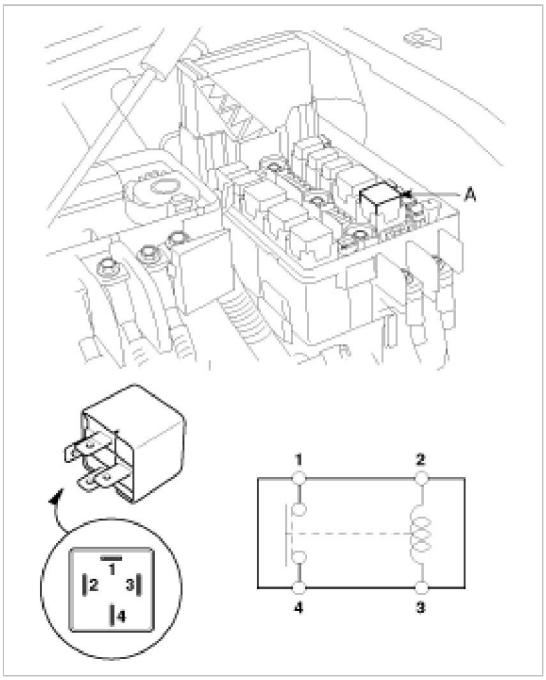


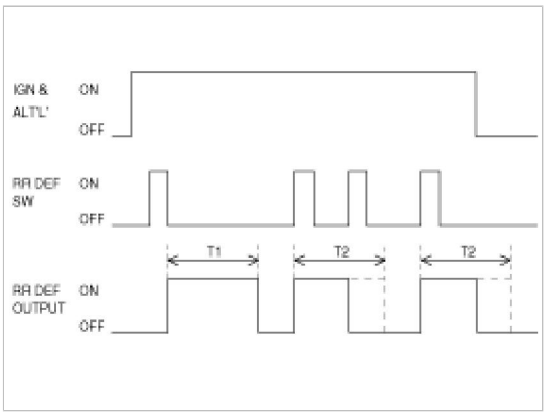
Terminal / Power	2	3	1	4
Disconnected	○	○		
Connected	⊖	⊕	○	○

Body Electrical System > Rear Glass Defogger > Rear Glass Defogger Timer > Repair procedures

Inspection

While operating the components, check whether the operations are normal as shown in the timing chart.

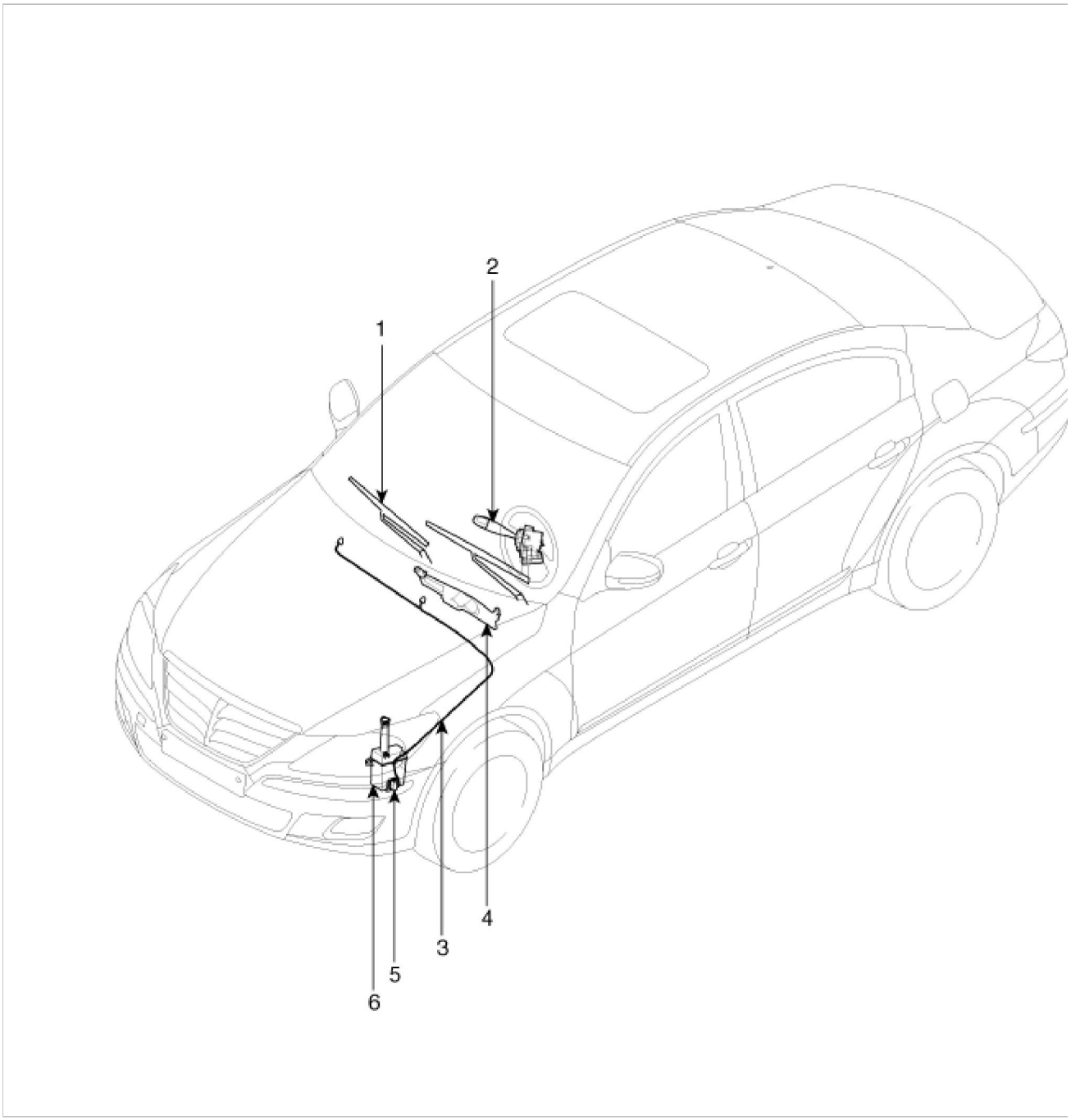
1. Once ALT "L" is ON, if the defogger is switched ON, the defogger will stay ON for 20 minutes duration.
2. If defogger switch is pressed again (see Step 1), or if ignition is switched OFF, the defogger will shut OFF.



