

Component Procedures: Rain Sensor

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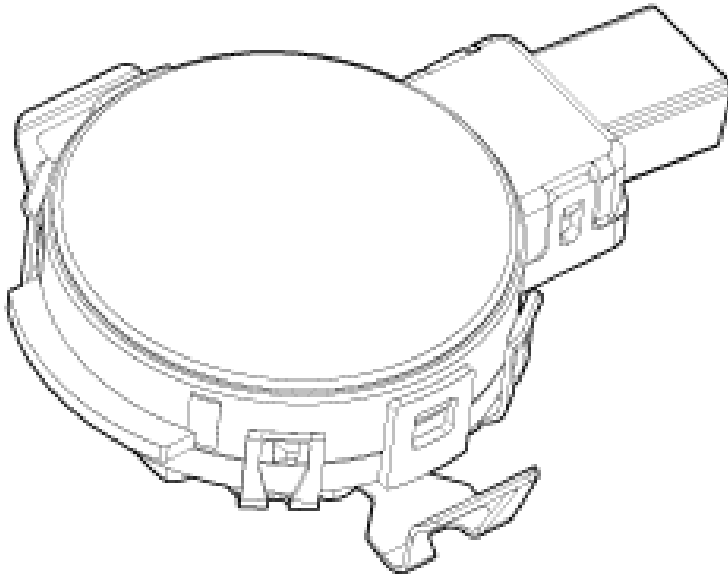
Component Procedures: Rain Sensor

Rain Sensor - Description and Operation (Article 44630)

- Description

Integrated Rain Sensor

- Wiper Control System When "AUTO" switch signal is received from the multi-function switch on the right, the integrated rain sensor detects the amount of rainfall. The sensor is installed inside the upper part of the front window for wiper motor control. This system automatically controls the operation duration and speed of the wiper depending on the measured amount of rainfall even if the driver does not operate the wiper switch .



- Functions and Operating Principles

Basic Principle

- Detecting the amount of rainfall The light (beam) emitted from light emitting diodes (LED) is totally reflected on the external surface of the windshield and comes back to the photo diodes. When there is water on the external surface of the windshield, the light is optically separated and reflected partially and the remaining brightness is measured by the photo diodes. Water remaining on the windshield results in the light being not totally reflected. The loss of brightness due to this indicates how much the glass surface is wet.

Interference

- Dust on the measuring surface and other surfaces on the light path (surface of light emitting diodes and photo diodes, fiber optics, bracket, and glass surface of windshield joint area) weakens the received light.
- Movement of windshield and bracket
- Movement of bracket due to vibration
- Damaged wiper blade

When the integrated rain sensor does not operate or malfunctions, the driver should operate the wiper switch manually.

NOTICE

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Automatic Operation

- Operational status of rain sensor Operation Mode Operation Direct Mode It is the normal operational status of the integrated rain sensor when the wiper switch is in "Auto" and the sensor detected dry windshield. Based

on this state, integrated rain sensor determines the operation mode of wiper depending on the rainfall and its duration. Intermittent Mode Integrated rain sensor activates the intermittent mode when wiper operation is done successively more than twice with a pause of 0.5 - 5 seconds. Low Speed The wiper operates continuously in low speed High Speed The wiper operates continuously in high speed

Operation Mode Operation

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Safety Function

- When there is ice or foreign matter in the detecting area, integrated rain sensor cannot recognize the condition for operation correctly.

Detecting Special Conditions

- Rain sensor Special Condition Operation based on special conditions detecting Splash When integrated rain sensor detects a high level of water (splash) in Direct or Intermittent mode, the system switches from Park to High speed. Then, wiping is done once in High speed and once more in Low speed. If the condition of rainfall does not change after wiping, it returns to the original condition (Direct or Intermittent). Smearing Smearing is a thin oil film that has dried fast and occurs when a small amount of rainfall is wiped by a dirty or worn-out wiper blade. Operational signal should not be issued when smearing occurs in Direct or Intermittent mode.

Dirt When no change is detected after wiping, integrated rain sensor determines that the windshield is dirty.

