12- Electrical system

Rear reversing radar

Precautions

Precautions

The monitorion function may be abnormal under the following conditions:

1. The reversing radar sensor is covered with mud, snow and other impurities (the monitorion function will be returned to normal after the sensor is cleaned).
2. The reversing radar sensor is frozen (the monitorion function will be returned to normal after the sensor temperature is increased).
3. The reversing radar sensor is covered.
4. In case of a fault in cold weather, the reversing radar sensor may not monitor any obstacle.

The monitorion range is affected by the following conditions:

1. The reverse radar sensor is covered by the mud or snow.
2. The vehicle is in extremely hot or cold area.

A monitorion error may occur under the following conditions:

1. The vehicle is driven on a rugged road, unpaved road or the road with high grass.
2. There is a speaker sound from another vehicle, the sound from a motorbike engine, the sound from a big air brake or the ultrasound from another sonar in the vicinity of the vehicle.
3. The vehicle is driven in heavy rain or the sensor is in contact with water (splashed with water).
4. The vehicle is tilted considerably.
5. The vehicle is equipped with the optional protection rod or wireless antenna.
6. The reverse radar sensor is covered by the mud or snow.
7. The vehicle is moving toward the high curbs or the corners of protruding objects.

The reversing radar sensor can not monitor the objects as follows:

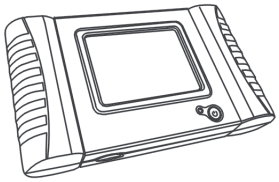
1. Wire, rope and other fine objects.
2. Cotton, snow and other materials that may absorb ultrasonic waves.
3. Objects with sharp edges.
4. Short objects.
5. Highly suspended objects.

Other precautions

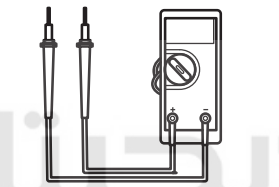
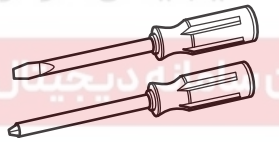
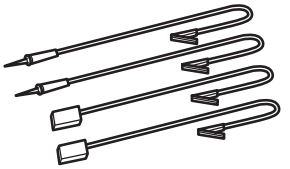
1. The reversing radar sensor can not monitor any object under the bumper. (The reverse radar sensor may detect lower items and thin bars and then lost tracking.)
2. The reversing radar sensor may not monitor any obstacle that are too close to it.
3. The reversing radar sensor may not monitor any obstacle when it falls or is violently bumped.

Preparation

Special maintenance tools

No.	Tool name	Tool figure	Tool code	Remarks
1	Diagnostic equipment of vehicle	 LFX60-SM-12127	-	System fault diagnosis

