

WIPER & WASHER**7810-01/7820-01/7820-22/7830-01/****INDEX****WIPER AND WASHER****OVERVIEW AND OPERATION
PROCESS**

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اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

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دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



WIPER & WASHER SYSTEM

7810-01

OVERVIEW AND OPERATION PROCESS

1. SYSTEM LAYOUT AND FUNCTION

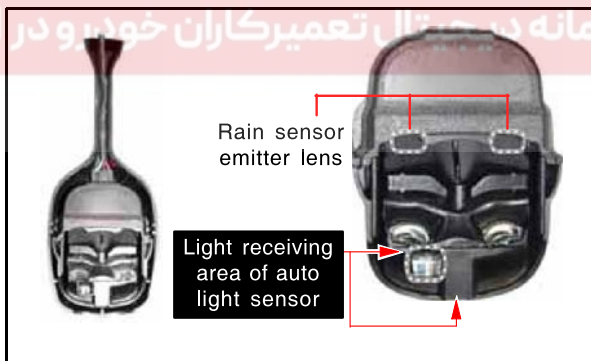
The wiper and washer system are controlled by STICS according to driver's wiper switch operation. And the detection of rain drops by rain sensor is transmitted to STICS as the signal for wiper system control. The characteristics of the wiper and washer system including basic functions of manual wiper are as follows.

1) Wiper Function Coupled Auto Washer



When the front wiper switch is off and this switch is pressed, washer fluid will be sprayed and the wiper will automatically operate 3 times. Then, the fluid will be sprayed again and the wiper will automatically operate 3 times.

2) Integrated Auto Light Sensor in Rain Sensor Unit



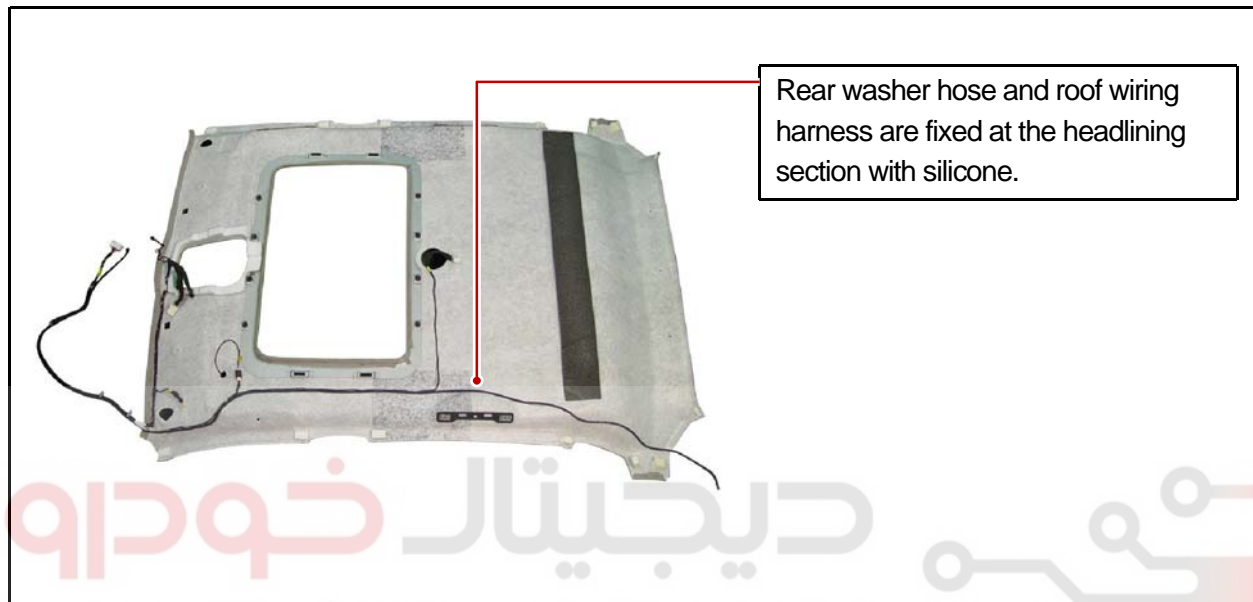
The rain sensor unit is installed on a proper location to detect the rain drops and the illumination intensity. To control the system, the sensed values of rain sensor and auto light sensor are sent to pin no. 63 in STICS unit.

Modification basis	
Application basis	
Affected VIN	

WIPER
undefined

3) Rear Washer Fluid Supply System

There is no separate washer fluid reservoir for the rear washer system in this vehicle. The rear washer system uses the front washer fluid reservoir. Because of this, the washer hose is supposed to be long between front reservoir tank and rear washer nozzle. To avoid being damaged or interfered while in assembling the vehicle, the rear washer hose is fixed on headlining with silicone.

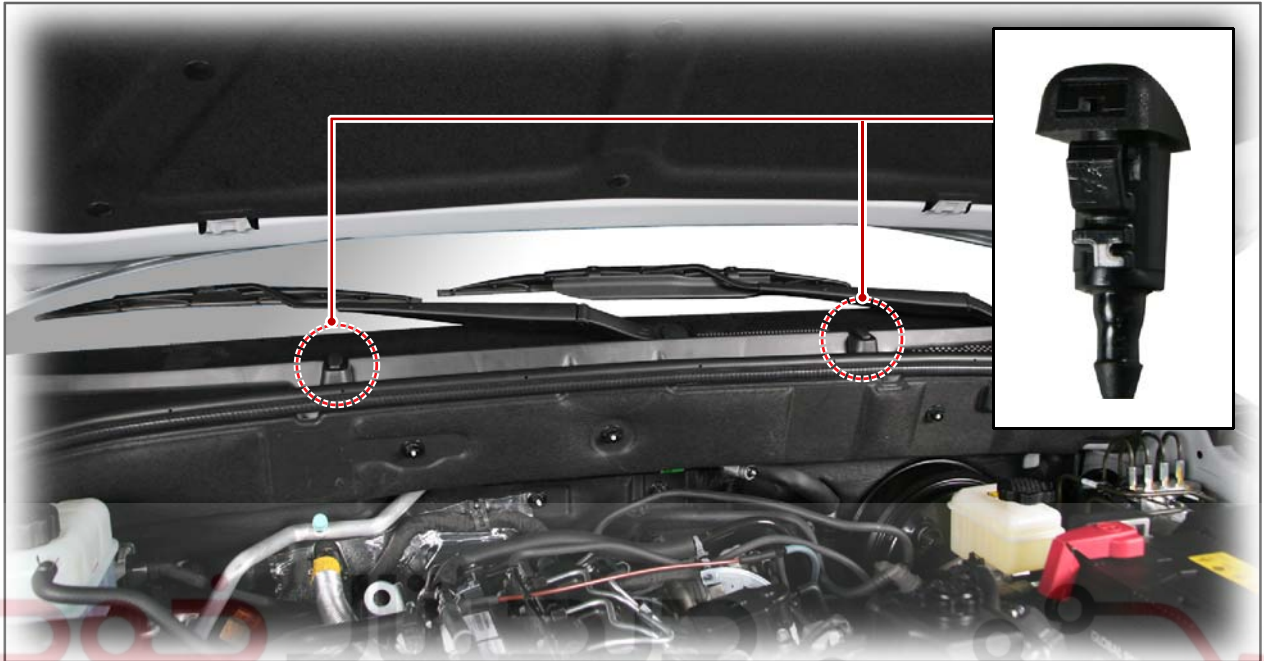


شرکت دیجیتال خودرو (مسئولیت محدود)

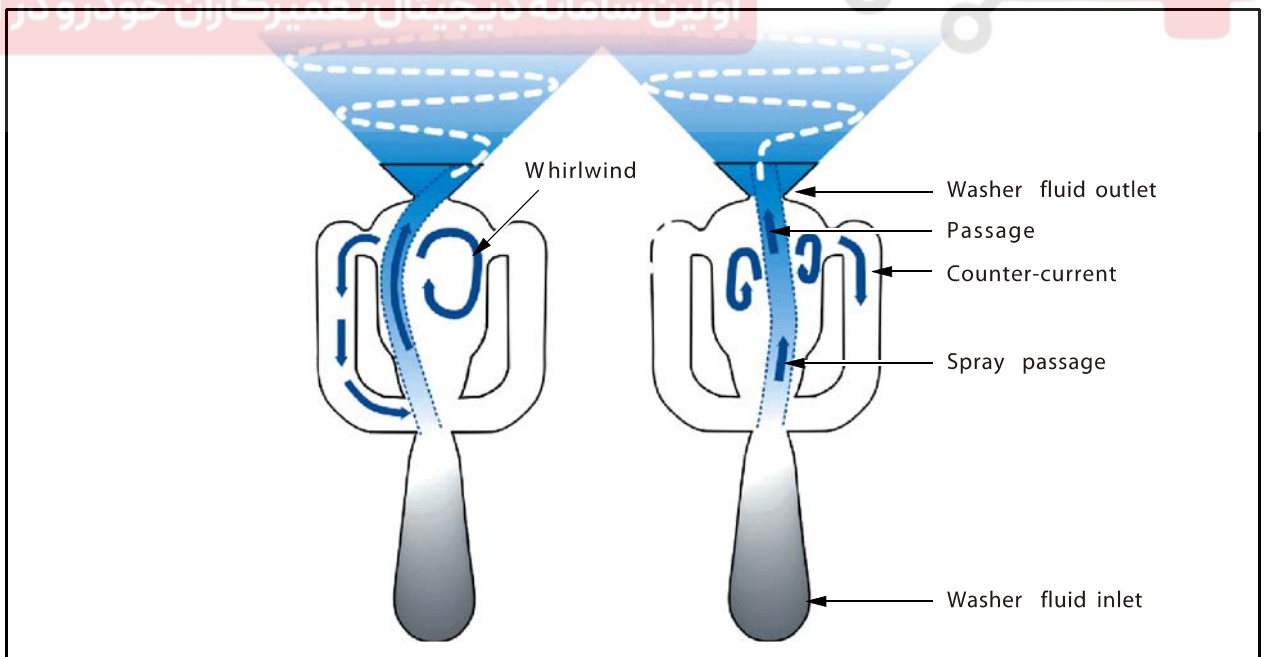
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4) Fluidic Washer Nozzle

Fluidic Washer Nozzle is applied to the front washer spray system in this vehicle. The inside of nozzle is designed to utilize the fluidic movement.



