# 10 - Bodywork

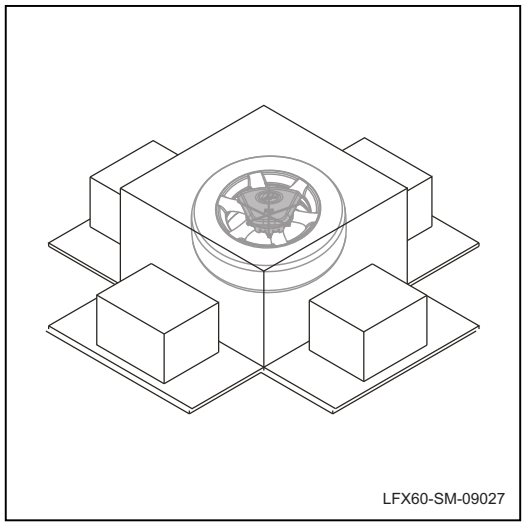

LFX60-SM-09030

(r). Remove the driver's airbag module from the steel ring.

(s). Put the driver's airbag in the plastic bag, tighten the pocket, handle the driver's airbag module as the disposal of the used parts.

**⚠Warning:**

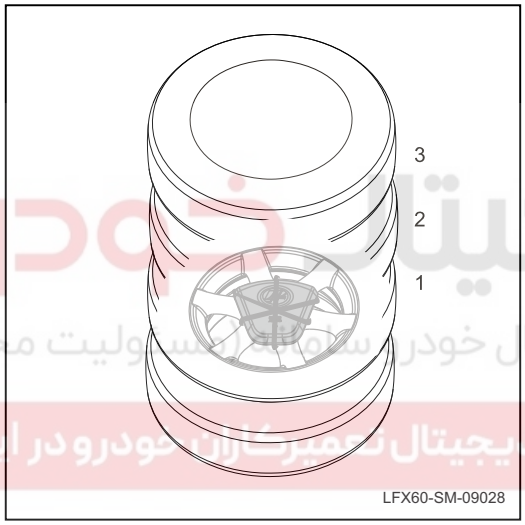
- **The airbag will be hot after fired. Wait for at least 30min before touching.**
- **Safety gloves and goggle should be worn to handle fired airbag.**
- **Do not splash the water onto the detonated airbag assembly.**
- **Clean your hand after operation.**


LFX60-SM-09027

(n). Cover the bundled airbag module with a cardboard box or a used tire.

**Cardboard cover method:**

**Cover the airbag module bond to wheel with a cardboard box bigger then wheel, put 190N weight on the box. As shown in the Figure.**

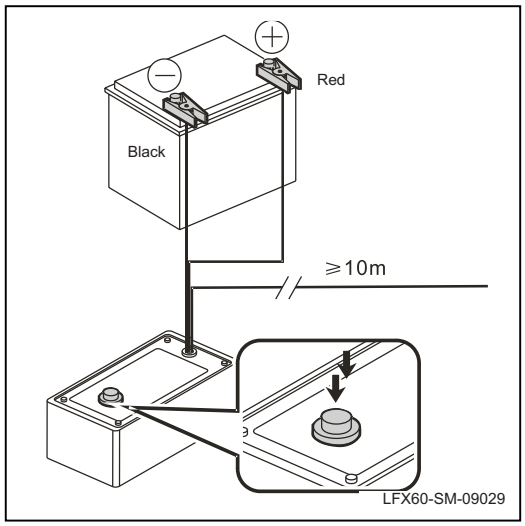


LFX60-SM-09028

**Tire cover method:**

**Cover the airbag module bond to wheel with at least three discarded wheel (without rim). As shown in the Figure.**



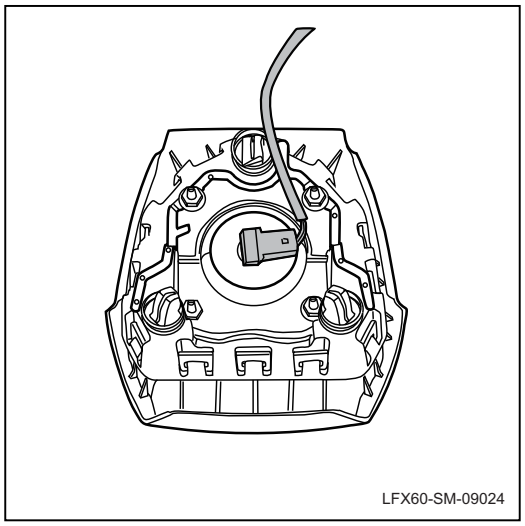


LFX60-SM-09029

(o). Connect the red and black clamps of the special tools for the airbag detonation to the positive and negative terminals of the backup battery.

(p). Check to ensure that there is no person or animal within 10m distance to the bundled airbag.

(q). Press down the detonation switch to detonate the airbag.


LFX60-SM-09024

(j). Connect the driver airbag adapter to the driver's airbag module.


LFX60-SM-09025

(k). Fix the driver's airbag with the harness to the prepared wheel.

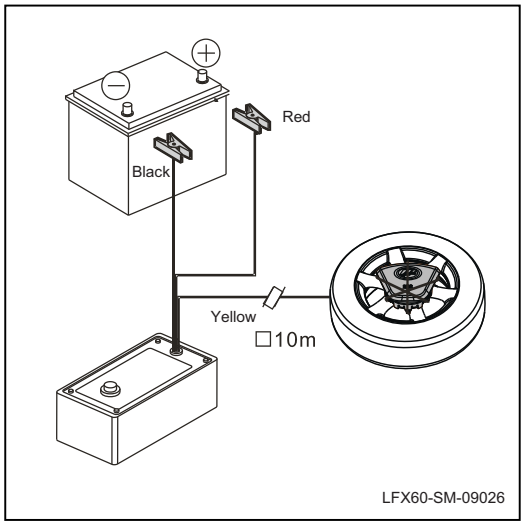
△**Tips:**

**Expansion of driver's airbag can damage wheel, thus discarded wheels should be used.**

⚠**Warning:**

- **Make sue the airbag is bond tightly with harness or equivalent. It is very dangerous if the harness are break when the airbag bursts during firing.**
- **Make sure to bind the driver's airbag facing up. If the metal side of airbag faces up, it can cut the harness during burst of airbag, which can cause risk of flying airbag. This is very dangerous.**





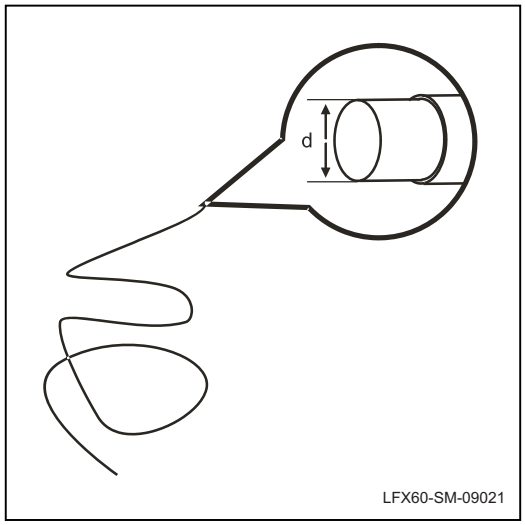
LFX60-SM-09026

(l). Connect the driver airbag adapter to the yellow connector on the special tools for airbag detonation.

△**Tips:**

**Leave the secondary latch of the cascade lock unengaged to avoid damage to connector and harness of the special tool. Make sure binding harness are loose than that of outside. The cascade lock and loose binding harness prevents excessive shock in burst of airbag, to protect harness of the special tool.**

(m). Move the special tools for airbag detonation away for 10m from the bundled airbag.




(d). Prepare some discarded vehicle harness.

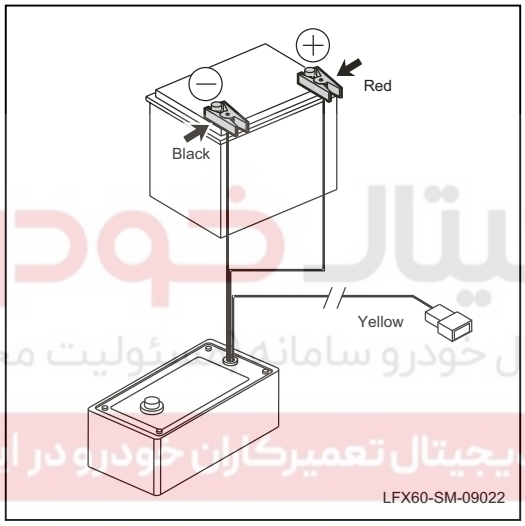
△**Tips:**

**The diameter d of the bare portion of the wire harness should be > 1.3 mm to meet the requirement that the cross-sectional area of the bare portion of the wire harness is greater than 1.25 mm².**

⚠**Warning:**

**The harness are used to tie the airbag in firing operation. Thicker or thinner harness may break when the airbag burst. This is very dangerous, so the choice of bundled harness or equivalent must be reliable.**

(e). Choose a suitable open area.



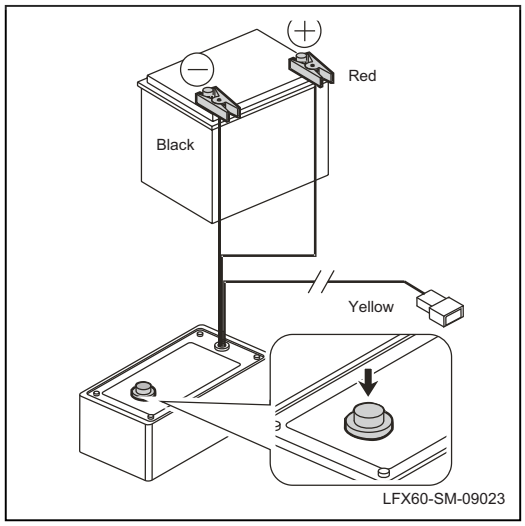

(f). Check the performance of the special tools for airbag detonation.

(g). Connect the special tools for airbag detonation to the battery.

△**Tips:**

**Hold red clip of the special tool onto positive post of the battery, while black one onto negative. The yellow connector is for airbag module. Leave it alone in this step.**






(h). Press down the activation switch of the special tools for airbag detonation to check that if the switch diode lamp is lit.

⚠**Warning:**

**If the LED does not light, the special should not be used because of fault.**

(g). Disconnect the special tools for airbag detonation from the battery.

## Scrapped airbag

### Scrapped

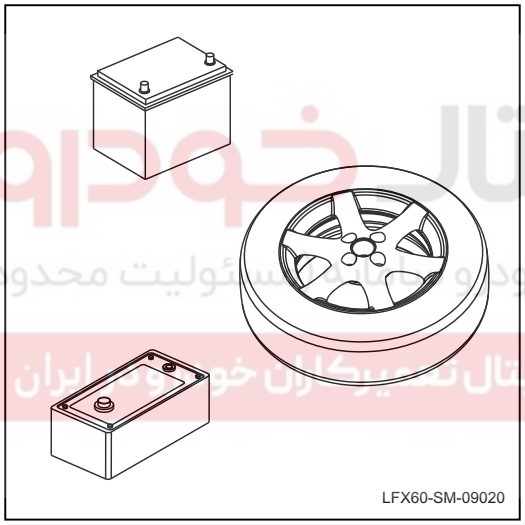
**1. Scrapped airbag.**

**△Tips:**

**When dispose vehicle or airbag module, the discarded airbag should be fired, this can eliminate any risk of burning in certain circumstances. Please follow the steps below to detonate, if the abandoned driver airbag can not detonate by accident, please contact Lifan dealer maintenance department.**

**⚠Warning:**

- **Never dispose driver's airbag module not fired.**
- **When detonating the airbag, a great explosion will occur.It is advisable to detonate at the outdoor without affecting nearby residents.**
- **The special tool for firing from Lifan should be used to fire discarded airbag. Operate this in a place far from the electrical interference.**
- **Any operation of firing should be conducted 10m away from airbag in firing operation.**
- **The airbag will be hot after fired. Wait for at least 30min before touching.**
- **Safety gloves and goggle should be worn to handle fired airbag.**
- **Do not splash the water onto the detonated airbag assembly.**
- **Clean your hand after operation.**




(a). Prepare the special tool for airbag firing
(b). Prepare a battery as power supply to fire airbag.
(c). Prepare a discarded wheel with rim and some discarded wheel without rim, and some cardboard boxes and weights.

## Replacement of airbag control module

### Removal

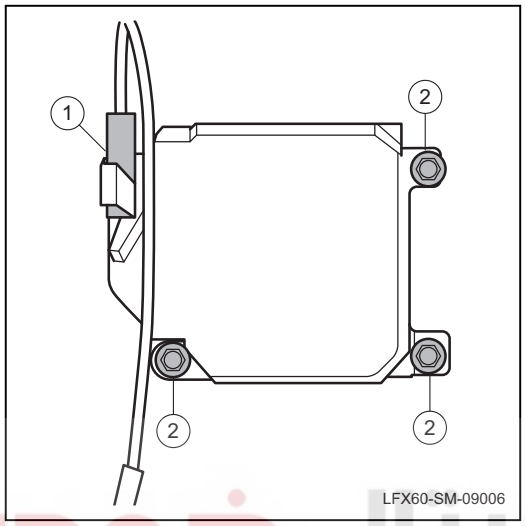
**1. Remove the airbag control module.**

(a). Disconnect the battery negative connector.

**Note:**

**Disconnect the battery negative terminal, wait for 90s at least and then continue operation.**

(b). Remove the sub-dashboard, **refer to:Replacement of sub-dashboard.**




(c). Disconnect the harness plug 1 of the airbag control module.

(d). Remove the fixing bolts 2 of the airbag control module.

(e). Take off the airbag control module.

### Installation

**1. Install the airbag control module.**

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

## Replacement of clock spring

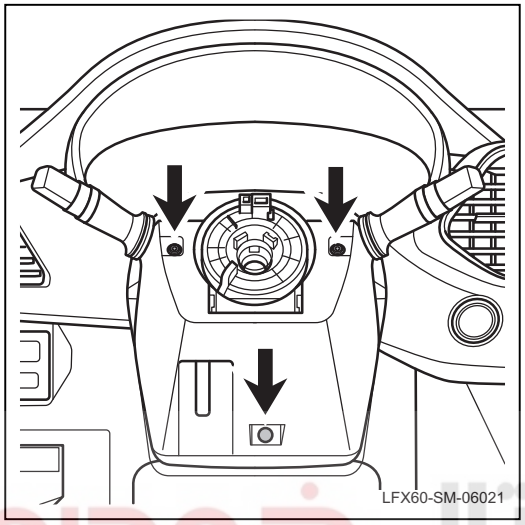
### Removal

**1. Remove the clockspring.**

(a). Disconnect the battery negative connector.

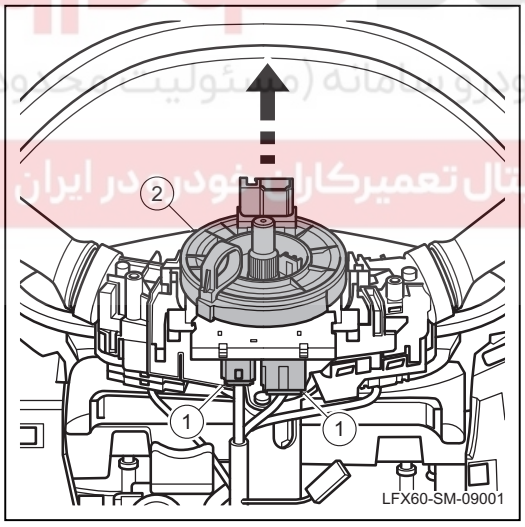
(b). Remove the driver's airbag. **Refer to the replacement of driver's airbag.**

(c). Remove the multi-function steering wheel, **refer to:Replacement of multi-function steering wheel.**




(d). Remove the multi-function steering wheel upper and lower shield fixing bolt.

(e). Take down the multi-function steering wheel upper and lower shield.




(f). Disconnect the harness plug 1 of clock spring.

(g). Separate the jaws of the clock spring, remove the clock spring 2.

**Note:**

**Mark the clockspring or fix it with adhesive tape for reusing.**

### Installation

**1. Install the clockspring.**

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

(b). Install the multi-function steering wheel, **refer to:Replacement of multi-function steering wheel**

(c). Install the driver airbag, **refer to:Replacement of the driver airbag.**

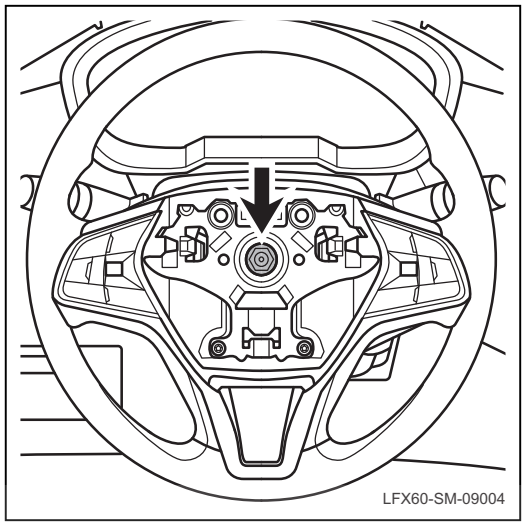
## Replacement of multi-function steering wheel

### Removal

**1. Remove the multi-function steering wheel.**

(a). Disconnect the battery negative connector.

(b). Remove the driver's airbag. **Refer to the replacement of driver's airbag.**




(c). Remove the lock nut of the multi-function steering wheel.

**ℹNote:**

**Before pulling out the steering wheel, make assembly mark on the steering shaft and the steering wheel to ensure that the parts can be mounted to the original position during installation.**

(d). Pull out the multi-function steering wheel.

### Installation

**1. Install the multi-function steering wheel.**

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

(b). Install the driver airbag, **refer to:Replacement of the driver airbag.**

## Replacement of the passenger airbag

### Removal

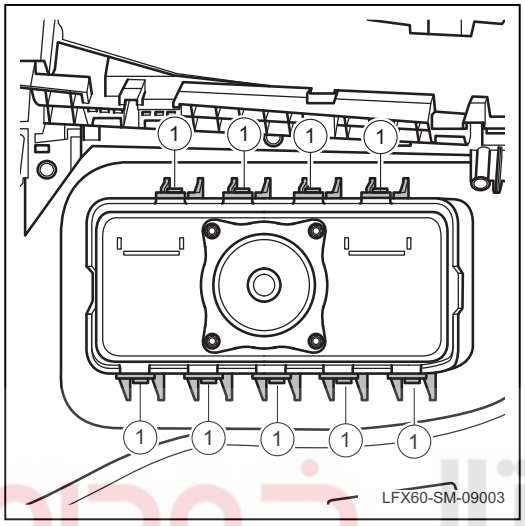
**1. Remove the passenger airbag**

(a). Disconnect the battery negative connector.

**Note:**

**Disconnect the battery negative terminal, wait for 90s at least and then continue operation.**

(b). Install the upper body of dashboard, **refer to:Replacement of the upper body of dashboard.**




(c). Gently pry the connection tab 1 of occupant airbag and dashboard.

**Warning:**

**Disassemble of the front passenger airbag is not allowed.**

(d). Take off the passenger airbag, and place in a safe position.

**Note:**

**It is very dangerous to put airbag module facing down. Burst bladder can make the module bouncing, which may cause serious injury. Position the module facing up.**

### Installation

**1. Install passenger airbag**

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

(b). Remove the upper body of dashboard, **refer to:Replacement of the dashboard assembly.**

(c). Check and clear the airbag fault code.

# Removal and Installation

### Replacement of the driver airbag

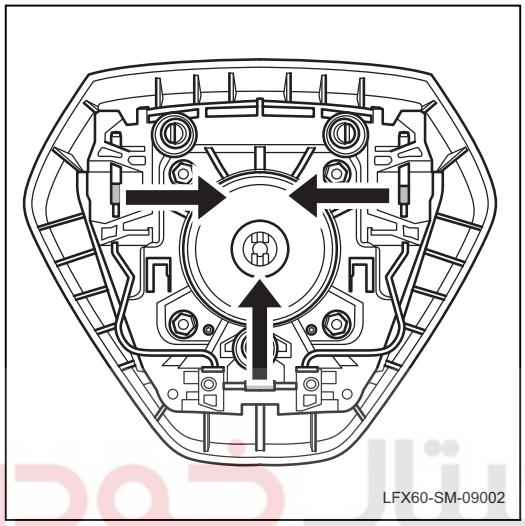
### Removal

**1. Remove the driver's airbag.**

(a). Disconnect the battery negative connector.

**Note:**

**Disconnect the battery negative terminal, wait for 90s at least and then continue operation.**



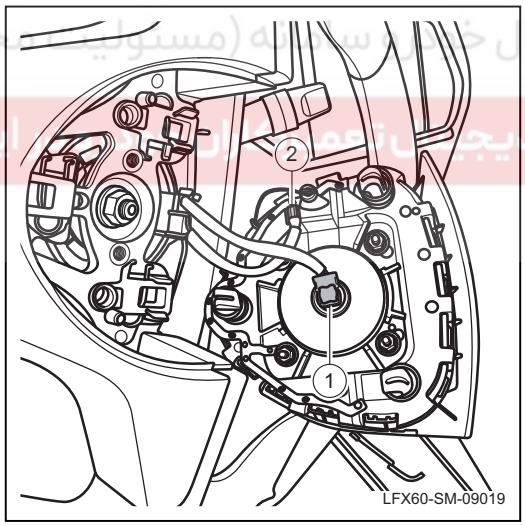

(b). Use the appropriate tool to pry the driver's airbag retainer in the direction of the arrow.

**Note:**

**Use tape to wrap around the appropriate tool to avoid damage to the lower surface of the steering wheel.**

(c). Turn over the driver airbag.






(d). Disconnect the harness plug 1 of the driver airbag.

(e). Disconnect the harness plug 2 of speaker.

**Note:**

**Do not pull the harness of the driver's airbag.**

(f). Take off the driver airbag assembly, and place in a safe position.

**Note:**

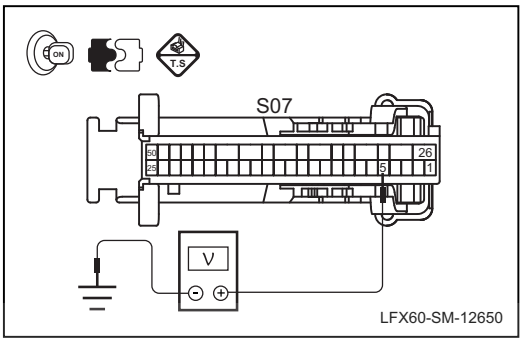
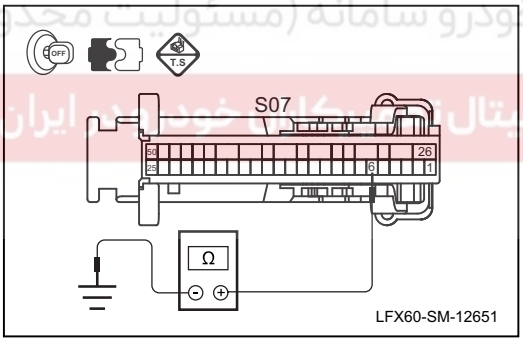
**It is very dangerous to put airbag module facing down. Burst bladder can make the module bouncing, which may cause serious injury. Position the module facing up.**

### Installation

**1. Install the driver airbag.**

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

(b). Check and clear the airbag fault code.

| Test condition | Details/results/measures |
|---|---|
| 4. Check the vehicle communication system. | |
| | A. Check whether the vehicle communication system is normal.<br>Is it OK after checking?<br>→**Yes**<br>To Step 5.<br>→**No**<br>Check the communication system for fault. |
| 5. Check the airbag control module power line. | |
|  LFX60-SM-12650 | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the airbag control module harness plug S07.<br>C. Connect the battery negative terminal and operate the start switch to turn the power to ON state.<br>D. Measure the voltage between the airbag control module harness plug S07 terminal 5 and the fixed ground point with the multimeter.<br>**Standard voltage: 11 ~ 14V**<br>Is it OK after checking?<br>→**Yes**<br>To Step 6.<br>→**No**<br>Repair the airbag control module power line open circuit fault and replace the harness if necessary. |
| 6. Check the airbag control module ground line. | |
|  LFX60-SM-12651 | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the airbag control module harness plug S07.<br>C. Measure the resistance between the airbag control module harness plug S07 terminal 6 and the fixed ground point with the multimeter.<br>**Standard resistance: less than 5 Ω**<br>Is it OK after checking?<br>→**Yes**<br>To Step 7.<br>→**No**<br>Repair the airbag control module ground line open circuit fault and replace the harness if necessary. |
| 7. Replace the airbag control unit. | |
| | A. Replace the airbag control unit.<br>**Refer to: Replacement of airbag control module**<br>Verify that the system is operated normally. |

## DTC U007300, U015500

### DTC description

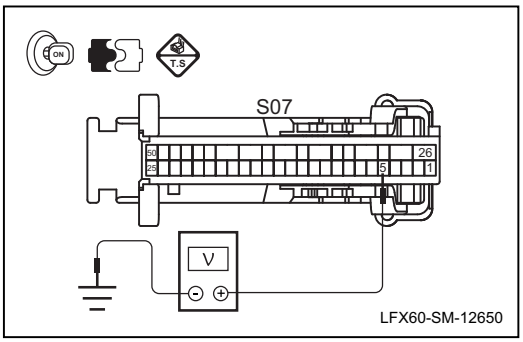
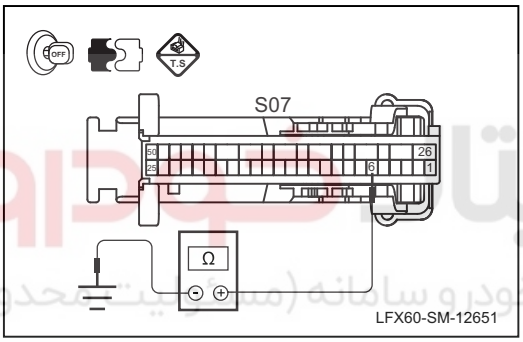
| DTC | Description | Definition |
|---|---|---|
| U007300 | CAN bus off-line | • Airbag control unit monitors system operating voltage abnormal |
| U015500 | IC signal loss | |

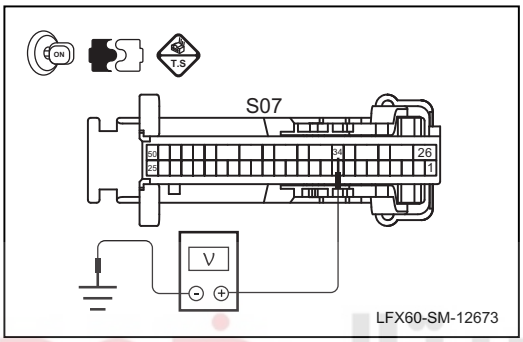
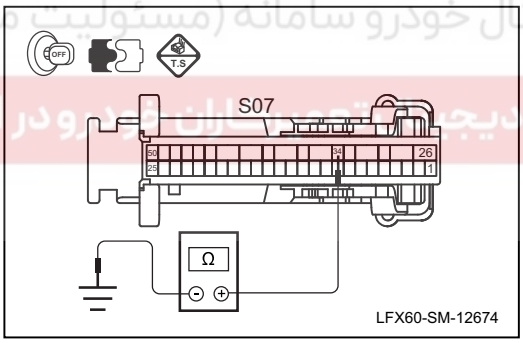
### Possible reasons

| DTC | Check the strategy | Set the condition (control strategy) | Define the fault location |
|---|---|---|---|
| U007300 | Line and check the hardware | • The CAN bus is offline for more than 400 ms<br>• The dashboard signal is lost for more than 200 ms | • CAN bus<br>• Airbag control module |
| U015500 | | | |

### Diagnostic process

| Test condition | Details/results/measures |
|---|---|
| 1. General inspection. | |
| | A. Check the harness plug of the airbag control unit for any signs of damage, poor contact, aging, loose and so on.<br>Is it OK after checking?<br>→**Yes**<br>To Step 2.<br>→**No**<br>Repair the fault parts. |
| 2. Read the DTC with the diagnostic meter. | |
| | A. Connect the diagnostic meter and check the system for the other relevant DTCs.<br>Is it OK after checking?<br>→**Yes**<br>To Step 3.<br>→**No**<br>Carry out the relevant fault diagnosis according to the DTCs. |
| 3. Check whether the DTC can be cleared. | |
| | A. Connect the diagnostic meter and access the airbag system to clear DTC.<br>B. Start the engine and check whether the DTC occurs again.<br>Does DTC occur?<br>→**Yes**<br>To Step 4.<br>→**No**<br>System normal. |

| Test condition | Details/results/measures |
|---|---|
| 6. Check the airbag control module power line. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the airbag control module harness plug S07.<br>C. Connect the battery negative terminal and operate the start switch to turn the power to ON state.<br>D. Measure the voltage between the airbag control module harness plug S07 terminal 5 and the fixed ground point with the multimeter.<br>**Standard voltage: 11 ~ 14 V**<br>Is it OK after checking?<br>→**Yes**<br>To Step 7.<br>→**No**<br>Repair the airbag control module power line open circuit fault and replace the harness if necessary. |
| 7. Check the airbag control module ground line. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the airbag control module harness plug S07.<br>C. Measure the resistance between the airbag control module harness plug S07 terminal 6 and the fixed ground point with the multimeter.<br>**Standard resistance: less than 5 Ω**<br>Is it OK after checking?<br>→**Yes**<br>To Step 8.<br>→**No**<br>Repair the airbag control module ground line open circuit fault and replace the harness if necessary. |
| 9. Replace the airbag control unit. | |
| | A. Replace the airbag control unit.<br>**Refer to: Replacement of airbag control module**<br>Verify that the system is operated normally. |

| Test condition | Details/results/measures |
|---|---|
| 3. Check whether the DTC can be cleared. | |
| | A. Connect the diagnostic meter and access the airbag system to clear DTC.<br>B. Start the engine and check whether the DTC occurs again.<br>Does DTC occur?<br>→**Yes**<br>To Step 4.<br>→**No**<br>System normal. |
| 4. Check the airbag output signal circuit and power supply for short circuit. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the airbag control module harness plug S07.<br>C. Measure the voltage between No.34 terminal of the harness plug S07 of the airbag control module and the reliable grounding.<br>**Standard voltage: 0V**<br>Is it OK after checking?<br>→**Yes**<br>To Step 5.<br>→**No**<br>Check the airbag output signal circuit and power supply for failure, and replace the wiring harness if necessary. |
| 5. Check the airbag output signal circuit and grounding for short circuit. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the airbag control module harness plug S07.<br>C. Connect the battery negative terminal and operate the start switch to turn the power to ON state.<br>D. Measure the resistance between No.34 terminal of the harness plug S07 of the airbag control module and the reliable grounding.<br>**Standard resistance: 10MΩ or higher**<br>Is it OK after checking?<br>→**Yes**<br>To Step 6.<br>→**No**<br>Check the airbag output signal circuit and grounding for short circuit failure, and replace the wiring harness if necessary. |

## DTC B103414, B103412, B100100, B105600

### DTC description

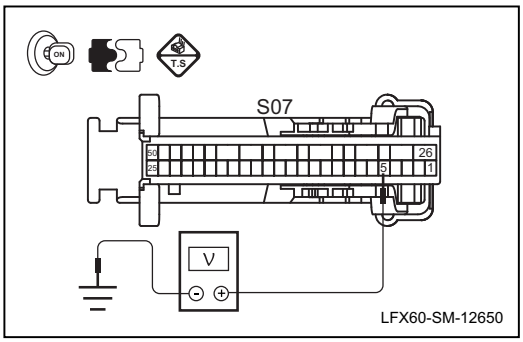
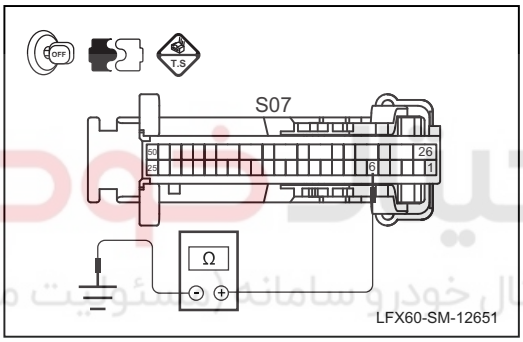
| DTC | Description | Definition |
|---|---|---|
| B103414 | Hard wire collision output channel 1 short to ground | • The system has detected a circuit fault |
| B103412 | Hard wire collision output channel 1 short to power | |
| B100100 | Mismatch vehicle model | |
| B105600 | Continuous failure condition of watchdog | |

### Possible reasons

| DTC | Check the strategy | Set the condition (control strategy) | Define the fault location |
|---|---|---|---|
| B10131B | Line and check the hardware | • Line short to the ground or open circuit<br>• Line short to power<br>• Line short circuit | • Line fault<br>• Airbag control module |
| B10131A | | | |
| B101311 | | | |
| B101312 | | | |

### Diagnostic process

| Test condition | Details/results/measures |
|---|---|
| 1. General inspection. | |
| | A. Check the harness plug of the airbag control unit, and the belt pretensioner on the passenger side for any signs of damage, poor contact, aging, loose and so on.<br>Is it OK after checking?<br>→**Yes**<br>To Step 2.<br>→**No**<br>Repair the fault parts. |
| 2. Read the DTC with the diagnostic meter. | |
| | A. Connect the diagnostic meter and check the system for the other relevant DTCs.<br>Is it OK after checking?<br>→**Yes**<br>To Step 3.<br>→**No**<br>Carry out the relevant fault diagnosis according to the DTCs. |

| Test condition | Details/results/measures |
|---|---|
| 4. Check the airbag control module power line. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the airbag control module harness plug S07.<br>C. Connect the battery negative terminal and operate the start switch to turn the power to ON state.<br>D. Measure the voltage between the airbag control module harness plug S07 terminal 5 and the fixed ground point with the multimeter.<br>**Standard voltage: 11 ~ 14 V**<br>Is it OK after checking?<br>→**Yes**<br>To Step 5.<br>→**No**<br>Repair the airbag control module power line open circuit fault and replace the harness if necessary. |
| 5. Check the grounding circuit of the airbag control module | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the airbag control module harness plug S07.<br>C. Measure the resistance between the airbag control module harness plug S07 terminal 6 and the fixed ground point with the multimeter.<br>**Standard resistance: less than 5 Ω**<br>Is it OK after checking?<br>→**Yes**<br>To Step 6.<br>→**No**<br>Repair the airbag control module ground line open circuit fault and replace the harness if necessary. |
| 6. Replace the assistant driver's side preloader. | |
| | A. Replace the assistant driver's side preloader.<br>Is the system normal?<br>→**Yes**<br>The fault is solved and the system is normal.<br>→**No**<br>To Step 7. |
| 7. Replace the airbag control unit. | |
| | A. Replace the airbag control unit.<br>**Refer to: Replacement of airbag control module.**<br>Verify that the system is operated normally. |

## DTC B100049, B105000

### DTC description

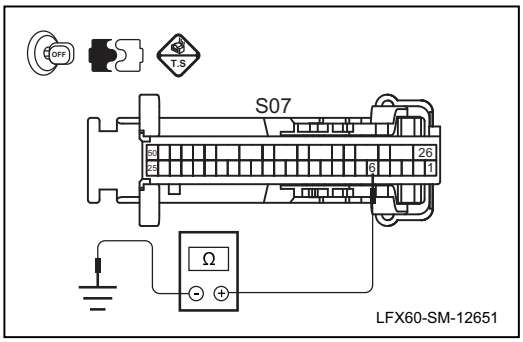
| DTC | Description | Definition |
|---|---|---|
| B100049 | Internal fault (replace ACU) | • ACU internal fault |
| B105000 | Frontal impact record (replace ACU) | |