In this state, operational signal should not be issued. If the windshield becomes clean (for example, by washer fluid), the integrated rain sensor returns to the normal condition. Washer fluid Integrated rain sensor does not respond to the washer fluid during the Washer mode. In other words, wiping speed does not change even if the washer fluid is sprayed (automatic operation of the washer pump is not reflected in the functioning of integrated rain sensor).

Special Condition Operation based on special conditions detecting

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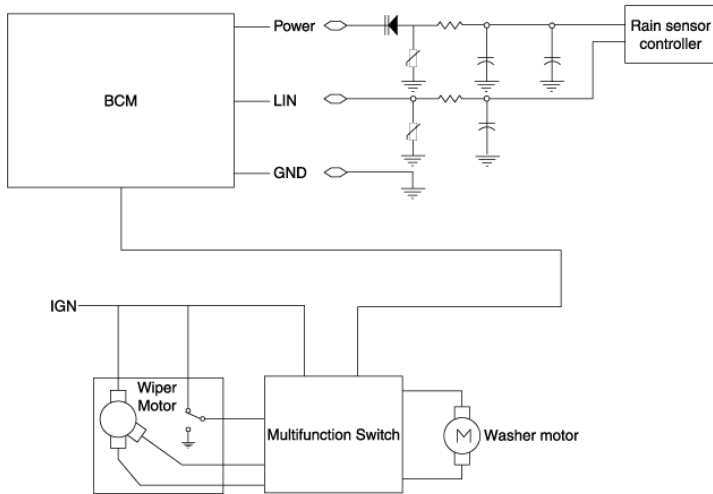
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Rain Sensor - Schematic Diagrams (Article 44628)

- Circuit Diagram



Rain Sensor - Components and Components Location (Article 44627)

- Components and Components Location



Connector A	No	Description
	1	Battery (+)
	2	LIN
	3	GND

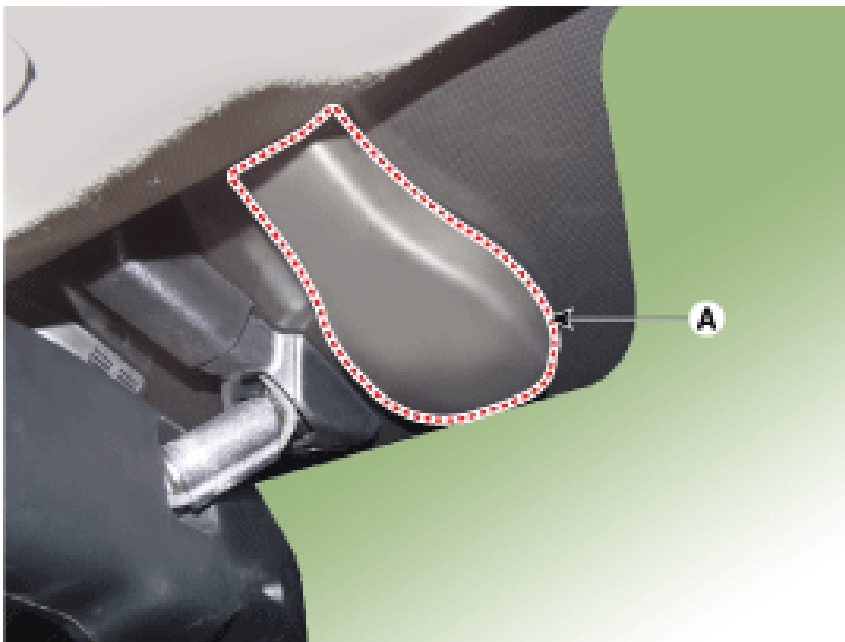
Rain Sensor - Repair Procedures (Article 44631)

- Removal

The dust or foreign substance on the rain sensor have a bad effect upon the rain sensor capability,so protect the sensor surface with protection cover until installing the rain sensor to bracket for accurate funtion. The coupling pad on the rain sensor surface has adhereive strength, so the coupling pad could stick to the windshield by environment condition during the using time. If separate it by force, it could be damaged. So make sure to separate the rain sensor from the windshield carefully.

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- Reomve the rain sensor cover (A).

