



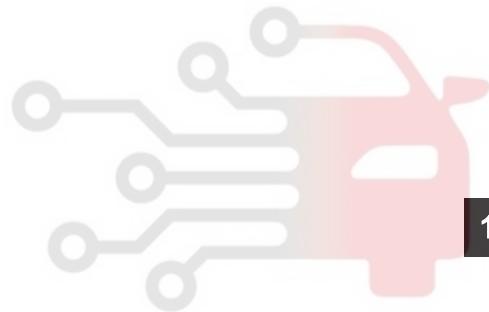
## 12 - Electrical system

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دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



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Wiper and scrubber



 力帆汽车  
LIFAN AUTO

## Wiper and scrubber

### Technical specifications

#### Torque Specifications

Name	Torque range	
	Nm	Lb -ft
Connect the rain wiper rod to the rain wiper arm	23	17
Connect the rear rain wiper motor to the rain wiper brush	23	17
Windscreen wahser fixed bolt	9	7
Connect the rain wiper motor to the vehicle body	9	7
Connect the rear rain wiper motor to the vehicle body	9	7

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## Precautions

### Precautions

1. Be sure to remove the battery cathode and wait for at least 1min before removing the system appliance wire, or it may cause personal injury.
2. If the wiper is blocked accidentally, the power should be cut timely for the prevention of burning the wiper motor. At this time, it is not enough to turn the rain wiper switch to OFF. It is necessary to quickly disconnect the battery cathode connector and remove the plug of the rain wiper motor from the socket of the combined switch.
3. The rain wiper brush should closely touch the vehicle window glass in use without a gap. Otherwise, the rain wiper can not clean well.
4. Forbid dry wiping in use to avoid damage to the rain wiper brush. If the rain wiper switch is triggered accidentally, it should be closed in time and the airwindow glass and the rain wiper should be cleaned and maintained to avoid accumulated dust.
5. After a rain wiper has been used for 1000h, the rain wiper motor should be disassembled for maintenance. The converter should be cleaned. The dual-zero paper is used to polish the electric brush trace on the converter's surface and the electric brush is replaced.
6. The washer cannot work for a long time and it cannot work for more than 5s every time. The break should not be less than 10s for each operation. The washer should not start without washing liquid.
7. The spray pipe must be fastened, it is prohibited to unplug the spray pipe casually. Do not spray the pipe interface for a long time when washing the car, so as to prevent it from corrosive aging.
8. For low temperature regions, be sure to add the cleaning solution meeting local temperature requirements.
9. Do not use the engine antifreeze or other substitutes to avoid damaging the window and paint.



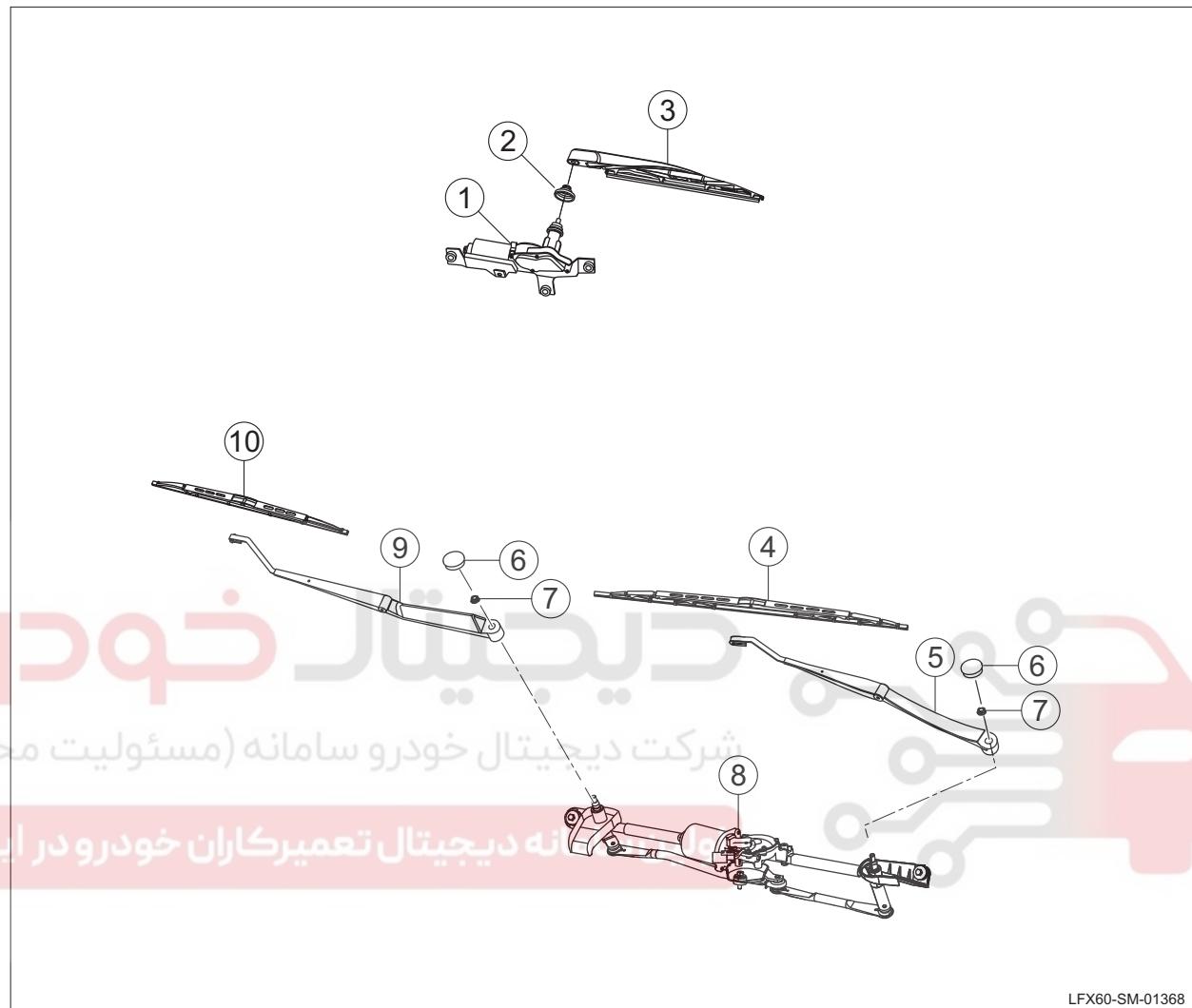
Wiper and scrubber



## Structure and installation location

### Part exploded view

#### Wiper



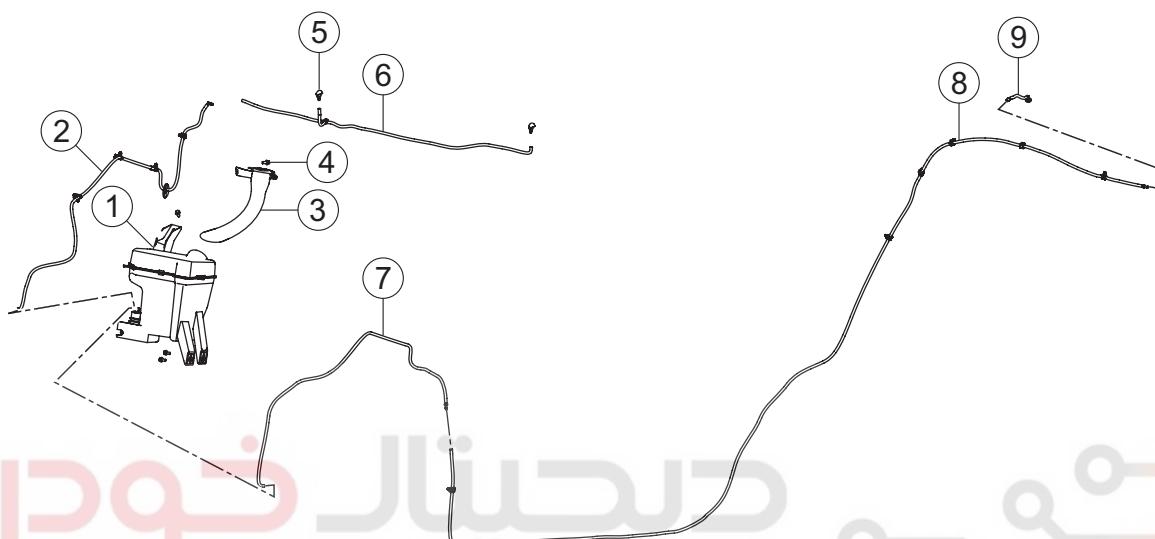
No.	Part name
1	Rear Wiper Motor Assembly
2	Motor rotating shaft jacket of rear rain wiper
3	Back door wiper assembly
4	Wiping brush component of left rain wiper
5	Wiping arm component of left rain wiper

No.	Part name
6	Wiper nut cap
7	Installation nut of rain wiper arm
8	Rain wiper connection rod and motor assembly
9	Wiping arm component of right rain wiper
10	Wiping brush component of right rain wiper

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## Washing storage liquid pot and pipeline



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LFX60-SM-01369

No.	Part name
1	Washing pot body component
2	Front section components of front air window hose
3	Injection pipe component of washing pot
4	Hexagon flange bolt
5	Front windscreen nozzle assembly

No.	Part name
6	Rear section components of front air window hose
7	Front section components of rear air window hose
8	Rear section components of rear air window hose
9	Rear windscreen nozzle assembly

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Wiper and scrubber



## Operating Principle

### System description

#### Front Wiper System

The front rain wiper system is composed of the rain wiper/washer switch, front rain wiper and connection rod, front rain wiper arm and front rain wiper blades.

#### Front Windshield Washer System

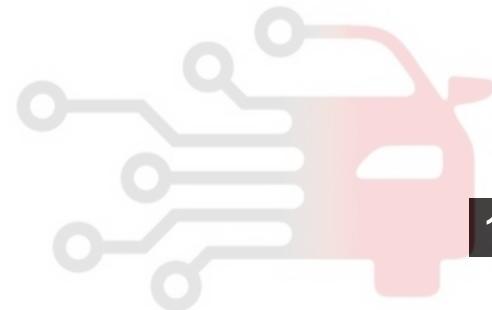
The front air window glass washing system is composed of the glass cleaning agent, washing liquid storage tank and motor, front washer sprayer, washing hose and rain wiper/washing switch. The washing motor is fixed on the washing liquid storage tank. The washing motor transfers the washing liquid to the front and rear washing sprayer via the washing hose. The washer switch is one part of the rain wiper/washer switch.

#### Rear Wiper System

The rear rain wiper is composed of the rain wiper/washer switch, rear rain wiper motor, rear rain wiper ram and rear rain wiper blades. The rear rain wiper motor is installed under the inside of the back door and is directly connected to the rear rain wiper arm.

#### Rear Windshield Washer System

The rear air window glass washer is composed of the glass cleaning agent, rear rain wiper motor assembly, rear washer sprayer, washing hose and rain wiper/washing switch. The washing motor transfers the washing liquid to the rear rain wiper sprayer above the back door via the washing hose and uniformly sprays them on the rear air window glass via the rear rain wiper sprayer.





## Diagnostic Information and Procedures

### Diagnosis Instructions

Before the rain wiping control system failure is diagnosed, please first read the system overview to know and familiarize the working principle of the rain wiping system and then start system diagnosis. When a failure occurs, these knowledge can assist you to identify correct failure diagnosis steps. More importantly, these knowledge can assist you to check if conditions described by the customer are normal.

Any failure diagnosis of the rain wiping system should start with rain wiping system check. It can guide repairers to take next logic step and diagnose failures. Comprehend and correctly use the diagnostic flow chart to shorten the diagnosis time and avoid the misjudgment.

### General equipment

Name
Diagnostic equipment of vehicle
Digital multimeter

### Visual Inspection

1. Confirm the problem raised by the customer.
2. Check for the evident mechanical or electrical damage trace and collision deformation trace through the visual check.