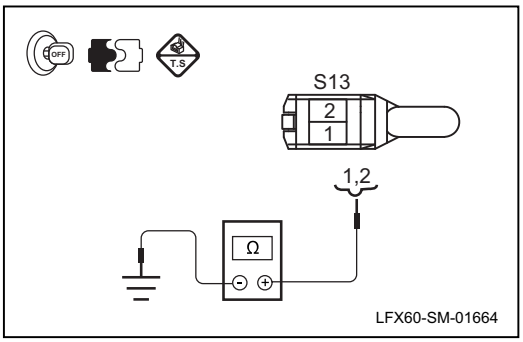
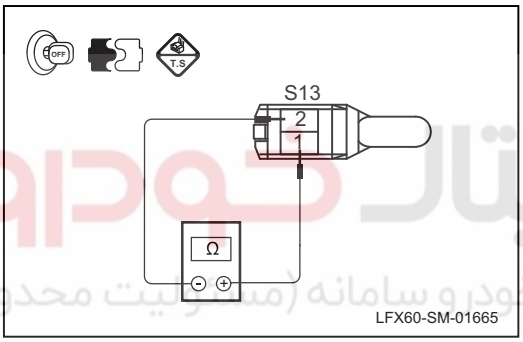
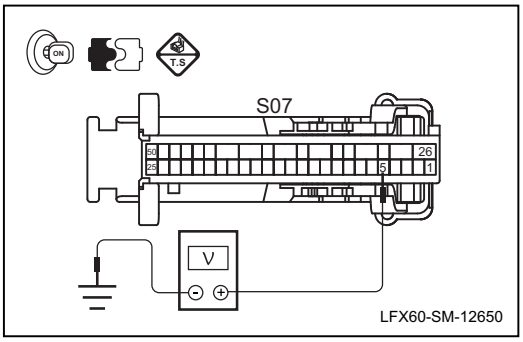
### Possible reasons

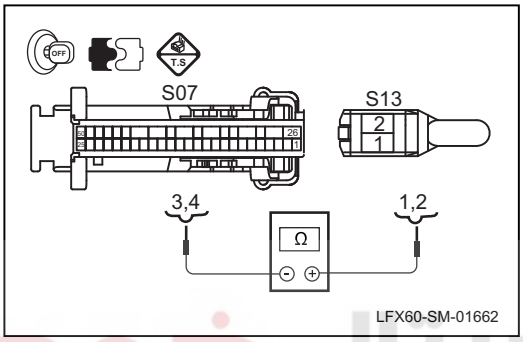
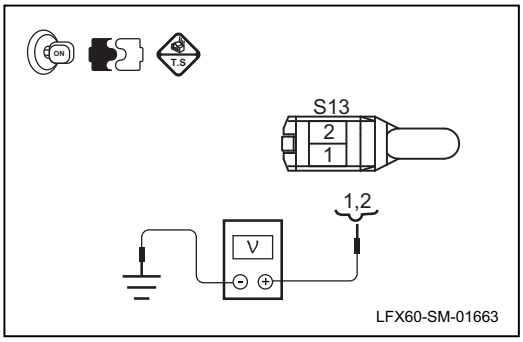
| DTC | Check the strategy | Set the condition (control strategy) | Define the fault location |
|---|---|---|---|
| B100049 | | • Internal fault | • Internal fault |
| B105000 | | • A collision has occurred | |

### Diagnostic process

| Test condition | Details/results/measures |
|---|---|
| 1. General inspection. | |
| | A. Check the airbag control unit harness plug for breakage, loose contact, aging or looseness.<br>Is it OK after checking?<br>→**Yes**<br>To Step 2.<br>→**No**<br>Repair the fault parts. |
| 2. Read the DTC with the diagnostic meter. | |
| | A. Connect the diagnostic meter and check the system for the other relevant DTCs.<br>Is it OK after checking?<br>→**Yes**<br>To Step 3.<br>→**No**<br>Carry out the relevant fault diagnosis according to the DTCs. |
| 3. Check whether the DTC can be cleared. | |
| | A. Connect the diagnostic meter and access the airbag system to clear DTC.<br>B. Start the engine and check whether the DTC occurs again.<br>Does DTC occur?<br>→**Yes**<br>To Step 4.<br>→**No**<br>System normal. |

| Test condition | Details/results/measures |
|---|---|
| 9. Check the airbag control module ground line. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the airbag control module harness plug S07.<br>C. Measure the resistance between the airbag control module harness plug S07 terminal 6 and the fixed ground point with the multimeter.<br>**Standard resistance: less than 5Ω**<br>Is it OK after checking?<br>**→Yes**<br>To Step 10.<br>**→No**<br>Repair the airbag control module ground line open circuit fault and replace the harness if necessary. |
| 10. Replace the assistant driver's side preloader. | |
| | A. Replace the assistant driver's side preloader.<br>Is the system normal?<br>**→Yes**<br>The fault is solved and the system is normal.<br>**→No**<br>To Step 11. |
| 11. Replace the airbag control unit. | |
| | A. Replace the airbag control unit.<br>**Refer to: Replacement of airbag control module**<br>Verify that the system is operated normally. |

| Test condition | Details/results/measures |
|---|---|
| 6. Check the drive signal circuit of the passenger's belt pretensioner and grounding for short circuit. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the assistant driver's side preloader harness plug S13.<br>C. Measure the resistance between the No.1, 2 terminals of the harness plug S13 of the passenger's belt pretensioner and the reliable ground with a multimeter.<br>**Standard resistance: 10MΩ or higher**<br>Is it OK after checking?<br>**→Yes**<br>To Step 7.<br>**→No**<br>Check the drive signal circuit of the passenger's belt pretensioner and grounding for short circuit failure, and replace if necessary. |
| 7. Check the drive signal circuits of the passenger's belt pretensioner for short circuit with each other. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the assistant driver's side preloader harness plug S13.<br>C. Measure the resistance between the No.1 and No.2 terminals of the harness plug S13 of the passenger's belt pretensioner with a multimeter.<br>**Standard resistance: 10MΩ or higher**<br>Is it OK after checking?<br>**→Yes**<br>To Step 8.<br>**→No**<br>Check the drive signal circuit of the passenger's belt pretensioner for short circuit failure with each other, and replace the wiring harness if necessary. |
| 8. Check the airbag control module power line. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the airbag control module harness plug S07.<br>C. Connect the negative connector of the battery, start the switch so that the power mode is in "ON" state.<br>D. Measure the voltage between No.5 terminal of the harness plug S07 of the airbag control module and the reliable grounding.<br>**Standard voltage: 11 ~ 14 V**<br>Is it OK after checking?<br>**→Yes**<br>To Step 9.<br>**→No**<br>Check the power supply circuit of the airbag control module circuit for open circuit failure, and replace the wiring harness if necessary. |

| Test condition | Details/results/measures |
|---|---|
| 3. Check whether the DTC can be cleared. | |
| | A. Connect the diagnostic meter and access the airbag system to clear DTC.<br>B. Start the engine and check whether the DTC occurs again.<br>Does DTC occur?<br>→**Yes**<br>To Step 4.<br>→**No**<br>System normal. |
| 4. Check the signal circuit of the passenger's belt pretensioner for continuity. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the harness plug S07 of the airbag control module, and disconnect harness plug S13 of the passenger's belt pretensioner.<br>C. Measure the resistance between the No.3 terminal of the harness plug S07 of the airbag control module and the No.2 terminal of the harness plug S13 of the passenger's belt pretensioner.<br>D. Measure the resistance between the No.4 terminal of the harness plug S07 of the airbag control module and the No.1 terminal of the harness plug S13 of the passenger's belt pretensioner.<br>**Standard resistance: less than 5 Ω**<br>Is it OK after checking?<br>→**Yes**<br>To Step 5.<br>→**No**<br>Check the signal circuit of the passenger's belt pretensioner for open circuit failure, and replace the wiring harness if necessary. |
| 5. Check the drive signal circuit of the passenger's belt pretensioner and power supply for short circuit. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the assistant driver's side preloader harness plug S13.<br>C. Connect the battery negative terminal and operate the start switch to turn the power to ON state.<br>D. Measure the voltage between the No.1, 2 terminals of the harness plug S13 of the passenger's belt pretensioner and the reliable ground with a multimeter.<br>**Standard voltage: 0V**<br>Is it OK after checking?<br>→**Yes**<br>To Step 6.<br>→**No**<br>Check the drive signal circuit of the passenger's belt pretensioner and power supply for short circuit failure, and replace the wiring harness if necessary. |

## DTC B10131B, B10131A, B101311, B101312

### DTC description

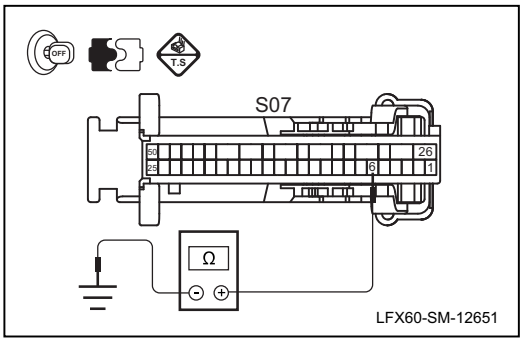
| DTC | Description | Definition |
|---|---|---|
| B10131B | Hi resistance circuit of co-driver's airbag tensioner | • When the airbag control unit, based on the diagnostic current sent to the passenger belt pretensioner power supply circuit, according to the situation of current changes in the circuit monitoring, compared to the stored preset standard value, set the fault code corresponding to the diagnostic results. |
| B10131A | Lo resistance circuit of co-driver's airbag tensioner | |
| B101311 | Co-driver's airbag tensioner short to ground | |
| B101312 | Co-driver's airbag tensioner short to power | |

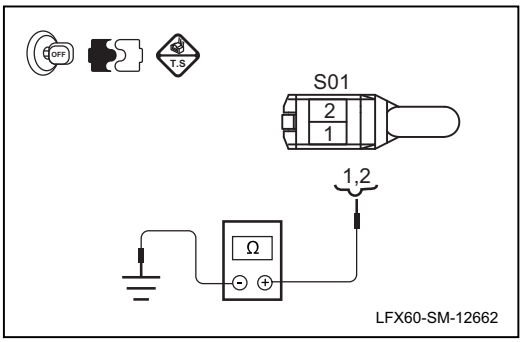
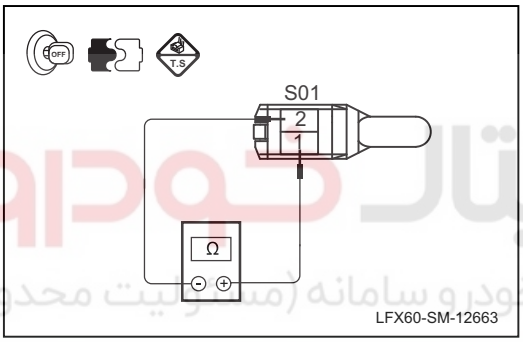
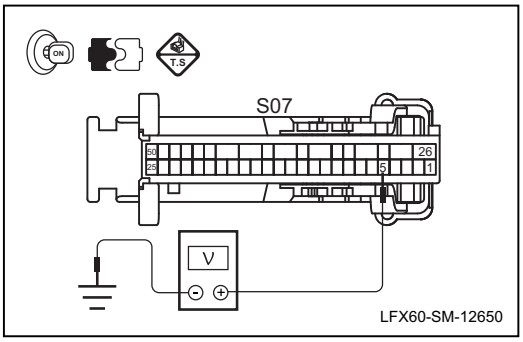
### Possible reasons

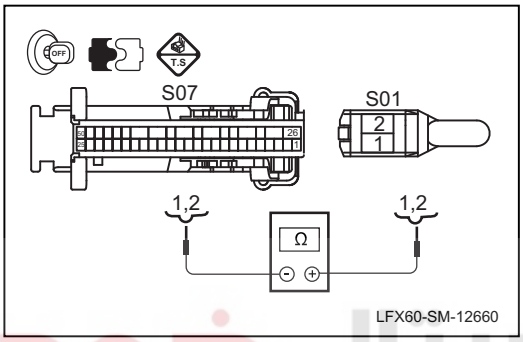
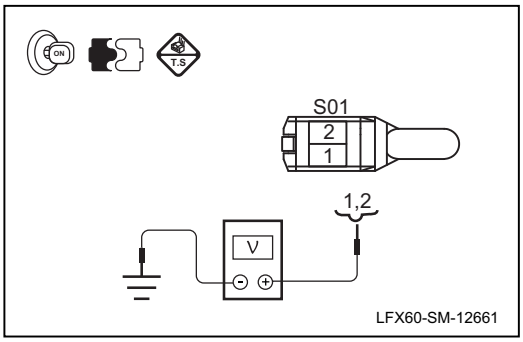
| DTC | Check the strategy | Set the condition (control strategy) | Define the fault location |
|---|---|---|---|
| B10131B | Line and check the hardware | • Line short to the ground or open circuit<br>• Line short to power<br>• Line short circuit | • Line fault<br>• Passenger's belt pretensioner<br>• Airbag control module |
| B10131A | | | |
| B101311 | | | |
| B101312 | | | |

### Diagnostic process

| Test condition | Details/results/measures |
|---|---|
| 1. General inspection. | |
| | A. Check the harness plug of the airbag control unit, and the belt pretensioner on the passenger side for any signs of damage, poor contact, aging, loose and so on.<br>Is it OK after checking?<br>→**Yes**<br>To Step 2.<br>→**No**<br>Repair the fault parts. |
| 2. Read the DTC with the diagnostic meter. | |
| | A. Connect the diagnostic meter and check the system for the other relevant DTCs.<br>Is it OK after checking?<br>→**Yes**<br>To Step 3.<br>→**No**<br>Carry out the relevant fault diagnosis according to the DTCs. |

| Test condition | Details/results/measures |
|---|---|
| 9. Check the airbag control module ground line. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the airbag control module harness plug S07.<br>C. Measure the resistance between the airbag control module harness plug S07 terminal 6 and the fixed ground point with the multimeter.<br>**Standard resistance: less than 5 Ω**<br>Is it OK after checking?<br>→**Yes**<br>To Step 10.<br>→**No**<br>Repair the airbag control module ground line open circuit fault and replace the harness if necessary. |
| 10. Replace the driver's belt pretensioner | |
| | A. Replace the driver's belt pretensioner<br>Is the system normal?<br>→**Yes**<br>The fault is solved and the system is normal.<br>→**No**<br>To Step 11. |
| 11. Replace the airbag control unit. | |
| | A. Replace the airbag control unit.<br>**Refer to: Replacement of airbag control module**<br>Verify that the system is operated normally. |

| Test condition | Details/results/measures |
|---|---|
| 6. Check the drive signal circuit of the driver's belt pretensioner and grounding for short circuit. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the driver's side preloader harness plug S01.<br>C. Measure the resistance between the No.1, 2 terminals of the harness plug S01 of the driver's belt pretensioner and the reliable grounding with a multimeter.<br>**Standard resistance: 10MΩ or higher**<br>Is the resistance normal?<br>**→Yes**<br>To Step 7.<br>**→No**<br>Check the drive signal circuit of the driver's belt pretensioner and grounding for short circuit failure, and replace the wiring harness if necessary. |
| 7. Check the drive signal circuit of the passenger's belt pretensioner and power supply for short circuit. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the driver's side preloader harness plug S01.<br>C. Measure the resistance between the No.1 and No.2 terminals of the harness plug S01 of the driver's belt pretensioner with a multimeter.<br>**Standard resistance: 10MΩ or higher**<br>Is the resistance check normal?<br>**→Yes**<br>To Step 8.<br>**→No**<br>Check the drive signal circuit of the driver's belt pretensioner for short circuit failure with each other, and replace the wiring harness if necessary. |
| 8. Check the airbag control module power line. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the airbag control module harness plug S07.<br>C. Connect the battery negative terminal and operate the start switch to turn the power to ON state.<br>D. Measure the voltage between the airbag control module harness plug S07 terminal 5 and the fixed ground point with the multimeter.<br>**Standard voltage: 11 ~ 14 V**<br>Is the voltage normal?<br>**→Yes**<br>To Step 9.<br>**→No**<br>Repair the airbag control module power line open circuit fault and replace the harness if necessary. |

| Test condition | Details/results/measures |
|---|---|
| 3. Check whether the DTC can be cleared. | |
| | A. Connect the diagnostic meter and access the airbag system to clear DTC.<br>B. Start the engine and check whether the DTC occurs again.<br>Does DTC occur?<br>→**Yes**<br>To Step 4.<br>→**No**<br>System normal. |
| 4. Check the signal circuit of the driver's belt pretensioner for continuity. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the airbag control module harness plug S07.<br>C. Disconnect of the harness plug S01 of the driver's belt pretensioner.<br>D. Measure the resistance between the No.1 terminal of the harness plug S07 of the airbag control module and the No.1 terminal of the harness plug S01 of the driver's belt pretensioner.<br>E. Measure the resistance between the No.2 terminal of the harness plug S07 of the airbag control module and the No.2 terminal of the harness plug S01 of the driver's belt pretensioner.<br>**Standard resistance: less than 5 Ω**<br>Is it OK after checking?<br>→**Yes**<br>To Step 5.<br>→**No**<br>Check the signal circuit of the driver's belt pretensioner for open circuit failure, and replace the wiring harness if necessary. |
| 5. Check the drive signal circuit of the driver's belt pretensioner and power supply for short circuit. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the driver's side preloader harness plug S01.<br>C. Connect the battery negative terminal and operate the start switch to turn the power to ON state.<br>D. Measure the voltage between the No.1, 2 terminals of the harness plug S01 of the driver's belt pretensioner and the reliable grounding with a multimeter.<br>**Standard voltage: 0V**<br>Is the voltage normal?<br>→**Yes**<br>To Step 6.<br>→**No**<br>Check the drive signal circuit of the driver's belt pretensioner and power supply for short circuit failure, and replace the wiring harness if necessary. |

## DTC B10121B, B10121A, B101211, B101212

### DTC description

| DTC | Description | Definition |
|---|---|---|
| B10121B | Driver's preloader resistance too high | • When the airbag control unit, based on the diagnostic current sent to the driver belt pretensioner power supply circuit, according to the situation of current changes in the circuit monitoring, compared to the stored preset standard value, set the fault code corresponding to the diagnostic results. |
| B10121A | Driver's preloader resistance too low | |
| B101211 | Driver's airbag tensioner resistance circuit short to ground | |
| B101212 | Driver's airbag tensioner resistance circuit short to power | |

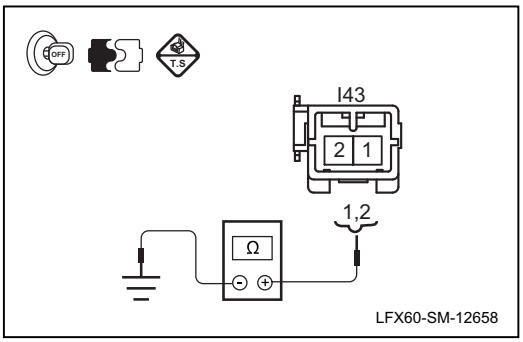
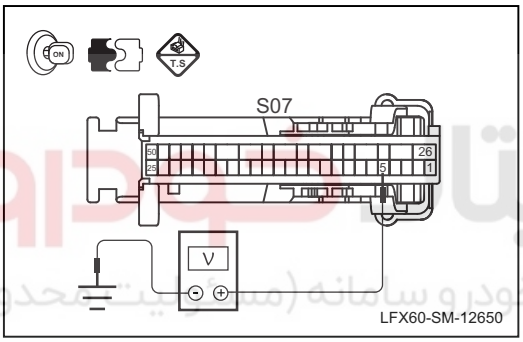
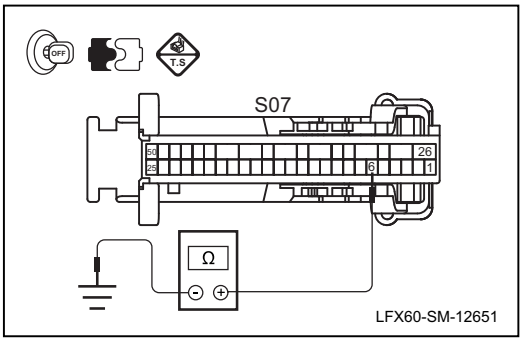
### Possible reasons

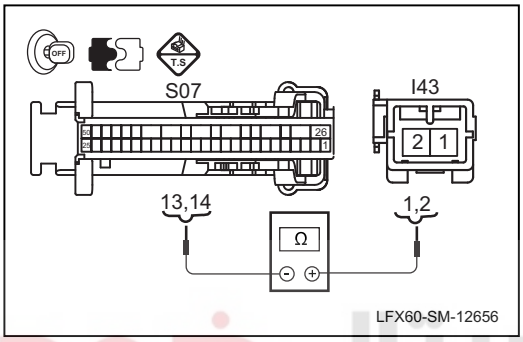
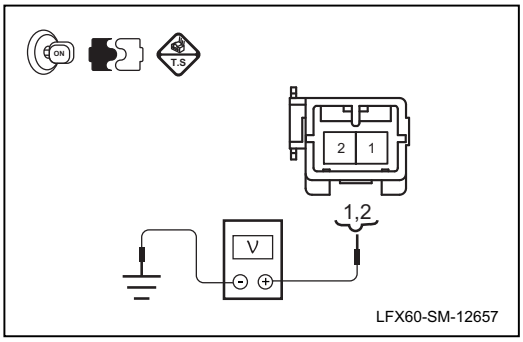
| DTC | Check the strategy | Set the condition (control strategy) | Define the fault location |
|---|---|---|---|
| B10121B | Line and check the hardware | • Line short to the ground or open circuit<br>• Line short to power<br>• Line short circuit | • Line fault<br>• Driver's belt pretensioner<br>• Airbag control module |
| B10121A | | | |
| B101211 | | | |
| B101212 | | | |

### Diagnostic process

| Test condition | Details/results/measures |
|---|---|
| 1. General inspection. | |
| | A. Check the harness plug of the airbag control unit, and the driver's belt pretensioner for any signs of damage, poor contact, aging, loose and so on.<br>Is it OK after checking?<br>→**Yes**<br>To Step 2.<br>→**No**<br>Repair the fault parts. |
| 2. Read the DTC with the diagnostic meter. | |
| | A. Connect the diagnostic meter and check the system for the other relevant DTCs.<br>Is it OK after checking?<br>→**Yes**<br>To Step 3.<br>→**No**<br>Carry out the relevant fault diagnosis according to the DTCs. |

| Test condition | Details/results/measures |
|---|---|
| 9. Replace the passenger airbag. | |
| | A. Replace the driver's side airbag.<br>**Refer to: Replacement of the passenger airbag**<br>Is it OK after checking?<br>→**Yes**<br>The fault is solved and the system is normal.<br>→**No**<br>To Step 11. |
| 10. Replace the airbag control unit. | |
| | A. Replace the airbag control unit.<br>**Refer to: Replacement of airbag control module**<br>Verify that the system is operated normally. |

| Test condition | Details/results/measures |
|---|---|
| 6. Check the drive signal circuit of the passenger airbag and grounding for short circuit. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the assistant driver's airbag harness plug I43.<br>C. Measure the resistance between the No.1, 2 terminals of the harness plug I43 of the passenger airbag and the reliable grounding with a multimeter.<br>**Standard resistance: 10MΩ or higher**<br>Is the resistance normal?<br>**→Yes**<br>To Step 7.<br>**→No**<br>Check the drive signal circuit of the driver airbag and grounding for short circuit failure, and replace the wiring harness if necessary. |
| 7. Check the airbag control module power line. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the airbag control module harness plug S07.<br>C. Connect the battery negative terminal and operate the start switch to turn the power to ON state.<br>D. Measure the voltage between the airbag control module harness plug S07 terminal 5 and the fixed ground point with the multimeter.<br>**Standard voltage: 11 ~ 14 V**<br>Is it OK after checking?<br>**→Yes**<br>To Step 8.<br>**→No**<br>Repair the airbag control module power line open circuit fault and replace the harness if necessary. |
| 8. Check the airbag control module ground line. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the airbag control module harness plug S07.<br>C. Measure the resistance between the airbag control module harness plug S07 terminal 6 and the fixed ground point with the multimeter.<br>**Standard resistance: less than 5 Ω**<br>Is the resistance normal?<br>**→Yes**<br>To Step 9.<br>**→No**<br>Repair the airbag control module ground line open circuit fault and replace the harness if necessary. |

| Test condition | Details/results/measures |
|---|---|
| 3. Check whether the DTC can be cleared. | |
| | A. Connect the diagnostic meter and access the airbag system to clear DTC.<br>B. Start the engine and check whether the DTC occurs again.<br>Does DTC occur?<br>→**Yes**<br>To Step 4.<br>→**No**<br>System normal. |
| 4. Check the drive signal circuit of the passenger's airbag for continuity. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the airbag control module harness plug S07.<br>C. Disconnect the harness plug I43 of the passenger airbag.<br>D. Measure the resistance between the No.14 terminal of the harness plug S07 of the airbag control module and the No.2 terminal of the harness plug I43 of the passenger airbag.<br>E. Measure the resistance between the No.13 terminal of the harness plug S07 of the airbag control module and the No.1 terminal of the harness plug I43 of the passenger airbag.<br>**Standard resistance: less than 5 Ω**<br>Is it OK after checking?<br>→**Yes**<br>To Step 5.<br>→**No**<br>Check the drive signal circuit of the passenger airbag for open circuit failure, and replace the wiring harness if necessary. |
| 5. Check the drive signal circuit of the passenger airbag and power supply for short circuit. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the assistant driver's airbag harness plug I43.<br>C. Connect the battery negative terminal and operate the start switch to turn the power to ON state.<br>D. Measure the voltage between the No.1, 2 terminals of the harness plug I43 of the passenger airbag and the reliable grounding with a multimeter.<br>**Standard voltage: 0 V**<br>Is the voltage normal?<br>→**Yes**<br>To Step 6.<br>→**No**<br>Check the drive signal circuit of the passenger airbag and power supply for short circuit failure, and replace the wiring harness if necessary. |

## DTC B10111B, B10111A, B101111, B101112

### DTC description

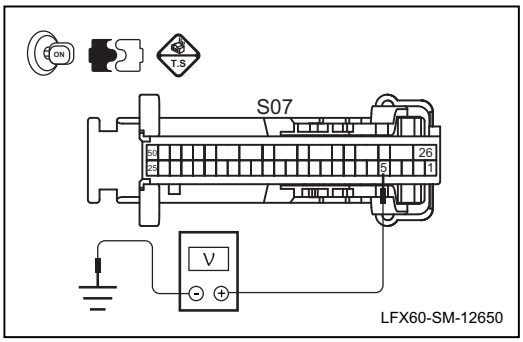
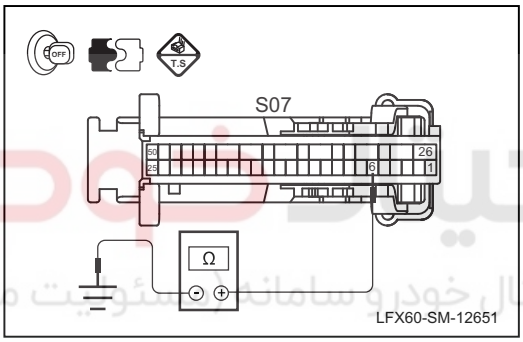
| DTC | Description | Definition |
|---|---|---|
| B10111B | High resistance of co-driver's airbag circuit | • When the airbag control unit, based on the diagnostic current sent to the passenger airbag power supply circuit, according to the situation of current changes in the circuit monitoring, compared to the stored preset standard value, set the fault code corresponding to the diagnostic results. |
| B10111A | Low resistance of co-driver's airbag circuit | |
| B101111 | Co-driver's airbag circuit short to ground. | |
| B101112 | Co-driver's airbag circuit short to power | |

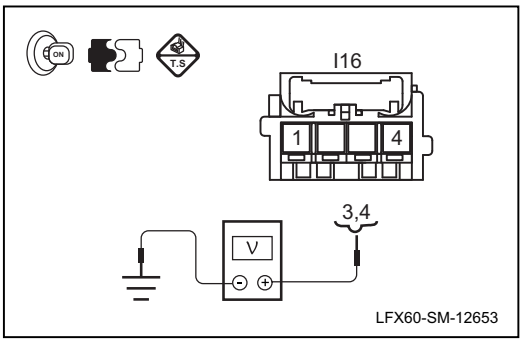
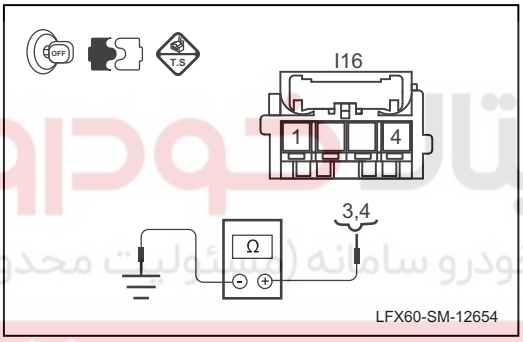
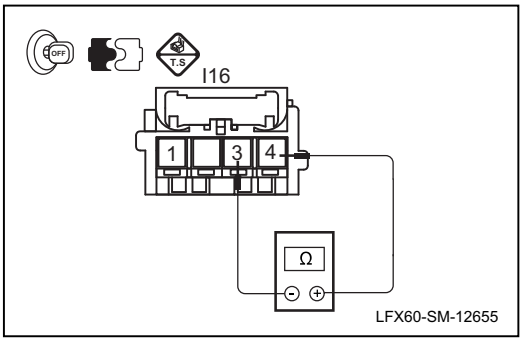
### Possible reasons

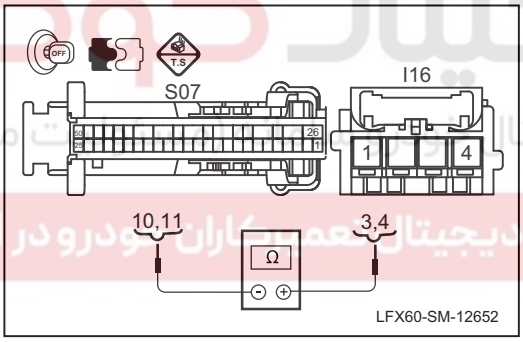
| DTC | Check the strategy | Set the condition (control strategy) | Define the fault location |
|---|---|---|---|
| B10101B | Line and check the hardware | • Line short to the ground or open circuit<br>• Line short to power<br>• Line short circuit | • Line fault<br>• Passenger airbag<br>• Airbag control module |
| B10101A | | | |
| B101011 | | | |
| B101012 | | | |

### Diagnostic process

| Test condition | Details/results/measures |
|---|---|
| 1. General inspection. | |
| | A. Check the airbag control unit and driver's side airbag harness plug for breakage, loose contact, aging or looseness.<br>Is it OK after checking?<br>→**Yes**<br>To Step 2.<br>→**No**<br>Repair the fault parts. |
| 2. Read the DTC with the diagnostic meter. | |
| | A. Connect the diagnostic meter and check the system for the other relevant DTCs.<br>Is it OK after checking?<br>→**Yes**<br>To Step 3.<br>→**No**<br>Carry out the relevant fault diagnosis according to the DTCs. |

| Test condition | Details/results/measures |
|---|---|
| 9. Check the airbag control module power line. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the airbag control module harness plug S07.<br>C. Connect the battery negative terminal and operate the start switch to turn the power to ON state.<br>D. Measure the voltage between the airbag control module harness plug S07 terminal 5 and the fixed ground point with the multimeter.<br>**Standard voltage: 11 ~ 14 V**<br>Is it OK after checking?<br>→**Yes**<br>To Step 10.<br>→**No**<br>Repair the airbag control module power line open circuit fault and replace the harness if necessary. |
| 10. Check the airbag control module ground line. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the airbag control module harness plug S07.<br>C. Measure the resistance between the airbag control module harness plug S07 terminal 6 and the fixed ground point with the multimeter.<br>**Standard resistance: less than 5 Ω**<br>Is it OK after checking?<br>→**Yes**<br>To Step 11.<br>→**No**<br>Repair the airbag control module ground line open circuit fault and replace the harness if necessary. |
| 11. Replace the driver airbag. | |
| | A. Replace the driver's side airbag.<br>**Refer to: Replacement of the driver airbag**<br>Is it OK after checking?<br>→**Yes**<br>The fault is solved and the system is normal.<br>→**No**<br>To Step 12. |
| 12. Replace the airbag control unit. | |
| | A. Replace the safety control unit.<br>**Refer to: Replacement of airbag control module**<br>Verify that the system is operated normally. |

| Test condition | Details/results/measures |
|---|---|
| 6. Check the drive signal circuit of the driver airbag and power supply for short circuit. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the driver's airbag harness plug I16.<br>C. Connect the battery negative terminal and operate the start switch to turn the power to ON state.<br>D. Measure the voltage between the No.3, 4 terminals of the harness plug I16 of the driver airbag and the reliable grounding with a multimeter.<br>**Standard voltage: 0V**<br>Is the voltage normal?<br>→**Yes**<br>To Step 7.<br>→**No**<br>Check the drive signal circuit of the driver airbag and power supply for short circuit failure, and replace the wiring harness if necessary. |
| 7. Check the drive signal circuit of the driver airbag and grounding for short circuit. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the driver's airbag harness plug I16.<br>C. Measure the resistance between the No.3, 4 terminals of the harness plug I16 of the driver airbag and the reliable grounding with a multimeter.<br>**Standard resistance:10MΩ or higher**<br>Is the resistance normal?<br>→**Yes**<br>To Step 8.<br>→**No**<br>Check the drive signal circuit of the driver airbag and grounding for short circuit failure, and replace the wiring harness if necessary. |
| 8. Check the drive signal circuits of the driver‘s side airbag for short circuit with each other. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the driver's airbag harness plug I16.<br>C. Measure the resistance between the No.3 and No.4 terminals of the harness plug I16 of the driver airbag with a multimeter.<br>**Standard resistance: 10MΩ or higher**<br>Is it OK after checking?<br>→**Yes**<br>To Step 9.<br>→**No**<br>Check the drive signal circuits of the driver’s airbag for short circuit failure with each other, and replace the wiring harness if necessary. |

| Test condition | Details/results/measures |
|---|---|
| 3. Check whether the DTC can be cleared. | |
| | A. Connect the diagnostic meter and access the airbag system to clear DTC.<br>B. Start the engine and check whether the DTC occurs again.<br>Does DTC occur?<br>→**Yes**<br>To Step 4.<br>→**No**<br>System normal. |
| 4. Check the clock spring. | |
| | A. Check that if the horn switch, multi-function steering wheel on the control button is normal, check the clock spring for signs of damage.<br>Make sure the clock spring is normal?<br>→**Yes**<br>To Step 5.<br>→**No**<br>Clock failure, replace the clock spring.<br>**Refer to: replacement of clock spring.** |
| 5. Check the drive signal circuit of the driver's airbag for continuity. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the harness plug S07 of the airbag control module, and disconnect harness plug I16 of the driver's airbag.<br>C. Measure the resistance between the No.11 terminal of the harness plug S07 of the airbag control module and the No.3 terminal of the harness plug I16 of the driver airbag.<br>D. Measure the resistance between the No.10 terminal of the harness plug S07 of the airbag control module and the No.4 terminal of the harness plug I16 of the driver airbag.<br>**Standard resistance: less than 1 Ω**<br>Is the resistance normal?<br>→**Yes**<br>To Step 6.<br>→**No**<br>Check the drive signal circuit of the driver airbag for open circuit failure, replace the wiring harness if necessary. |

