until shift lever reaches the lower limit (there will be a slight sound of a snap ring in place), and shift lever can not be pushed down.
- Slightly apply force to push the lever upward after assembly, confirm it is assembled in place.
- Do not hit the lever to avoiding damaging connector.

1. Installation is in the reverse order of removal.

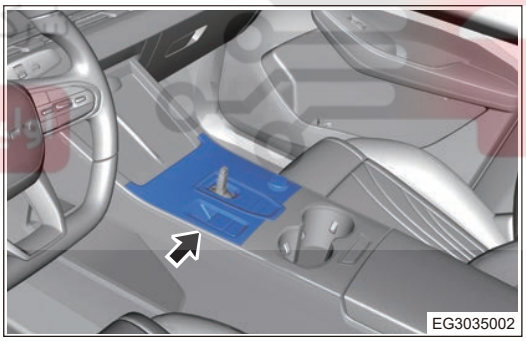
Electronic Shift Control Mechanism Assembly

Removal

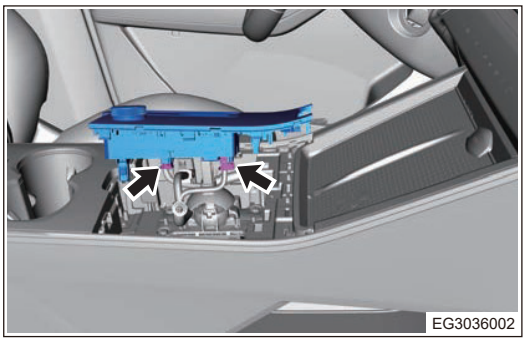
⚠ Warning

- When removing shift control mechanism assembly, be sure to wear safety equipment to prevent accidents.
- Appropriate force should be applied, when removing shift control mechanism assembly. Be careful not to operate roughly.

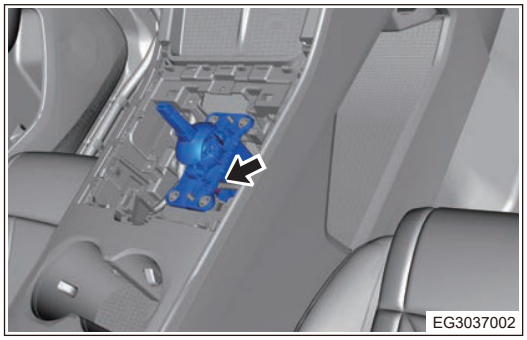
1. Turn ignition switch to OFF.
2. Disconnect the negative battery cable.
3. Remove the shift knob assembly.
4. Using an interior crow plate, carefully pry off auxiliary fascia console control panel assembly (arrow).



5. Disconnect switch connector (arrow) from auxiliary fascia console control panel, and remove upper cover plate assembly.

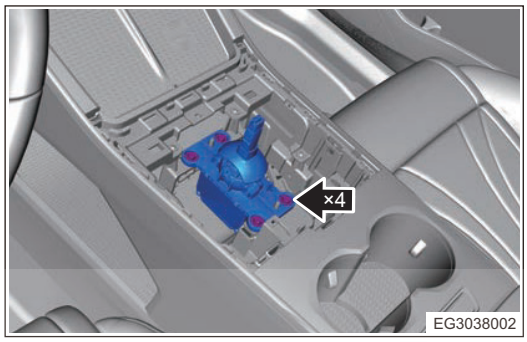


6. Disconnect the electronic shift control mechanism assembly wire harness connector (arrow).



7. Remove 4 fixing bolts (arrow) from electronic shift control mechanism assembly, then remove electronic shift control mechanism assembly.

   Tightening torque: 5 ± 1 N·m



Installation

⚠ Caution

- After replacing electronic shift mechanism assembly, use the diagnostic tester to write VIN code.
- Insert shift lever assembly along the direction of shift lever of shift control mechanism, until shift lever reaches the lower limit (there will be a slight sound of a snap ring in place), and shift lever cannot be pushed down.
- Slightly apply force to push the knob upward after assembly, confirm it is assembled in place.
- Do not hit the lever to avoiding damaging connector.

