

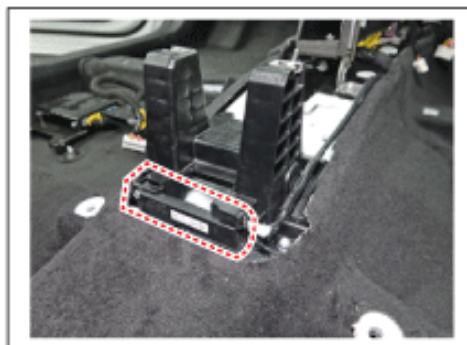
Component Location

(1)

[1]



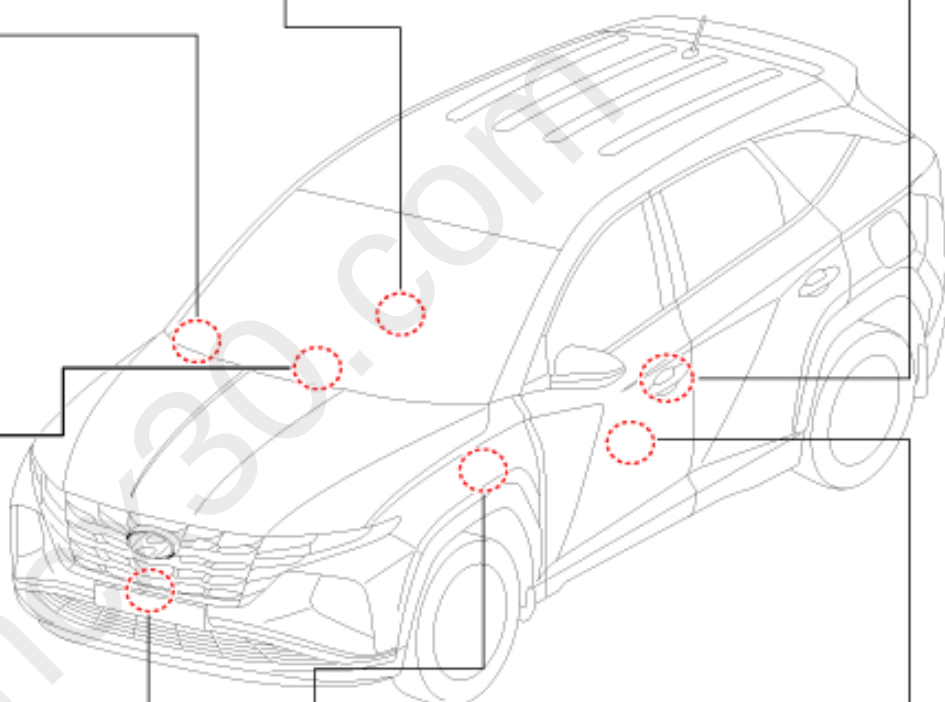
[2]



[3]



[4]



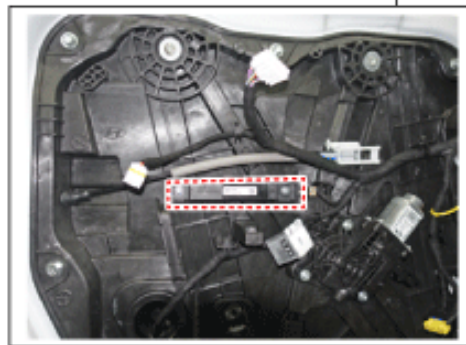
[5]



[6]



[7]

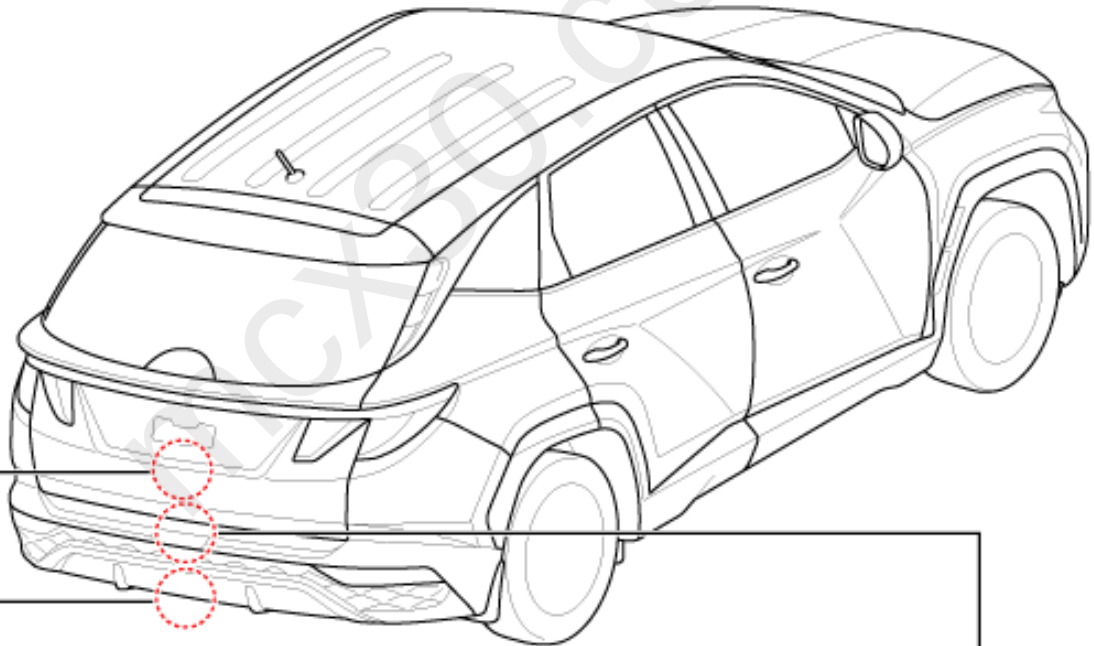


1. Integrated body control unit (IBU)
2. Interior antenna 2
3. Door outside handle
4. Interior antenna 1

5. Front antenna
6. Buzzer
7. Door antenna

Component Location (2)

[1]



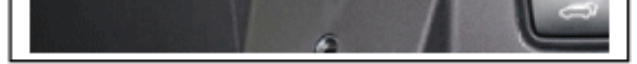
[2]



[3]



[2]



[3]

1. Tailgate antenna
2. Rear bumper antenna

3. Tailgate open switch

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Specifications

Smart Key Unit (IBU)

Items	Specification
Rated voltage	DC 12V
Operating voltage	DC 9 ~ 16V
Operating temperature	-30°C ~ 75°C
Load	Max. 4.0mA (When welcome light function off) (2.5mA increase When operation of Welcome Light. (60 days average))

Smart Key (FOB Key)

Items	Specification
Battery	Lithium battery 3V 1EA (CR2032)
Distance	30m from vehicle, RF : 30m, Passive(LF) : 0.7m
Battery life	More than 2 years (20 times / a day) ☐ An inappropriately disposed battery can be harmful to the environment and human health. Dispose the battery according to your local law(s) or regulation.
Push buttons	7 (Door lock / unlock, Tailgate open, Panic, Button remote start, Forward, Backward)
Frequency(Rx)	125 kHz
Frequency(Tx)	433.92 Mhz
Numbers	2EA

Antenna

Items	Specification
Rated voltage	DC 12V
Operating voltage	DC 9 ~ 16V
Operating temperature	-22°F to 167°F (-30°C to 75°C)
Frequency	125kHz

Numbers	Interior(2EA), Door(2EA), Front bumper(1EA), Rear bumper (1EA), Tailgate (1EA)
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Inspection

Self Diagnosis With Scan Tool

It will be able to diagnose defects of SMART KEY system with diagnostic tool quickly. diagnostic tool can operates actuator forcefully, input/output value monitoring and self diagnosis.

The following three features will be major problem in SMART KEY system.

1. Problem in SMART KEY unit input.
2. Problem in SMART KEY unit.
3. Problem in SMART KEY unit output.

So the following three diagnosis operates will be the major problem solution process.

4. SMART KEY unit Input problem : switch diagnosis
5. SMART KEY unit problem : communication diagnosis
6. SMART KEY unit Output problem : antenna and switch output diagnosis

