12- Electrical system

Constant speed cruise

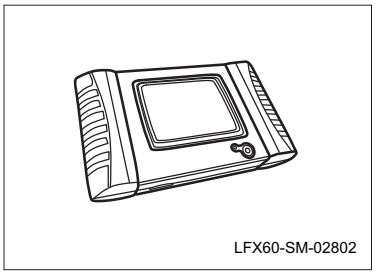
Precautions

Precautions

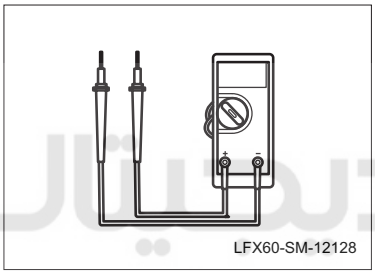
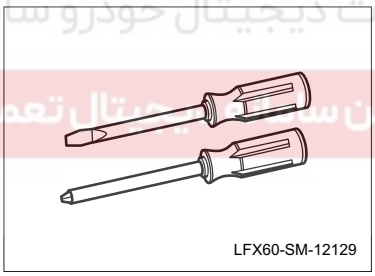
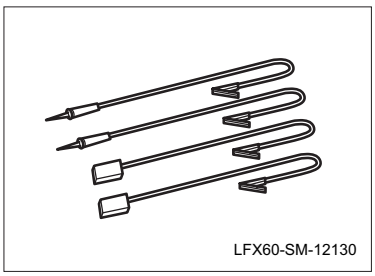
1. Do not see the constant speed cruise control button during the operation process and pay attention to driving safety; it is recommended to familiarize the opening process after parking.

Preparation

Special maintenance tools

No.	Tool name	Tool figure	Tool code	Remarks
1	Diagnosis equipment	 LFX60-SM-02802	-	System fault diagnosis

