ELECTRONIC SHIFT MODULE

ELECTRONIC SHIFT MODULE

Warnings & Precautions

Warnings

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

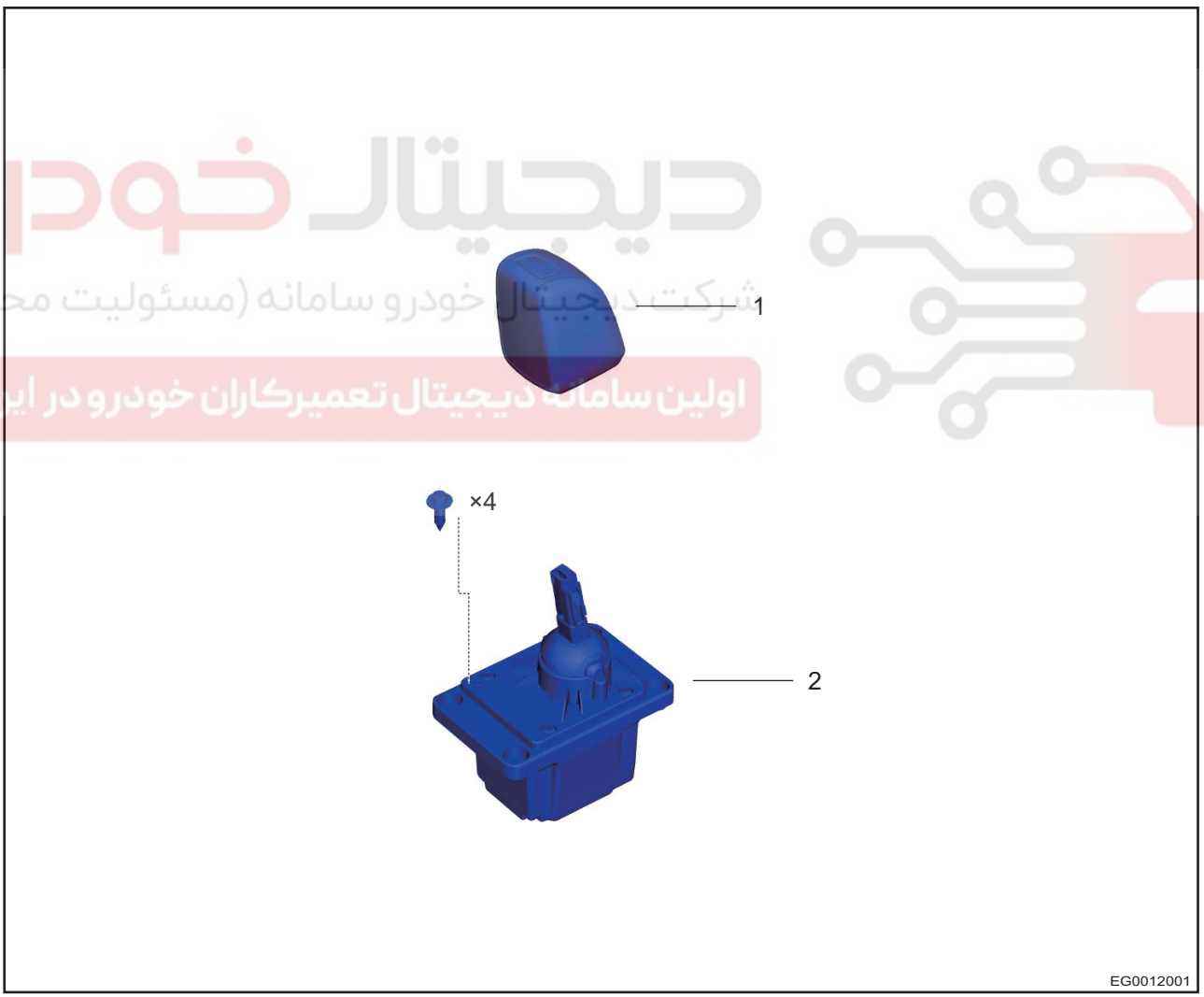
Precautions

In order to avoid dangerous operation and damage to the vehicle before maintenance in this section, please follow the following instructions.