This is a shape of the inside of nozzle. It is designed to change the spraying direction continuously according to the spraying time (fan-shape). The figure below shows the changes of spraying direction according to the spraying time.



It is designed to be changed spraying direction using the whirlwind and backflow generated in nozzle.

Modification basis	
Application basis	
Affected VIN	

WIPER
undefined

2. CONFIGURATION (INCLUDING RAIN SENSOR)

Multifunction wiper and washer switch



Auto washer switch

Pressing the switch makes washer fluid to be sprayed for 2 sec. with four wiping, and washer fluid to be sprayed for 1.5 sec. with three wiping, with no delay of time

Front nozzle assembly



Front nozzle

Installed on both sides of the cowl grille assembly (one on each side). Sprays washer fluid in fan-shape to cover the windshield area as much as possible.

Washer reservoir tank assembly



Washer reservoir tank

Tank that supplies washer fluid to front washer system

Rain sensor unit



Integrated into the auto light sensor. Detects and sends amount of rain drops to STICS



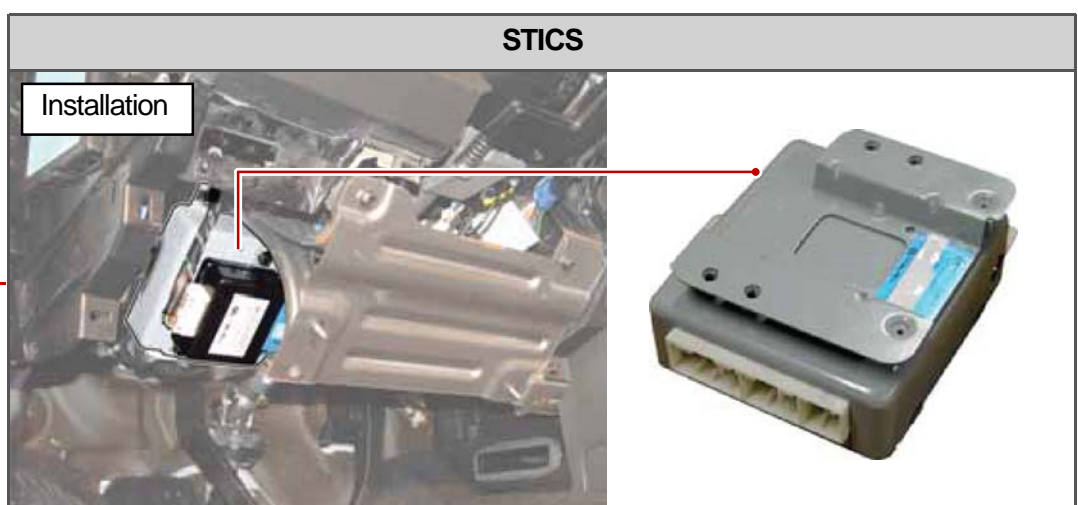
Rear Washer Hose Mounting



Rear washer hose mounting

There is no separate washer fluid reservoir for the rear washer system in this vehicle. The rear washer system uses the front washer fluid reservoir. Because of this, the washer hose is supposed to be long between front reservoir tank and rear washer nozzle. To avoid being damaged or interfered while in assembling the vehicle, the rear washer hose is fixed on headlining with silicone.

STICS



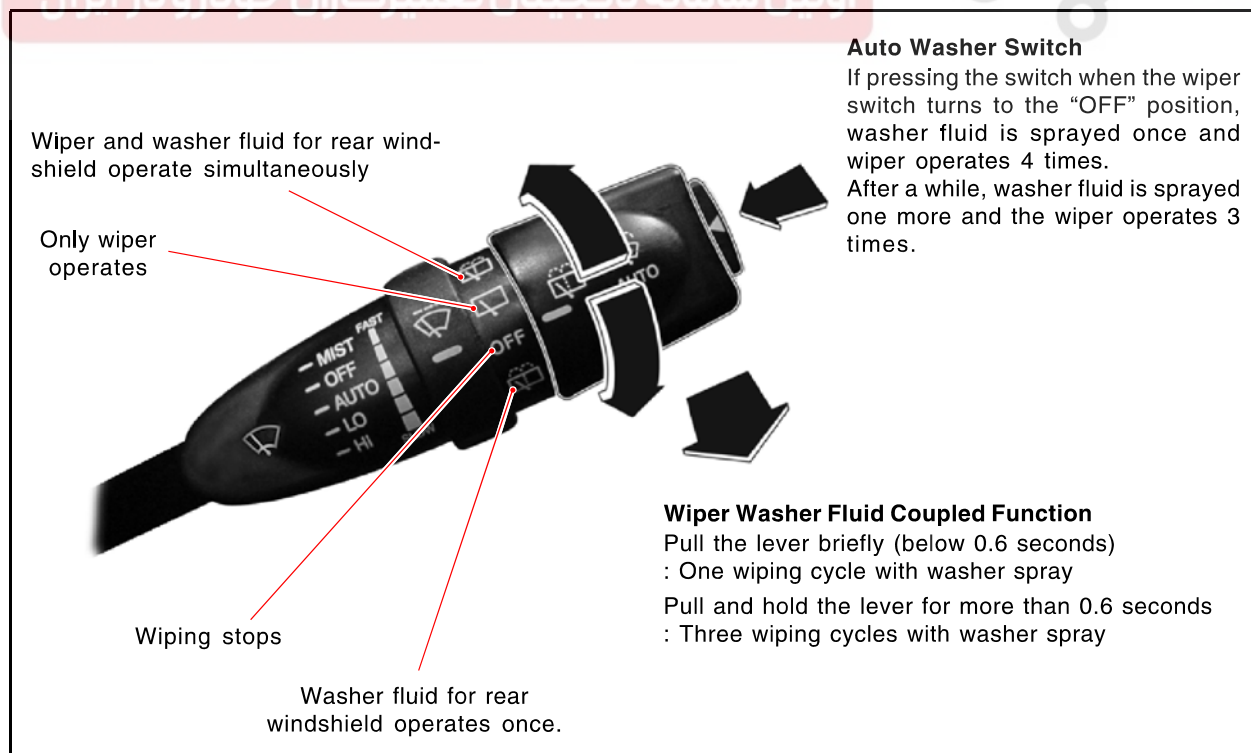
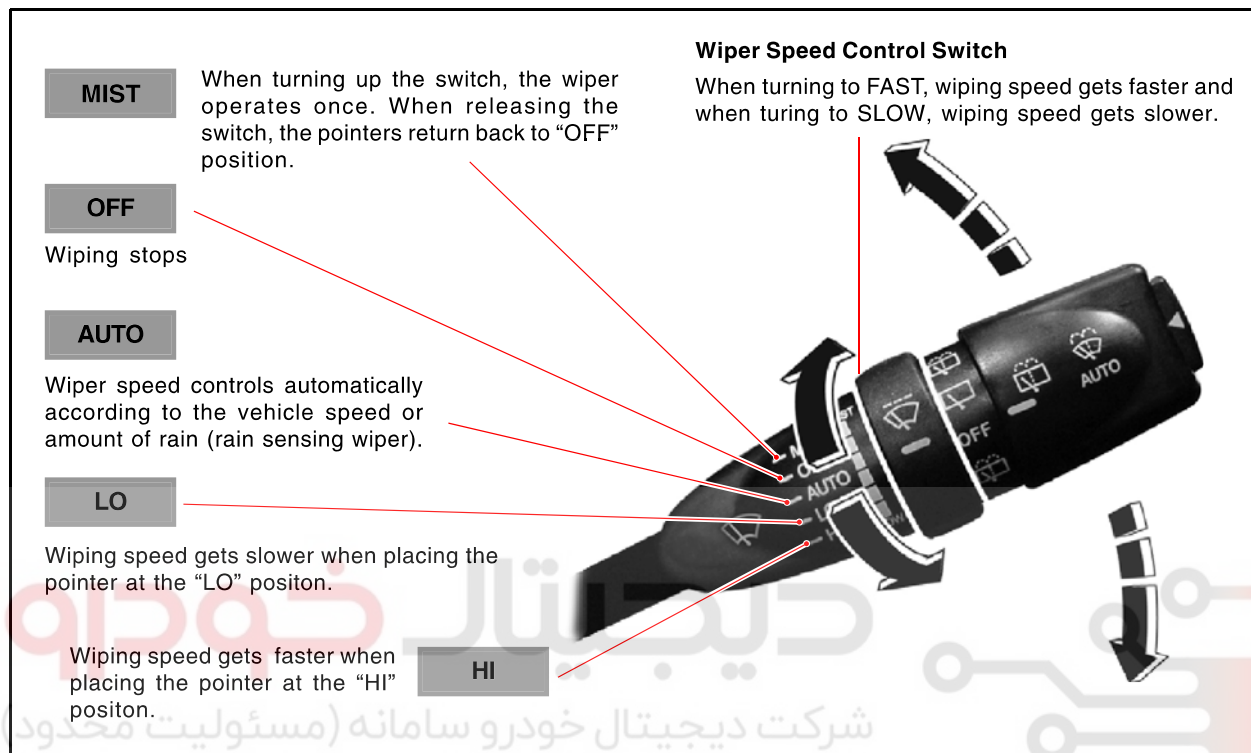
STICS receives the rain sensing data from the rain sensor and controls the wiper and washer systems.