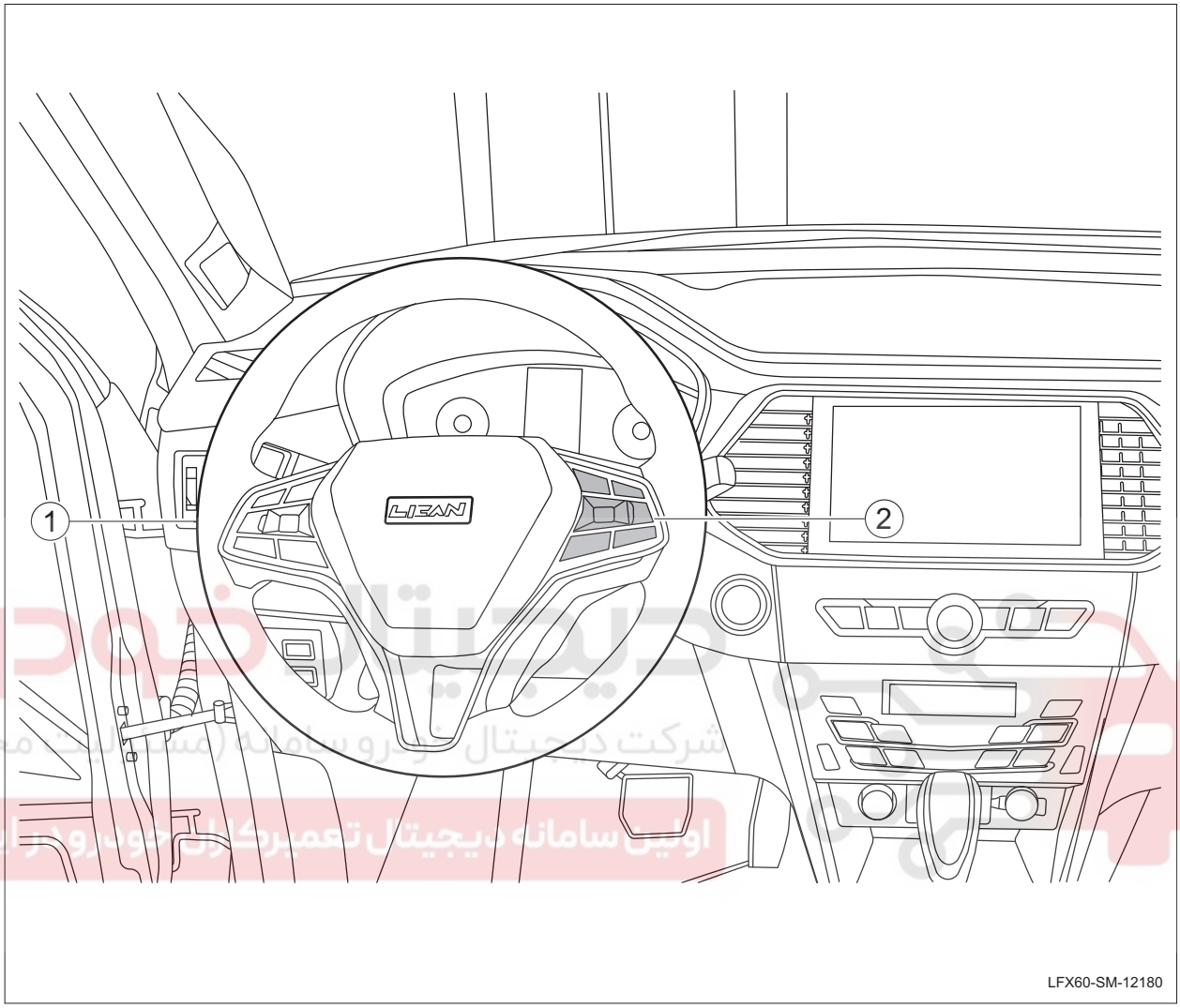
General maintenance tools

No.	Tool name	Tool figure	Tool code	Remarks
1	Digital multimeter	 LFX60-SM-12128	-	Test the voltage, resistance
2	Screwdriver	 LFX60-SM-12129	-	Remove the screw and panel
3	Wiring group	 LFX60-SM-12130	-	Check the line

Structure and installation location

Component Location Plan

Constant speed cruise switch



No.	Part name
1	Steering wheel

No.	Part name
6	Constant speed cruise control button

Operating Principle

System overview

Turn on the cruise control

When the main switch is pressed to turn on the cruise system, the cruise indicator on the dashboard will be turned on. At the speed of above 38km/h (can be calibrated) and below 180km/h (can be calibrated), (Set) button is short pressed to set the cruise speed, the vehicle will enter the cruise at the constant speed (without depressing the throttle, the vehicle can enter the cruise at the set speed).

When the main switch is in OFF status, the cruise function does not action in any case.

Acceleration cruise

Under the constant speed cruise status, short press RES button to increase the cruise speed by 2km (can be calibrated).

Under the constant speed cruise status, long press RES button to automatically and slowly increse the speed until the appropriate speed is achieved before releasing the button.

Deceleration cruise

Under the constant speed cruise status, short press Set button to decrease the cruise speed by 2km (can be calibrated).

Under the constant speed cruise status,, long press Set button to automatically and slowly decrease the cruise speed until the appropriate speed is achieved before releasing the button.

Constant speed cruise release

Under the cruise status, press Cancel button to release the constant speed cruise.

Constant speed cruise restore

After releasing the constant speed cruise, short press RES button and do not depress the accelerator, the speed can be automatically restored to the cruise speed before release.

Under the constant speed cruise status, directly depress the accelerator to increase the speed; but after releasing the accelerator, the speed will be slowly restored to the previously set cruising speed.

LIM actively adjustable speed switch

The adjustable speed limit function allows the driver to set the maximum speed of the vehicle with the adjustable speed limit control switch. After the actively adjustable speed limit function is activated, the vehicle speed will not exceed the maximum speed set by the driver, to ensure that the speed can not exceed the maximum speed, and improve the driving safety.

Speed limit opening

After pressing LIM button, at any speed of above 30km/h (can be calibrated) and below 180km/h (can be calibrated), short press (Set +/-) button to activate the adjustable speed limit function, to set the initial target speed limit as the current speed.

Speed limit target value adjustment

When the adjustable speed limit is activated, short press (RES +) button, to increase the target speed limit value by 1km (can be calibrated).

When the adjustable speed limit is activated, long press (RES +) button to continuously increase the target speed limit at the calibration rate to the desired value before releasing the button.

When the adjustable speed limit is activated, short press (Set -) button, to decrease the target speed limit value by 1km (can be calibrated).

When the adjustable speed limit is activated, long press (Set -) button, to continuoulsy decrease the target speed limit at the calibration rate to the desired value before releasing the button.