### Visual inspection table

Mechanical	Electrical
<ul style="list-style-type: none"> <li>• Front windshield</li> <li>• Rear windshield</li> <li>• Sprayer</li> <li>• Washing liquid pipeline</li> <li>• Washing liquid water pot</li> <li>• Rain wiper</li> <li>• Rain wiping arm</li> <li>• Rain wiper transmission arm</li> </ul>	<ul style="list-style-type: none"> <li>• Fuse</li> <li>• Line</li> <li>• Wiper cluster switch</li> <li>• Front wiper motor</li> <li>• Rear wiper motor</li> <li>• Washer motor</li> </ul>

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

Wiper and scrubber



### List of fault symptoms

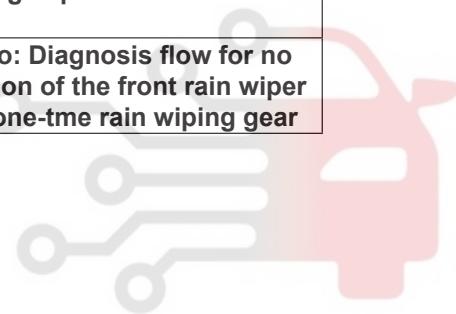
Symptom	Possible point of failure	Recommended Measures
The front rain wiper does not work	<ul style="list-style-type: none"> <li>Fuse</li> <li>Front wiper mechanism not installed in position</li> <li>Front wiper mechanism fault</li> <li>Wiper cluster switch</li> <li>Battery voltage low</li> <li>Front wiper motor</li> <li>Line fault</li> </ul>	Refer to: Diagnosis flow for non-operating front rain wiper
The front rain wiper cannot stop	<ul style="list-style-type: none"> <li>Line fault</li> <li>The rain wiper return signal failure</li> <li>Wiper cluster switch</li> <li>Front wiper motor</li> </ul>	Refer to: Diagnosis flow for non-stopping front rain wiper
The front rain wiper does not operate at the low-rate gear	<ul style="list-style-type: none"> <li>Line fault</li> <li>Low-rate signal failure</li> <li>Wiper cluster switch</li> <li>Front wiper motor</li> </ul>	Refer to: Diagnosis flow for non-operating front rain wiper at low rate gear
The front rain wiper does not operate at the high-rate gear	<ul style="list-style-type: none"> <li>Line fault</li> <li>High-rate signal failure</li> <li>Wiper cluster switch</li> <li>Front wiper motor</li> </ul>	Refer to: Diagnosis flow for non-operating front rain wiper at high rate gear
The front rain wiper does not operate at the intermittent gear	<ul style="list-style-type: none"> <li>Line fault</li> <li>Wiper cluster switch</li> </ul>	Refer to: Diagnosis flow for non-operating front rain wiper at intermittent gear
The front rain wiper continuously operates under the intermittent mode	<ul style="list-style-type: none"> <li>Line fault</li> <li>Intermittent signal failure of front rain wiper</li> <li>Wiper cluster switch</li> </ul>	Refer to: Diagnosis flow for continuous operation of front rain wiper at low intermittent gear
The rain wiper cannot wipe cleanly	<ul style="list-style-type: none"> <li>Washing solution unqualified</li> <li>Battery voltage low</li> <li>Wiper blade fault</li> <li>Windshield scratch, fracture</li> <li>Wiper mechanism fault</li> <li>Front wiper motor</li> </ul>	Refer to: Diagnosis flow for unclean rain wiping
Jitter in rain wiping	<ul style="list-style-type: none"> <li>The rain wiping mechanism is not installed in place</li> <li>Washing solution unqualified</li> <li>Battery voltage low</li> <li>Wiper blade fault</li> <li>Wiper mechanism fault</li> <li>Windshield scratch, fracture</li> <li>Front wiper motor</li> </ul>	Refer to: Diagnosis flow for jitter in rain wiping
The front rain wiper cannot return to the initial position	<ul style="list-style-type: none"> <li>Front wiper mechanism not installed in position</li> <li>Front wiper mechanism fault</li> <li>Line fault</li> <li>Wiper cluster switch</li> <li>Return signal failure of the front rain wiper motor</li> <li>Front wiper motor</li> </ul>	Refer to: Diagnosis flow for failed return to the initial position of the front rain wiper
The rear rain wiper does not work	<ul style="list-style-type: none"> <li>Rear wiper mechanism not installed in position</li> <li>Rear wiper mechanism fault</li> <li>Wiper cluster switch</li> <li>Battery voltage low</li> <li>Line fault</li> </ul>	Refer to: Diagnosis flow for non-operating rear rain wiper



Symptom	Possible point of failure	Recommended Measures
The rear rain wiper cannot return to the initial position.	<ul style="list-style-type: none"> <li>Rear wiper mechanism not installed in position</li> <li>Rear wiper mechanism fault</li> <li>Line fault</li> <li>Wiper cluster switch</li> <li>Return signal failure of rear rain wiper motor</li> <li>Rear wiper motor</li> </ul>	<b>Refer to: Diagnosis flow for failed return to the initial position of rear rain wiper</b>
The front washer does not work	<ul style="list-style-type: none"> <li>Washing solution insufficient</li> <li>Nozzle fault</li> <li>Cleaning hose fault</li> <li>Front washer switch</li> <li>Line fault</li> <li>Washer motor</li> </ul>	<b>Refer to: Diagnosis flow for no operation of the front washer</b>
The rear washer does not work	<ul style="list-style-type: none"> <li>Washing solution insufficient</li> <li>Nozzle fault</li> <li>Cleaning hose fault</li> <li>Rear washer switch</li> <li>Line fault</li> <li>Washer motor</li> </ul>	<b>Refer to: Diagnosis flow for no operation of the rear washer</b>
Water is not sprayed in place	<ul style="list-style-type: none"> <li>Washing solution insufficient</li> <li>Nozzle fault</li> <li>Cleaning hose fault</li> <li>Washer motor</li> </ul>	<b>Refer to: Diagnosis flow for no spraying in place</b>
The front rain wiper cannot work at the one-time wiping gear	<ul style="list-style-type: none"> <li>Fuse</li> <li>Line</li> <li>Wiper cluster switch</li> </ul>	<b>Refer to: Diagnosis flow for no operation of the front rain wiper at the one-time rain wiping gear</b>

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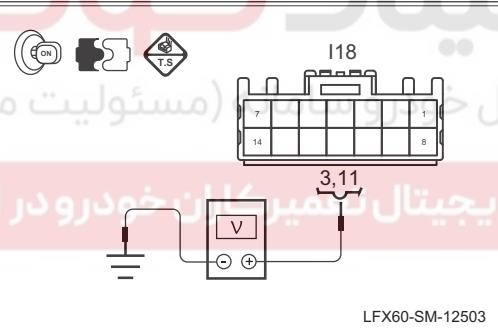


Wiper and scrubber

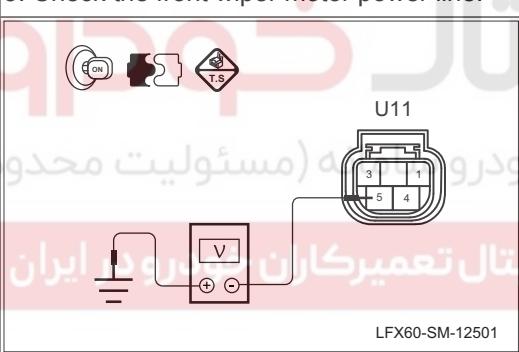
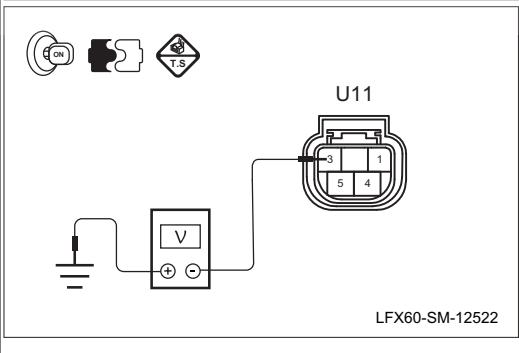


## Diagnosis flow for non-operating front rain wiper

Test condition	Details/results/measures
1. General inspection.	<p>A. Check if the harness plug of the rain wiper switch and front rain wiper motor are damaged, are aging and fall off.</p> <p>B. Check installation position and status of the front rain wiper.</p> <p>Is it OK after checking?</p> <p>→Yes To step 2. →No Repair or replace the damaged components.</p>
2. Check the front wiper motor fuse.	<p>A. Check the front wiper fuse FS25, FS26.</p> <p><b>Fuse rated capacity: 20A</b></p> <p>Is it OK after checking?</p> <p>→Yes To step 3. →No Replace the front wiper fuse.</p>
3. Check the wiper cluster switch power line.	<p>A. Operate the start switch to set the power mode to the “OFF” state.</p> <p>B. Disconnect the battery negative connector.</p> <p>C. Disconnect the wiper cluster switch harness plug I18.</p> <p>D. Connect the battery negative terminal.</p> <p>E. Operate the start switch to set the power mode to the “ON” state.</p> <p>F. Measure the voltage between the terminal 3 and 11 of the rain wiper combined switch harness plug I18 and the reliable grounding point.</p> <p><b>Standard value: 11 ~ 14 V</b></p> <p>Is the voltage normal?</p> <p>→Yes To step 4. →No Repair the wiper cluster switch power line fault and replace the harness if necessary.</p>

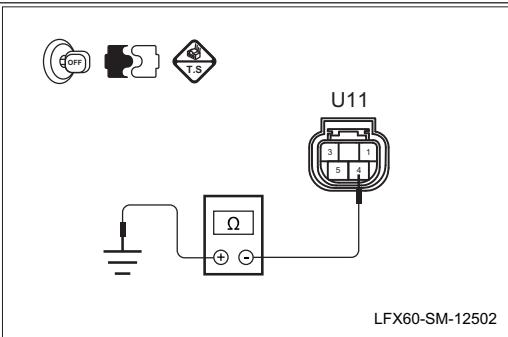




Test condition	Details/results/measures
4. Check the wiper cluster switch.	<p>A. Operate the start switch to set the power mode to the “OFF” state.</p> <p>B. Disconnect the battery negative connector.</p> <p>C. Disconnect the wiper cluster switch harness plug I18.</p> <p>D. Set the combined switch of the front rain wiper at the high-rate gear.</p> <p>E. Measure the resistance between the terminal 3 and 6 of the rain wipe combined switch.</p> <p><b>Standard value: less than 1Ω</b></p> <p>F. Set the combined switch of the front rain wiper at the low-rate gear.</p> <p>G. Measure the resistance between the terminal 3 and 10 of the rain wipe combined switch.</p> <p><b>Standard value: less than 1Ω</b></p> <p>Is the resistance normal?</p> <p>→Yes To step 5.</p> <p>→No Replace the wiper cluster switch. Refer to: Replacement of wiper cluster switch.</p>
5. Check the front wiper motor power line.	 <p>A. Operate the start switch to set the power mode to the “OFF” state.</p> <p>B. Disconnect the battery negative connector.</p> <p>C. Disconnect the front wiper motor harness plug U11.</p> <p>D. Connect the battery negative terminal.</p> <p>E. Operate the start switch to set the power mode to the “ON” state.</p> <p>F. Set the combined switch of the front rain wiper at the high-rate gear.</p> <p>G. Measure the voltage between the terminal 5 of the rain wiper motor harness plug U11 and the reliable grounding point.</p> <p><b>Standard value: 11 ~ 14 V</b></p> <p>H. Set the combined switch of the front rain wiper at the low-rate gear.</p> <p>I. Measure the voltage between the terminal 3 of the rain wiper motor harness plug U11 and the reliable grounding point.</p> <p><b>Standard value: 11 ~ 14 V</b></p> <p>Is the voltage normal?</p> <p>→Yes To step 6.</p> <p>→No Repair the front wiper motor power line fault and replace the harness if necessary.</p> 

Wiper and scrubber

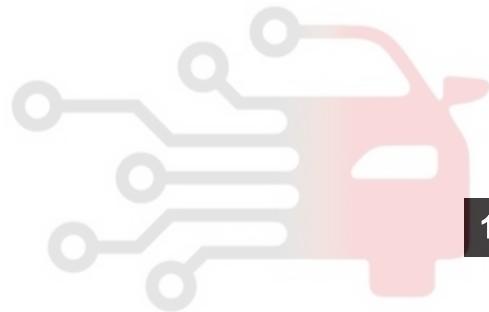


Test condition	Details/results/measures
<p>6. Check the front wiper motor ground line.</p>  <p>LFX60-SM-12502</p>	<p>A. Operate the start switch to set the power mode to the "OFF" state.      B. Disconnect the battery negative connector.      C. Disconnect the front wiper motor harness plug U11.      D. Measure the resistance between the front wiper motor harness plug U11 terminal 4 and fixed ground point with the multimeter.  <b>Standard value: less than 5Ω</b>      Is the resistance normal?      →Yes      To step 7.      →No      Repair the front wiper motor ground line fault and replace the harness if necessary.</p>
<p>7. Replace the front wiper motor.</p>	<p>A. Replace the front wiper motor.  <b>Refer to: Replace the front rain wiper motor</b>      Confirm the system is normal.</p>

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## Diagnosis flow for non-stopping front rain wiper

Test condition	Details/results/measures
1. General inspection.	<p>A. Check the front wiper harness plug and wiper cluster switch for breakage, aging, loose contact and looseness. Is it OK after checking? →Yes To step 2. →No Repair or replace the damaged components.</p>
2. Check the wiper cluster switch.	<p>A. Operate the start switch to set the power mode to the “OFF” state. B. Disconnect the battery negative connector. C. Disconnect the wiper cluster switch harness plug I18. D. Shift the combined switch of the front rain wiper to the Close status. E. Measure the resistance between the terminal 3 of the rain wipe combined switch and the terminal 6 of the power. F. Measure the resistance between the terminal 3 and 10 of the rain wipe combined switch. <b>Standard value: 10MΩ or higher</b> Is the resistance normal? →Yes To step 3. →No Replace the wiper cluster switch. <b>Refer to: Replacement of wiper cluster switch.</b></p>
3. Check the front wiper motor power line.	<p>A. Operate the start switch to set the power mode to the “OFF” state. B. Disconnect the battery negative connector. C. Disconnect the front wiper motor harness plug U11. D. Shift the combined switch of the front rain wiper to “OFF” status. E. Connect the battery negative terminal. F. Operate the start switch to set the power mode to the “ON” state. G. Measure the voltage between the terminal 1, 5 and 3 of the rain wipe motor harness plug U11 and the reliable grounding point. <b>Standard value: 0 V</b> Is the voltage normal? →Yes To step 4. →No Repair the front wiper motor power line fault and replace the harness if necessary.</p>

Wiper and scrubber



## 4. Replace the front wiper motor.

A. Replace the front wiper motor.  
**Refer to: Replacement of front wiper motor and connecting rod assembly.**  
 Confirm the system is normal.