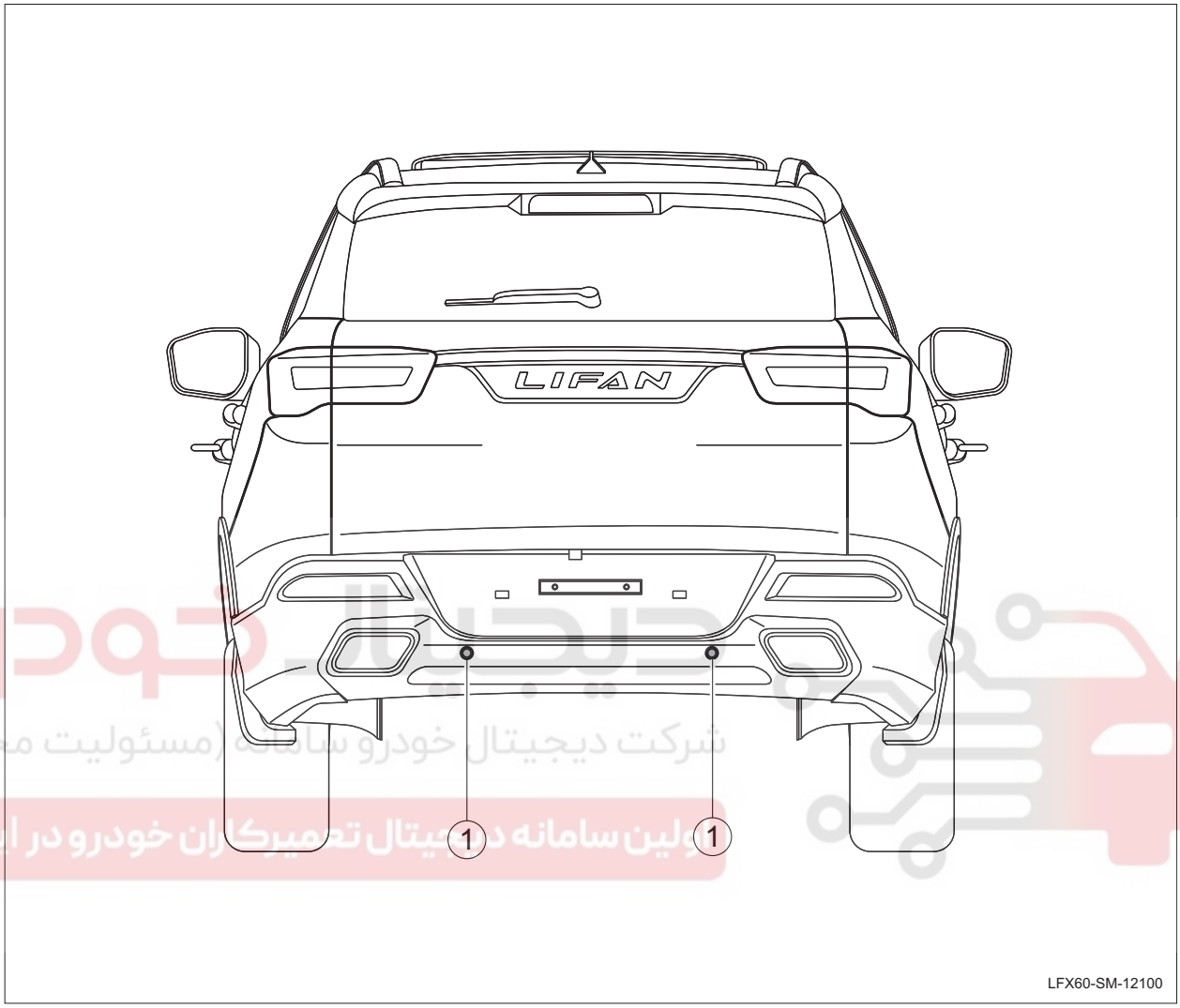
General maintenance tools

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

Rear anti-collision radar sensor



No.	Part name
1	Rear anti-collision radar probe

No.	Part name

Front anti-collision radar sensor

No.	Part name
1	Front anti-collision radar probe

No.	Part name

Diagnosis Information and Procedures

Diagnosis Instructions

Before the reversing radar system troubleshooting, must familiarize and understand its working principle, and then perform its diagnosis, which helps to determine the correct troubleshooting steps in case of a fault, and more importantly, to determine whether the situation descrived by the user is normal.

In any reversing radar system fault diagnosis, must first inspect it, and 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 the evident mechanical or electrical damage trace.

Visual inspection table

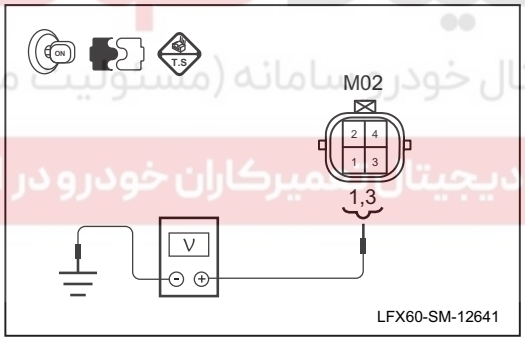
Electrical
• Fuse • Line • Harness plug • Rear radar sensor • Front radar sensor