## DTC B10101B, B10101A, B101011, B101012

### DTC description

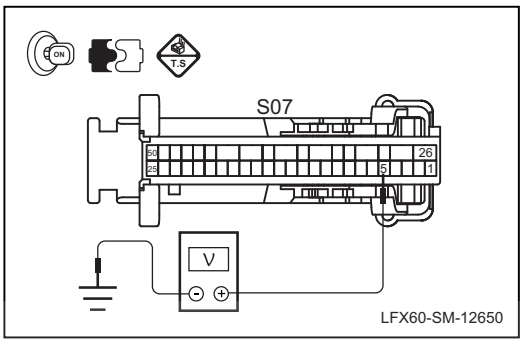
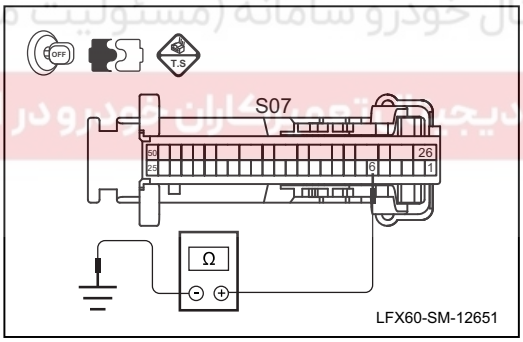
| DTC | Description | Definition |
|---|---|---|
| B10101B | High resistance of driver's airbag circuit | • When the airbag control unit, based on the diagnostic current sent to the driver airbag power supply circuit, according to the situation of current changes in the circuit monitoring, compared to the stored preset standard value, set the fault code corresponding to the diagnostic results. |
| B10101A | Low resistance of driver's airbag circuit | |
| B101011 | Driver's airbag circuit short to ground | |
| B101012 | Driver's airbag circuit short to power | |

### Possible reasons

| DTC | Check the strategy | Set the condition (control strategy) | Define the fault location |
|---|---|---|---|
| B10101B | Line and check the hardware | • Line short to the ground or open circuit<br>• Line short to power<br>• Line short circuit | • Line fault<br>• Clock spring<br>• Driver airbag<br>• Airbag control module |
| B10101A | | | |
| B101011 | | | |
| B101012 | | | |

### Diagnostic process

| Test condition | Details/results/measures |
|---|---|
| 1. General inspection. | |
| | A. Check the airbag control unit and driver's side airbag harness plug for breakage, loose contact, aging or looseness.<br>Is it OK after checking?<br>→**Yes**<br>To Step 2.<br>→**No**<br>Repair the fault parts. |
| 2. Read the DTC with the diagnostic meter. | |
| | A. Connect the diagnostic tool to check whether the system has any other related trouble code.Whether the Check is normal?<br>→**Yes**<br>To Step 3.<br>→**No**<br>Carry out the relevant fault diagnosis according to the DTCs. |

| Test condition | Details/results/measures |
|---|---|
| 4. Check the power supply system of vehicle. | |
| | A. Check whether the power supply system of vehicle is normal.<br>Is it OK after checking?<br>→**Yes**<br>To Step 5.<br>→**No**<br>Check the power supply system for fault. |
| 5. Check the airbag control module power line. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the airbag control module harness plug S07.<br>C. Connect the battery negative terminal and operate the start switch to turn the power to ON state.<br>D. Measure the voltage between the airbag control module harness plug S07 terminal 5 and the fixed ground point with the multimeter.<br>**Standard voltage: 11 ~ 14 V**<br>Is the voltage normal?<br>→**Yes**<br>To Step 6.<br>→**No**<br>Repair the airbag control module power line open circuit fault and replace the harness if necessary. |
| 6. Check the airbag control module ground line. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the airbag control module harness plug S07.<br>C. Measure the resistance between No.6 terminal of the harness plug S07 of the airbag control module and the reliable grounding.<br>**Standard resistance: less than 5 Ω**<br>Is the resistance normal?<br>→**Yes**<br>To Step 7.<br>→**No**<br>Check the airbag control module grounding circuit for open circuit failure, and replace if necessary.<br>Harness. |
| 7. Replace the airbag control unit. | |
| | A. Replace the airbag control unit.<br>**Refer to: Replacement of airbag control module**<br>Verify that the system is operated normally. |

## DTC B111717, B111716

### DTC description

| DTC | Description | Definition |
|---|---|---|
| B111717 | The voltage is too high | • Airbag control unit monitors system operating voltage abnormal |
| B111716 | The voltage is too low | |

### Possible reasons

| DTC | Check the strategy | Set the condition (control strategy) | Define the fault location |
|---|---|---|---|
| B111717 | Line and check the hardware | Voltage exceeds 17 V and maintains 10s | • Charging system<br>• Failure of airbag control unit and its circuit |
| B111716 | | Voltage less than 17V and maintains 10s | |

### Diagnostic process

| Test condition | Details/results/measures |
|---|---|
| 1. General inspection. | |
| | A. Check the airbag control unit harness plug for breakage, loose contact, aging or looseness.<br>Is it OK after checking?<br>→**Yes**<br>To Step 2.<br>→**No**<br>Repair the fault parts. |
| 2. Read the DTC with the diagnostic meter. | |
| | A. Connect the diagnostic meter and check the system for the other relevant DTCs.<br>Is it OK after checking?<br>→**Yes**<br>To Step 3.<br>→**No**<br>Carry out the relevant fault diagnosis according to the DTCs. |
| 3. Check whether the DTC can be cleared. | |
| | A. Connect the diagnostic meter and access the airbag system to clear DTC.<br>B. Start the engine and check whether the DTC occurs again.<br>Does DTC occur?<br>→**Yes**<br>To Step 4.<br>→**No**<br>System normal. |

## DTC diagnosis flow index

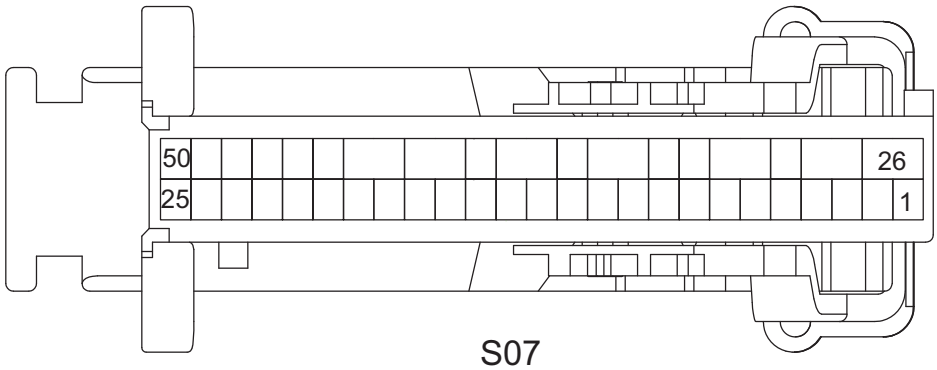
| DTC | Description | Diagnostic process |
|---|---|---|
| B111717 | The voltage is too high | **Refer to: DTC B111717, B111716** |
| B111716 | The voltage is too low | |
| B10101B | High resistance of driver's airbag circuit | **Refer to: DTC B10101B, B10101A, B101011, B101012** |
| B10101A | Low resistance of driver's airbag circuit | |
| B101011 | Driver's airbag circuit short to ground | |
| B101012 | Driver's airbag circuit short to power | |
| B10111B | High resistance of co-driver's airbag circuit | **Refer to: DTC B10111B, B10111A, B101111, B101112** |
| B10111A | Low resistance of co-driver's airbag circuit | |
| B101111 | Co-driver's airbag circuit short to ground. | |
| B101112 | Co-driver's airbag circuit short to power | |
| B10121B | Driver's preloader resistance too high | **Refer to: DTC B10121B, B10121A, B101211, B101212** |
| B10121A | Driver's preloader resistance too low | |
| B101211 | Driver's airbag tensioner resistance circuit short to ground | |
| B101212 | Driver's airbag tensioner resistance circuit short to power | |
| B10131B | Hi resistance circuit of co-driver's airbag tensioner | **Refer to: DTC B10131B, B10131A, B101311, B101312** |
| B10131A | Lo resistance circuit of co-driver's airbag tensioner | |
| B101311 | Co-driver's airbag tensioner short to ground | |
| B101312 | Co-driver's airbag tensioner short to power | |
| B100049 | Internal fault (replace ACU) | **Refer to: DTC B100049, B105000** |
| B105000 | Frontal impact record (change the ACU) | |
| B103414 | Hard wire collision output channel 1 short to ground | **Refer to: DTC B103414, B103412, B100100, B105600** |
| B103412 | Hard wire collision output channel 1 short to power | |
| B100100 | Mismatch vehicle model | |
| B105600 | Continuous failure condition of watchdog | |
| U007300 | CAN bus off-line | **Refer to: DTC U007300, U015500** |
| U01550 | IC signal loss | |

## DTC (DTC) List

| Fault code (DTC) | Faultdescription |
|---|---|
| B111717 | The voltage is too high |
| B111716 | The voltage is too low |
| B10101B | High resistance of driver's airbag circuit |
| B10101A | Low resistance of driver's airbag circuit |
| B101011 | Driver's airbag circuit short to ground |
| B101012 | Driver's airbag circuit short to power |
| B10111B | High resistance of co-driver's airbag circuit |
| B10111A | Low resistance of co-driver's airbag circuit |
| B101111 | Co-driver's airbag circuit short to ground. |
| B101112 | Co-driver's airbag circuit short to power |
| B10121B | Driver's preloader resistance too high |
| B10121A | Driver's preloader resistance too low |
| B101211 | Driver's airbag tensioner resistance circuit short to ground |
| B101212 | Driver's airbag tensioner resistance circuit short to power |
| B10131B | Hi resistance circuit of co-driver's airbag tensioner |
| B10131A | Lo resistance circuit of co-driver's airbag tensioner |
| B101311 | Co-driver's airbag tensioner short to ground |
| B101312 | Co-driver's airbag tensioner short to power |
| B100049 | Internal fault (replace ACU) |
| B105000 | Frontal impact record (change the ACU) |
| B103414 | Hard wire collision output channel 1 short to ground |
| B103412 | Hard wire collision output channel 1 short to power |
| B103413 | Hard wire collision output channel 2 short to ground |
| B103411 | Hard wire collision output channel 2 short to power |
| B100100 | Mismatch vehicle model |
| B105600 | Continuous failure condition of watchdog |
| U007300 | CAN bus off-line |
| U015500 | IC signal loss |

| Terminal number | Wire diameter/color | Terminal description |
|---|---|---|
| S07-23 | - | - |
| S07-24 | - | - |
| S07-25 | - | - |
| S07-26 | - | - |
| S07-27 | - | - |
| S07-28 | - | - |
| S07-29 | - | - |
| S07-30 | - | - |
| S07-31 | - | - |
| S07-32 | - | - |
| S07-33 | - | - |
| S07-34 | 0.30Br/O | Collision signal output |
| S07-35 | - | - |
| S07-36 | - | - |
| S07-37 | - | - |
| S07-38 | - | - |
| S07-39 | - | - |
| S07-40 | 0.30 Bl/W | PCAN-L |

## Control module terminal list




S07

LFX60-SM-12677

| Terminal number | Wire diameter/color | Terminal description |
|---|---|---|
| S07-01 | 0.50 G/Bl | Drive signal of Left warning seat belt is low |
| S07-02 | 0.50 B/Bl | Drive signal of Left warning seat belt is high |
| S07-03 | 0.50 Br | Drive signal of Right warning seat belt is high |
| S07-04 | 0.50 Bl | Drive signal of Right warning seat belt is low |
| S07-05 | 0.50 R/Y | Power source |
| S07-06 | B | Grounding |
| S07-07 | - | - |
| S07-08 | - | - |
| S07-09 | - | - |
| S07-10 | 0.50 Br | Drive signal of driver airbag is high |
| S07-11 | 0.50 V | Drive signal of driver airbag is low |
| S07-12 | - | - |
| S07-13 | 0.50W | Drive signal of passenger airbag is low |
| S07-14 | 0.50 P | Drive signal of passenger airbag is high |
| S07-15 | 0.30 Bl/B | PCAN-H |
| S07-16 | - | - |
| S07-17 | - | - |
| S07-18 | - | - |
| S07-19 | - | - |
| S07-20 | - | - |
| S07-21 | - | - |
| S07-22 | - | - |

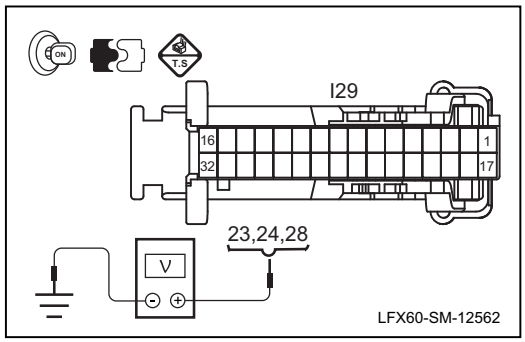
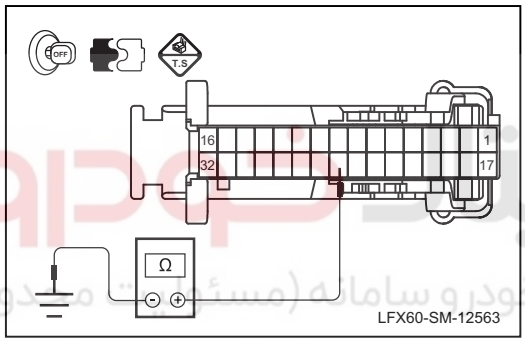
| Test condition | Details/results/measures |
|---|---|
| 5. Replace the airbag control unit. | |
| | A. Replace the airbag control unit.<br>**Refer to: Replacement of airbag control module.**<br>Verify that the system is operated normally. |

**The diagnostic process for the airbag indicator always light up**

**⚠Warning:**
**Before repairing the airbag system, disconnect the battery negative terminal more than 90s to ensure safety.**

| Test condition | Details/results/measures |
|---|---|
| 1. General inspection. | |
| | A. Check the clock spring, instrument cluster harness plug and airbag module harness plug for breakage, loose contact, aging or looseness.<br>Is it OK after checking?<br>→**Yes**<br>To Step 2.<br>→**No**<br>Repair the abnormal part. |
| 2. Check the trouble code. | |
| | A. Connect the diagnostic equipment.<br>B. Operate the start switch to set the power mode to the "on" state.<br>C. Enter the airbag system and check the system for the presence of the fault code.<br>Is there a trouble code?<br>→**No**<br>To Step 3.<br>→**Yes**<br>Carry out the relevant fault diagnosis according to the DTC. |
| 3. Check the communication system between the instrument cluster and the airbag. | |
| | A. Check the communication system between the instrument cluster and the airbag.<br>Is the communication system normal?<br>→**Yes**<br>To Step 4.<br>→**No**<br>Check communication system between the instrument cluster and the SRS for failure and repair, replace if necessary, |
| 4. Replace the instrument cluster. | |
| | A. Replace the instrument cluster.<br>**Refer to: Replacement of instrument cluster**<br>Is the system normal?<br>→**Yes**<br>Fault solved.<br>→**No**<br>To Step 5. |

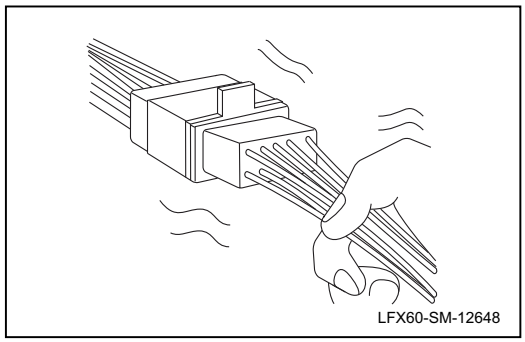
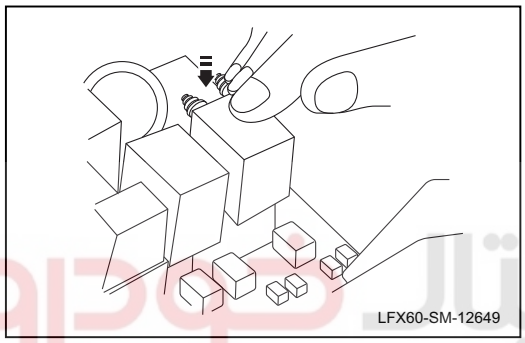
| Test condition | Details/results/measures |
|---|---|
| 7. Replace the instrument cluster. | |
| | A. Replace the instrument cluster.<br>**Refer to: Replacement of instrument cluster**<br>Is the system normal?<br>→**Yes**<br>Fault solved.<br>→**No**<br>To Step 8. |
| 8. Replace the airbag control unit. | |
| | A. Replace the airbag control unit.<br>**Refer to: Replacement of airbag control module**<br>Verify that the system is operated normally. |

| Test condition | Details/results/measures |
|---|---|
| 4. Check the instrument cluster power line. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the instrument cluster harness plug I29.<br>C. Connect the battery negative terminal and operate the start switch to turn the power to ON state.<br>D. Measure the voltage between the instrument cluster harness plug I29 terminal 23, 24, 28 and the fixed ground point with the multimeter.<br>**Standard voltage: 11 ~ 14 V**<br>Is the voltage normal?<br>→**Yes**<br>To Step 5.<br>→**No**<br>Repair the instrument cluster power line fault and replace the harness if necessary. |
| 5. Check the instrument cluster ground line. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the instrument cluster harness plug I29.<br>C. Measure the resistance between the instrument cluster harness plug I29 terminal 25 and the fixed ground point with the multimeter.<br>**Standard resistance: less than 5 Ω**<br>Is the resistance normal?<br>→**Yes**<br>To Step 6.<br>→**No**<br>Repair the instrument cluster ground line open circuit fault and replace the harness if necessary. |
| 6. Check the communication system between the instrument cluster and SRS. | |
| | A. Check the communication system between the instrument cluster and SRS.<br>Is the communication system normal?<br>→**Yes**<br>To Step 7.<br>→**No**<br>Repair the communication system fault between the instrument cluster and SRS and replace the harness if necessary. |

**The diagnostic process for the airbag indicator does not light up**

**⚠Warning:**
**Before repairing the airbag system, disconnect the battery negative terminal more than 90s to ensure safety.**

| Test condition | Details/results/measures |
|---|---|
| 1. General inspection. | |
| | A. Check the clock spring, instrument cluster harness plug and airbag module harness plug for breakage, loose contact, aging or looseness.<br>Is it OK after checking?<br>→**Yes**<br>To Step 2.<br>→**No**<br>Repair the abnormal part. |
| 2. Check the trouble code. | |
| | A. Connect the diagnostic equipment.<br>B. Operate the start switch to set the power mode to the "on" state.<br>C. Access the instrument system and SRS system to check the system for DTC.<br>Is there a trouble code?<br>→**No**<br>To Step 3.<br>→**Yes**<br>Carry out the relevant fault diagnosis according to the DTC. |
| 3. Check the fuse. | |
| | A. Check the fuse FS23, FS24, FS30.<br>**Fuses rated capacity are:5A, 10 A, 25 A.**<br>Is the fuse normal?<br>→**Yes**<br>To Step 4.<br>→**No**<br>Check the fuse circuit, replace with fuses of different rated capacity |

| Test condition | Details/results/measures |
|---|---|
| 3. Method of checking the sensor plug or harness. | |
|  LFX60-SM-12648 | A. Connect the diagnostic meter to the diagnostic interface (DLC).<br>B. Operate the start switch to turn the power to ON state (shut down the engine).<br>C. Access the data flow of the switch you are checking.<br>D. While monitoring the data stream, gently shake each plug or harness horizontally and horizontally.<br>E. If the data flow is not stable, check whether the connection is bad. |
| 4. Method of checking the actuator or relay. | |
|  LFX60-SM-12649 | A. Connect the diagnostic meter to the diagnostic interface (DLC).<br>B. Operate the start switch to turn the power to ON state (shut down the engine).<br>**Note:**<br>**"If the engine is started, perform the following steps during its operation in idling mode."**<br>C. Prepare the output status control function for the actuator or relay being checking.<br>D. After the output status control function is activated, use a finger to vibrate the actuator or relay 3s."<br>If you hear an unstable "click" sound, check for any improper connection or improper installation of the actuator and/or relay.<br>**Note:**<br>**Strongly vibrating relay may cause the relay to be disconnected.** |
| 5. Simulate the fault by the road test and read the data stream. | |
| | A. Connect the diagnostic meter to the diagnostic interface (DLC).<br>B. Simulate the fault by the road test and read the data stream.<br>C. If the data stream value is instable or the malfunction occurs, repair or replace the parts. |

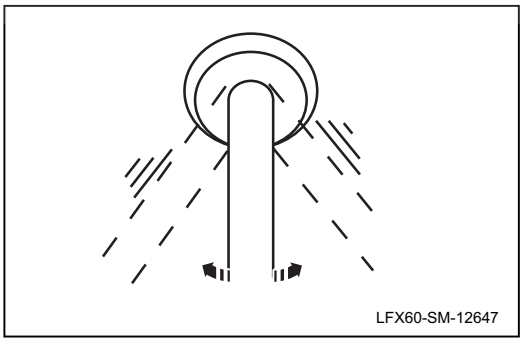
**Troubleshooting process for intermittent failure**

**ℹNote:**

- **Clear DTC.**
- **Carry out the simulation test.**
- **Check and shake the harness and harness plug.**

If DTC examination cannot confirm the fault and the fault occurs occasionally during the use, In this case, confirm all the circuits and parts that may cause the fault. In many cases, the basic inspection shown in the flow chart below can quickly and effectively locate the fault parts, in particular the loose contact of harness plug.

Definition: the fault does not occur currently but the historical fault diagnosis records show that the fault ever occurred. Or the customer reports this fault while the fault does not relate to the DTC and the fault symptom cannot be reproduced currently.

| Test condition | Details/results/measures |
|---|---|
| 1. Vibration method | |
| | A. If the fault occurs or the fault is more severe or the engine vibration occurs when the vehicle is running on the rough road, go to Step 2.<br>**ℹNote:**<br>**Several causes can result in the vehicle or engine vibration fault. Check the following items:**<br>B. The plug is not fully in place.<br>C. The harness does not have enough clearance.<br>D. The wiring harness is arranged across the bracket or moving part.<br>E. The wiring harness is placed too close to the high temperature parts.<br>F. Incorrect wiring, improperly tightened or loosened wiring will cause the wiring to be squeezed between the parts.<br>G. The connection of the plug, the vibrating part, and the position through which the harness passes are important areas that need to be inspected, for example:the harness passes through the firewall and the body panel. |
| 2. Inspection method for switch plug or harness | |
|  <br>LFX60-SM-12647 | A. Connect the diagnostic meter to the diagnostic interface (DLC).<br>B. Operate the start switch to make the power mode to the ON State (shut down the engine).<br>C. Access the data flow of the switch you are checking.<br>D. Turn on the switch manually.<br>E. While monitoring the data stream, gently shake each plug or harness horizontally and horizontally."<br>F. If the data stream value is instable, check whether the contact is loose. |

## List of fault symptoms

| Symptom | Possible Cause | Recommended Measures |
|---|---|---|
| Intermittent fault | • Clear DTC<br>• Carry out the simulation test<br>• Check and shake the harness, harness plug | **Refer to: Intermittent fault diagnostic flow** |
| The airbag indicator does not light up | • Fuse<br>• Line fault<br>• Instrument cluster<br>• Airbag control module | **Refer to: The diagnostic process for the airbag indicator does not light up** |
| The airbag indicator always light up | • Fuse, circuit<br>• There is a collision occurrence record<br>• Performed non-canonical operations<br>• The number of times recorded in the airbag control unit exceeds the specified number of collisions<br>• Instrument cluster<br>• Airbag control module<br>• Airbag<br>• Battery | **Refer to: The diagnostic process for the airbag indicator always light up** |

# Diagnostic Information and Procedures

## Diagnosis Instructions

Before the diagnoses of the airbag system, read the system overview first.Understand and become familiar with the working principle of the airbag system, and then start the airbag system diagnosis, so that in the event of failure to help determine the correct fault diagnosis steps, more importantly, it also helps determine whether the situation described by the customer is normal operating.

Any troubleshooting of the airbag system should take the airbag system check as a starting point and instruct the service personnel to take the next logical step to troubleshoot. Comprehend and correctly use the diagnostic flow chart to shorten the diagnosis time and avoid the misjudgement.

## Visual Inspection

**Note:**

- **When storing unexpanded airbag modules, make sure that the airbag opening is not facing the surface of the loaded airbag module. "Airbag openings shall not point downward.Do not place any objects on the airbag module.There should be enough space around the airbag for the airbag to unfold unexpectedly. Otherwise, people will be injured."**
- **Do not immerse undeveloped airbag modules in water or expose them to other liquids.**
- **Do not deploy unexpanded airbag modules near fire or in high temperature areas to prevent the airbag from being accidentally unfolded and people from being injured.**

1. Confirm the problem raised by the customer.
2. Visually check whether there is any obvious mechanical or electrical damage sign.

**Visual inspection table**

| Mechanical | Electric apparatus |
|---|---|
| • Steering wheel<br>• Driver's seat<br>• Dashboard assembly | • Fuse<br>• Line<br>• Driver's airbag<br>• Passenger airbag<br>• Clock spring<br>• Airbag control module<br>• Instrument cluster |

3. Check the airbag system lines that are easy to observe or can be seen.

Wiring harness and fulcrum of the vibration should be the main parts thoroughly checked.If failure is caused by vibration, tt is advisable to gently vibrate the potentially defective parts with your fingers and check for malfunctions.

- Gently shake the plug in the vertical and horizontal directions.
- Gently shake the harness in the vertical and horizontal directions.

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.

**Driver airbag, passenger airbag**

**⚠Warning:**
**When transporting an unexpanded airbag module:**

- **Do not carry wires or plugs on the airbag module.**
- **Make sure the airbag opening is not facing you or someone else.**

The driver airbag module includes a housing, an inflatable airbag, an ignition detonator, and a gas generating agent.When the vehicle is impacted in the front and the impact force is large enough, the airbag control unit will issue an ignition command to the ignition circuit to deploy the airbag.And then, the gas will rapidly expand the airbag.Once it is filled with gas, the airbag will discharge gas via the vent holes. All the harness connector terminal of airbag control unit (driver airbag, passenger airbag deployment circuit) has a short-circuit bar.When the plug is disconnected, the short-circuit bar will short the airbag inflatable module deploy circuit, to prevent the airbag from accidentally deploy during maintenance.

**Clock Spring**

**⚠Warning:**
**Improper installation of the clock spring assembly can damage the internal spring coil of the clock spring, which may cause a coil failure, resulting in an airbag not working properly, thus resulting in personal injury.**

The airbag clock spring is on the steering column and below the steering wheel.The clock spring can maintain a continuous electrical contact between the driver's airbag deployment circuit and the driver's airbag when the steering wheel is rotated.

**Airbag harness system**

The airbag system harness connects the airbag control unit, the inflatable module, the expansion circuit, and the data circuit through a waterproof plug.The harness of airbag system deploy circuit shall be yellow for identification. When repairing the harness of airbag system, follow the appropriate tests and circuit repair procedures in this manual.

# Operating Principle

## System Overview

**⚠Warning:**

**The vehicle is equipped with the airbag systems; any failure to follow the correct operating procedures will lead to the following cases:**

- **The airbag unexpectedly deploys.**
- **The airbag system does not work if required.**

**⚠Warning:**

**Strictly observe the following rules to prevent the above conditions:**

- **Before working, confirm whether you are working on the airbag system component, around the airbag or on the line.**
- **Remove the airbag system if you are carrying out maintenance operations on the airbag system components, around them, or on their lines.**

The airbag system (SRS AIRBAG) is a safety protection device used in conjunction with seat belts. The airbag cannot substitute the belt. The driver and occupants must always be fastened with the seat belt and adjust to the most appropriate condition according to the body.

**ⓘNote:**

**Strictly observe the following rules to prevent the above conditions:**

The airbag system can not replace the seat belt function.Failure to wear a seat belt may cause serious personal injury when the airbag is detonated.The airbag system is designed to protect the driver and passengers when the vehicle is severely impacted. When there is any frontal vehicle collision to meet the airbag detonation conditions, the airbag ECU will send a signal to trigger the gas charging system of driver and copilot airbag. The gas charging system will produce a chemical reaction in an instant so as to fill gas into airbag and buffer the forward impaction speed of front-row driver and passengers, and prevent drivers and front-row passengers from hitting the steering wheel and the upper/lower instrument panel directly. At the same time, airbag ECU also sends signals to the seat belt pre-tightening device so as to tighten the seat belt backwards.

The airbag system consists of the following components:

- Combination instrument assembly
- Airbag control module
- Driver's airbag
- Passenger airbag

## Airbag indicator

The airbag indicator is located in the dashboard assembly to inform the driver of the airbag system failure and to verify that the airbag control unit is communicating with the dashboard.When operate start switch to switch the power mode to "ON" state, make sure that the airbag indicator is on.If the indicator light remains on, it is not extinguished or flashes, you must check the failure of the entire airbag system.

**⚠Warning:**

**If the airbag system is faulty, it may cause the airbag unable to deploy, or deploy the airbag when the collision does not reach the set severity.**

## Airbag control unit

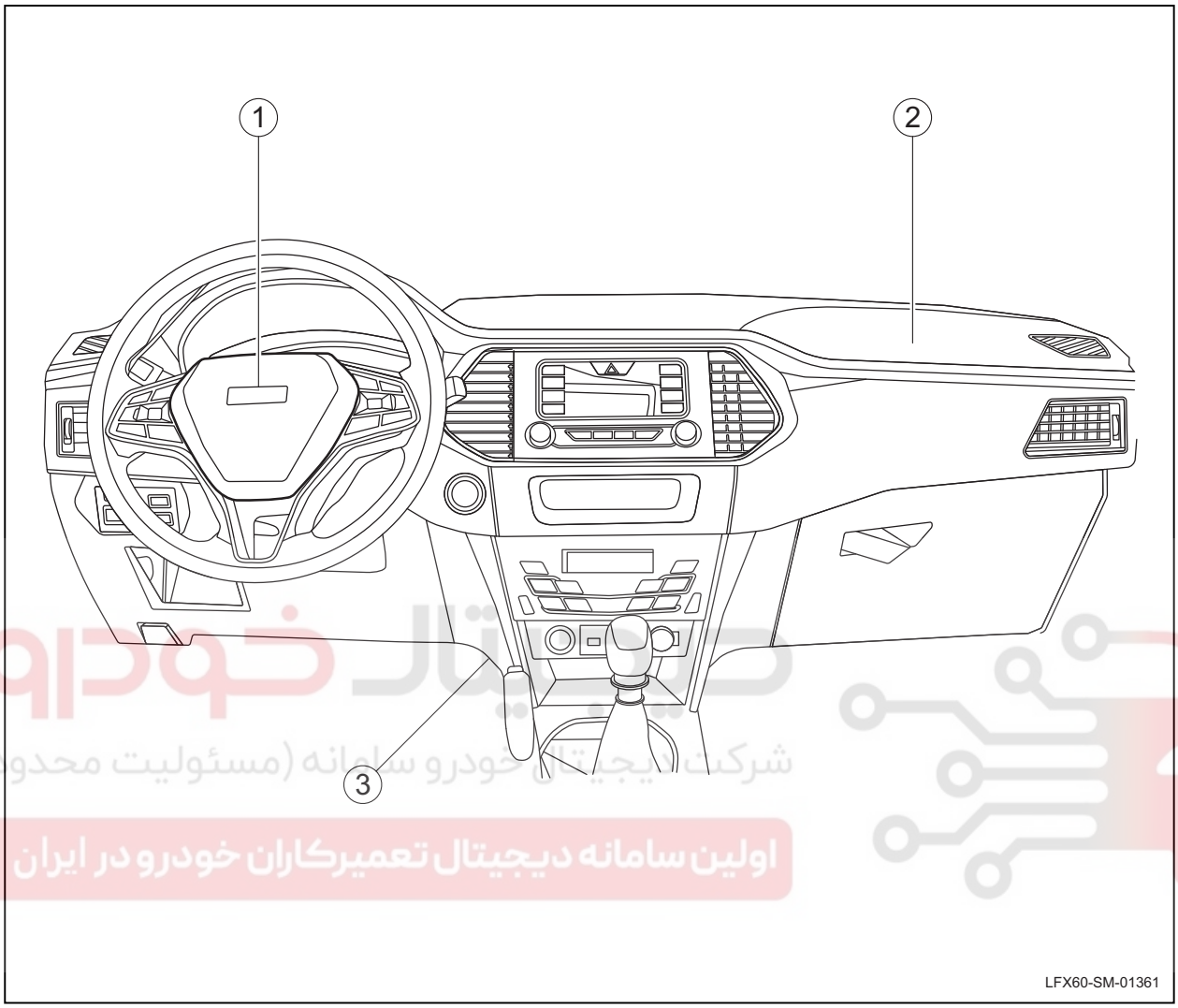
**⚠Warning:**

- **The airbag control unit has a redundant power supply, and the airbag can still be deployed after the battery voltage is lost during the collision.**
- **Disconnect the negative connector of battery for more than 90s before servicing the airbag system to ensure safety.**
- **In order to prevent accidental deployment of the airbag and cause personal injury, the undeveloped airbag module shall not be disposed as conventional workshop waste. Safely discard the unexpanded airbag module by using the expansion program. If the sealed container is damaged during the scrapping process, some of the substances contained in the unexpanded module may cause serious illness or personal injury.**

The airbag control unit, which is a microprocessor, is the control center of the airbag system.When the vehicle is impacted, the airbag control unit compares the detected collision signal with the value in the memory. When the generated signal value exceeds the stored value, the airbag control unit issues an ignition command to each of the ignition circuits to deploy the airbag.When the airbag is deployed, the airbag control unit records the status of the airbag system and lights on the airbag indicator on the instrument cluster.After the vehicle is started, the airbag control unit will perform continuous diagnostic monitoring of the electrical components and circuits of the airbag system.If the airbag control unit detects a fault, a fault diagnosis code is stored and the airbag indicator light is illuminated to inform the driver the failure.