T1 : 20 ± 1 min.
T2 : MAX 20 ± 1 min.

Body Electrical System > Windshield Wiper/Washer > Components and Components Location

Component Location

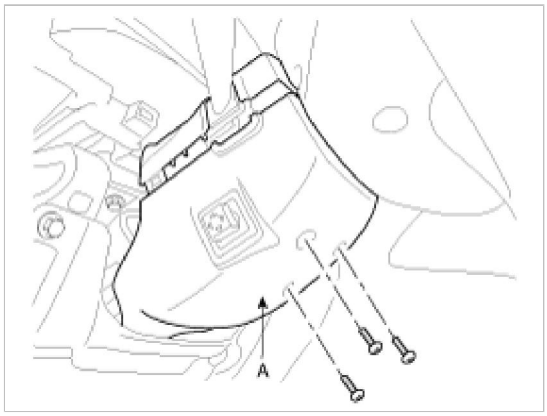


1. Windshield wiper arm & blade	4. Windshield wiper motor & linkage
2. Wiper & washer switch	5. Washer motor
3. Windshield washer hose	6. Washer reservoir

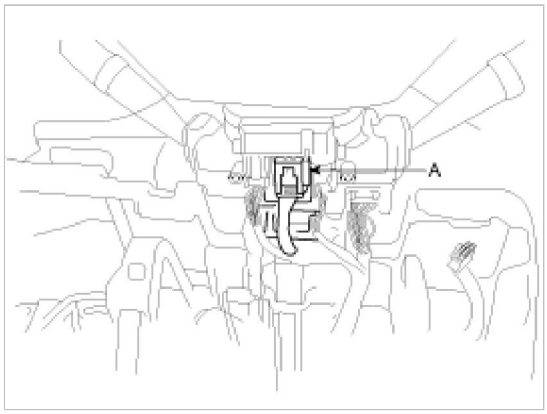
Body Electrical System > Windshield Wiper/Washer > Windshield Wiper-Washer Switch > Repair procedures

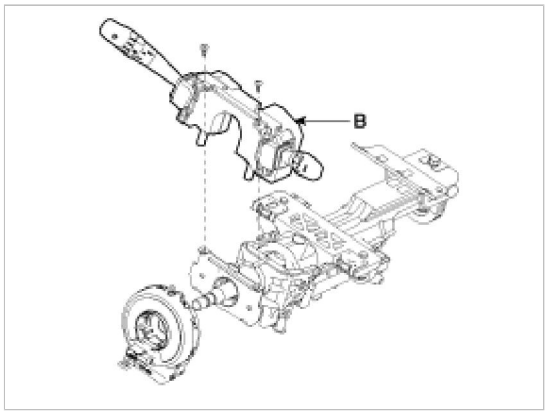
Removal

1. Remove the steering column upper and lower shrouds (A) after removing 3 screws.



2. Remove the multi function switch assembly (A) after disconnecting the connector and removing the screws (2EA).



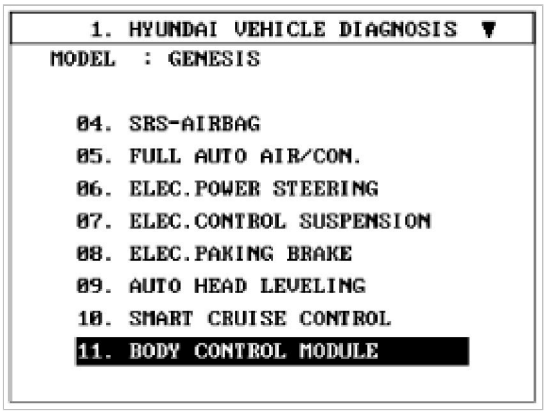


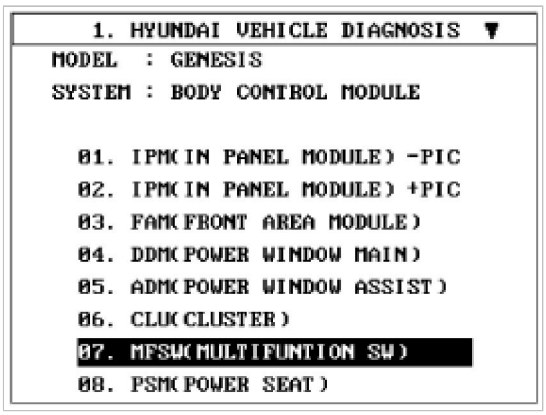
Installation

1. Install the multi function switch assembly after connecting the connectors.
2. Install the steering column upper and lower shrouds.