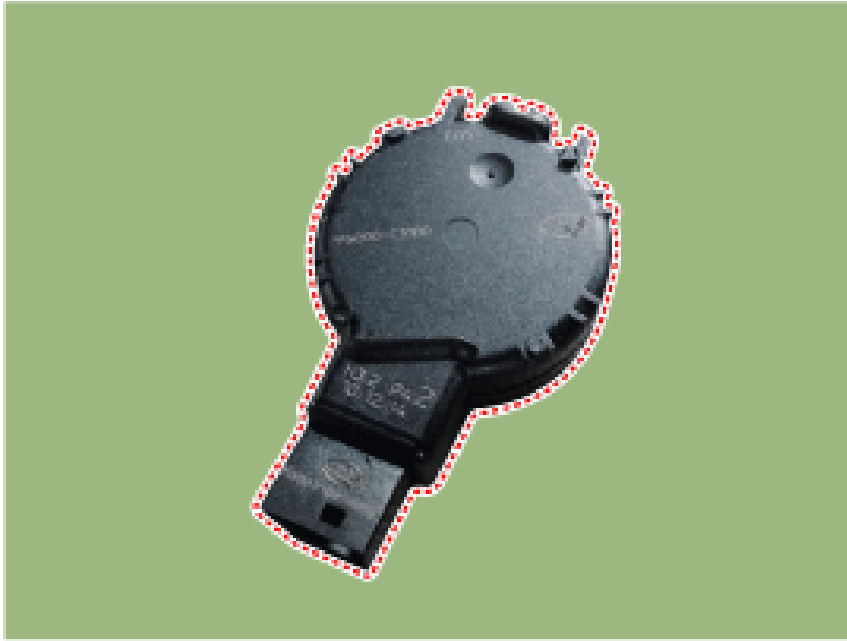


- Disconnect the wiring harness connector (A).



- Be careful not to damage the cover latch by applying excessive force. To remove the latch, pull aside the latch using the cover hole with a small flat - blade screwdriver (A).





- Rain sensor module is attached to the front windshield by glue replacing the front windshield, remove the rain sensor module from the existing front windshield and install on the new front windshield.

- Installation

Check the operation of the rain sensor and the light sensor before mounting. Check the sensor for silicon damage. Check whether the rain sensor connector is tightened. Check whether the rain sensor and bracket are properly tightened. Check whether the sensor mounted area is free from foreign matters. Recalibrate sensitivity of the switch if the auto-wiping operation is insensitivity or too much sensitive. In case the silicone of the rain sensor is normal or slightly damaged as shown in the below images, it can be reused.

Normal Damage within 1.5 mm of outer part In case the silicone of the rain sensor is damaged as shown in the below images, it should be replaced with a new silicone. Foreign substances Fingerprint Damage Damage In case the silicone of the rain sensor is damaged it should be replaced it as shown below. 1) Remove the damaged silicone gel pad from the lens plate completely. Be careful not to damage or contaminate the surface of the lens plate during removal. 2) Attach the new silicone gel pad after removing the silicone paper (A) then remove the transparent film (B). When attaching the silicone gel pad to the sensor, be careful not to contaminate It is very important that the silicon (coupling pad) is completely pushed against the windshield and stuck without any air bubble. In case of replacing the damaged windshield, you may reuse the undamaged existing rain sensor. The windshield glass has to be clean and free of contamination or foreign substances.