1. Installation is in the reverse order of removal.

Matching Learning

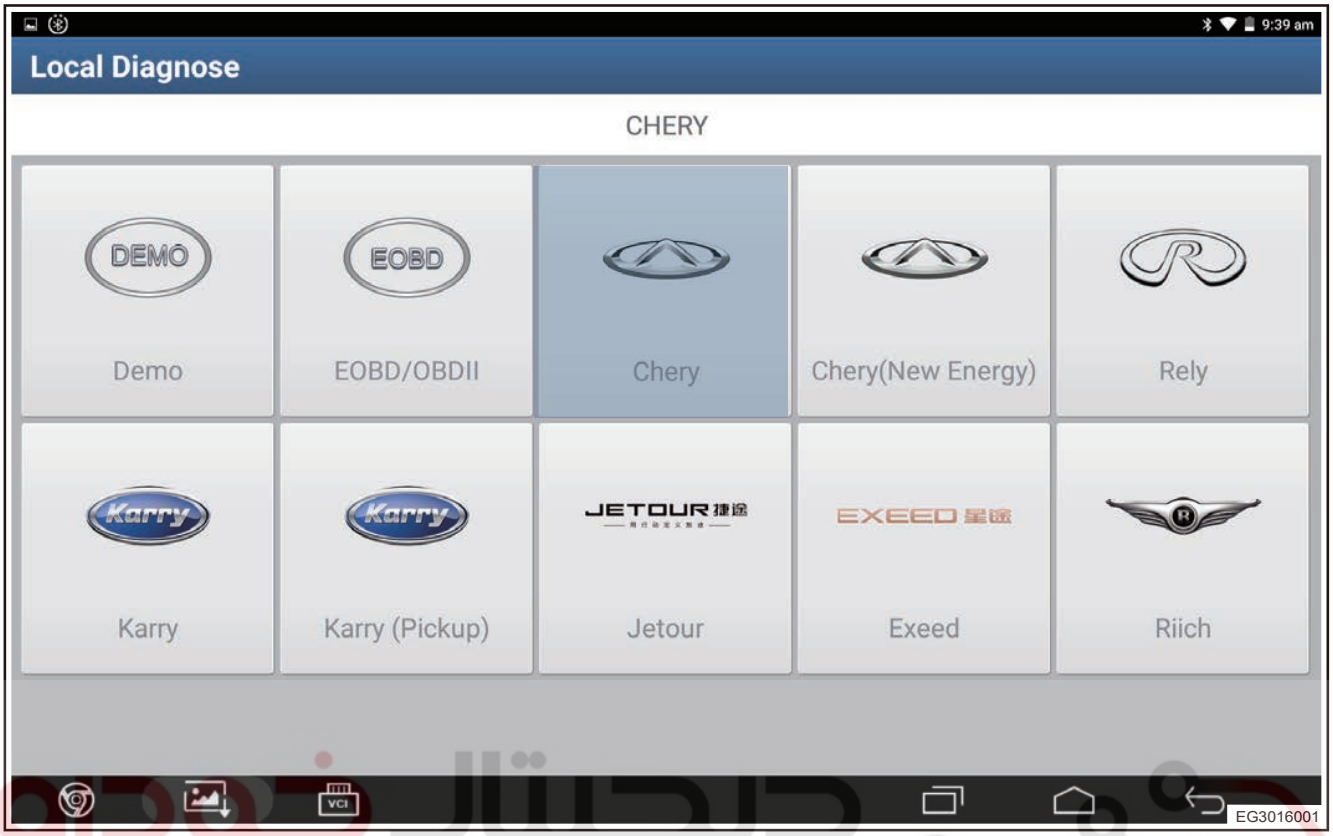
Write VIN Code

Hint:

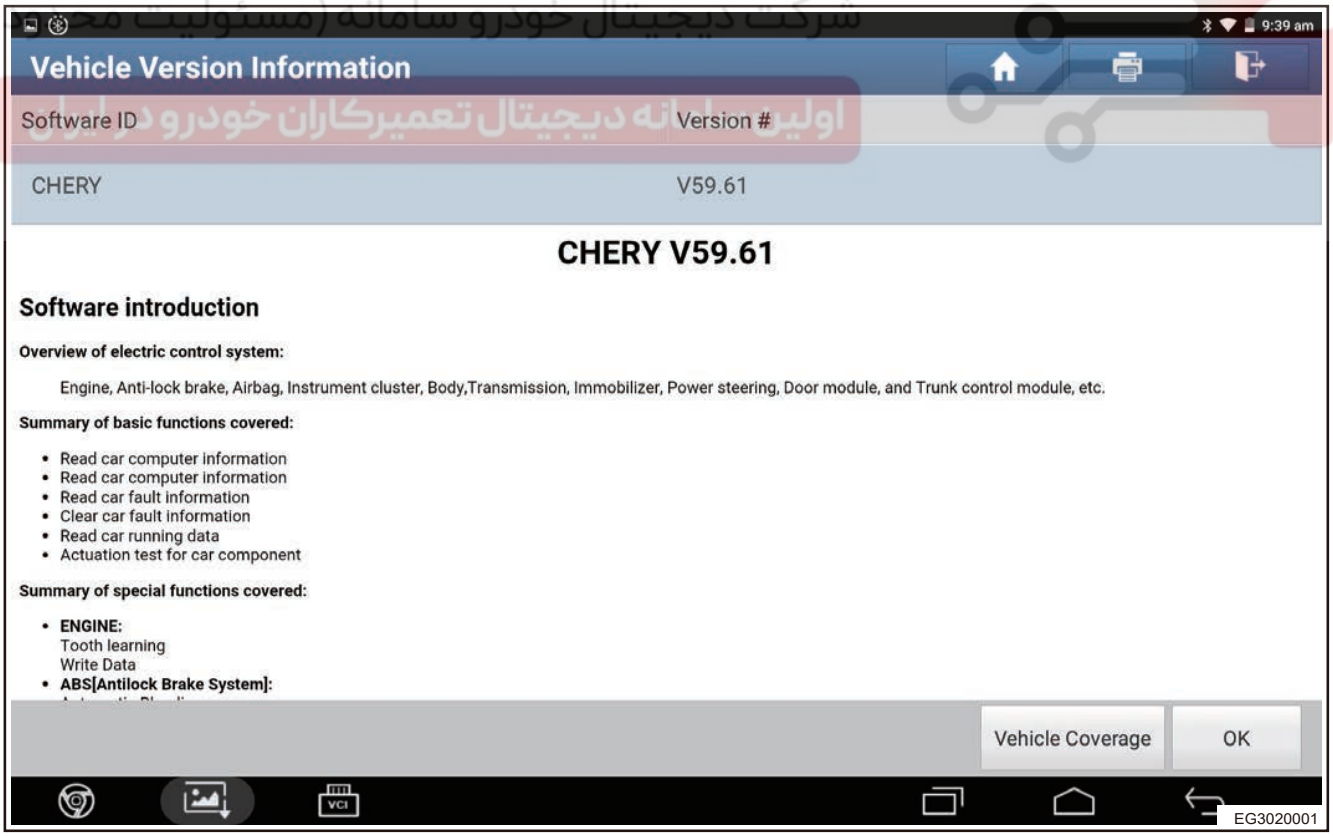
- After replacing electronic shift mechanism assembly, use the diagnostic tester to write VIN code.