# Structure and installation location

## Component Location Plan

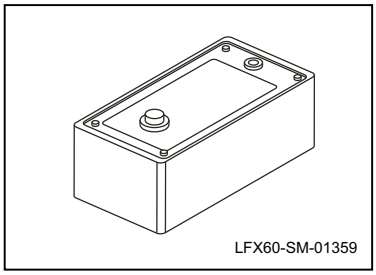
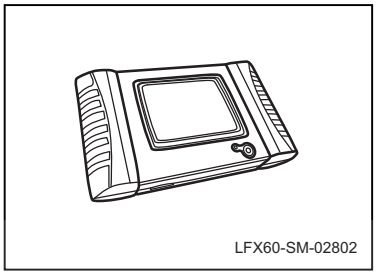
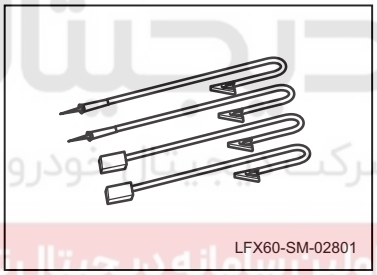
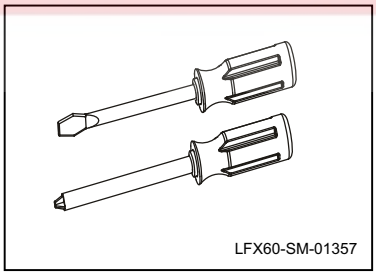
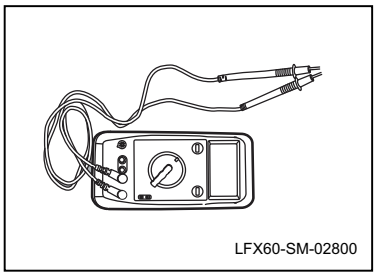



| No. | Part Name |
|---|---|
| 1 | Driver Airbag |
| 2 | Passenger safety |

| No. | Part Name |
|---|---|
| 3 | Airbag control unit |
| | |

# Preparation

## General maintenance tools

| No. | Tool name | Tool figure | Tool code | Remarks |
|---|---|---|---|---|
| 1 | Special tool for airbag firing |  LFX60-SM-01359 | - | Firing the airbag |
| 2 | Diagnosis equipment |  LFX60-SM-02802 | - | Fault diagnose of airbag system |
| 3 | Wiring group |  LFX60-SM-02801 | - | Testing circuit |
| 4 | Screwdriver |  LFX60-SM-01357 | - | To remove and install the screw and pry the snap ring etc. |
| 5 | Digital universal meter |  LFX60-SM-02800 | - | Measure the voltage and resistance |

## Precautions

⚠Warning:

- Failure to follow the correct procedure may result in a sudden deployment of the airbag and even a serious accident. Meanwhile, any incorrect action on airbag system can cause malfunction of the system.
- It is important to make sure that the ignition switch is turned OFF and the battery is disconnected from the positive and negative poles for 90 seconds.(The safety system is equipped with a backup power supply, so if it is operated within 90s of the positive and negative poles of the battery is disconnected, may lead to the airbag to deploy suddenly).
- Do not expose the airbag assembly to hot air or open flames.

ℹNote:

- Because it is difficult to confirm the failure of the airbag system, the diagnostic trouble code (DTC) will be the most important source of information for troubleshooting. Examine DTC before disconnect the battery in troubleshooting of the airbag system.
- Even if the impact is very small, and the airbag assembly is not deployed, the speaker button assembly and the airbag electronic control unit (SRS ECU) should be checked.
- If an airbag electronic control unit (SRS ECU) may be impacted during maintenance, be sure to disconnect the connector of airbag electronic control unit (SRS ECU) first.
- Do not use airbag system parts removed from another vehicle. Always replace with new parts.
- Do not disassemble the speaker button assembly.
- If the horn button assembly falls on the ground or cracks, pits, or other defects on the housing, be sure to replace with new parts.
- For failure check of system circuit, digital multimeter with high impedance should be used.
- The information label is affixed to the parts of the airbag system, and the precautions on the label must be followed.
- When the negative connector of battery is disconnected, the memory of the electronic clock and audio system will be cleared. Record all necessary data before repair. Reset electronic clock and audio system after repair. Standby power supply other than the vehicle must not be used to keep data memory. The standby power supply will power airbag system, so that the airbag may deploy suddenly in repair.
- Do not disassemble or repair the driver's and front passenger's airbag module and airbag electronic control unit (SRS ECU) assembly for recycle or other reasons.
- The airbag ECU, airbag module, clock spring, etc.should be removed when the painting operation is likely to cause an impact due to overheating (above 93 °C).
- The connector of Airbag electronic control unit (SRS ECU) assembly , the connector between the airbag electronic control unit (SRSECU) assembly and clock spring , the connector between the clock spring and the driver airbag module and the connector between the front passenger airbag module and the airbag electronic control unit (SRS ECU) are equipped with a protective mechanism to prevent accidental deployment of the airbag. All requirements must be followed in repair of airbag system to avoid injury for sudden deployment and other parts.
- During the maintenance of the airbag system, the airbag module must be loaded immediately after removal from the transport equipment.If the work is terminated, the airbag module should be returned to the conveyor and the airbag module can not be placed in an unattended place.When storing the removed airbag module, place the deployment face of airbag up.
- Do not place the airbag assembly in a high temperature environment or open flame.
- • After the airbag system is repaired, do not rush to connect the airbag module to the circuit.The electrical inspection should be carried out before the airbag module can be accessed.
- When the airbag system is connected to the power supply, no person is allowed in the vehicle.
- After the airbag system is repaired, check that if the SRS warning light is working properly.
- The airbag has a certain service life.If airbag life is reached, airbag and label must be replaced.

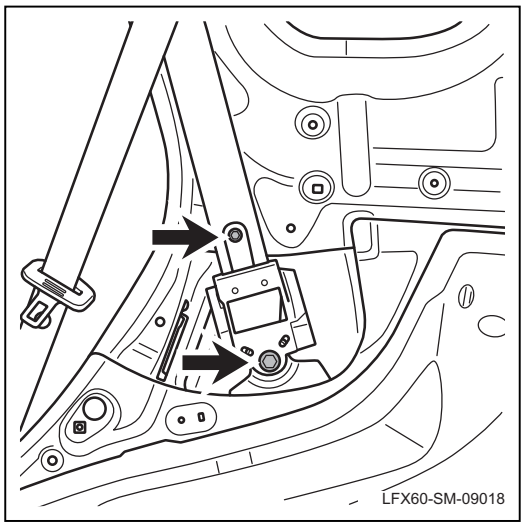
# Airbag system

## Technical specifications

### Torque Specifications

| Name | Torque range | |
|---|---|---|
| | Metric (Nm) | British(lb-ft) |
| Airbag ECU and floor connection bolts | 9 | 7 |

# 09 - Safety protection device




(d). Remove the fixing bolts of the seat belt retractor.
(e). Take of the rear seat belt assembly.

**Installation**

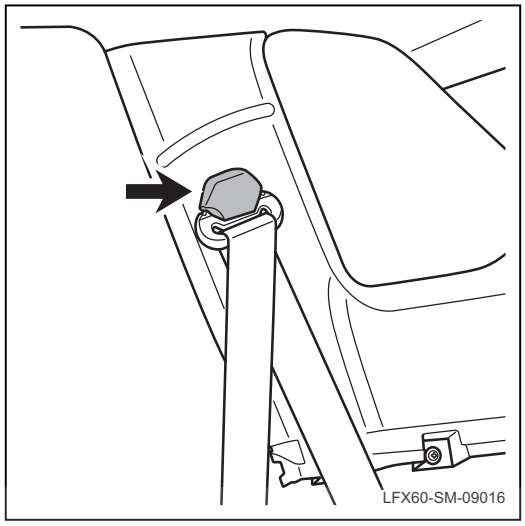
**1. Install the rear seat belt assembly.**
(a). The installation sequence is the reverse of the disassembly order.
(b). Remove the C pillar lower decorative panel. **Refer to the replacement of C pillar lower decorative panel.**

**Replacement of rear seat belt assembly**

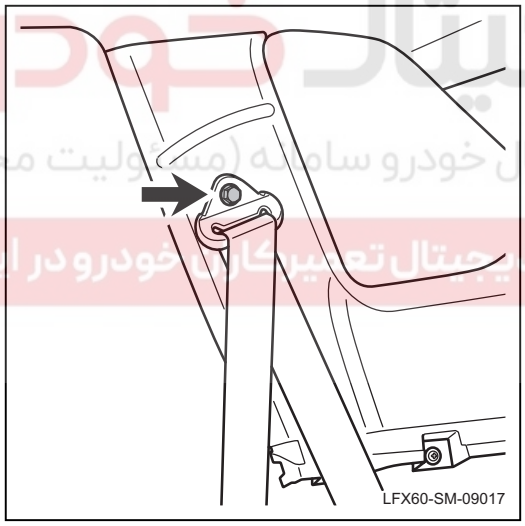
**Removal**

1. **Remove the rear seat belt assembly.**

(a). Remove the C pillar lower decorative panel. **Refer to the replacement of C pillar lower decorative panel.**




(b). Remove the trim cover of fixing bolts of the seat belt.



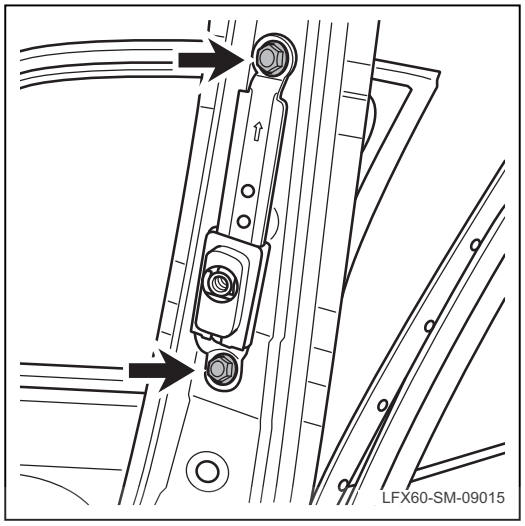

(c). Remove the fixing bolts of the seat belt.

## Replacement of front seat belt adjuster

### Removal

**1. Remove the front seat belt adjuster.**

(a). Remove the upper trim panel of B-pillar, **refer to:Replacement of the upper trim panel of B-pillar.**




(b). Remove the fixing bolts of the front seat belt adjuster.

(c). Take off the front seat belt adjuster.

### Installation

**1. Install the front seat belt adjuster.**

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

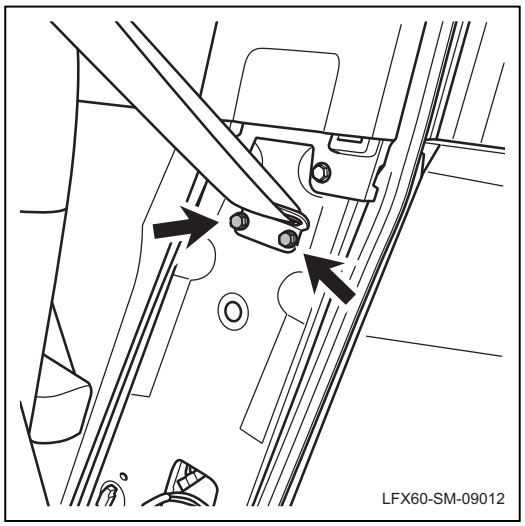
(b). Install the upper trim panel of B-pillar, **refer to:Replacement of the upper trim panel of B-pillar.**

**Installation**

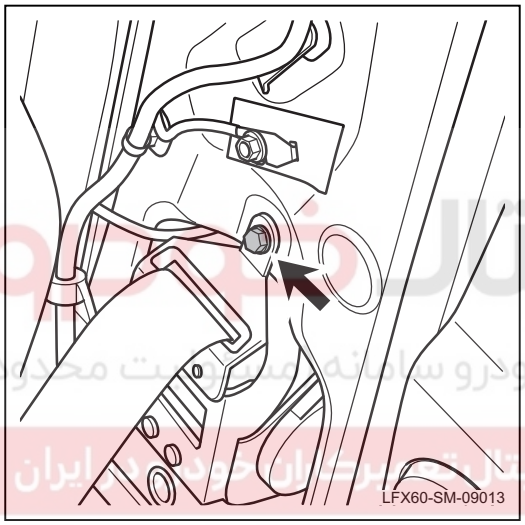
1. Install the front seat belt assembly.

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

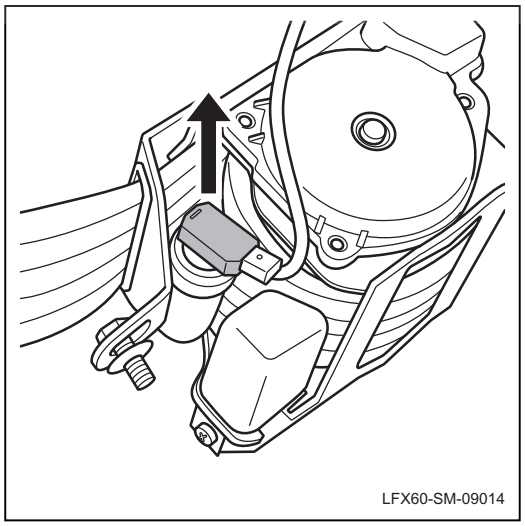
(b). Install the lower trim panel of B-pillar, **refer to:Replacement of the lower trim panel of B-pillar.**




(e). Remove the fixing bolts of stop collar for the front seat belt assembly.




(f). Remove the fixing bolts of the front seat belt assembly.




(g). Disconnect the harness plug of seat belt pretensioner.
(h). Take of the front seat belt assembly.

**Replacement of front seat belt assembly**

**Removal**

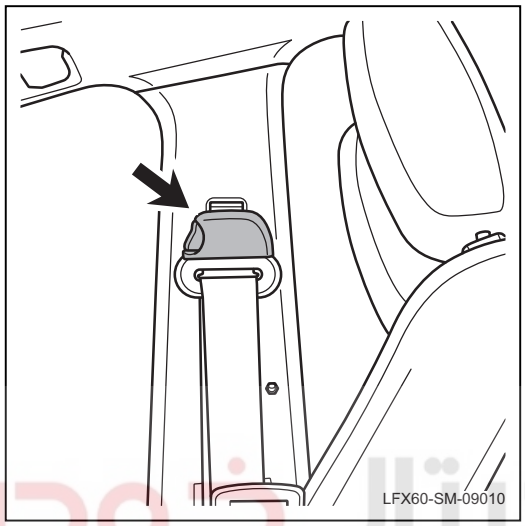
**1. Remove the front seat belt assembly.**

(a). Disconnect the battery negative connector.

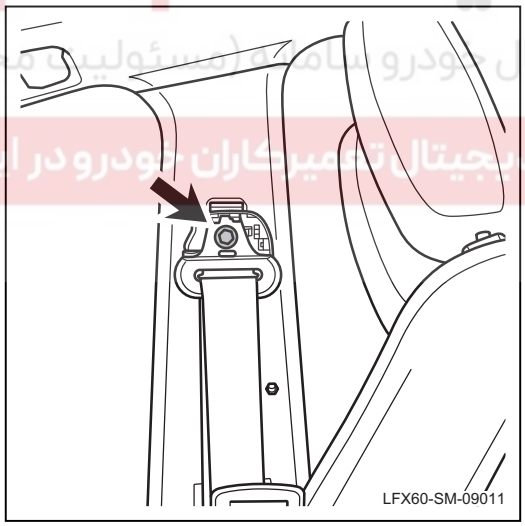
**Note:**

**Disconnect the battery negative terminal, wait for 90s at least and then continue operation.**

(b). Remove the B pillar lower decorative panel. **Refer to the replacement of B pillar lower decorative panel.**




(c). Remove the trim cover of fixing bolts of the front seat belt assembly.



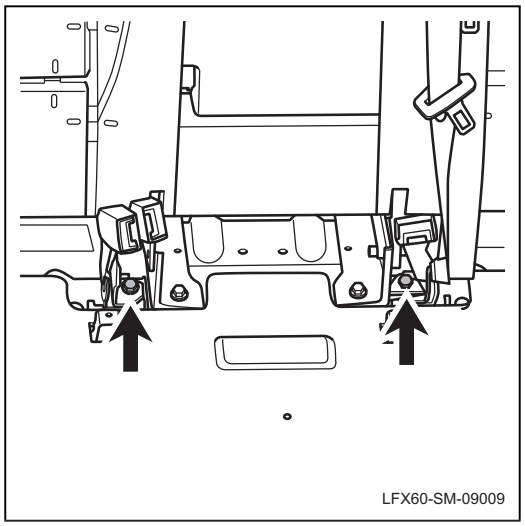

(d). Remove the fixing bolts of the front seat belt assembly.

## Replacement of rear seat belt buckle assembly

### Removal

**1. Remove the rear seat belt buckle assembly.**

(a). Remove the rear seat cushion, **refer to:Replacement of the rear seat cushion.**




(b). Remove the fixing bolts of the rear seat belt buckle assembly.

(c). Take off the rear seat belt buckle assembly.

### Installation

**1. Install the rear seat belt buckle assembly.**

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

# Removal and Installation

## Replacement of front seat belt buckle

### Removal

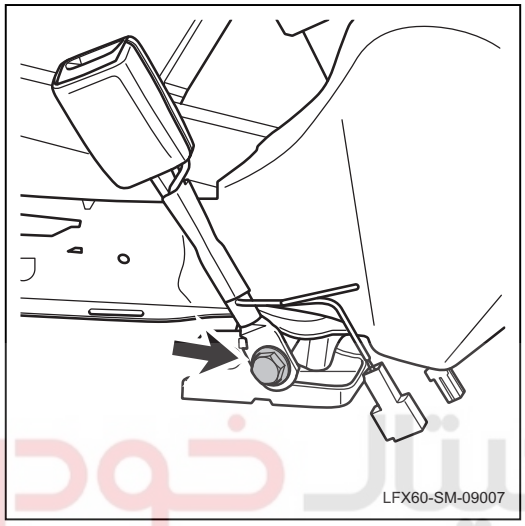
**1. Remove the front seat belt buckle.**

(a). Disconnect the battery negative connector.

**Note:**

**Disconnect the battery negative terminal, wait for 90s at least and then continue operation.**

(b). Remove the front seat assembly. **Refer to: Replacement of front row seat assembly.**




(c). Remove the fixing bolts of the front seat belt buckle.

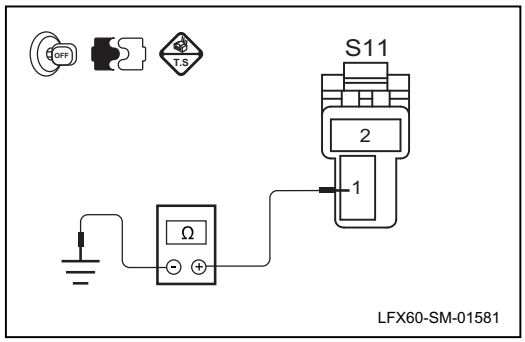
(d). Take of the front seat belt buckle.

### Installation

**1. Install the front seat belt buckle.**

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

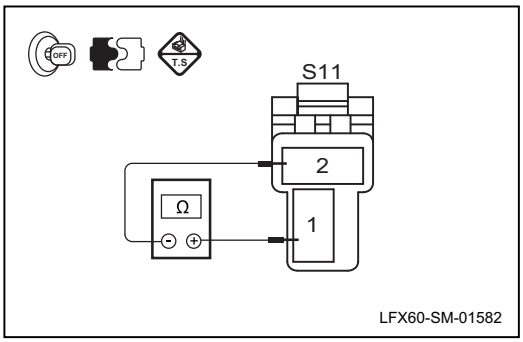
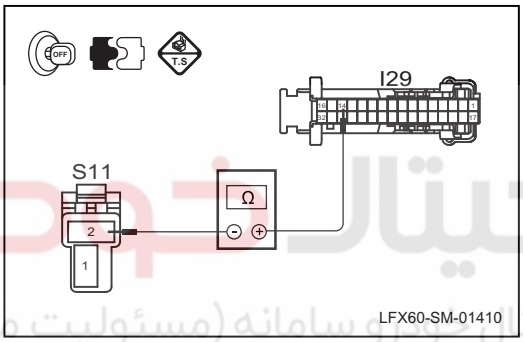
(b). Install the front seat assembly. **Refer to: Replacement of front row seat assembly.**

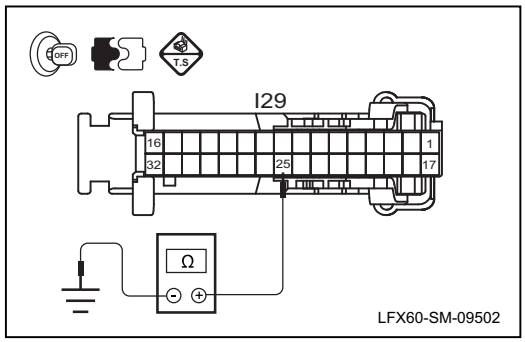
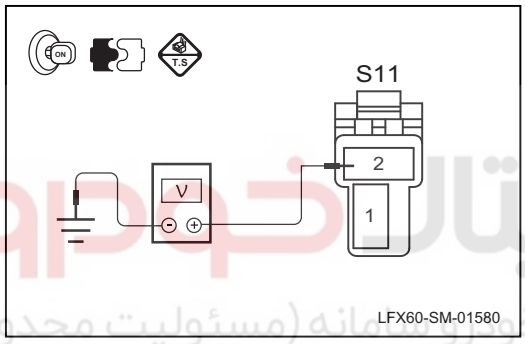
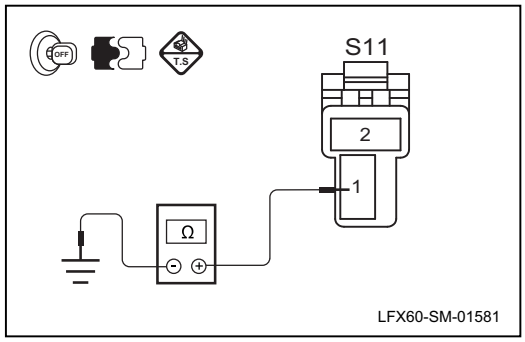
| Test condition | Details/results/measures |
|---|---|
| 4. Check the signal cable of passenger's seat belt warning light. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the assistant driver belt buckle harness plug S11.<br>C. Measure the resistance between the No.1 terminal of the harness plug S11 of the passenger's belt buckle and the reliable ground point with a multimeter.<br>**Standard resistance: 10MΩ or higher**<br>Is the resistance normal?<br>**→Yes**<br>To Step 5.<br>**→No**<br>Check the wiring harness between the No.1 terminal of the harness plug S11 of the passenger's belt buckle and the ground point for failure, and replace the wiring harness if necessary. |
| 5. Replace the instrument cluster. | |
| | A. Replace the instrument cluster.<br>**Refer to: Replacement of instrument cluster assembly**<br>Verify that the system is operated normally. |

**The diagnostic process for the passenger's seat belt warning light keeps on**

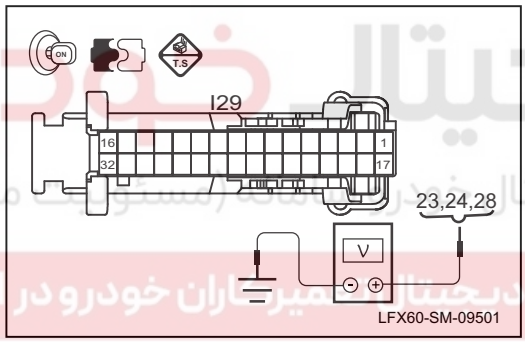
| Test condition | Details/results/measures |
|---|---|
| 1. Check if the passenger's seat belt is buckled up. | |
| | A. Check whether the belt is correctly fastened.<br>Is the belt correctly fastened?<br>→**Yes**<br>To Step 2.<br>→**No**<br>Fasten the belt and test whether the system is normal. |
| 2. Check the assistant driver's belt buckle. | |
| | A. Operate the start switch to turn the power to OFF state.<br>B. Disconnect the assistant driver belt buckle harness plug S11.<br>C. Operate start switch to switch the power mode to "ON" state, observe for whether the seat belt warning light is off.<br>Does the belt warning lamp turn off?<br>→**Yes**<br>Replace the belt buckle.<br>**Refer to: Replacement of belt buckle**<br>→**No**<br>To Step 3. |
| 3. Check the occupant detecting sensor. | |
| | A. Check whether the occupant detecting signal is normal.<br>**Standard value: less than 150Ω (with occupant detecting); if belt not fastened, signal lamp on; if belt fastened, signal lamp off.**<br>**Standard value: more than 10kΩ (with occupant detecting), signal lamp off.**<br>**Standard value: signal lamp off if no occupant detecting.**<br>Is it OK after checking?<br>→**Yes**<br>To Step 4.<br>→**No**<br>Replace the occupant detecting sensor. |

| Test condition | Details/results/measures |
|---|---|
| 10. Replace the instrument cluster. | |
| | A. Replace the instrument cluster.<br>**Refer to: Replacement of instrument cluster assembly**<br>Verify that the system is operated normally. |

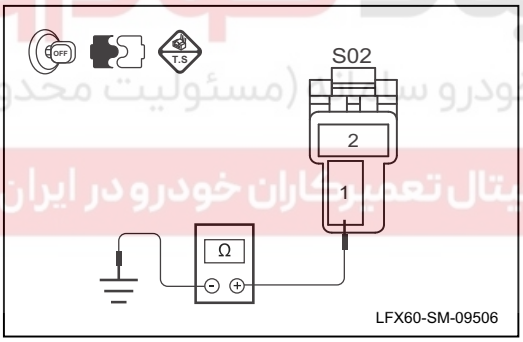
| Test condition | Details/results/measures |
|---|---|
| 7. Check the assistant driver's belt buckle. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the assistant driver belt buckle harness plug S11.<br>C. Measure the resistance between the No.1 and No.2 terminal of the harness plug S11 of the passenger's belt buckle with a multimeter.<br>**Standard resistance: less than 1 Ω**<br>Is it OK after checking?<br>**→Yes**<br>To Step 8.<br>**→No**<br>Replace the belt buckle.<br>Refer to: Replacement of front belt buckle |
| 8. Check the circuit of occupant detection sensor. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative terminal.<br>B. Disconnect the assistant driver belt buckle harness plug S11.<br>C. Disconnect the instrument cluster harness plug I29.<br>D. Measure the voltage between the No.2 terminal of the harness plug S11 of the passenger's belt buckle and the No.14 of I29 with a multimeter.<br>**Standard resistance:less than 5 Ω**<br>Is it OK after checking?<br>**→Yes**<br>To Step 9.<br>**→No**<br>Check the wiring harness between the No.2 terminal of the harness plug S11 of the passenger's belt buckle and the instrument cluster for open circuit fault, and replace the wiring harness if necessary. |
| 9. Check the occupant detecting sensor. | |
| | A. Check whether the occupant detecting signal is normal.<br>**Standard value: less than 150Ω (with occupant detecting); if belt not fastened, signal lamp on; if belt fastened, signal lamp off.**<br>**Standard value: more than 10kΩ (with occupant detecting), signal lamp off.**<br>**Standard value: signal lamp off if no occupant detecting.**<br>Is it OK after checking?<br>**→Yes**<br>To Step 10.<br>**→No**<br>Replace the occupant detecting sensor. |

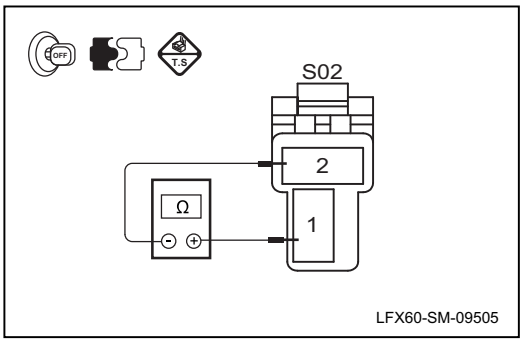
| Test condition | Details/results/measures |
|---|---|
| 4. Check the instrument cluster ground wire. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative cable.<br>B. Disconnect the instrument cluster harness plug I29.<br>C. Measure the resistance between No. 25 terminal of the harness plug I29 of the instrument cluster and the reliable grounding.<br>**Standard resistance: Less than 5 Ω**<br>Is it OK after checking?<br>**→Yes**<br>To step 5.<br>**→No**<br>Check the wiring harness between the No. 25 terminal of the harness plug I29 and the ground point for open circuit fault, and replace the wiring harness if necessary. |
| 5. Check the power supply for passenger's seat belt buckle. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative cable.<br>B. Disconnect the assistant driver belt buckle harness plug S11.<br>C. Connect the battery negative terminal and operate the start switch to turn the power to ON state.<br>D. Measure the voltage between the No. 2 terminal of the harness plug S11 of the passenger's belt buckle and the ground point with a multimeter.<br>**Standard voltage: 11 ~ 14 V**<br>Is it OK after checking?<br>**→Yes**<br>To step 6.<br>**→No**<br>Check the circuits of the passenger's belt buckle for open circuit fault, and replace the wiring harness if necessary. |
| 6. Check the grounding circuit for passenger's seat belt buckle. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative cable.<br>B. Disconnect the assistant driver belt buckle harness plug S11.<br>C. Measure the resistance between the No. 1 terminal of the harness plug S11 of the passenger's belt buckle and the ground point with a multimeter.<br>**Standard resistance: less than 5 Ω**<br>Is it OK after checking?<br>**→Yes**<br>To step 7.<br>**→No**<br>Check the wiring harness between the No. 1 terminal and the ground point of the harness plug S11 of the passenger's belt buckle for open circuit fault, and replace the wiring harness if necessary. |

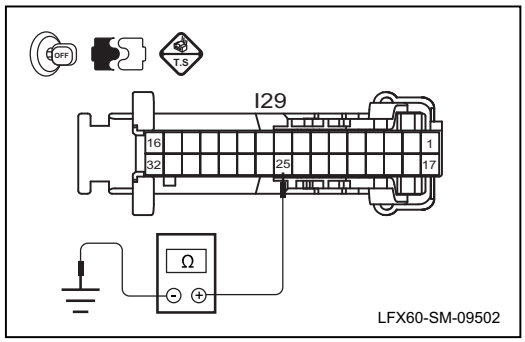
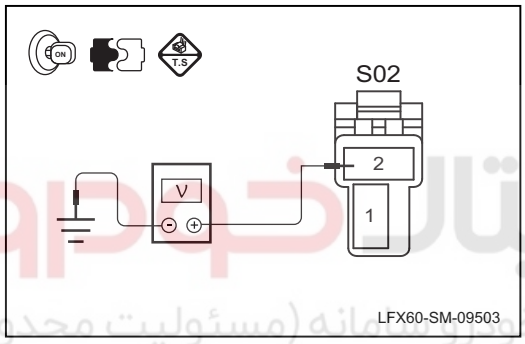
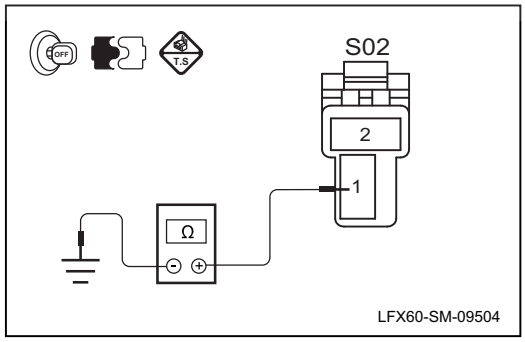
**The diagnostic process for the passenger's seat belt warning light does not light up**

| Test condition | Details/results/measures |
|---|---|
| 1. General inspection. | |
| | A. Check the instrument cluster harness plugs for breakage, loose contact, aging or looseness.<br>Is it OK after checking?<br>→**Yes**<br>To step 2.<br>→**No**<br>Examine and repair the fault location. |
| 2. Check the instrument cluster fuse. | |
| | A. Check the instrument cluster fuse FS01, FS06, FS14.<br>**Fuse rated capacity: FS01 (10A), FS06 (20A), FS14 (10A)**<br>Is the system normal?<br>→**Yes**<br>To step 3.<br>→**No**<br>Replace the fuse of same model. |
| 3. Check the instrument cluster power. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative cable.<br>B. Disconnect the instrument cluster harness plug I29.<br>C. Connect the battery negative terminal and operate the start switch to turn the power to ON state.<br>D. Measure the voltage between the instrument cluster harness plug I29 terminal 23, 24 28 and the fixed ground point with the multimeter.<br>**Standard voltage: 11 ~ 14 V**<br>Is it OK after checking?<br>→**Yes**<br>To step 4.<br>→**No**<br>Repair the instrument cluster power line open circuit fault and replace the harness if necessary. |

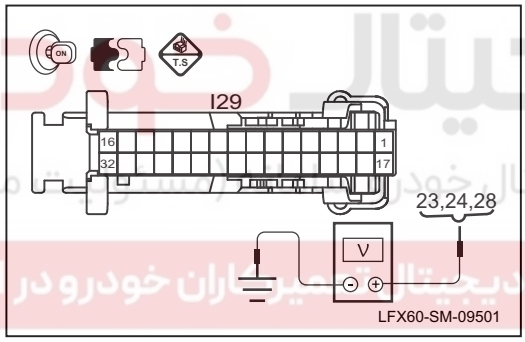
**The diagnostic process for the driver's seat belt warning light keeps on**

| Test condition | Details/results/measures |
|---|---|
| 1. Check if the driver's seat belt is buckled up. | |
| | A. Check whether the belt is correctly fastened.<br>Is the belt correctly fastened?<br>→**Yes**<br>To step 2.<br>→**No**<br>Fasten the belt and test whether the system is normal. |
| 2. Check the driver's belt buckle. | |
| | A. Operate the start switch to set the power mode to the "OFF" state.<br>B. Disconnect the driver belt buckle harness plug S02.<br>C. Operate start switch to switch the power mode to "ON" state, observe for whether the seat belt warning light is off.<br>Does the belt warning lamp turn off?<br>→**Yes**<br>Replace the belt buckle.<br>**Refer to the replacement of belt buckle**<br>→**No**<br>To step 3. |
| 3. Check the signal cable of driver's seat belt warning light. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative cable.<br>B. Disconnect the driver belt buckle harness plug S02.<br>C. Measure the resistance between the No. 1 terminal of the harness plug S02 of the driver's belt buckle and the reliable ground point with a multimeter.<br>**Standard resistance: 10MΩ or higher**<br>Is it OK after checking?<br>→**Yes**<br>To step 4.<br>→**No**<br>Check the wiring harness between the No. 1 terminal of the harness plug S02 of the driver's belt buckle and the ground point for short circuit fault, and replace the wiring harness if necessary. |
| 4. Replace the instrument cluster. | |
| | A. Replace the instrument cluster.<br>**Refer to the replacement of instrument cluster assembly**<br>Verify that the system is operated normally. |

| Test condition | Details/results/measures |
|---|---|
| 7. Check the driver's belt buckle. | |
|  | A. Operate start switch to switch the power mode to “OFF” state, disconnect the negative connector of the battery.<br>B. Disconnect the harness plug S02 of the seat belt buckle.<br>C. Measure the resistance between the No. 1 and No. 2 terminal of the harness plug S02 of the belt buckle with a multimeter.<br>**Standard resistance: less than 1 Ω**<br>Is it OK after checking?<br>→**Yes**<br>To step 8.<br>→**No**<br>Replace the belt buckle.<br>Refer to the replacement of front belt buckle |
| 8. Replace the instrument cluster. | |
| | A. Replace the instrument cluster.<br>**Refer to the replacement of instrument cluster assembly**<br>Verify that the system is operated normally. |

| Test condition | Details/results/measures |
|---|---|
| 4. Check the instrument cluster ground wire. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative cable.<br>B. Disconnect the instrument cluster harness plug I29.<br>C. Measure the resistance between No. 25 terminal of the harness plug I29 of the instrument cluster and the reliable grounding with a multimeter.<br>**Standard resistance: less than 5 Ω**<br>Is it OK after checking?<br>**→Yes**<br>To step 5.<br>**→No**<br>Check the wiring harness between the No. 25 terminal of the harness plug I29 and the ground point for open circuit fault, and replace the wiring harness if necessary. |
| 5. Check the power supply for driver's seat belt buckle. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative cable.<br>B. Disconnect the driver belt buckle harness plug S02.<br>C. Connect the battery negative terminal and operate the start switch to turn the power to ON state.<br>D. Measure the voltage between the No. 1 terminal of the harness plug S02 of the driver's belt buckle and the ground point with a multimeter.<br>**Standard voltage: 11 ~ 14 V**<br>Is it OK after checking?<br>**→Yes**<br>To step 6.<br>**→No**<br>Check the circuits of the driver's belt buckle for open circuit fault, and replace the wiring harness if necessary. |
| 6. Check the grounding circuit for driver's seat belt buckle. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative cable.<br>B. Disconnect the driver belt buckle harness plug S02.<br>C. Measure the resistance between the No. 1 terminal of the harness plug S02 of the driver's belt buckle and the ground point with a multimeter.<br>**Standard resistance: less than 5 Ω**<br>Is it OK after checking?<br>**→Yes**<br>To step 7.<br>**→No**<br>Check the wiring harness between the No. 1 terminal of the harness plug S02 of the driver's belt buckle and the ground point for open circuit fault, and replace the wiring harness if necessary. |

**The diagnostic process for the driver's seat belt warning light does not light up**

| Test condition | Details/results/measures |
|---|---|
| 1. General inspection. | |
| | A. Check the instrument cluster harness plugs for breakage, loose contact, aging or looseness.<br>Is it OK after checking?<br>→**Yes**<br>To step 2.<br>→**No**<br>Repair the fault position. |
| 2. Check the instrument cluster fuse. | |
| | A. Check the instrument cluster fuse FS01, FS06, FS14.<br>**Fuse rated capacity: FS01 (10A), FS06 (20A), FS14 (10A)**<br>Is the system normal?<br>→**Yes**<br>To step 3.<br>→**No**<br>Replace the fuse of same model. |
| 3. Check the instrument cluster power. | |
|  | A. Operate the start switch to turn the power to OFF state and disconnect the battery negative cable.<br>B. Disconnect the instrument cluster harness plug I29.<br>C. Connect the battery negative terminal and operate the start switch to turn the power to ON state.<br>D. Measure the voltage between the instrument cluster harness plug I29 terminal 23, 24 28 and the fixed ground point with the multimeter.<br>**Standard voltage: 11 ~ 14 V**<br>Is it OK after checking?<br>→**Yes**<br>To step 4.<br>→**No**<br>Repair the instrument cluster power line open circuit fault and replace the harness if necessary. |

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## List of fault symptoms

If the fault occurs but the fault diagnosis code (DTC) is not stored in the control module and the fault can not be confirmed in the basic inspection, the fault diagnosis and troubleshooting should be performed according to the order listed in the table below.

| Symptom | Possible point of failure | Recommended Measures |
|---|---|---|
| The seat belt can not be retracted | • Belt retractor | • Replace the belt assembly |
| The seat belt can not be locked | • Belt retractor | • Replace the belt assembly |
| Seat belt buckle out of function, buckle off | • Belt buckle | • Replace the seat belt buckle |
| The driver's seat belt warning light does not light up | • Line<br>• Harness connector<br>• Belt buckle<br>• Instrument cluster | **Refer to: The diagnostic process for the driver's seat belt warning light does not light up** |
| The driver's seat belt safety warning light keeps on | • Line<br>• Belt buckle<br>• Instrument cluster | **Refer to: The diagnostic process for the driver's seat belt warning light keeps on** |
| The passenger's seat belt warning light does not light up | • Line<br>• Harness connector<br>• Belt buckle<br>• Instrument cluster<br>• Occupant detecting sensor | **Refer to: The diagnostic process for the passenger's seat belt warning light does not light up** |
| The passenger's seat belt safety warning light keeps on | • Line<br>• Belt buckle<br>• Instrument cluster<br>• Occupant detecting sensor | **Refer to: The diagnostic process for the passenger's seat belt warning light keeps on** |

# Diagnostic Information and Procedures

## Diagnosis Instructions

Before the diagnose of the seat belt system, familiarize yourself with the working principle of the seatbelt system, and then start the seat belt system diagnostics, which helps not only to determine the correct troubleshooting step in the event of a failure, and more importantly Any troubleshooting of the seat belt system should take the seat belt system check as a starting point and instruct the service personnel to take the next logical step to troubleshoot.