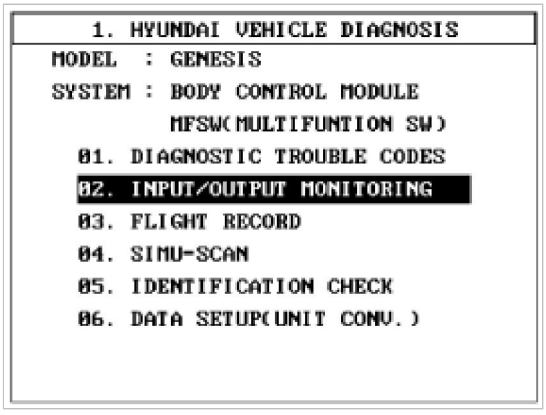
Inspection

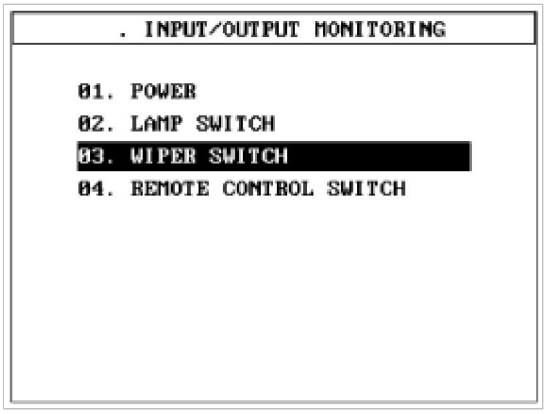
1. Check BCM input/output specification of windshield wiper/washer switch using the scan tool. If the specification is abnormal, replace the windshield deicer switch module.

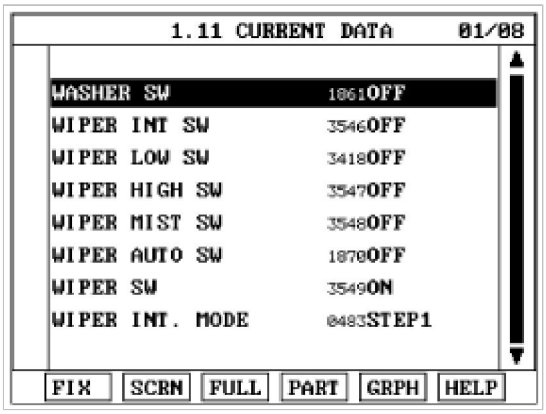


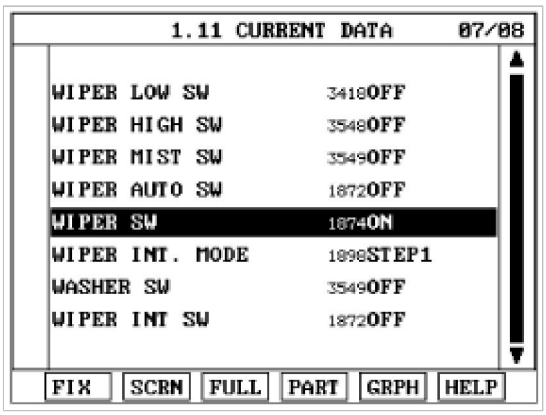


2. Select option "Input/output monitoring".







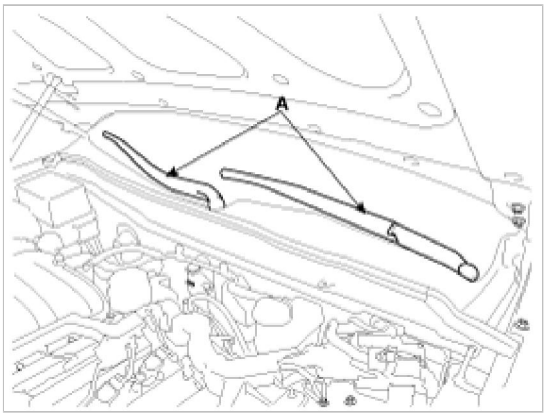


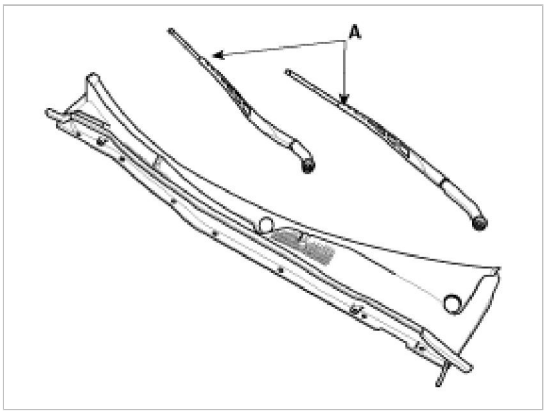
Body Electrical System > Windshield Wiper/Washer > Front Wiper Motor > Repair procedures

Removal

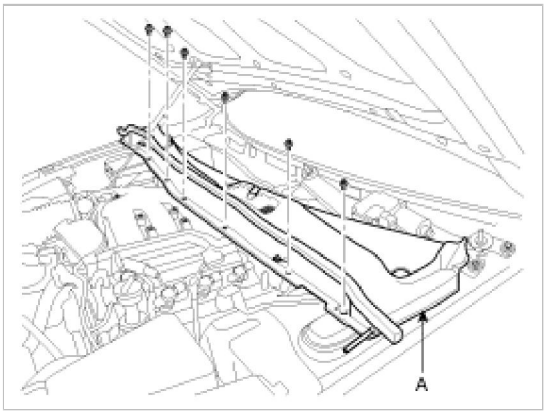
1. Remove the windshield wiper arm (A) and blade after removing a nut.

