CONSTANT SPEED CRUISE SYSTEM

GENERAL INFORMATION

Description

Turn on the constant speed cruise control switch after vehicle reaches a certain speed. Set vehicle speed can be maintained by constant speed cruise control without accelerator pedal depressed. Cruise control system consists of following components:

- Constant speed cruise control switch (multi-function switch)

  Instrument cluster (ICM)

  - Body Control Module (BCM)
  - Engine Control Module (ECM)
  - Transmission Control Module (TCM)
  - ABS control module
  - Accelerator pedal
  - Brake switch
  - Clutch switch

  Do not use cruise control in following situations. Otherwise, it may result in a loss of vehicle control to cause an accident, such as serious injury or even death.

  - In traffic congestion areas.
  - On roads with sharp bends.
  - On winding roads.
  - On wet and slippery roads covered with water, ice or snow.
- On steep roads or hills. Vehicle speed may be higher (or lower) than the set speed.
  - In emergency lanes.

Operation

Body Control Module (BCM) receives resistance signal from constant speed cruise control switch (multi-function switch), and sends it to CAN bus, then Engine Control Module (ECM) drives and illuminates the indicator on instrument cluster.

ECM determines that whether enters or exits cruise state depending on vehicle speed signal, brake signal, clutch signal, acceleration and deceleration signals and current operating condition.

After entering cruise state, ECM controls throttle opening to maintain set vehicle speed range.

Operation Method

1. When pressing cruise ON button with ignition switch ON, cruise indicator in instrument cluster will come on and flash (it is normal for pre-cruise state); if cruise SET/- button is pressed when vehicle speed is between about 40 - 130 km/h with driving, vehicle will cruise at a constant speed when SET/- button is pressed (at this time, do not put your foot on accelerator pedal, and cruise system will control throttle opening automatically depending on road conditions), while cruise indicator in instrument cluster will remain on, it indicates that cruise state has been entered; if cruise indicator in instrument cluster still flashes, it indicates that cruise state has not been entered. Please perform operations again to try to enter cruise state (if cruise state still cannot be entered, check and repair cruise system malfunction).
2. Under cruise state, when depressing the accelerator pedal (cruise indicator remains on during this process), vehicle speed will increase; and vehicle will automatically return to cruise state before accelerator pedal is depressed when releasing the accelerator pedal. (Note: vehicle speed will increase only when the opening with accelerator pedal depressed is more than that corresponding cruise torque).
3. Under cruise state, when depressing the accelerator pedal (cruise indicator remains on during this process), vehicle speed will increase; and vehicle will cruise at new speed when pressing cruise SET/- button while releasing accelerator pedal.

4. Under cruise state, vehicle will cruise at the speed of 2 km/h more than previous speed each time short pressing RES/+ button (less than 0.5 seconds) (cruise indicator remains on during this process); under cruise state, when long pressing RES/+ button (more than 0.5 seconds) (cruise indicator remains on during this process), vehicle speed will increase continuously and vehicle speed will stop increasing after RES/+ button is released, then vehicle will cruise at a speed when releasing RES/+ button (it is not recommended to long press RES/+ button continuously, as vehicle speed will increase continuously and cause driving security problem).
5. Under cruise state, vehicle will cruise at the speed of 2 km/h less than previous speed with constant speed cruise switch ON each time short pressing SET/- button (less than 0.5 seconds) (cruise indicator remains on during this process); under cruise state, when long pressing SET/- button (more than 0.5 seconds) (cruise indicator remains on during this process), vehicle speed will decrease continuously and it will stop decreasing after SET/- button is released, then vehicle will cruise at a speed when releasing SET/- button. (Note: long pressing SET/- button is equivalent to coasting with accelerator pedal released and without brake function, depress brake pedal if brake is required).
6. Under cruise state, when depressing brake pedal or clutch pedal, cruise indicator in instrument cluster will flash (at this time, it is normal for entering pre-cruise state) and vehicle speed will decrease; when releasing brake pedal or clutch pedal and pressing SET/- button, vehicle will set cruise state again and cruise indicator in instrument cluster will remain on if vehicle speed is not less than 40 km/h.
7. Under cruise state, when brake pedal is depressed and cruise indicator in instrument cluster flashes, it indicates that pre-cruise state is entered. If cruise button is not operated any more, vehicle will keep in pre-cruise state, and driver can perform operations according to normal driving specifications.
8. If malfunction that will affect cruise security occurs in the whole vehicle, cruise state cannot be entered.
9. When cruise main switch is turned to OFF, vehicle cruise system will turn off and cruise cannot be set.

