

CONSTANT SPEED CRUISE SYSTEM

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GENERAL INFORMATION

Description

Turn on the constant speed cruise control switch after vehicle reaches a certain speed. The set vehicle speed can be maintained by constant speed cruise control, without accelerator depressed. Cruise control system consists of the 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 under following conditions. 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, such as those covered with rain, ice or snow.
- On steep 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 panel via CAN net driver.

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

Operation Method

1. With ignition switch ON, press ON button of cruise to illuminate and blink the cruise indicator on instrument cluster (a normal cruise mode condition); When vehicle is driving at approximately between 40 km and 130 km/h, press SET/- button of cruise, and vehicle will drive at constant cruise speed as pressed (Do not put your foot on acceleration pedal at this time, as cruise system automatically adjust throttle valve opening angle). 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 acceleration 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 is increased only when depressed acceleration pedal opening angle is greater than the one corresponding to cruise torque).
3. Under cruise mode, depress the acceleration pedal (cruise indicator remains on during this procedure) to increase vehicle speed, and press SET/- button of cruise while releasing acceleration pedal, then vehicle is driving 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 when 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 depressing), vehicle speed will

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increase continuously. When releasing RES/+ button, vehicle stops accelerating and vehicle speed as releasing RES/+ button will be kept (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 when depressing), 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 when depressing), vehicle speed will decrease continuously. When releasing SET/- button, vehicle stops decelerating and cruise at vehicle speed while releasing SET/- button. (Note: Press and hold SET/- button to coast with accelerator undepressed and without braking function. Depress brake pedal when braking is necessary).
6. Under cruise mode, when depressing brake pedal or clutch pedal, cruise indicator on the instrument cluster blinks (a normal cruise mode condition), and vehicle speed decreases. When vehicle speed is above 40 km/h, release brake pedal or clutch pedal and press SET/- button, and then vehicle resets cruise mode and cruise indicator on the instrument cluster remains on.
7. Depress brake pedal under cruise mode and cruise indicator on instrument cluster blinks, which indicates pre cruise mode. If cruise button is no longer operated, vehicle will keep pre cruise mode, and driver can operate with normal driving regulations.
8. Cruise mode cannot be entered if malfunction that affects cruise safety of vehicle.
9. When cruise main switch is in OFF position, cruise system of vehicle is turned off and cruise cannot be set.

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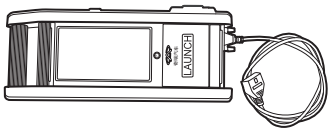
Specifications

Torque Specifications

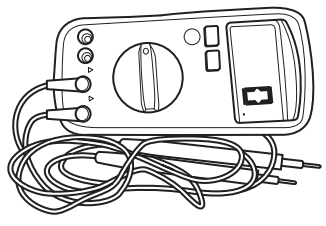
Description	Torque (N·m)
Ground Wire Harness Fixing Screw	0.7 ± 0.2
"Steering Wheel Quick Button Trim Cover Fixing Screw"	0.7 ± 0.2