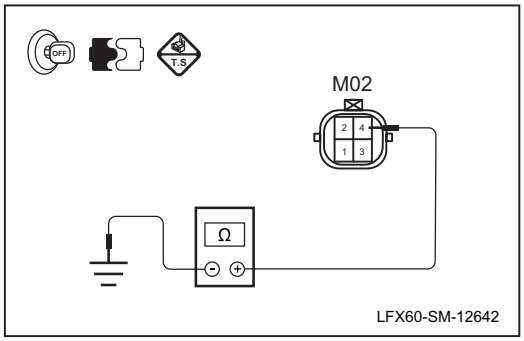
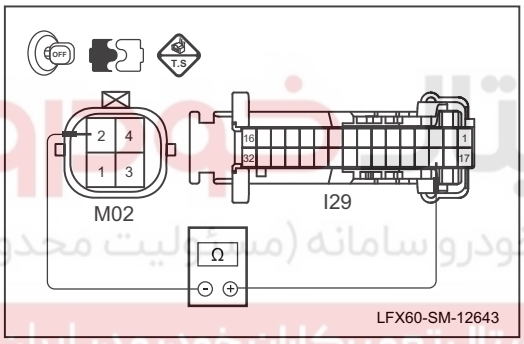
3. If the observed or raised problem is the evident and the cause has been found, ensure to fix this fault before proceeding with the next step.
4. If no problem is found through the visual check, confirm the fault and refer to the fault symptom list.

Fault symptoms table

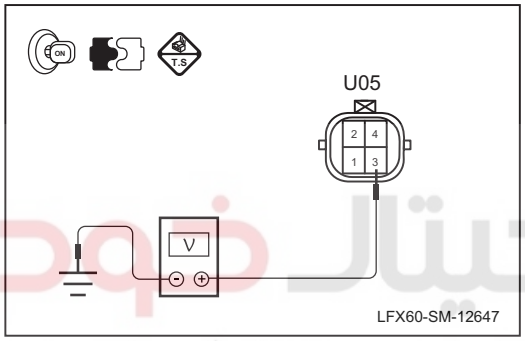
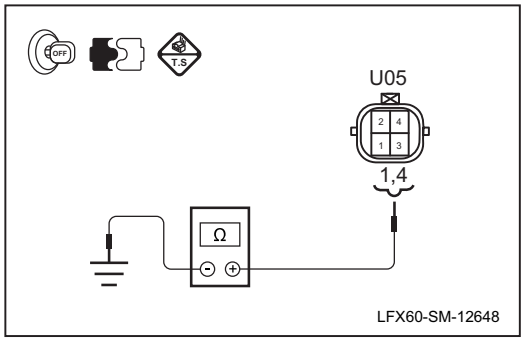
Symptom	Possible Cause	Recommended measure
All anti-corrosion radars can not alarm	• Fuse	**Refer to: All anti-corrosion radars can not alarm**
	• The system voltage is too low	
	• Line fault	
	• Anti-collision radar	
	• Instrument cluster	
The front anti-collision radar does not alarm	• Line fault	**Refer to: The front anti-collision radar does not alarm**
	• Anti-collision radar	
The alarm distance is inaccurate in case of any obstacle	• The obstacle is sound-absorbing material, such as: sponge, foam, and etc.	• It is a collision radar characteristic, and there is no return sound
	• The obstacle is too small	• The anti-collision radar can not monitor it
	• There is dirt or foreign matter on the anti-collision radar surface	• Inspect the anti-corrosion radar connector
	• The anti-collision radar connector has poor contact	• Keep anti-collision radar surface clean and clean the dirt on the surface
	• Anti-collision radar	• Replace the anti-collision radar