1. Connect diagnostic tester, and select “Chery”.

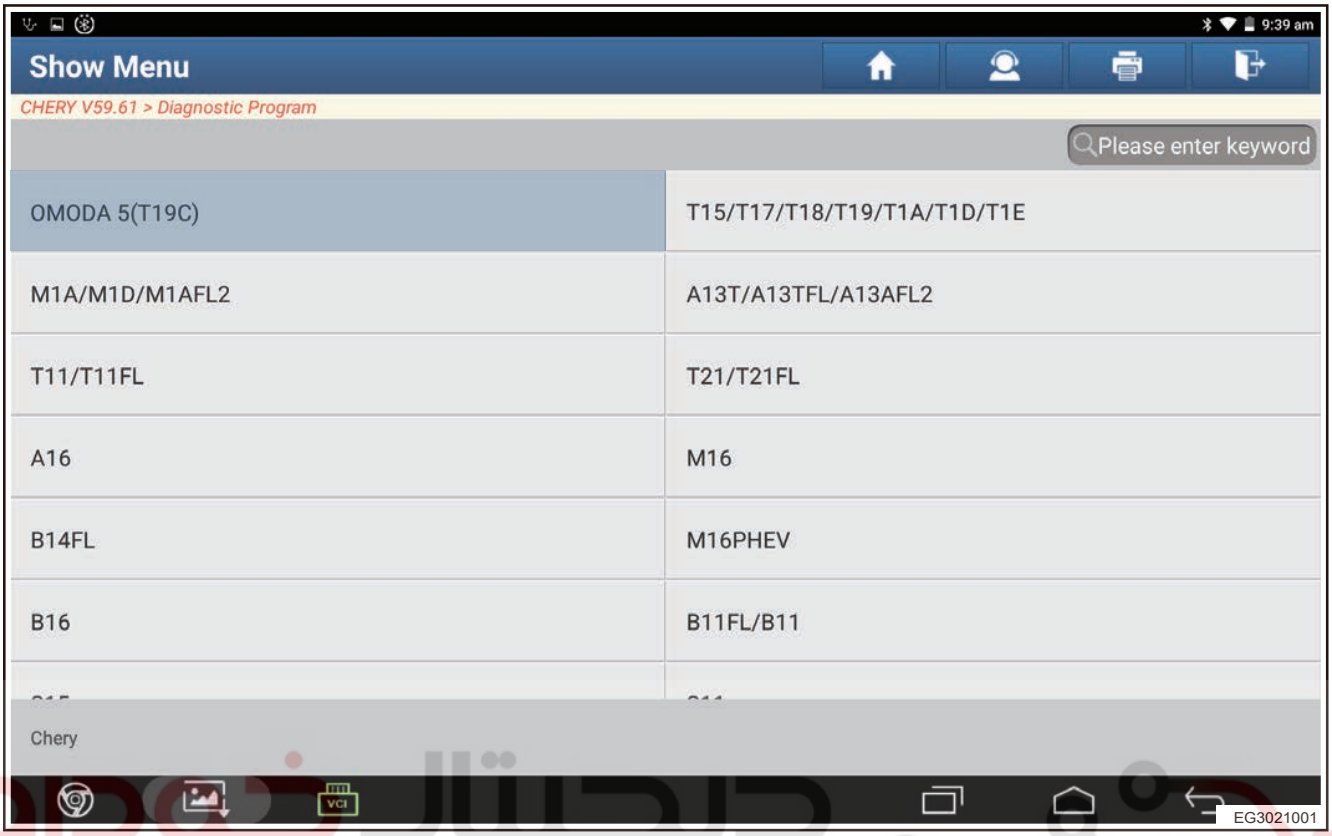
04 - 7DCT



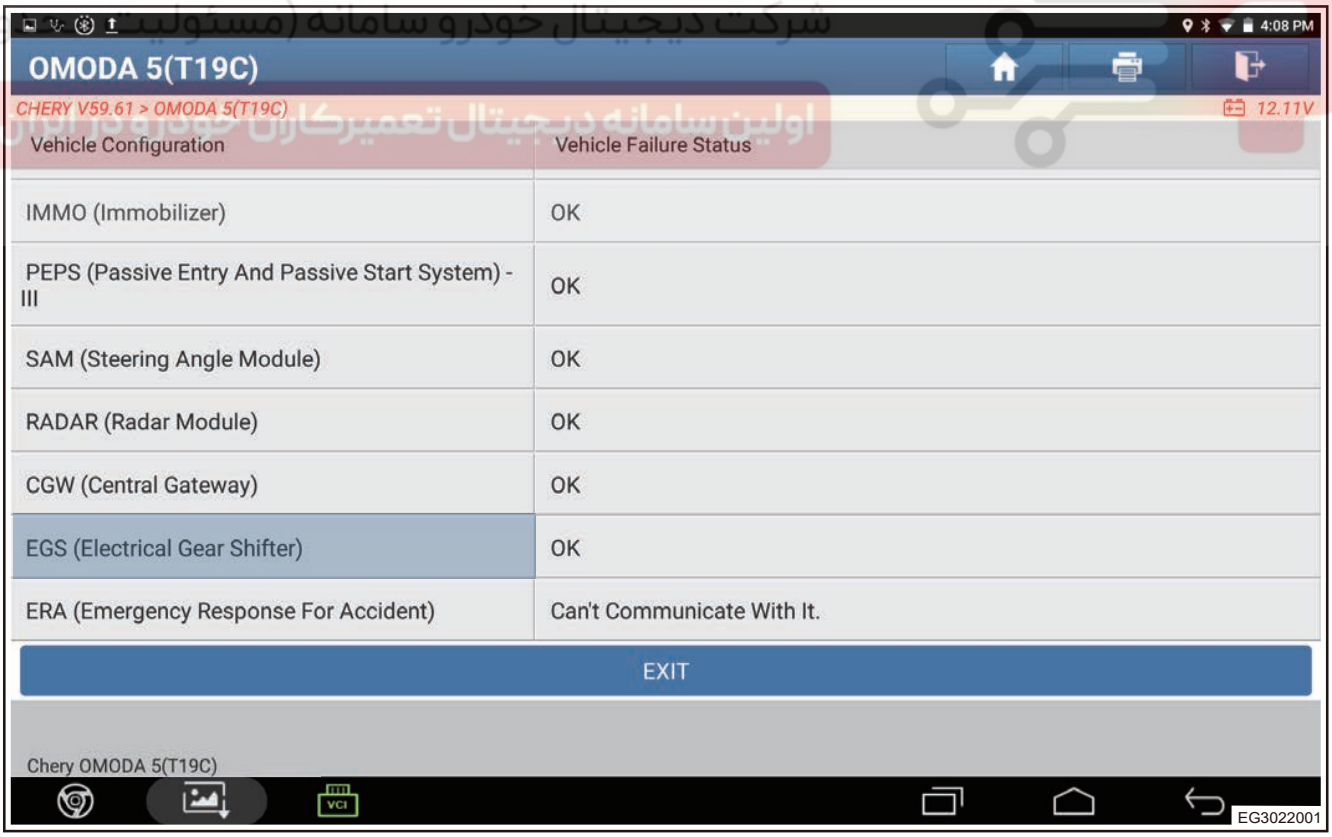
2. Select Vehicle Version Information, and click “OK”.