Tools

Special Tool

X-431 3G Diagnostic Tester	 RCH0000001
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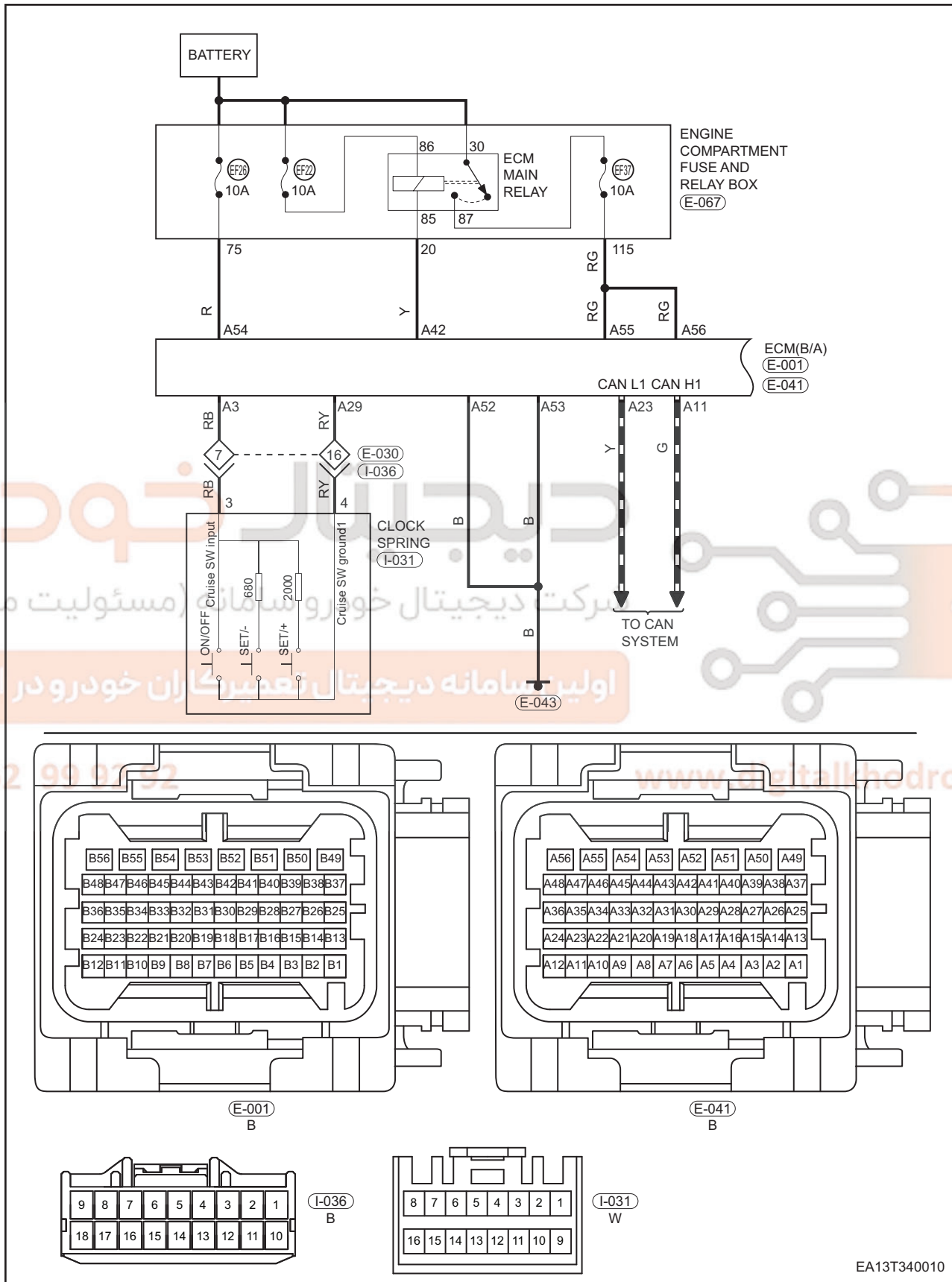
General Tool