1. Appropriate force should be applied, when removing upper cover plate body. Be careful not to operate roughly.

System Overview

System Component Diagram

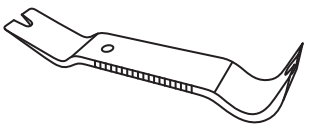
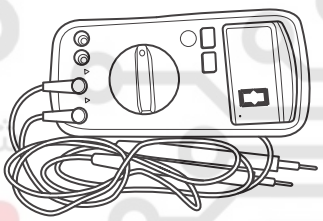
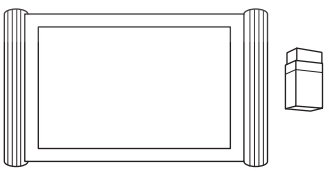


1	Shift Lever Assembly	2	Electronic Shift Control Mechanism Assembly

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 whether to cause damage to the transmission, so as to better protect the transmission and correct the driver's 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. 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.

Special Tools and Equipment

General Tools

Tool Name	Tool Drawing
Interior Crow Plate	 S00020
Digital Multimeter	 S00002
Diagnostic Tester	 S00001

Tightening Torque List

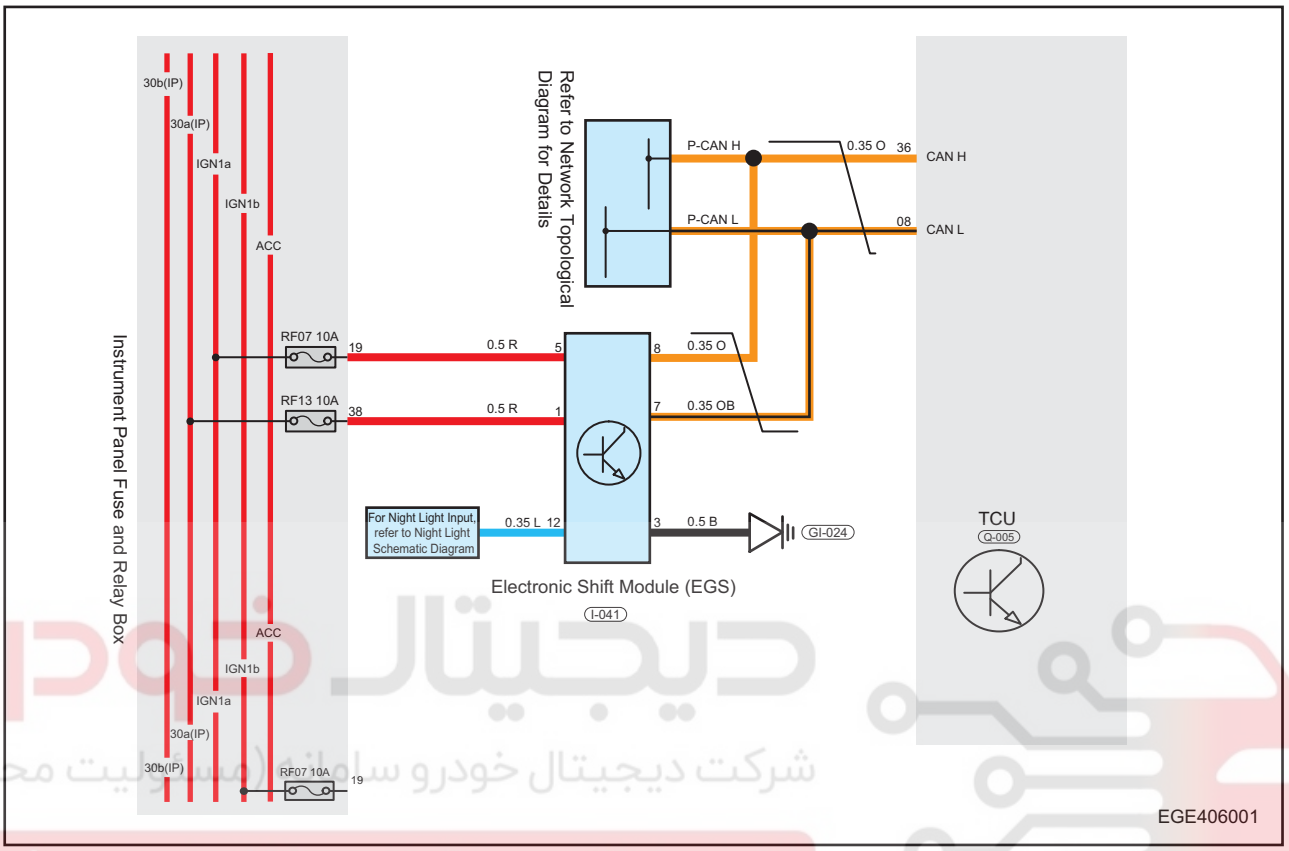
Torque Specifications

Description	Tightening torque
Electronic Shift Module Fixing Screw	1.5 ± 0.5 N·m

System Schematic Diagram

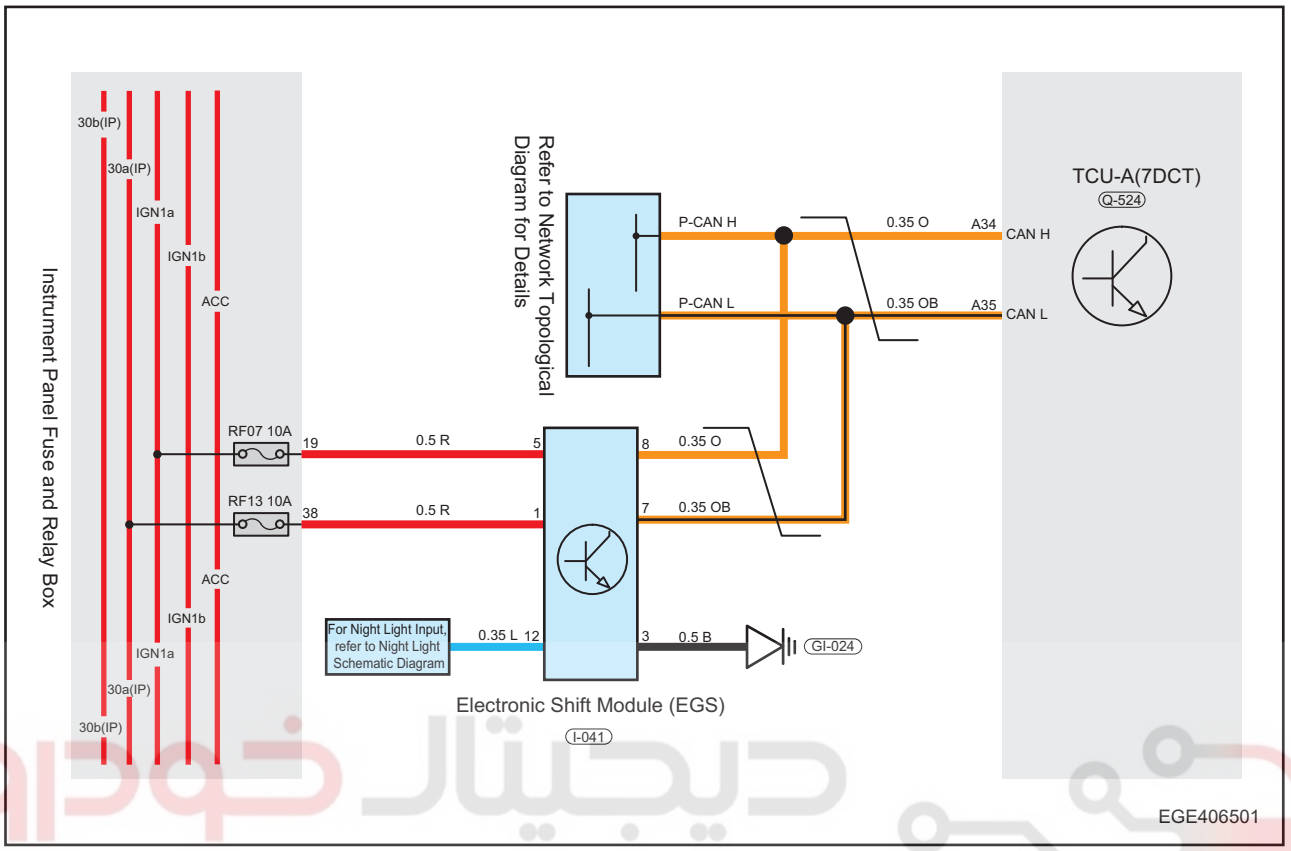
Electronic Shift Module

Electronic Shift System CVT25 (page 1 of 1)



29

Electronic Shift System 7DCT (page 1 of 1)



DIAGNOSIS INFORMATION AND STEPS

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.