Modification basis	
Application basis	
Affected VIN	

WIPER
undefined

3. WIPER & WASHER RELATED FUNCTION AND SPECIFICATION

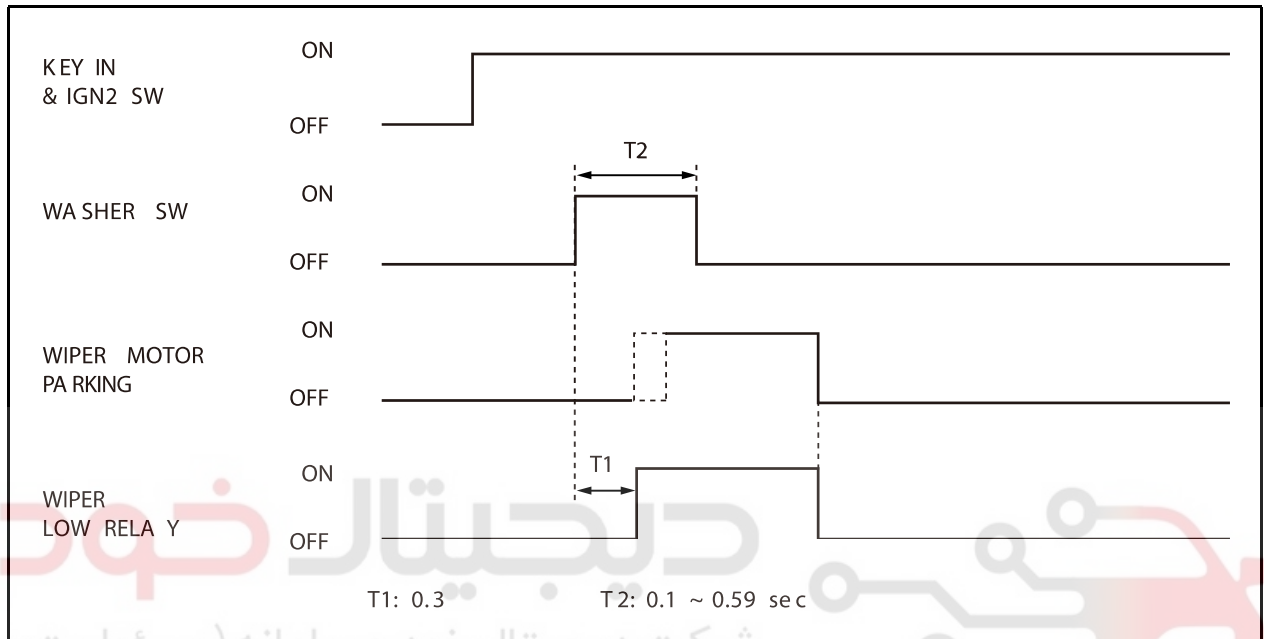
1) Wiper and Washer Fluid Switch Operation



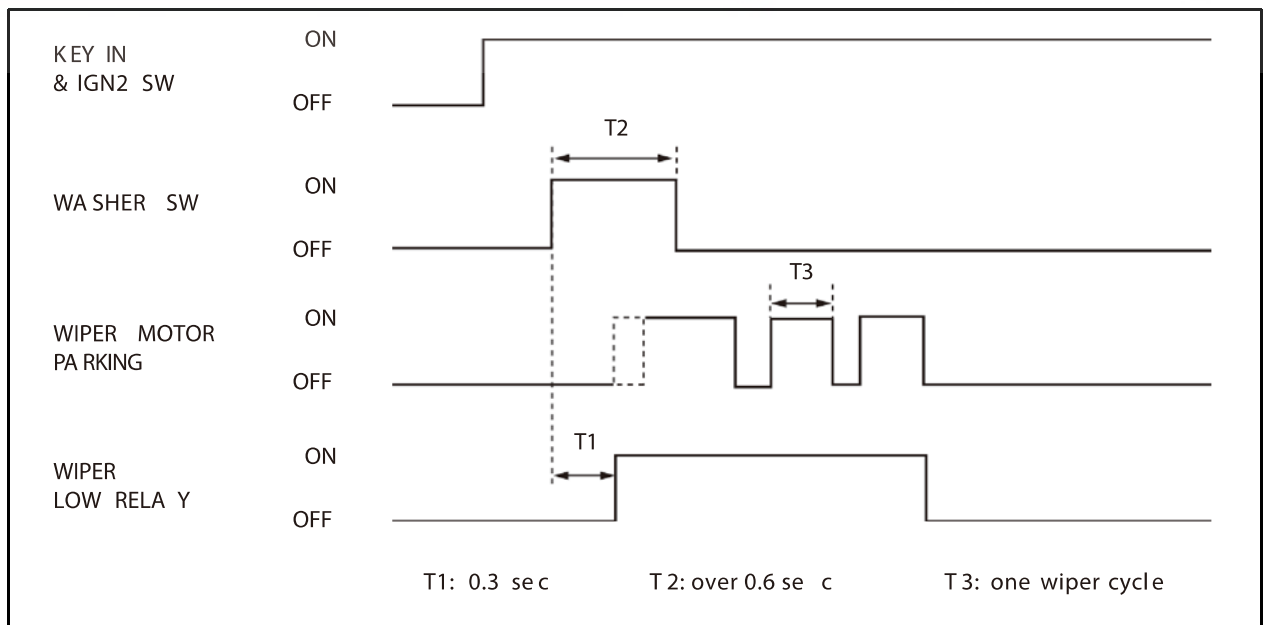
2) STICS Control Logic Related to Wiper and Washer

(1) Wiper MIST and Front Washer Coupled Wiper

1. The wiper relay is turned on 0.3 seconds after turning "ON" the washer switch for 0.1 ~ 0.59 seconds with the ignition key "ON", and it is turned off when the parking terminal is turned off.



2. The wiper relay is turned on 0.3 seconds after turning "ON" the washer switch over 0.6 seconds with the ignition key "ON", and it is turned on three times immediately after turning off the washer switch.