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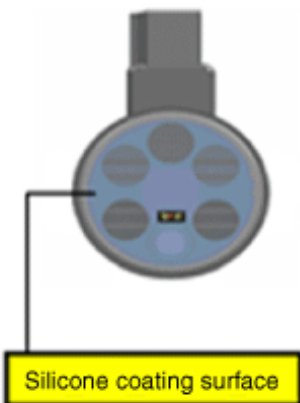
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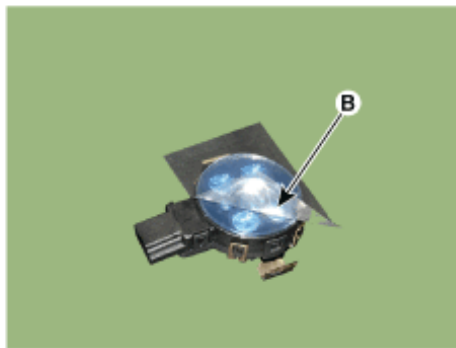
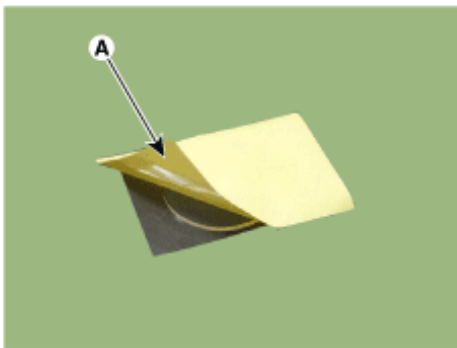
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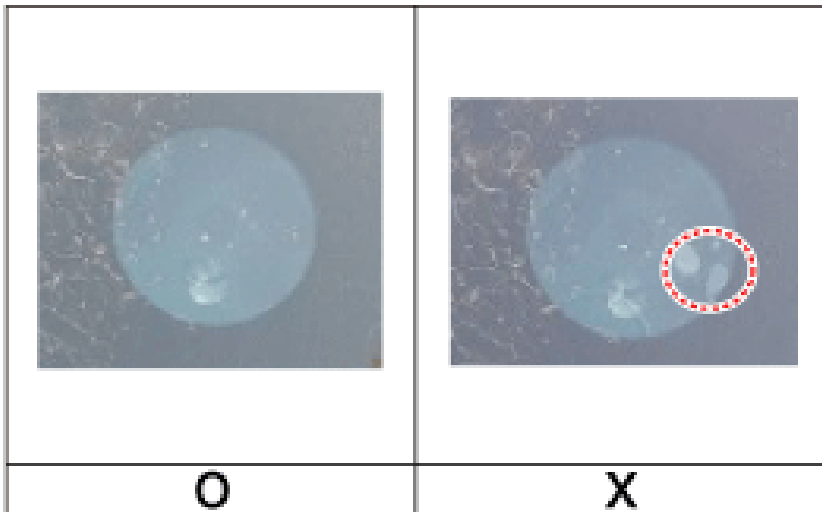
Be careful not to damage or contaminate the surface of the lens plate during removal.

NOTICE

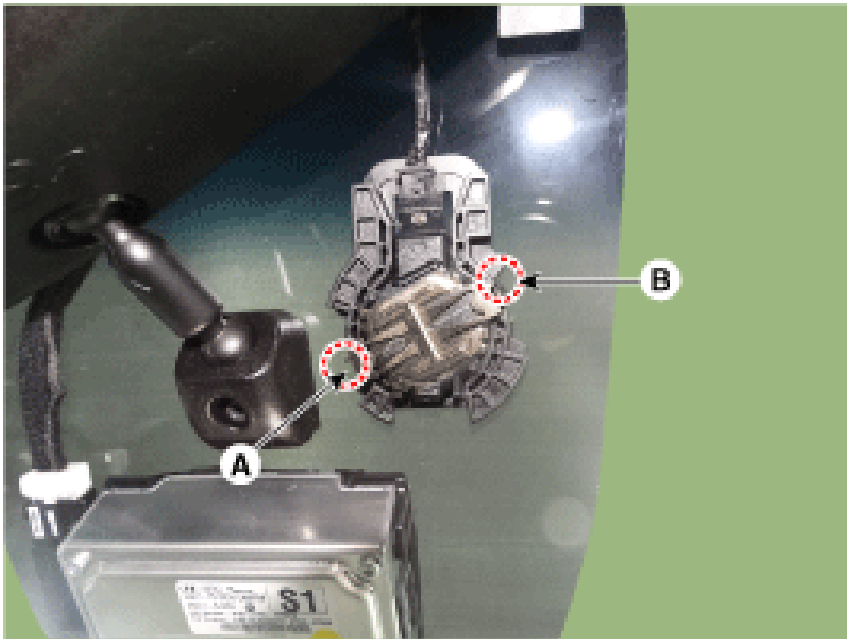
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- In case of replacing the damaged windshield, you may reuse the undamaged existing rain sensor.
- The windshield glass has to be clean and free of contamination or foreign substances.
- Connect the rain sensor connector.
- Push one of the latch of spring arm (A) down until it snaps and you hear a click sound. And then push the latch of second spring arm (B) for keeping the sensor in right position. Do not snap both spring arms at the same time. An incorrectly mounted snap connection may cause malfunctions of the rain/light sensor.



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