Tighting torque :
27~31 Nm (2.8~3.2 kgf.m, 20~23 lb-ft)



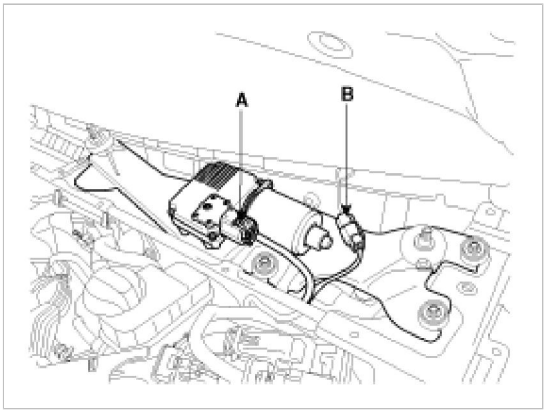


2. Remove the weather strip then remove the cowl top cover (A) after removing 6 clips.



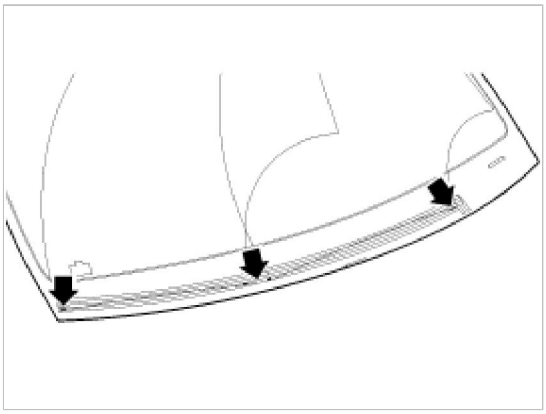
3. Remove the windshield wiper motor and linkage assembly after removing 4 bolts. Disconnect the wiper motor connector (A) and windshield deicer connector (B) from the wiper motor & linkage assembly.

Tighting torque :
7-11Nm (0.7-1.1, kgf.m, 5.0-7.9 lb-ft)



Installation

1. Install the wiper arm and blade to the specified position.



NOTE

For your convenience, move the windshield wiper blades to the service position as follows;

1. Remove the key from the ignition switch.
2. Move the wiper switch to the single wiping position and hold the switch until the wiper arm is in the fully up position.
3. Raise the wiper arm.
4. Replace the blade assembly.
5. Return the wiper arm on the windshield.
6. Turn the ignition switch to the ON position.
7. Move the wiper switch to any position and then to the OFF position.

CAUTION

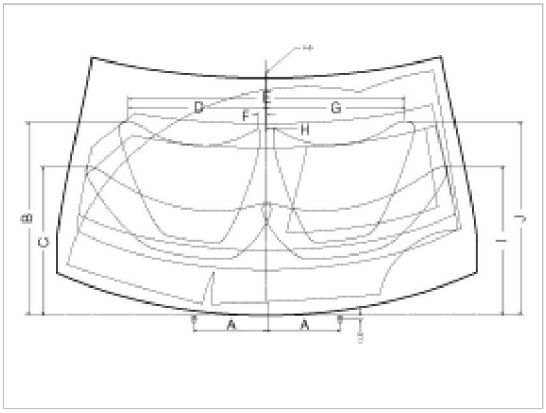
Do not allow the wiper arm to fall against the windshield, since it may chip or crack the windshield.

CAUTION

Common sources of contamination are insects, tree sap, and hot wax treatments used by some commercial car washes. If the blades are not wiping properly, clean both the window and the blades with a good cleaner or mild detergent, and rinse thotoughlly with clean water.

2. Set the washer nozzle on the specified spray position.

Specified position	Distance [in (mm)]
A	10.2 (260)
B	27.1 (689)
C	20.8 (530)
D	19.3 (492)
E	38.7 (984)
F	1.25 (32)
G	19.3 (492)
H	1.25 (32)
I	20.8 (530)
J	27.1 (690)



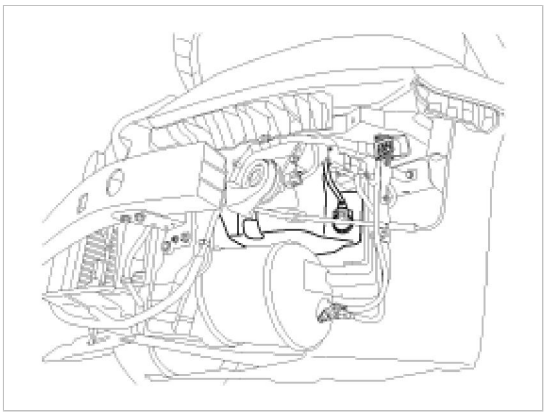
Body Electrical System > Windshield Wiper/Washer > Front Washer Motor > Repair procedures

Removal

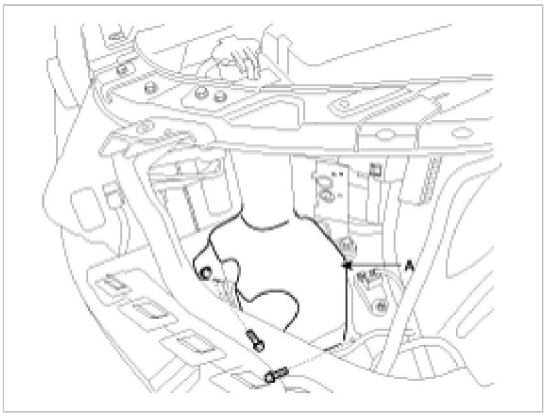
CAUTION

1) When servicing the washer pump, be careful not to damage the washer pump seal.
2) Do not operate the washer pump before filling the washer reservoir.
   Failure to do so could result in premature pump failure.