Speed limit function release

When the adjustable speed limit is activated, press LIM button, to release the current speed limit activation status and then enter the normal driving status.

Diagnosis Information and Procedures

Diagnosis Instructions

Before the cruise system troubleshooting, must understand and familiarize the working principle of the speaker system system, and then perform its diagnosis, so as to determine the correct fault diagnosis procedure in case of fault, and more importantly, determine whether the situations described by the user are normal.

For any fault diagnosis of the cruise system, must inspect it firstly, and then guide the maintenance staff to take the next logical steps for fault diagnosis. Comprehend and correctly use the diagnostic flow chart to shorten the diagnosis time and avoid the misjudgement.

General equipment

Name
Diagnostic equipment of vehicle
Digital multimeter

Visual Inspection

1. Confirm the problem raised by the customer.
2. Check for evident mechanical and electrical faults.

Visual inspection table

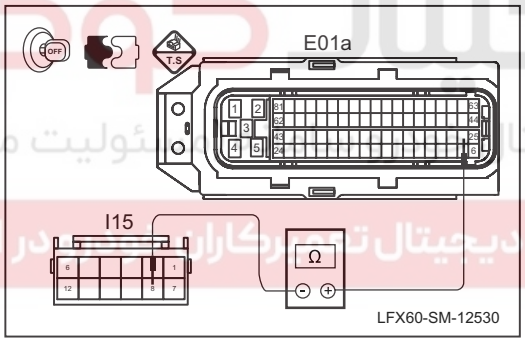
Mechanical	Electrical
• Brake pedal	• Line • Brake switch • Cruise control switch • Cruise setting switch

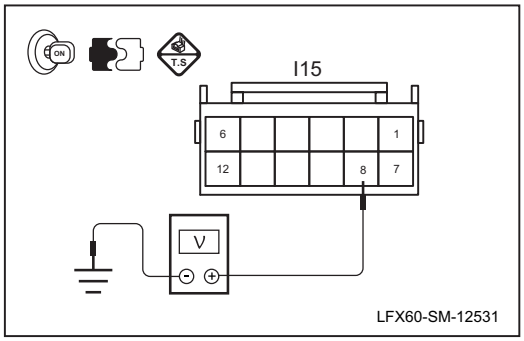
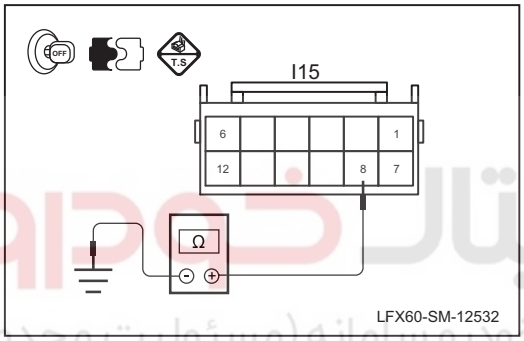
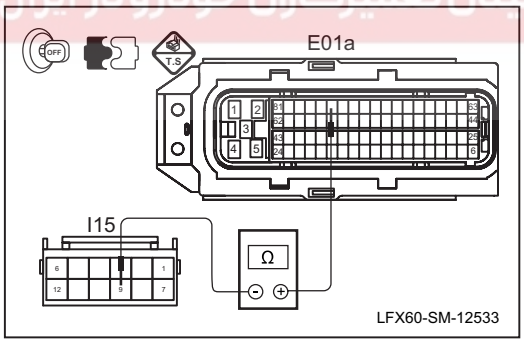
3. Check the system lines easy to see or can be seen.
4. If the observed or raised problem is the evident and the cause has been found, ensure to fix this fault before proceeding with the next step.
5. If no problem is found through the visual check, confirm the fault and refer to the fault symptom list.

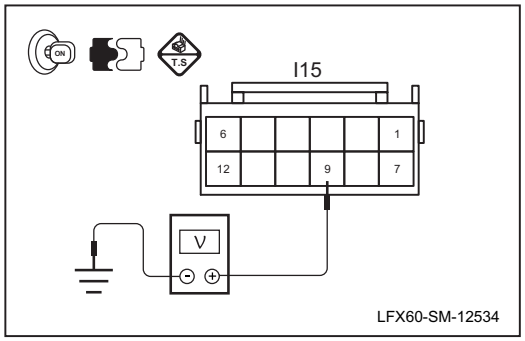
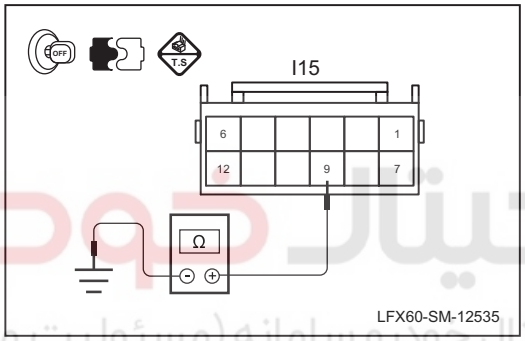
Fault symptoms table