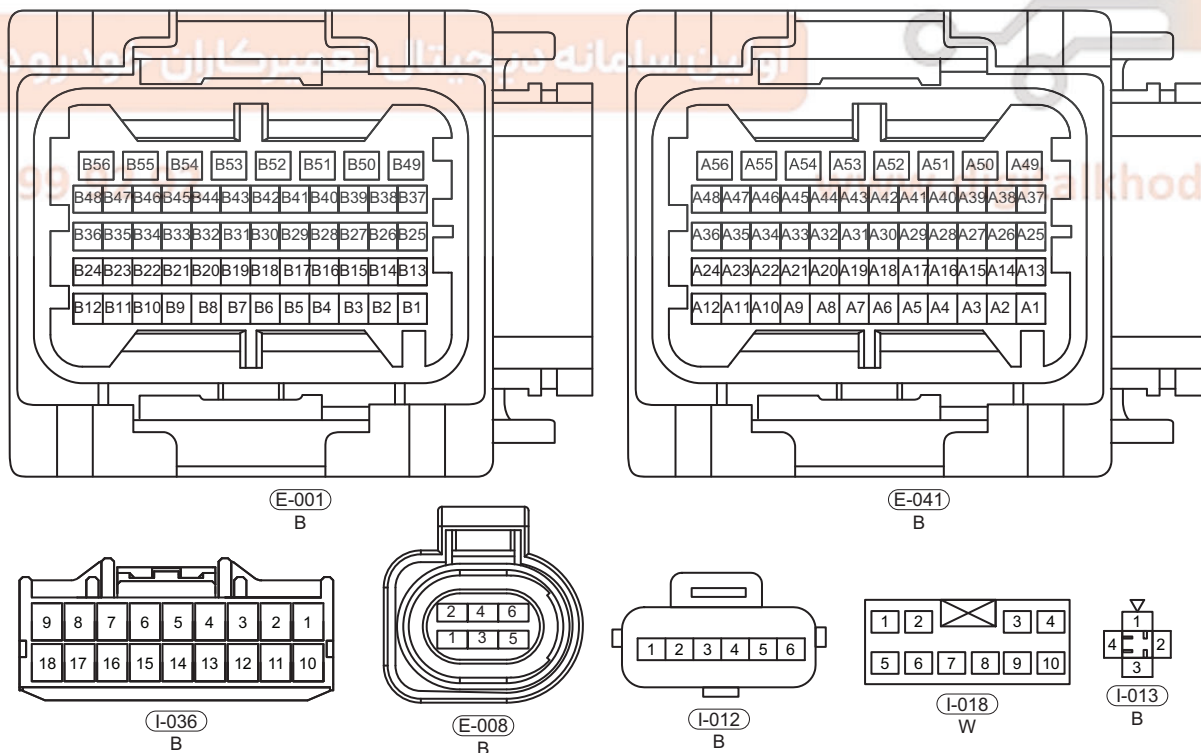
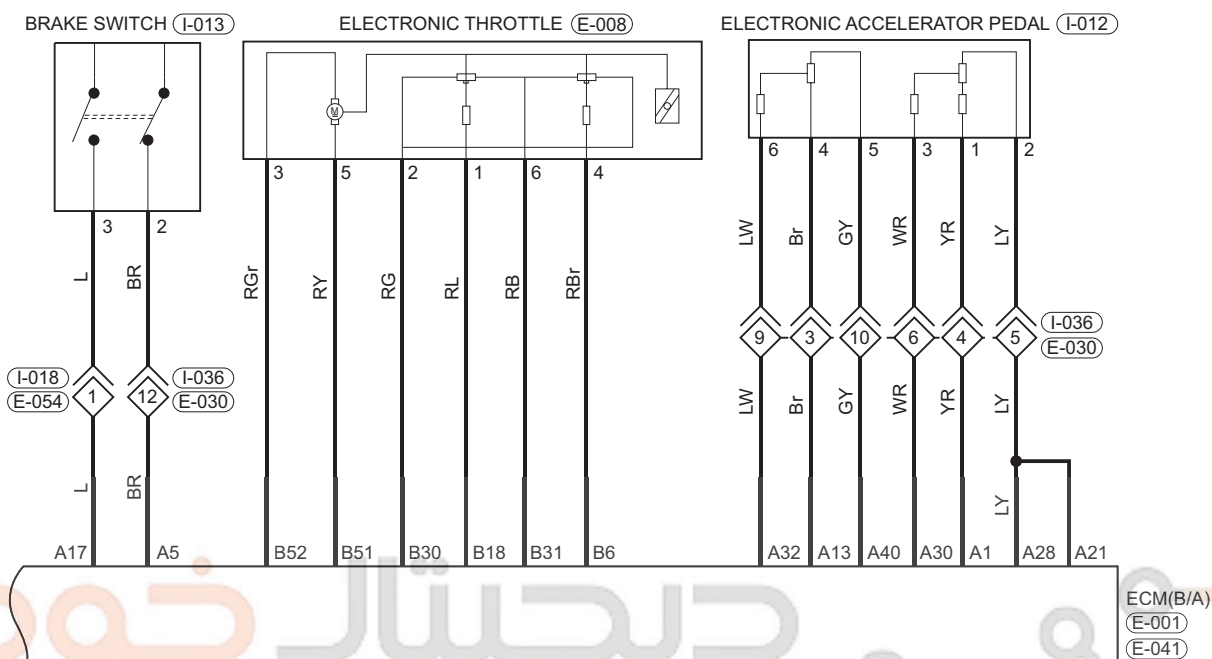
Digital Multimeter	 RCH0000002
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Circuit Diagram