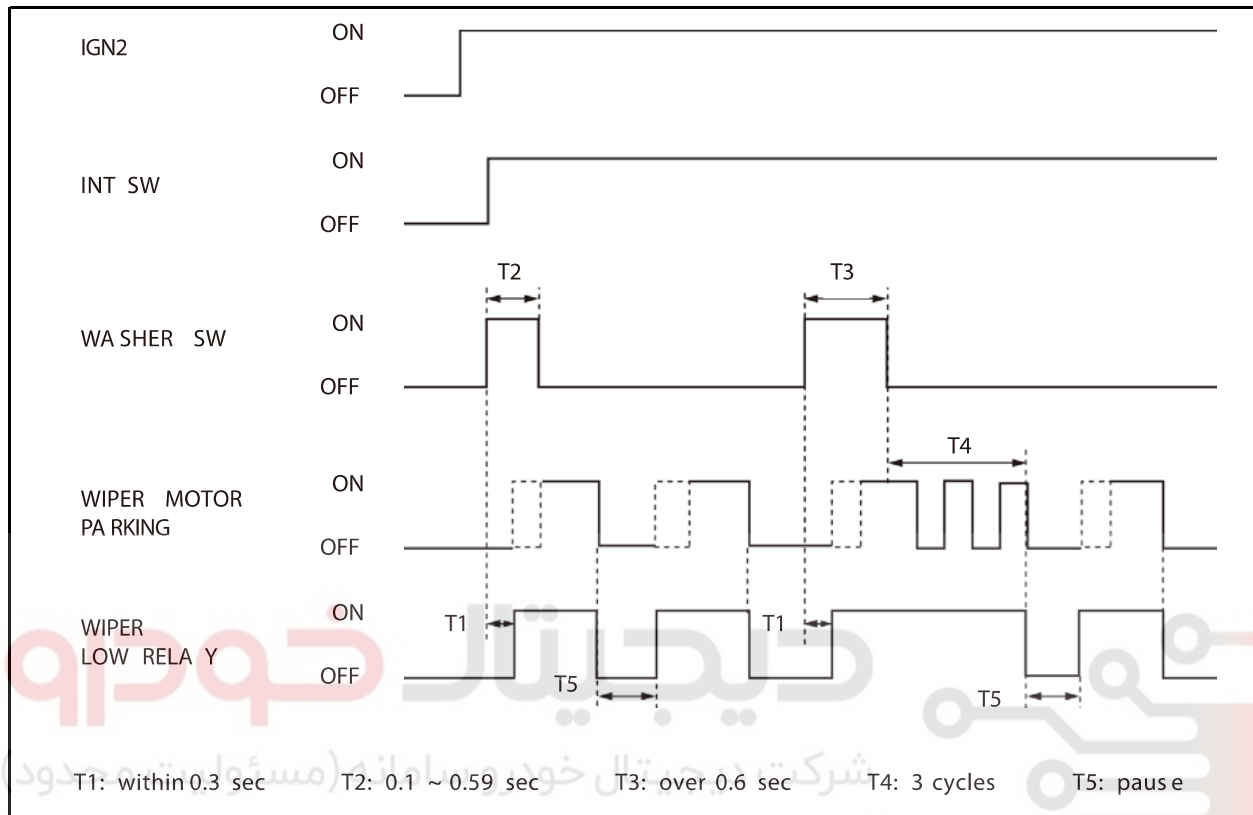


Modification basis	
Application basis	
Affected VIN	

WIPER
undefined

08-10 7810-01

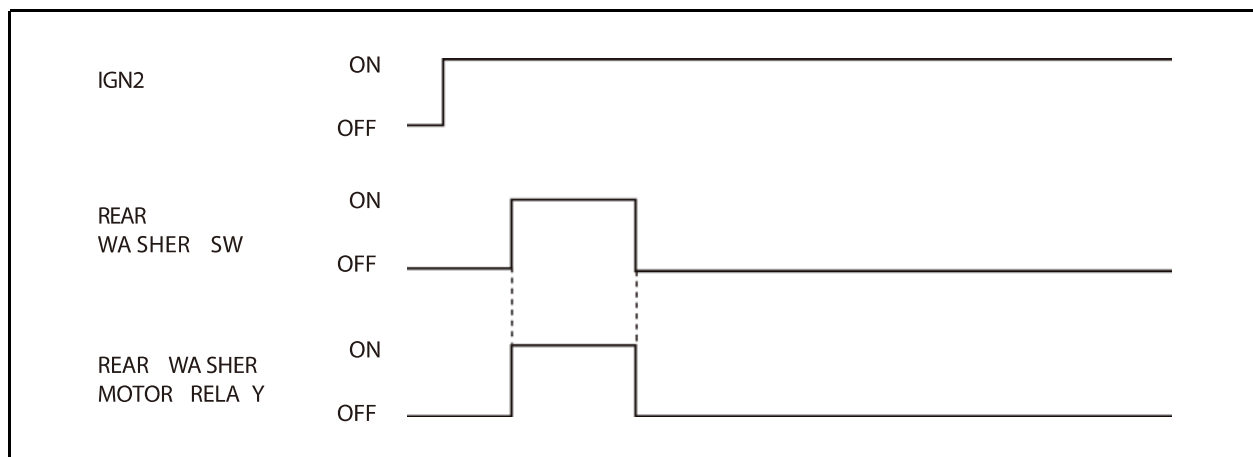
3. When the washer switch is ON for more than 0.6 seconds during the wiper operation by the INT switch, the operation in step (2) is performed. When it is ON for a certain period of time (0.1 to 0.59 seconds), the operation in step (1) is performed.



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(2) Rear Washer Motor Control

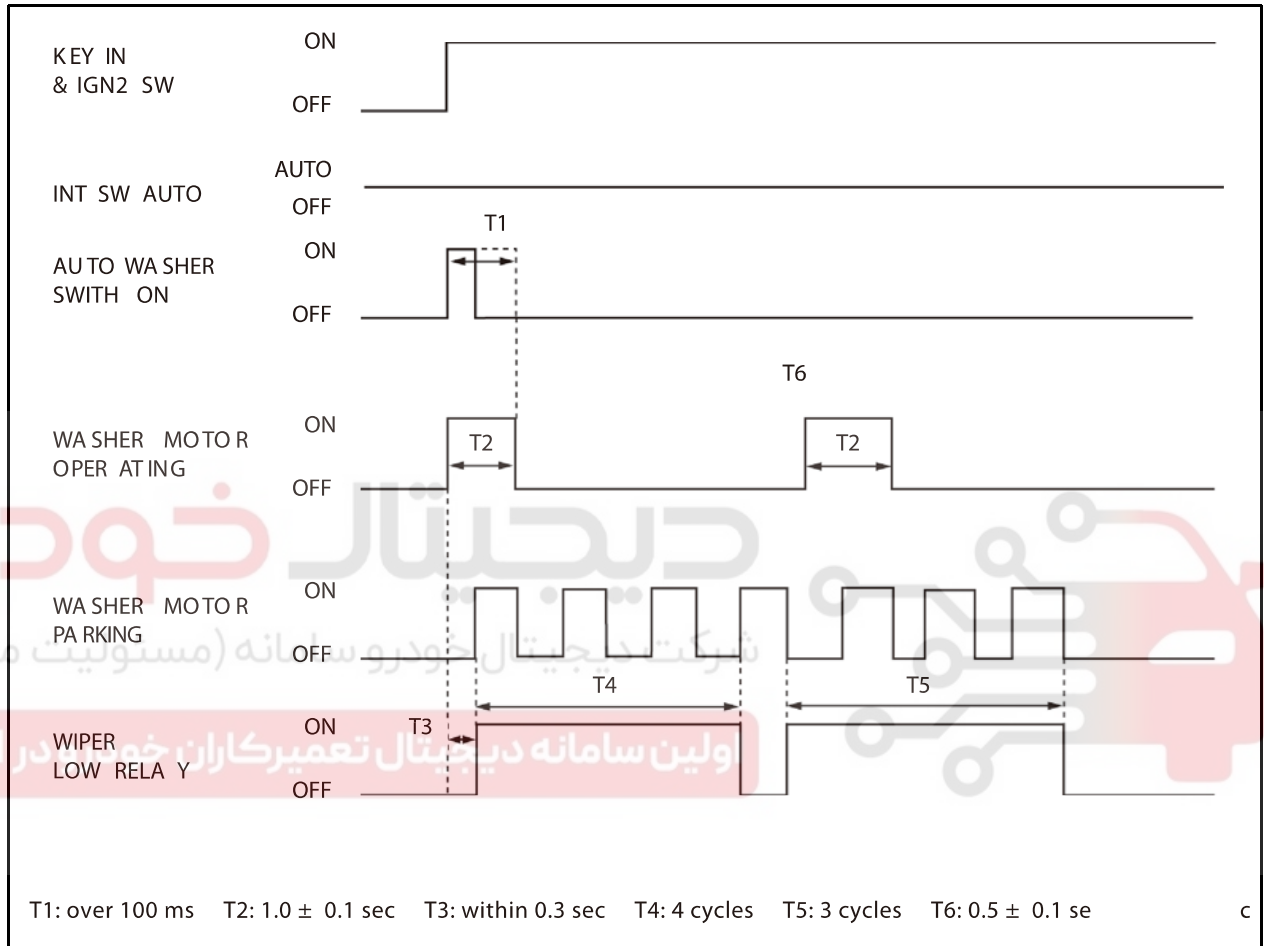
1. When the rear washer switch is turn on with the ignition switch "ON", the rear washer motor relay output is activated from the time when the rear washer switch is turned on, and it is deactivated when the rear washer switch is turned off.
2. It cannot be activated while the front washer switch or the auto washer and wiper (AFW: Advanced Fast Washer) is in operation.



WIPER
undefined

Modification basis	
Application basis	
Affected VIN	

- The auto washer switch output is overridden during the washer coupled wiper operation.
- The auto washer switch input is overridden during the auto washer coupled wiper operation.
- The auto washer switch input is overridden during the rain sensor coupled wiper or vehicle speed sensitive INT wiper operation.
- When the auto INT switch input is received during the auto washer operation, the auto washer operation stops and the auto INT operation is activated.



