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 depressing accelerator pedal. 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 Unit (TCU)
- ABS/ESP 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 and cause an accident, resulting in 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.

Operation

Engine Control Module (ECM) receives resistance signal from constant speed cruise control switch (multi-function switch), and turns on indicator on instrument cluster via CAN network driver.

ECM determines whether to enter or exit cruise mode according to vehicle speed signal, brake signal, clutch signal, acceleration and deceleration signals and current operating conditions. After entering cruise mode, ECM controls throttle valve opening angle to keep vehicle speed within a set range.

Operation Method

1. With engine switch ON, press ON button of cruise to illuminate and blink the cruise indicator on instrument cluster (pre-cruise mode, that is, a normal cruise mode condition); When vehicle is driving at a speed of approximately 40 km/h to 150 km/h, press SET/- button of cruise or press and hold RES/+ button (stay for more than 0.5 second), and vehicle will drive at constant cruise speed while button is pressed (Do not put your foot on accelerator pedal at this time, as cruise system automatically adjusts throttle valve opening angle according to road conditions). Meanwhile cruise indicator on the instrument cluster remains on, it indicates the vehicle enters cruise mode; If cruise indicator on the instrument cluster remains blink, it has not entered cruise mode, and attempt to enter cruise mode by performing procedure again (If it still fails, repair any problem in cruise system).
2. Under cruise mode, depress the accelerator pedal (cruise indicator remains on during this procedure) to increase vehicle speed, and release acceleration pedal to automatically resume vehicle to speed cruise condition before acceleration pedal is depressed. (Note: Vehicle speed increases only when depressed accelerator pedal opening angle is greater than the one corresponding to cruise torque).
3. Under cruise mode, depress the accelerator pedal (cruise indicator remains on during this procedure) to increase vehicle speed, and press SET/- button of cruise while releasing accelerator pedal, the vehicle will drive at a new cruise speed.
4. Under cruise mode, each time RES/+ button is pressed briefly (less than 0.5 s) (cruise indicator remains on while pressing), vehicle speed will increase by 2 km/h; Under cruise mode, each time RES/+ button is

pressed firmly (more than 0.5 s) (cruise indicator remains on when pressing), vehicle speed will increase continuously. When RES/+ button is released, vehicle stops accelerating and cruises at vehicle speed while releasing RES/+ button. (It is recommended not to press and hold RES/+ button, as it may increase vehicle speed continuously which may lead to driving hazard).

5. Under cruise mode, each time SET/- button is pressed briefly (less than 0.5 s) (cruise indicator remains on while pressing), vehicle speed will decrease by 2 km/h; Under cruise mode, each time SET/- button is pressed firmly (more than 0.5 s) (cruise indicator remains on while pressing), vehicle speed will decrease continuously. When SET/- button is released, vehicle stops decelerating and cruises at vehicle speed while releasing SET/- button. (Note: Pressing and holding SET/- button is equal to coasting with accelerator pedal released and without braking function. it is necessary to depress brake pedal while braking).
6. Under cruise mode, when depressing brake pedal or clutch pedal, cruise indicator on the instrument cluster blinks (pre-cruise mode, that is, a normal cruise mode condition), and vehicle speed decreases. When vehicle speed is 40 km/h or higher, release brake pedal or clutch pedal and press RES/+ button (short press; If hold it for more than 0.5 s to increase setting speed and vehicle speed will be constant at the current speed while RES/+ button is released), the vehicle returns to previous cruise mode it was in before the pedal was depressed and cruise indicator on the instrument cluster remains on.
7. Under cruise mode, when depressing brake pedal or clutch pedal, cruise indicator on the instrument cluster blinks (pre-cruise mode, that is, a normal cruise mode condition), and vehicle speed decreases. When vehicle speed is less than 40 km/h, release brake pedal or clutch pedal and press RES/+ button, and vehicle cannot return to previous cruise mode it was in before the pedal was depressed, however, accelerator pedal can be depressed further, keep depressing accelerator pedal with the same force after vehicle speed reaches to 40 Km/h or higher, then press RES/+ button (operate continuously; it will switch to acceleration mode if RES/+ button is pressed for more than 0.5 s, and current speed will be set as constant speed after releasing the button) and release accelerator pedal, the vehicle returns to previous cruise mode it was in before the pedal was depressed and cruise indicator on the instrument cluster remains on.
8. Under cruise mode, when depressing brake pedal or clutch pedal, cruise indicator on the instrument cluster blinks, which indicates pre-cruise mode. If cruise button is no longer operated, vehicle will keep in pre-cruise mode, and driver can operate according to normal driving regulations.
9. Cruise mode cannot be entered and cruise indicator blinks if malfunction that affects cruise safety of vehicle occurs. Repair any problem in cruise system.
10. Under cruise mode, press OFF button to exit cruise mode, and cruise indicator on the instrument cluster goes off.