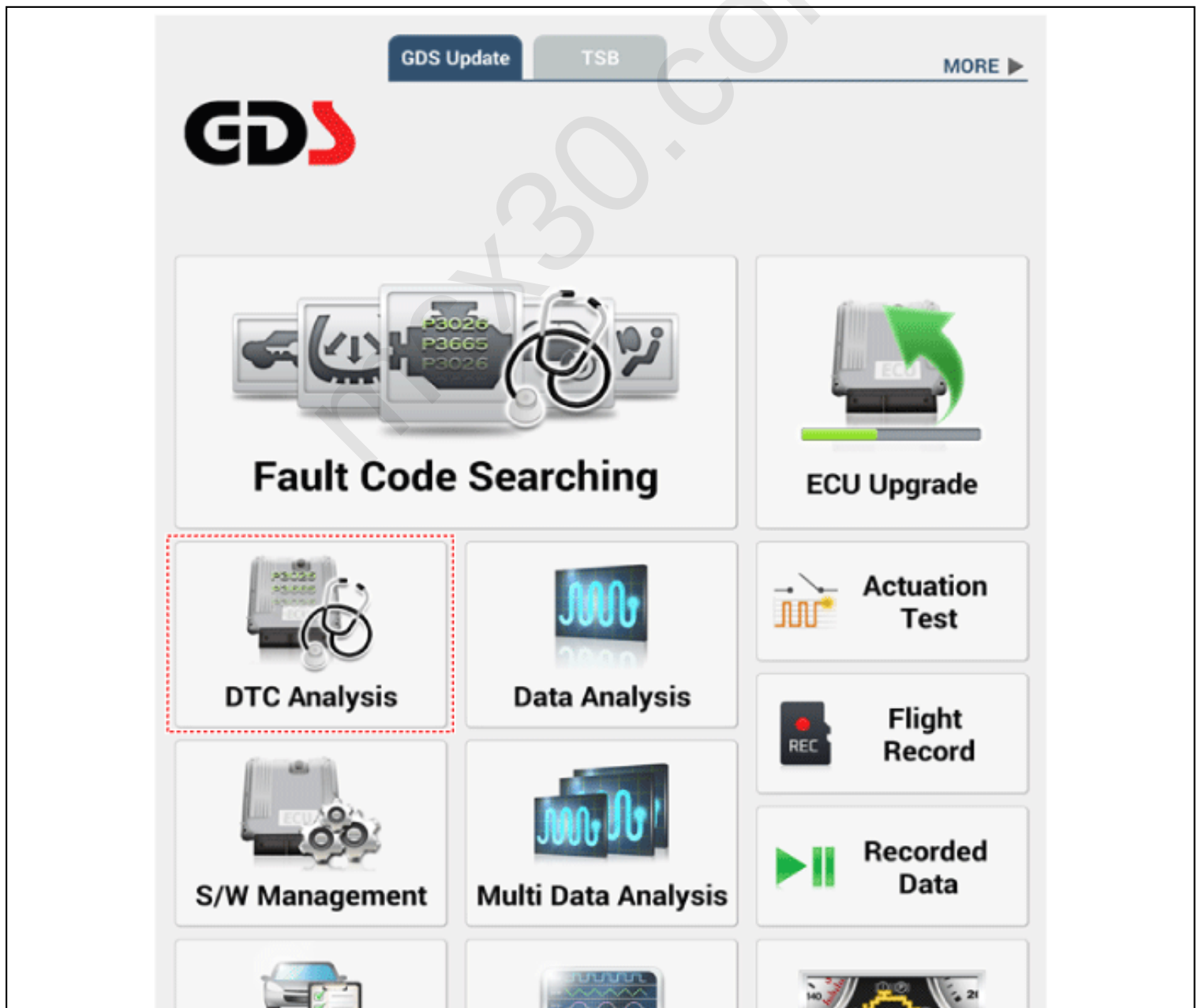
Switch Diagnosis

1. In the body electrical system, failure can be quickly diagnosed by using the vehicle diagnostic system (diagnostic tool).

The diagnostic system(diagnostic tool) provides the following information.

- (1) Fault Code Searching : Checking failure and code number (DTC)
- (2) Data Analysis : Checking the system input/output data state
- (3) Actuation test : Checking the system operation condition
- (4) S/W Management : Controlling other features including system option setting and zero point adjustment

2. If diagnose the vehicle by diagnostic tool, select "DTC Analysis" and "Vehicle".





3. If check current status, select the "Data Analysis" and "Car model".



4. Select the SMK' to be checked in order to check the vehicle with the tester.



Data Analysis			
Stop Graph Selective Display Actuation Test			
Sensor Name(48)	Value	Unit	Link Up
Start Stop Button Switch1	OFF	-	
Start Stop Button Switch2	OFF	-	
ACC	ON	-	
IGN1	ON	-	
IGN2	ON	-	
Start Relay Feed Back Signal	OFF	-	
Gearshift P Position(AT)/Clutch(MT)	ON	-	
Brake Switch	OFF	-	
Driver Door Handle Toggle Button Switch	OFF	-	
Assist Door Handle Toggle Button Switch	OFF	-	
Battery Voltage Monitoring Input(by CPU)	7.2	V	
Engine Speed	0	RPM	
Vehicle Speed Signal	0	km/h	
ACC Relay Output	6.9	V	
IGN1 Relay Output	6.9	V	
IGN2 Relay Output	6.9	V	
Starter Relay Output	0.6	V	
Battery Voltage Monitoring Input(by Load)	7.2	V	
External Buzzer	OFF	-	
SSB Illumination GND Output	OFF	-	

5. You can see the situation of each switch on scanner after connecting the "current data" process.

Display	Description
FL Toggle SW	ON : Push button is ON in the driver door handle.
FR Toggle SW	ON : Push button is ON in the assist door handle.
Tailgate open SW	ON : Tailgate button is ON.
Gear P Position	ON : Shift lever is P position.
IGN 1	ON : IGN switch is IG position.
ACC	ON : IGN switch is ACC position.

Fault Code Searching

1. Fault code searching that the each linked components operates normal.
2. Connect the cable of diagnostic tool to the data link connector in driver side crash pad lower panel.
3. Select the 'Fault Code Searching' and 'Car model'.



Antenna Actuation Diagnosis

1. Connect the cable of diagnostic tool to the data link connector in driver side crash pad lower panel.

2. Select the 'Actuation Test' and 'Car model'.

GDS Update

TSB

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Fault Code Searching



ECU Upgrade



DTC Analysis



Data Analysis



Actuation Test



Flight Record



S/W Management



Multi Data Analysis



Recorded Data



Digital Before Service



Measurement



OBD- II



NEW THINKING.
HYUNDAI NEW POSSIBILITIES.

3. Set the smart key near the related antenna and operate it with a diagnostic tool.

Actuation Test				
● Test Item(14)				
IGN1 Relay				
IGN2 Relay				
Starter Relay				
External Buzzer				
Interior Antenna 1				
Interior Antenna 2				
Interior Antenna 3				
Bumper Antenna Active				
Activate Driver Side Antenna				
Activate Assist Side Antenna				
Data Analysis				
< Stop Graph Selective Display Group >				
Sensor Name(48)		Value	Unit	
Start Stop Button Switch1		OFF	-	
Start Stop Button Switch2		OFF	-	
ACC		ON	-	
IGN1		ON	-	
IGN2		ON	-	
Start Relay Feed Back Signal		OFF	-	
Gearshift P Position(AT)/Clutch(MT)		ON	-	
Brake Switch		OFF	-	

4. Set the smart key near the related antenna and operate it with a diagnostic tool.

5. If the LED of smart key is blinking, the smart key is normal.

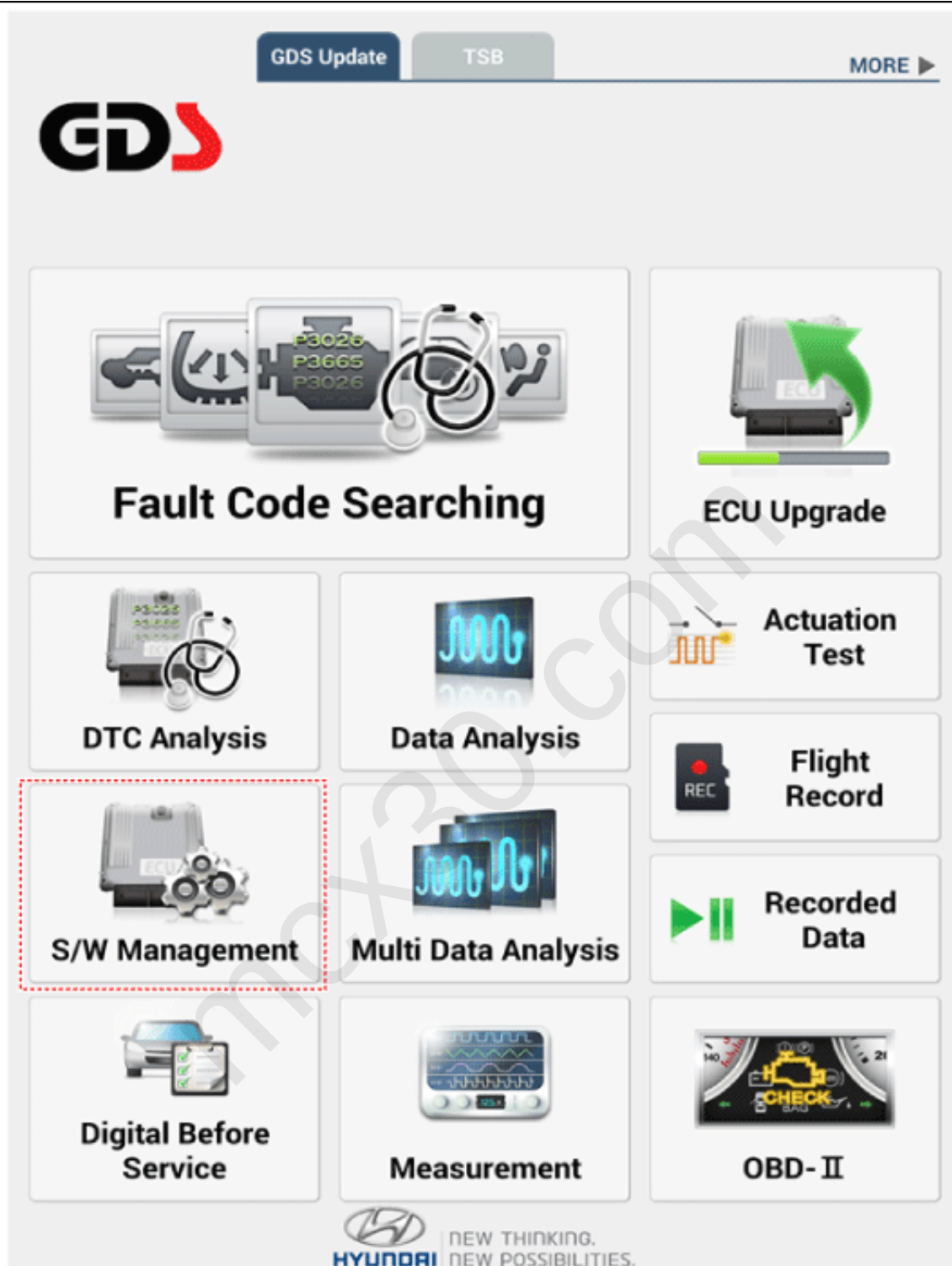
6. If the LED of smart key is not blinking, check the voltage of smart key battery.