1. Disconnect the negative (-) battery terminal.
2. Remove the front bumper cover. (Refer to Body group - Front bumper)
3. Remove the washer hose and the washer motor connector.
4. Disconnect the washer fluid level sensor switch connector.



5. Remove the washer reservoir after removing 2 bolts.



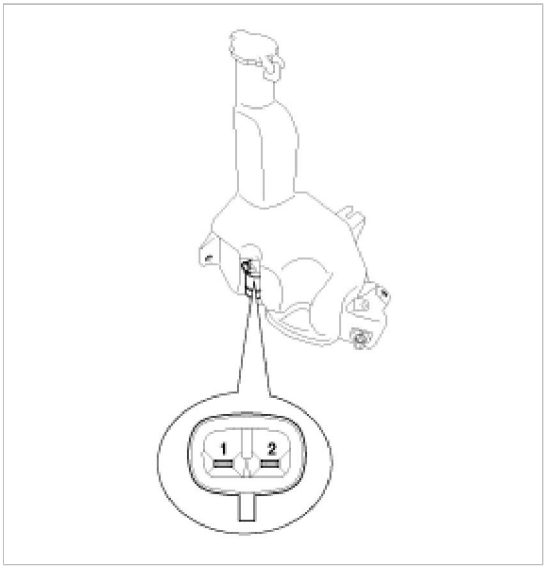
Inspection

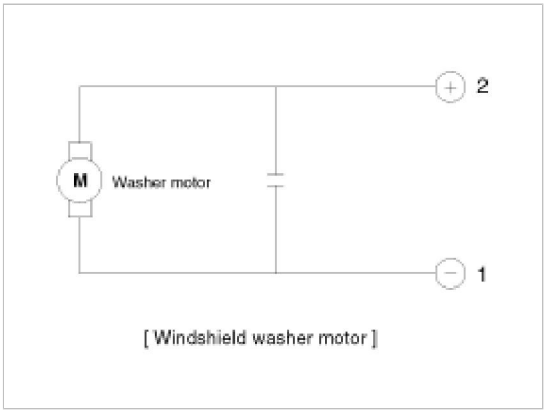
Front Washer Motor

1. With the washer motor connected to the reservoir tank, fill the reservoir tank with water.

> **NOTE**
>
> Before filling the reservoir tank with water, check the filter for foreign material or contamination. if necessary, clean the filter.

2. Connect positive (+) battery cables to terminal 2 and negative (-) battery cables to terminal 1 respectively.
3. Check that the motor operates normally and the washer motor runs and water sprays from the front nozzles.
4. If they are abnormal, replace the washer motor.





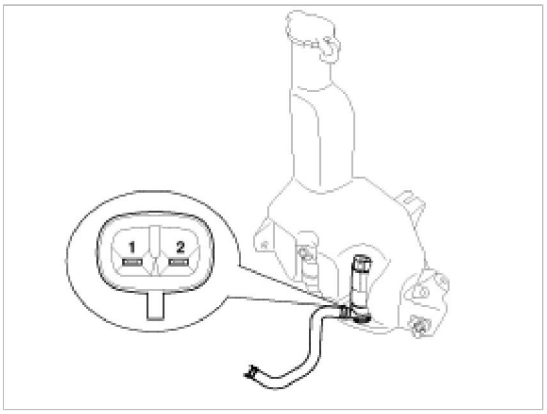
[Windshield washer motor]

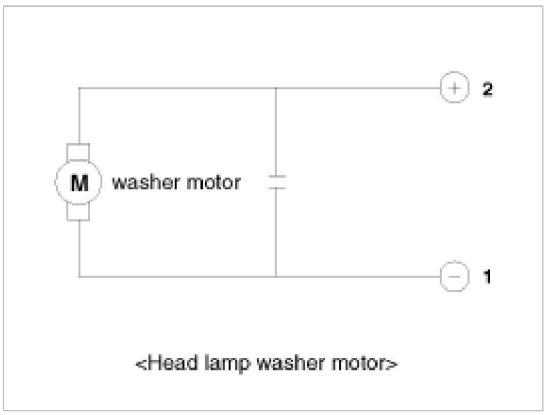
Head Lamp Washer Motor

1. With the washer motor connected to the reservoir tank, fill the reservoir tank with water.

> **NOTE**
>
> Before filling the reservoir tank with water, check the filter for foreign material or contamination. if necessary, clean the filter.

2. Connect positive (+) battery cables to terminal 2 and negative (-) battery cables to terminal 1 respectively.
3. Check that the motor operates normally and the washer motor runs and water sprays from the head lamp nozzles.
4. If they are abnormal, replace the washer motor.