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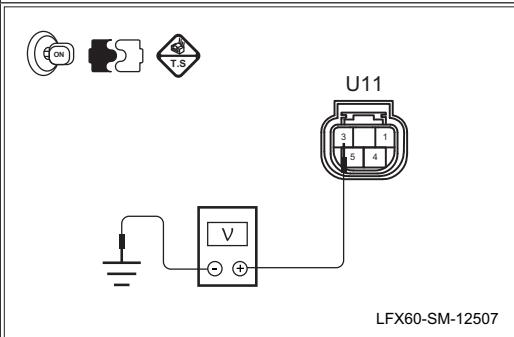
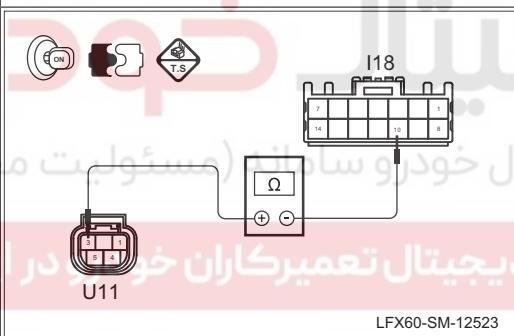


## Diagnosis flow for non-operating front rain wiper at low rate gear

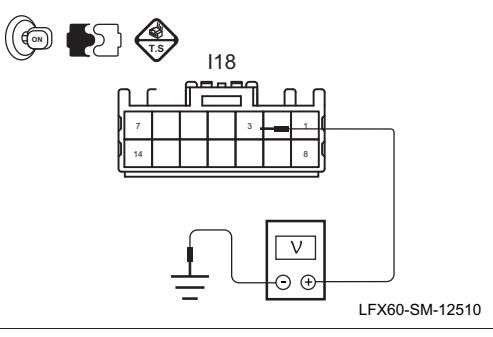
Test condition	Details/results/measures
1. General inspection.	<p>A. Check the front wiper harness plug and wiper cluster switch for breakage, aging, loose contact and looseness. Is it OK after checking? →Yes To step 2. →No Repair or replace the damaged components.</p>
2. Check the front wiper motor fuse.	<p>A. Check the front wiper fuse FS25, FS26. <b>Fuse rated capacity: 20A</b> Is it OK after checking? →Yes To step 3. →No Replace the front wiper fuse.</p>
3. Check the front wiper motor ground line.	<p>A. Operate the start switch to set the power mode to the “OFF” state. B. Disconnect the battery negative connector. C. Disconnect the front wiper motor harness plug U11. D. Measure the resistance between the front wiper motor harness plug U11 terminal 4 and fixed ground point with the multimeter. <b>Standard value: less than 5Ω</b> Is the resistance normal? →Yes To step 4. →No Repair the front wiper motor ground line fault and replace the harness if necessary.</p>

Wiper and scrubber

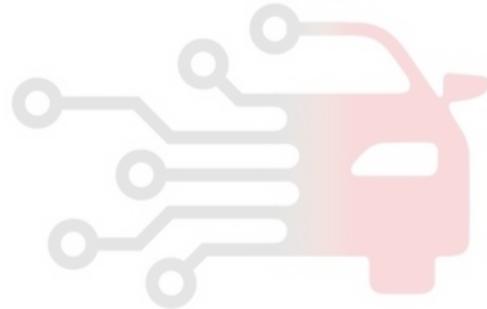


Test condition	Details/results/measures
<p>4. Check the voltage of the rain wiper motor at the low rate gear.</p> 	<p>A. Operate the start switch to set the power mode to the "OFF" state.      B. Disconnect the battery negative connector.      C. Disconnect the front wiper motor harness plug U11.      D. Connect the battery negative terminal.      E. Operate the start switch to set the power mode to the "ON" state.      F. Shift the combined switch of the rain wiper to the low rate position.      G. Measure the voltage between the front wiper motor harness plug U11 terminal 3 and fixed ground point with the multimeter.  <b>Standard value: 11 ~ 14 V</b>      Is the voltage normal?      →Yes      Replace the front wiper motor.  <b>Refer to: Replacement of front wiper motor and connecting rod assembly.</b>      →No      To step 5.</p>
<p>5. Check the power line of the front rain wiper motor at the low rate gear.</p> 	<p>A. Operate the start switch to set the power mode to the "OFF" state.      B. Disconnect the battery negative connector.      C. Disconnect the front wiper motor harness plug U11.      D. Disconnect the wiper cluster switch harness plug I18.      E. Measure the resistance between the front wiper motor harness plug U11 terminal 3 and the wiper cluster switch I18 terminal 10.  <b>Standard value: less than 5Ω</b>      Is the resistance normal?      →Yes      To step 6.      →No      Repair the front wiper motor low gear power line fault and replace the harness if necessary.</p>



Test condition	Details/results/measures
<p>6. Check the power circuit of the combined switch of the front rain wiper at the low rate gear.</p> 	<p>A. Operate the start switch to set the power mode to the "OFF" state.      B. Disconnect the battery negative connector.      C. Disconnect the wiper cluster switch harness plug I18.      D. Operate the start switch to set the power mode to the "ON" state.      E. Measure the voltage between the wiper cluster switch harness plug I18 terminal 3 and fixed ground point with the multimeter.  <b>Standard value: 11 ~ 14 V</b>      Is the voltage normal?      →Yes      To step 7.      →No      Repair the wiper cluster switch low speed power line fault and replace the harness if necessary.</p>
<p>7. Replace the wiper cluster switch.</p>	<p>A. Replace the wiper cluster switch.  <b>Refer to: Replacement of wiper cluster switch.</b>      Confirm the system is normal.</p>

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Wiper and scrubber



### Diagnosis flow for non-operating front rain wiper at high rate gear

Test condition	Details/results/measures
1. General inspection.	<p>A. Check the front wiper harness plug and wiper cluster switch for breakage, aging, loose contact and looseness. Is it OK after checking?</p> <p>→Yes To step 2. →No Repair or replace the damaged components.</p>
2. Check the front wiper motor fuse.	<p>A. Check the front wiper fuse FS25, FS26.</p> <p><b>Fuse rated capacity: 20A</b></p> <p>Is it OK after checking?</p> <p>→Yes To step 3. →No Replace the front wiper fuse.</p>
3. Check the front wiper motor ground line.	<p>A. Operate the start switch to set the power mode to the "OFF" state.</p> <p>B. Disconnect the battery negative connector.</p> <p>C. Disconnect the front wiper motor harness plug U11.</p> <p>D. Measure the resistance between the front wiper motor harness plug U11 terminal 4 and fixed ground point with the multimeter.</p> <p><b>Standard value: less than 5Ω</b></p> <p>Is the resistance normal?</p> <p>→Yes To step 4. →No Repair the front wiper motor ground line fault and replace the harness if necessary.</p>



Test condition	Details/results/measures
<p>4. Check the voltage of the rain wiper motor at the high rate gear.</p> <p>LFX60-SM-12509</p>	<p>A. Operate the start switch to set the power mode to the "OFF" state.      B. Disconnect the battery negative connector.      C. Disconnect the front wiper motor harness plug U11.      D. Connect the battery negative terminal.      E. Operate the start switch to set the power mode to the "ON" state.      F. Shift the combined switch of the rain wiper to the high rate position.      G. Measure the voltage between the front wiper motor harness plug U11 terminal 5 and fixed ground point with the multimeter.  <b>Standard value: 11 ~ 14 V</b>      Is the voltage normal?      →Yes      Replace the front wiper motor.  <b>Refer to: Replacement of front wiper motor and connecting rod assembly.</b>      →No      To step 5.</p>
<p>5. Check the power line of the front rain wiper motor at the high rate gear.</p> <p>LFX60-SM-01724</p>	<p>A. Operate the start switch to set the power mode to the "OFF" state.      B. Disconnect the battery negative connector.      C. Disconnect the front wiper motor harness plug U11.      D. Disconnect the wiper cluster switch harness plug I18.      E. Measure the resistance between the front wiper motor harness plug U11 terminal 5 and the wiper cluster switch I18 terminal 6.  <b>Standard value: less than 5Ω</b>      Is the resistance normal?      →Yes      To step 6.      →No      Repair the front wiper motor high gear power line fault and replace the harness if necessary.</p>

Wiper and scrubber



Test condition	Details/results/measures
6. Check the power circuit of the combined switch of the front rain wiper at the high rate gear.	<p>A. Operate the start switch to set the power mode to the “OFF” state.</p> <p>B. Disconnect the battery negative connector.</p> <p>C. Disconnect the wiper cluster switch harness plug I18.</p> <p>D. Operate the start switch to set the power mode to the “ON” state.</p> <p>E. Measure the voltage between the wiper cluster switch harness plug I18 terminal 3 and fixed ground point with the multimeter.</p> <p><b>Standard value: 11 ~ 14 V</b></p> <p>Is the voltage normal?</p> <p>→Yes To step 7.</p> <p>→No Repair the wiper cluster switch high speed power line fault and replace the harness if necessary.</p>
7. Replace the wiper cluster switch.	<p>A. Replace the wiper cluster switch.</p> <p><b>Refer to: Replacement of wiper cluster switch.</b></p> <p>Confirm the system is normal.</p>

دیجیتال خودرو سامانه (مسئولیت محدود)



12

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

12-1601

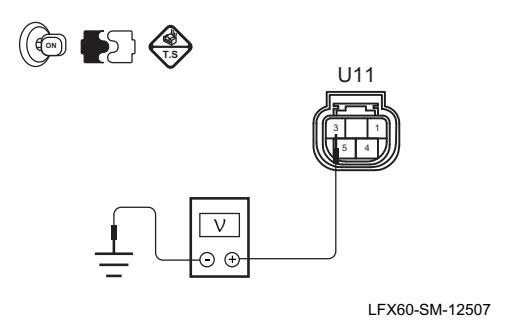
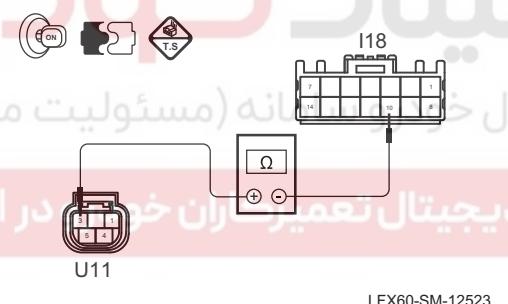


## Diagnosis flow for no operation of the front rain wiper at the one-time rain wiping gear

Test condition	Details/results/measures
1. General inspection.	<p>A. Check the front wiper harness plug and wiper cluster switch for breakage, aging, loose contact and looseness. Is it OK after checking?</p> <p>→Yes To step 2. →No Repair or replace the damaged components.</p>
2. Check the front wiper motor fuse.	<p>A. Check the front wiper fuse FS25, FS26. <b>Fuse rated capacity: 20A</b> Is it OK after checking?</p> <p>→Yes To step 3. →No Replace the front wiper fuse.</p>
3. Check the front wiper motor ground line.	<p>A. Operate the start switch to set the power mode to the "OFF" state.</p> <p>B. Disconnect the battery negative connector.</p> <p>C. Disconnect the front wiper motor harness plug U11.</p> <p>D. Measure the resistance between the front wiper motor harness plug U11 terminal 4 and fixed ground point with the multimeter. <b>Standard value: less than 5Ω</b> Is the resistance normal?</p> <p>→Yes To step 4. →No Repair the front wiper motor ground line fault and replace the harness if necessary.</p>