Priorities in Washer Operations

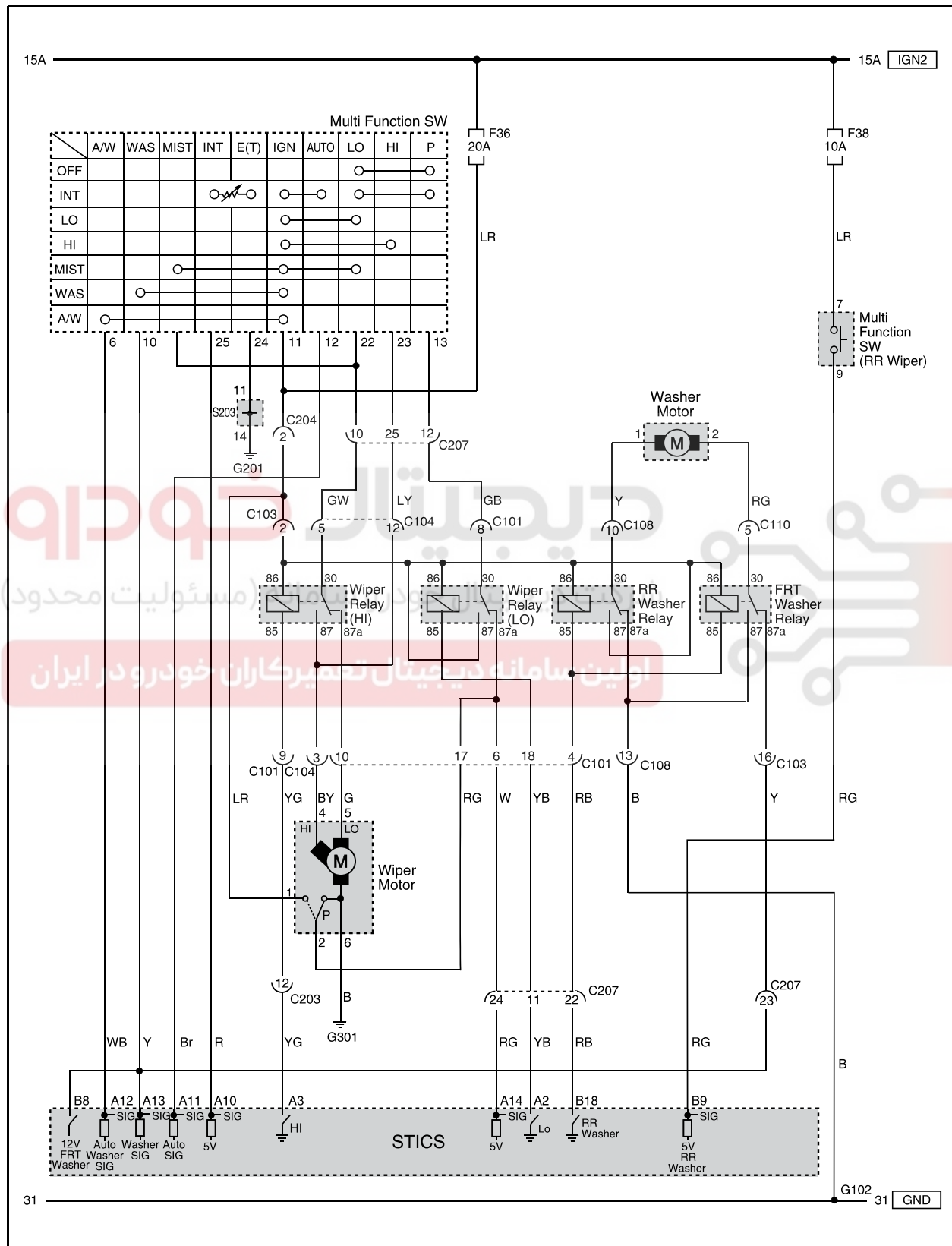
- The rear washer switch input is overridden during the front washer operation.
- The rear washer switch input is overridden during the auto washer and wiper (AFW) operation.
The front washer switch input is overridden during the rear washer operation.
- The auto washer switch input is overridden during the rear washer operation.
- The front washer switch input is overridden during the auto washer and wiper (AFW) operation.
- The auto washer switch input is overridden during the front washer operation.
-

Modification basis	
Application basis	
Affected VIN	

WIPER
undefined

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4. WIPER AND WASHER SYSTEM RELATED CIRCUIT DIAGRAM



WIPER
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Modification basis	
Application basis	
Affected VIN	

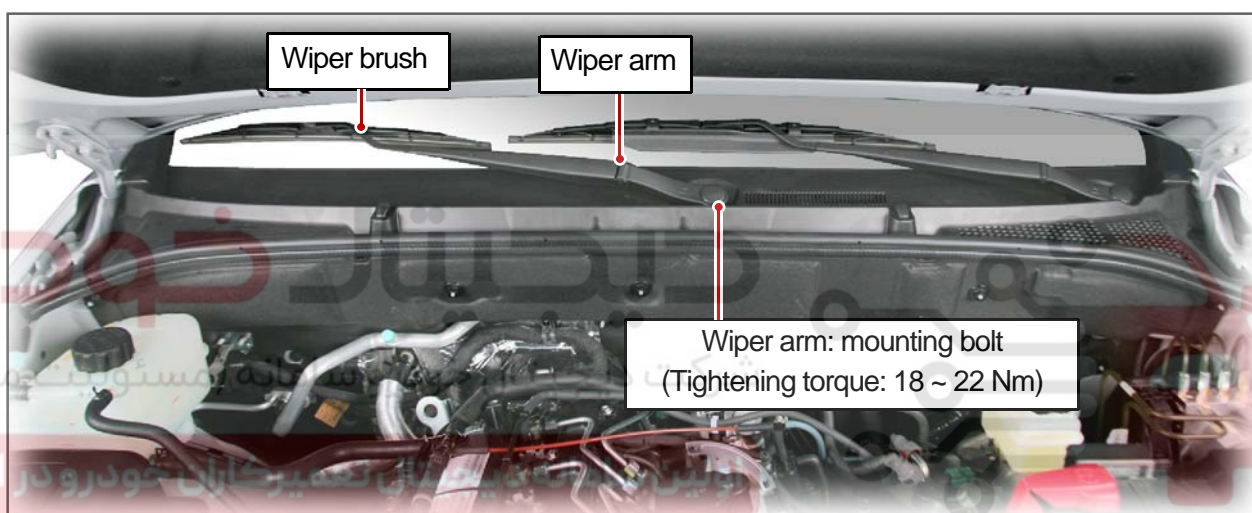
REMOVAL AND INSTALLATION

7810-01

HOW TO CORRECT ANGLE OF FRONT WIPER ARM

The wiper arm blade should be replaced depending on its conditions. However, its expected life span may be shorten or it may not operate properly due to wrong installation or deformation of wiper arm. Under such circumstances, measure the attack angle of the wiper blade against the windshield and adjust the angle of the wiper arm using the adjuster (refer to the following figure).

However, normally, the wiper arm does not need to be adjusted since most wiper arms are designed to fit to the windshield. The following information is the reference to check the wiping operation.



⚠ CAUTION

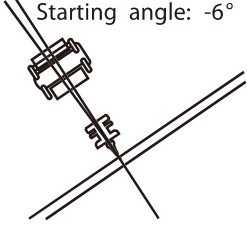
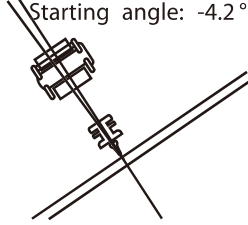
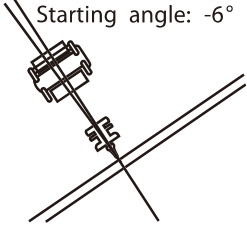
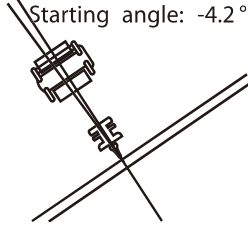
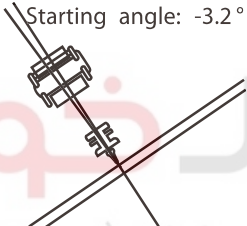
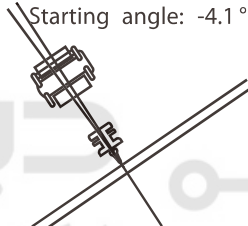
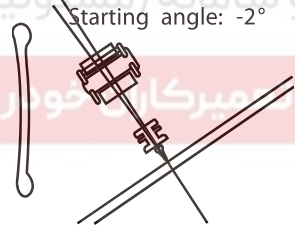
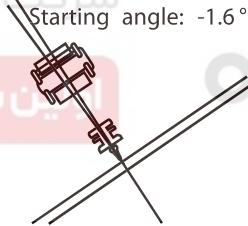
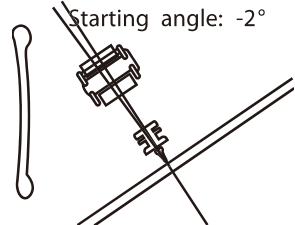
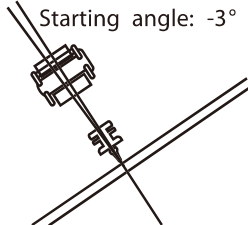
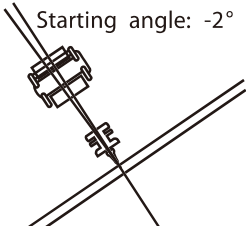
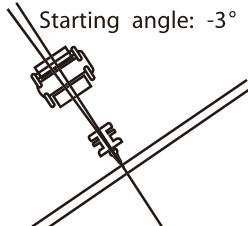
- Check the wiper blade for its wear or damage before measuring the attack angel. Also, keep in mind that the wiper may not operate properly if the windshield is coated even the wiper arm and its angle are in normal operating conditions.
- The attack angel and return angle is the angle against the windshield line when viewed from the pivot center line.
- The single wiper system used in Chairman cannot be repaired. Thus, if the problem persists after replacing the wiper brush for abnormal wiping and then checking by performing the above step (1), you should replace the wiper arm.