Symptom	Possible point of failure	Recommended measure
The cruise function does not action/fault	• Line • Cruise control switch • Cruise setting switch • Brake switch • ECM	**Refer to: The cruise function does not action/ fault diagnosis flow**

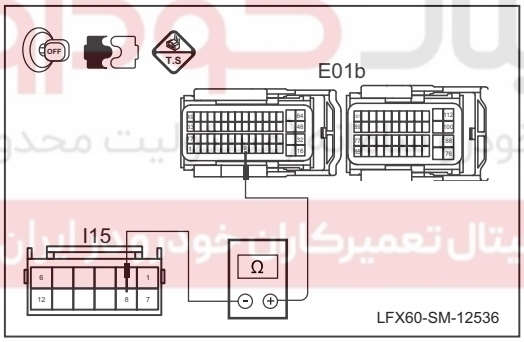
Diagnosis procedure about that the cruise function does not action/fault (Delphi)

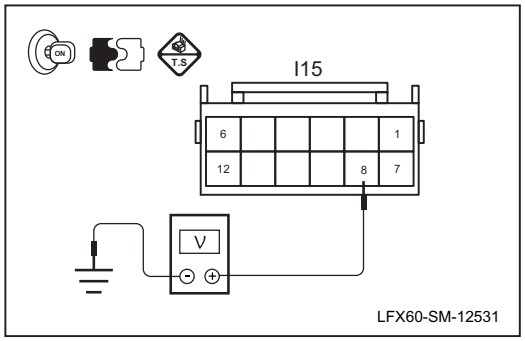
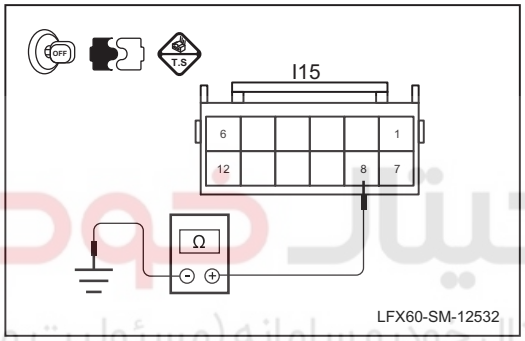
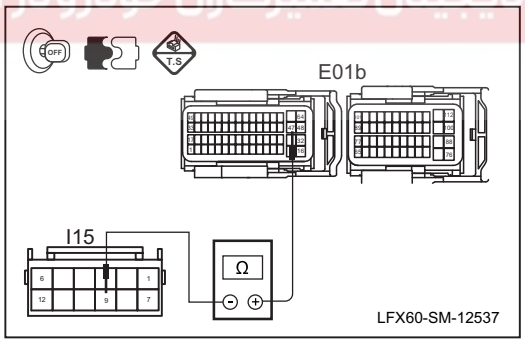
Test condition	Details/results/measures
1. General inspection.	
	A. Check the cruise control switch, stop lamp switch and ECM harness plug for breakage, loose contact, aging or looseness. Is it OK after checking? →**Yes** To step 2. →**No** Repair the fault position.
2. Check the auxiliary safety system.	
	A. Check the auxiliary safety system for fault related to the clock spring. Is it OK after checking? →**Yes** To step 3. →**No** Repair the auxiliary safety system.
3. Check the cruise control signal line for open circuit.	
	A. Operate the start switch to turn the power to OFF state. B. Disconnect the battery negative connector. C. Disconnect the clock spring harness plug I15. D. Disconnect the ECM harness plug E01a. E. Measure the resistance between the clock spring harness plug I15 terminal 8 and ECM harness plug E01a terminal 26. **Standard value: Less than 5Ω** Is the measurement normal? →**Yes** To step 4. →**No** Repair the cruise control switch signal line open circuit fault and replace the harness if necessary.