7. Antenna actuation

- Interior Antenna 1
- Interior Antenna 2
- Bumper Antenna
- Driver Door Antenna
- Assist Door Antenna

Antenna Status Check

1. Connect the cable of diagnostic tool to the data link connector in driver side crash pad lower panel.
2. Select the 'S/W Management' and 'Car model'.



3. Select the 'Smart Key Unit' and 'Antenna Status Check'.

S/W Management

Systems

Components

Unfold All

■ Lane Keeping Assist

■ Auto Headlamp Leveling System

■ Immobilizer

■ Smart Key Unit

■ System Identification

■ Current FOB Key Check

■ Serial Communication Line Check

■ Neutralization Mode

■ SMK STATUS INFORMATION

■ ESCL STATUS INFORMATION

■ ESCL OPEN STATUS CHECK

■ FOB KEY STATUS INFORMATION

■ Smart Key Code Saving

■ Antenna Status Check

■ Amplifier

■ Cluster Module

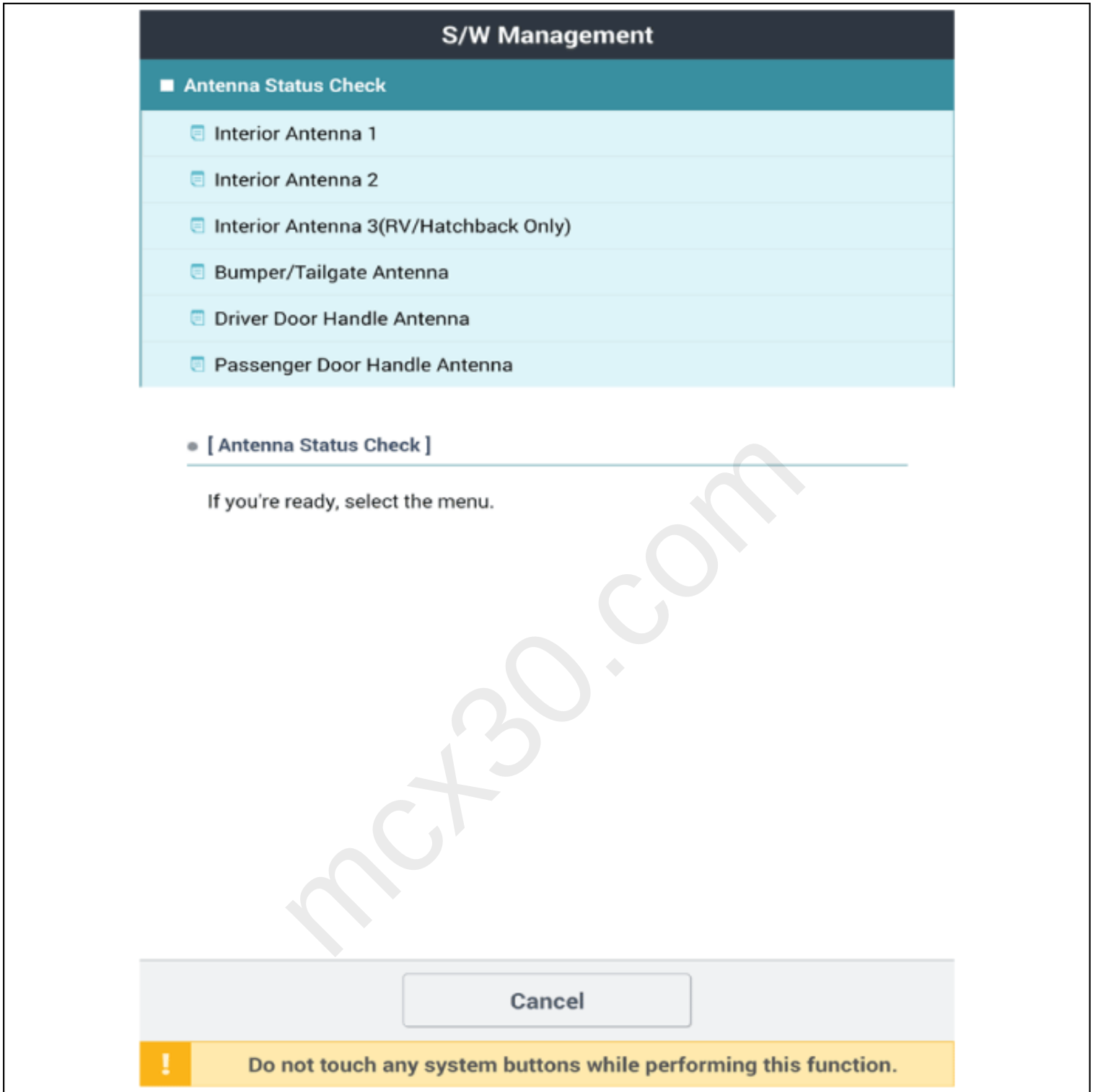
■ Head Up Display

■ IBU-BCM

!

Do not touch any system buttons while performing this function.

4. Set the smart key near the related antenna and operate it with a diagnostic tool.



5. If the smart key runs normal , the related antenna, smart key(transmission, reception) and exterior receiver are normal.

6. Antenna status

- Interior Antenna 1
- Interior Antenna 2
- Bumper Antenna
- Driver Door Antenna
- Assist Door Antenna

FOB Status Check

1. Connect the cable of diagnostic tool to the data link connector in driver side crash pad lower panel.

2. Select the 'S/W Management' and 'Car model'.



3. Select the 'Smart Key Unit' and 'FOB KEY STATUS INFORMATION'.

S/W Management

Systems

Components

Unfold All

■ Lane Keeping Assist

■ Auto Headlamp Leveling System

■ Immobilizer

■ Smart Key Unit

■ System Identification

■ Current FOB Key Check

■ Serial Communication Line Check

■ Neutralization Mode

■ SMK STATUS INFORMATION

■ ESCL STATUS INFORMATION

■ ESCL OPEN STATUS CHECK

■ FOB KEY STATUS INFORMATION

■ Smart Key Code Saving

■ Antenna Status Check

■ Amplifier

■ Cluster Module

■ Head Up Display

■ IBU-BCM

!

Do not touch any system buttons while performing this function.

S/W Management

■ FOB KEY STATUS INFORMATION

● [FOB Key Status Information]

Key Status : NORMAL

Button Status : -

OK

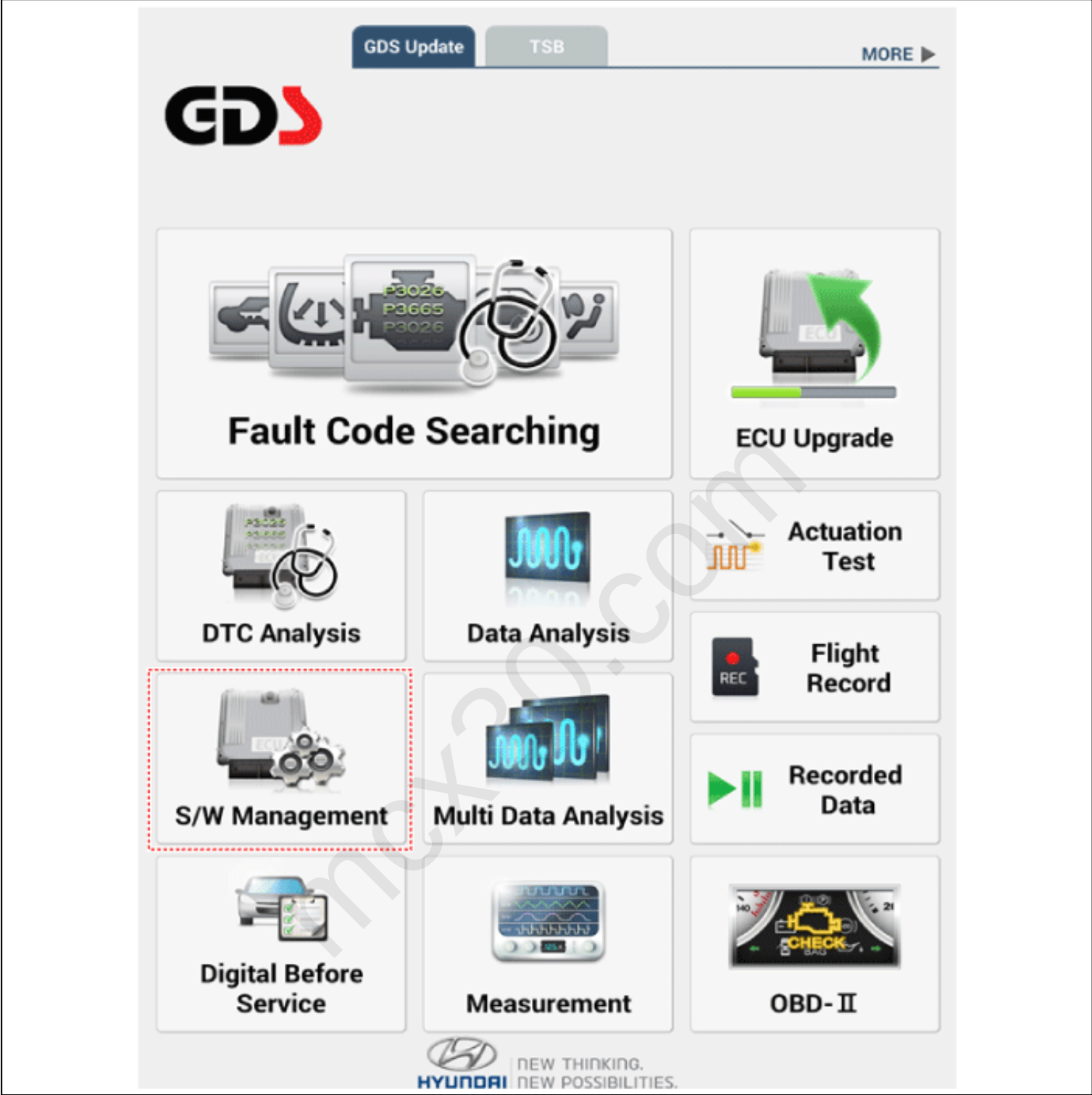


Do not touch any system buttons while performing this function.