Constant Speed Cruise System (Page 1 of 2)

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EA13T340020

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	34-11
	Wire harness or connector	-
	Engine Control Module (ECM)	-
Vehicle speed cannot be set (cruise control indicator turns on)	Constant speed cruise control switch	34-11
	Wire harness or connector	-
	Brake switch	-
	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 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 fault.
- Measure voltage, current and resistance.

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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, the malfunction is current.
4. Only use a digital multimeter to measure the voltage of electronic system.
5. Refer to any Technical Bulletin that may apply to the malfunction.
6. Visually check related wire harness and connector.
7. Check and clean all CD system grounds related to the latest DTC.
8. Check and clean all Engine Control Module (ECM) ground points related to current DTC.

Intermittent DTC Troubleshooting

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If malfunction is intermittent, perform the followings:

- 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 related circuit signal is interrupted.
- If possible, try to duplicate the conditions under which the DTC was set.
- Look for the data that has changed or the DTC to reset during the wiggle test.
- Look for broken, bent, protruded or corroded terminals.
- Inspect the mounting areas of audio system, 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 grounding parts related to the current DTC.
- Remove the No Disc DVD from the malfunctioning vehicle and install it to a new vehicle and perform a test. If this DTC cannot be cleared, there is malfunction in the No Disc DVD. If DTC can be cleared, reinstall the No Disc DVD to original vehicle.
- If multiple trouble codes were set, refer to the circuit diagrams to look for any common ground circuit or power supply circuit applied to the DTC.
- Refer to any Technical Bulletin that may apply to the 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 the 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 eyelet 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:

HINT: Use following procedures to troubleshoot the audio system.

1 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 the battery before proceeding to next step.

NEXT

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3 Customer problem analysis

NEXT

4 Check for DTCs (current DTC and history DTC)

Output
DTC

Go to step 5

No DTC
is output

Go to next step

NEXT

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

NEXT

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

NEXT

7 Troubleshoot according to Problem SymptomsTable, then go to step 8

NEXT

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8	Adjust, repair or replace	NEXT
9	Conduct test and confirm malfunction has been repaired	NEXT
10	End	

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ON-VEHICLE SERVICE

Constant Speed Cruise Control Switch

Removal

HINT:

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

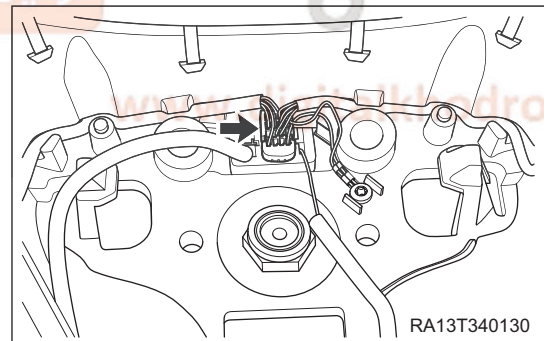
WARNING

- Be sure to read the precautions for SRS airbag before removing steering wheel quick button (See page 31-4).