Determine the condition described by the customer is normal or not. Understanding and using the diagnostic flowchart correctly reduces diagnostic time and avoids misjudgment of components.

## 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 check table

| Mechanical | Electrical |
|---|---|
| • Belt retractor<br>• Belt buckle | • Fuse<br>• Line<br>• Harness connector<br>• Instrument cluster<br>• Occupant detecting sensor |

3. Solve the problem finding before the next step inspection.
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.

# Operating Principle

## System overview

**⚠Warning:**
**The vehicle is equipped with a safety device, such that failure to follow the correct operating procedures will lead to the following**

- **The airbag unexpectedly deploys.**
- **The safety device is disabled when necessary.**

**⚠Warning:**
**Strictly observe the following rules to prevent the above conditions:**

- **Before proceeding, make sure that if you are servicing on the safety device parts, around them, or on their lines.**
- **If you are performing maintenance on a safety device assembly, around it, or on its line, remove the safety device.**

The seat belt is a safety protection device that protects the driver and the passenger, in conjunction with the airbag. The airbag cannot substitute the belt. The driver and passenger must always be fastened with the seat belt and adjust to the most appropriate condition according to the body.

## Seatbelt

A three-point and crossing safety belt is used in all seats. The front seat belt retractor is mounted on the bottom of the B-pillar and incorporates a torsion bar load limiting device. This device consists of a (torsion bar) retractor rolling bar mounted on a pivot. Once the sensor locks the retractor slider and the preset load is activated, it will reverse and release additional seat belt.

## Seat belt buckle

The seat belt buckle, together with the seat belt, forms a passenger protection device. The driver's seat belt buckle is internally integrated with a seat belt warning light switch. When the driver is not buckled up in the process of driving, the seat belt warning light on the dashboard will continue to light up, to remind the driver of the seat belt for the protection the driver's driving safety.

## Seat belt height adjuster

The front seat belt is equipped with a seat belt height adjuster, and the occupant can adjust the seat belt height by adjusting the seat belt height adjuster according to the body shape. Make occupants more comfortable in the use of seat belts, but also better protect the safety of occupants.

# General Inspection

**Seat belt inspection**

1. Contraction is not normal

If the seat belt does not retract properly, check that if the anchor cover and the mounting plate are properly installed and do not rub against the seat belt. If necessary, make sure that the seat belt does not rub against one end of the retractor cover groove. If necessary, adjust the retractor to place the seat belt in a central position by loosening the fixing bolt and retighten the bolt.

2. Simple test

When the vehicle is stationary and parked on a flat road surface, tightly grasp the seat belt and pulling it out quickly. The retractor must be locked within 25 cm to prevent more of the belt from coming out. In this test, any seat belt retractor from which the belt is pulled out can not be reused, and a new seat belt must be installed.

**Seat belt buckle inspection**

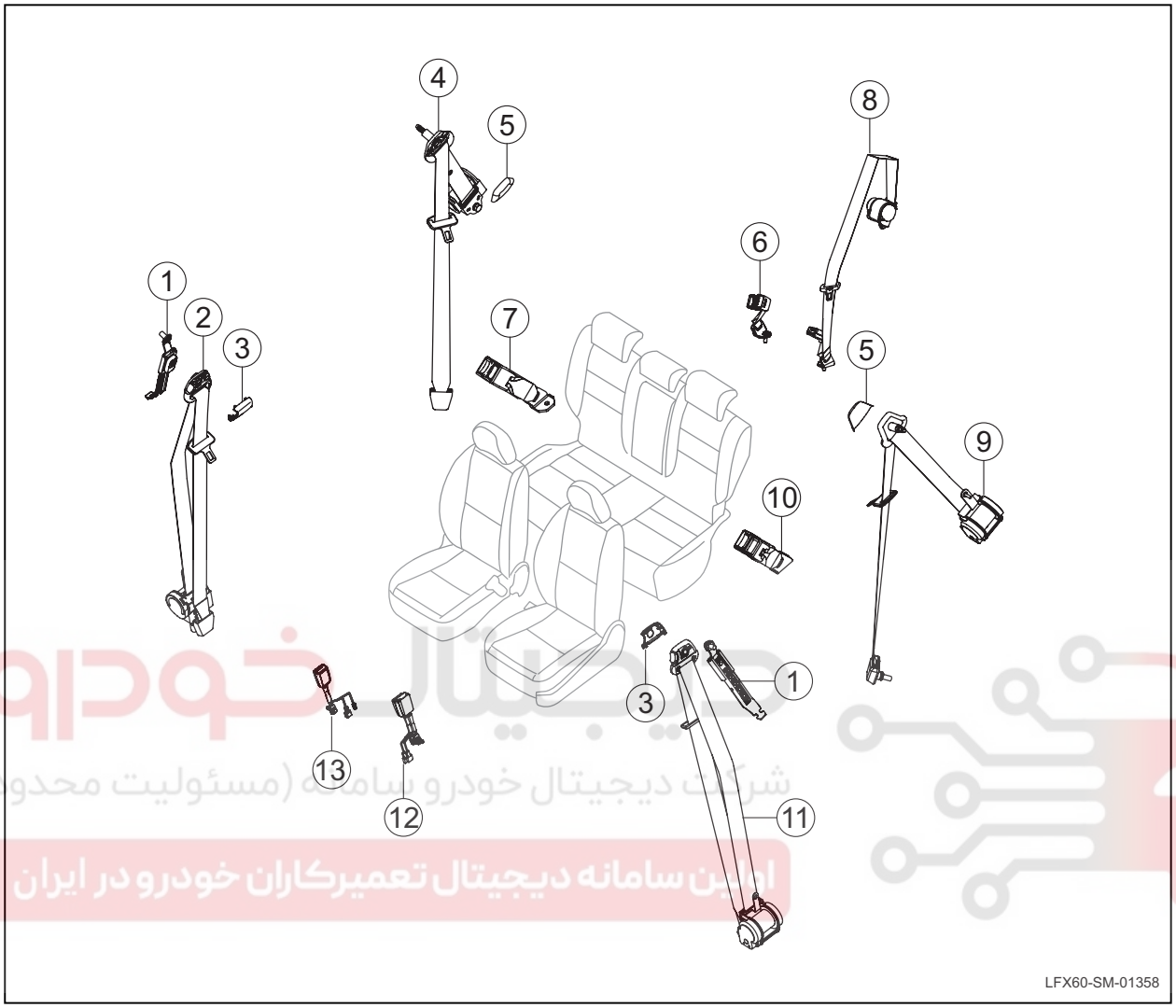
1. Insert the seat belt into the buckle and pull the seat belt firmly to make sure that the buckle does not release.
2. Remove the driver seat belt buckle, observe the seat belt warning light status on dashboard, and confirm the display is normal.

**Front seat belt height adjuster inspection**

1. Adjust the front seat belt height adjuster, seat belt height adjuster should be free to adjust, no jamming phenomenon.
2. Check that the seat belt height adjuster can be reliably adjusted in a position that does not slide.

# Structure and installation location

## Part exploded view

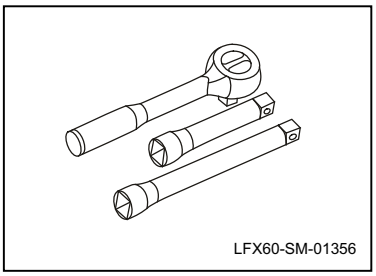
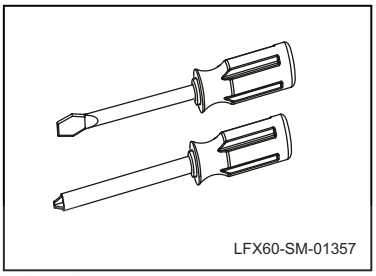
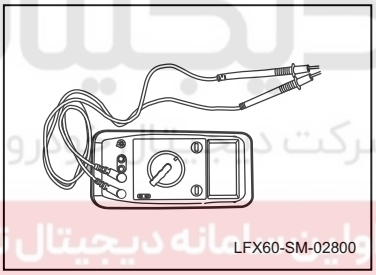



| No. | Part name |
|---|---|
| 1 | Front seat belt height adjustment device |
| 2 | Right front seatbelt retractor |
| 3 | Front seat belt ring cover |
| 4 | Right rear seatbelt retractor |
| 5 | Rear seat belt ring cover |
| 6 | Rear middle lock |
| 7 | Right rear harness |

| No. | Part name |
|---|---|
| 8 | Rear middle retractor |
| 9 | Left rear seatbelt retractor |
| 10 | Left rear seatbelt buckle |
| 11 | Left front seatbelt retractor |
| 12 | Left front seatbelt buckle |
| 13 | Right front seatbelt buckle |
| | |

# Preparation

## General service tool

| No. | Tool name | Tool drawing | Tooling code | Remarks |
|---|---|---|---|---|
| 1 | Fast wrench and hedger |  LFX60-SM-01356 | - | Tighten or remove bolts and nuts |
| 2 | Screwdriver |  LFX60-SM-01357 | - | To remove and install the screw and pry the snap ring etc. |
| 3 | Digital multimeter |  LFX60-SM-02800 | - | Measure the voltage and resistance |

# Precautions

## Precautions

1. Change seatbelt with worn or split webbing and dysfunctional buckle.
2. After collision evolving tension on seatbelt, change the seatbelt, even there is no damage found on it.
3. It is forbidden to insert anything into the buckle. Never modify or remove the seatbelt.
4. Mild detergent should be used to clean dirty seatbelt. Corrosive detergent, dye and dry cleaning agent may impair strength of seatbelt seriously.
5. If the webbing of seatbelt is worn, split or floppy due to chemical or sunshine, it must be changed.
6. If metal joint of seatbelt deformed, distorted or rusted, it must be changed.
7. Performance requirement of the retractor: rewind freely in installed orientation.
8. Performance requirement of the adjuster: easy adjustment, hold webbing of seatbelt tightly and reliable.
9. Performance requirement of the buckle lock: obvious feeling of insertion and release, no self release. The system should not be failure.

# Seatbelt

## Technical specifications

### Torque Specifications

| Name | Torque range | |
|---|---|---|
| | Metric (Nm) | British (lb-ft) |
| Fixing bolt of the front seat belt height adjuster | 45 | 33 |
| Fixing bolts for front seat belt retractor / rear seat belt | 45 | 33 |
| Fixing bolts for back seat belt / rear seat belt retractor | 45 | 33 |
| Rear middle seat belt retractor | 45 | 33 |

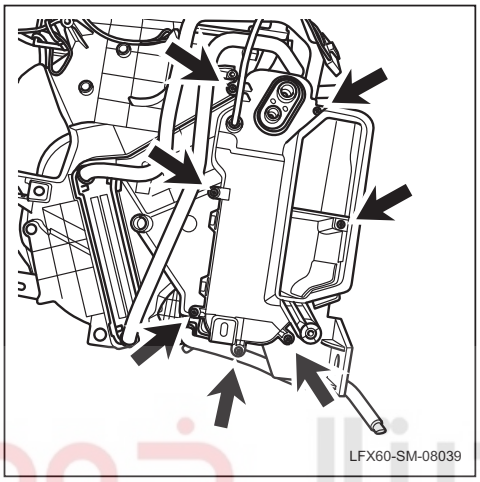
# 09 - safety protection device

## Replacement of the evaporator

### Removal

1. **Remove the evaporator.**

(a). Disconnect the battery negative connector.
(b). Recover the refrigerant, **refer to the A/C refrigerant recovery and filling procedures.**
(c). Recover the engine coolant, **refer to engine coolant draining and filling procedures.**
(d). Remove the HVAC assembly, **refer to the replacement of HVAC assembly.**
(e). Remove the expansion valve, **refer to the replacement of expansion valve.**


LFX60-SM-08039

(f). Remove the connecting bolts of the blower housing and the evaporator housing and separate them.
(g). Remove the fixing screw of evaporator upper cover.
(h). Take off the evaporator.

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### Installation

1. **Install the evaporator.**

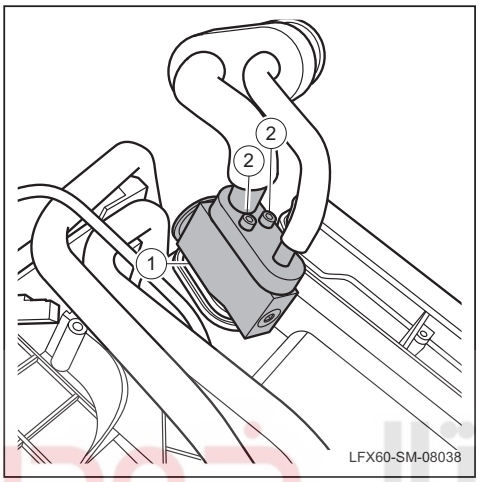
(a). The installation sequence is the reverse of the disassembly order.
(b). Install the expansion valve, **refer to the replacement of expansion valve.**
(c). Install HVAC assembly, **refer to the replacement of HVAC assembly.**
(d). Fill the engine coolant,**refer to the engine coolant draining and filling procedures.**
(e). Refill refrigerant, **refer to the recycling and filling procedures for air conditioner refrigerants.**
(f). Connect the negative connector of the battery.

## Replacement of expansion valve

### Removal

**1. Remove the expansion valve.**

(a). Disconnect the battery negative connector.
(b). Recover the refrigerant. **Refer to the A/C refrigerant recovery and filling procedures.**
(c). Recycling of engine coolant, **refer to the recycling and filling procedures for engine coolant.**
(d). Remove the HVAC assembly, **refer to the replacement of HVAC assembly.**

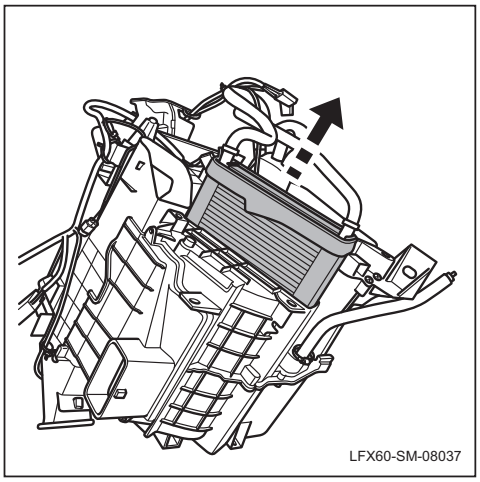



(e). Remove the fixing bolt 2 of expansion valve.
(f). Take off the expansion valve 1.

### Installation

**1. Install the expansion valve.**

(a). The installation sequence is the reverse of the disassembly order.
(b). Install the HVAC assembly, **refer to the replacement of the HVAC assembly.**
(c). Filling of engine coolant, **refer to the recycling and filling procedures for engine coolant.**
(d). Refill refrigerant, **refer to the recycling and filling procedures for air conditioner refrigerants**
(e). Connect the battery negative terminal




(i). Take off the heating water tank.

**Installation**

**1. Install the heating water tank.**

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

(b). Install the HVAC assembly, **refer to the replacement of HVAC.**

(c). Fill the refrigerant, **refer to the A/C refrigerant recovery and filling procedures.**

(d). Fill the engine coolant, **refer to the engine coolant draining and filling procedures.**

(e). Connect the battery negative terminal

**Replacement of heating water tank**

**Removal**

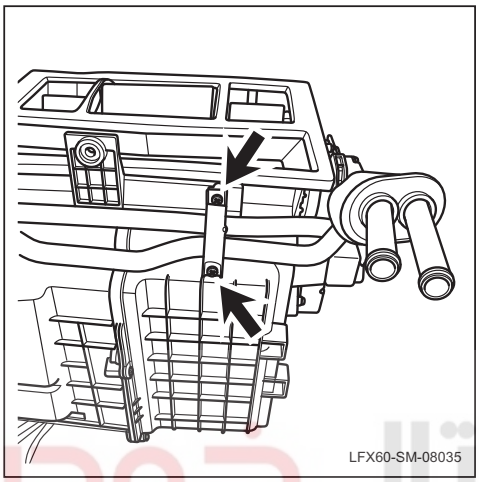
**1. Remove the heating water tank**

(a). Recover the refrigerant. **Refer to the A/C refrigerant recovery and filling procedures.**

(b). Recycling of engine coolant, **refer to the recycling and filling procedures for engine coolant.**

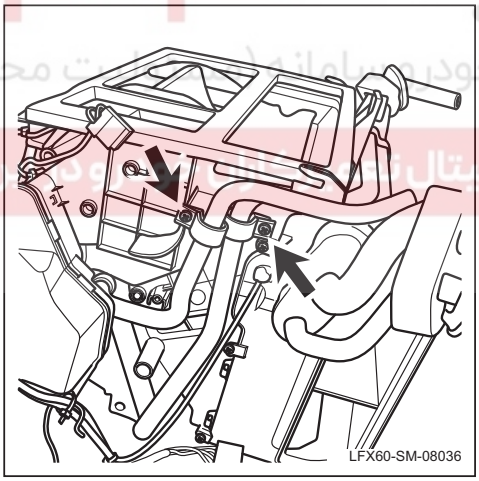
(c). Disconnect the battery negative terminal.

(d). Remove the HVAC assembly. **Refer to the replacement of HVAC assembly.**




(e). Remove the blower tank and evaporator tank connecting bolt and separate them.

(f). Remove the fixing screw of heating water tank.




(g). Remove the fixing screw of heating water tank.

(h). Disconnect the harness snap and the fixing screw of HVAC assembly.

**Replacement of new return throttle motor**

**Removal**

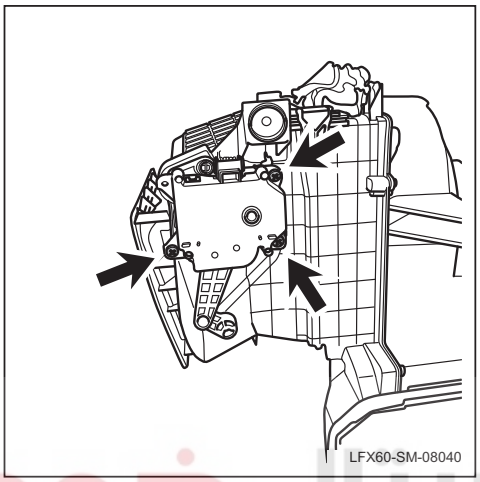
**1. Remove the new return throttle motor.**

(a). Disconnect the battery negative cable.

(b). Recover the refrigerant. **Refer to the A/C refrigerant recovery and filling procedures.**

(c). Recover the engine coolant. **Refer to engine coolant draining and filling procedures.**

(d). Remove the HVAC assembly. **Refer to the replacement of HVAC assembly.**




(e). Remove the blower tank and evaporator tank connecting bolt and separate them.

(f). Disconnect the harness connector 1 of new return throttle motor.

(g). Remove the fixing screw of the new return throttle motor.

(h). Take off the new return throttle motor.

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**Installation**

**1. Install the new return throttle motor.**

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

(b). Install the HVAC assembly, **refer to the replacement of HVAC.**

(c). Fill the refrigerant, **refer to the A/C refrigerant recovery and filling procedures.**

(d). Fill the engine coolant, **refer to the engine coolant draining and filling procedures.**

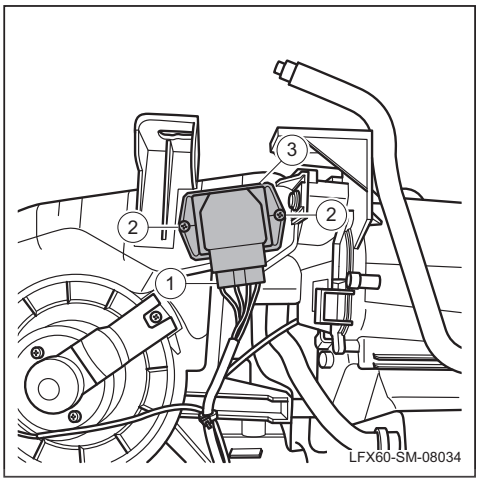
(e). Connect the battery negative terminal

## Replacement of blower speed control module

### Removal

**1. Remove the blower speed regulation module.**

(a). Disconnect the battery negative cable.




(b). Disconnect the harness plug 1 of blower speed control module.

(c). Remove the fixed screw 2 of the blower speed control module.

(d). Take off the blower speed control module

### Installation

**1. Install the blower speed control module**

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

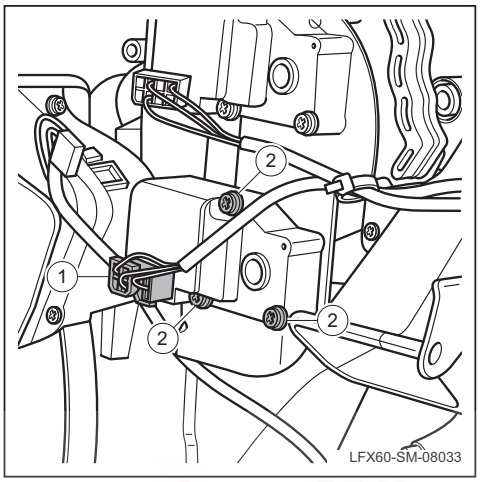
**Replacement of cool and heat throttle motor**

**Removal**

**1. Remove the cool and heat throttle motor.**

(a). Disconnect the battery negative connector.

(b). Remove the dashboard lower left panel assembly. **Refer to the replacement of dashboard assembly.**




(c). Disconnect the harness connector 1 of cool and heat throttle motor.

(d). Remove the fixing screw 2 of cool and heat throttle motor.

(e). Take off the cool and heat throttle motor.

**Installation**

**1. Install the cool and heat throttle motor.**

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

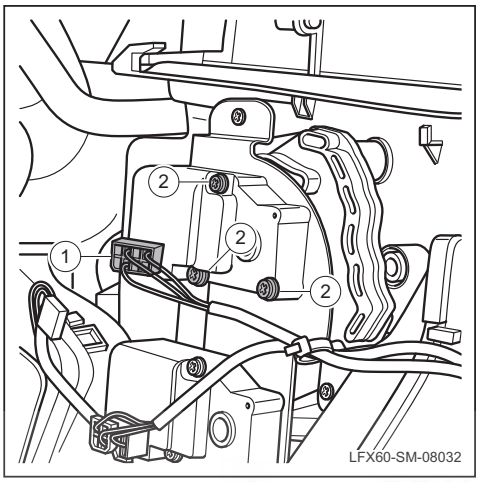
**Replacement of mode throttle motor**

**Removal**

**1. Remove the mode throttle motor.**

(a). Disconnect the battery negative connector.

(b). Remove the dashboard lower left panel assembly. Refer to the replacement of dashboard assembly.




(c). Disconnect the harness connector 1 of mode throttle motor.

(d). Remove the fixing screw 2 of mode throttle motor.

(e). Take off the mode throttle motor.

**Installation**

**1. Install the mode throttle motor.**

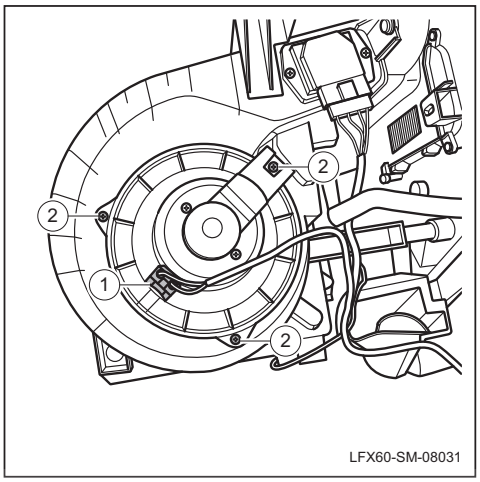
(a). The installation sequence is the reverse of the disassembly order.

## Replacement of blower motor

### Removal

**1. Remove the blower motor.**

(a). Disconnect the battery negative cable.




(b). Disconnect the harness connector 1 of blower motor.

(c). Remove the fixed screw 2 of the blower motor.

(d). Take off the blower motor.

### Installation

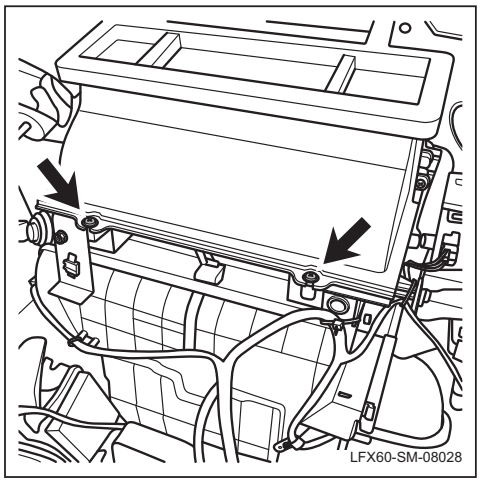
**1. Install the blower motor.**

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

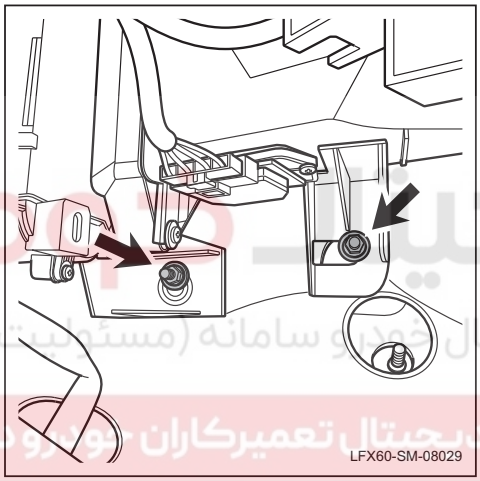
**Installation**

1. **Install the evaporator assembly.**

(a). The installation sequence is the reverse of the disassembly order.
(b). Fill the A/C refrigerant. **Refer to the A/C refrigerant recovery and filling procedures.**
(c). Check for refrigeration system leak.

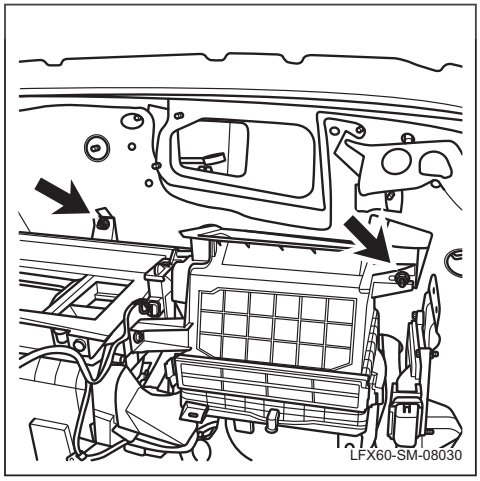



(s). Remove the fixing screws of the upper outlet of HVAC assembly and take it off.

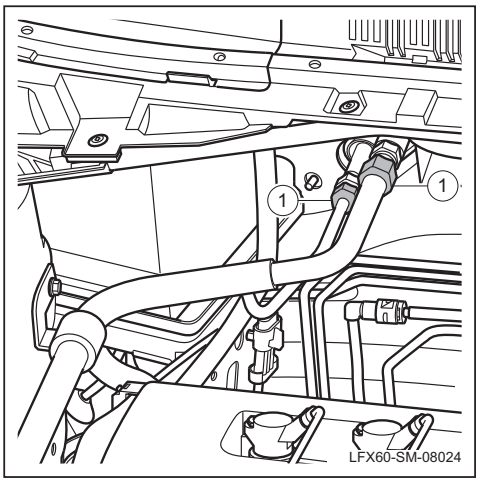



(t). Remove the lower fixing nut of HVAC assembly.

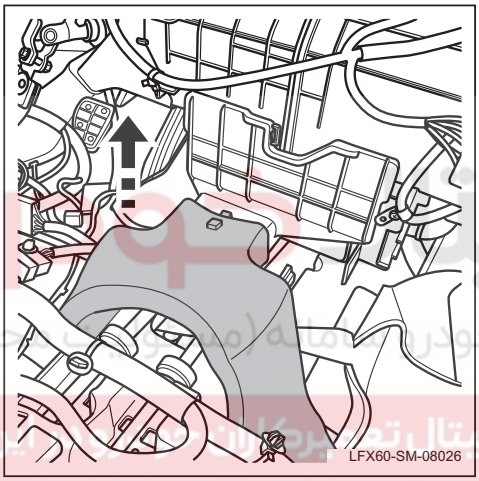




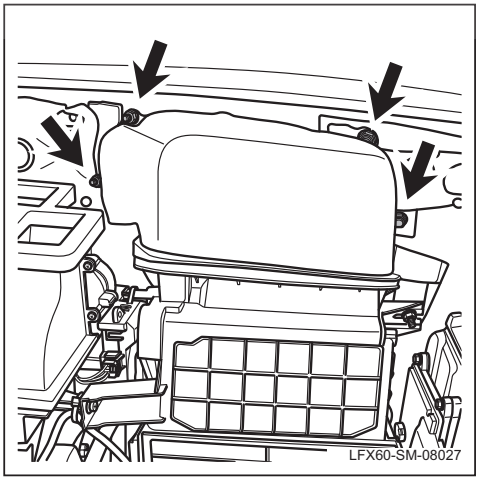

(u). Remove the fixing nut of HVAC assembly.
(v). Take off the HVAC assembly.



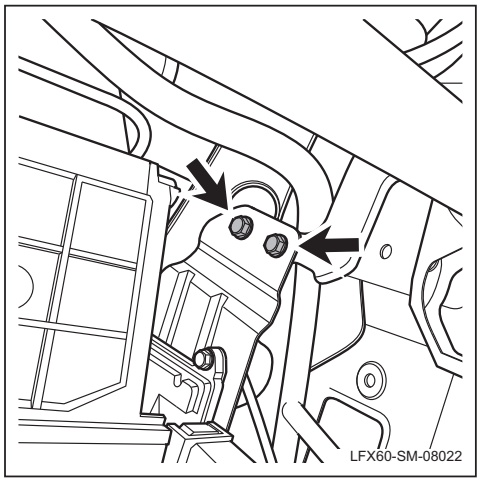

(o). Remove the lock nut 1 of air conditioner piping.
(p). Remove the air conditioner piping.



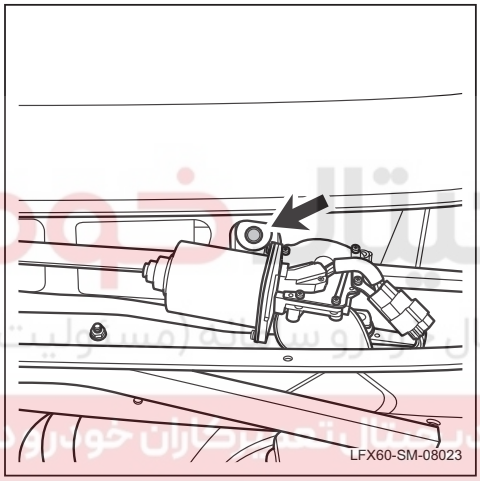

(q). Remove the floor duct.




(r). Remove the fixing nut of HVAC assembly.

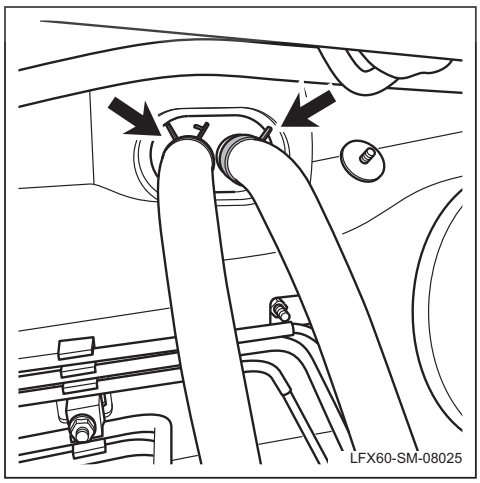



(i). Remove the fixing bolts of the ECU module bracket and the pipe beam.