Electronic shift module system:

Symptom	Suspected Area
Electronic shift module lost communicate with EMS Electronic shift module lost communicate with TCU Electronic shift module lost communication with BSM Electronic shift module lost communicate With ICM controller Electronic shift module lost communication with BCM	Damaged wire harness or connector
	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

Diagnosis Procedure

Hint:

Use following procedures to troubleshoot the electronic shift module.

1	**Vehicle brought to workshop**

NEXT

2	**Check battery voltage**

Check if battery voltage is normal.

OK

Standard voltage: Not less than 12 V.

Result

Result	Proceed to
OK	A
NG	B

B → **Replace battery**

A

3	**Customer problem analysis**

NEXT

4	**Read DTCs**

Result

Result	Proceed to
DTC	A
No DTC	B

B → Repair according to Problem Symptoms Table

A

5	Read the DTCs (Current DTC and history DTC)

29

Result

Result	Proceed to
DTC	A
No DTC	B

B → According to intermittent DTC troubleshooting

A

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

DTC Confirmation Procedure

Confirm that battery voltage is no less than 12 V before performing following procedures.

- Turn ENGINE START STOP switch to OFF.
- Connect diagnostic tester (the latest software).
- Turn ENGINE START STOP switch to ON.
- Use the diagnostic tester to record and clear DTCs stored in system.
- Turn ENGINE START STOP switch to OFF and wait for a few seconds.
- Turn ENGINE START STOP switch to ON, check the DTCs in 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 wiggle test.
- Check for broken, bent, protruded or corroded terminals.
- Check electronic shift system components and mounting areas for damage, foreign matter, etc. that will cause incorrect signals.

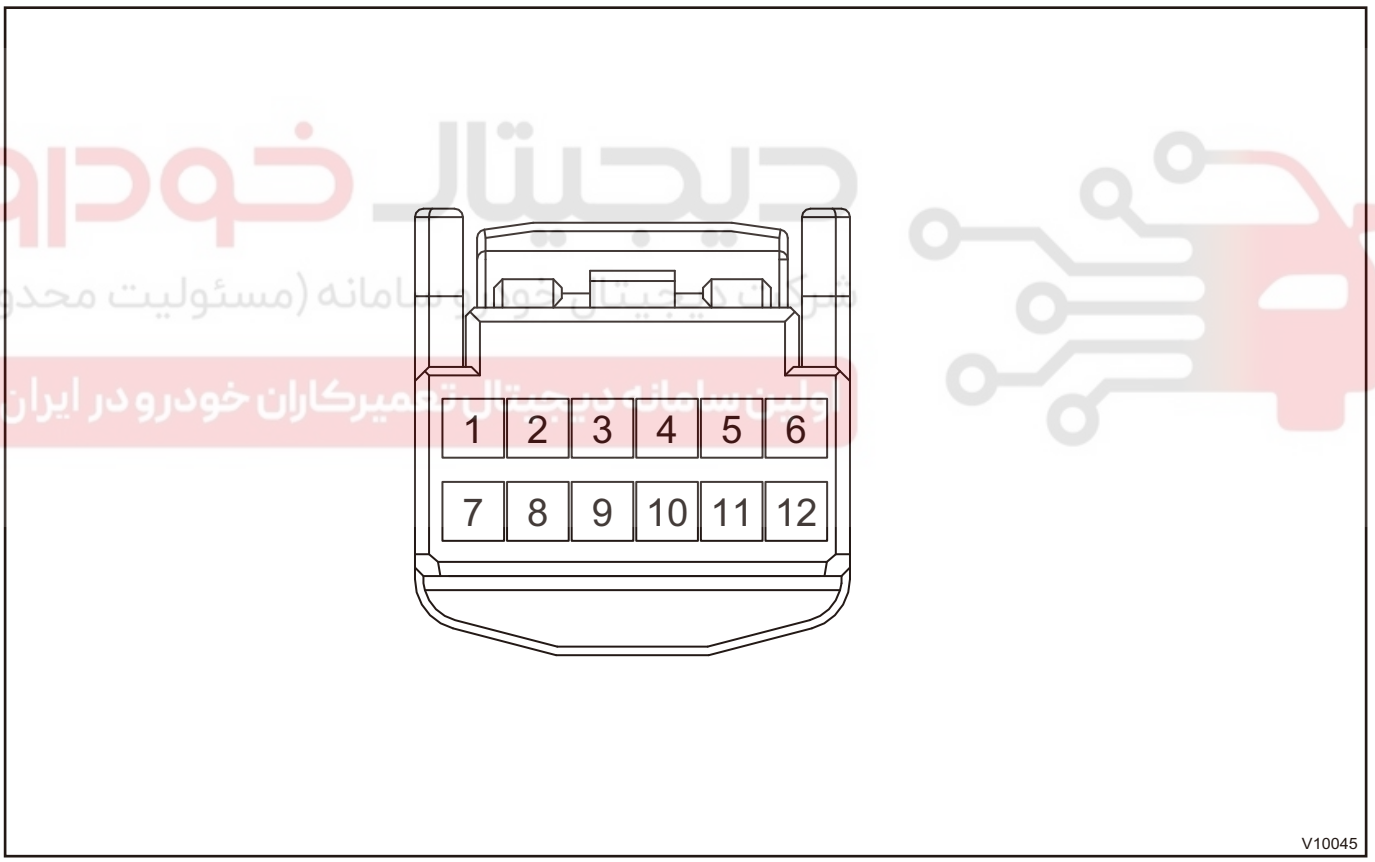
- Check and clean all wire harness connectors and ground parts related to DTC.
- If multiple trouble codes were set, refer to circuit diagrams to look for any common ground circuit or power supply circuit applied to DTC.
- Refer to any Technical Bulletin that may apply to this malfunction.