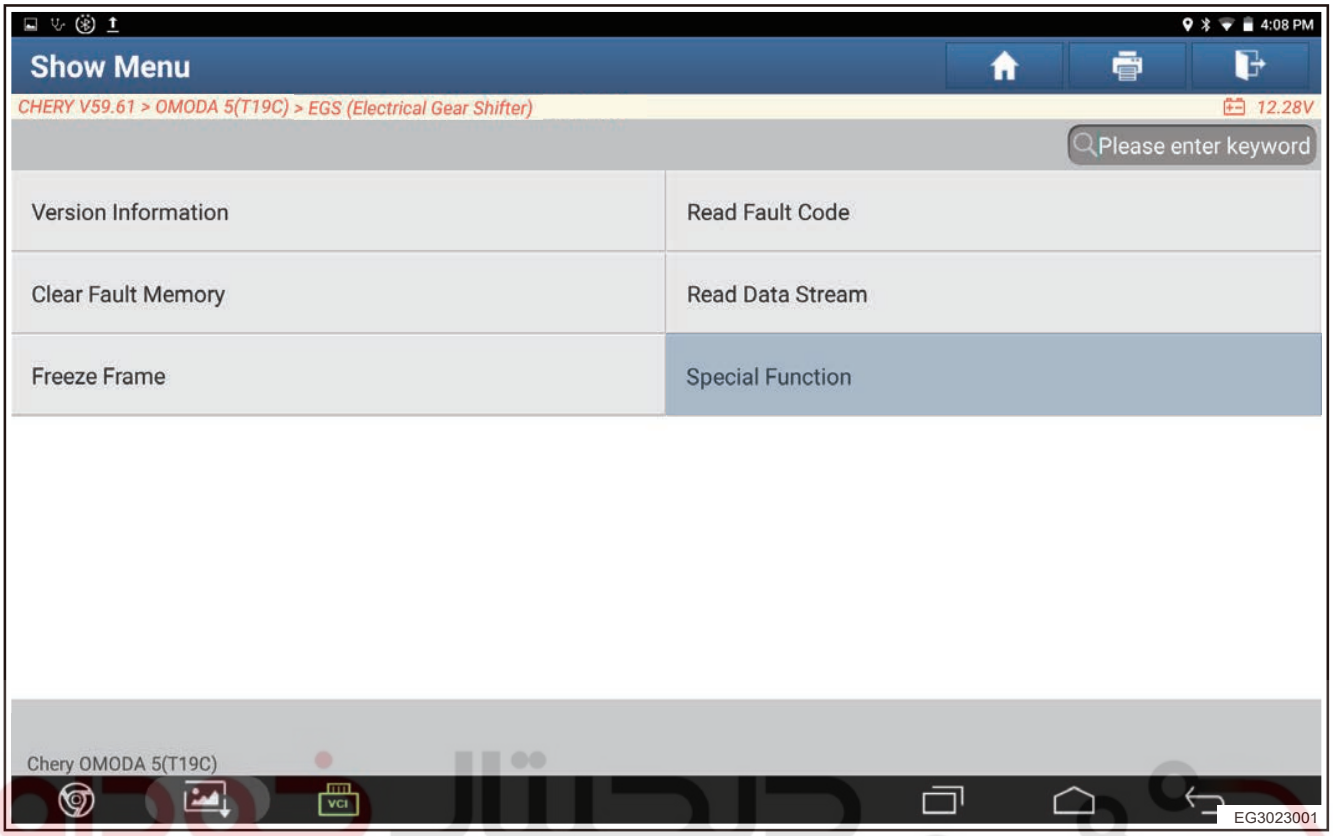
3. Select “OMODA 5(T19C)” vehicle model.



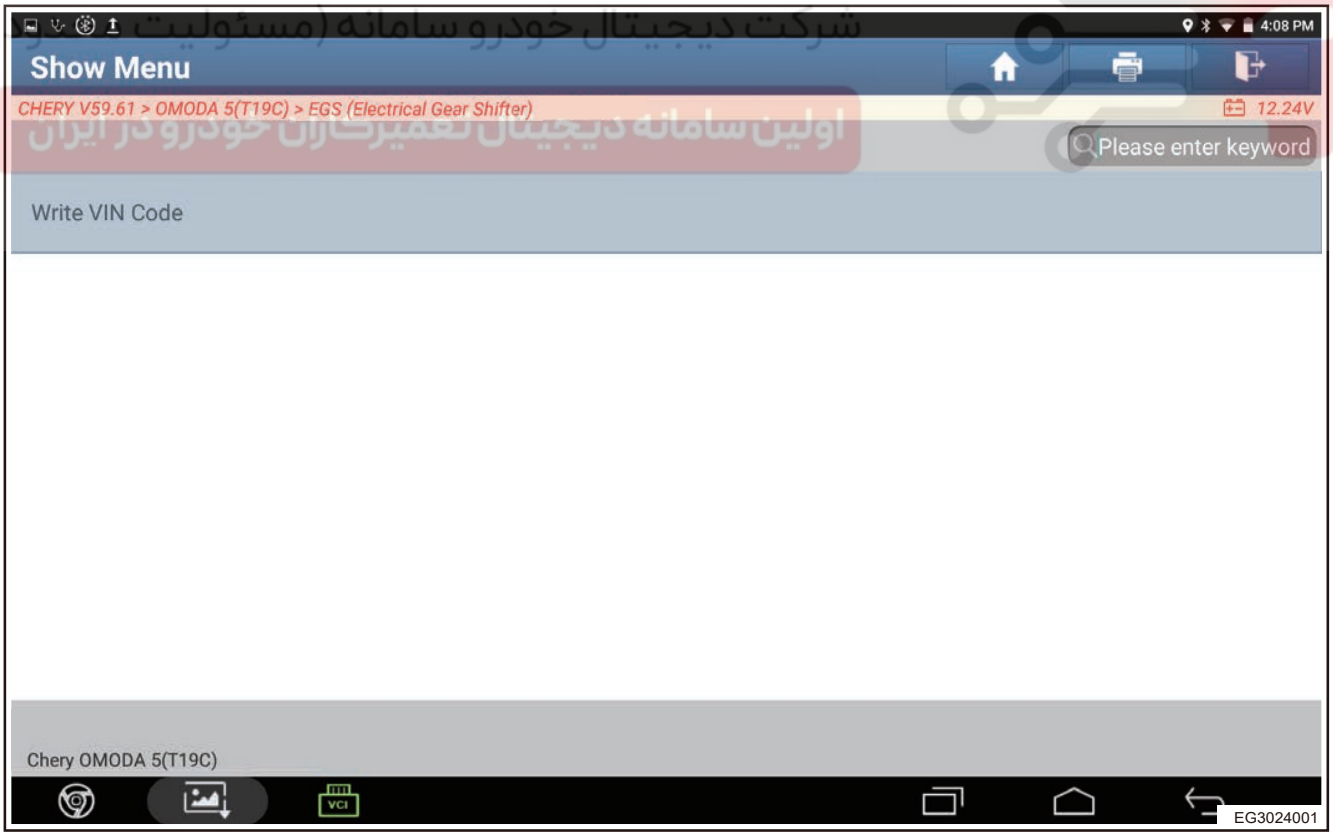
4. Select “EGS (Electrical Gear Shifter)”.