Wiper and scrubber



Test condition	Details/results/measures
<p>4. Check the voltage of the front rain wiper motor at "MIST" gear.</p>  <p>LFX60-SM-12507</p>	<p>A. Operate the start switch to set the power mode to the "OFF" state.      B. Disconnect the battery negative connector.      C. Disconnect the front wiper motor harness plug U11.      D. Connect the battery negative terminal.      E. Operate the start switch to set the power mode to the "ON" state.      F. Shift the combined switch of the rain wiper to "MIST" position under coordination of one person.      G. Measure the voltage between the terminal 3 of the front rain wiper motor harness plug U11 and the reliable grounding point (for test accuracy, measure multiple times under coordination of two persons).</p> <p><b>Standard value: 11 ~ 14 V</b></p> <p>Is the voltage normal?      →Yes      Replace the front wiper motor.  <b>Refer to: Replacement of front wiper motor and connecting rod assembly.</b>      →No      To step 5.</p>
<p>5. Check the front wiper motor MIST gear power line.</p>  <p>LFX60-SM-12523</p>	<p>A. Operate the start switch to set the power mode to the "OFF" state.      B. Disconnect the battery negative connector.      C. Disconnect the front wiper motor harness plug U11.      D. Disconnect the wiper cluster switch harness plug I18.      E. Measure the resistance between the terminal 3 of the front rain wiper motor harness plug U11 and the terminal 10 of the rain wiper combined switch I18.</p> <p><b>Standard value: less than 5Ω</b></p> <p>Is the resistance normal?      →Yes      To step 6.      →No      Repair the front wiper motor low gear power line fault and replace the harness if necessary.</p>



Test condition	Details/results/measures
6. Check the power circuit of the combined switch of the front rain wiper at "MIST" gear.	<p>A. Operate the start switch to set the power mode to the "OFF" state.</p> <p>B. Disconnect the battery negative connector.</p> <p>C. Disconnect the wiper cluster switch harness plug I18.</p> <p>D. Operate the start switch to set the power mode to the "ON" state.</p> <p>E. Measure the voltage between the wiper cluster switch harness plug I18 terminal 11 and fixed ground point with the multimeter.</p> <p><b>Standard value: 11 ~ 14 V</b></p> <p>Is the resistance normal?</p> <p>→Yes To step 7.</p> <p>→No Repair the wiper cluster switch low speed power line fault and replace the harness if necessary.</p>
7. Replace the wiper cluster switch.	<p>A. Replace the wiper cluster switch.</p> <p><b>Refer to: Replacement of wiper cluster switch.</b></p> <p>Confirm the system is normal.</p>

دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

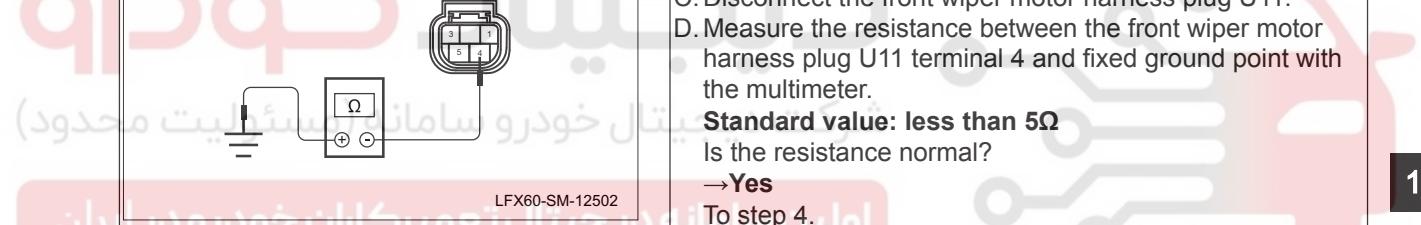


Wiper and scrubber



### Diagnosis flow for non-operating front rain wiper at intermittent gear

Test condition	Details/results/measures
1. General inspection.	<p>A. Check the front wiper harness plug and wiper cluster switch for breakage, aging, loose contact and looseness. Is it OK after checking? →Yes To step 2. →No Repair or replace the damaged components.</p>
2. Check the front wiper motor fuse.	<p>A. Check the front wiper fuse FS25, FS26. <b>Fuse rated capacity: 20A</b> Is it OK after checking? →Yes To step 3. →No Replace the front wiper fuse.</p>
3. Check the front wiper motor ground line.	<p>A. Operate the start switch to set the power mode to the “OFF” state. B. Disconnect the battery negative connector. C. Disconnect the front wiper motor harness plug U11. D. Measure the resistance between the front wiper motor harness plug U11 terminal 4 and fixed ground point with the multimeter. <b>Standard value: less than 5Ω</b> Is the resistance normal? →Yes To step 4. →No Repair the front wiper motor ground line fault and replace the harness if necessary.</p>





Test condition	Details/results/measures
<p>4. Check the voltage of the front rain wiper motor at “INT” gear.</p> <p>LFX60-SM-12507</p>	<p>A. Operate the start switch to set the power mode to the “OFF” state.      B. Disconnect the battery negative connector.      C. Disconnect the front wiper motor harness plug U11.      D. Connect the battery negative terminal.      E. Operate the start switch to set the power mode to the “ON” state.      F. Shift the combined switch of the rain wiper to “INT” position.      G. Measure the voltage between the front wiper motor harness plug U11 terminal 3 and fixed ground point with the multimeter.  <b>Standard value: 11 ~ 14 V</b>      Is the voltage normal?      →Yes      Replace the front wiper motor.  <b>Refer to: Replacement of front wiper motor and connecting rod assembly.</b>      →No      To step 5.</p>
<p>5. Check the front wiper motor INT gear power line.</p> <p>LFX60-SM-12524</p>	<p>A. Operate the start switch to set the power mode to the “OFF” state.      B. Disconnect the battery negative connector.      C. Disconnect the front wiper motor harness plug U11.      D. Disconnect the wiper cluster switch harness plug I18.      E. Measure the resistance between the terminal 3 of the front rain wiper motor harness plug U11 and the terminal 10 of the rain wiper combined switch harness plug I18.  <b>Standard value: less than 5Ω</b>      Is the resistance normal?      →Yes      To step 6.      →No      Repair the front wiper motor INT gear power line fault and replace the harness if necessary.</p>

Wiper and scrubber

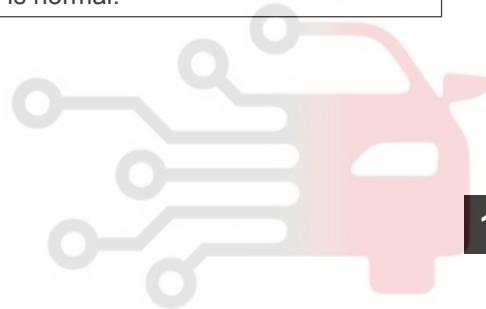


Test condition	Details/results/measures
6. Check the power circuit of the combined switch of the front rain wiper at "INT" gear.	<p>A. Operate the start switch to set the power mode to the "OFF" state.</p> <p>B. Disconnect the battery negative connector.</p> <p>C. Disconnect the wiper cluster switch harness plug I18.</p> <p>D. Connect the battery negative terminal.</p> <p>E. Operate the start switch to set the power mode to the "ON" state.</p> <p>F. Measure the voltage between the wiper cluster switch harness plug I18 terminal 3 and fixed ground point with the multimeter.</p> <p><b>Standard value: 11 ~ 14 V</b></p> <p>Is the voltage normal?</p> <p>→Yes To step 7.</p> <p>→No Repair the wiper cluster switch low speed power line fault and replace the harness if necessary.</p>
7. Replace the wiper cluster switch.	<p>A. Replace the wiper cluster switch.</p> <p><b>Refer to: Replacement of wiper cluster switch.</b></p> <p>Confirm the system is normal.</p>

دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

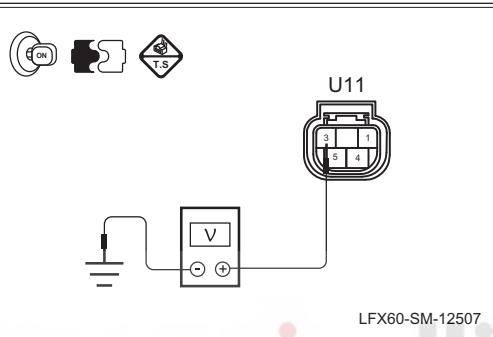
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12-1607



## Diagnosis flow for continuous operation of the front rain wiper under the intermittent mode

Test condition	Details/results/measures
1. General inspection.	
	<p>A. Check the front wiper harness plug and wiper cluster switch for breakage, aging, loose contact and looseness. Is it OK after checking?</p> <p>→Yes To step 2.</p> <p>→No Repair or replace the damaged components.</p>
2. Check the front wiper motor INT gear power line.	
	<p>A. Operate the start switch to set the power mode to the “OFF” state.</p> <p>B. Disconnect the battery negative connector.</p> <p>C. Disconnect the front wiper motor harness plug U11.</p> <p>D. Disconnect the wiper cluster switch harness plug I18.</p> <p>E. Connect the battery negative terminal.</p> <p>F. Operate the start switch to set the power mode to the “ON” state.</p> <p>G. Check the voltage between the terminal 3 of the harness plug U11 of the front rain wiper motor and the reliable grounding point.</p> <p><b>Standard value: 0 V</b></p> <p>Is the voltage normal?</p> <p>→Yes To step 3.</p> <p>→No Repair the front wiper motor INT gear power line fault and replace the harness if necessary.</p>
3. Replace the wiper cluster switch.	
	<p>A. Replace the wiper cluster switch.</p> <p><b>Refer to: Replacement of wiper cluster switch.</b></p> <p>Confirm the system is normal.</p>

Wiper and scrubber



### Diagnosis flow for unclean rain wiping

Test condition	Details/results/measures
1. General inspection.	<p>A. Fill the genuine washing solution and operate the wiper. Is it OK after checking? →Yes Replace the genuine washing solution. →No To step 2.</p>
2. Check the wiper blade.	<p>A. Check the wiper blade cleaning condition. B. Check the wiper blade for aging, abrasion and breakage. Is it OK after checking? →Yes To step 3. →No Clean the wiper blade and replace it if necessary. <b>Refer to: Replacement of front wiper blade</b> <b>Refer to: Replacement of rear wiper blade</b></p>
3. Check the wiper arm.	<p>A. Check the installation position of wiper arm. B. Check the elasticity of wiper arm. Is it OK after checking? →Yes To step 4. →No Adjust the wiper arm installation position and replace the wiper arm if necessary. <b>Refer to: Replacement of front wiper arm</b> <b>Refer to: Replacement of rear wiper arm</b></p>
4. Check the windshield.	<p>A. Check the windshield cleaning condition. B. Check the windshield for scratch and breakage. Is it OK after checking? →Yes To step 5. →No Clean the windshield and replace it if necessary.</p>



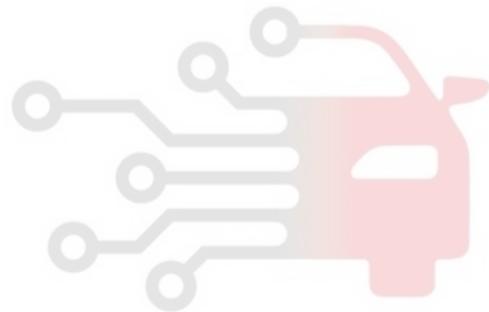
Wiper and scrubber

Test condition	Details/results/measures
5. Replace the rain wiper connection rod.	<p>A. Replace the rain wiper connection rod.</p> <p><b>Refer to: Replacement of front wiper motor and connecting rod assembly.</b></p> <p><b>Refer to: Replacement of rear wiper motor and connecting rod assembly.</b></p> <p>Confirm the system is normal.</p>

# دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



12-1610

Wiper and scrubber



### Diagnosis flow for jitter in rain wiping

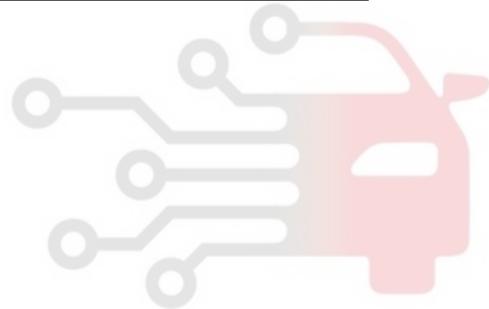
Test condition	Details/results/measures
1. General inspection.	<p>A. Fill the genuine washing solution and operate the wiper. Is it OK after checking? →Yes Replace the genuine washing solution. →No To step 2.</p>
2. Check the wiper blade.	<p>A. Check the wiper blade cleaning condition. B. Check the wiper blade for aging, abrasion and breakage. Is it OK after checking? →Yes To step 3. →No Clean the wiper blade and replace it if necessary. <b>Refer to: Replacement of front wiper blade</b> <b>Refer to: Replacement of rear wiper blade</b></p>
3. Check the wiper arm.	<p>A. Check the installation position of wiper arm. B. Check the elasticity of wiper arm. Is it OK after checking? →Yes To step 4. →No Adjust the wiper arm installation position and replace the wiper arm if necessary. Refer to: Replacement of front wiper arm Refer to: Replacement of rear wiper arm</p>
4. Check the windshield.	<p>A. Check the windshield cleaning condition. B. Check the windshield for scratch and breakage. Is it OK after checking? →Yes To step 5. →No Clean the windshield and replace it if necessary.</p>