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 works. Circuits are very sensitive to proper grounding. A loose or corroded ground can 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 add-on accessories interfere with ground circuit.
- If several wire harnesses are crimped into one ground terminal, check for proper crimps. Make sure that all wire harnesses are clean and securely fastened while providing a good ground path.

Electronic Shift Module Assembly Terminal Definition



Terminal No.	Description	Terminal No.	Description
1	Constant power supply	7	P-CAN L
2	-	8	P-CAN H
3	CND	9	-
4	-	10	-
5	IG power supply	11	-
6	-	12	Background light power supply

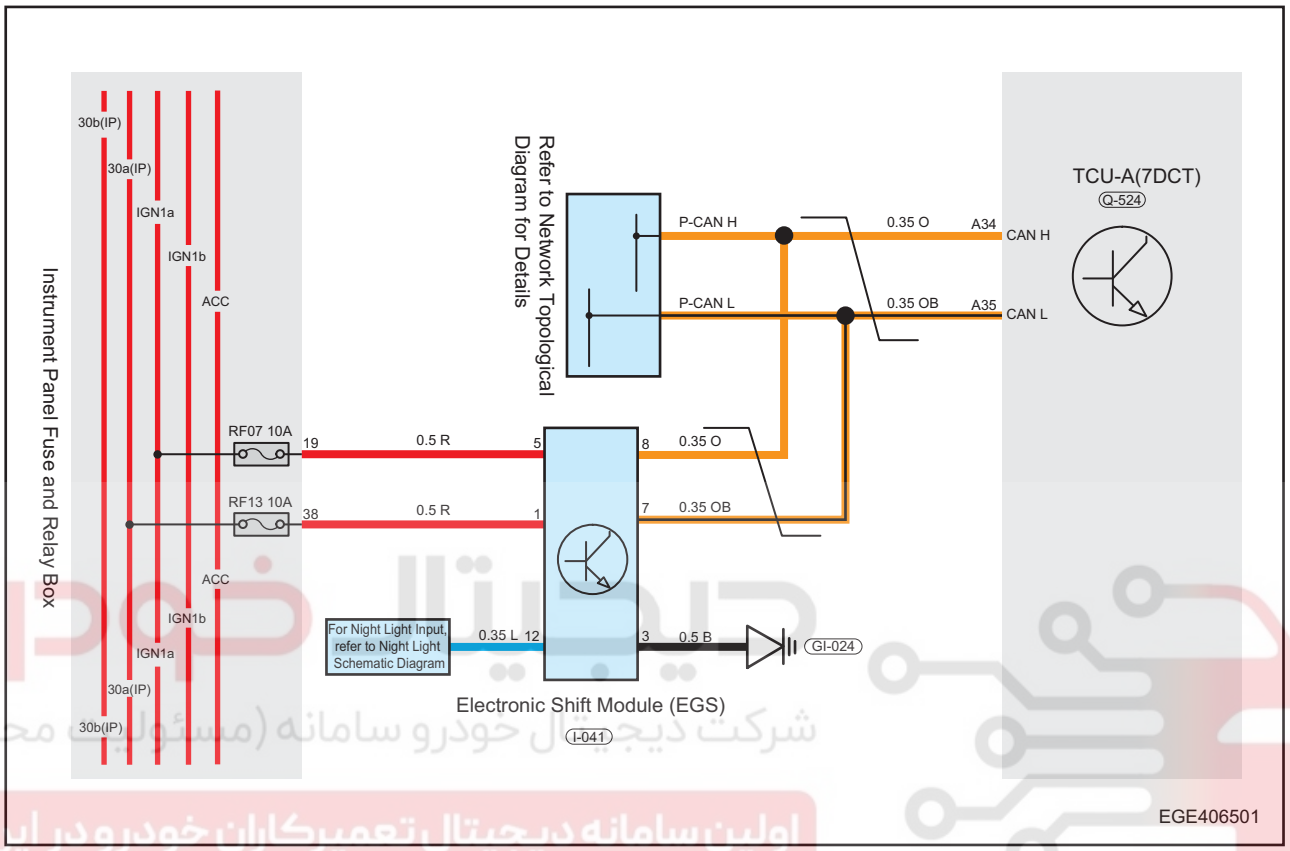
Diagnostic Trouble Code (DTC) Chart

DTC	DTC Definition
C1950-16	Battery Voltage - Circuit Voltage Below Threshold
C1951-17	Battery Voltage - Circuit Voltage Above Threshold
C1952-00	FW Stuck
C1953-00	BW Stuck
C1954-00	TIP+ Stuck
C1955-00	TIP- Stuck
C1956-49	Light Detection Fault
C1957-49	Heavy Detection Fault
C1958-48	Program Cycle Violated
C1959-13	Park Button 1 Open Circuit
C195A-11	Park Button 1 Short to GND
C195C-92	Park Button 1 Pressed for 60s
C195D-13	Park Button 2 Open Circuit
C195E-11	Park Button 2 Short to GND
C195F-12	Park Button 2 Short to VCC
C1960-92	Park Button 2 Pressed for 60s
C1961-38	Invalid PWM for Overlight
C1962-46	Calibration Parameters be Corruped
U0073-88	Control Module Communication Bus Off CAN Busoff
U0100-87	Lost Communication With EMS
U0101-87	Lost Communication With TCU
U0129-87	Lost Communication With BSM
U0155-87	Lost Communication With ICM
U0401-81	Invalid Data Received from EMS
U0402-81	Invalid Data Received from TCU
U0418-81	Invalid Data Received from BSM
U0423-81	Invalid Data Received from ICM
U0140-87	Lost Communication With BCM