Smart Key Status Check

1. Connect the cable of diagnostic tool to the data link connector in driver side crash pad lower panel.

2. Select the 'S/W Management' and 'Car model'.



3. Select the 'Smart Key Unit' and 'SMK STATUS INFORMATION'.

S/W Management

Systems

Components

Unfold All

■ Lane Keeping Assist

■ Auto Headlamp Leveling System

■ Immobilizer

■ Smart Key Unit

■ System Identification

■ Current FOB Key Check

■ Serial Communication Line Check

■ Neutralization Mode

■ SMK STATUS INFORMATION

■ ESCL STATUS INFORMATION

■ ESCL OPEN STATUS CHECK

■ FOB KEY STATUS INFORMATION

■ Smart Key Code Saving

■ Antenna Status Check

■ Amplifier

■ Cluster Module

■ Head Up Display

■ IBU-BCM

!

Do not touch any system buttons while performing this function.

S/W Management

■ SMK STATUS INFORMATION

● [SMK Status Information]

Key : 2

Status : LEARNT

OK



Do not touch any system buttons while performing this function.

Neutralization Status Check

1. Connect the cable of diagnostic tool to the data link connector in driver side crash pad lower panel.

2. Select the 'S/W Management' and 'Car model'.

GDS Update

TSB

MORE ▶

Fault Code Searching

ECU Upgrade

DTC Analysis

Data Analysis

Actuation Test

S/W Management

Multi Data Analysis

Flight Record

Recorded Data

Digital Before Service

Measurement

OBD- II

NEW THINKING.
HYUNDAI NEW POSSIBILITIES.

3. Select the 'Smart Key Unit' and 'Neutralization Mode'.

S/W Management

Systems

Components

Unfold All

■ Lane Keeping Assist

■ Auto Headlamp Leveling System

■ Immobilizer

■ Smart Key Unit

■ System Identification

■ Current FOB Key Check

■ Serial Communication Line Check

■ Neutralization Mode

■ SMK STATUS INFORMATION

■ ESCL STATUS INFORMATION

■ ESCL OPEN STATUS CHECK

■ FOB KEY STATUS INFORMATION

■ Smart Key Code Saving

■ Antenna Status Check

■ Amplifier

■ Cluster Module

■ Head Up Display

■ IBU-BCM

!

Do not touch any system buttons while performing this function.

S/W Management

■ Neutralization Mode

- ECM Neutralization
- SMK Neutralization
- ESCL Neutralization

● [Neutralization Mode]

This function needs only when you do swapping test with normal vehicle's parts related to SMK except for Smart Key (FOB).

- Related parts : SMK ECU, ECM

⚠ [Caution]

In case that Smart Key, SMK ECU, ECM are replaced with new one, it doesn't need to neutralize and please carry out only Smart Key teaching.

If you're ready, select the menu.

Cancel



Do not touch any system buttons while performing this function.

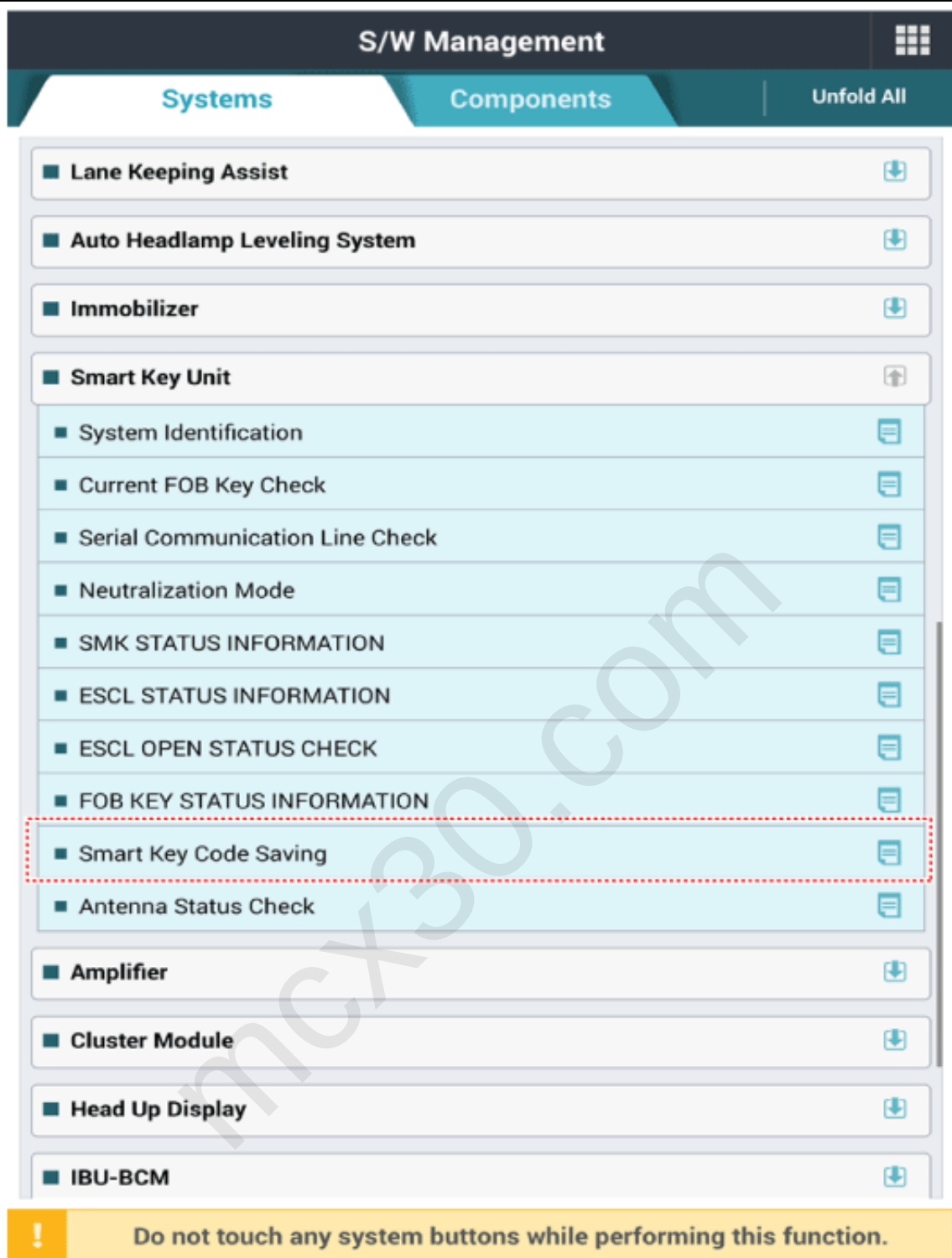
Smart Key

Smart Key Code Saving

1. Connect the DLC cable of diagnostic tool to the data link connector (16 pins) in driver side crash pad lower panel, turn the power on diagnostic tool.



2. Select the 'S/W Management' and 'Car model'.
3. Select the 'Smart Key Unit' and 'Smart Key Code Saving'.



4. Follow the instructions on the screen.

S/W Management

■ Smart Key Code Saving

● [Smart key code saving]

● [Condition]

1. IG Off

Please have FOB key to teach and press **[OK]** button.

OK

Cancel



Do not touch any system buttons while performing this function.

Components
(1)

Integrated Body Control Unit (IBU)



Connector Pin Information

No	Connector A	Connector B	Connector C	Connector D
1	Speed_input	-	ECU ground	Blower motor operate_output
2	-	Rear washer switch_output	power ground	-
3	Front washer switch_input	ESCL (+)_output	Battery (+) ECU	-
4	PDW-R power_input	ESCL (-)_output	Battery (+) power	-
5	RPM_input	Front wiper low relay_output	-	-
6	-	-	Immobilizer antenna power_output	Start feedback_output
7	ACC relay_output	PDW switch IND_output	Immobilizer antenna ground_output	-
8	Multifunction switch ground_output	-	IGN 1_output	-
9	ESCL COM	-	-	Passenger outside handle_output
10	Front wiper switch_output	-	-	-
11	IGN1 relay_output	-	B_CAN (Low)	-
12	Head lamp (High) switch_output	-	B_CAN (High)	-
13	IGN2 relay_output	Auto light sensor signal_output	Start relay_output	Front bumper antenna(+)_output
14	Mirror unfolding_output	-	P_CAN (Low)	Bumper antenna power_output

15	wiper relay power_output	-	P_CAN (High)	Passenger outside handle antenna(+)_output
16	Rear right seat belt IND_output	SSB switch 2_input	Sunroof status_output	Driver outside handle antenna(+)_output
17	Rear left seat belt IND_output	PDW OPT_output	PDW-R switch_output	Tailgate antenna (+)_output
18	-	Front wiper back up switch_input	IFU door unlock signal_output	Interior antenna2 power_output
19	Rear wiper relay	Front wiper high relay_output	LIN3	Interior antenna1 power_output
20	-	SSB symbol illumination (+)_output	LIN4	ESCL Enable_output
21	PDW power_output	-	-	-
22	-	-	ATM solenoid_output	-
23	-	Auto light sensor ground_output	ACC_output	-
24	Brake switch_output	-	-	-
25	Rear wiper relay_output	-	-	Driver outside handle switch_output
26	UIPROA OPT_output	-	-	-
27	Front wiper volume switch_output	-	-	-
28	-	-	-	-
29	Light switch_output	-	kline IMMO	-
30	Puddle lamp_output	SSB switch1_output	RVM switch_output	Front bumper antenna(-)_output
31	Fog lamp switch_output	ESCL unlock switch_IN	P-Position_output (AT)	Bumper antenna ground_output