Test condition	Details/results/measures
5. Check the rain wiper connection rod.	<p>A. Check the installation of wiper link mechanism.          B. Check the wiper link mechanism for deformation and damage.          Is it OK after checking?          → <b>Yes</b>          To step 6.          → <b>No</b>          Adjust the wiper link mechanism and replace it if necessary.  <b>Refer to: Replacement of front wiper motor and connecting rod assembly.</b>  <b>Refer to: Replacement of rear wiper motor and connecting rod assembly.</b></p>
6. Replace the wiper motor.	<p>A. Replace the rain wiper motor.  <b>Refer to: Replacement of front wiper motor and connecting rod assembly.</b>  <b>Refer to: Replacement of rear wiper motor and connecting rod assembly.</b>          Confirm the system is normal.</p>

دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



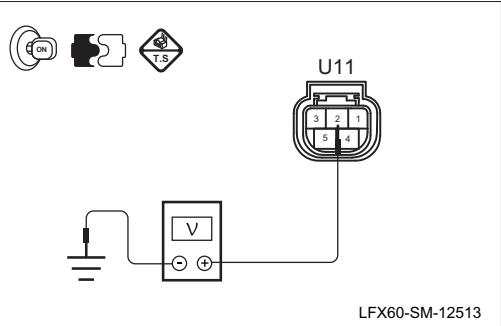
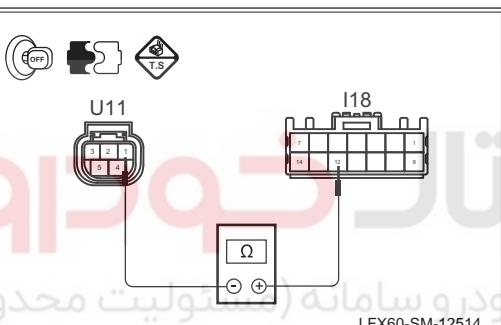
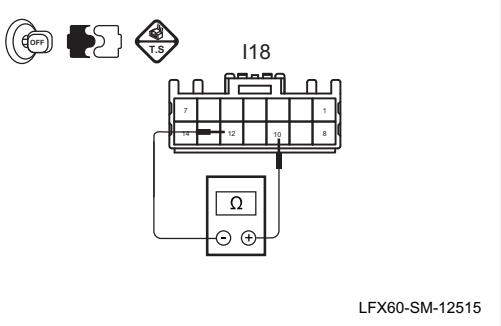
Wiper and scrubber



### Diagnosis flow for failed return to the initial position of the front rain wiper

Test condition	Details/results/measures
1. General inspection.	<p>A. Check the front wiper harness plug and wiper cluster switch for breakage, aging, loose contact and looseness. Is it OK after checking?</p> <p>→Yes To step 2. →No Repair or replace the damaged components.</p>
2. Check the front wiper arm.	<p>A. Check the installation position of wiper arm. B. Check the elasticity of wiper arm. Is it OK after checking?</p> <p>→Yes To step 3. →No Adjust the installation position of the front rain wiper arm. If necessary, replace the front rain wiper arm. Refer to: Replacement of front wiper arm</p>
3. Check the connection rod of the front rain wiper.	<p>A. Check the installation of wiper link mechanism. B. Check the wiper link mechanism for deformation and damage. Is the system normal?</p> <p>→Yes To step 4. →No Adjust the connection rod of the front rain wiper. If necessary, replace the connection rod of the front rain wiper. Refer to: Replacement of front wiper motor and connecting rod assembly.</p>
4. Check the wiper return fuse.	<p>A. Check the wiper fuse FS26. <b>Fuse rated capacity: 20A</b> Is it OK after checking?</p> <p>→Yes To step 5. →No Replace the front wiper fuse.</p>



Test condition	Details/results/measures
<p>5. Check the return power line of the front rain wiper motor.</p> 	<p>A. Operate the start switch to set the power mode to the "OFF" state.      B. Disconnect the battery negative connector.      C. Disconnect the front wiper motor harness plug U11.      D. Connect the battery negative terminal.      E. Measure the voltage between the terminal 2 of the front rain wiper motor harness plug U11 and the reliable grounding point.  <b>Standard value: 11 ~ 14 V</b>      Is it OK after checking?      →Yes      To step 6.      →No      Repair return power line failures of the front rain wiper. If necessary, replace the harness.</p>
<p>6. Check the return line of the front rain wiper.</p> 	<p>A. Operate the start switch to set the power mode to the "OFF" state.      B. Disconnect the battery negative connector.      C. Disconnect the front wiper motor harness plug U11.      D. Disconnect the harness connector I18 of the combined switch of the rain wiper.      E. Measure the resistance between the terminal 1 of the front rain wiper motor harness plug U11 and the terminal 12 of the rain wiper combined switch harness connector I18.  <b>Standard value: less than 5Ω</b>      Is the resistance normal?      →Yes      To step 7.      →No      Repair motor circuit harness failures of the front rain wiper. If necessary, replace the harness.</p>
<p>7. Check the wiper cluster switch.</p> 	<p>A. Operate the start switch to set the power mode to the "OFF" state.      B. Disconnect the battery negative connector.      C. Disconnect the wiper cluster switch harness plug I18.      D. Shift the combined switch of the rain wiper to "Off" position.      E. Measure the resistance between the terminal 10 and 12 of the rain wiper combined switch harness connector I18.  <b>Standard value: less than 1Ω</b>      Is the resistance normal?      →Yes      To step 8.      →No      Replace the wiper cluster switch.  <b>Refer to: Replacement of wiper cluster switch.</b></p>

Wiper and scrubber

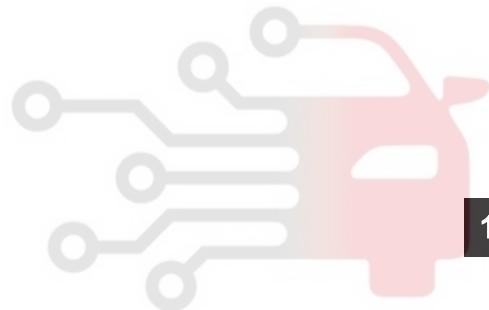


Test condition	Details/results/measures
8. Check the motor of the front rain wiper.	<p>A. Replace the front wiper motor.  <b>Refer to: Replace the front rain wiper and connection rod assembly.</b>          Confirm the system is normal.</p>

# دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



12

12-1615

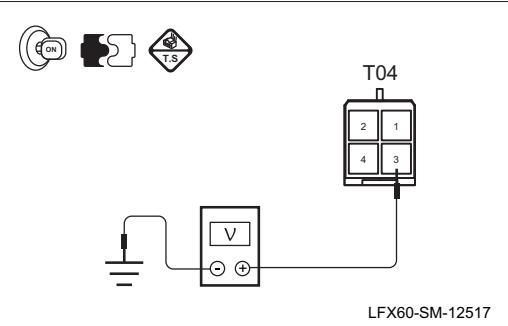
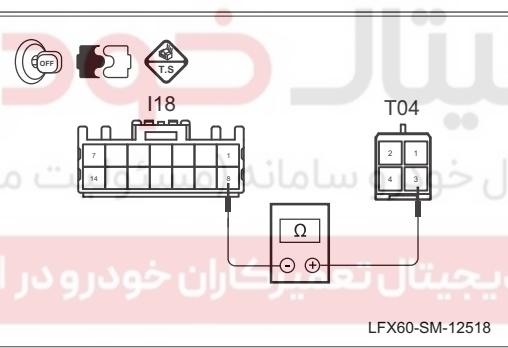


## Diagnosis flow for invalid rear rain wiper

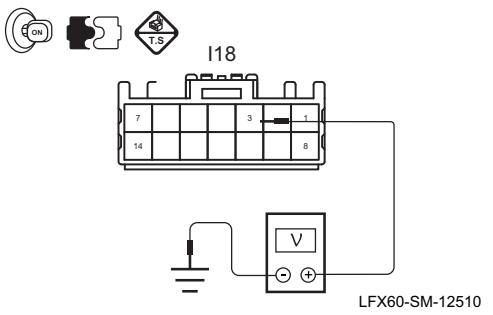
Test condition	Details/results/measures
1. General inspection.	<p>A. Check if the harness plug of the combined switch of the rain wiper and rear rain wiper motor are damaged and aging and fall off.</p> <p>B. Check installation position and status of the rear rain wiper mechanism.</p> <p>Is it OK after checking?</p> <p>→Yes To step 2.</p> <p>→No Repair or replace the damaged components.</p>
2. Check the fuse of the rear rain wiper.	<p>A. Check the front wiper fuse FS25.</p> <p><b>Fuse rated capacity: 20A</b></p> <p>Is it OK after checking?</p> <p>→Yes To step 3.</p> <p>→No Replace the front wiper fuse.</p>
3. Check the rear wiper motor ground line.	<p>A. Operate the start switch to set the power mode to the "OFF" state.</p> <p>B. Disconnect the battery negative connector.</p> <p>C. Disconnect the rear wiper motor harness plug T04.</p> <p>D. Check the resistance between the terminal 4 of the harness plug T04 of the rear rain wiper motor and the reliable grounding point.</p> <p><b>Standard value: less than 5Ω</b></p> <p>Is the resistance normal?</p> <p>→Yes To step 4.</p> <p>→No Repair motor grounding line failures of the rear rain wiper. If necessary, replace the harness.</p>

Wiper and scrubber

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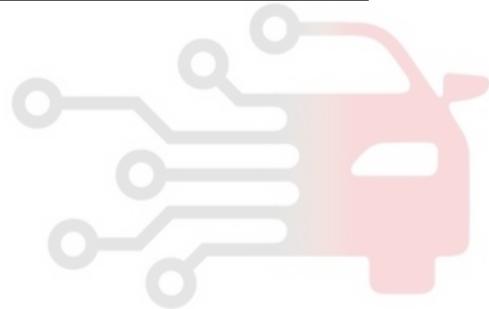
Test condition	Details/results/measures
<p>4. Check the input voltage of the rear rain wiper motor.</p> 	<p>A. Operate the start switch to set the power mode to the “OFF” state.      B. Disconnect the battery negative connector.      C. Disconnect the rear wiper motor harness plug T04.      D. Operate the start switch to set the power mode to the “ON” state.      E. Shift the combined switch to the wiping gear of the rear rain wiper.      F. Measure the voltage between the terminal 3 of the rear rain wiper harness plug T04 and the reliable grounding point.</p> <p><b>Standard value: 11 ~ 14V</b>      Is the voltage normal?      →Yes      Replace rear wiper motor.  <b>Refer to: Replacement of rear wiper motor and connecting rod assembly.</b>      →No      To step 5.</p>
<p>5. Check the input voltage line of the rear rain wiper motor.</p> 	<p>A. Operate the start switch to set the power mode to the “OFF” state.      B. Disconnect the battery negative connector.      C. Disconnect the rear wiper motor harness plug T04.      D. Disconnect the wiper cluster switch harness plug I18.      E. Measure the resistance between the terminal 3 of the rear rain wiper harness plug T04 and the terminal 8 of the rain wiper combined switch harness plug I18.</p> <p><b>Standard value: less than 5Ω</b>      Is the resistance normal?      →Yes      To step 6.      →No      Repair motor input voltage line failures of the rear rain wiper. If necessary, replace the harness.</p>



Test condition	Details/results/measures
<p>6. Check the power voltage of the combined switch of the rain wiper.</p> 	<p>A. Operate the start switch to set the power mode to the “OFF” state.      B. Disconnect the battery negative connector.      C. Disconnect the wiper cluster switch harness plug I18.      D. Operate the start switch to set the power mode to the “ON” state.      E. Measure the voltage between the wiper cluster switch harness plug I18 terminal 3 and fixed ground point with the multimeter.  <b>Standard value: 11 ~ 14 V</b>      Is the voltage normal?      →Yes      To step 7.      →No      Repair the wiper cluster switch power line fault and replace the harness if necessary.</p>
<p>7. Replace the combined switch of the rain wiper.</p>	<p>A. Replace the wiper cluster switch.  <b>Refer to: Replacement of cluster switch.</b>      Confirm the system is normal.</p>

دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



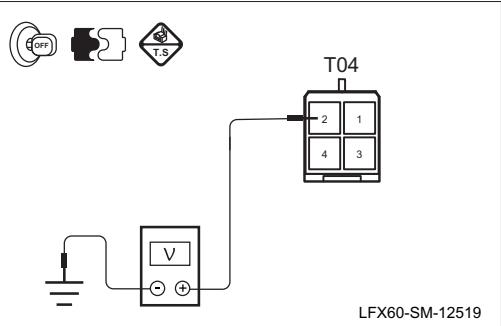
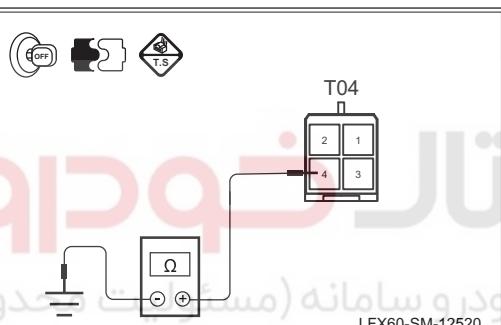
Wiper and scrubber