(j). Remove the front fixing bolts of dashboard pipe column beam.
(k). Disconnect the harness clip and harness plug of the dashboard pipe column beam.
(l). Take off the dashboard pipe column beam.





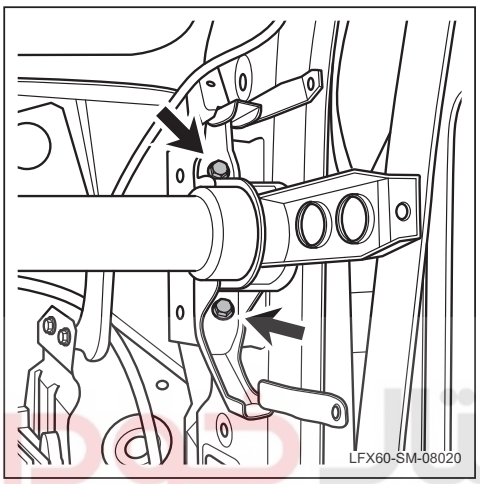

(m). Remove the clamp of heating water pipe.
(n). Remove the heating water pipes.

## Replacement of HVAC assembly

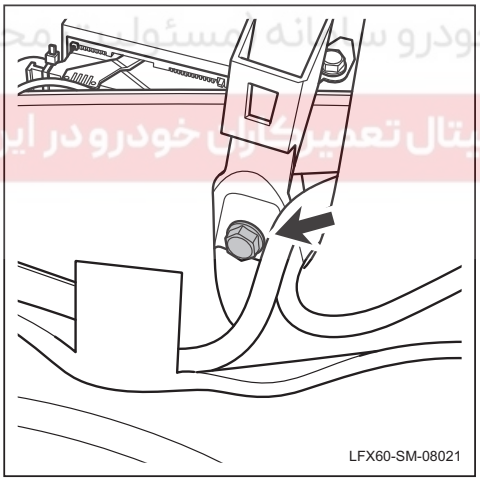
### Removal

**1. Remove the HVAC assembly.**

(a). Recover the refrigerant. **Refer to the A/C refrigerant recovery and filling procedures.**
(b). Recycling of engine coolant, **refer to the recycling and filling procedures for coolant.**
(c). Disconnect the battery negative terminal.
(d). Remove the console, **refer to the replacement of the console assembly.**
(e). Remove the dashboard, **refer to the replacement of the dashboard assembly.**
(f). Remove the front cover, **refer to the replacement of the front ventilation cover assembly.**




(g). Remove the left and right fixing bolts of dashboard pipe column beam.




(h). Remove the lower fixing bolts of dashboard pipe column beam.

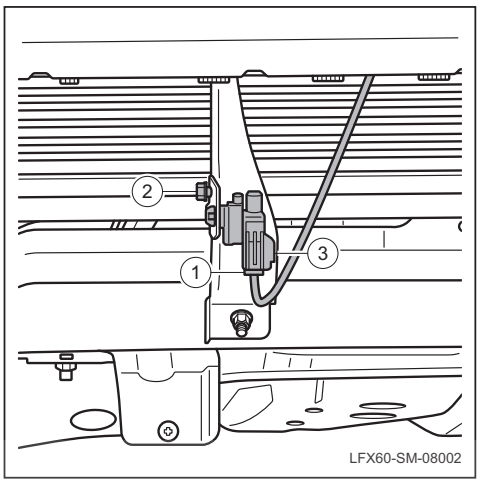
## Replacement of ambient temperature sensor

### Removal

**1. Remove the ambient temperature sensor.**

(a). Disconnect the battery negative connector.

(b). Remove the front bumper. Refer to the replacement of front bumper assembly.




(c). Disconnect the harness plug 1 of the ambient temperature sensor.

(d). Remove the fixing bolts 2 of bracket for ambient temperature sensor.

(e). Take off the ambient temperature sensor 3.



### Installation

**1. Install the ambient temperature sensor.**

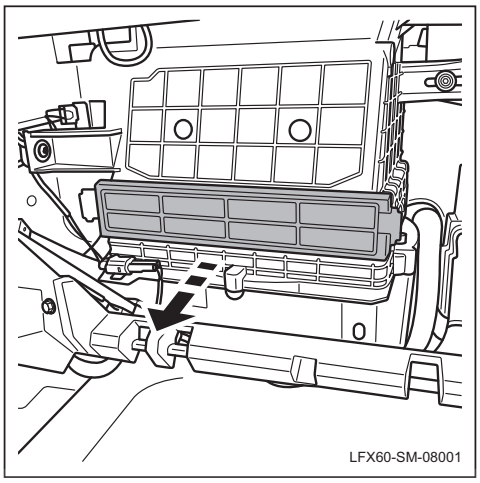
(a). The installation order is the reverse of the disassembly order.

**Replacement of air conditioner filter**

**Removal**

**1. Remove the air conditioner filter**

(a). Remove the glovebox, **refer to the replacement of the dashboard assembly.**

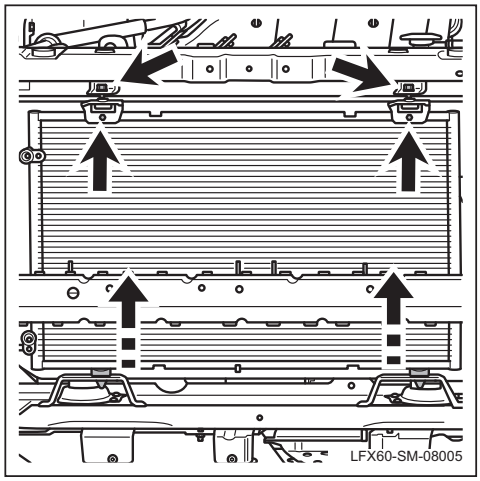



(b). Remove the housing of air conditioning filter and take off the air conditioning filter.

**Installation**

**1. Install the air conditioner filter**

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




(h). Remove the fixing bolts of the condenser bracket.
(i). Take off the condenser assembly upwards.

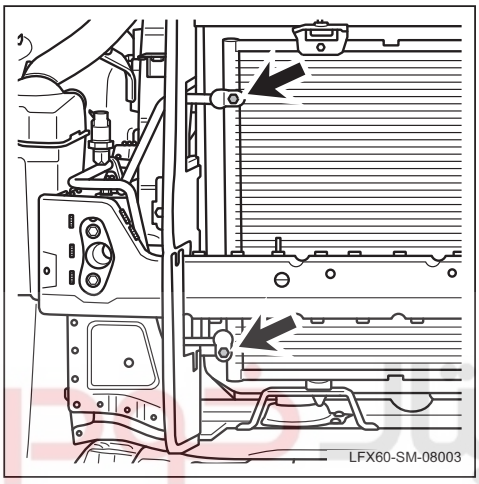
**Installation**

**1. The installation sequence is reverse to the removal sequence.**
(a). The installation sequence is the reverse of the disassembly order.
(b). Fill the A/C refrigerant. **Refer to the A/C refrigerant recovery and filling procedures.**
(c). Check for refrigeration system leak.

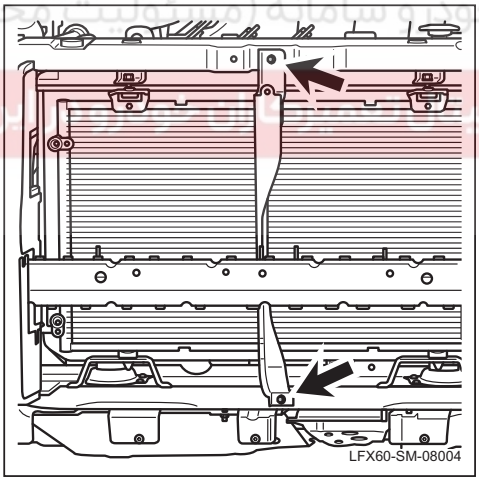
**Replacement of condenser**

**Removal**

1. Remove the condenser.
(a). Disconnect the battery negative cable.
(b). Remove the front bumper. **Refer to the replacement of front bumper assembly.**
(c). Remove the hood lock, **refer to the replacemen of hood lock.**
(d). Remove the ambient temperature sensor, **refer to the replacement of ambient temperature sensor.**
(e). Recycle the refrigerant, **refer to the recycling and filling procedures for air conditioner refrigerants**




(f). Remove the fixing bolts of the condenser piping.



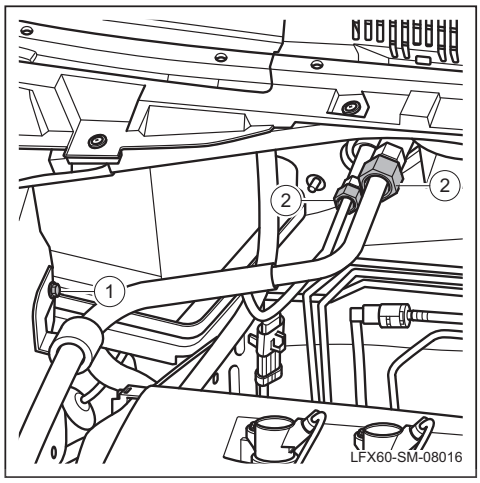

(g). Remove the lock nut of the front braket.

## Replacement of the front piping of evaporator

### Removal

**1. Remove the front piping of evaporator**

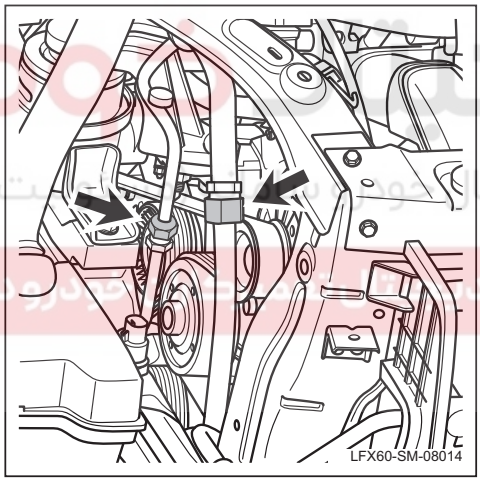
(a). Recover the refrigerant. Refer to the A/C refrigerant recovery and filling procedures.




(b). Remove the fixing bolts 1 of bracket for the air conditioner piping.

(c). Remove the lock nut 2 of the front piping of evaporator






(d). Remove the lock nut of air conditioner piping.

(e). Take off the front piping of evaporator.

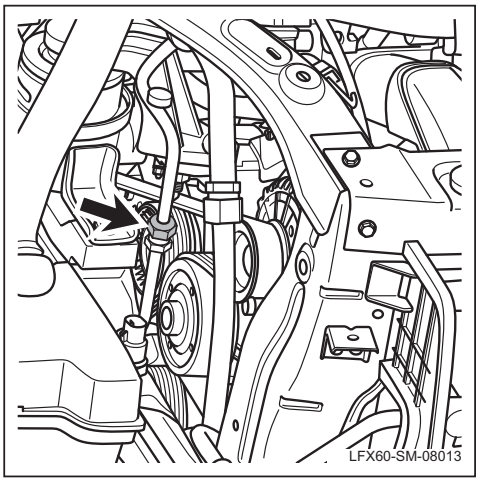
### Installation

**1. Install the condenser to evaporator front section line.**

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

(b). Fill the A/C refrigerant. **Refer to the A/C refrigerant recovery and filling procedures.**

(c). Check for refrigeration system leak.




(f). Remove the lock nut of air conditioner piping.
(g). Take off the front piping from condenser to evaporator

**Installation**

**1. Install the condenser to evaporator front section line.**
(a). The installation sequence is the reverse of the disassembly order.
(b). Fill the A/C refrigerant. Refer to the A/C refrigerant recovery and filling procedures.
(c). Check for refrigeration system leak.

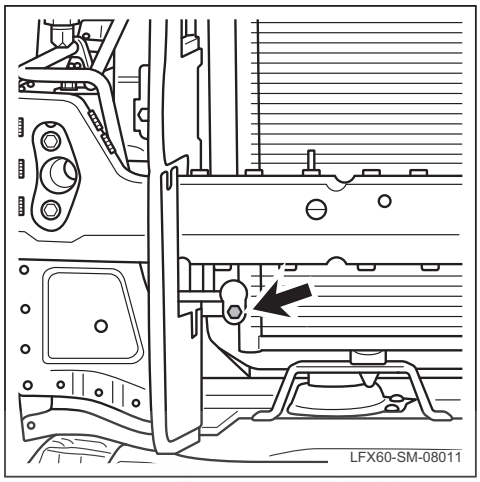
**Replacement of the front piping from condenser to evaporator**

**Removal**

**1. Remove the front piping from condenser to evaporator**

(a). Recover the refrigerant. Refer to the A/C refrigerant recovery and filling procedures.

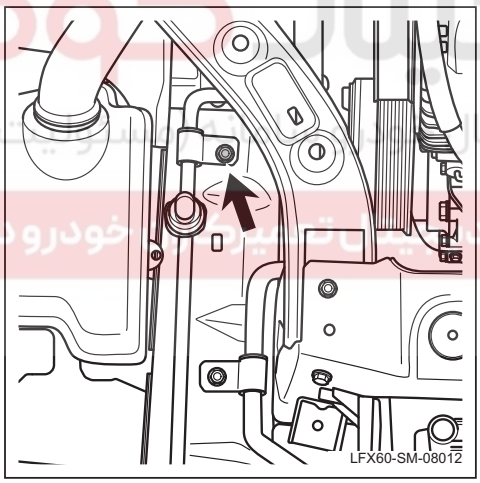
(b). Remove the front bumper and grid assembly. Refer to the replacement of front bumper assembly.



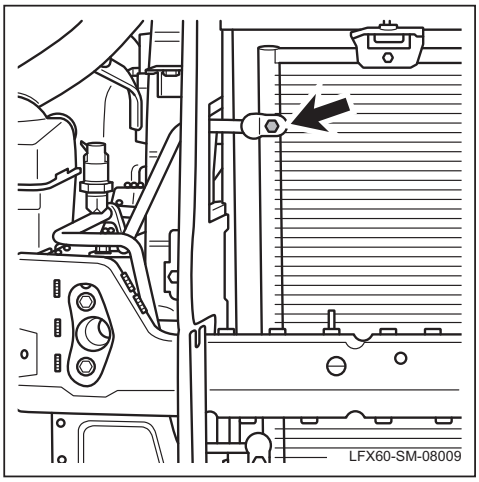

(c). Remove the pipe fixing bolts on the condenser.

(d). Disconnect the harness plug of air conditioner pressure switch.






(e). Remove the fixing bolts of bracket for the air conditioner piping.




(e). Remove the pipe fixing bolts on the condenser.
(f). Take off the piping from compressor to condenser.

**Installation**

**1. Install the piping from compressor to condenser.**
(a). The installation sequence is the reverse of the disassembly order.
(b). Fill the A/C refrigerant. **Refer to the A/C refrigerant recovery and filling procedures.**
(c). Check for refrigeration system leak.

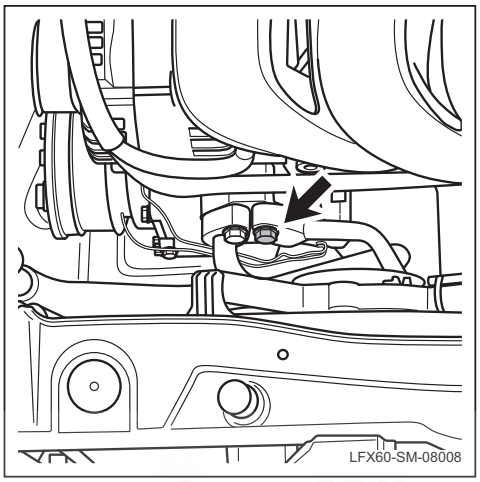
**Replacement of the piping from compressor to condenser**

**Removal**

**1. Remove the piping from compressor to condenser.**

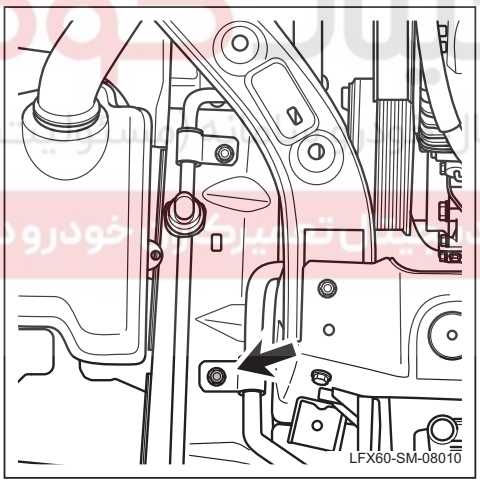
(a). Recover the refrigerant. **Refer to the A/C refrigerant recovery and filling procedures.**

(b). Remove the front bumper and grid assembly. **Refer to the replacement of front bumper assembly.**

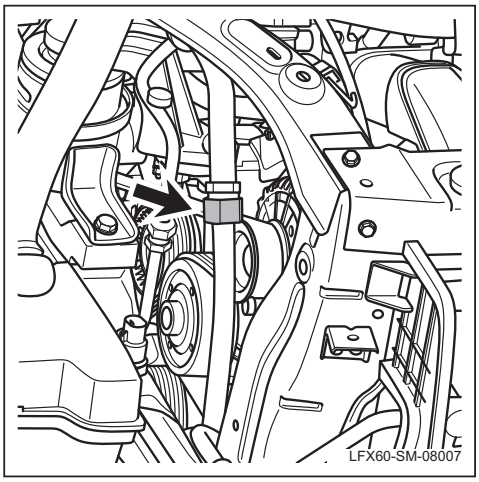



(c). Remove the pipe fixing bolts on the compressor.






(d). Remove the fixing bolts of bracket for the air conditioner piping.




(d). Remove the lock nut of the compressor piping.
(e). Take off the front piping from compressor to evaporator.

**Installation**

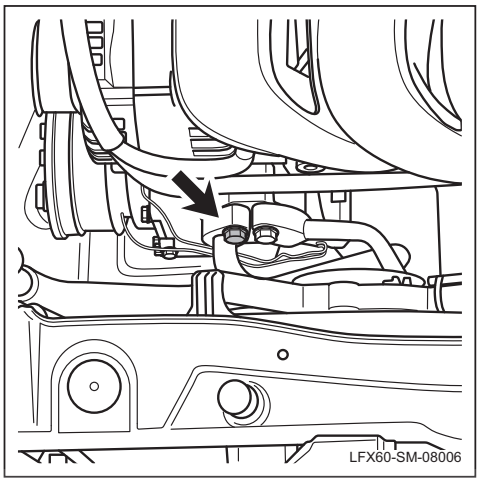
**1. Install the front piping from compressor to evaporator.**
(a). The installation sequence is the reverse of the disassembly order.
(b). Fill the A/C refrigerant. **Refer to the A/C refrigerant recovery and filling procedures.**
(c). Check for refrigeration system leak.

**Replacement of the front piping from compressor to evaporator**

**Removal**

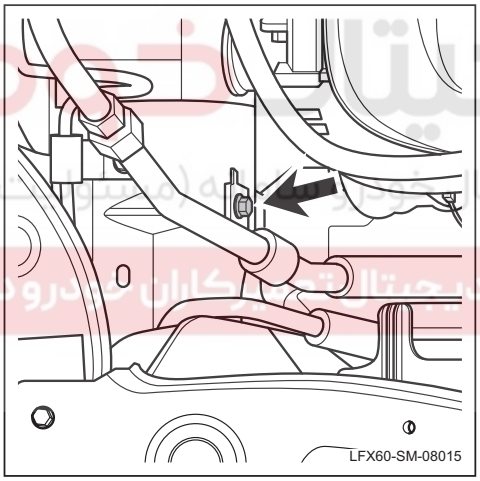
**1. Remove the compressor to evaporator front section line.**

(a). Recover the refrigerant. **Refer to the A/C refrigerant recovery and filling procedures.**

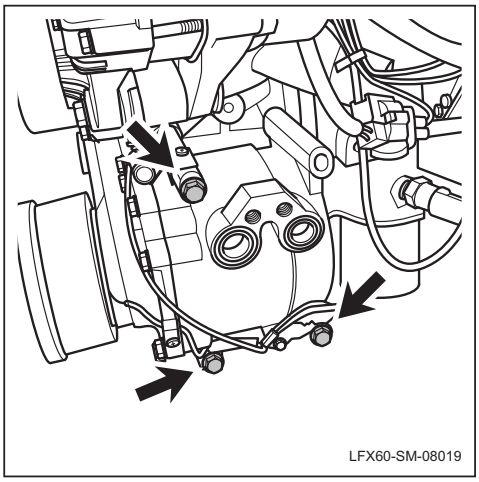



(b). Remove the pipe fixing bolts on the compressor.






(c). Remove the fixing bolts of bracket for the air conditioner piping.




(h). Remove the fixing bolts of the compressor.
(i). Take off the compressor.

**Installation**

**1. Install the compressor.**
(a). The installation sequence is the reverse of the disassembly order.
(b). Fill the A/C refrigerant. **Refer to the A/C refrigerant recovery and filling procedures.**
(c). Check for refrigeration system leak.

## Replacement of compressor

### Removal

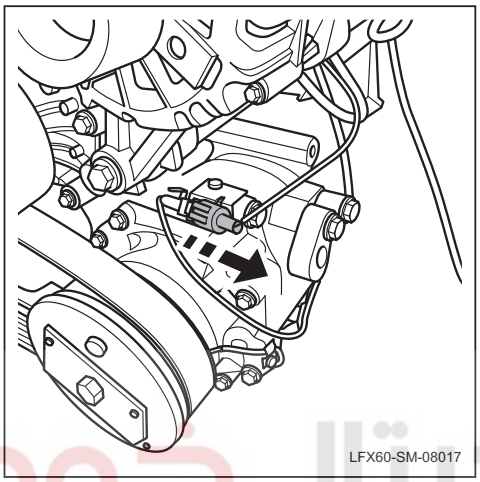
1. **Remove the compressor to evaporator front section line.**

(a). Recycle refrigerant, **refer to the recycling and filling procedures for air conditioner refrigerants**

(b). Disconnect the battery negative terminal .

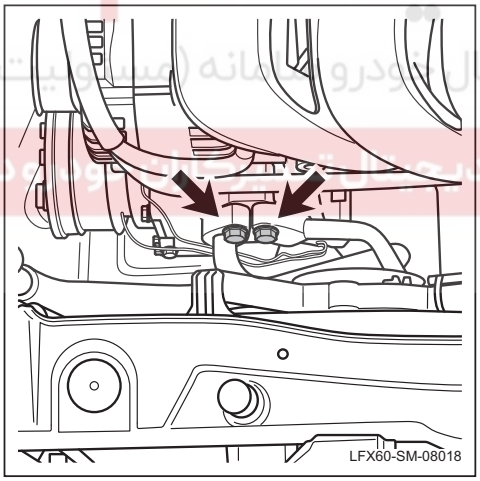
(c). Remove the compressor belt, **refer to the replacement of the compressor belt.**

(d). Lift the vehicle, **refer to:Lifting and support of the vehicle.**




(e). Remove the bottom guard of the engine.

(f). Disconnect the harness plug of the compressor.




(g). Remove the fixing bolts of the air conditioner compressor piping.

**Replacement of the air conditioner control panel**

**Removal**

1. **Remove the air conditioner control panel.**

(a). Remove the air conditioner control panel, **refer to the replacement of the dashboard assembly.**

**Installation**

1. **Install the air conditioner control panel.**

(a). Install the air conditioner control panel, **refer to the replacement of the dashboard assembly.**

a. Use the lubricants used exclusively for the R-134a system.
b. Refer to the manufacturer's instruction manual for details on how to use the refrigerant recycling and filling machine and add the specified lubricating oil to the vehicle air conditioning system.
c. When the filled oil reaches the required level, close the valve.

**Filling**

1. Filling of the air conditioner refrigerants.
a. Open the low pressure side valve on the control panel.
b. Open the high pressure side valve on the control panel.
c. Refer to the manufacturer's instruction manual for details on how to use the refrigerant recycling and filling machine.
d. Fill the air conditioner with the specified amount of refrigerant, make sure that the unit of measurement is correct (ie kilograms, kilograms or pounds).
e. Start filling.
2. After the refrigerant filling is complete, do the following:
a. Close the valves of the high and low pressure side on the control panel of refrigerant recycling and filling machine, both valves should be closed.
b. Start the vehicle air conditioning system.
c. Keep the engine running until the readings of the pressure gauge on the high pressure side and the low pressure side is stable.
d. Compare the readings with the system specifications.
e. Check the outlet temperature of evaporator to ensure that the air conditioning system operates in accordance with system specifications.
f. Turn off the air conditioning system.
g. Disconnect the hoses of the high and low pressure side from the vehicle.
h. Perform the cleaning operation of the air conditioning hose according to the instructions of the refrigerant recycling and filling machine.

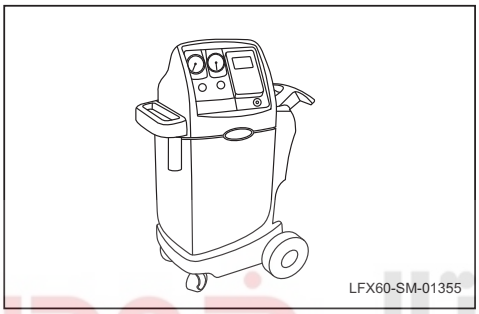
## Removal and installation

### Recycling and filling procedures for air conditioner refrigerants

**Recycle**

1. Recycle of the air conditioner refrigerants.

a. Refrigerant recycling and filling machine can complete the recovery, emptying and refilling procedures of air conditioning system with one connection. During recovery and emptying, the refrigerant is filtered to ensure that the refrigerant filled in the air conditioning system is clean and dry.




**⚠Warning:**

**Refrigerant-related operations should be carried out in a well-ventilated environment without inhalation of refrigerant vapor. Avoid inhalation of vapor or mist of air conditioning refrigerant R-134a (tetrafluoroethane) and lubricating oil. Contact them will irritate the eyes, nose and throat. Works should be performed in a well-ventilated area.When removing R-134a from the air conditioning system, use a certified service facility (R-134a Recycling Equipment) that meets the requirements of SAE (American Society of Automotive Engineers) J 2210.If the system is accidentally discharged, the workspace must be ventilated before continuing maintenance..More information about health and safety is available from the refrigerant and lubricating oil manufacturers.**

b. Connect the hose of high pressure side with quick connector to the high pressure side connector of the vehicle air conditioning system.

c. Open joint valve on the high pressure side.

d. Connect the hose of low pressure side with quick connector to the low pressure side connector of the vehicle air conditioning system.

e. Open joint valve on the low pressure side..

f. Check the the pressure gauge on the high pressure and low pressure side of the control panel on the refrigerant recycling and filling machine to ensure the air conditioning system pressure. If there is no pressure, there is no recyclable refrigerant in the system.

g. Open valves on the high pressure side and low pressure side.

h. Connect the refrigerant recycling and filling machine to appropriate power socket.

i. Turn on the main power switch.

j. Start the recycling process. Refer to the operation instructions supplied by the manufacturer and further learn about the use of refrigerant recovery and filling machine.

k. Check the low pressure side pressure gauge of control panel. If the air conditioning system pressure is kept at zero, the recovery is completed.

l. If the data indication of the low pressure side pressure gauge is not zero, then the system still has refrigerant in it. Recover the remaining refrigerant. Repeat this step until the system pressure remains at zero for 2 minutes.

**Empty the refrigerants.**

a. The refrigerant tank of Refrigerant Recycling and Filling Machine must be filled with sufficient amount of R-134a refrigerant for filling. Check the amount of refrigerant in the tank. If the refrigerant is less than 2 kg, add new refrigerant is to the refrigerant tank. Refer to the instructions of the Refrigerant Recycling and filing Machine for how to add the refrigerant. Check that the hoses of high pressure side and low pressure side are connected to the air conditioning system and open the valves of high pressure side and low pressure side on the control panel of the refrigerant recycling and filling machine.

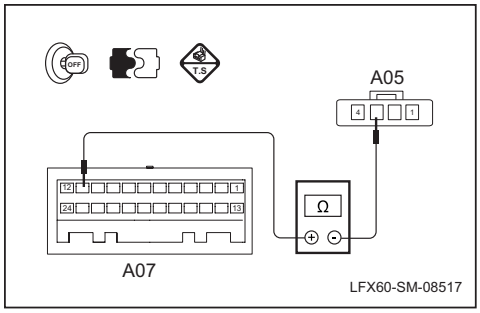
b. Operate according to the operation procedure of the refrigerant recycling and filling machine, start the vacuum pump and start the empty program.

c. Check the system for leaks. Refer to the operation instructions supplied by the manufacturer and further learn about the use of refrigerant recovery and filling machine.

**Lubricating oil filling, refilling of refrigeration system**

**ⓘNote:**

**It is necessary to replenish the lubricating oil discharged from the air conditioning system during the recovery of the refrigerant.**

| Test condition | Details/results/measures |
|---|---|
| 11. Check the feedback signal circuit of the blower speed control resistor. | |
|  | A. Operate the ignition switch to turn the power to OFF state.<br>B. Disconnect the battery negative connector.<br>C. Disconnect the blower speed regulation module harness plug A05.<br>D. Disconnect the A/C control panel harness plug A07.<br>E. Measure the resistance between the No. 3 terminal of the harness plug A05 of blower speed control module and the No. 11 terminal of the air conditioner control panel A07 with a multimeter.<br>**Standard value: Less than 5Ω**<br>Is the resistance normal?<br>**→Yes**<br>To step 12.<br>**→No**<br>Repair the blower speed regulation resistance control signal line fault and replace the harness if necessary. |
| 12. Check the blower speed control resistor. | |
| | A. Replace the blower speed control resistor.<br>**Refer to: Replacement of blower speed control resistor**<br>Is the troubleshooting successful?<br>**→Yes**<br>Replace the blower speed regulation resistance.<br>**→ No**<br>To step 13. |
| 13. Check the A/C control panel. | |
| | A. Replace the A/C control panel.<br>**Refer to: Replacement of A/C control panel**<br>Confirm that the fault has been ruled out. |

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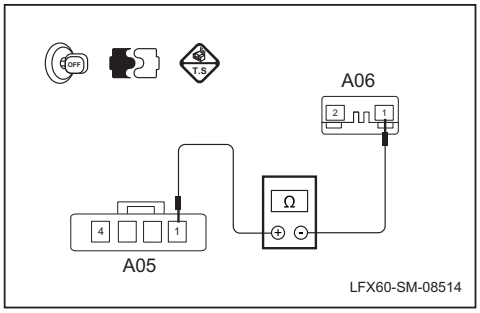
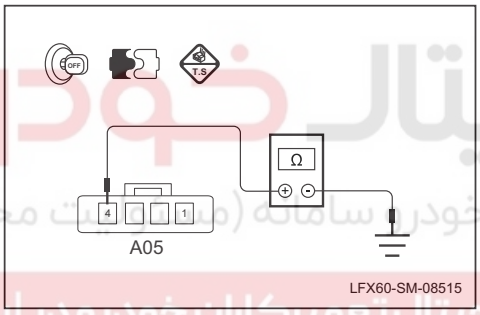
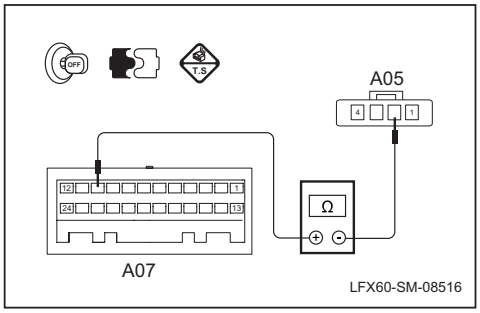
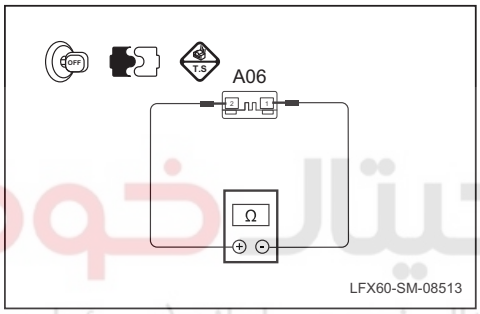
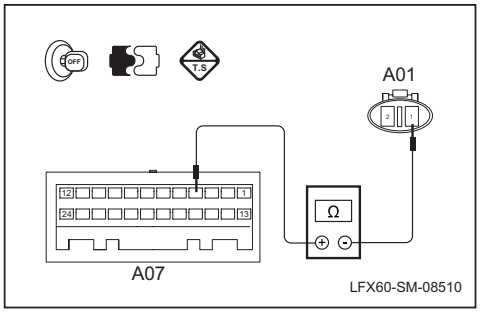
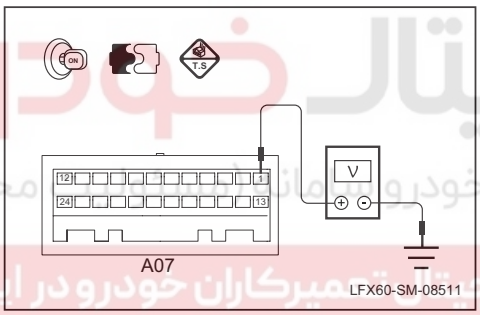
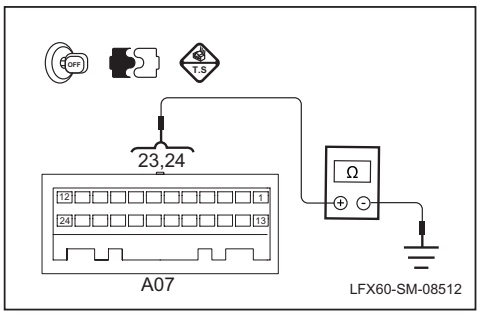
| Test condition | Details/results/measures |
|---|---|
| 8. Check the blower grounding circuit. | |
|  | A. Operate the ignition switch to turn the power to OFF state.<br>B. Disconnect the battery negative connector.<br>C. Disconnect the blower harness plug A06.<br>D. Disconnect the harness plug A05 of blower speed control module.<br>E. Measure the resistance between the No. 1 terminal of the harness plug A06 of blower and No. 1 terminal of the harness plug A05 of the blower speed control module with a multimeter.<br>**Standard value: Less than 5Ω**<br>Is the resistance normal?<br>**→Yes**<br>To step 9.<br>**→No**<br>Check the blower input voltage circuit for failure and replace the wiring harness if necessary. |
| 9. Check the grounding circuit of the blower speed control resistor. | |
|  | A. Operate the ignition switch to turn the power to OFF state.<br>B. Disconnect the battery negative connector.<br>C. Disconnect the blower speed regulation module harness plug A05.<br>D. Measure the resistance between No. 4 terminal of the harness plug A05 of the blower speed control module and the reliable grounding with a multimeter.<br>**Standard value: Less than 5Ω**<br>Is the resistance normal?<br>**→Yes**<br>To step 10.<br>**→No**<br>Check the grounding circuit of the blower speed control resistor for failure and replace the wiring harness if necessary. |
| 10. Check the control signal circuit of the blower speed control resistor. | |
|  | A. Operate the ignition switch to turn the power to OFF state.<br>B. Disconnect the battery negative connector.<br>C. Disconnect the blower speed regulation module harness plug A05.<br>D. Disconnect the A/C control panel harness plug A07.<br>E. Measure the resistance between the No. 2 terminal of the harness plug A05 of blower speed control module and the No. 10 terminal of the air conditioner control panel A07 with a multimeter.<br>**Standard value: Less than 5Ω**<br>Is the resistance normal?<br>**→Yes**<br>To step 11.<br>**→No**<br>Repair the blower speed regulation resistance control signal line fault and replace the harness if necessary. |