DTC	C1950-16	Battery Voltage - Circuit Voltage Below Threshold

DTC	C1951-17	Battery Voltage - Circuit Voltage Above Threshold

Circuit Diagram



Description

DTC	DTC	DTC	DTC
C1950-16	Battery Voltage - Circuit Voltage Below Threshold	ENGINE START STOP switch is in ON and engine is running	Damaged wire harness or connector Battery EGS
C1951-17	Battery Voltage - Circuit Voltage Above Threshold		

Caution:

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

1	Check battery voltage

(a) Check if battery voltage is normal.

(b) Check battery voltage with multimeter voltage band.

OK

Standard voltage: Not less than 12 V.

Result

Result	Proceed to
OK	A
NG	B

B → Check and repair battery

A

2	Check fuse

(a) Check if fuses RF07 and RF13 are blown.

Result

Result	Proceed to
OK	A
NG	B

B → Replace fuse

A

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 I-041.
(d) Using a digital multimeter, check for open between connector I-041 and instrument panel fuse and relay box wire harness according to table below.

OK

Multimeter Connection	Condition	Specified Condition
I -041 (5) - Instrument panel fuse and relay box (19)	Always	⩽ 1 Ω
I -041 (1) - Instrument panel fuse and relay box (38)		⩽ 1 Ω

Result

Result	Proceed to
OK	A
NG	B

B → Repair or replace related wire harness

A

4	Inspect ground

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the electronic shift module connector I-041.
(c) Using ohm band of multimeter, check for continuity between I-041 (3) and GI-024.

OK

Multimeter Connection	Condition	Specified Condition
I-041(4) - GI-024	ENGINE START STOP switch "OFF"	⩽ 1 Ω

OK

Ground point is normal

Result

Result	Proceed to
OK	A
NG	B

B → **Repair ground point**

A

5	Reconfirm DTCs

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

OK

Same DTCs are not output.