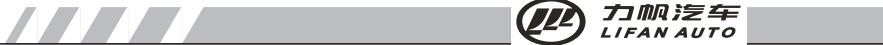
### Diagnosis flow for failed return to the initial position of rear rain wiper

Test condition	Details/results/measures
1. General inspection.	<p>A. Check the rear wiper harness plug and wiper cluster switch for breakage, aging, loose contact and looseness. Is it OK after checking? →Yes To step 2. →No Repair or replace the damaged components.</p>
2. Check the rear wiper arm.	<p>A. Check the installation position of rear wiper arm. B. Check the elasticity of rear wiper arm. Is it OK after checking? →Yes To step 3. →No Adjust the installation position of the rear rain wiper arm. If necessary, replace the rear rain wiper arm. <b>Refer to: Replacement of rear wiper arm</b></p>
3. Check the connection rod of the rear rain wiper.	<p>A. Check the installation of rear wiper link mechanism. B. Check the rear wiper link mechanism for deformation and damage. Is it OK after checking? →Yes To step 4. →No Adjust the wiper link mechanism and replace it if necessary. <b>Refer to: Replacement of rear wiper motor and connecting rod assembly.</b></p>
4. Check the wiper return fuse.	<p>A. Check the wiper fuse FS26. <b>Fuse rated capacity: 20A</b> Is it OK after checking? →Yes To step 5. →No Replace the front wiper fuse.</p>



Test condition	Details/results/measures
<p>5. Check the return power of the rear rain wiper motor.</p> 	<p>A. Operate the start switch to set the power mode to the "OFF" state.      B. Disconnect the battery negative connector.      C. Disconnect the rear wiper motor harness plug T04.      D. Connect the battery negative terminal.      E. Measure the voltage between the terminal 2 of the front rain wiper motor harness plug T04 and the reliable grounding point.  <b>Standard value: 11 ~ 14V</b>      Is the voltage normal?      →Yes      To step 6.      →No      Repair return power line failures of the REAR rain wiper. If necessary, replace the harness.</p>
<p>6. Check the rear wiper motor ground line.</p> 	<p>A. Operate the start switch to set the power mode to the "OFF" state.      B. Disconnect the battery negative connector.      C. Disconnect the rear wiper motor harness plug T04.      D. Measure the resistance between the terminal 4 of the rain wiper motor harness plug T04 and the reliable grounding point.  <b>Standard value: less than 5Ω</b>      Is the resistance normal?      →Yes      To step 7.      →No      Repair rear rain wiper and grounding line failures. If necessary, replace the harness.</p>
<p>7. Replace the wiper motor.</p>	<p>A. Replace the rear wiper motor.  <b>Refer to: Replacement of rear wiper motor and connecting rod assembly.</b>      Confirm the system is normal.</p>

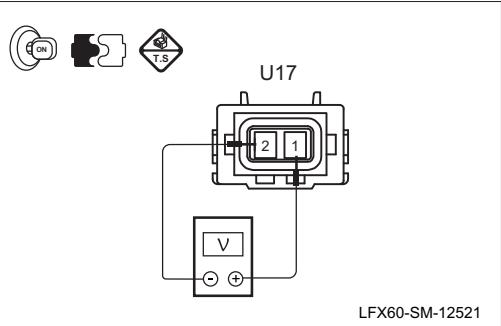
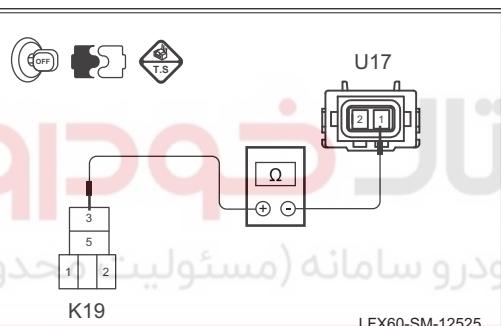
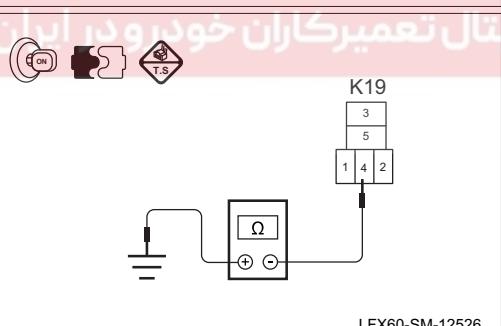
Wiper and scrubber



### Diagnosis flow for no operation of the front washer

Test condition	Details/results/measures
1. General inspection.	<p>A. Check whether the washing solution is sufficient and the washing line is free of falling or damage.</p> <p>B. Check the washer harness plug and cluster switch for breakage, aging, loose contact and looseness.</p> <p>Is it OK after checking?</p> <p>→Yes To step 2.</p> <p>→No Repair or replace the abnormal components.</p>
2. Check the fuse.	<p>A. Check the fuse FS25.</p> <p><b>Fuse rated capacity: 20A</b></p> <p>Is it OK after checking?</p> <p>→Yes To step 3.</p> <p>→No Replace the fuse.</p>
3. Check the washer motor relay.	<p>A. Operate the start switch to set the power mode to the “OFF” state.</p> <p>B. Disconnect the battery negative connector.</p> <p>C. Remove the washer relay 1K18 and washer relay 2K19.</p> <p>D. Replace the washer relay K18 and K19 with the relay of same model and check whether the system is normal.</p> <p>Is it OK after checking?</p> <p>→No To step 4.</p> <p>→Yes Replace the K18 of the electric appliance of the washing relay and the electric appliance 2 K19 of the washing relay.</p>



Test condition	Details/results/measures
<p>4. Check the washer motor power voltage.</p>  <p>LFX60-SM-12521</p>	<p>A. Operate the start switch to set the power mode to the "OFF" state.      B. Disconnect the battery negative connector.      C. Disconnect the washer motor harness plug U17.      D. Connect the battery negative terminal.      E. Operate the start switch to shift the power mode to "ON" status and make the front rain wiper spray water.      F. Measure the voltage between the washer motor harness plug U17 terminal 1 and terminal 2.</p> <p><b>Standard value: 11 ~ 14 V</b>      Is the voltage normal?      →<b>No</b>      To step 5.      →<b>Yes</b>      Replace the washer motor.  <b>Refer to: Replacement of washer motor</b></p>
<p>5. Check the washer motor ground line.</p>  <p>LFX60-SM-12525</p>  <p>LFX60-SM-12526</p>	<p>A. Operate the start switch to set the power mode to the "OFF" state.      B. Disconnect the battery negative connector.      C. Disconnect the washer motor harness plug U17.      D. Remove the washer motor relay K19.      E. Measure the resistance between the terminal 3 of the washer motor relay K19 and the terminal 1 of the washer motor harness plug U17.      F. Measure the resistance between the washer motor relay K19 terminal 4 and fixed ground point.</p> <p><b>Standard value: less than 5Ω</b>      Is the resistance normal?      →<b>Yes</b>      To step 6.      →<b>No</b>      Repair the washer motor ground line fault and replace the harness if necessary.</p>

Wiper and scrubber

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Test condition	Details/results/measures
6. Check the washer motor power line.	<p>A. Operate the start switch to set the power mode to the "OFF" state.  B. Disconnect the battery negative connector.  C. Disconnect the washer motor harness plug U17.  D. Disconnect the combined switch I18.  E. Remove the washer motor relay K18.  F. Measure the resistance between the terminal 3 of the washer motor relay K18 and the terminal 2 of the washer motor harness plug U17.  G. Measure the resistance between the terminal 5 of the rain wiper combined switch harness connector I18 and the terminal 4 of the washer motor relay K18.</p> <p><b>Standard value: less than 5Ω</b></p> <p>Is the resistance normal?</p> <p>→Yes To step 7. →No Repair the washer motor power line fault and replace the harness if necessary.</p>
7. Check the wiper cluster switch power line.	<p>A. Operate the start switch to set the power mode to the "OFF" state.  B. Disconnect the battery negative connector.  C. Disconnect the wiper cluster switch harness connector I18.  D. Connect the battery negative terminal.  E. Operate the start switch to set the power mode to the "ON" state.  F. Measure the voltage between the wiper cluster switch harness connector I18 terminal 3 and fixed ground point.</p> <p><b>Standard value: 11 ~ 14 V</b></p> <p>Is the voltage normal?</p> <p>→Yes To step 8. →No Repair the wiper cluster switch power line fault and replace the harness if necessary.</p>
8. Replace the wiper cluster switch.	<p>A. Replace the wiper cluster switch.  <b>Refer to: Replacement of wiper cluster switch.</b>  Confirm the system is normal.</p>

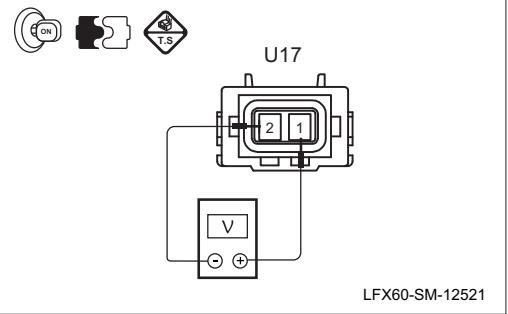
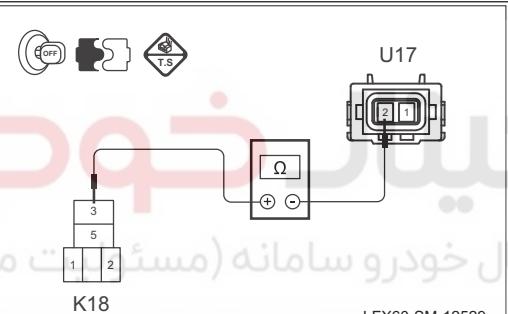
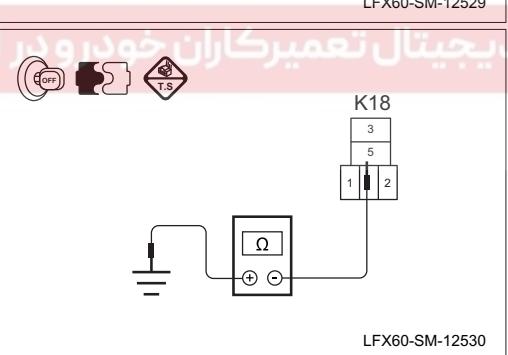


## Diagnosis flow for no operation of the rear washer

Test condition	Details/results/measures
1. General inspection.	<p>A. Check whether the washing solution is sufficient and the washing line is free of falling or damage.</p> <p>B. Check the washer harness plug and cluster switch for breakage, aging, loose contact and looseness.</p> <p>Is it OK after checking?</p> <p>→Yes To step 2.</p> <p>→No Repair or replace the abnormal components.</p>
2. Check the fuse.	<p>A. Check the fuse FS25.</p> <p><b>Fuse rated capacity: 20A</b></p> <p>Is it OK after checking?</p> <p>→Yes To step 3.</p> <p>→No Replace the fuse.</p>
3. Check the washer motor relay.	<p>A. Operate the start switch to set the power mode to the “OFF” state.</p> <p>B. Disconnect the battery negative connector.</p> <p>C. Remove the washer relay 1K18 and washer relay 2K19.</p> <p>D. Replace the washer relay K18 and K19 with the relay of same model and check whether the system is normal.</p> <p>Is it OK after checking?</p> <p>→No To step 4.</p> <p>→Yes Replace the K18 of the electric appliance of the washing relay and the electric appliance 2 K19 of the washing relay.</p>