32	Mirror folding_output	Wiper parking switch_output	Clutch ignition lock switch_output (MT)	Passenger outside handle antenna(-) _output
33	-		IGN2_output	Driver outside handle antenna (-) _output
34	Rear center seat belt IND_output		LIN1	Tailgate antenna (-)_output
35	-		LIN2	Interior antenna2 ground_output
36	-		Auto light sensor power_output	Interior antenna1 ground_output
37	External amplifier_output			
38	PDW-R power_output			

Circuit
Diagram



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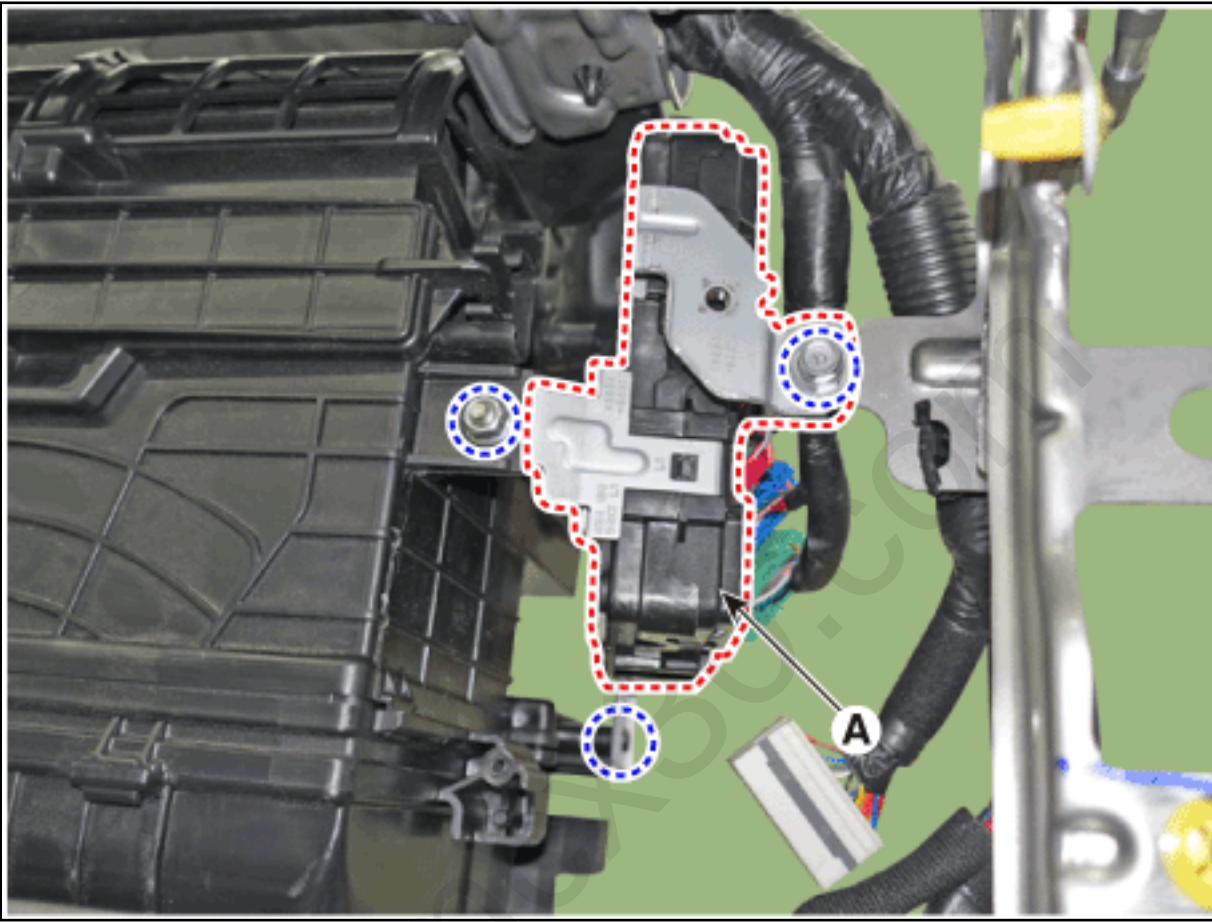
Removal

Integrated Body Control Unit (IBU)

1. Disconnect the negative (-) battery terminal.
2. Remove the heater control unit.

(Refer to Heating, Ventilation And Air Conditioning - "Heater Control Unit")

3. Remove the IBU (A) after loosening mounting bolt, nut and screw.



4. Disconnect IBU connectors and then remove the IBU (A).



Inspection

Smart Key Unit

(Refer to Smart Key System - "Smart Key Diagnostic")

Smart Key Switch

(Refer to Smart Key System - "Smart Key Diagnostic")

Smart Key Antenna

Refer to Smart Key System - "Smart Key Diagnostic")

Installation

Integrated Body Control Unit (IBU)

1. Install the IBU and connect the connector.
2. Install the heater control unit.
3. Install the negative (-) battery terminal and check the smart key system.

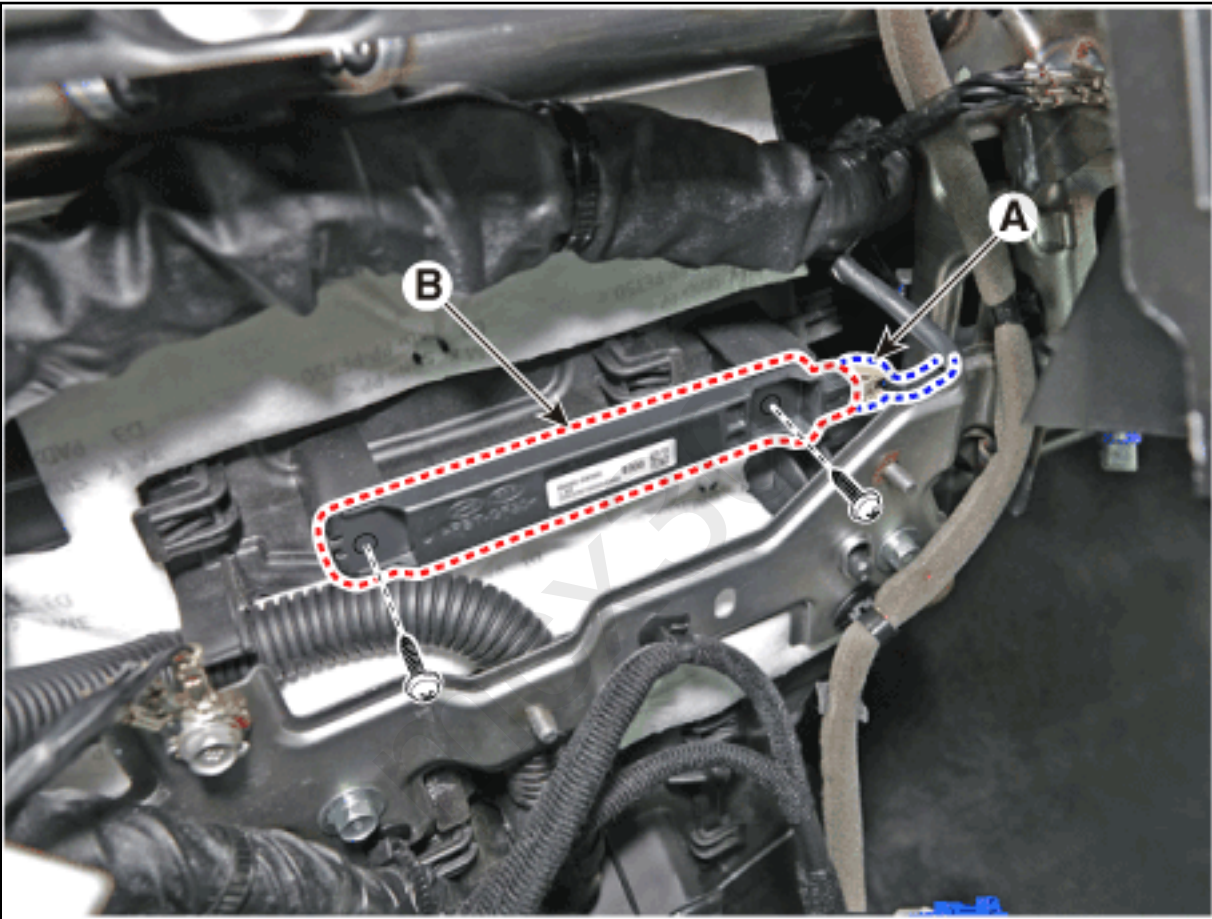
Removal

Interior 1 Antenna



- Take care not to scratch the crash pad and related parts.