Modification basis	
Application basis	
Affected VIN	

WIPER
undefined

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1) Attack Angle of Wiper Blade Against the Windshield by Model

	Driver side	Angle adjustment	Passenger side	Angle adjustment
Actyon	Starting angle: -6° 	-6°	Starting angle: -4.2° 	-4°
Kyron	Starting angle: -6° 	-6°	Starting angle: -4.2° 	-4°
Rodius	Starting angle: -3.2° 	-4°	Starting angle: -4.1° 	-4°
Rexton	Starting angle: -2° 	-2°	Starting angle: -1.6° 	-2°
Musso	Starting angle: -2° 	-2°	Starting angle: -3° 	-3°
Korando	Starting angle: -2° 	-2°	Starting angle: -3° 	-3°
Chairman	Not available (If necessary, replace the wiper arm)			

WIPER
undefined

Modification basis	
Application basis	
Affected VIN	







2) Measurement and Adjustment of Wiper Arm Angle

► Tools

Protractor	Adjustor	Adjustor
		<p>Work position</p>  <p>Work direction</p> <p>Wiper arm</p> <p>Windshield glass</p> <p>Blade</p>

- How to use protractor: Set to "0". Rear the value of the opposite side of the pointer.
- Standard angle of wiper arm: Driver side (3.2°)/Passenger side (4.1°)

► How to adjust

1. Install the protractor (end part of shield (end of the wiper arm)).	2. Zero the protractor after installation. (Install the protractor to the windshield glass)	3. Install the protractor set to "0°" on the upper side of the wiper arm and check the mounting angle.
		
4. Check if the angle is within the specified range. (Install it to the upper part of the wiper arm)	5. If the angle is out of the specified value, the specified range, adjust it using the JIG.	6. Deliver the vehicle after adjusting the customer after adjustment specification.
		

Modification basis	
Application basis	
Affected VIN	

WIPER
undefined

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7810-01

S.G.N.

7810-01 FRONT WIPER ASSEMBLY

Preceding work

- Disconnect the negative battery cable.



1. Insert the remover as shown in the figure below in order to remove the cowl grille left/right covers with the hood lowered.



2. Remove the disconnected cover from the mounting groove.

**CAUTION**

Be careful not to damage the cover during removal.

WIPER
undefined

Modification basis	
Application basis	
Affected VIN	



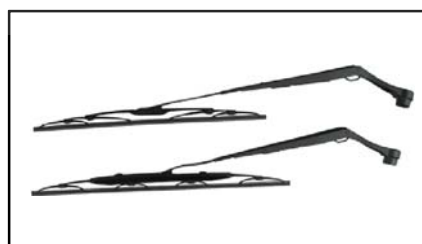
3. Remove the mounting nut caps of the left/right wiper arms.



4. Remove the mounting nuts of the left/right wiper arms.



5. Remove the left/right wiper arms.



6. Remove the hood rear seal.

Modification basis	
Application basis	
Affected VIN	

WIPER
undefined

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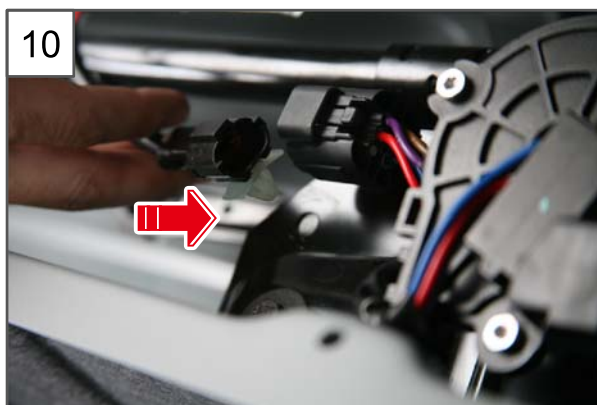
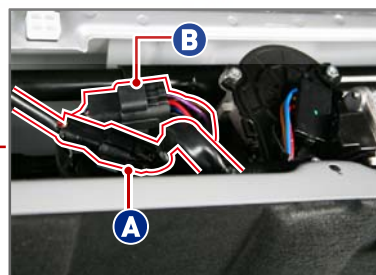
7. Remove the six cowl assembly mounting pins.



8. Remove the washer nozzle hose and remove the cowl assembly.



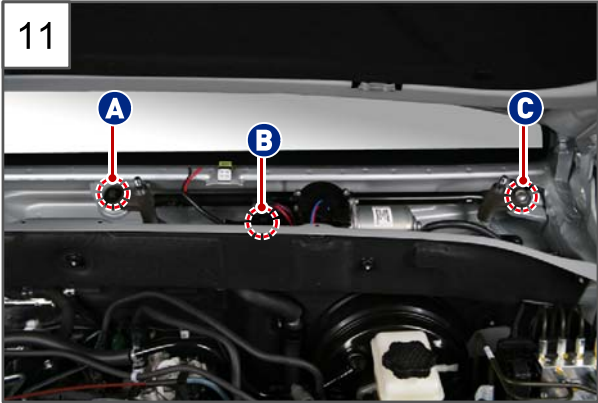
9. Disconnect the windshield heated wire (A) and wiper motor connector (B).



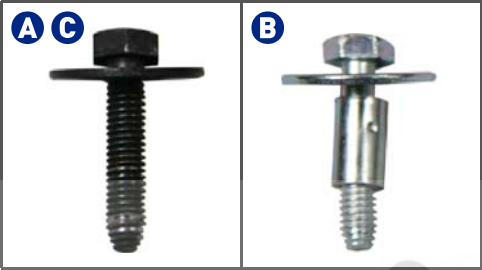
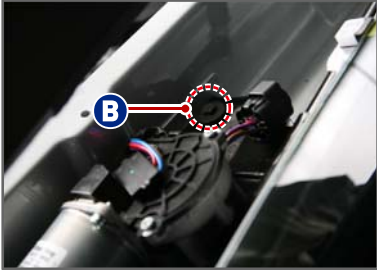
10. Disconnect the mounting pin of the windshiled heated wire connector from the wiper assembly.

WIPER
undefined

Modification basis	
Application basis	
Affected VIN	



11.Unscrew the three wiper assembly mounting bolts.



12.Remove the wiper assembly.



Modification basis	
Application basis	
Affected VIN	

WIPER
undefined

08-20

7810-01

Layout of Front Wiper Assembly

Wiper blade
(Passenger side)

Wiper blade
(Driver side)

Cowl assembly

Link assembly

Wiper motor



Wiper Motor Assembly





Connector





WIPER

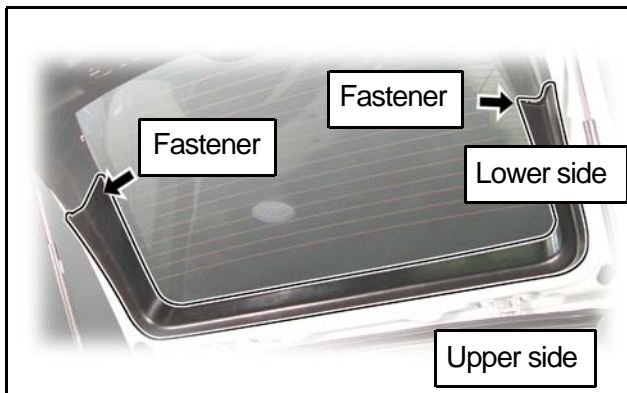
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Modification basis	
Application basis	
Affected VIN	

S.G.N.

7830-01 REAR WIPER ASSEMBLY**Preceding work** 1. Disconnect the negative battery cable.

1. Remove the tailgate upper trim.



2. Remove the tailgate lower trim (fasteners at A, B, C and D).

Upper mounting screw on the tailgate lower trim



Lower mounting screw on the lower trim



Lower mounting screws on the tailgate.