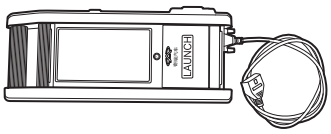
Specifications

Torque Specifications

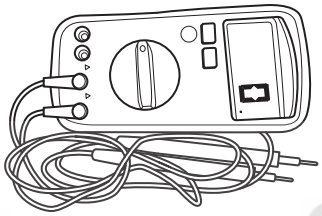
Description	Torque (N·m)
Ground Wire Harness Fixing Screw	0.7 ± 0.2
Steering Wheel Quick Button Trim Cover Fixing Screw	0.7 ± 0.2

Tools

Special Tool

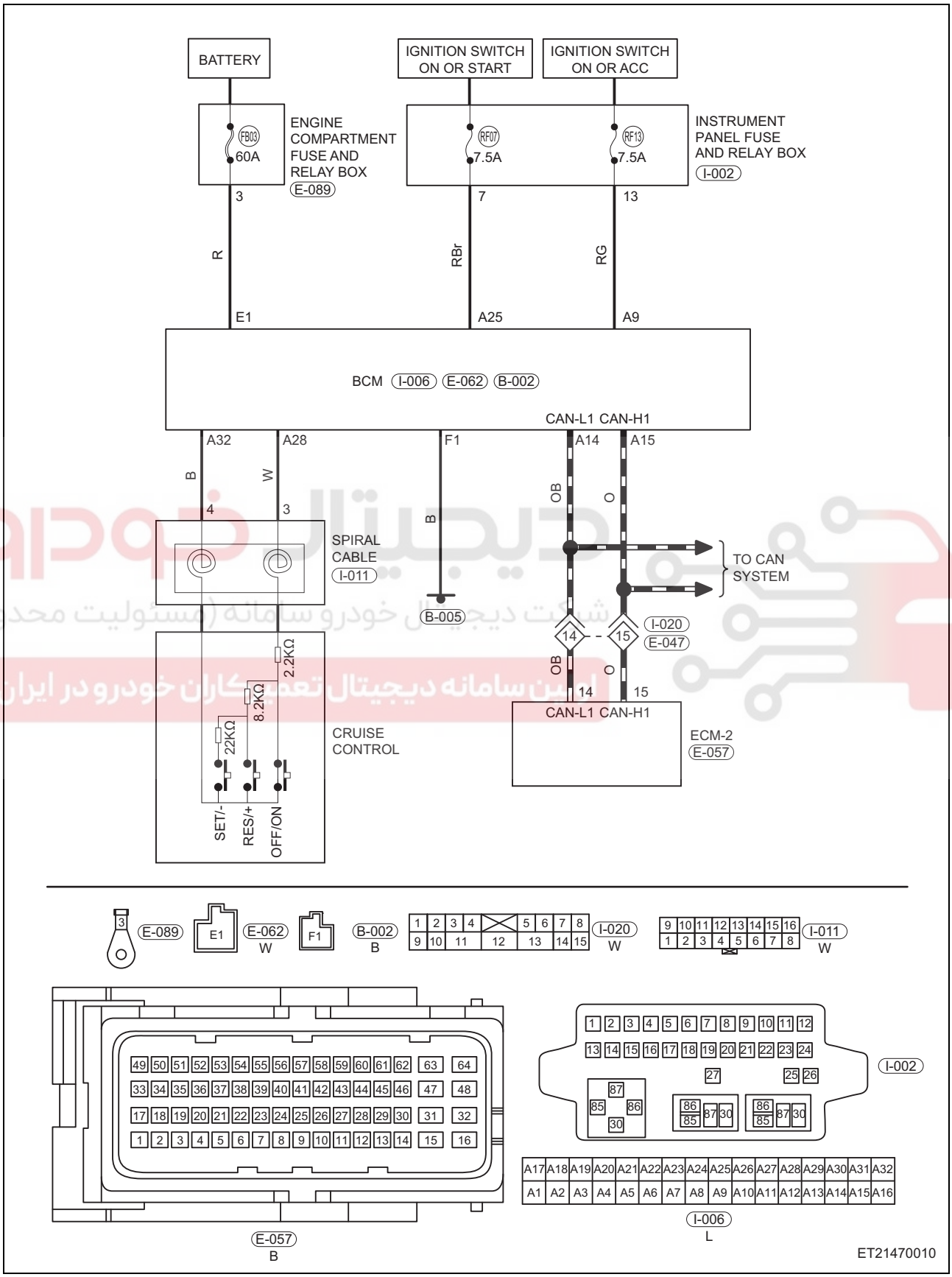
X-431 3G Diagnostic Tester	 RCH0000001

General Tool

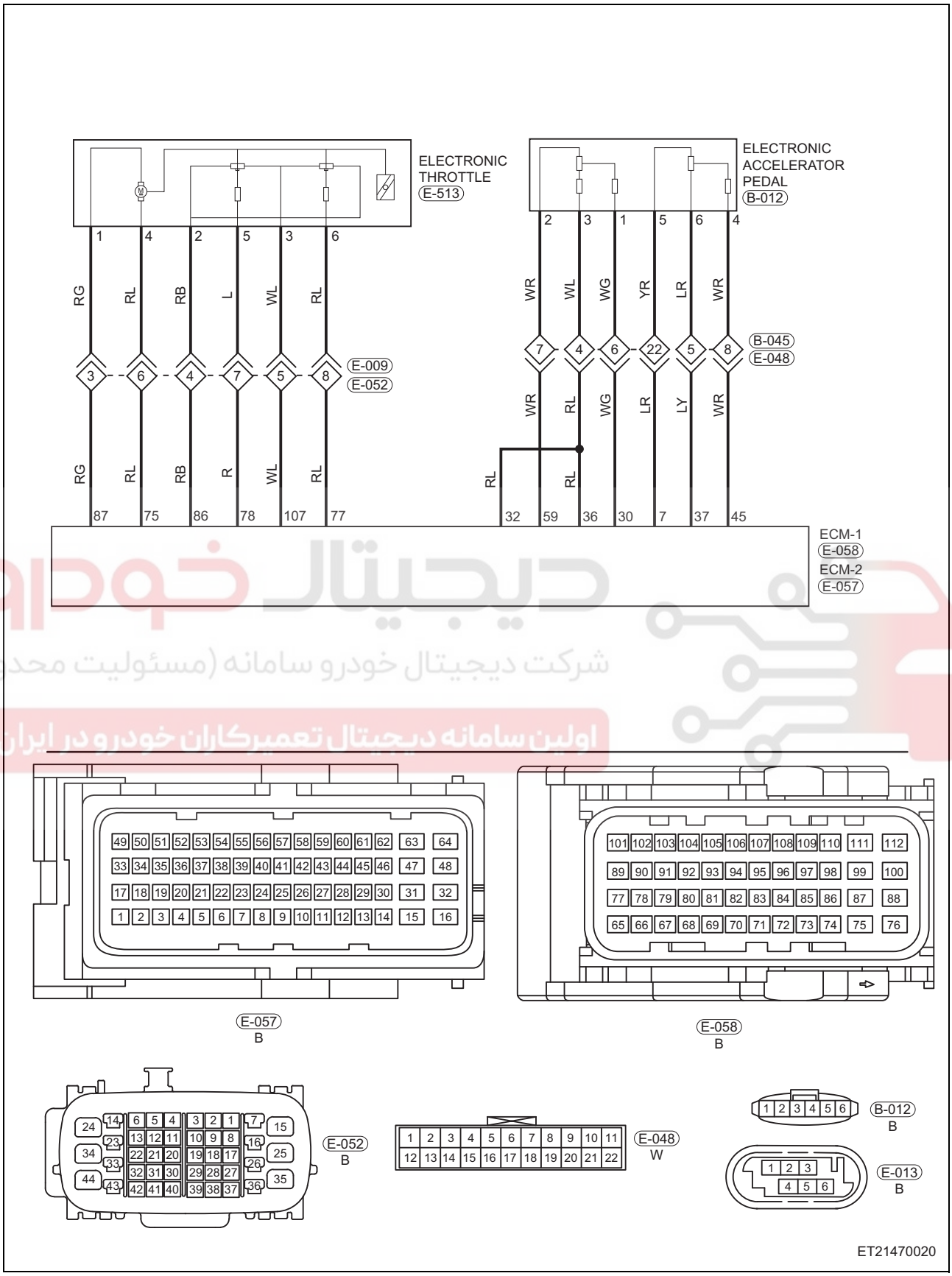
Digital Multimeter	 RCH0000002

Circuit Diagram

Cruise Control System (Page 1 of 2)



Cruise Control System (Page 2 of 2)



DIAGNOSIS & TESTING

Problem Symptoms Table

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

Symptom	Suspected Area	See page
Vehicle speed cannot be set (cruise control indicator turns off)	Constant speed cruise control switch	47-12
	Wire harness or connector	-
	Body Control Module (BCM)	
	Engine Control Module (ECM)	-
Vehicle speed cannot be set (cruise control indicator turns on)	Constant speed cruise control switch	47-12
	Wire harness or connector	-
	Brake switch	-
	Exhaust pipe gasket	-
	Exhaust Pipe	-
	ABS	
	Clutch switch (for MT model)	
	Body Control Module (BCM)	-
	Engine Control Module (ECM)	

Diagnosis Tools

X-431 3G Diagnostic Tester

When connecting X-431 3G diagnostic tester:

- Connect X-431 3G diagnostic tester (the latest software) to Data Link Connector (DLC) for communication with vehicle.
- DLC is located at driver side instrument panel crossmember.
- DLC uses a trapezoidal design which can hold 16 terminals.