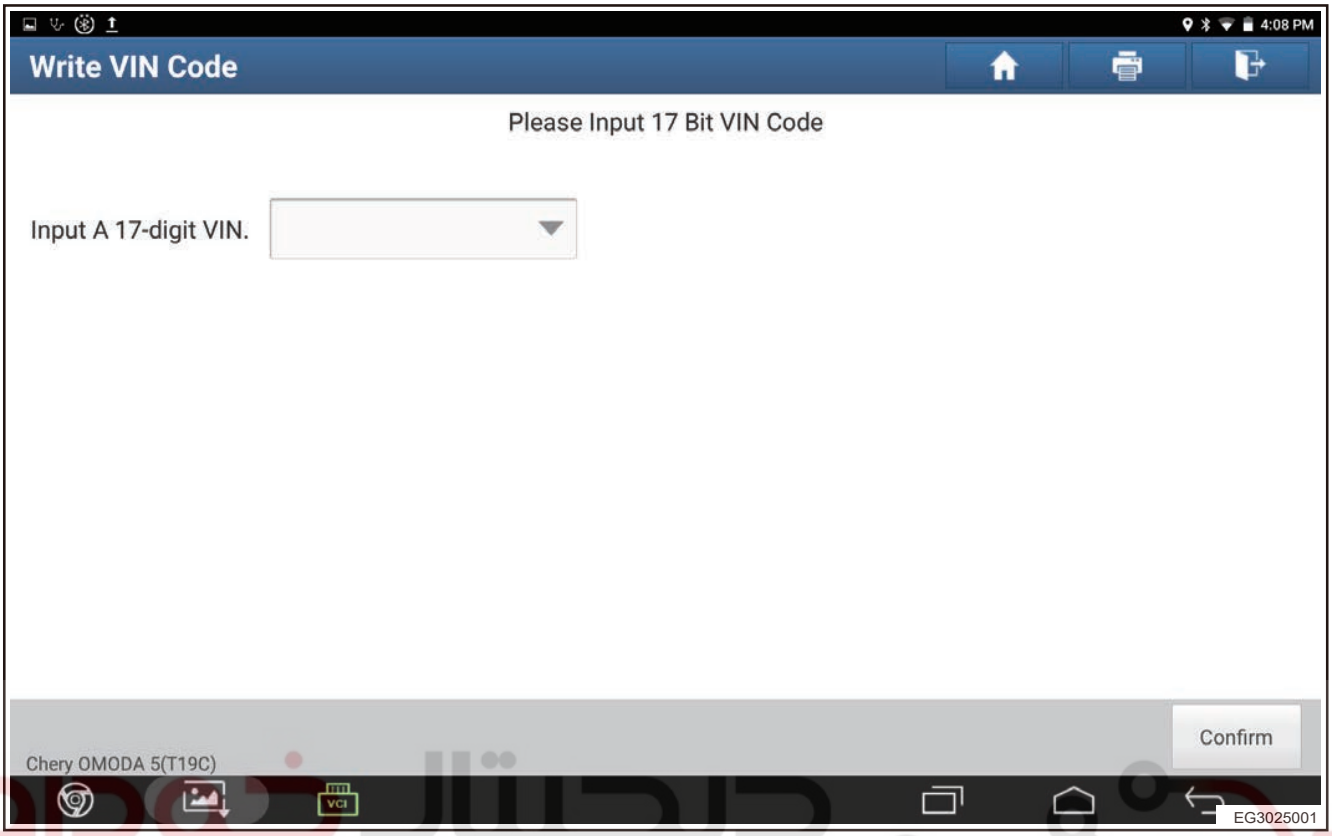
5. Select “Special Function”.