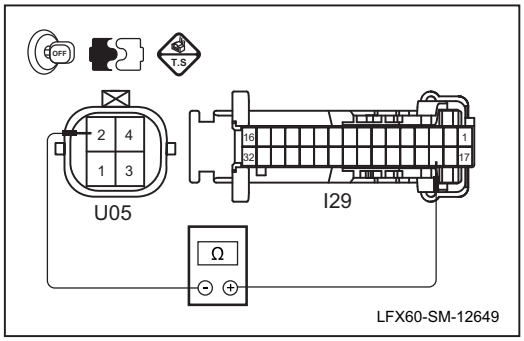
Diagnosis procedure about that all radar do not alarm

Test condition	Details/results/measures
1. General inspection.	
	A. Inspect the wiring harness connectors of the anti-collision radar and the instrument cluster for damage, poor contact, aging, loosening or other signs. B. Inspect the anti-collision radar surface for any foreign body. Is it OK after checking? →**Yes** To step 2. →**No** Repair the fault position.
2. Inspect the anti-corrision radar fuse.	
	A. Inspect the reversing radar fuse FS11. **Fuse rated capacity: 15 A** Is it OK after checking? →**Yes** To step 3. →**No** Replace the fuse.
3. Inspect the anti-collision radar power line (with the left rear anti-collision radar as an example).	
	A. Operate the ignition switch to turn the power to OFF state. B. Disconnect the battery negative cable. C. Disconnect the rear left anti-collision radar harness plug M02. D. Connect the battery negative terminal. E. Measure the voltage between Terminals 1 and 3 of the left rear anti-collision radar witing harness connector M02 and the reliable grounding point with a multimeter. **Standard value: 11 ~ 14 V** Is the voltage is OK? →**Yes** To step 4. →**No** Inspect and repair the left rear anti-collision radar power line fault; if necessary, replace the wiring harness.

Test condition	Details/results/measures
4. Inspect the left rear anti-collision radar grounding point.	
	A. Operate the ignition switch to turn the power to OFF state. B. Disconnect the battery negative connector. C. Disconnect the rear left anti-collision radar harness plug M02. D. Measure the resistance between Terminal 4 of the left rear anti-collision radar wiring harness connector M02 and the reliable grounding point with a multimeter. **Standard value: Less than 5Ω** Is the resistance normal? →**Yes** To step 5. →**No** Inspect and repair the left rear anti-collision radar grounding point fault; if necessary, replace the wiring harness.
5. Inspect the left rear anti-collision radar signal line.	
	A. Operate the ignition switch to turn the power to OFF state. B. Disconnect the battery negative connector. C. Disconnect the rear left anti-collision radar harness plug M02. D. Disconnect the instrument cluster harness plug I29. E. Measure the resistance between Terminal 2 of the left rear anti-collision radar wiring harness connector M02 and Terminal 19 of the instrument cluster wiring harness connector I29 with a multimeter. **Standard value: Less than 5Ω** Is the resistance normal? →**Yes** To step 6. →**No** Inspect and repair the left rear anti-collision radar signal line fault; if necessary, replace the wiring harness.
6. Inspect the left rear anti-collision radar.	
	A. Replace left rear radar. **Refer to: Replacement of Rear Anti-collision Radar Sensor** Is the system normal? →**Yes** Replace the left rear anti-collision radar. →**No** To step 7.
7. Check the instrument cluster.	
	A. Replace the instrument cluster. **Refer to: Replacement of instrument cluster assembly** Confirm that troubleshooting is completed.