Wiper and scrubber

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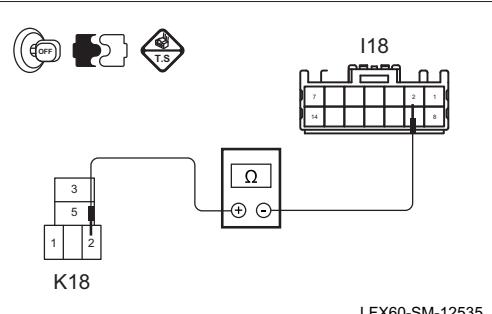
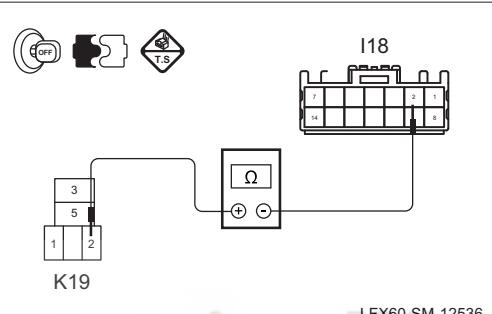
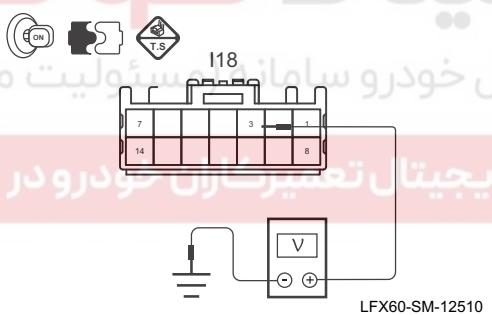
Test condition	Details/results/measures
<p>4. Check the washer motor power voltage.</p> 	<p>A. Operate the start switch to set the power mode to the "OFF" state.      B. Disconnect the battery negative connector.      C. Disconnect the washer motor harness plug U17.      D. Connect the battery negative terminal.      E. Operate the start switch to shift the power mode to "ON" status and make the rear rain wiper spray water.      F. Measure the voltage between the washer motor harness plug U17 terminal 1 and terminal 2.</p> <p><b>Standard value: 11 ~ 14 V</b>      Is it OK after checking?      →<b>No</b>      To step 5.      →<b>Yes</b>      Replace the washer motor.  <b>Refer to: Replacement of washer motor</b></p>
<p>5. Check the washer motor ground line.</p>  	<p>A. Operate the start switch to set the power mode to the "OFF" state.      B. Disconnect the battery negative connector.      C. Disconnect the washer motor harness plug U17.      D. Remove the washer motor relay K18.      E. Measure the resistance between the terminal 3 of the washer motor relay K18 and the terminal 2 of the washer motor harness plug U17.      F. Measure the resistance between the washer motor relay K18 terminal 5 and fixed ground point.</p> <p><b>Standard value: less than 5Ω</b>      Is it OK after checking?      →<b>Yes</b>      To step 6.      →<b>No</b>      Repair the washer motor ground line fault and replace the harness if necessary.</p>



Test condition	Details/results/measures
6. Check the washer motor power line.	<p>A. Operate the start switch to set the power mode to the "OFF" state.</p> <p>B. Disconnect the battery negative connector.</p> <p>C. Disconnect the washer motor harness plug U17.</p> <p>D. Disconnect the wiper cluster switch harness plug I18.</p> <p>E. Remove the washer motor relay K19.</p> <p>F. Measure the resistance between the terminal 3 of the washer motor relay K19 and the terminal 1 of the washer motor harness plug U17.</p> <p>G. Measure the resistance between the terminal 5 of the washer motor relay K19 and the terminal 2 of the washer motor harness plug I18.</p> <p><b>Standard value: less than 5Ω</b></p> <p>Is it OK after checking?</p> <p>→Yes</p> <p>To step 7.</p> <p>→No</p> <p>Repair the washer motor power line fault and replace the harness if necessary.</p>
7. Check the grounding line of the relay of the washer motor.	<p>A. Operate the start switch to set the power mode to the "OFF" state.</p> <p>B. Disconnect the battery negative connector.</p> <p>C. Remove the washer motor relay K18.</p> <p>D. Remove the washer motor relay K19.</p> <p>E. Measure the resistance between the terminal 1 of the washer motor relay K18 and the reliable grounding point.</p> <p>F. Measure the resistance between the washer motor relay K19 terminal 1 and fixed ground point.</p> <p><b>Standard value: less than 5Ω</b></p> <p>Is it OK after checking?</p> <p>→Yes</p> <p>To step 8.</p> <p>→No</p> <p>Repair grounding failures of the washer motor relay. If necessary, replace the harness.</p>

Wiper and scrubber



Test condition	Details/results/measures
<p>8. Check the power line of the relay of the washer motor.</p>  <p>LFX60-SM-12535</p>  <p>LFX60-SM-12536</p>	<p>A. Operate the start switch to set the power mode to the "OFF" state.</p> <p>B. Disconnect the battery negative connector.</p> <p>C. Disconnect the wiper cluster switch harness plug I18.</p> <p>D. Remove the washer motor relay K18.</p> <p>E. Remove the washer motor relay K19.</p> <p>F. Measure the resistance between the terminal 2 of the rain wiper combined harness plug I18 and the terminal 2 of the washer motor relay K18.</p> <p>G. Measure the resistance between the terminal 2 of the rain wiper combined switch harness plug B18 and the terminal 2 of the washer motor relay K10.</p> <p><b>Standard value: less than 5Ω</b></p> <p>Is it OK after checking?</p> <p>→Yes To step 9.</p> <p>→No Repair power line failures of the washer motor relay. If necessary, replace the harness.</p>
<p>9. Check the wiper cluster switch power line.</p>  <p>LFX60-SM-12510</p>	<p>A. Operate the start switch to set the power mode to the "OFF" state.</p> <p>B. Disconnect the battery negative connector.</p> <p>C. Disconnect the wiper cluster switch harness connector I18.</p> <p>D. Connect the battery negative terminal.</p> <p>E. Operate the start switch to set the power mode to the "ON" state.</p> <p>F. Measure the voltage between the wiper cluster switch harness connector I18 terminal 3 and fixed ground point.</p> <p><b>Standard value: 11 ~ 14 V</b></p> <p>Is it OK after checking?</p> <p>→Yes To step 10.</p> <p>→No Repair power line failures of the rain wiper combined switch. If necessary, replace the harness.</p>
<p>10. Replace the wiper cluster switch.</p>	<p>A. Replace the wiper cluster switch.</p> <p><b>Refer to: Replacement of wiper cluster switch.</b></p> <p>Confirm the system is normal.</p>



## Diagnosis flow for no spraying in place

Test condition	Details/results/measures
1. General inspection.	<p>A. Check the capacity of the washingliquid.            B. Check if the washing hose is distorted, bent and damage.            Is it OK after checking?            →<b>Yes</b>            To step 2.            →<b>No</b>            Examine and repair the fault location.</p>
2. Check the washer's sprayer.	<p>A. Check the washer's sprayer.            Is it OK after checking?            →<b>No</b>            Replace the washer's sprayer.            →<b>Yes</b>            To step 4.</p>
3. Check washing conditions.	<p>A. Wash and check the spraying angle and position of the washer's sprayer.            Is it OK after checking?            →<b>Yes</b>            To step 4.            →<b>No</b>            Adjust the washer's sprayer.</p>
4. Check the washer's motor.	<p>A. Replace the washer's motor.  <b>Refer to: Replacement of washer motor</b>            Confirm the system is normal.</p>

Wiper and scrubber

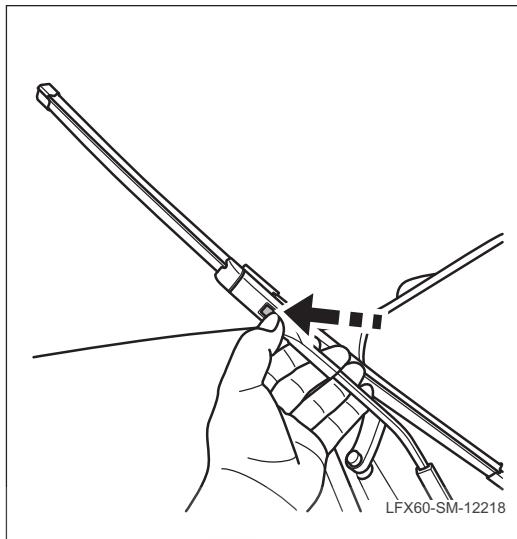


## Removal and Installation

Replace the blades of the rain wiper.

### Removal

#### 1. Disassemble the blades of the front rain wiper.



(a). Press the disassembly button of the rain wiper blade and pull out the rain wiper blades upward.

**● Note:**

When the rain wiper blades are disassembled, rotate the key to (key switch is in OFF level) prevent the rain wiper from rotating in disassembling, affecting disassembly and damaging the windshield.

### Installation

#### 1. Install the front rain wiper blades.

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

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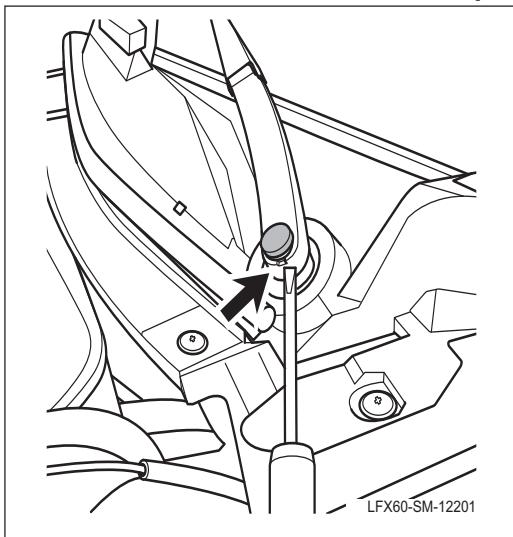
12-1629



## Replace the front wipe arm

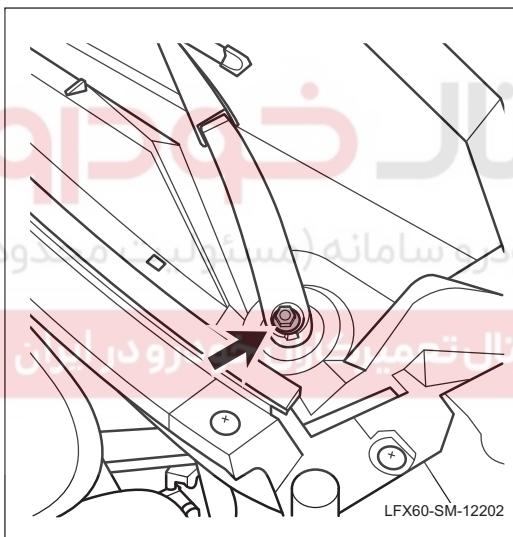
### Removal

#### 1. Disassemble the front rain wiper arm.



(a).

Open the front engine cover and tilt the protective cover of the rain wiper by using a screwdriver.



(b).

Disassemble fixing bolts of the front rain wiper arm.

(c).

Remove the front rain wiper arm.

(d).

Disassemble the front rain wiper blades, refer to: replacement of the front rain wiper blades.

### Installation

#### 1. The installation sequence is reverse to the removal sequence.

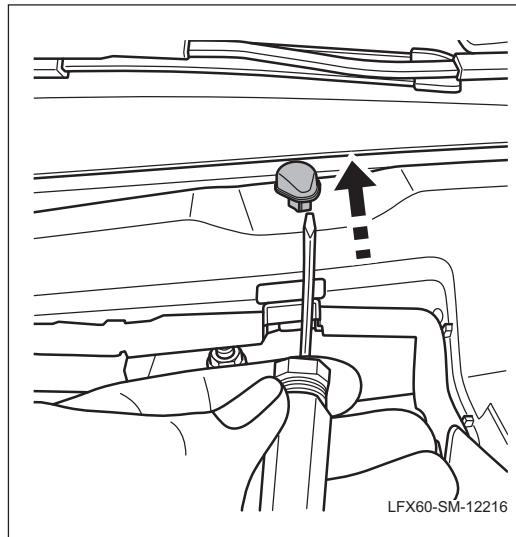
Wiper and scrubber



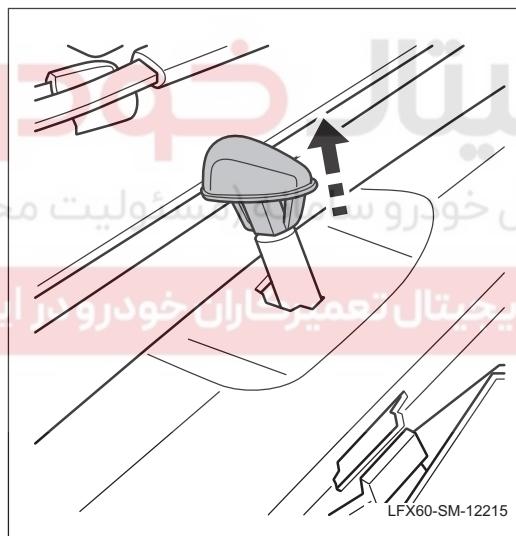
## Replace the front washer sprayer

### Removal

#### 1. Disassemble the front washer sprayer.



(a). Open the front engine cover and disassemble the front washer sprayer by using a proper tool.



(b). Disconnect the washer sprayer hose.  
(c). Remove the front washer sprayer.

**● Note:**

The front washer sprayer is easy to break in disassembly. It is recommended to heat it with the blow dryer and disassemble it in order to avoid break.