Result

Result	Proceed to
OK	A
NG	B

A → **System operates normally**

B → **Replace EGS shift module assembly**

DTC	C1952-00	FW Stuck
DTC	C1953-00	BW Stuck
DTC	C1954-00	TIP+ Stuck
DTC	C1955-00	TIP- Stuck
DTC	C1956-49	Light Detection Fault
DTC	C1957-49	Heavy Detection Fault
DTC	C1958-48	Program Cycle Violated
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	C1961-38	Invalid PWM for Overlight

Description

DTC	DTC	DTC	DTC
C1952-00	FW Stuck	ENGINE START STOP switch is in ON and engine is running	Damaged wire harness or connector, electronic shift module (EGS)
C1953-00	BW Stuck		
C1954-00	TIP+ Stuck		
C1955-00	TIP- Stuck		
C1956-49	Light Detection Fault		
C1957-49	Heavy Detection Fault		
C1958-48	Program Cycle Violated		
C1959-13	Park Button 1 Open Circuit		
C195A-11	Park Button 1 Short to GND		
C195B-12	Park Button 1 Short to VCC		
C195C-92	Park Button 1 Pressed for 60s		
C195D-13	Park Button 2 Open Circuit		
C195E-11	Park Button 2 Short to GND		
C195F-12	Park Button 2 Short to VCC		
C1960-92	Park Button 2 Pressed for 60s		
C1961-38	Invalid PWM for Overlight		

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 diagnostic tester (the latest software).
- Turn ENGINE START STOP switch to ON.
- Use the diagnostic tester to record and clear DTCs stored in system.
- Turn ENGINE START STOP switch to OFF and wait for a few seconds.
- Turn ENGINE START STOP switch to ON, check the DTCs in 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.

1	Check shift module connector

(a) Turn off all electrical equipment and ENGINE START STOP switch.
(b) Disconnect the negative battery cable.
(c) Disconnect the electronic shift module connector I-041.
(d) Check if wire harnesses are worn, pierced, pinched or partially broken.
(e) Check for broken, bent, protruded or corroded terminals.

Result

Result	Proceed to
OK	A
NG	B

B → **Repair or replace related connector or wire harness**

A

2	Inspect ground circuit

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Inspect the electronic shift module ground point GI-024.

Result

Result	Proceed to
OK	A
NG	B

B → **Repair ground Circuit**

A

3	Check shift module

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Replace with a new electronic shift module, and determine if fault still exists.

Result

Result	Proceed to
OK	A
NG	B

B → **Replace shift module assembly**

A

4	Reconfirm DTCs

(a) Connect all connectors.
(b) Connect the negative battery cable.
(c) Turn ENGINE START STOP switch to ON.
(d) Check if same DTCs or same problem symptoms are output.

OK

Same DTCs are not output.

Result

Result	Proceed to
OK	A

A → **System operates normally**

DTC	U0073-88	Control Module Communication Bus Off CAN Busoff

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	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

Description

DTC	DTC	DTC	DTC
U0073-88	Control Module Communication Bus Off CAN Busoff	ECU does not detect CAN line BUSOFF fault, engine runs	Damaged wire harness or connector, CAN bus hardware circuit malfunction
U0100-87	Lost Communication With EMS		
U0101-87	Lost Communication With TCU		
U0129-87	Lost Communication With BSM		
U0155-87	Lost Communication With ICM		
U0401-81	Invalid Data Received from EMS		
U0402-81	Invalid Data Received from TCU		
U0418-81	Invalid Data Received from BSM		
U0423-81	Invalid Data Received from ICM		

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

1	(Refer to CAN system)