Diagnosis procedure about that the front anti-collision radar does not alarm

Test condition	Details/results/measures
1. General inspection.	
	A. Inspect the anti-collision radar wiring harness connector for damage, poor contact, aging, loosening or other signs. B. Inspect the front collision radar sensor surface for any foreign matter. Is it OK after checking? →**Yes** To step 2. →**No** Repair the fault position.
2. Inspect the front anti-corrosion radar power line (with the left front anti-collision radar as an example).	
	A. Operate the ignition switch to turn the power to OFF state. B. Disconnect the battery negative connector. C. Disconnect the front left anti-collision radar harness plug U05. D. Connect the battery negative terminal. E. Operate the ignition switch to turn the power to ON state. F. Measure the voltage between Terminal 3 of the left front anti-collision radar wiring harness connector U05 terminal and the reliable grounding point with a multimeter. **Standard value: 11 ~ 14 V** Is the voltage is OK? →**Yes** To step 3. →**No** Inspect and repair the reversing radar power line open circuit fault; if necessary, replace the wiring harness.
3. Inspect the left front anti-collision radar grounding point.	
	A. Operate the ignition switch to turn the power to OFF state. B. Disconnect the battery negative connector. C. Disconnect the front left anti-collision radar harness plug U05. D. Measure the resistance between Terminals 1 and 4 of the left rear reversing radar witing harness connector U05 and the reliable grounding point with a multimeter. **Standard value: Less than 5Ω** Is the resistance normal? →**Yes** To step 4. →**No** Inspect and repair the left front anti-collision radar grounding point fault; if necessary, replace the wiring harness.

Test condition	Details/results/measures
4. Inspect the left front anti-collision radar signal line.	
	A. Operate the ignition switch to turn the power to OFF state. B. Disconnect the battery negative cable. C. Disconnect the front left anti-collision radar harness plug U05. D. Disconnect the instrument cluster harness plug I29. E. Measure the resistance between Terminal 2 of the left front anti-collision radar wiring harness connector U05 and Terminal 19 of the instrument cluster wiring harness connector I29 with a multimeter. **Standard value: Less than 5Ω** Is the resistance normal? →**Yes** To step 5. →**No** Inspect and repair the reversing radar signal line fault; if necessary, replace the wiring harness.
5. Inspect the left front anti-collision radar.	
	A. Replace the left front anti-collision radar. **Refer to: Replacement of Front Anti-collision Radar Sensor** Confirm that troubleshooting is completed.

Removal and Installation

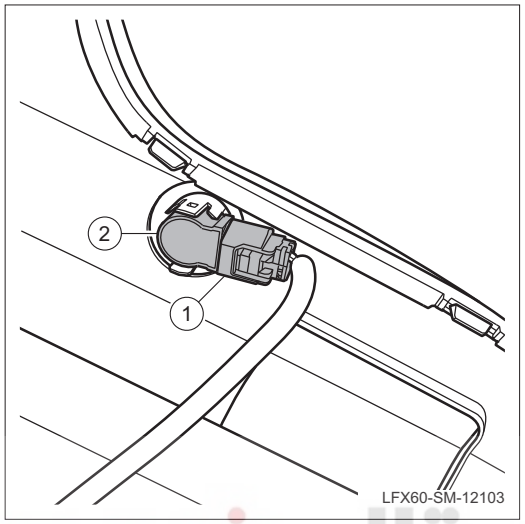
Replacement of Rear Anti-collision Radar Sensor

Removal

1. Remove the rear anti-collision radar sensor.

(a). Disconnect the battery negative connector.

(b). Remove the rear bumper assembly; **refer to: Replacement of Rear Bumper Assembly.**



(c). Disconnect the rear anti-collision radar sensor wiring harness connector 1.

(d). Remove the rear anti-collision radar sensor 2.

Installation

1. Install the rear anti-collision radar sensor.

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

Replacement of Front Anti-collision Radar Sensor

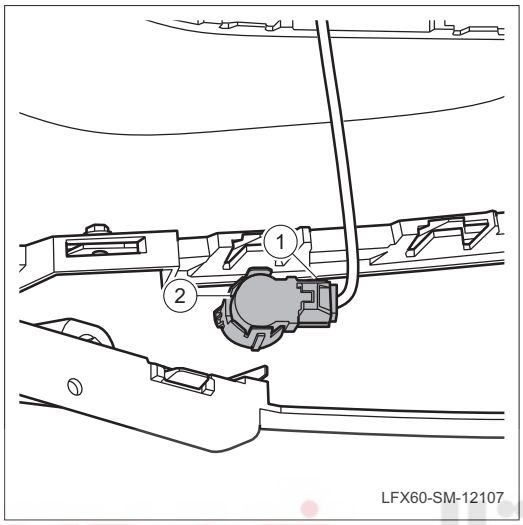
Removal

1. Remove the front anti-collision radar sensor.

(a). Disconnect the battery negative connector.