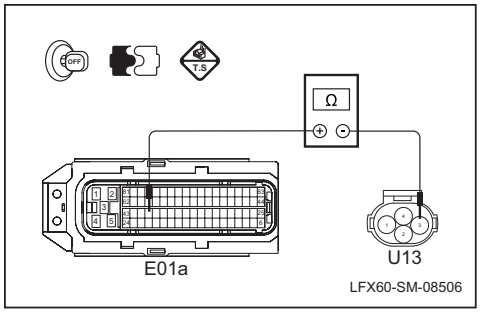
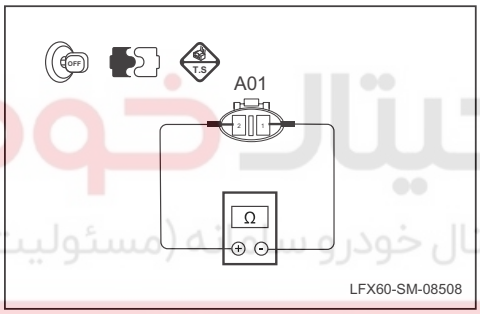
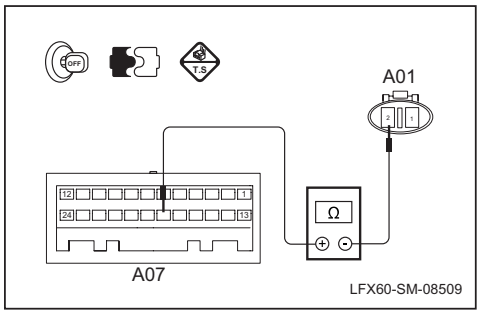
| Test condition | Details/results/measures |
|---|---|
| 5. Check the blower relay control circuit. | |
| | A. Operate the ignition switch to turn the power to OFF state.<br>B. Remove the K18 blower relay.<br>C. Measure the resistance between No. 2 terminal of the K18 blower relay of the dashboard electrical box and the reliable ground point with a multimeter.<br>**Standard value: Less than 5Ω**<br>Is the resistance normal?<br>→ **Yes**<br>To step 6.<br>→ **No**<br>Check the blower relay control circuit for failure and replace the wiring harness if necessary. |
| 6. Check the blower. | |
|  | A. Operate the ignition switch to turn the power to OFF state.<br>B. Disconnect the battery negative connector.<br>C. Disconnect the blower harness plug A06.<br>D. When measured with a multimeter, the No. 1 and No. 2 terminals of the blower should be conducting.<br>Is it OK after checking?<br>→**Yes**<br>To step 7.<br>→**No**<br>Replace the blower.<br>**Refer to: Replacement of blower** |
| 7. Check the blower input voltage circuit. | |
| | A. Operate the ignition switch to turn the power to OFF state.<br>B. Disconnect the battery negative connector.<br>C. Remove the K18 blower relay.<br>D. Disconnect the harness plug A06 of the blower.<br>E. Measure the resistance between the No. 5 terminal of the K18 blower relay of the dashboard electrical box and No. 2 of the harness plug A06 of the blower with a multimeter.<br>**Standard value: Less than 5Ω**<br>Is the resistance normal?<br>→**Yes**<br>To step 8.<br>→**No**<br>Check the blower input voltage circuit for failure, and replace the dashboard electrical box as necessary. |

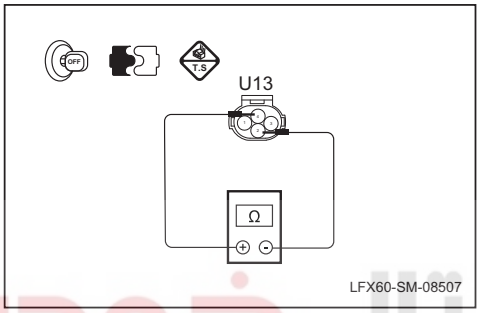
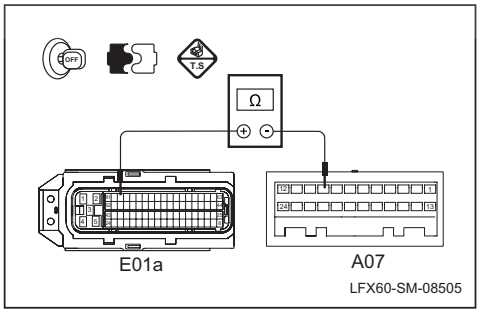
**Blower out of operation diagnosis flow**

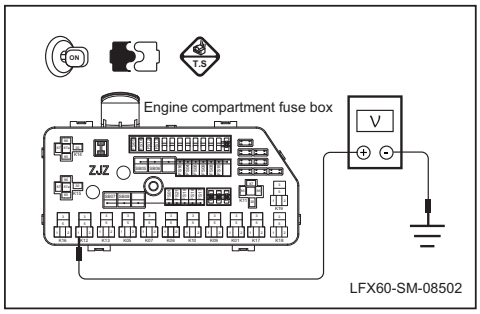
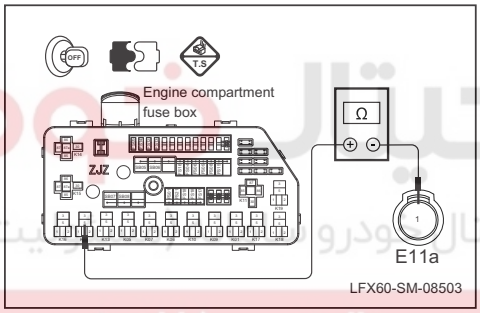
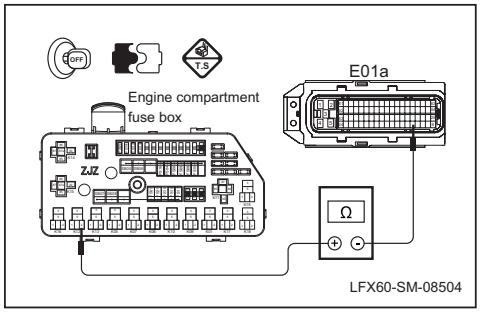
| Test condition | Details/results/measures |
|---|---|
| 1. General inspection. | |
| | A. Check the blower harness connector for aging, shedding, damage and other abnormalities.<br>Is it OK after checking?<br>→**Yes**<br>To step 2.<br>→**No**<br>Repair the fault position. |
| 2. Check the K18 blower fuses. | |
| | A. Check the blower fuse SB09.<br>**Fuse rated capacity: 30 A**<br>Is it OK after checking?<br>→**Yes**<br>To step 3.<br>→**No**<br>Replace the blower fuses. |
| 3. Check the blower relay. | |
| | A. Operate the ignition switch to turn the power to OFF state.<br>B. Replace the K18 blower relay with a new one.<br>C. Operate the ignition switch to turn the power to ON state.<br>D. Turn on the blower and check if the blower is operating properly<br>Is the blower normal?<br>→**Yes**<br>Replace the K18 blower relay.<br>→**No**<br>To step 4. |
| 4. Check the blower relay power supply circuit. | |
| | A. Operate the ignition switch to turn the power to OFF state.<br>B. Remove the K18 blower relay.<br>C. Operate the ignition switch to turn the power to ON state.<br>D. Measure the voltage between No. 1 and 3 terminals of the K18 blower relay of the dashboard electrical box and the reliable ground point with a multimeter.<br>**Standard value: 11 ~ 14 V**<br>Is the voltage normal?<br>→**Yes**<br>To step 5.<br>→**No**<br>Check the blower relay power circuit for failure, replace the dashboard electrical box as necessary. |

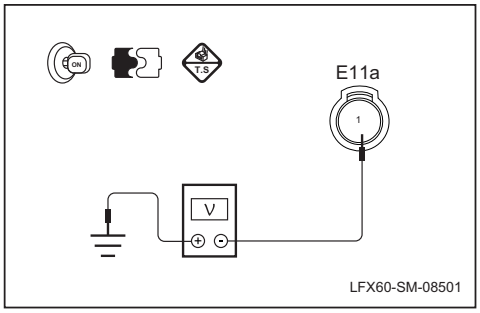
| Test condition | Details/results/measures |
|---|---|
| 19. Check the A/C control panel. | |
| | A. Replace the A/C control panel.<br>**Refer to: Replacement of A/C control panel**<br>Is the troubleshooting successful?<br>→**Yes**<br>Replace the air conditioner control panel.<br>→**No**<br>To step 20. |
| 20. Check ECM. | |
| | A. Replace ECM.<br>**Refer to: Replacement of ECM**<br>Confirm that the fault has been ruled out. |

| Test condition | Details/results/measures |
|---|---|
| 16. Check the evaporator temperature sensor signal grounding circuit. | |
|  | A. Operate the ignition switch to turn the power to OFF state.<br>B. Disconnect the battery negative connector.<br>C. Disconnect the evaporator temperature harness plug A01.<br>D. Disconnect the A/C control panel harness plug A07.<br>E. Measure the resistance between the evaporator temperature harness plug A01 terminal 1 and A/C control panel harness plug A07 terminal 4 with the multimeter.<br>**Standard value: Less than 5Ω**<br>Are the resistance and the voltage normal?<br>→**Yes**<br>To step 17.<br>→**No**<br>Check the evaporator temperature sensor signal grounding circuit for failure, and replace the wiring harness if necessary. |
| 17. Check the air conditioner control panel power supply circuit. | |
|  | A. Operate the ignition switch to turn the power to OFF state.<br>B. Disconnect the battery negative connector.<br>C. Disconnect the A/C control panel harness plug A07.<br>D. Connect the battery negative terminal<br>E. Operate the ignition switch to turn the power to ON state.<br>F. Measure the voltage between No. 1 terminal of the harness plug A07 of the air conditioner control panel and the reliable grounding with a multimeter.<br>**Standard value: 11 ~ 14 V**<br>Is the voltage normal?<br>→**Yes**<br>To step 18.<br>→**No**<br>Check the air conditioner control panel power supply circuit for failure and replace the wiring harness if necessary. |
| 18. Check the air conditioner control panel grounding circuit. | |
|  | A. Operate the ignition switch to turn the power to OFF state.<br>B. Disconnect the battery negative connector.<br>C. Disconnect the A/C control panel harness plug A07.<br>D. Measure the resistance between No. 23, 24 terminal of the harness plug A07 of the air conditioner control panel and the reliable grounding with a multimeter.<br>**Standard value: Less than 5Ω**<br>Is the resistance normal?<br>→**Yes**<br>To step 19.<br>→**No**<br>Check the air conditioner control panel grounding circuit for failure and replace the wiring harness if necessary. |

| Test condition | Details/results/measures |
|---|---|
| 13. Check the A / C switch signal circuit. | |
|  | A. Operate the ignition switch to turn the power to OFF state.<br>B. Disconnect the battery negative connector.<br>C. Disconnect the ECM harness connector E01a.<br>D. Disconnect the A/C pressure switch harness plug U13.<br>E. Measure the resistance between the No. 40 terminal of the ECM harness plug E01a and the No. 3 terminal of the harness plug U13 of the air conditioner pressure switch with a multimeter.<br>**Standard value: Less than 5Ω**<br>Is the resistance normal?<br>→**Yes**<br>To step 14.<br>→**No**<br>Check the A/C switch signal circuit for open circuit failure and replace the wiring harness if necessary. |
| 14. Check the evaporator temperature sensor. | |
|  | A. Operate the ignition switch to turn the power to OFF state.<br>B. Disconnect the battery negative connector.<br>C. Disconnect the temperature harness plug A01a of evaporator.<br>D. Measure the resistance between the No. 1 and No. 2 terminal of the evaporator temperature harness plug A01 with a multimeter.<br>Is the resistance normal?<br>→**Yes**<br>To step 15.<br>→**No**<br>Replace the evaporator temperature sensor<br>**Refer to: Replacement of evaporator temperature sensor** |
| 15. Check the evaporator temperature sensor signal circuit. | |
|  | A. Operate the ignition switch to turn the power to OFF state.<br>B. Disconnect the battery negative connector.<br>C. Disconnect the evaporator temperature harness plug A01.<br>D. Disconnect the A/C control panel harness plug A07.<br>E. Measure the resistance between the evaporator temperature harness plug A01 terminal 2 and A/C control panel harness plug A07 terminal 18 with the multimeter.<br>**Standard value: Less than 5Ω**<br>Is the resistance normal?<br>→**Yes**<br>To step 16.<br>→**No**<br>Check and repair the evaporator temperature sensor signal circuit. |

| Test condition | Details/results/measures |
|---|---|
| 10. Check the refrigerant. | |
| | A. Connect the A/C pressure test meter.<br>B. Check if the refrigerant leaks or is missing.<br>Is it OK after checking?<br>→**No**<br>To step 11.<br>→**Yes**<br>Check the refrigerant for leak failure, refill the refrigerant.<br>**Refer to: Recycling and filling procedures for air conditioner refrigerants** |
| 11. Check the test pressure switch. | |
|  | A. Fill the refrigerant by standard procedure.<br>B. Operate the ignition switch to switch the power mode to "OFF".<br>C. Disconnect the negative connector of the battery.<br>D. Disconnect the A/C pressure switch harness plug U13.<br>E. Measure the resistance between the No. 2 and No. 4 terminals of the air conditioner pressure switch U13 with a multimeter.<br>**Standard value: Less than 5Ω**<br>F. Measure the resistance between the No. 1 and No. 43 terminals of the air conditioner pressure switch U13 with a multimeter.<br>**Standard value: 10MΩ or higher**<br>Is it OK after checking?<br>→**Yes**<br>To step 12.<br>→**No**<br>Replace the air conditioner pressure switch.<br>**Refer to: Replacement of air conditioner pressure switch** |
| 12. Check the A/C switch feedback signal circuit. | |
|  | A. Operate the ignition switch to turn the power to OFF state.<br>B. Disconnect the battery negative connector.<br>C. Disconnect the ECM harness connector E01a.<br>D. Disconnect the A/C control panel harness plug A07.<br>E. Measure the resistance between the No. 79 terminal of the ECM harness plug E01a and the No. 9 terminal of the harness plug A07 of the air conditioner control panel with a multimeter.<br>**Standard value: Less than 5Ω**<br>Is the resistance normal?<br>→**Yes**<br>To step 13.<br>→**No**<br>Check the A/C switch feedback signal circuit for open circuit failure and replace the wiring harness if necessary. |

| Test condition | Details/results/measures |
|---|---|
| 7. Check the air conditioning compressor relay power supply line. | |
|  | A. Operate the ignition switch to turn the power to OFF state.<br>B. Remove the K12 air conditioner compressor relay.<br>C. Operate the ignition switch to turn the power to ON state.<br>D. Measure the voltage between No. 1, 3 terminals of the K12 air conditioner compressor relay of the front compartment electrical box and the reliable ground point with a multimeter.<br>**Standard value: 11 ~ 14 V**<br>Is the voltage normal?<br>**→Yes**<br>To step 8.<br>**→No**<br>Check the air conditioner compressor relay power circuit for failure, and replace the front compartment electrical box as necessary. |
| 8. Check the compressor input voltage circuit. | |
|  | A. Operate the ignition switch to turn the power to OFF state.<br>B. Disconnect the battery negative connector.<br>C. Remove the K12 A/C compressor relay.<br>D. Disconnect the harness plug E11a of the compressor.<br>E. Measure the resistance between No. 5 terminal of K12 air conditioner compressor relay of the front compartment electrical box and No. 1 terminal of the compressor harness plug E11a with a multimeter.<br>**Standard value: Less than 5Ω**<br>Is the resistance normal?<br>**→Yes**<br>To step 9.<br>**→No**<br>Check the compressor input voltage circuit for failure, and replace the front compartment electrical box as necessary. |
| 9. Check the compressor relay control circuit. | |
|  | A. Operate the ignition switch to turn the power to OFF state.<br>B. Disconnect the battery negative connector.<br>C. Remove the K12 A/C compressor relay.<br>D. Disconnect the ECM harness connector E01a.<br>E. Measure the resistance between the engine compartment fuse box K12 A/C compressor relay terminal 2 and the compressor harness plug E01a terminal 10 with the multimeter.<br>**Standard value: Less than 5Ω**<br>Is the resistance normal?<br>**→Yes**<br>To step 21.<br>**→No**<br>Check the compressor relay control circuit for failure, and replace the front compartment electrical box as necessary. |

| Test condition | Details/results/measures |
|---|---|
| 4. Check the compressor input voltage. | |
|  | A. Operate the ignition switch to turn the power to OFF state.<br>B. Disconnect the battery negative connector.<br>C. Disconnect the harness plug E11a of the compressor.<br>D. Connect the battery negative terminal<br>E. Start the engine.<br>F. Press down the power key of the diagnostic device for the vehicle with a fault.<br>G. Select the following items on the menu:Power System / Engine System (Delphi VVT ETC) / I/O Control Function Unit / Air Conditioner Clutch.<br>H. Measure the voltage between the No. 1 terminal of the harness plug E11a of the compressor and the reliable grounding with a multimeter.<br>**Standard value: 11 ~ 14 V**<br>Is the voltage normal?<br>→**Yes**<br>Replace the compressor.<br>→**No**<br>To step 5. |
| 5. Check the compressor fuses. | |
| | A. Check the compressor fuses FS16.<br>**Fuse rated capacity: 10 A**<br>Is it OK after checking?<br>→**Yes**<br>To step 6.<br>→**No**<br>Replace the compressor fuse. |
| 6. Check the air conditioning compressor relay. | |
| | A. Operate the ignition switch to turn the power to OFF state.<br>B. Replace the K12 air conditioner compressor relay with a new one.<br>C. Start the engine.<br>D. Turn on the air conditioner and set the air conditioner in the cooling and running state.<br>Check if the compressor is operating properly?<br>→**Yes**<br>Replace the air conditioner compressor relay.<br>→**No**<br>To step 7. |

## Compressor out of operation diagnosis flow

| Test condition | Details/results/measures |
|---|---|
| 1. General inspection. | |
| | A. Check if the compressor belt is off.<br>B. Check the compressor harness plug for aging, shedding, damage and other abnormalities.<br>Is it OK after checking?<br>→**Yes**<br>To step 2.<br>→**No**<br>Repair the fault position. |
| 2. Check the engine DTC. | |
| | A. Read and see if there is a DTC in the engine control system by using automotive diagnostic equipment.<br>Is there a DTC?<br>→**Yes**<br>**Refer to: Diagnostic trouble code (DTC) list. Perform DTC diagnostic procedure.**<br>→**No**<br>To step 3. |
| 3. Input and output function test. | |
| | A. Start the engine.<br>B. Press down the power key of the diagnostic device for the vehicle with a fault.<br>C. Select the following items on the menu:Power System / Engine System (Delphi VVT ETC) / I/O Control Function Unit / Air Conditioner Clutch.<br>Is the compressor operating properly?<br>→**Yes**<br>To step 10.<br>→**No**<br>To step 4. |

| Test condition | Details/results/measures |
|---|---|
| 4. Check the internal and external circulation throttle. | |
| | A. Adjust to internal circulation mode.<br>B. Check whether the internal and external circulation throttle is operating properly.<br>Is it OK after checking?<br>→**No**<br>To step 5.<br>→**Yes**<br>Carry out the following adjustment and repair and check whether the system is normal.<br>• Adjust the internal and external circulation throttle mechanism,<br>• Check the internal and external circulation throttle mechanical actuators and the internal and external circulation throttle motors. |
| 5. Check the heating water tank. | |
| | A. Replace the heating water tank.<br>**Refer to: Replacement of heating water tank**<br>Confirm that the fault has been ruled out. |

## Diagnostic process for lack of heating

| Test condition | Details/results/measures |
|---|---|
| 1. Check the engine cooling system. | |
| | A. Check the temperature of engine coolant.<br>B. Is the temperature of engine coolant at 82 °C?<br>Is it OK after checking?<br>→**Yes**<br>To step 2.<br>→**No**<br>Make the following adjustments and repairs and confirm that the system is operating properly.<br>• Extend the engine running time.<br>• Check the cooling system for air.<br>• Check that if the thermostat is operating properly.<br>• Check if the warm water pipes are blocked. |
| 2. Check the air output of the A/C dashboard air outlet | |
| | A. Adjust the blower speed to the maximum.<br>B. Check whether the air output of the A/C dashboard air outlet is too low.<br>Is the air output too low?<br>→**Yes**<br>After completing the following adjustment, measure again and check whether the system is normal.<br>• Check the A/C filter for clogging and replace it if necessary.<br>• Check the blower.<br>• Check the blower speed regulation module.<br>• Check the air outlet line.<br>→**No**<br>To step 3. |
| 3. Check the temperature throttle. | |
| | A. Adjust the temperature to the highest.<br>B. Check that if the temperature throttle is operating properly.<br>Is it OK after checking?<br>→**Yes**<br>To step 4.<br>→**No**<br>Carry out the following adjustment and repair and check whether the system is normal.<br>• Adjust the temperature throttle mechanism,<br>• Check the temperature throttle mechanical actuator and the cool and heat throttle motor.<br>• Check that if the duct is leaking or blocking.<br>• Check the A/C control panel. |

| Test condition | Details/results/measures |
|---|---|
| 5. Check the air conditioner cooling system. | |
| | A. Check the condenser for serious dirt.<br>Is it OK after checking?<br>→**Yes**<br>To step 6.<br>→**No**<br>Clean the air conditioner condenser. |
| 6. Check the engine cooling system. | |
| | A. Check the following parts of the engine cooling system.<br>• Is the coolant missing?<br>• Whether the thermostat is operating properly.<br>• Operating status of the cooling fan.<br>• Status of the radiator.<br>• Status of the radiator windshield.<br>Adjust and repair according to the check situation to, and confirm that the system is operating properly. |

| Test condition | Details/results/measures |
|---|---|
| 3. Check the refrigerant pressure. | |
| | A. Connect the A/C pressure test meter.<br>B. start the engine, turn on the air conditioner.<br>C. With engine speed of 2000rpm, measure the high and low pressure of the air conditioner system.<br>**Standard value:**<br>**High pressure 1.40 ~ 1.75 MPa**<br>**Low pressure 0.25 ~ 0.35 MPa**<br>Is it OK after checking?<br>→**No**<br>To step 4.<br>→**Yes**<br>Carry out the following adjustment or repair and check whether the system is normal.<br>• If both the high and the low pressure of the air conditioner are high, check whether the piping of the refrigeration system is blocked. Check if the refrigerant is too much; drain too much refrigerant and refrigerant oil. Replace the expansion valve.<br>• If the air conditioner pressure is high but the low pressure is low, clean and replace the blocked high pressure pipe; replace the expansion valve.<br>• If the air conditioner pressure is low but the low pressure is high, add the refrigeration oil, repair or replace the compressor.<br>• If both the air conditioner high pressure and low pressure are low, then repair, replace the leaked components of air conditioner system, according to the standard provisions for the filling of air conditioner refrigerant.<br>• If the air conditioner pressure is low but low pressure is vacuum, replace the liquid storage drying bottle, replace the expansion valve, clean or replace the blocked low pressure pipe, extend the system vacuum time, fill the standard air conditioner refrigerant specified by manufacturer. |
| 4. Check the operating status of the compressor. | |
| | A. Check the compressor belt for slipping.<br>B. Check that if the compressor clutch is normal.<br>C. Check that if the compressor working condition is normal.<br>Is it OK after checking?<br>→**Yes**<br>To step 5.<br>→**No**<br>Carry out the following adjustment or repair and check whether the system is normal.<br>• Check and adjust the compressor belt.<br>• Check the compressor clutch coil.<br>• Check the compressor control circuit.<br>• Check the air conditioner pressure switch.<br>• Check the evaporator temperature sensor.<br>• Check the compressor.<br>• Check the A/C control panel.<br>• Check the ECM. |

## Diagnostic process for lack of cooling

| Test condition | Details/results/measures |
|---|---|
| 1. Check the outlet temperature of air conditioner dashboard. | |
| | A Start the engine at 2,000 rpm and measure the outlet air temperature of the air panel.<br>Is the outlet temperature too high?<br>→**Yes**<br>After completing the following adjustment, measure again and check whether the system is normal.<br>• Switch to internal circulation mode.<br>• Move the vehicle is into the shade.<br>• Adjust the cool and heat throttle to the lowest temperature.<br>→**No**<br>To step 2. |
| 2. Check the air output of the A/C dashboard air outlet | |
| | A. Adjust the blower speed to the maximum.<br>B. Check whether the air output of the A/C dashboard air outlet is too low.<br>Is the air output too low?<br>→**Yes**<br>After completing the following adjustment, measure again and check whether the system is normal.<br>• Check the A/C filter for clogging and replace it if necessary.<br>• Check the blower.<br>• Check the blower speed regulation module.<br>• Check the air outlet line.<br>→**No**<br>To step 3. |

| Symptom | Possible Cause | Recommended Measures |
|---|---|---|
| Abnormal air volume | • Air duct blocked | • Clean the duct |
| | • Duct leaks | • Reinstall or replace the duct |
| | • A/C filter clogging | • Replace the air conditioner filter **Refer to:Replacement of air conditioner filter** |
| | • Blower fault | • Check or replace the blower **Refer to: Replacement of blower** |
| | • Air conditioner control panel failure | • Check or replace the air conditioner control panel **Refer to: Replacement of A/C control panel** |
| Blower out of operation | • Harness and plug | **Refer to:Diagnostic process for blower does not operate** |
| | • Blower fuses | |
| | • Blower relay | |
| | • Blower fault | |
| | • A/C control panel | |

| Symptom | Possible Cause | Recommended Measures |
|---|---|---|
| Air conditioner is not cooling (normal air volume) | • Refrigerant leaks, missing | • Check the refrigerant for leak and refill the refrigerant |
| | • The compressor belt slips and falls off | • Check the accessory belt |
| | • The compressor does not operate | **Refer to: Compressor out of operation diagnosis flow** |
| | • Temperature flap fault | • Check if the temperature throttle is jammed and the hybrid throttle is operating |
| | • The compressor is damaged | • Replace the compressor **Refer to: Replacement of compressor** |
| A/C refrigerating output insufficient | • Refrigerant leaks, not enough | **Refer to: A/C refrigerating output insufficient diagnosis flow** |
| | • A/C filter clogging | |
| | • The compressor belt slips | |
| | • Fan fan is operating abnormally | |
| | • Condenser dissipation abnormal | |
| | • Air conditioner piping is blocked | |
| | • Temperature flap fault | |
| | • Blower fault | |
| | • Compressor fault | |
| A/C refrigerating output insufficient | • Air in cooling system | **Refer to: A/C refrigerating output insufficient diagnosis flow** |
| | • Heater water pipe clogging | |
| | • Heater radiator surface dirty or inside clogging | |
| | • Blower fault | |
| | • Temperature mixing flap fault | |
| Lack of heating | • Air in cooling system | **Refer to: Diagnostic process for lack of heating** |
| | • Heater water pipe clogging | |
| | • Heater radiator surface dirty or inside clogging | |
| | • Blower fault | |
| | • Temperature mixing flap fault | |
| Compressor out of operation | • The refrigerant is completely leaked | **Refer to: Compressor out of operation diagnosis flow** |
| | • Compressor fuses | |
| | • Harness and plug | |
| | • Compressor relay | |
| | • A/C pressure switch | |
| | • Evaporator temperature sensor | |
| | • A/C control panel | |
| | • Compressor | |
| | • ECM | |

## List of fault symptoms

| Symptom | Possible Cause | Recommended Measures |
|---|---|---|
| Water from air conditioner leak into the vehicle | • The drain-pipe of evaporator is blocked | • Clean the drain pipe |
| | • The drain-pipe of evaporator falls off | • Reinstall the evaporator drain pipe |
| | • The evaporator housing is damaged | • Replace the evaporator housing **Refer to: Replacement of HVAC** |
| Abnormal air conditioner pressure (both high and low pressure are high) | • The refrigeration system is mixed with air | • Vacuumize, refill the refrigerant |
| | • Refrigerant overcharged | • Recover the surplus refrigerant |
| | • Too many refrigerant lubricants | • Re-fill the refrigerant by standard procedure |
| | • Poor heat dissipation of condenser | • Clean the condenser surface or replace the condenser **Refer to: Replacement of condenser** |
| | • The cooling fan is operating abnormally | • Check the cooling fan |
| Abnormal air conditioner pressure (both high and low pressure are low) | • Refrigerant insufficient | • Check for refrigerant failure and refill the refrigerant |
| Abnormal air conditioner pressure (High pressure is normal, low pressure is high) | • Expansion valve failure | • Check or replace the expansion valve **Refer to: Replacement of expansion valve** |
| | • Refrigerant overcharged | • Recover the surplus refrigerant |
| | • Compressor fault | • Check and replace the compressor **Refer to: Replacement of compressor** |
| Abnormal air conditioner pressure (High pressure is normal, low pressure is low) | • Refrigerant insufficient | • Refill refrigerant |
| | • Expansion valve blocked by ice | • Replace the liquid storage drying bottle |
| | • Dirt on evaporator surface or internal blocking | • Clean or replace the evaporator<br>• Refer to: **Replacement of the evaporator** |
| The evaporator is frozen | • Evaporator temperature sensor failure | • Check and replace the evaporator temperature sensor **Refer to: Replacement of evaporator temperature sensor** |
| | • The refrigerant is overfilled | • Recover the surplus refrigerant |
| | • The amount of air passing through the evaporator is insufficient | • Check that if the blower is operating properly and that the air conditioner filter is blocked |
| | • Expansion valve failure | • Check or replace the expansion valve **Refer to: Replacement of expansion valve.** |

# Diagnostic Information and Procedures

## Diagnosis Instructions

Before the diagnose of the electric air conditioner system, familiarize yourself with the working principle of the electric air conditioner system, and then start the electric air conditioner system diagnostics, which helps not only to determine the correct troubleshooting step in the event of a failure, and more importantly

It helps to determine the condition described by the customer is normal or not.

Any troubleshooting of the electric air conditioner system should take the electric air conditioner system check as a starting point and instruct the service personnel to take the next logical step, for troubleshooting. Comprehend and correctly use the diagnostic flow chart to shorten the diagnosis time and avoid the misjudgement.

**General equipment**

| |
|---|
| Digital multimeter |
| Diagnostic equipment of vehicle |
| Thermometer |
| Electronic leak detector |
| Pressure gage |
| Refrigerant recovery and filling machine |

## Visual Inspection

1. Confirm the problem of the customer.
2. Visually check whether there is any obvious mechanical or electrical damage sign.

**Visual check table**

| Mechanical | Electrical |
|---|---|
| • Attachment belt<br>• Refrigerant<br>• Compressor<br>• Expansion valve<br>• Air conditioner piping<br>• Condenser<br>• Air conditioner filter<br>• Air conditioner outlet pipe | • Fuse<br>• Harness or plug<br>• A/C pressure switch<br>• A/C control panel<br>• Blower speed control module<br>• Blower<br>• Cool and heat throttle motor<br>• Mode throttle motor<br>• New return throttle motor<br>• Compressor |

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. f for the problem, there are no obvious findings, then confirm the fault and refer to the symptom table.

pass to the evaporator.

**Evaporator**

The evaporator is located on the refrigerant piping between the expansion throttle device and the compressor, and is used to vaporize the liquid refrigerant after throttling and depressurization, to absorb the heat of the outside air. The cold wind was blown into the compartment, to achieve the purpose of cooling.

The evaporator cools and dries the air, and its tilted mounting position provides good runoff and reduces condensate and odor residue.

**Refrigerant R-134a, refrigerant oil**

Vehicles use R-134a refrigerant, refrigerant R-134a is non-toxic, flame retardant, transparent, colorless liquefied gas. Refrigerants have the following effects in air conditioner systems:

- Absorb heat
- Transfer heat
- Release heat

The refrigerating oil acts as a lubricant in the operation of the compressor to reduce the degree of friction and wear during the operation of the compressor, thereby extending the service life of the compressor. The refrigerating oil acts as a sealing between the piston and the cylinder surface of the compressor, and the rotation between the rotating bearings, to prevent the refrigerant from leaking. Refrigerant oil is used for lubrication in the compressor between the moving parts, it can take away the heat generated during the operation, so that the moving parts maintain a low temperature, thereby enhancing the efficiency and the reliability of use of the compressor.

Be sure to follow the instructions and carry out the following repairs:

- Recycle of refrigerants
- Recycle of refrigerant oil
- Filling of refrigerant
- Filling of refrigerant oil

**⚠Warning:**

- The amount of refrigerant oil should not exceed the maximum amount of filling.
- The filling amount of the refrigerant should not exceed the maximum filling amount.
- In strict accordance with the standard filling procedure, it should be operated by professionals,Otherwise it may cause harm to the person.

**AC pressure switch**

Air conditioner pressure switch is a three-state pressure switch, for air conditioner pressure signal transmission.

**Heating system**

The heat generated by the engine is transfered through the warm water pipes into the warm water tank, which can provide the vehicle a suitable temperature in cold weather. When heating is needed, the driver simply adjust the temperature adjustment knob on the air conditioner controller to drive the temperature adjuster motor, which controls the cold / warm air throttle for temperature adjustment.

The heating system is mainly composed of heat exchangers, blowers and corresponding piping, and the heated air is controlled by the throttle to get into the passenger compartment.

**Air distribution system**

The air distribution system distributes the cold and hot air produced by the cooling and heating system, according to different situations and the requirements of the crew from the different outlet of the wind, so that the passenger compartment temperature and air velocity are kept in a certain range, to form a more comfortable environment. The air distribution system is mainly composed of an intake pipe, an air mixing pipe and a gas distribution pipe. The air conditioner filter is located on the right side of the HVAC assembly on the right side of the cab, to filter the dust in the air circulation.

**HVAC assembly**

HVAC assembly is located in the dashboard, includes the blower, blower motor speed control module, dust filter, heater core, evaporator, expansion valve, mixed throttle control motor and a variety of air deflection throttle , and ventilation duct.

## Operating Principle

### System overview

The air conditioner system is designed for the vehicle to provide a comfortable ride environment regardless of the external weather conditions. The system controls the air entering the passenger compartment by performing the following functions:

- Cooling down
- Drying
- Heating
- Circulating

Fresh air from the air conditioner first get into the wind hood, then go through the air conditioner air filter, blower assembly, evaporator box assembly, warm water tank assembly, duct, and then reach the various outlet, into the space inside the vehicle. The air conditioner system consists of the following components:

- Cooling System
- Heater system
- Air distribution system
- Air-conditioning control system

The air conditioner system has the following characteristics:

- Filter the air into the car
- Provide a suitable temperature for the car
- Electricity ventilation
- Front windshield defrost

The driver can adjust the front air conditioner controller to achieve the following functions:

- Adjust the temperature inside the cab
- Blower speed
- Outflow mode
- Front windscreen defrost
- Rear windscreen defrost

### Refrigerating system

The purpose of cooling is achieved by the heat absorption during the refrigerant transition from liquid to gas. The cooling process consists of the compression process, the cooling process (exothermic), the throttling process and the evaporation process (endothermic).