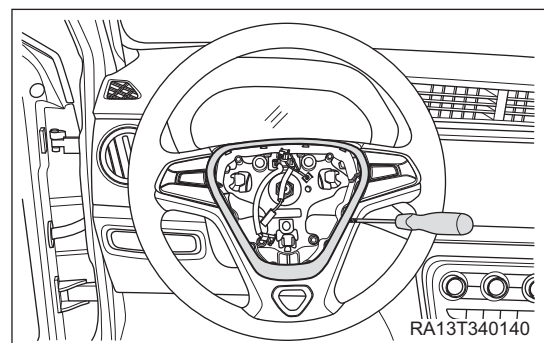
CAUTION

- Be sure to wear necessary safety equipment to prevent accidents when removing constant speed cruise control switch.
- DO NOT damage clips 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 31-46).
4. Remove the steering wheel quick button.
 - a. Disconnect the steering wheel quick button connector (arrow).



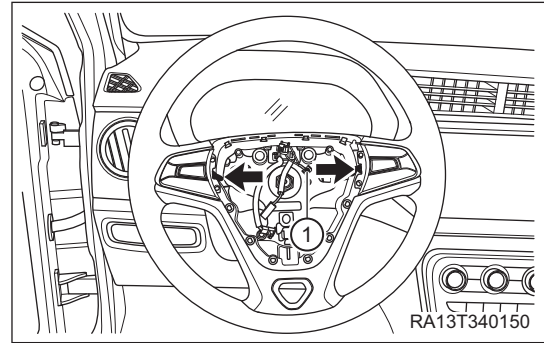
- b. Pry off steering wheel trim frame (arrow) with a screwdriver wrapped with tape.



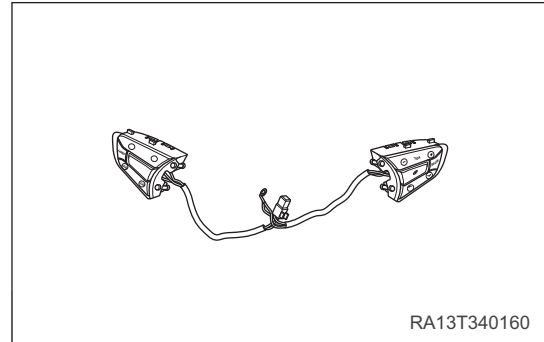
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- c. Using a screwdriver wrapped with protective tape, pry off the claws (arrow) on steering wheel quick button, and remove the fixing screw (1) from ground wire harness.

(Tightening torque: $0.7 \pm 0.2 \text{ N}\cdot\text{m}$)



- d. Press the steering wheel quick button.



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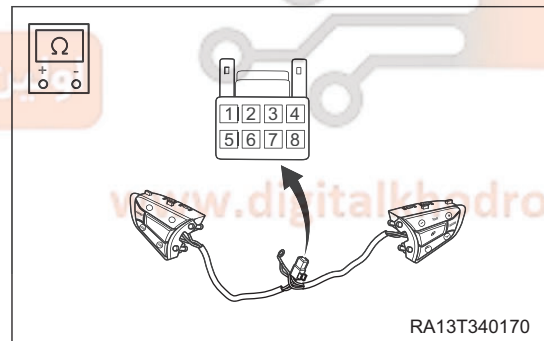
Inspection

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

Tester Connection	Condition	Specified Condition
Terminal 1 - Terminal 2	RES/+	2 kΩ
Terminal 1 - Terminal 2	SET/-	680 Ω
Terminal 1 - Terminal 2	OFF/ON	Continuity

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

2. Check if connectors are damaged. the wire harness if necessary.
3. Check if the No Disc DVD housing is deformed or damaged. the wire harness if necessary.



Installation

Installation is in the reverse order of removal.

CAUTION

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

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