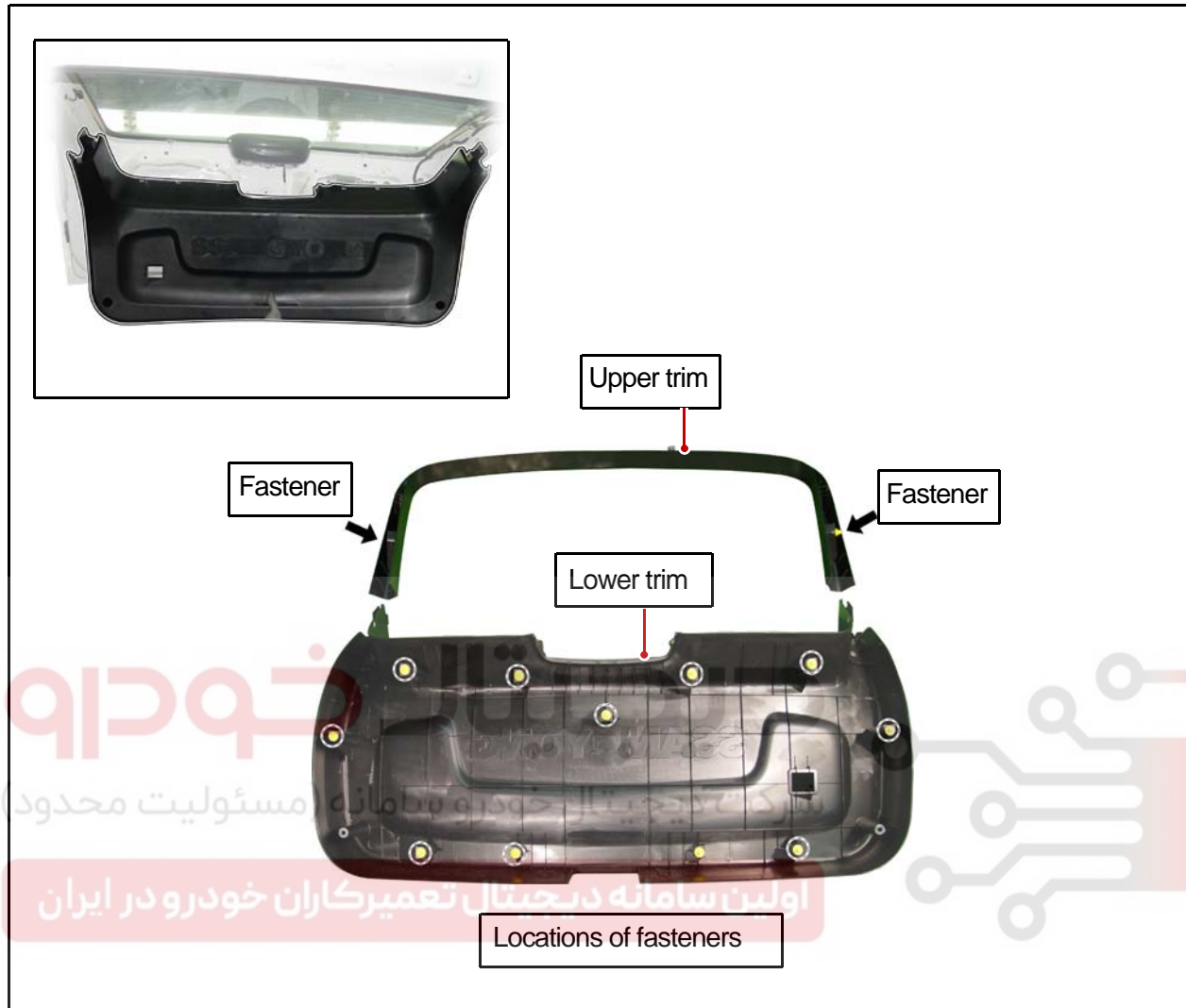


Modification basis	
Application basis	
Affected VIN	

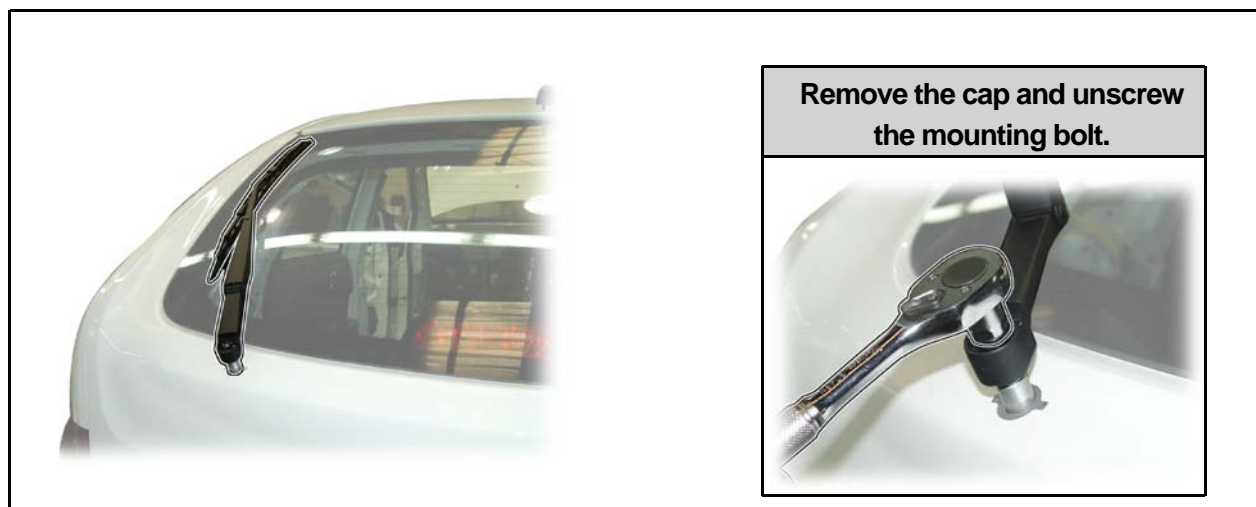
WIPER
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3. Remove the tailgate trim and vinyl cover by pulling them from the lower side.



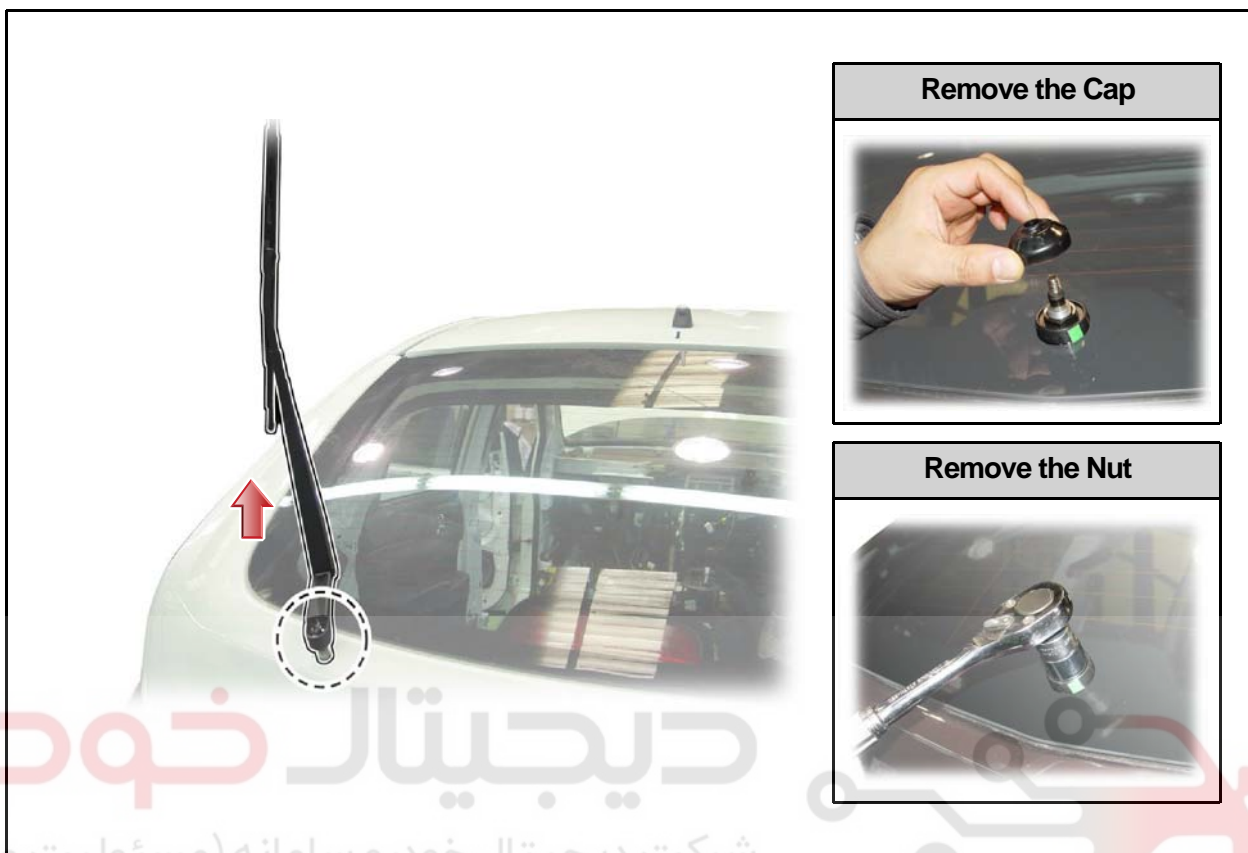
4. Close the tailgate and then remove the wiper blade assembly.



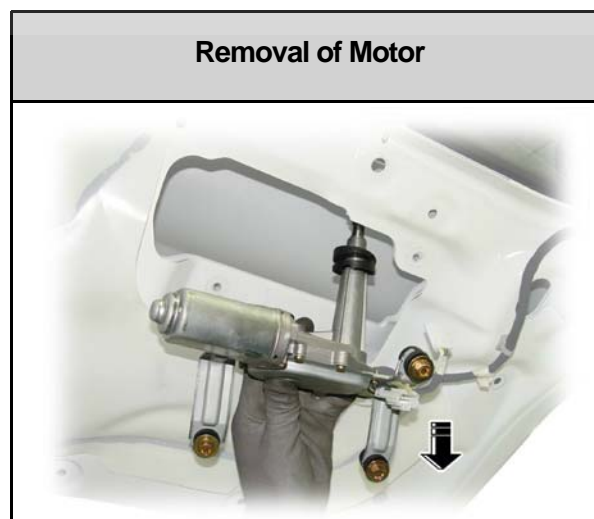
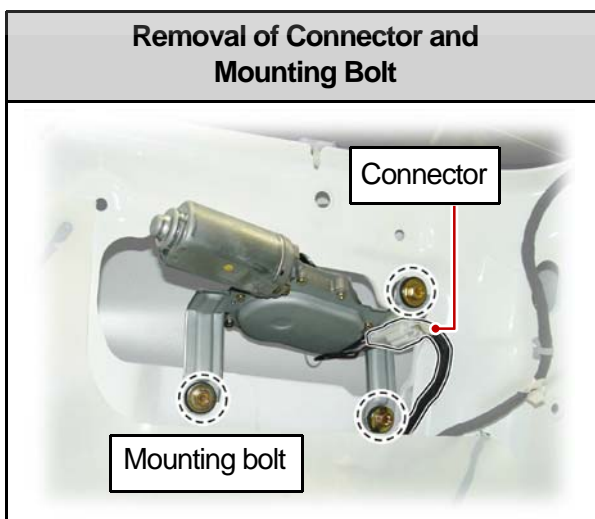
WIPER
undefined

Modification basis	
Application basis	
Affected VIN	

5. Remove the wiper blade. Remove the wiper motor cap and unscrew the mounting nut.



6. Disconnect the wiper motor connector and remove three mounting bolts with the tailgate open. Remove the rear wiper motor assembly.