6. Select “Write VIN Code”.



7. Write VIN code. After confirming information, click “Confirm”.



8. Interface shows “VIN Written Successfully!”, then click “OK”.

DRIVE SHAFT

Warnings and precautions

Warnings

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

1. Be sure to wear safety equipment to prevent accidents, when removing drive shaft assembly.

Precautions

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

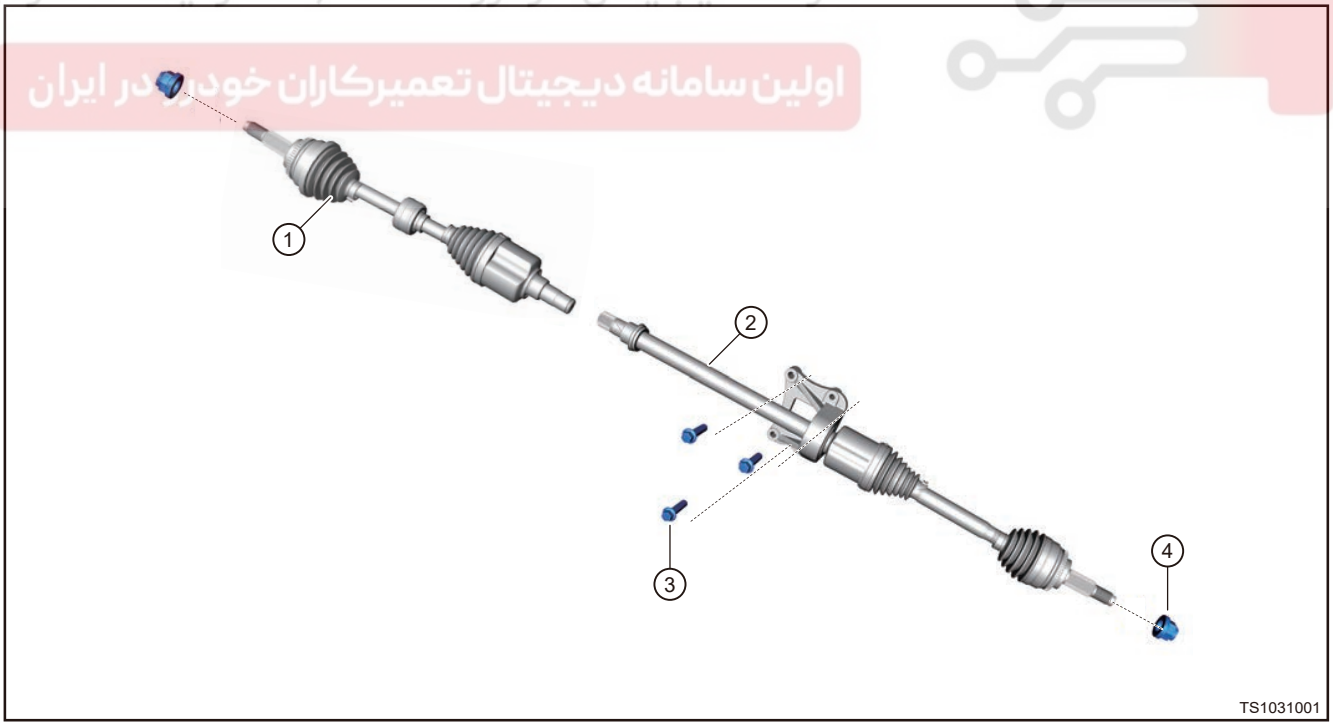
1. Appropriate force should be applied, when removing drive shaft assembly. Be careful not to operate roughly.
2. When loosening staked part of nut, it is necessary to loosen it completely, otherwise, threads of drive shaft assembly will be damaged.

System Overview

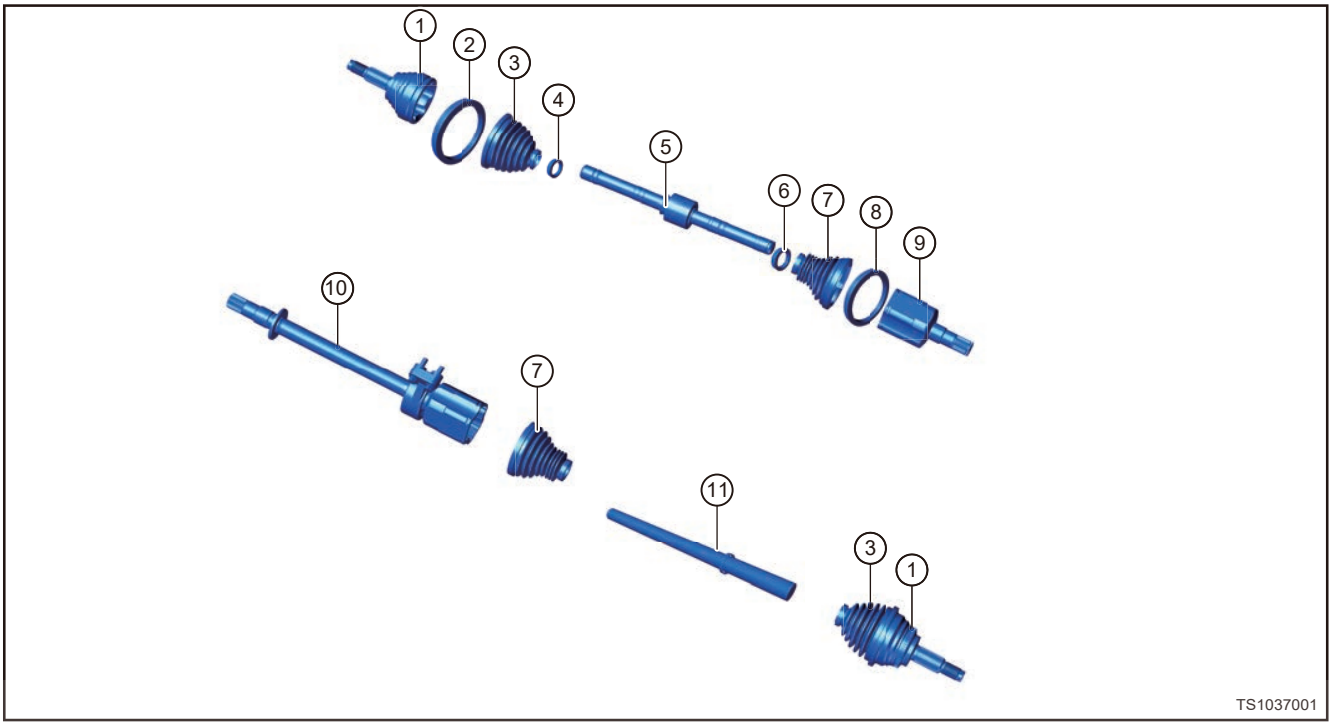
System Description

Drive shaft, which is a solid shaft, transmits torque between differential and drive wheels. Generally, the inner end of drive shaft is connected with drive shaft gear by spline, and the outer end is connected with wheel hub. Drive shaft transmits torque from differential to wheels, thus rotating the wheels to run vehicle.