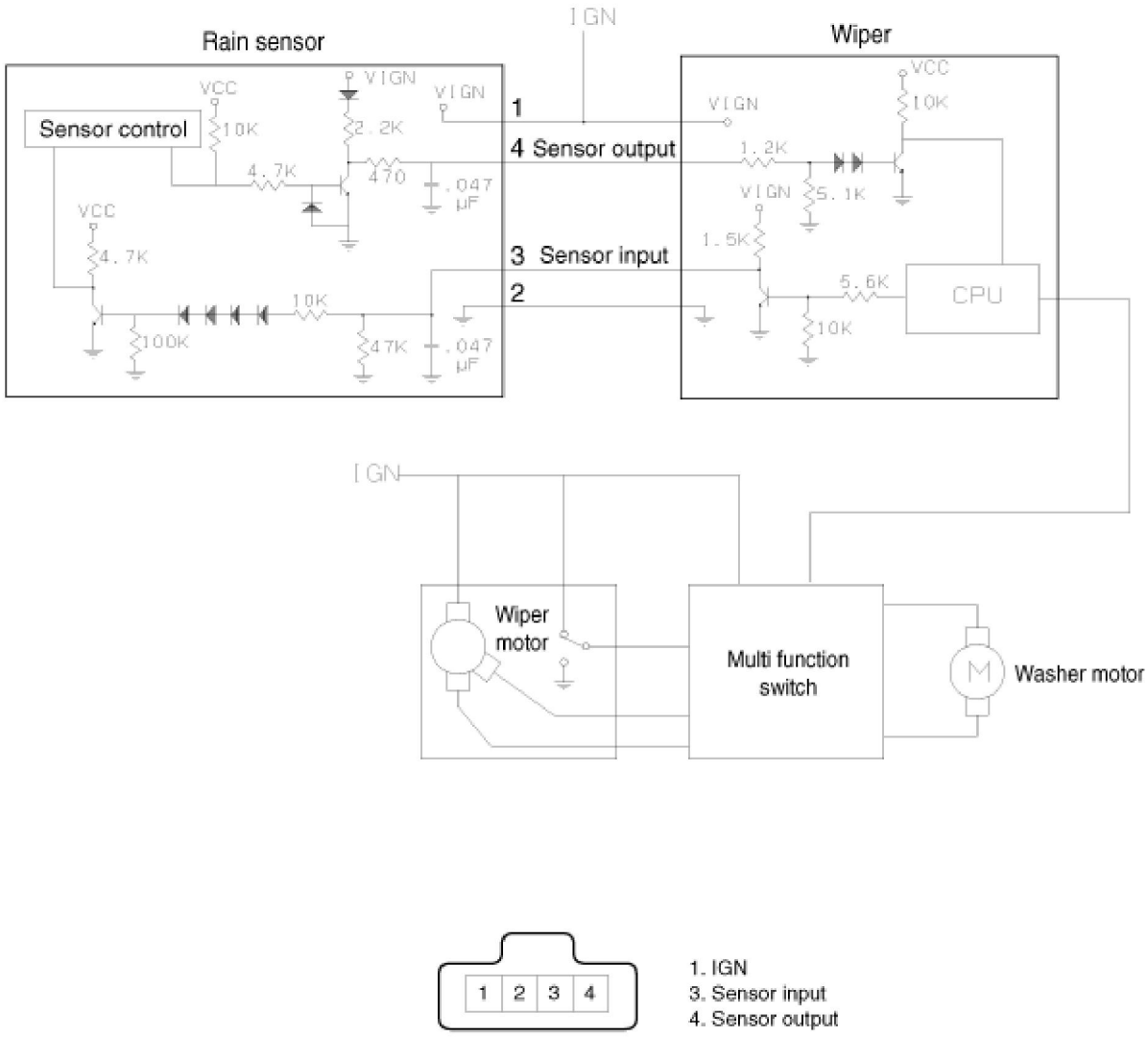
<Head lamp washer motor>

Installation

1. Install the washer reservoir.
2. Install the washer motor hose and connectors.
3. Install the front bumper cover.

Body Electrical System > Windshield Wiper/Washer > Rain Sensor > Schematic Diagrams

Circuit Diagram

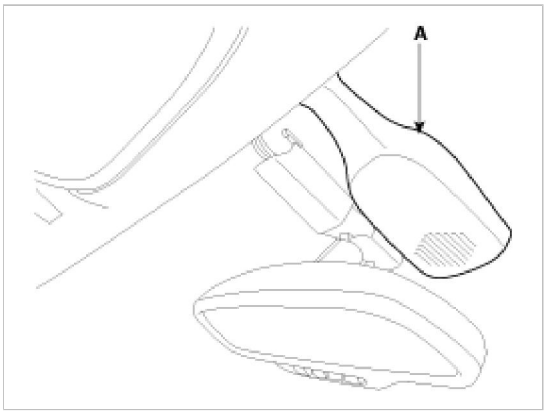


1. IGN
3. Sensor input
4. Sensor output

Body Electrical System > Windshield Wiper/Washer > Rain Sensor > Description and Operation

Description

The Rain sensing windshield wiper system is a wiper system that, in addition to providing normal wiper functions off, mist, manual low speed, manual high speed, and wash, provides automatic control of automatic intermittent automatic low, and automatic high speeds.
When the ignition key is in the ON position, the rain sensor (A) will be activated.