Removal & Installation

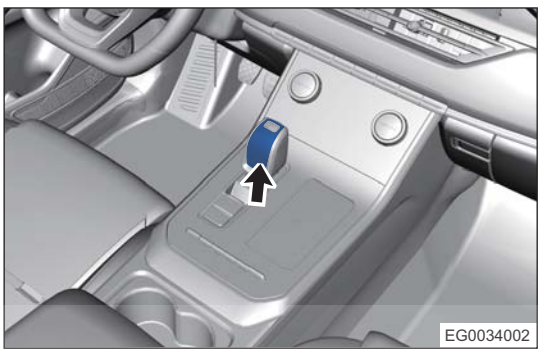
Shift Lever Assembly

Removal

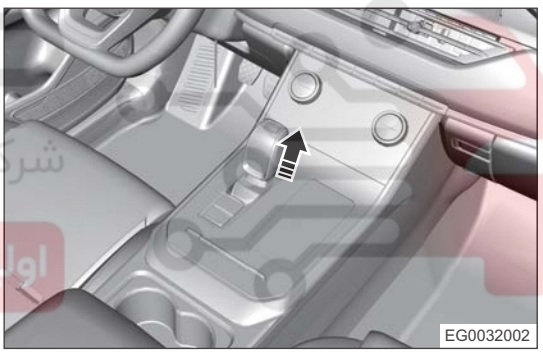
Warning:

- 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.
3. Remove shift lever front panel (arrow) with a tool.



4. Remove the shift lever snap ring.
5. Remove shift lever assembly in direction of arrow.



Installation

1. Installation is in the reverse order of removal.

   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.

Shift Control Mechanism Assembly

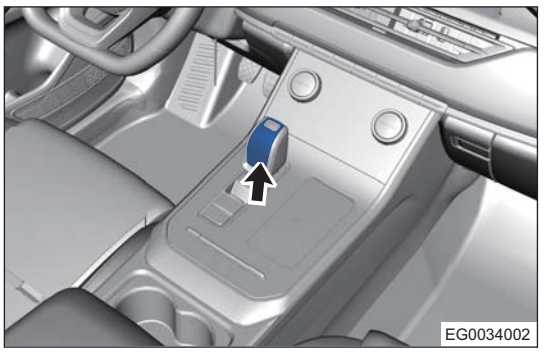
Removal

Warning:

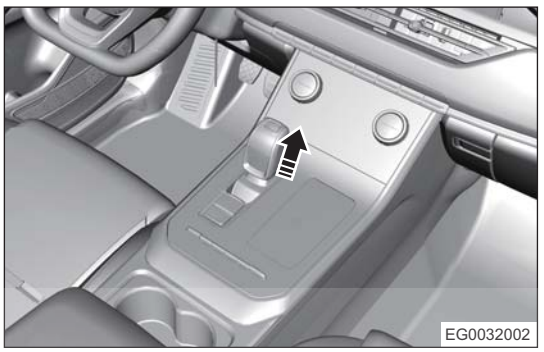
- When removing shift control mechanism assembly, be sure to wear safety equipment to prevent accidents.
- Appropriate force should be applied, when removing shift control mechanism assembly. Be careful not to operate roughly.

1. Disconnect the negative battery cable.
2. Remove the shift lever assembly.

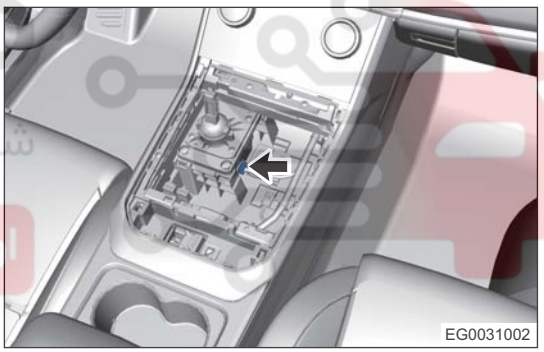
3. Remove shift lever front panel (arrow) with a tool.



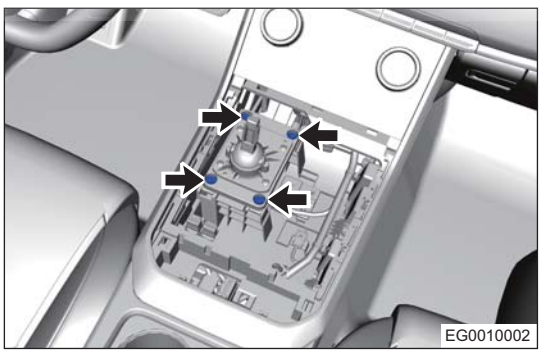
4. Remove the shift lever snap ring.
5. Remove shift lever assembly in direction of arrow.



6. Remove the auxiliary fascia console switch and cover plate assembly.
7. Disconnect the shift control mechanism connector (arrow).



8. Remove 4 shift control mechanism assembly fixing bolts (arrow).
   Tightening torque: 5 ± 1 N·m



Installation

1. Installation is in the reverse order of removal.
   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.

- MEMO -