System Components Diagram



1	Front Left Drive Shaft Assembly	3	Hexagon Flange Bolt
2	Front Right Drive Shaft with Bearing Bracket Assembly	4	Hexagon Flange Face Self-locking Nut



1	Outer Ball Cage	7	Inner Ball Cage Boot
2	Outer Ball Cage Large Clamp	8	Inner Ball Cage Large Clamp
3	Outer Ball Cage Boot	9	Inner Ball Cage
4	Outer Ball Cage Small Clamp	10	Intermediate Drive Shaft Assembly Body
5	Front Left Drive Shaft Assembly Body	11	Front Right Drive Shaft Assembly Body
6	Inner Ball Cage Small Clamp		

On-vehicle Service

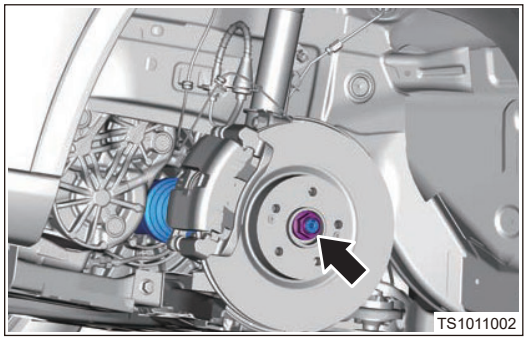
Replacement of Front Left Drive Shaft Assembly

Removal

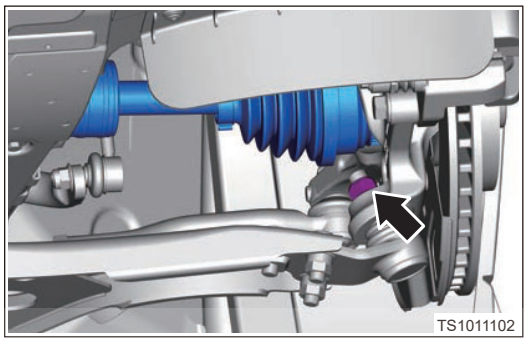
⚠ Warning

- Be sure to wear safety equipment to prevent accidents, when removing front left drive shaft assembly.
- Appropriate force should be applied, when removing front left drive shaft assembly. Be careful not to operate roughly.

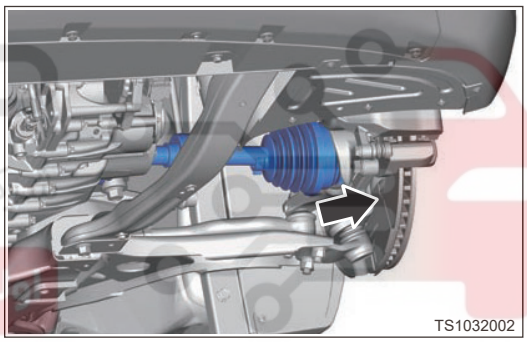
1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove the front left wheel.
4. Remove the engine lower protector assembly.
5. Drain the transmission oil.
6. Remove front left drive shaft locking nut (arrow) while applying brake.



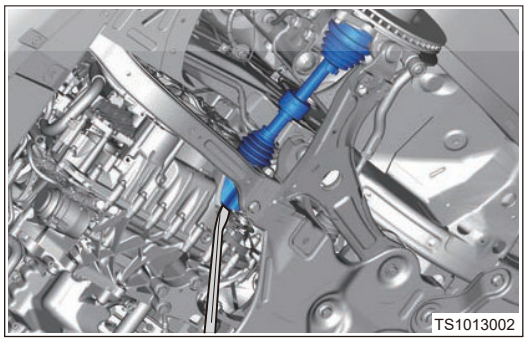
7. Remove coupling nut (arrow) between front left steering knuckle and control arm ball pin, and separate control arm ball pin from steering knuckle with tools.



8. Detach the front left drive shaft outer ball cage spline from spline groove of front hub.



9. Carefully pry out the inner ball cage spline inserted into transmission end with crowbar.



10. Remove the front left drive shaft assembly.

Installation

⚠ Caution

- Do not pull shaft lever and outer ball cage end during assembly to avoid inner ball cage tripod joint slipping out excessively from interior of housing. Otherwise, inner end boot will be squeezed when it is intruded again, causing oil leakage and affecting its service life. Confirmation method after assembling in place: When an obvious metallic sound between drive shaft and transmission positioning surface is heard, hold the inner ball cage sliding sleeve and pull it outward. If it cannot be pulled out, it indicates that it has been installed in place.
- When the inner ball cage is inserted into transmission, be careful not to make spline to scratch differential oil seal, or it will cause damage to oil seal main lip.
- Take particular care to prevent contact and collision between the sealing boot and hard objects such as tools rack and chassis parts during the assembly and transport; If there are any damages or scratch traces of the boot during assembly, the sample must be replaced and do not assemble it to vehicle privately.
- Do not hold the sealing boot with hands to prevent wrinkles from forming on sealing boot during installation.
- Protect the threads, spline and installation surface to prevent from forming defects such as nick, scratch.
- Make sure that there is no excessive pivot angle, excessive impact, excessive stretch and excessive compression on both ends of universal joint during fixture and assembly operation to avoid contact between drive shaft internal end sealing boot and tripod universal joint.
- Serious tensile deformation of boot is strictly prohibited during assembly.

1. Insert the front left drive shaft inner ball cage spline into transmission output end so that snap ring drops in transmission left output end snap spring groove.

⚠ Caution

- Check if snap spring retainer is assembled in place after assembly.

2. Insert outer ball cage spline of front left drive shaft assembly into spline groove of front hub, and install hexagon flange self-locking nut.
3. Install the coupling nut between front left steering knuckle and control arm ball pin.
4. Tighten the axle front left drive shaft locking nut while applying brake.

   Tightening torque:
   270 ± 20 N·m
5. Fill the transmission oil.
6. Install the engine lower protector assembly.
7. Install the front left wheel.

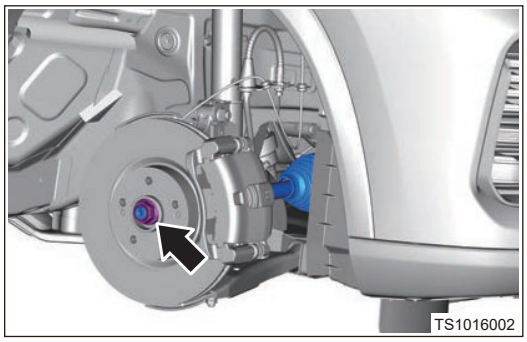
Replacement of Front Right Drive Shaft Assembly

Removal

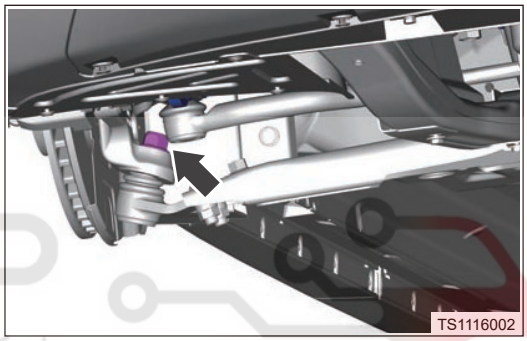
⚠ Warning

- Be sure to wear safety equipment to prevent accidents, when removing front right drive shaft assembly.
- Appropriate force should be applied, when removing front right drive shaft assembly. Be careful not to operate roughly.