Operating Modes - Rainsensing Windshield Wiper System

Multifunction Switch Position	Rainsensor Operating Mode	Sensor Action
MIST	MIST	Mist is controlled by the column switch. The sensor has no affect on this function
OFF	OFF	If not already parked, wiper motor runs in low speed until blades are in the depressed park position.
AUTOMATIC Automatic mode has 5 SENSITIVITY settings.	AUTOMATIC	AUTOMATIC Automatic INT/speed control. The sensitvity to raindrop accumulation on the windshield is set by the MULTIFUNCTION SWITCH sensitivity adjustment.
LOW SPEED	MANUAL	Wiper motor runs continuously in low speed, for example 45 wipes/minute. The sensor has no affect on this function
HI SPEED	MANUAL	Wiper motor runs continuously in high speed, for example 60 wipes/minute. The sensor has no affect on this function
WASH - DEMAND WASHER SW ⩾ 0.6 SEC	WASH	If washer sw on after 0.6 sec then wipes during 2.5 to 3.8 sec. The rain sensor enables the wipers and controls the after wipes.
WASH - DEMAND WASHER SW < 0.6 SEC	WASH	If washer sw on less than 0.2 to 0.6 sec then once wipes

OFF Mode

With the wipe switch in the OFF position and the ignition switch in the ON positions, the Rainsensor is considered to be in "OFF" mode. In this mode, the sensor commands the wiper to be off.
The Rainsensor monitors the state of the windshield during OFF mode so that knowledge of the state of the windshield is present when the MULTIFUNCTION SWITCH is moved to any SENSITIVITY setting. This optimizes the performance of the sensor when moving from the OFF condition to an AUTOMATIC mode. The algorithm assumes the nominal sensitivity setting when in the OFF mode.

Automatic Mode

When the MULTIFUNCTION SWITCH is moved to AUTO position and the ignition switch is in the RUN or ACCESSORY positions, the Rainsensor is considered to be in "AUTOMATIC" mode. Once a single "Instant wipe" has occurred, the wipers remain at "Innerwiper/park" untill the Rainsensor determines that the dwell time at that position is appropriate for the amount of precipitation on the windshield, considering the driver input from the switch SENSITIVITY setting. After the dwell time the Rainsensor provides input to the wiper motor to activate the wipers to clear the preciptation from the windshield.

Automatic Int
For all AUTOMATIC INT operations the Rainsensor commands the wipers to operate in LOW SPEED for one wipe, followed by a variable dwell period in the inner wipe position.

Automatic Low
AUTOMATIC LOW SPEED operation is utilized when the amount of precipitation imping on the windshield exceeds the AUTOMATIC INT TO AUTOMATIC LOW threshold. This threshold includes sufficient hysterisis to prevent cycling between AUTOMATIC INT and AUTOMATIC LOW SPEED operation with a steady amount of precipitation accumulation on the windshield.

Automatic High
AUTOMATIC HIGH SPEED operation is utilized when the amount of precipitation imping on the windshield exceeds the AUTOMATIC LOW to AUTOMATIC HIGH threshold. This threshold includes sufficient hysterisis to prevent cycling between AUTOMATIC LOW to AUTOMATIC HIGH operation with a steady amount of precipitation accumulation on the windshield.

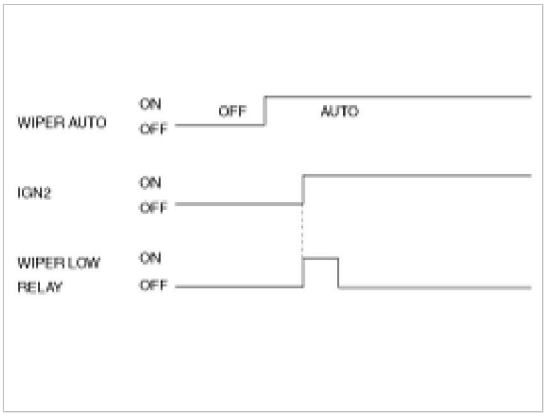
Wash Mode
The Rainsensor monitors the MULTIFUNCTION SWITCH to determine if the wash function is selected. Rainsensor enables the wiper motor to run in low speed during the wash mode and performs follow up wipes during 2.5 to 3.8 sec.

Manual Mode
The Rainsensor determines when a manual mode such as manual low, Mist, Off or manual high is selected. The column switch performs these modes and the rain sensor has no affect.

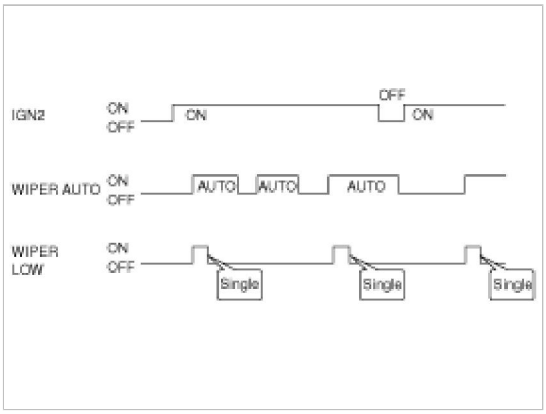
Body Electrical System > Windshield Wiper/Washer > Rain Sensor > Repair procedures

Inspection

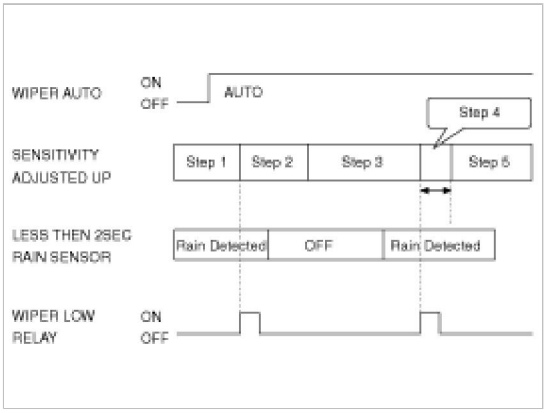
Rain Sensing Wiper
1. In IGN2 ON state, if auto switch input (LIN communication) is ON then both wiper low relay and wiper high relay outputs are controlled by the rain sensor input signal.
2. If the wiper switch has been left in automatic mode with the vehicle ignition OFF, and then the vehicle ignition switch is turned on, a single wipe will be performed.