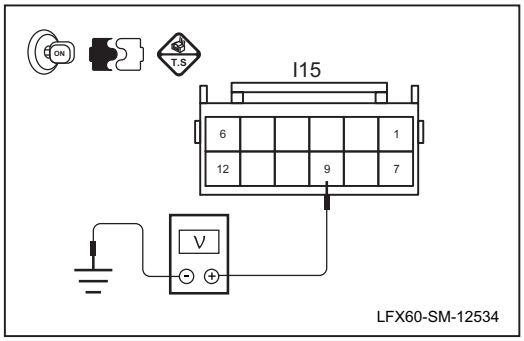
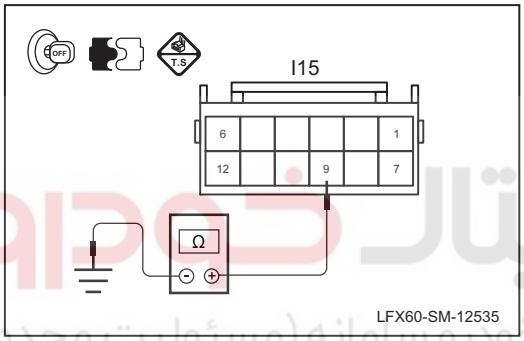
Test condition	Details/results/measures
4. Check the cruise control switch signal line for short circuit to the power.	
	A. Operate the start switch to turn the power to OFF state. B. Disconnect the battery negative connector. C. Disconnect the clock spring harness plug I15 and operate the start switch to turn the power to ON state. D. Measure the voltage between the clock spring harness plug I15 terminal 8 and the fixed ground point. **Standard value: 0V** Is the measurement normal? →**Yes** To step 5. →**No** Repair the cruise control switch signal line and power short circuit fault and replace the harness if necessary.
5. Check the cruise control switch signal line for short circuit to the ground.	
	A. Operate the start switch to turn the power to OFF state. B. Disconnect the battery negative connector. C. Disconnect the clock spring harness plug I15. D. Measure the resistance between the clock spring harness plug I15 terminal 8 and the fixed ground point. **Standard value: 10MΩ or higher** Is the measurement normal? →**Yes** To step 6. →**No** Repair the cruise control switch signal line and ground short circuit fault and replace the harness if necessary.
6. Check the cruise control switch ground line for open circuit.	
	A. Operate the start switch to turn the power to OFF state. B. Disconnect the battery negative connector. C. Disconnect the clock spring harness plug I15. D. Disconnect the ECM harness plug E01a. E. Measure the resistance between the clock spring harness plug I15 terminal 9 and ECM harness plug E01a terminal 76. **Standard value: Less than 5Ω** Is the measurement normal? →**Yes** To step 7. →**No** Repair the cruise control switch ground line open circuit fault and replace the harness if necessary.

Test condition	Details/results/measures
7. Check the cruise control switch ground line for short circuit to the power.	
	A. Operate the start switch to turn the power to OFF state. B. Disconnect the battery negative connector. C. Disconnect the clock spring harness plug I15 and operate the start switch to turn the power to ON state. D. Measure the voltage between the clock spring harness plug I15 terminal 9 and the fixed ground point. **Standard value: 0 V** Is the measurement normal? **→Yes** To step 8. **→No** Repair the cruise control switch ground line and power short circuit fault and replace the harness if necessary.
8. Check the cruise control switch signal line for short circuit to the power negative pole.	
	A. Operate the start switch to turn the power to OFF state. B. Disconnect the battery negative connector. C. Disconnect the clock spring harness plug I15. D. Measure the resistance between the clock spring harness plug I15 terminal 9 and the fixed ground point. **Standard value: 10MΩ or higher** Is the measurement normal? **→Yes** To step 9. **→No** Repair the cruise control switch ground line and power negative pole short circuit fault and replace the harness if necessary.
9. Replace the cruise control switch.	
	A. Replace the cruise control switch. B. Replacement of cruise control switch. Is the system normal? **→Yes** Troubleshooting is completed. **→No** To step 10.
10. Replace ECM.	
	A. Replace ECM. **Refer to: Replacement of ECM.** Confirm the system is normal.