Digital Multimeter

When using digital multimeter:

- Troubleshoot electrical malfunctions and wire harness system.
- Look for basic malfunction.
- Measure voltage, current and resistance.

Diagnostic Help

1. Connect X-431 3G diagnostic tester (the latest software) to Data Link Connector (DLC), and make it communicate with vehicle electronic module through data network.
2. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
3. If DTC cannot be deleted, malfunction is current.
4. Only use a digital multimeter to measure voltage of electronic system.
5. Refer to any Technical Bulletin that may apply to the malfunction.

6. Visually check the related wire harness.
7. If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

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 the conditions under which DTC was set.
- Look for data that has changed or DTC to reset during wiggle test.
- Look for broken, bent, protruded or corroded terminals.
- Inspect the mounting areas of Engine Control Module (ECM), wire harness or wire harness connector and so on for damage, foreign matter, etc. that will cause incorrect signals.
- Check and clean all wire harness connectors and ground parts related to DTC.
- Refer to any Technical Bulletin that may apply to malfunction.

Ground Inspection

Groundings are very important to entire circuit system, 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) and oxidation may increase load resistance. This situation will seriously affect the normal operation of circuit. Check the ground points as follows:

1. Remove ground bolt or nut.
2. Check all contact surfaces for tarnish, dirt and rust, etc.
3. Clean as necessary to ensure that contacting is in good condition.
4. Reinstall ground bolt or nut securely.
5. Check if add-on accessories interfere with ground circuit.
6. If several wire harnesses are crimped into one ground terminal, check for proper crimps. Make sure all wire harnesses are clean, securely fastened with providing a good ground path.

Diagnosis Procedure

HINT:
Use following procedures to troubleshoot the constant speed cruise system.

1	**Vehicle brought to workshop**

47

NEXT

2	**Check battery voltage**

Standard voltage: 11 to 14 V

If voltage is below 11 V, recharge or replace battery before proceeding to next step.

NEXT

3	Customer problem analysis

NEXT

4	Check for DTCs (current DTC and history DTC)

DTC occurs → For current DTC, go to step 6

No DTC → For history DTC, go to step 7

5	Problem repair (no DTC), then go to step 8

NEXT

6	Troubleshoot according to Diagnostic Trouble Code (DTC) chart, then go to step 8

NEXT

7	Troubleshoot according to Problem Symptoms Table, then go to step 8

NEXT

8	Adjust, repair or replace

NEXT

9	Conduct test and confirm malfunction has been repaired

NEXT

10	End

Constant Speed Cruise Control Switch

Removal

HINT:
Constant speed cruise control switch is located on multi-function switch.

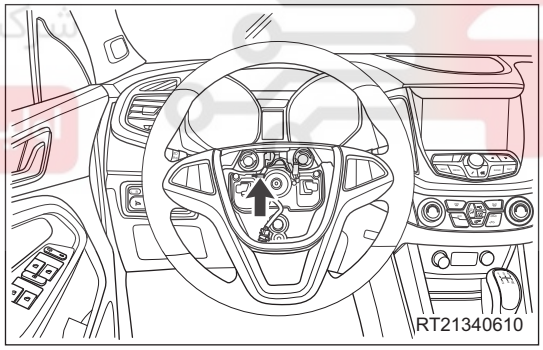
⚠ WARNING

- Be sure to read the precautions for SRS airbag before removing steering wheel quick button (See page 43-77).

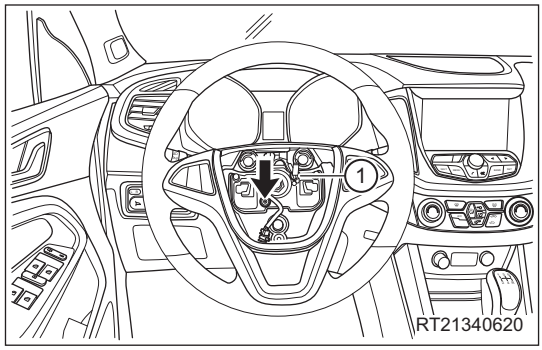
CAUTION

- Be sure to wear necessary safety equipment to prevent accidents, when removing constant speed cruise control switch.
- DO NOT damage the clip on steering wheel quick button trim cover, when removing constant speed cruise control switch.