1. Compression process

The compressor draws the low temperature and low pressure gas at the outlet of the evaporator, compresses it into gas with high temperature and high pressure, and then feeds it into the condenser.

2. Cooling process (exothermic)

The high temperature and high pressure gas enters the condenser and exchanges heat with the air. The cooling fan blows the heat into the atmosphere and cools the refrigerant into liquid.

3. Throttle process

The liquid refrigerant with medium temperature and high pressure is throttled and depressurized by the expansion valve, to discharge the expansion device in a mist (fine droplets).

4. Evaporation process (endothermic)

The refrigerant mist throttled and depressurized by the expansion valve get into the evaporator to evaporate into a gas. Evaporation process absorbs the heat around and reduces the temperature inside the vehicle.

### Compressor

The air conditioner compressor is driven pulley rotated by the compressor clutch, which is transmitted from the belt driven by the engine crankshaft. When the compressor clutch solenoid is not energized, the compressor pulley is free to rotate. The compressor pulley idles at this time, does not drive the compressor shaft. When the clutch coil is energized, the clutch disc and hub are pushed toward the pulley. The magnetic force locks the clutch disc and the pulley as one to drive the compressor shaft, and the compressor starts to operate.

### Condenser, liquid storage drying bottle

The high-pressure high-temperature refrigerant vapor from the air-conditioning compressor flows into the condenser. The condenser is made of aluminum tubes and cooling fins which allow rapid heat transfer of the high-pressure high-temperature refrigerant vapor. The cooling fins condense the high-pressure high-temperature refrigerant vapor to high-pressure medium-temperature liquid by heat dissipation. The internal structure of the liquid storage drying bottle can ensure that when the high-pressure high-temperature gas-liquid mixed refrigerant enters, only the high-pressure medium-temperature liquid refrigerant exit the drying bottle. The drying solution has a desiccant that absorbs the moisture in the refrigeration system and the desiccant can not be reused.

### Expansion throttle device

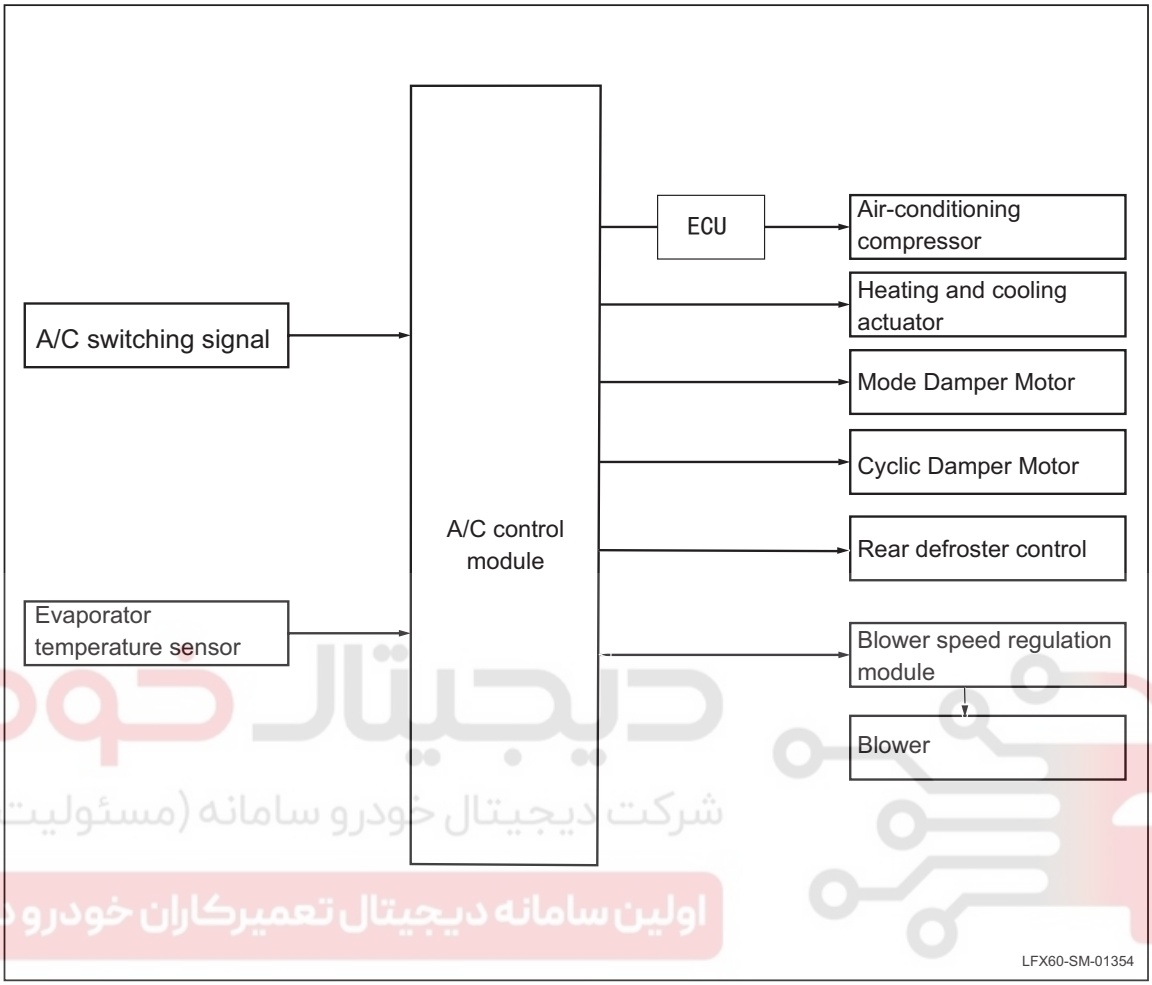
The expansion throttle device throttles and decompresses the high pressure liquid refrigerant from the condenser or the liquid storage drying bottle, to adjust and control the amount of the liquid refrigerant entering the evaporator, to accommodate the change in the cooling load. At the same time, to prevent the hydraulic phenomenon and abnormal overheating of the evaporator outlet steam.

Expansion valve is mainly composed of thin film and the valve shell, which is a neck expansion valve, which adjust the refrigerant flow according to the refrigerant pressure and temperature.

When the cooling requirement is low, the valve closes to reduce the amount of refrigerant.

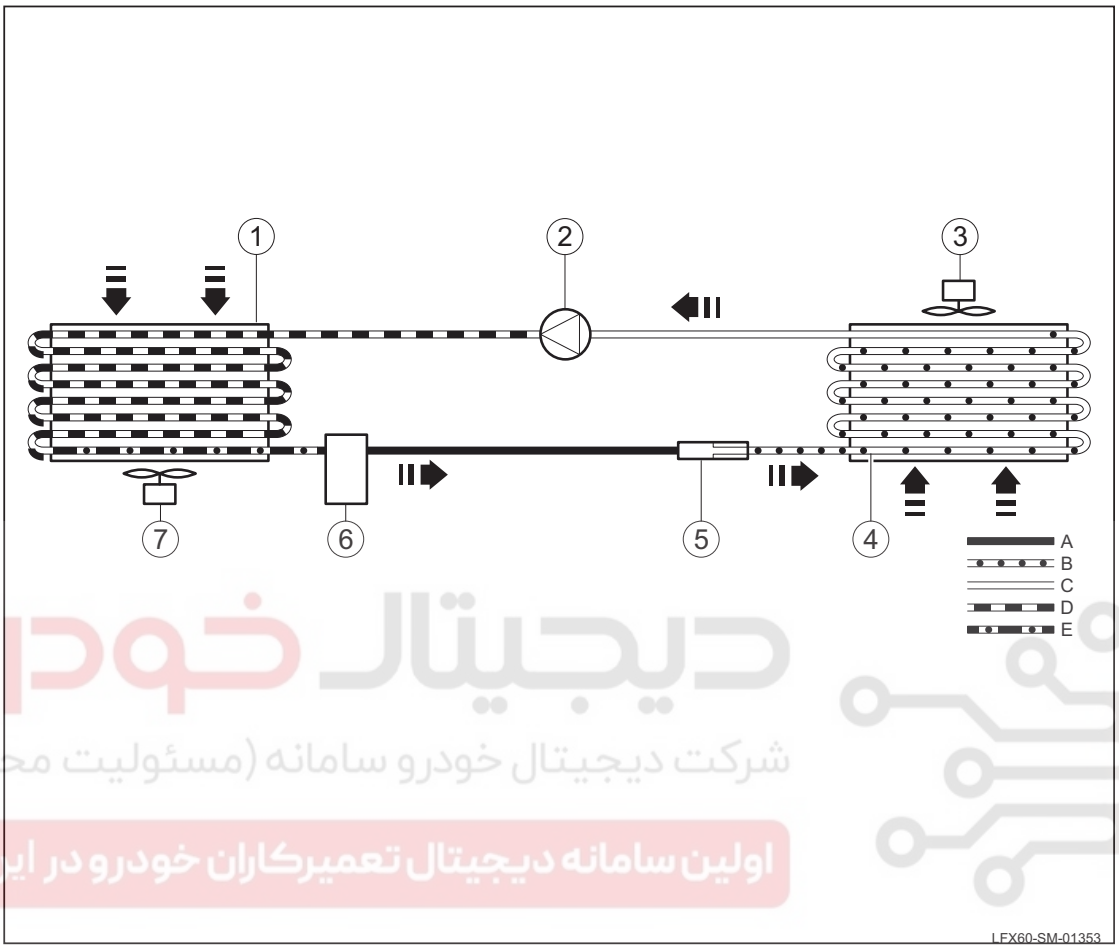
When the cooling requirement is high, the valve will open slightly so that more refrigerant will

## Air conditioner control



# Air conditioner schematic

## Refrigerating system




| No. | Part name |
|---|---|
| 1 | Condenser |
| 2 | Compressor |
| 3 | Blower assembly |
| 4 | Evaporator assembly |
| 5 | Expansion Valve |
| 6 | Drying bottle |

| No. | Part name |
|---|---|
| 7 | Cooling fan |
| A | High pressure, medium temperature and liquid state |
| B | Low pressure, low temperature and liquid state |
| C | Low pressure, low temperature and gas state |
| D | High pressure, high temperature and gas state |
| E | High pressure, high temperature and gas-liquid mixing state |

- Inlet and outlet of drying bottle.
- Condenser inlet and outlet.
- Brazing and welding parts.
- Damaged parts.
- Front and rear cover of compressor.
- All plugs and connectors.
- Test the high and low pressure service port / service valve.

**Leak detection by fluorescent dye**

**Note:**

- **Some vehicles have signs of refrigerant oil and refrigerant at the air conditioner pipe joints, which may be left for ease of installation of air conditioner piping and lubrication of spring lock interface of air conditioner piping. When the connector is suspected to leak, wipe the parts clean and use the R-134a Electronic Leak Detector to check for leaks.**
- **The leaks can be precisely positioned by the yellow-green light of the tracer. Since there may be more than one leak, normally each part should be checked.**

1. Add 7.4mm fluorescent tracer to the air conditioner refrigerant system.
2. After running the air conditioner system for 15min, turns off the engine.
3. Use an ultraviolet lamp to check all parts of the air conditioner system to determine the leak.
4. If a leak is found, recycle the refrigerant with the fluorescent tracer, repair or replace the leaked part, and refill the refrigerant with the fluorescent tracer into the air conditioner system.
5. Use oily solvents to remove traces of any fluorescent tracer on piping or components.
6. Run the air conditioner system for a few minutes and use the UV lamp again to check all parts of the air conditioner system and confirm the troubleshooting.

**Leak detection by soap solution**

For large leakage in the connection part of refrigerant piping, soapy water can be sprayed around the piping to see whether bubble is generated on the surface. This method is relatively simple and convenient, but the system microleakage can not be detected.

**Leak detection by vacuum**

1. Recycle the refrigerant and vacuumize the system (approx. 30 min).

**Note:**

**If the air conditioner system is filled with refrigerant, then some of the refrigerant will remain in the refrigeration oil of the compressor. The remaining refrigerant will still evaporate and will cause a slight increase in the reading of the pressure gauge (up to 2 divisions) during the leak test, but this increase in pressure does not mean that the air conditioner system is leaking.**

2. Turn off the manual valves for refrigerant on the high and low pressure gauge of the recycling and filling machine.
3. Observe the low pressure gauge on the refrigerant recycling and filling machine.

- If the reading on the gauge is increased by more than 2 kPa, it means that the system is leaked. You need to fill about 300g refrigerant for the leak check.
- If there is no leakage in the system, continue with the filling procedure.

**Leak check for evaporator core**

Evaporator core leakage is difficult to find, test the evaporator core according to the following procedures:

1. Set the blower speed to the maximum for at least 15 minutes.
2. Turn off the blower.
3. Wait for 10min.
4. Remove the blower speed regulation module.
5. Insert the leak detector probe as close as possible to the evaporator core, and a continuous alarm sound appears when the leak detector detects a leak.

**Leak check for compressor shaft seal**

1. Use the workshop compressed air to blow the rear and the compressor / front of pulley for at least 15s.
2. Wait for 1~2 min.
3. Detect at the front of the pulley. A continuous alarm sound appears when the leak detector detects a leak.

**Refrigerant oil quality inspection**

- Contrast method

Take the standard refrigerant oil into the test tube as standard oil, and then take the refrigerant oil to be checked into a tube of the same size for comparison. If the color of the refrigerant oil to be checked is light yellow or orange, it can be used; if it has become dirty solution of red brown, it can not be used.

- Dropping method

Remove the refrigerant oil to be checked and drop it on a clean white sheet and observe the color of the oil droplets after a while. If the color is light and in uniform distribution, it means that there are no impurities in the oil, and it can be used; if the central part of the oil droplets has black spots, indicating that the oil has deteriorated, and it can not be used.

the temperature difference is less than 20 °C, check the condenser heat sink for foreign matter or damage, and if the radiator fan operation is normal.

- The air conditioner piping between the expansion valve and the evaporator should be cold from the installation point of expansion valve. Depending on the climate, the surface of the air conditioner piping may also freeze.
- The air conditioner piping between the evaporator and the compressor should be cold.
- Test the temperature of evaporator core output piping and prepare the following when measuring:
- Open all windows.
- Set the air distribution to the head outlet and open the air outlet for all vents.
- Turn on external circulation mode.
- Select the lowest blower switch setting.
- Select the lowest temperature setting.

**Note:**

**The temperature measurement can not be performed using a non-contact thermometer because the surface temperature radiation can lead to incorrect measurements.**

1. Connect the temperature sensor to the evaporator core output piping. The temperature sensor must be mounted as close as possible to the evaporator core, connecting the temperature sensor to the digital multimeter.
2. Start the engine and allow the engine to run idle for several minutes.
3. Turn on the air conditioner, after 3min, measure the surface temperature of the evaporator core output piping.
4. If the measured temperature is 4 °C or less, the air conditioner system is normal. If the temperature is too high, the cooling of air conditioner system is not enough, continue to the next inspection step.

Frequent failure of the refrigeration system and its causes:

• Poor or no cooling

The air conditioner piping or the drying bottle is blocked or hindered, by comparing the temperature of the air conditioner piping or the surface of the drying bottle to find out the blocked or hindered position. The place with temperature difference is the place blocked or hindered.

**Note:**

**It is normal to have a temperature difference between the piping before and after the expansion valve. When the blocked or hindered place is found, check the relevant parts and replace the parts with new ones if necessary.**

- The cooling performance is reduced (the compressor returns to normal after about 6 minutes of stopping)

This is due to the presence of moisture in the system, causing the expansion valve to freeze. In order to ensure that the moisture is completely removed from the refrigerant circuit, the time for evacuation must be extended to 2 to 3 hours and the drying bottle must be replaced with a new one.

**Refrigeration system leak test**

When you suspect that the system leaks the refrigerant, it should be tested for sure. The leak test should also be performed when the maintenance operation you are performing affects the piping or plugs. Leakage usually occurs at the refrigerant plug or interface. The cause of the leak usually includes the following faults:

- The mounting torque of the parts is not appropriate.
- The seal is damaged.
- Dust or fibers on O-rings.

There shall be appropriate pressure in the air conditioner system for leak detection, at least 340kPa. But compressed air is not allowed in the system; otherwise moisture, dust or other impurities of the air will increase the burden of desiccant or pollute the system. Leak check of refrigeration system uses the following methods.

**Electronic leak detection**

1. Use the electronic leak detector to inspect the entire piping of the refrigeration system carefully.

**Note:**

**Electronic leak detectors are sensitive to front window glass washings, solvents and cleaning agents and certain vehicle adhesives. The surface must be wiped clean, to avoid incorrect reading. Make sure that all surfaces are dry so as not to damage the electronic leak detector.**

1. Move at 25 ~ 50mm / s to detect each connection for one whole circle.
2. Within 6mm from the probe tip to the detection surface.
3. Do not block the air inlet.
4. If a leak is detected, the audible alarm will change from 1 ~ 2 per second to continuous alarm. Adjust the balance control; maintain the alarm sound to 1 to 2 sounds per second.
5. Even if a leak has been detected, all parts of the following must be tested:

- Evaporator inlet and outlet.

## General Inspection

### General equipment

| Name |
|---|
| Digital multimeter |
| Refrigerant recovery and filling machine |
| Pressure gage |
| Thermometer |
| Electronic leak detector |
| UV leak detector |
| Sprayer |

**⚠Warning:**

- **Before servicing the electrical system, disconnect the negative terminal of the battery, and welding or steam cleaning operations on or near the vehicle with air conditioner piping or components are prohibited.**
- **Do not use water, corrosive solvents or flammable and explosive solvents to clean the air conditioner system. It is recommended to use R-141b, heptane and other cleaning agents.**

The operating efficiency and service life of the air conditioner system depends on the chemical stability of the refrigeration system. Contaminants can change the stability of refrigerant and refrigerant oil when the refrigeration system is contaminated by foreign matter such as dust, air or moisture. And also affect the relationship between pressure and temperature, reduce efficiency, and may lead to corrosion and abnormal wear and tear of the system parts and components. Please check the air conditioner system as described below:

- Before disconnecting the plug, clean the plug and the oil around the plug to reduce the possibility of oil entering the system.
- Immediately after the pipe is disconnected, tighten the ends of the plug with a cap, stopper or tape to prevent oil, foreign matter and moisture from entering.
- Keep all tools clean and dry, including pressure gauge components and all parts for replacement.
- Add refrigerant oil with clean and dry conveyors and containers to ensure that the refrigerant oil is not contaminated.
- Operate as quickly as possible to shorten the time that the air conditioner system is exposed to the air.
- The air conditioner system must be re-emptied and refilled after exposure to air. All parts are dry and sealed before leaving the factory, and these sealed parts can only be opened at the time of installation. Before unpacking, all parts should be at room temperature, prevent moisture in the air from condensing into the parts inside the system, and re-seal all parts as soon as possible.

**ℹNote:**

- **Do not store the refrigerant at sun exposure or next to a heat sour e.**
- **The refrigerant can not be discharged directly into the atmosphere in any case.**
- **Refrigerants such as R-134a (tetrafluoroethane) and R-12 (dichlorodifluoromethane) are not mixable.**
- **The type and grade of refrigerant oil of specified by the compressor manufacturer must be used and different types and grades of refrigerant oil can not be mixed, otherwise the compressor will be damaged.**
- **Since the refrigeration oil is highly easy to absorb water, shorten the air contact time so long as possible.**

### Refrigeration system testing

If you suspect a problem with the air conditioner system, check the following:

- Check the outer surface of the radiator and condenser core to ensure that the airflow is not blocked by dust, leaves or other foreign matter.
- Check the surface between the condenser and the radiator as well as all outer surfaces.
- Check that if the condenser core, hose and connecting pipe are blocked or kinked.
- Check the operation of the blower motor.
- Check all air conditioner lines for leak or blocking.
- Check that if the compressor clutch is slipping.
- Check the compressor belt tension.

### Quick inspection for Refrigeration piping

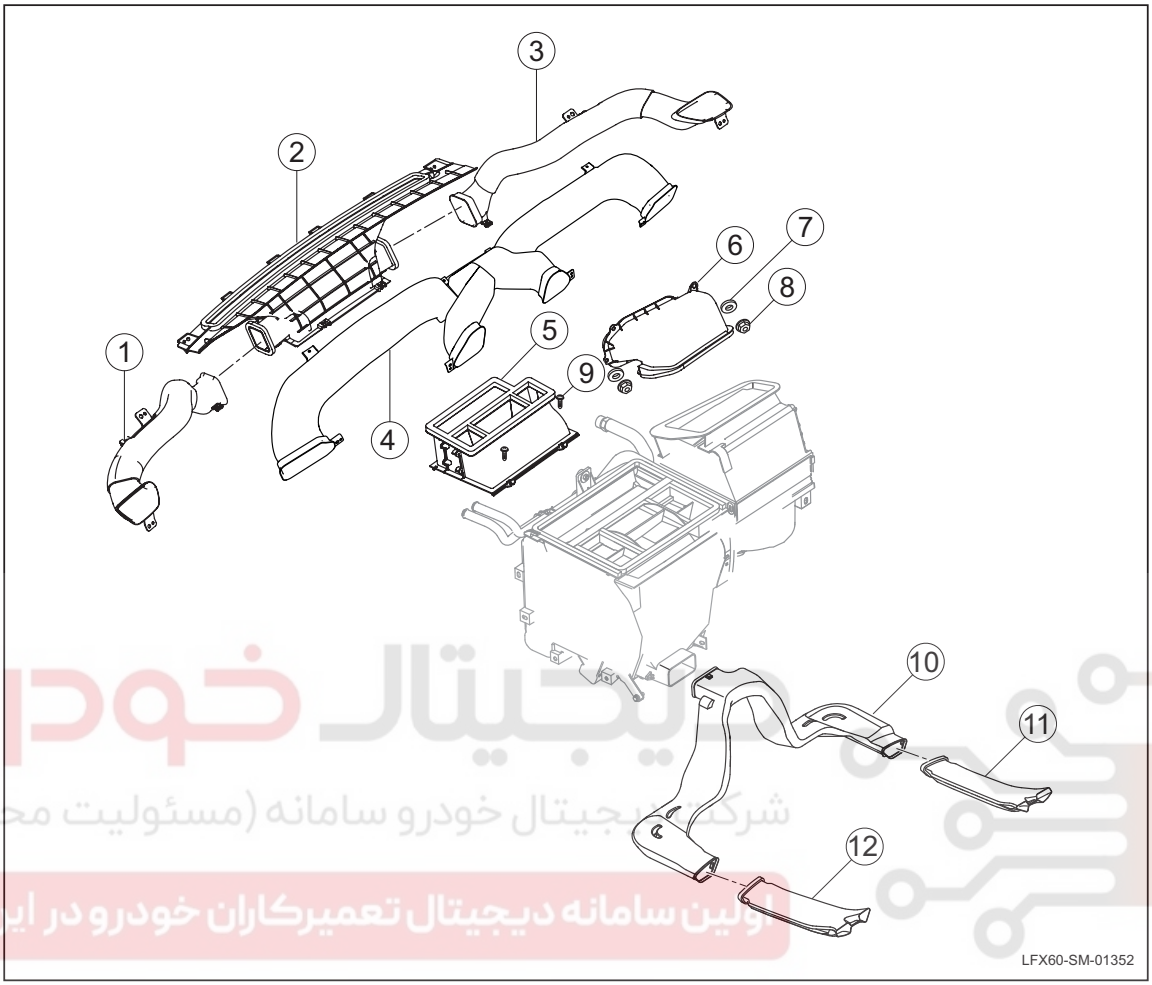
**⚠Warning:**

**In some cases, the refrigerant piping and air conditioner components may be extremely hot or extremely cold. When checking the refrigerant piping or air conditioner unit, care should be taken when touching is required. Failure to follow this statement can result in personal injury.**

- The air conditioner piping from the compressor to the condenser should be hot.
- The air conditioner piping from the condenser to the expansion valve should be warm, but not as hot as the air conditioner piping described above.
- Determine the temperature difference between the condenser heat and the air outlet by measuring the temperature. Depending on the ambient temperature, the temperature difference should be greater than 20 °C. If

08

## Ventilation device



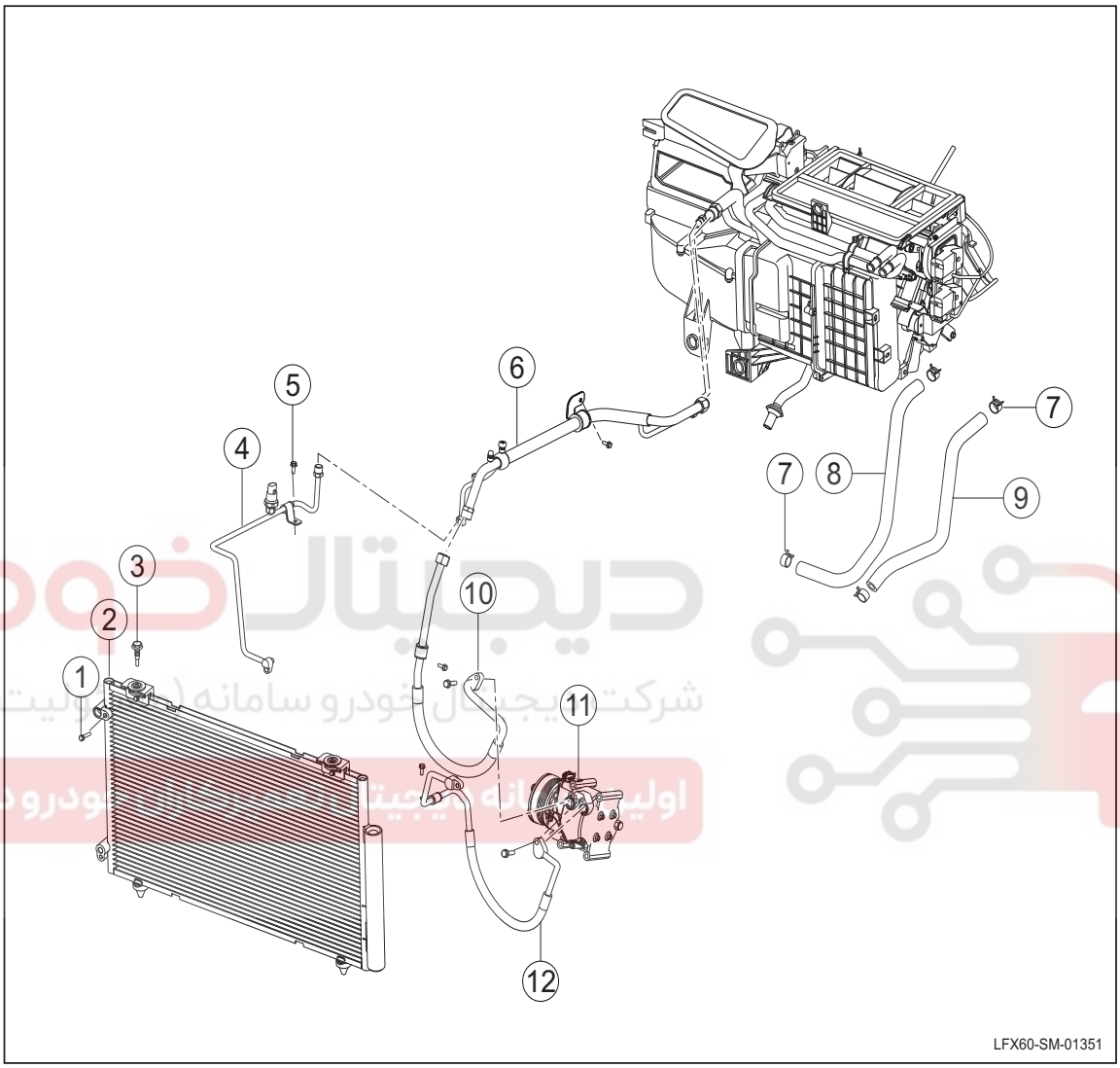

| No. | Part name |
|---|---|
| 1 | Left defrost duct |
| 2 | Central defrost duct components |
| 3 | Right blowing face air duct assembly |
| 4 | Central blowing duct assembly |
| 5 | Central transition duct assembly |
| 6 | New air duct assembly |
| 7 | Plain washer |

| No. | Part name |
|---|---|
| 8 | Hexagon nuts M6 |
| 9 | Cross recessed pan head tapping screws, large washer assembly |
| 10 | Rear feet blowing middle air duct |
| 11 | Rear feet blowing right wind fairing assembly |
| 12 | Rear feet blowing left wind fairing assembly |
| | |
| | |

# Structure and installation location

## Part exploded view

### Air conditioner piping system




| No. | Part name |
|---|---|
| 1 | Hexagon head bolt and taper elastic washer assembly |
| 2 | Condenser assembly |
| 3 | Condenser mounting bolts |
| 4 | High pressure pipe of A/C |
| 5 | Hexagonal bolts |
| 6 | High and low pressure coaxial tube |

| No. | Part name |
|---|---|
| 7 | Steel strip elastic clamp |
| 8 | Heater inlet pipe |
| 9 | Heater outlet pipe |
| 10 | Low pressure pipe of A/C |
| 11 | Compressor |
| 12 | Compressor exhaust pipe |

## Precautions

**Note:**

**Following precautions must be observed during inspection and repair of A/C system, otherwise may cause vehicle damaged and personal injury.**

1. Special gloves and glasses must be used, because the refrigerant has extremely low freezing point and strong volatile, it can cause chilblain or blind if touch skin or eyes.
2. If the refrigerant is spilled onto skin or eyes, wash with clean water immediately, then seek medical treatment from hospital. Never touch hurt skin or eye with your hand or tissue.
3. Working related to refrigerant must be conducted in areas with good ventilation. Released refrigerant may cause oxygen deficit phenomena.
4. Working related to refrigerant must be conducted in clean atmosphere without damp and/or dust, which may flow into A/C system causing damage.
5. A leak detector should be prepared during working related to refrigerant. Leaking should be prevent, because leaked R134a may set off reaction with hot items causing noxious gas.
6. Only R134a should be used as refrigerant for this vehicle. Any other refrigerant has adverse effects on system components.
7. R134a refrigerant and R12 refrigerant are not compatible, so they can not be mixed even with very few amount
8. No kindling or flammable items should be exist in areas of working related to refrigerant. Spacial care must be taken to avoid the refrigerant container exposed in heat sources because this may cause explosion.
9. The R134a is stored with high pressure, thus the container should never be exposed in high temperature conditions. If necessary, c heck to ensure temperature of storage areas is below 52℃ .
10. Caps should be used to prevent water, dust etc. getting into components of A/C system. The caps should be removed before work, and reinstalled after work.
11. It is advisable to avoid any work related to A/C system in rainy days because moisture has extremely adverse impact on system.
12. After the air conditioner system is disassembled, the O-ring seal must be coated with refrigerant oil, especially on the bolt-type connection parts, and manual installation at first and then fixed with a special tool
13. In assembly of flanged connection, the nuts and bolts should be tightened with pipes pushed gently.
14. Operation requirement should be adhered to install A/C, any torque above specification or excessive force on O seals may cause leaking of refrigerant.
15. No hose may be twist.
16. Any components should be removed before the refrigerant is totally recovered. If not, internal pressure of system may push out refrigerant and oil, causing environmental pollution.
17. After replacement of A/C component, refrigeration oil should be added along with refrigerant .
18. Refrigerant R134a must be used for this vehicle.

- R134a refrigerants that all indicators such as ingredients, moisture content, impurities, and non-condensable gases are qualified must be used.
- The filling amount of refrigerant must strictly comply with the provisions of the vehicle factory, too much or too little will have bad influence on the cooling effect of air conditioner.
- Before filling the refrigerant, thoroughly check that if the sealing seals of each pipe joint are intact and the parts are leaked.
- Before the compressor can operate, it can be filled from the low pressure side and the high pressure side. After the compressor is running, it can only be filled slowly from the low pressure side.
- After the R134a refrigerant is added, it shall be checked for leak carefully with electronic leak detector.

19. Add refrigerant oil properly.

- The type and grade of refrigerant oil of specified by the manufacturer must be used and different types and grades of refrigerant oil can not be mixed, otherwise the compressor will be damaged.
- Filling shall in strict accordance with the provisions of the amount, note that the refrigerant oil hinders heat transfer, excessive filling will seriously reduce the air conditioner effect; generally no need to fill refrigerant oil, for refrigerant oil has been filled by the manufacturers; when replacing parts (except for compressors), the same type of refrigerant oil shall be added properly.
- Since the refrigeration oil is highly easy to absorb water, shorten the air contact time so long as possible.
- The refrigerant oil should be filled from the compressor exhaust port before vacuumize.

# Electric air conditioning system

## Technical specifications

### Torque Specifications

| Name | Torque range | |
|---|---|---|
| | Metric (Nm) | British (lb-ft) |
| Air conditioning compressor mounting bolts | 25 | 18 |

### Components

| | | |
|---|---|---|
| Compressor model | | WXH-106-AP |
| Condenser assembly | Type | Parallel-flow |
| | Specification D×H× W mm | 625×397×16mm |
| | Heat exchanging capacity | ≥ 4.5m / s Surface wind speed 13.1kW |
| Evaporator core | Type | Stack-up type |
| | Specification D×H× W mm | 58×255×255 |
| | Refrigeration capacity | Inlet air volume 423 m³/h, refrigerating capacity ≥ 4.2KW |
| Heater element | Type | Stack-up type |
| | Specification D×H× W mm | 27×220×180 |
| | Heat capacity | 6L/h flow, with 350 m³/h air volume, the collected volume ≥ 4.5kW |
| Air flow adjustment | | 8 gear |
| Max air flow | | Face cooling ≥ 423m³/h |
| | | Feet heating ≥ 300 m³/h |
| Refrigerant | Type | R134a |
| | Filling volume | 540g±20g |
| Lubricating oil | Type | PAG56 |
| | Filling volume | 120ml |
| A/C system | Max cooling power | At the compressure speed of 1800 rpm ≥ 4.8kW |
| | Temperature adjustment range | 18℃ ~32 |

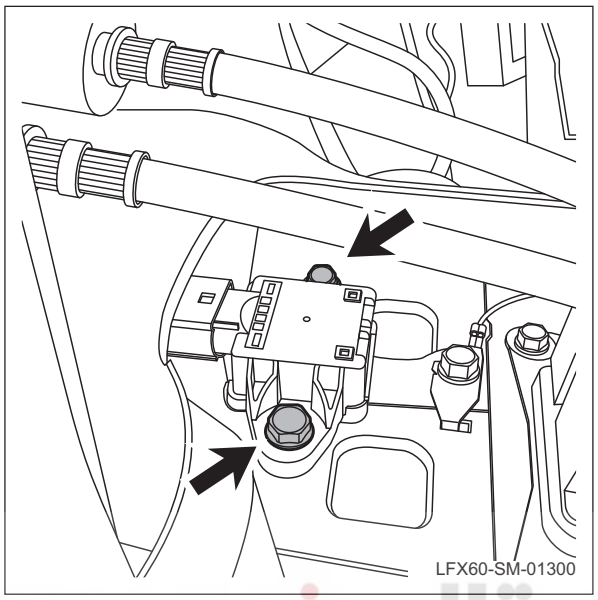
# 08- Electric air conditioning system

## Replacement of yaw rate sensor

### Removal

**1. Remove the yaw rate sensor.**

(a). Remove the front lower panel of the console, **refer to the replacement of the console assembly.**




(b). Disconnect the harness plug of the yaw rate sensor.

(c). Remove the mounting bolts of the yaw rate sensor.

(d). Take off the yaw rate sensor.

### Installation

**1. Install the yaw rate sensor.**

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