The cruise function does not action/ fault diagnosis flow (Connect the power supply)

Test condition	Details/results/measures
1. General inspection.	
	A. Check the cruise control switch, stop lamp switch and ECM harness plug for breakage, loose contact, aging or looseness. Is it OK after checking? →**Yes** To step 2. →**No** Repair the fault position.
2. Check the auxiliary safety system.	
	A. Check the auxiliary safety system for fault related to the clock spring. Is it OK after checking? →**Yes** To step 3. →**No** Repair the auxiliary safety system.
3. Check the cruise control signal line for open circuit.	
	A. Operate the start switch to turn the power to OFF state. B. Disconnect the battery negative connector. C. Disconnect the clock spring wiring harness connector I15 and ECM wiring harness connector E01b. D. Measure the resistance between Terminal 8 of the clock spring wiring harness connector I15 and Terminal 9 of ECM wiring harness connector E01b. **Standard value: Less than 5Ω** Is the measurement normal? →**Yes** To step 4. →**No** Repair the cruise control switch signal line open circuit fault and replace the harness if necessary.

Test condition	Details/results/measures
4. Check the cruise control switch signal line for short circuit to the power.	
	A. Operate the start switch to turn the power to OFF state. B. Disconnect the battery negative connector. C. Disconnect the clock spring harness plug I15 and operate the start switch to turn the power to ON state. D. Measure the voltage between the clock spring harness plug I15 terminal 8 and the fixed ground point. **Standard value: 0 V** Is the measurement normal? →**Yes** To step 5. →**No** Repair the cruise control switch signal line and power short circuit fault and replace the harness if necessary.
5. Check the cruise control switch signal line for short circuit to the ground.	
	A. Operate the start switch to turn the power to OFF state. B. Disconnect the battery negative connector. C. Disconnect the clock spring harness plug I15. D. Measure the resistance between the clock spring harness plug I15 terminal 8 and the fixed ground point. **Standard value: 10MΩ or higher** Is the measurement normal? →**Yes** To step 6. →**No** Repair the cruise control switch signal line and ground short circuit fault and replace the harness if necessary.
6. Check the cruise control switch ground line for open circuit.	
	A. Operate the start switch to turn the power to OFF state. B. Disconnect the battery negative connector. C. Disconnect the clock spring harness plug I15. D. Disconnect the ECM harness connector E01b. E. Measure the resistance between Terminal 9 of the clock spring wiring harness connector I15 and Terminal 47 of ECM wiring harness connector E01b. **Standard value: Less than 5Ω** Is the measurement normal? →**Yes** To step 7. →**No** Repair the cruise control switch ground line open circuit fault and replace the harness if necessary.

Test condition	Details/results/measures
7. Check the cruise control switch ground line for short circuit to the power.	
	A. Operate the start switch to turn the power to OFF state. B. Disconnect the battery negative connector. C. Disconnect the clock spring harness plug I15 and operate the start switch to turn the power to ON state. D. Measure the voltage between the clock spring harness plug I15 terminal 9 and the fixed ground point. **Standard value: 0 V** Is the measurement normal? →**Yes** To step 8. →**No** Repair the cruise control switch ground line and power short circuit fault and replace the harness if necessary.
8. Check the cruise control switch signal line for short circuit to the power negative pole.	
	A. Operate the start switch to turn the power to OFF state. B. Disconnect the battery negative connector. C. Disconnect the clock spring harness plug I15. D. Measure the resistance between the clock spring harness plug I15 terminal 9 and the fixed ground point. **Standard value: 10MΩ or higher** Is the measurement normal? →**Yes** To step 9. →**No** Repair the cruise control switch ground line and power negative pole short circuit fault and replace the harness if necessary.
9. Replace the cruise control switch.	
	A. Replace the cruise control switch. Replacement of cruise control switch. Is the system normal? →**Yes** Troubleshooting is completed. →**No** To step 10.
10. Replace ECM.	
	A. Replace ECM. **Refer to: Replacement of ECM.** Confirm the system is normal.

Removal and Installation

Replacement of Cruise Switch

Removal

1. Remove the cruise switch.

(a). Disconnect the battery negative connector.
(b). Remove the driver airbag; **refer to: Replacement of Driver Airbag.**
(c). Remove the steering wheel. **Refer to the replacement of steering wheel.**
(d). Disconnect the steering wheel multi-function switch wiring harness connector.
(e). Remove the cruise switch.

Installation

1. Install the cruise switch.

(a). The installation sequence is the reverse of the disassembly order.