Modification basis	
Application basis	
Affected VIN	

WIPER
undefined

Rear Wiper Assembly

Wiper blade assembly (passenger side)

Splasher ring-tailgate wiper

Mounting nut

Spacer ring-tailgate wiper

Rear wiper motor and linkage assembly

Front

Rear

WIPER

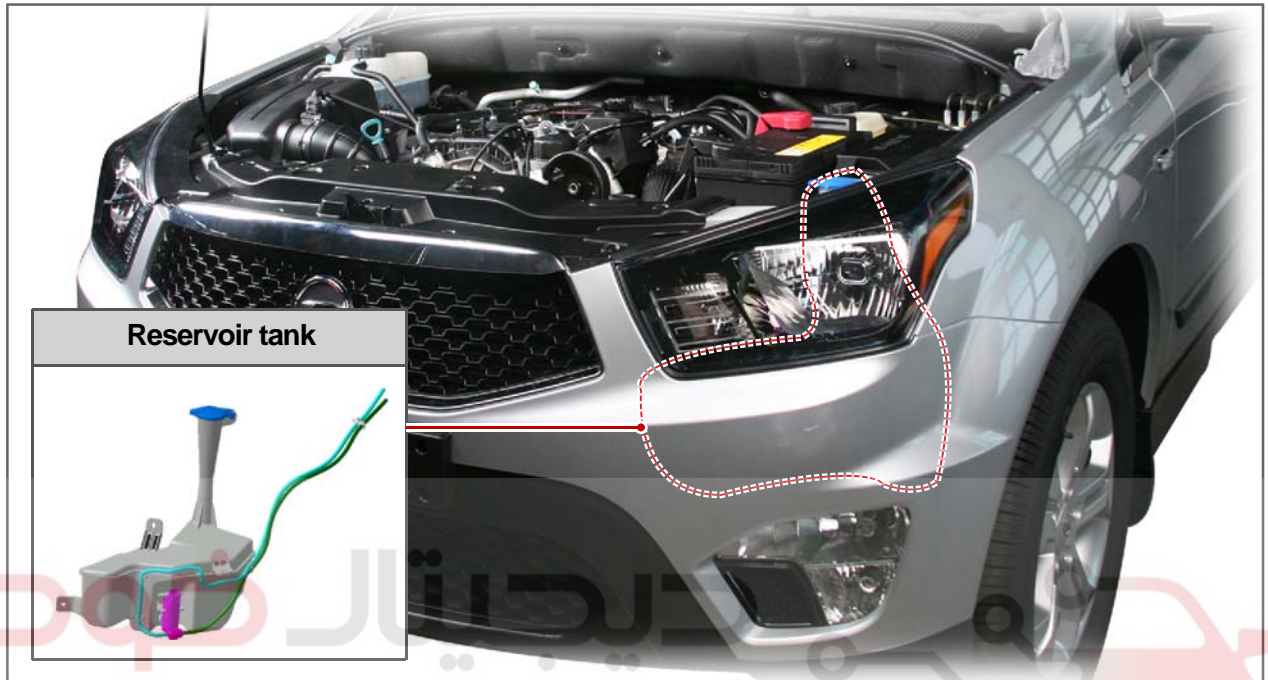
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Modification basis	
Application basis	
Affected VIN	

S.G.N.

7820-01 RESERVOIR TANK**Preceding work**

1. Disconnect the negative battery cable.
2. Remove the headlamp and front bumper.



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1. Remove the front wheel house cover.



2. Unscrew the four mounting bolts of the side extension assembly and remove the side extension assembly.

Modification basis	
Application basis	
Affected VIN	

WIPER
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CFUSE
AND

STICS

IMMOBILI
ZERCLUSTE
R

LAMP

SWITCH

WIPER &
WASHERRAIN
SENSOR

P/S

AUDIO
SYSTEM

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7820-01



3. Disconnect the washer motor connector.



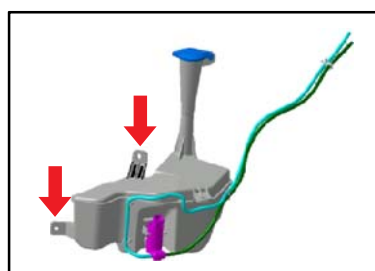
4. Remove the mounting pin of the washer hose in the driver side fender.



5. Disconnect the washer hose connection in the driver side fender.



6. Unscrew the two mounting bolts on the reservoir tank and remove the reservoir tank.



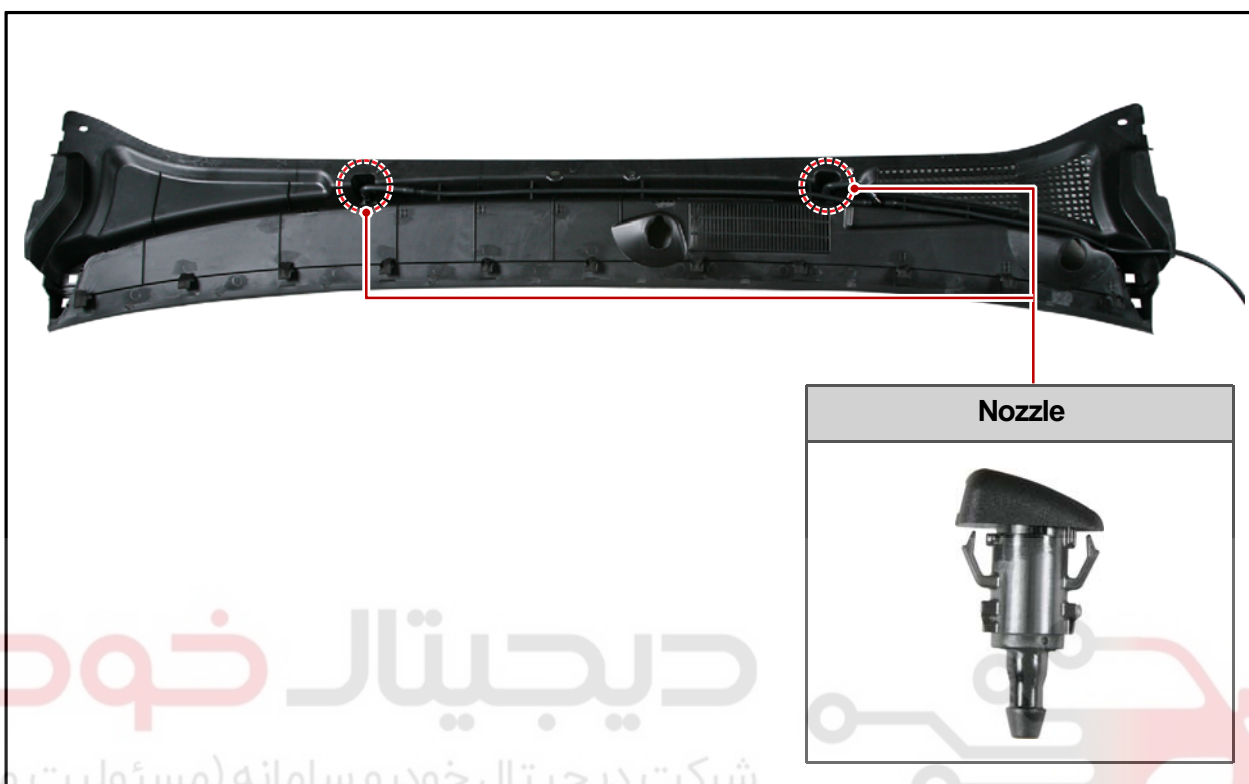
WIPER
undefined

Modification basis	
Application basis	
Affected VIN	

S.G.N.

7820-22 NOZZLE AND HOSE**Preceding work**

- Remove the cowl assembly.



1. Disconnect the washer hose to the nozzle.



2. Remove the key to the nozzle secured to the cowl assembly groove by pressing it.



3. Installation is in the reverse order of removal.

Modification basis	
Application basis	
Affected VIN	

WIPER
undefined

2) Rear Washer Nozzle



1. Pry off the rear washer nozzle from the tailgate with a flat blade screwdriver.



CAUTION

- Be careful not to damage the body and the nozzle.

2. Separate the nozzle from the hose.



CAUTION

- The water may be entered into the engine compartment if the curved area of the engine hood and the nozzle is not adhered closely. Therefore, install the washer nozzle on clean surface.