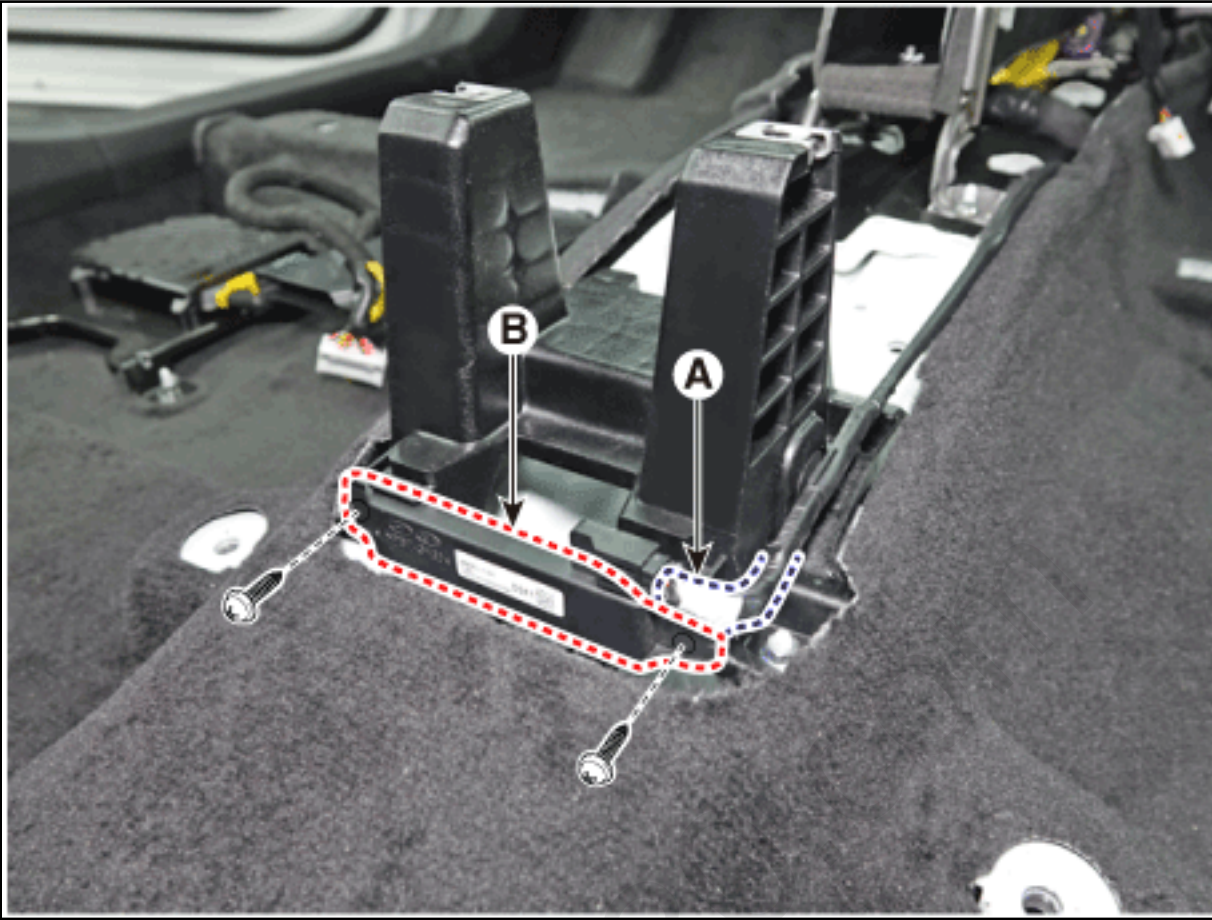
1. Disconnect the negative (-) battery terminal.
2. Remove the ecall unit.
(Refer to Emergency Call system - "Emergency Call (eCall) Unit")
3. Remove the interior 1 antenna (B) after loosening mounting screws and disconnect the connector (A).



Interior 2 Antenna

1. Disconnect the negative (-) battery terminal.
2. Remove the console floor console assembly.
(Refer to Body - "Floor Console Assembly")

3. Remove the interior 2 antenna (B) after loosening mounting screws and disconnect the connector (A).

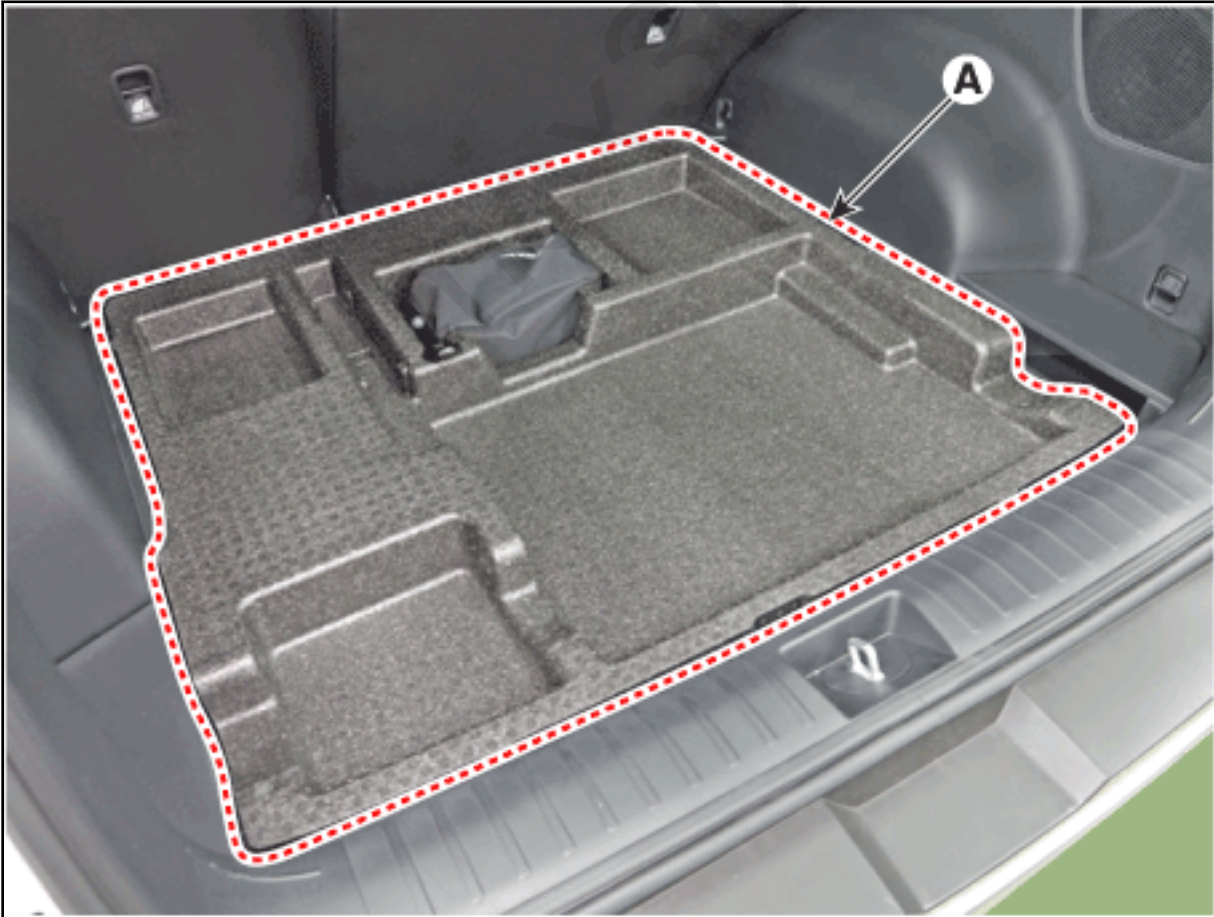


Tailgate Antenna

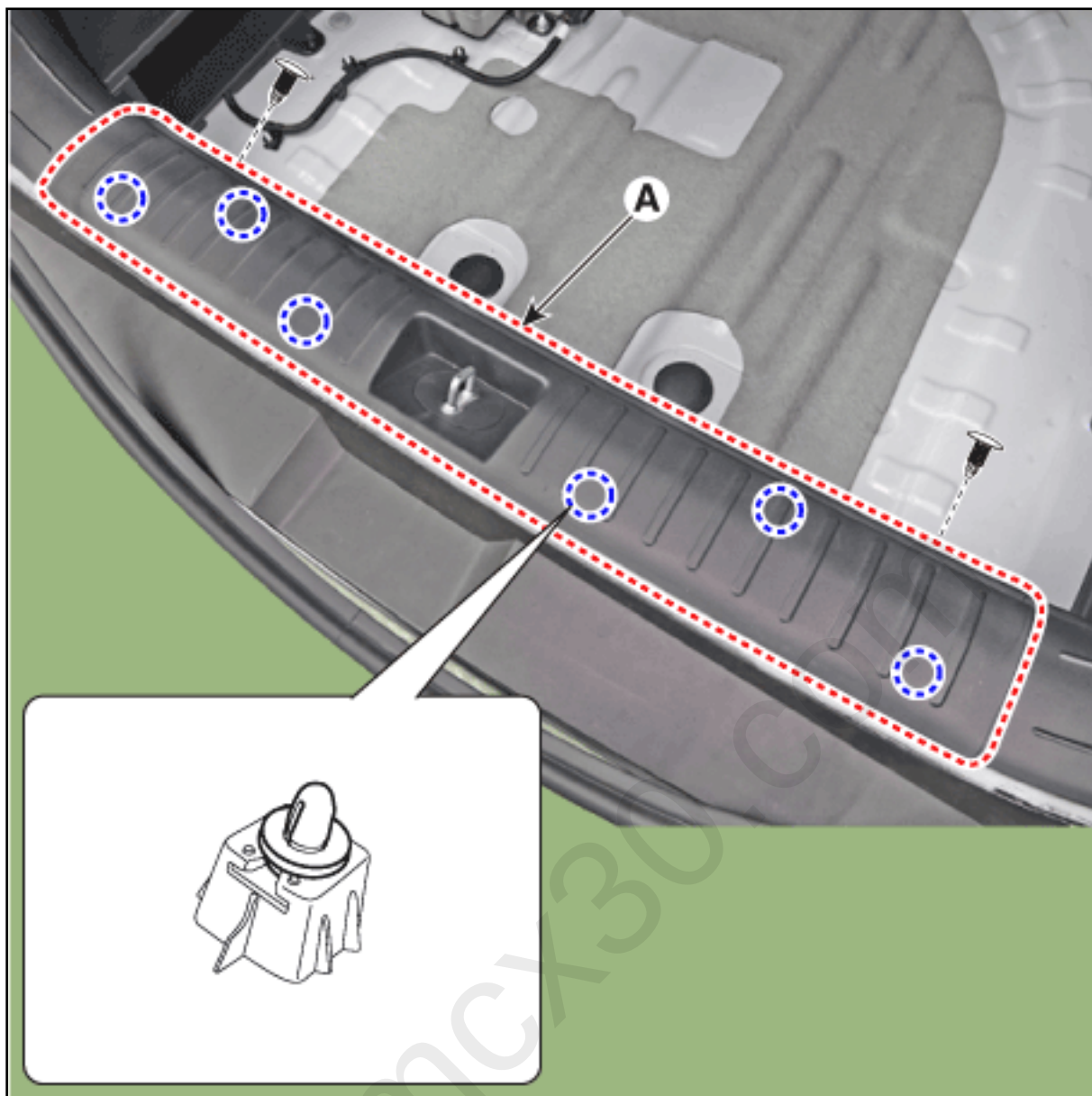
1. Disconnect the negative (-) battery terminal.
2. Remove the luggage mat (A).