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### Installation

#### 1. Install the front washer sprayer.

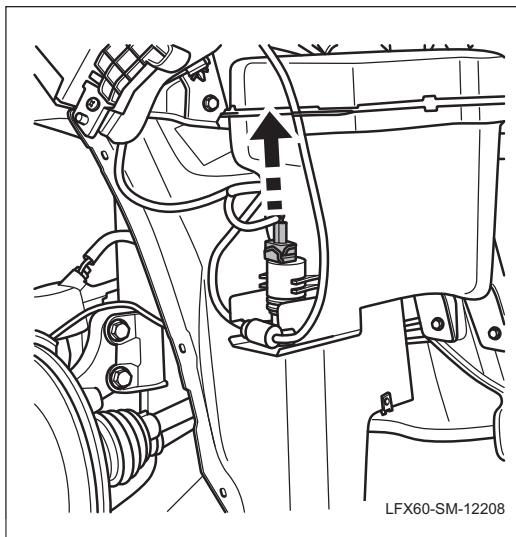
(a). The installation sequence is the reverse of the disassembly order.

12-1631



### Replace the storage tank motor of the washing liquid.

1. **Disassemble the motor of the front and rear washing liquid storage tank.**
  - (a). Disconnect the battery negative connector.
  - (b). Remove the front bumper assembly. **Refer to the replacement of front bumper assembly.**



- (c). Disconnect the harness connector 1 of the front and rear washing liquid storage tank motor.
- (d). Disassemble the hose 2 of the front and rear washing liquid storage tank motor.
- (e). Remove the motor 3 of the front and rear washing liquid storage tank.

### Installation

1. **Install the motor of the front and rear washing liquid storage tank.**
  - (a). The installation sequence is the reverse of the disassembly order.



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Wiper and scrubber

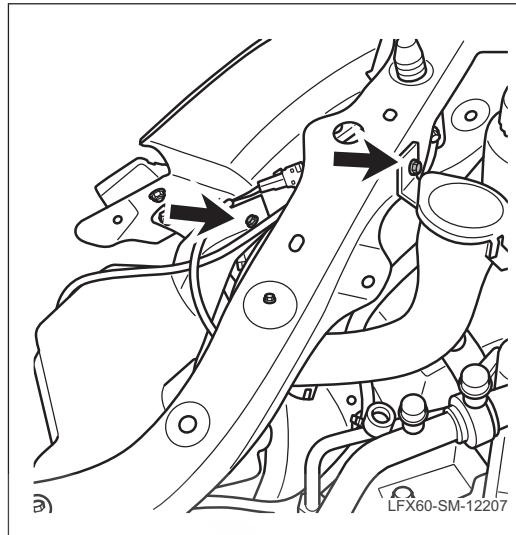


## Repalce the washing liquid storage tank

### Removal

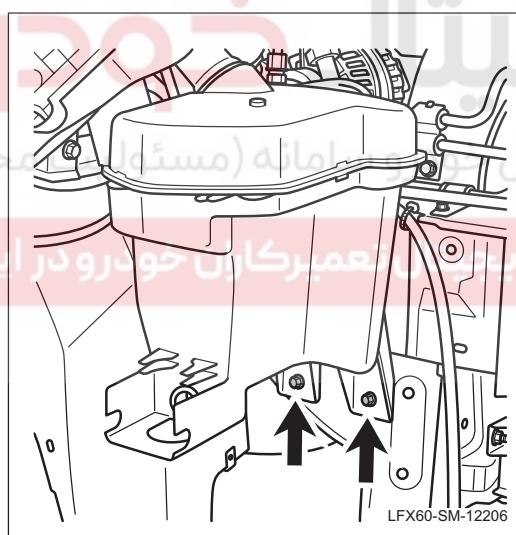
#### 1. Disassemble the washing liquid storage tank.

(a). Disassemble the front bumper assembly, refer to: replacement of the front bumper assembly.



(b). Disassemble fixing bolts above the washing liquid storage tank.

(c). Disassemble the front and rear washing liquid storage tank motor by referring to replacement of the front and rear washing liquid storage tank motor.



(d). Disassemble the fixing bolts under the washing liquid storage tank.

(e). Remove the washing liquid storage tank.

### Installation

#### 1. Install the washing liquid storage tank.

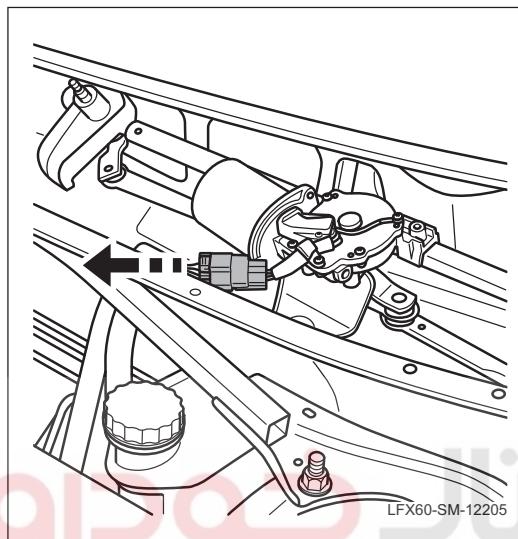
(a). The installation sequence is the reverse of the disassembly order.



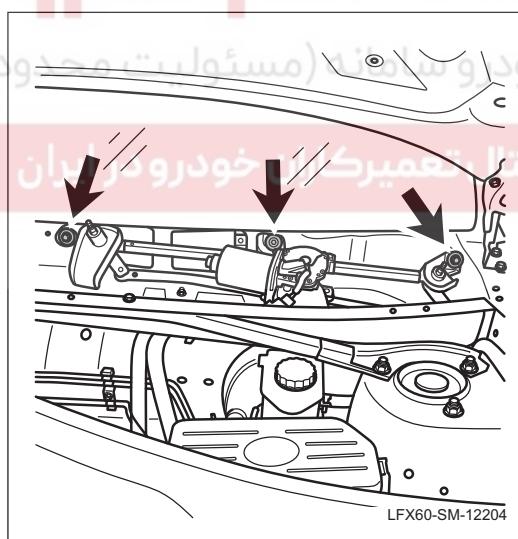
## Replace the front rain wiper motor and connection rod assembly

### Removal

1. **Disassemble the front rain wiper motor and connection rod assembly.**
  - (a). Disconnect the battery negative connector.
  - (b). Disassemble the front rain wiper arm assembly, **refer to: replacement of the front rain wiper arm.**
  - (c). Disassemble the front ventilation cover plate, **refer to: replacement of the front ventilation cover plate.**



- (d). **Disconnect the plug of the front rain wiper motor.**



- (e). **Disassemble fixing bolts of the front rain wiper motor and connection rod assembly.**
- (f). **Remove the front rain wiper motor and connection rod assembly.**

### Installation

1. **Install the front rain wiper motor and connection rod assembly.**
  - (a). The installation sequence is the reverse of the disassembly order.

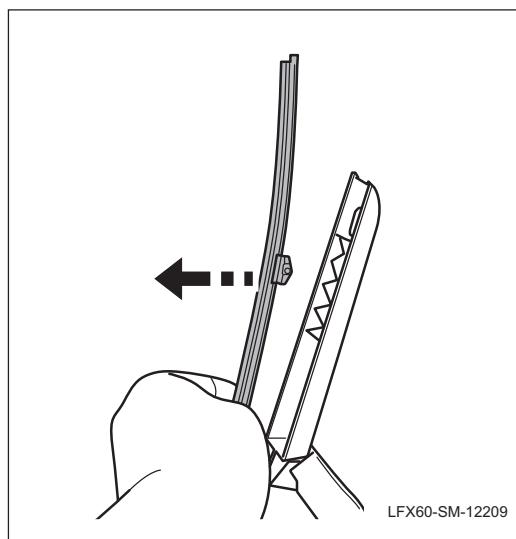
Wiper and scrubber



### Replace the rear rain wiper blades.

#### Removal

##### 1. Disassemble the rear rain wiper blades.

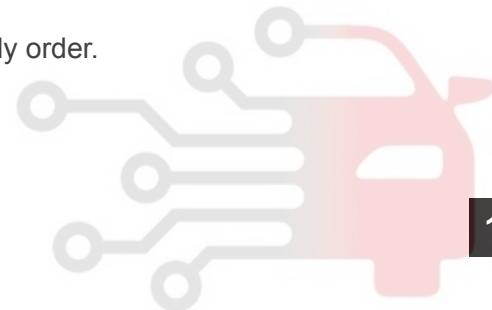


(a). Separate the rain wiper arm from the rain wiper blades.

#### Installation

##### 1. Install the rear rain wiper blades.

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



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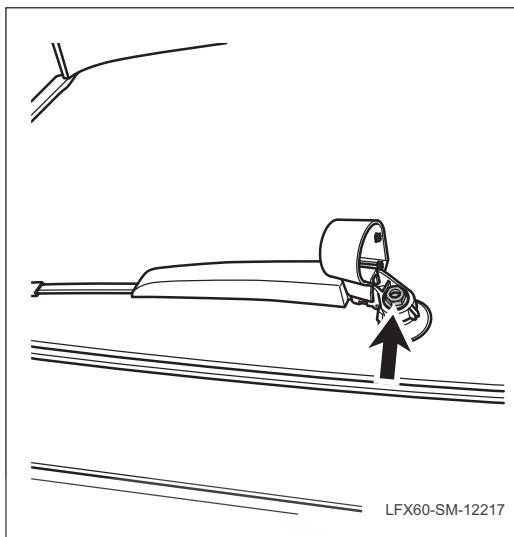
12-1635



## Replace the rear wiper arm

### Removal

1. Disassemble the rear rain wiper arm.
- (a). Disassemble the rear rain wiper blades, refer to: replacement of the rear rain wiper blades.



- (b). Pull up the fixing nut cover 1 of the rear rain wiper arm.
- (c). Disassemble fixing nut 2 of the rear rain wiper arm.
- (d). Remove the rear rain wiper arm.

**● Note:**

Rotate the key to (shift the key to OFF gear) in disassembly of the rain wiper to prevent rear rain wiper arm from swinging in disassembly and affecting disassembly or damaging the windshield.

### Installation

1. Install the rear rain wiper arm.
- (a). The installation sequence is the reverse of the disassembly order.

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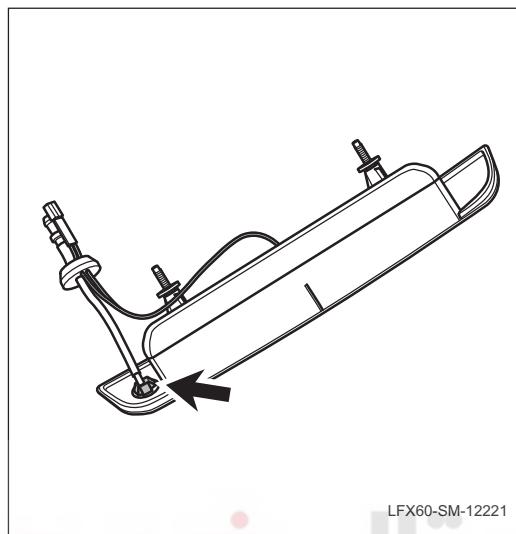
Wiper and scrubber



## Replace the rear washer sprayer

### Removal

1. **Disassemble the rear washer sprayer.**
- (a). Disconnect the battery negative connector.
- (b). Disassemble the spoiler assembly, **refer to: replacement of the spoiler assembly.**
- (c). Disassemble high brake light, **refer to: replacement of the high brake light assembly.**



- (d). Remove the rear washer sprayer by using a proper tool.

### Installation

1. **Install the rear washer sprayer.**
- (a). The installation sequence is the reverse of the disassembly order.

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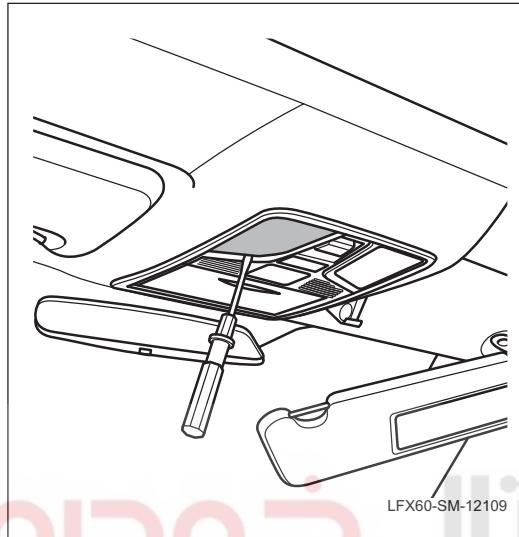




## Replace the motor assembly of rear rain wiper

### Removal

1. **Disassemble the rear rain wiper motor assembly.**
  - (a). Disconnect the battery negative connector.
  - (b). Disassemble the rear rain wiper arm, **refer to: replacement of the rear rain wiper arm.**
  - (c). Disassemble the internal protection plate of the rear back door, **refer to: Disassembly of the internal protection plate of the rear back door.**



- (d). Disconnect the harness connector of the rear rain wiper motor assembly.



- (e). Disassemble motor assembly of the fixing bolts of the rear rain wiper.
- (f). Remove the motor assembly of the rear rain wiper

### Installation

1. **Install the rear rain wiper motor assembly.**
  - (a). The installation sequence is the reverse of the disassembly order.