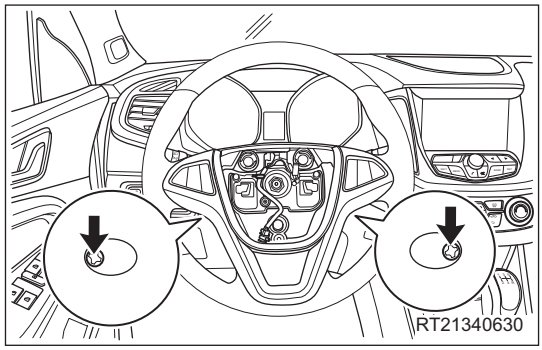
1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove the driver airbag (See page 43-77).
4. Remove the steering wheel quick button trim cover.
   a. Cut the wire harness band (arrow).



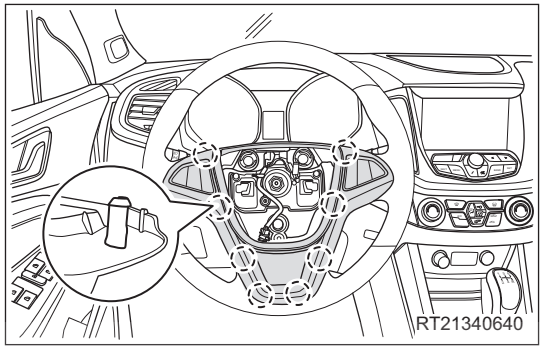
   b. Remove fixing screw (arrow) from ground wire harness.
   c. Remove the wire harness fixing screw (1).
   (Tightening torque: 0.7 ± 0.2 N·m)



d. Remove 2 fixing screws (arrow) from steering wheel quick button trim cover.
(Tightening torque: 0.7 ± 0.2 N·m)

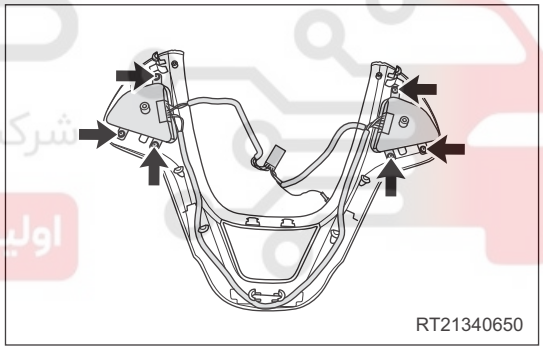


e. Using a screwdriver wrapped with protective tape, pry up claws on steering wheel quick button trim cover, and remove steering wheel quick button trim cover



5. Remove the steering wheel quick button.

a. Remove 6 fixing screws (arrow) from steering wheel quick button, and remove steering wheel quick button.
(Tightening torque: 0.7 ± 0.2 N·m)



Inspection

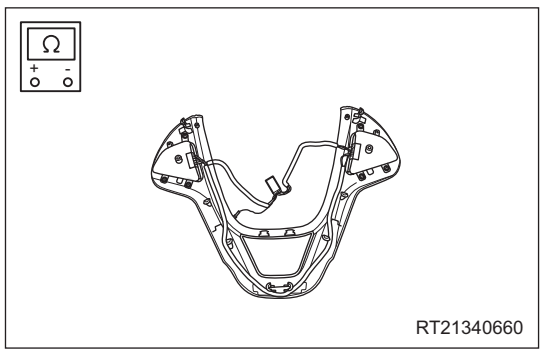
1. Check the constant speed cruise control switch.

a. Check constant speed cruise control switch for damage. Replace it if necessary.

b. Check constant speed cruise control switch connector for damage or poor terminal connection. Replace it if necessary.

c. Using a digital multimeter, measure resistance of constant speed cruise control switch according to table below.

Multimeter Connection	Switch Condition	Specified Condition
Terminal 3 - Terminal 4	RES/+	10.3 kΩ
Terminal 3 - Terminal 4	RES/-	32.3 kΩ



Multimeter Connection	Switch Condition	Specified Condition
Terminal 3 - Terminal 4	OFF/ON	2.2 kΩ

If result is not as specified, replace steering wheel quick button.

Installation

Installation is in the reverse order of removal.

CAUTION

- Operate carefully to prevent damage to other components, when installing constant speed cruise control switch.
- Install each connector into place, when installing constant speed cruise control switch.
- Tighten fixing screw to the specified torque, when installing constant speed cruise control switch.
- Check steering wheel quick button for proper operation, after installing constant speed cruise control switch.