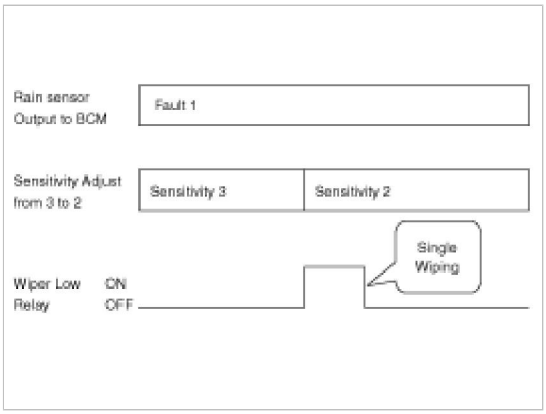
3. A single wipe will be performed whenever rain has been detected (Rain Detected signal from Rain sensor) and the wiper switch is moved to the AUTO position. But a single wipe will not be performed when the wiper switch is moved to the AUTO position and OFF signal is being received from Rain sensor. But if the wiper switch is moved to AUTO position for the first time since vehicle ignition switch is turned on then a single wipe will be performed regardless of Rain Detected or OFF signal.



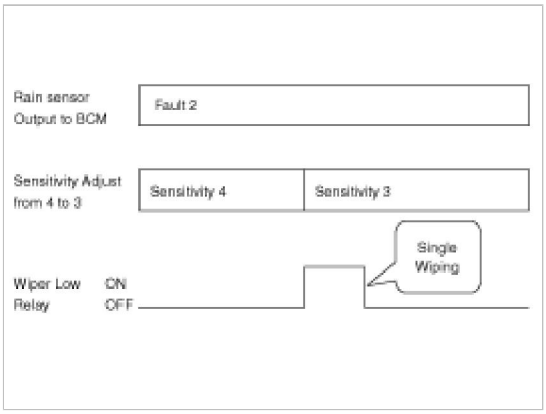
4. The drive may adjust the rain sensor performance by adjusting the sensitivity input. When in automatic mode, the BCM will perform a single wipe each time the sensitivity is adjusted upward to a more sensitive setting (downward more then one step). This single wipe will only be performed if Rain Detected signal is being received from the Rain sensor. If the sensitivity adjustment is adjusted upward more than one sensitivity, the BCM will only perform a single wipe unless the time between Increases is more than 2 seconds.



5. Fault strategy for the rain sensor
   Rain Sensor Fault 1 - Internal Fault Detected
   This failure is detected when the wiper is in automatic mode and the input faulty rain sensor from the rain sensor has a duty cycle corresponding to Fault 1. The confirmation delay for the failure is of 1 sec.
   When this failure is detected, the wiper outputs are OFF and the wiper will also do a wipe in slow speed on the transition from sensitivity 3 to sensitivity 2 (Step 2 to 3) in order to signal the presence of this fault. If another sensitivity is set, the wiper won’t make any additional wipe.



   Rain Sensor Fault 2 - Glass Attachment Fault Detected
   This failure is detected when the wiper is in automatic mode and the input faulty rain sensor from the rain sensor has a duty cycle corresponding to Fault 2. The confirmation delay for the failure is of 1 s.
   When this failure is detected, the wiper outputs are OFF and the wiper will also do a wipe on the transition from sensitivity 4 to sensitivity 3 (Step 1 to 2) in order to signal the presence of this fault. If another sensitivity is set, the wiper won’t make any additional wipe.



Rain Sensor Fault 3 - No Input Signal Present

This failure is detected when the wiper is in automatic mode and the input faulty rain sensor from the rain sensor has a duty cycle corresponding to Fault 3 or in case the duty cycle of the input faulty rain sensor is 0% or 100%. The confirmation delay for the failure is of 1 s.

When this failure is detected, the wiper outputs are OFF.

Removal

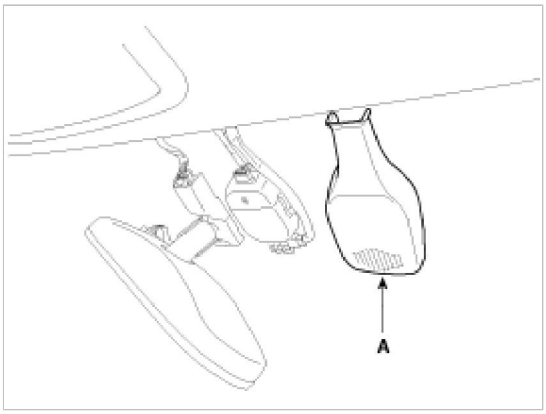
CAUTION

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 adherive 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.

1. Remove the rain sensor cover (A) first.



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