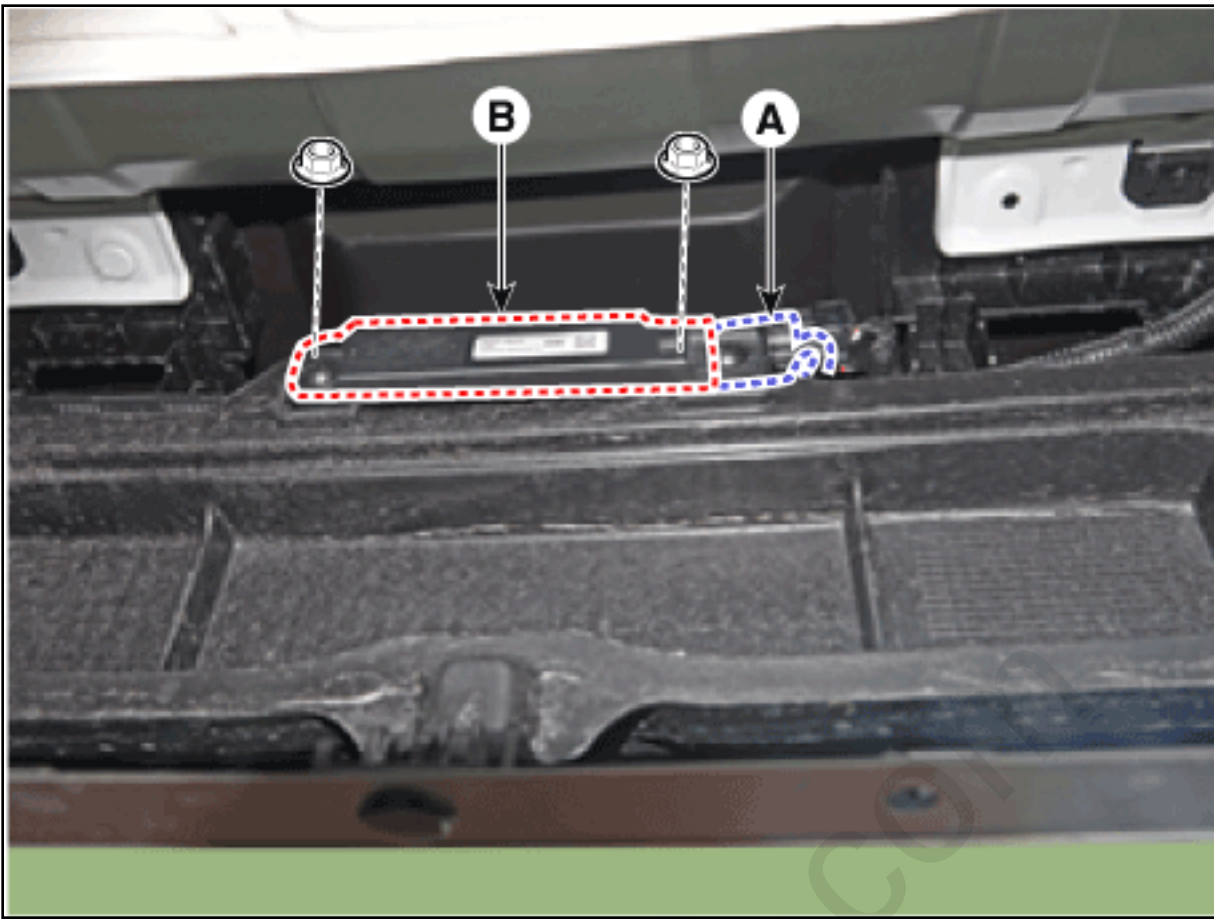
3. Remove the luggage floor tray (A).



4. Loosen the mounting clips and remove the rear transverse trim (A).



5. Remove the tailgate antenna (B) after loosening mounting screws and disconnect the connector (A).



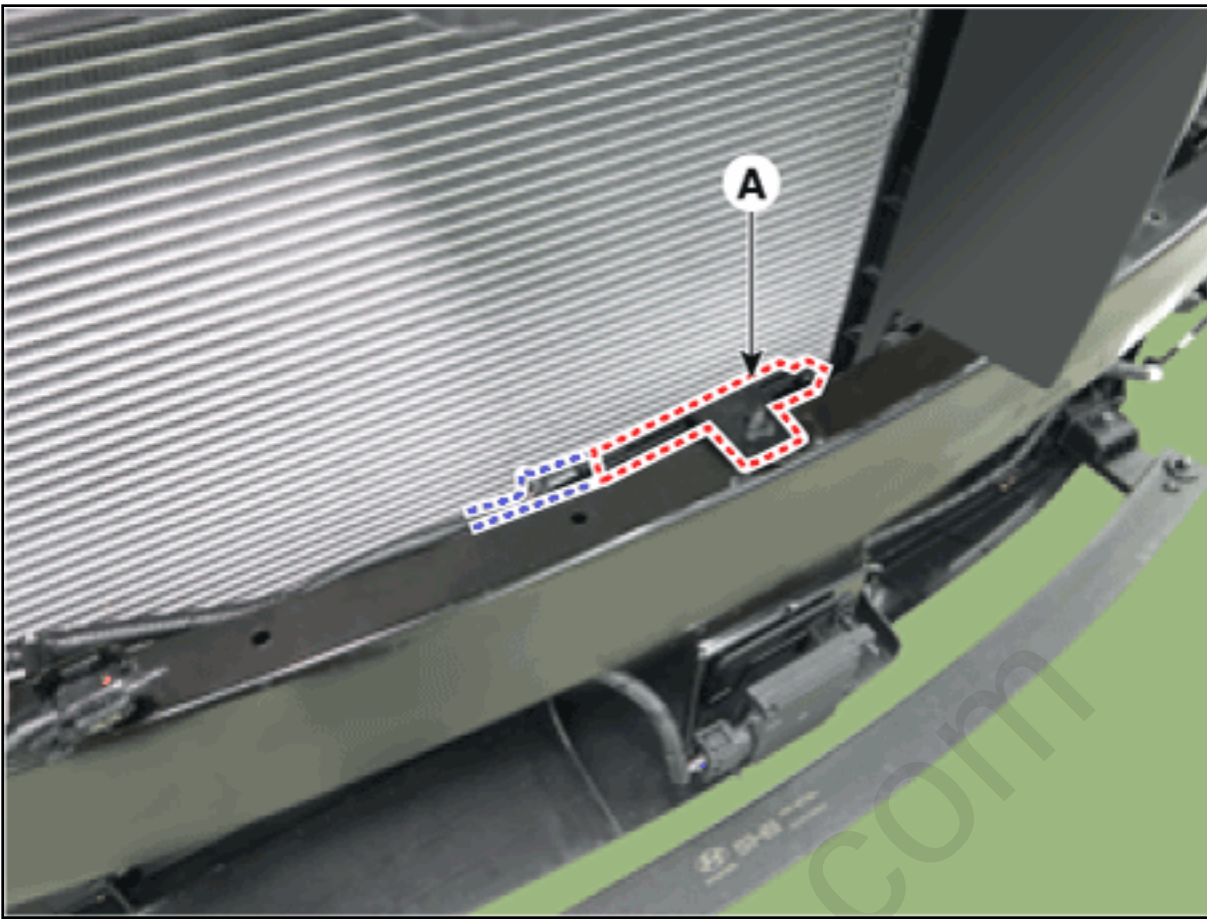
Buzzer

1. Disconnect the negative (-) battery terminal.
2. Remove the front left wheel guide.
(Refer to Body - "Front Wheel Guard")
3. Disconnect the connector, then remove the buzzer (A).