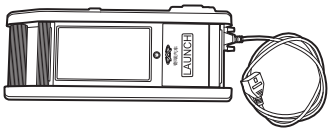
Specification

Torque Specification

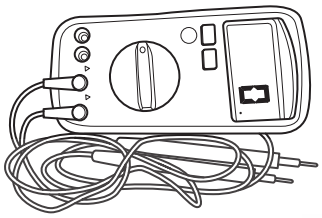
Description	Torque (N·m)
Steering Wheel Quick Button Fixing Screw	0.7 ± 0.2

Tools

Special Tool

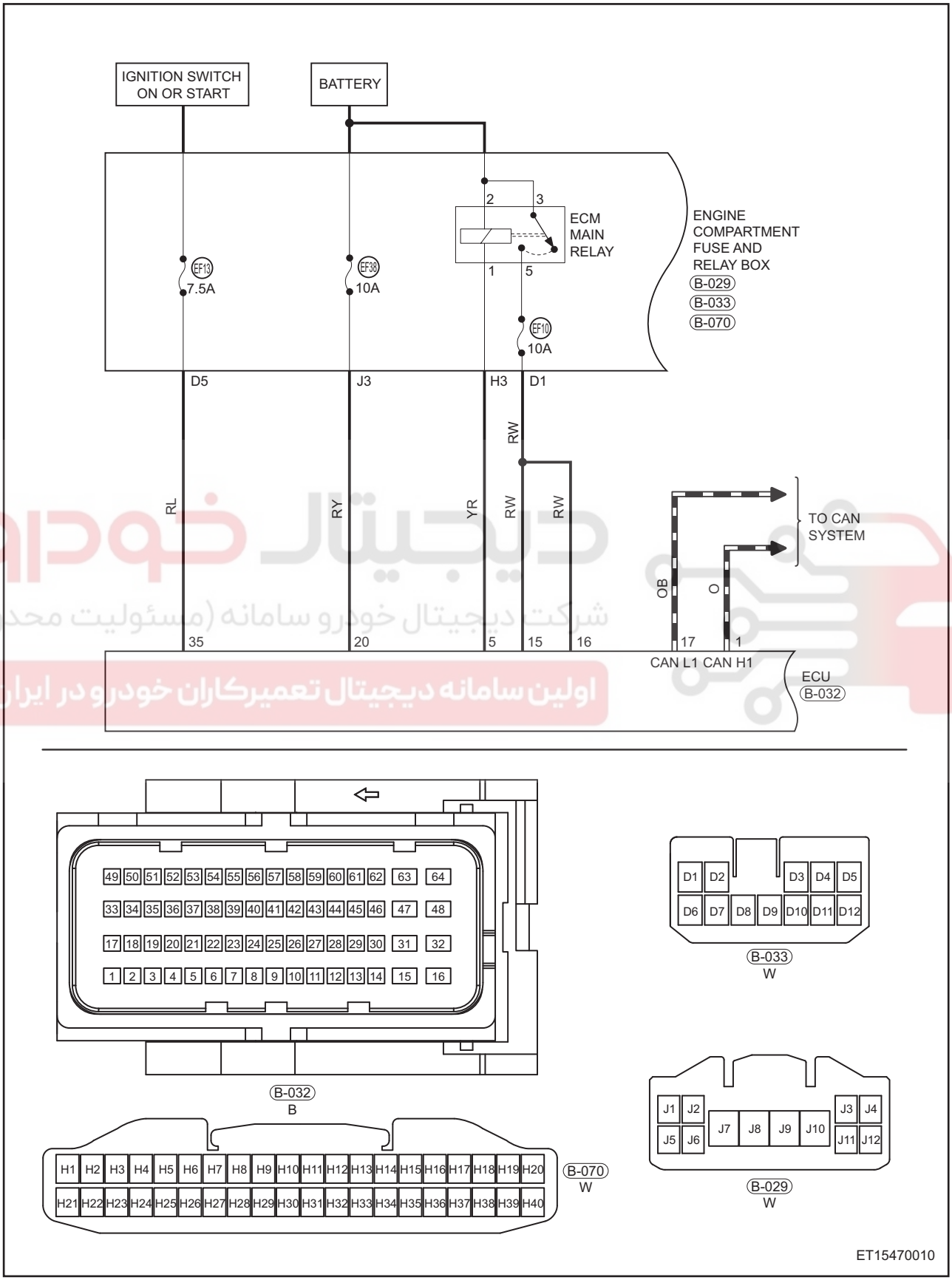
X-431 3G Diagnostic Tester	 RCH0000001

General Tool

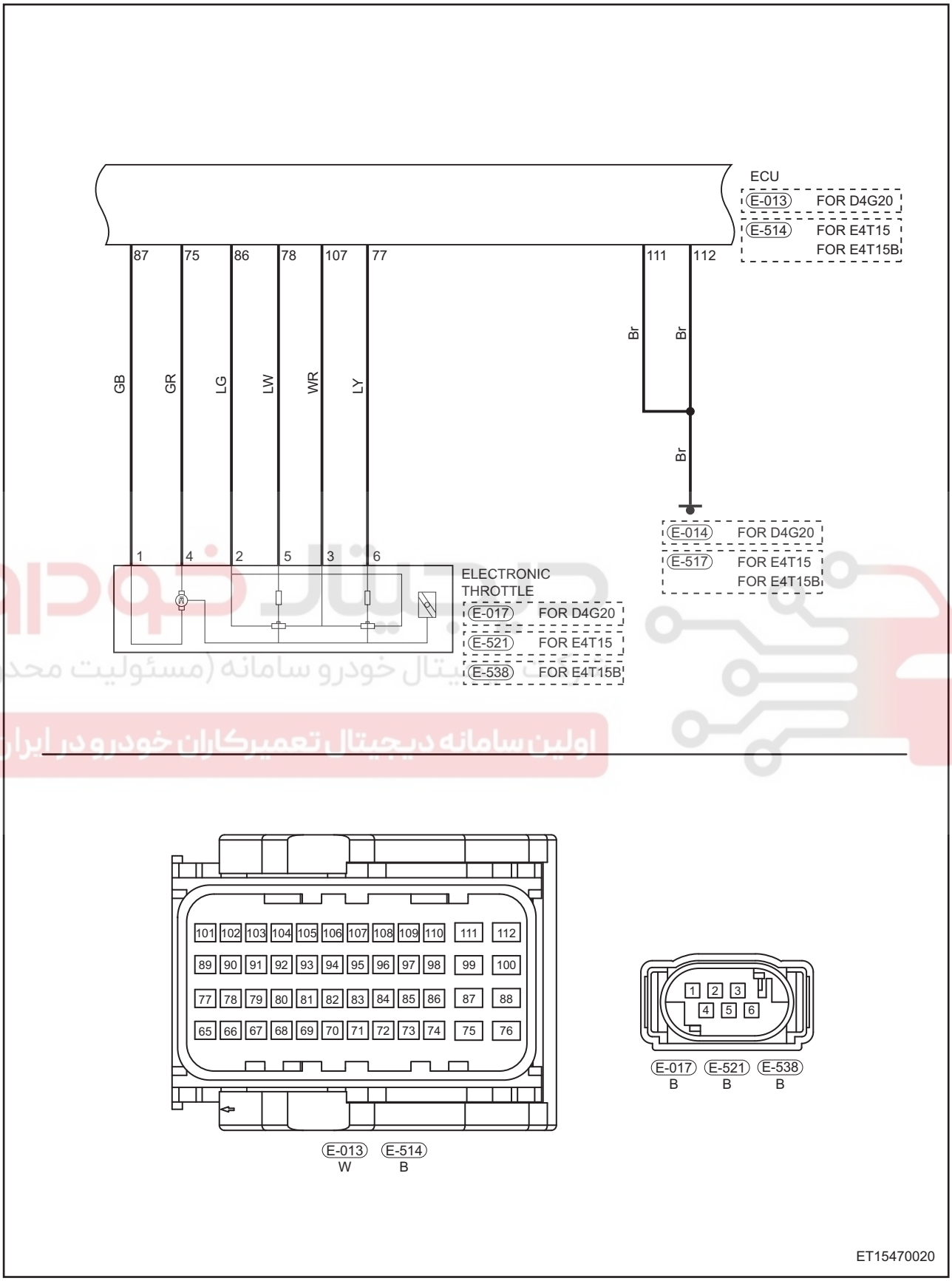
Digital Multimeter	 RCH0000002

Circuit Diagram

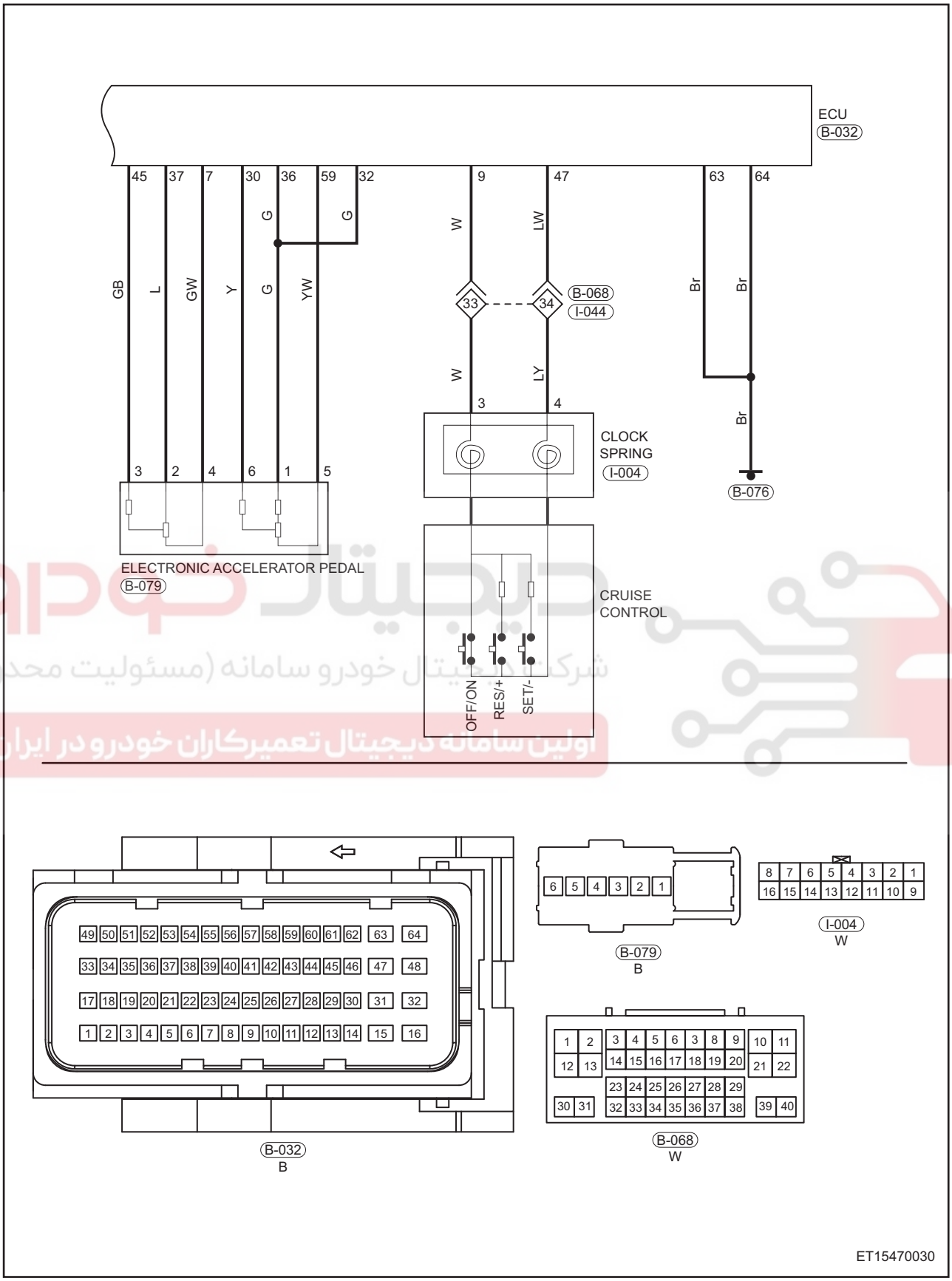
Constant Speed Cruise System (Page 1 of 3)



Constant Speed Cruise System (Page 2 of 3)



Constant Speed Cruise System (Page 3 of 3)



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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	48-12
	Wire harness or connector	-
	Engine Control Module (ECM)	-
Vehicle speed cannot be set (cruise control indicator turns on)	Constant speed cruise control switch	48-12
	Wire harness or connector	-
	Brake Switch	-
	ABS/ESP	38-83
	Clutch switch (for MT model)	-
	Body Control Module (BCM)	-
	Engine Control Module (ECM)	06-248

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 on instrument panel lower left protector.
- 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

When using digital multimeter:

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 malfunction.
6. Visually check related wire harness and connector.