(b). Lift the vehicle. **Refer to the vehicle lift and support.**

(c). Remove the lower engine guard panel; **refer to: Replacement of Lower Engine Guard Panel.**



(d). Disconnect the front anti-collision radar sensor wiring harness connector 1.

(e). Remove the front anti-collision radar sensor 2.

Installation

1. Install the front anti-collision radar sensor.

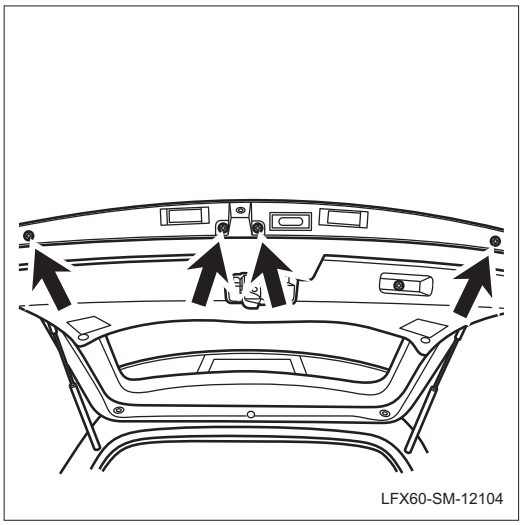
(a). The installation sequence is the reverse of the disassembly order.

Replacement of Reversing Monitoring Camera

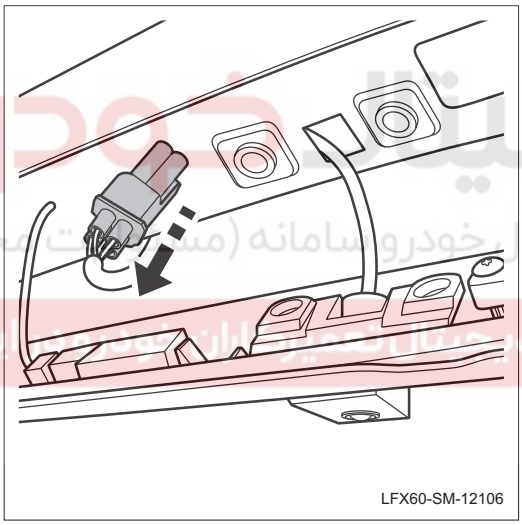
Removal

1. Remove the reversing monitoring camera.

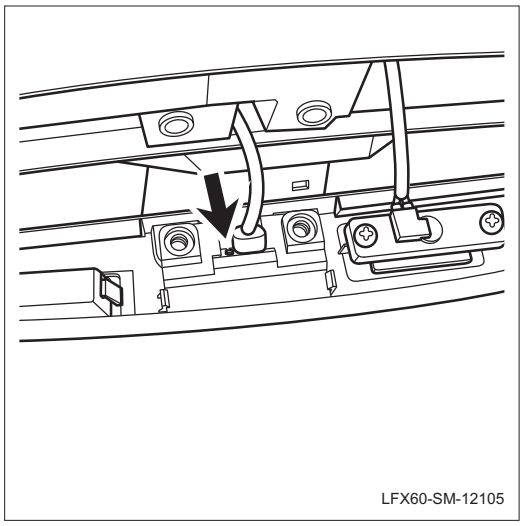
(a). Disconnect the battery negative connector.



(b). Remove the license plate lamp cover fixing screws and remove the license plate lamp cover.



(c). Disconnect the rear reversing monitoring camera wiring harness connector.



(d). Remove the reversing monitoring camera fixing screws and remove the reversing monitoring camera.

Installation

1. Install the reversing monitoring camera.

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