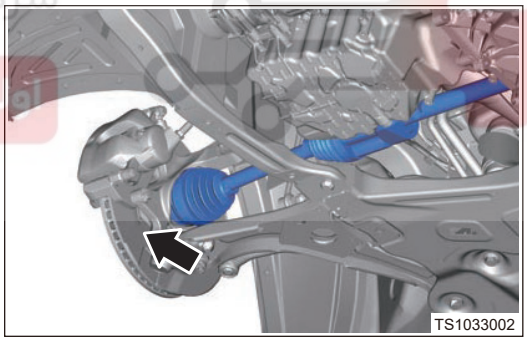
1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove the front right wheel.
4. Remove the engine lower protector assembly.
5. Drain the transmission oil.
6. Remove the front right drive shaft locking nut (arrow) while applying brake.



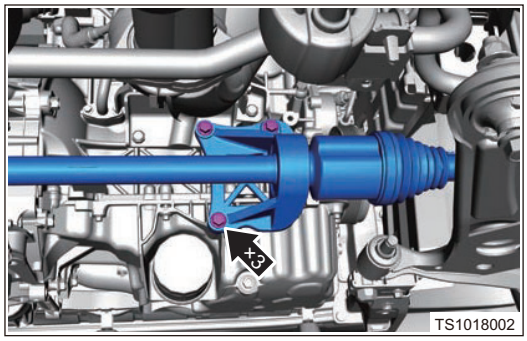
7. Remove the coupling nut (arrow) between front right steering knuckle and control arm ball pin, and separate control arm ball pin from steering knuckle with tools.



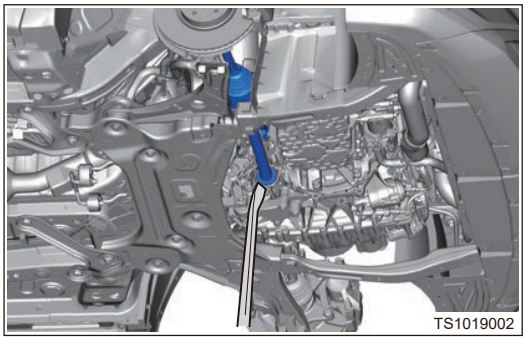
8. Detach the front right drive shaft outer ball cage spline from spline groove of front hub.



9. Remove 3 fixing bolts (arrow) between front right drive shaft assembly and engine.



10. Carefully pry out the inner ball cage spline inserted in transmission end with crowbar.



11. Remove the front right drive shaft with bearing bracket assembly.

Installation

⚠ Caution

- Do not pull shaft lever and outer ball cage end during assembly to avoid inner ball cage tripod joint slipping out excessively from interior of housing. Otherwise, inner end boot will be squeezed when it is intruded again, causing oil leakage and affecting its service life. Confirmation method after assembling in place: When an obvious metallic sound between drive shaft and transmission positioning surface is heard, hold the inner ball cage sliding sleeve and pull it outward. If it cannot be pulled out, it indicates that it has been installed in place.
- When the inner ball cage is inserted into transmission, be careful not to make spline to scratch differential oil seal, or it will cause damage to oil seal main lip.
- Take particular care to prevent contact and collision between the sealing boot and hard objects such as tools rack and chassis parts during the assembly and transport; If there are any damages or scratch traces of the boot during assembly, the sample must be replaced and do not assemble it to vehicle privately.
- Do not hold the sealing boot with hands to prevent wrinkles from forming on sealing boot during installation.
- Protect the threads, spline and installation surface to prevent from forming defects such as nick, scratch.
- Make sure that there is no excessive pivot angle, excessive impact, excessive stretch and excessive compression on both ends of universal joint during fixture and assembly operation to avoid contact between drive shaft internal end sealing boot and tripod universal joint.
- Serious tensile deformation of boot is strictly prohibited during assembly.

1. Insert front right drive shaft assembly long handle sliding sleeve inner spline into transmission right output end, and align the intermediate bracket holes with engine cylinder hole and oil pan hole.

⚠ Caution

- Check if snap spring retainer is assembled in place after assembly.

2. Install 3 fixing bolts between front right drive shaft assembly and engine.
3. Insert the front right drive shaft assembly outer ball cage spline into spline groove of front hub, and install hexagon flange self-locking nut.
4. Install the coupling nut between front right steering knuckle and control arm ball pin.
5. Tighten the axle front right drive shaft locking nut while applying brake.

   Tightening torque:
   270 ± 20 N·m
6. Fill the transmission oil.
7. Install the engine lower protector assembly.
8. Install the front right wheel.

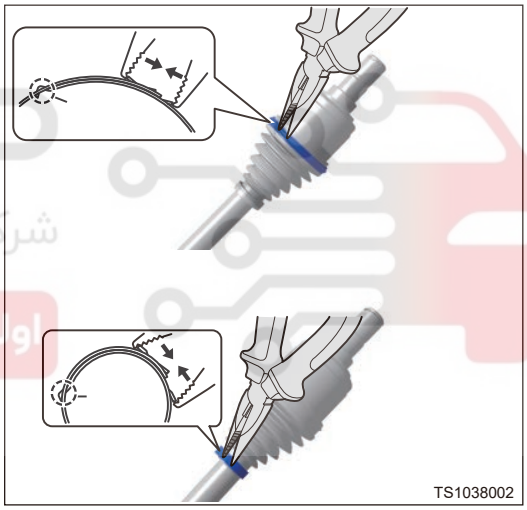
Replacement of Inner Ball Cage

Removal

⚠ Warning

- DO NOT put matchmarks on the rotating surface of rotary drum.
- Operate carefully to prevent dust boot from being damaged.

1. Remove the drive shaft assembly.
2. Using needle nose pliers, remove the inner ball cage dust boot clamps.



3. Separate the dust boot from inner ball cage in direction of arrow.