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 connectors are loose.
- Check if wire harnesses are worn, pierced, pinched or partially broken.
- Wiggle related wire harnesses and connectors 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.
- Check and clean all wire harness connectors and grounding parts related to current 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 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 case will seriously affect 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 if they are installed correctly. Make sure all wire harnesses are clean, securely fastened and providing a good ground path.

Diagnosis Procedure

HINT:
Use following procedures to troubleshoot the cruise system.

1	**Vehicle brought to workshop**

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 → Go to step 5

No DTC → Go to next step

NEXT

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

ON-VEHICLE SERVICE

Constant Speed Cruise Control Switch

Removal

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

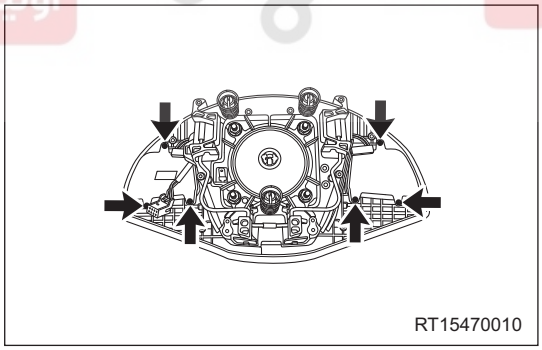
⚠ WARNING

- Be sure to read the precautions for SRS airbag before removing steering wheel quick button (See page 45-91).

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 engine switch.
2. Disconnect the negative battery cable for more than 1 minute.
3. Remove the driver airbag (See page 45-88).
4. Remove the steering wheel quick button.
   a. Remove fixing screws (arrow) from steering wheel quick button with a screwdriver.
      (Tightening torque: 0.7 ± 0.2 N·m)



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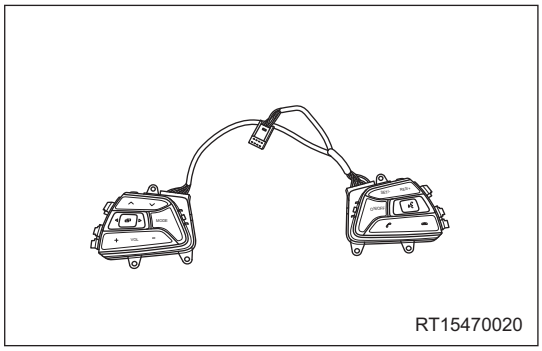
   b. Remove the steering wheel quick button.



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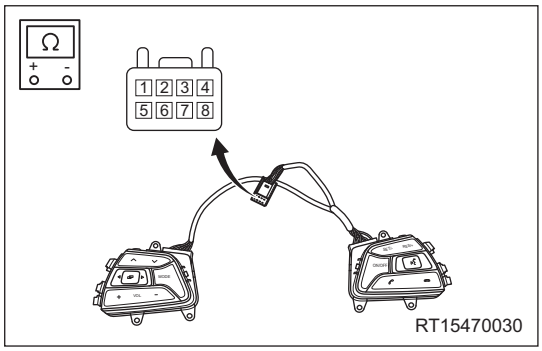
Inspection

1. Check the constant speed cruise control switch.
   a. Check constant speed cruise control switch for damage. Replace if necessary.
   b. Check constant speed cruise control switch connector for damage or poor terminal connection. Replace if necessary.
   c. Using digital multimeter, check for continuity between terminals of constant speed cruise control switch according to table below.



Multimeter Connection	Condition	Specified Condition
Terminal 1 - Terminal 2	RES/+	2.2 kΩ
Terminal 1 - Terminal 2	SET/-	680 Ω
Terminal 1 - Terminal 2	OFF/NO	Continuity

   If result is not as specified, replace steering wheel quick button.
2. Check connectors for damage. Replace if necessary.

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.

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