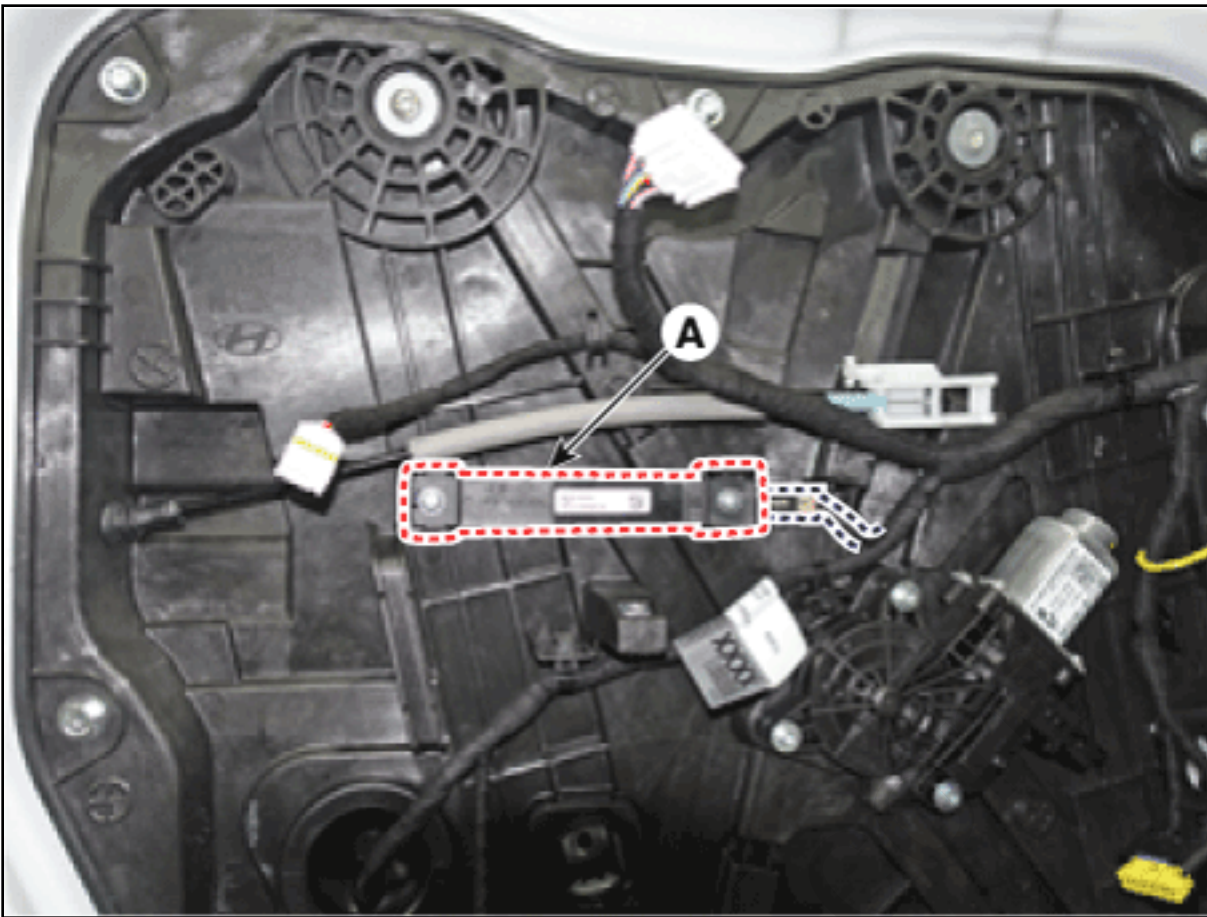
Front Antenna

1. Disconnect the negative (-) battery terminal.
2. Remove the front bumper assembly.
(Refer to Body - " Front Bumper Assembly")
3. Remove the front antenna (A) after disconnecting antenna connector.



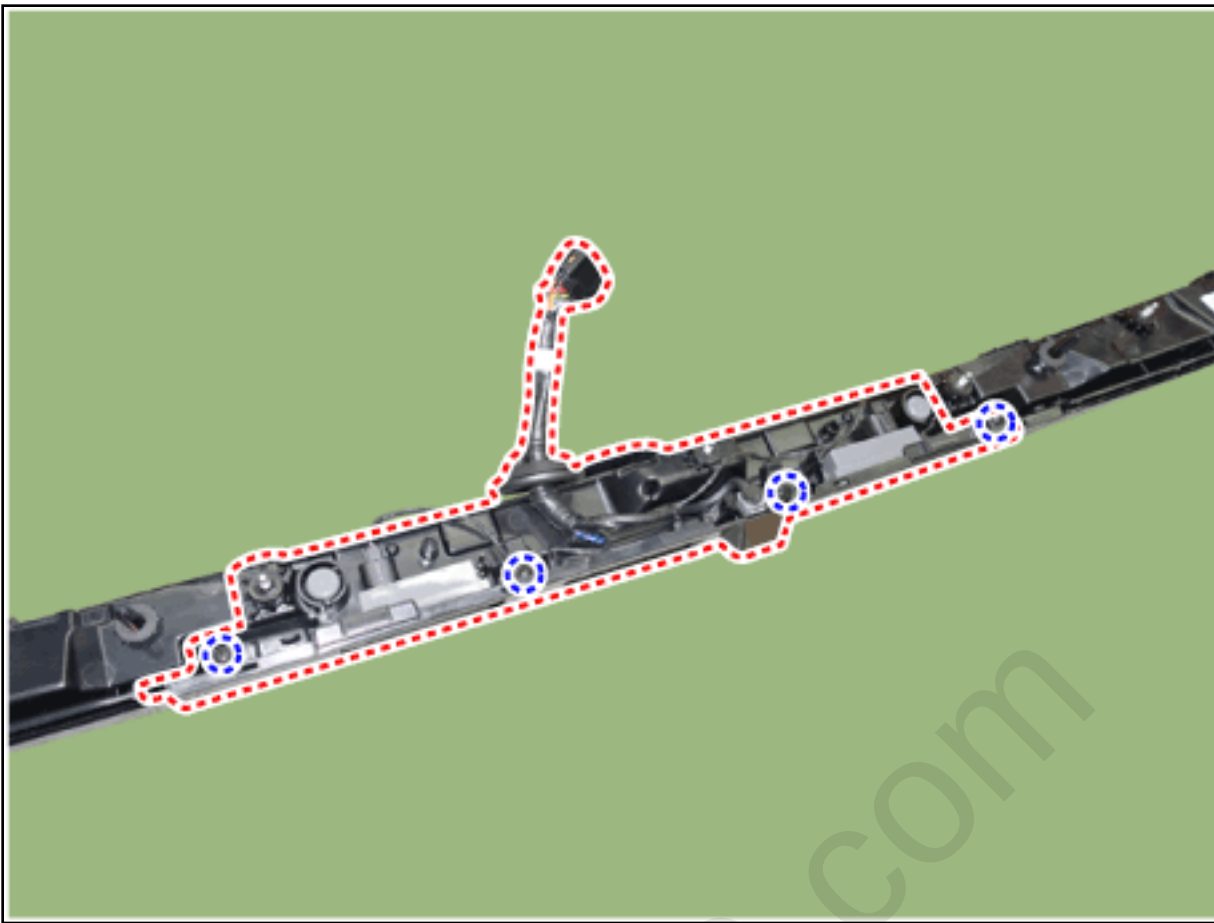
Door Antenna

1. Disconnect the negative (-) battery terminal.
2. Remove the front door trim.
(Refer to Body - "Front Door Trim")
3. Remove the door antenna (A) after disconnecting antenna connector.

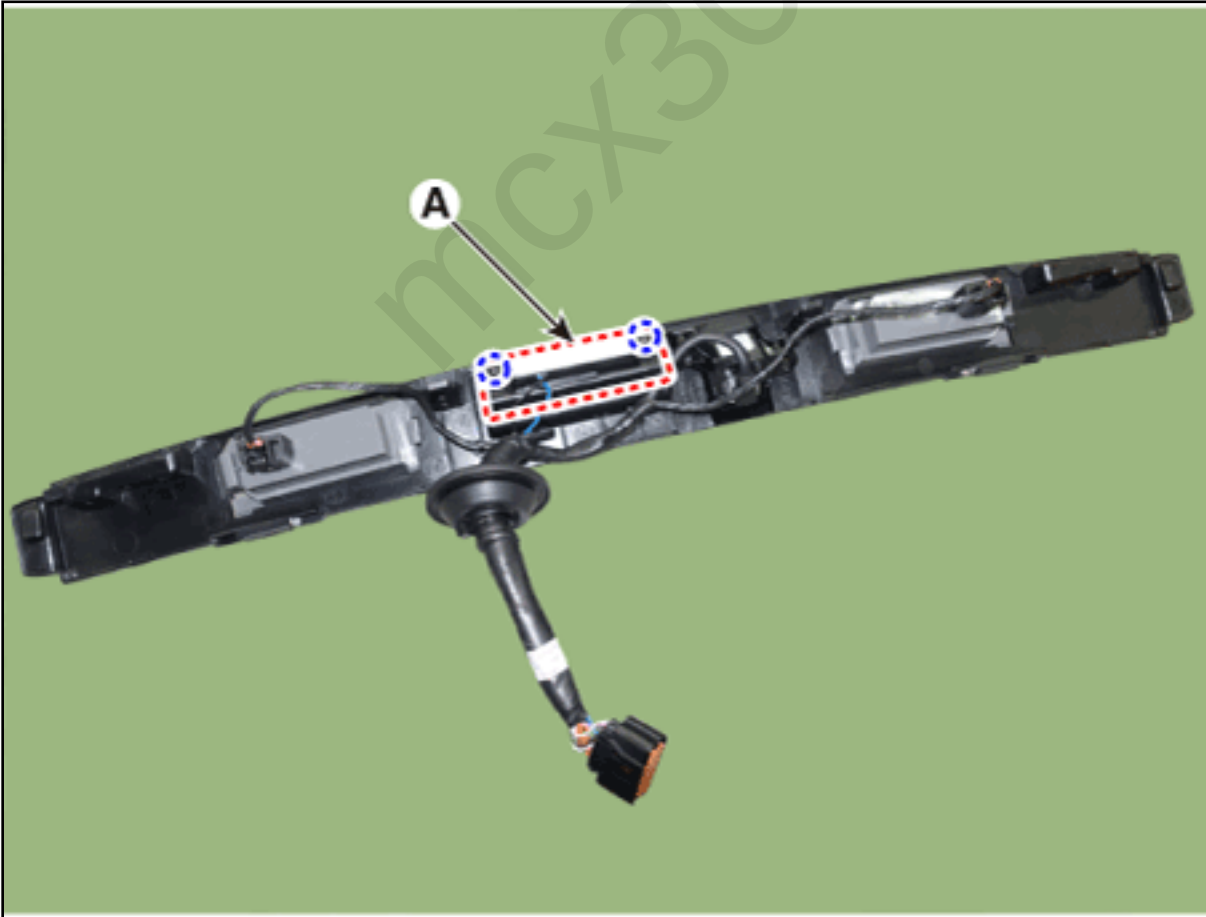


Tailgate Open Switch

1. Disconnect the negative (-) battery terminal.
2. Remove the rear inside combination lamp.
(Refer to Lighting System - "Rear Combination Lamp")
3. Remove the tailgate open switch assembly after loosening mounting screws.



4. Remove the tailgate open switch (A).

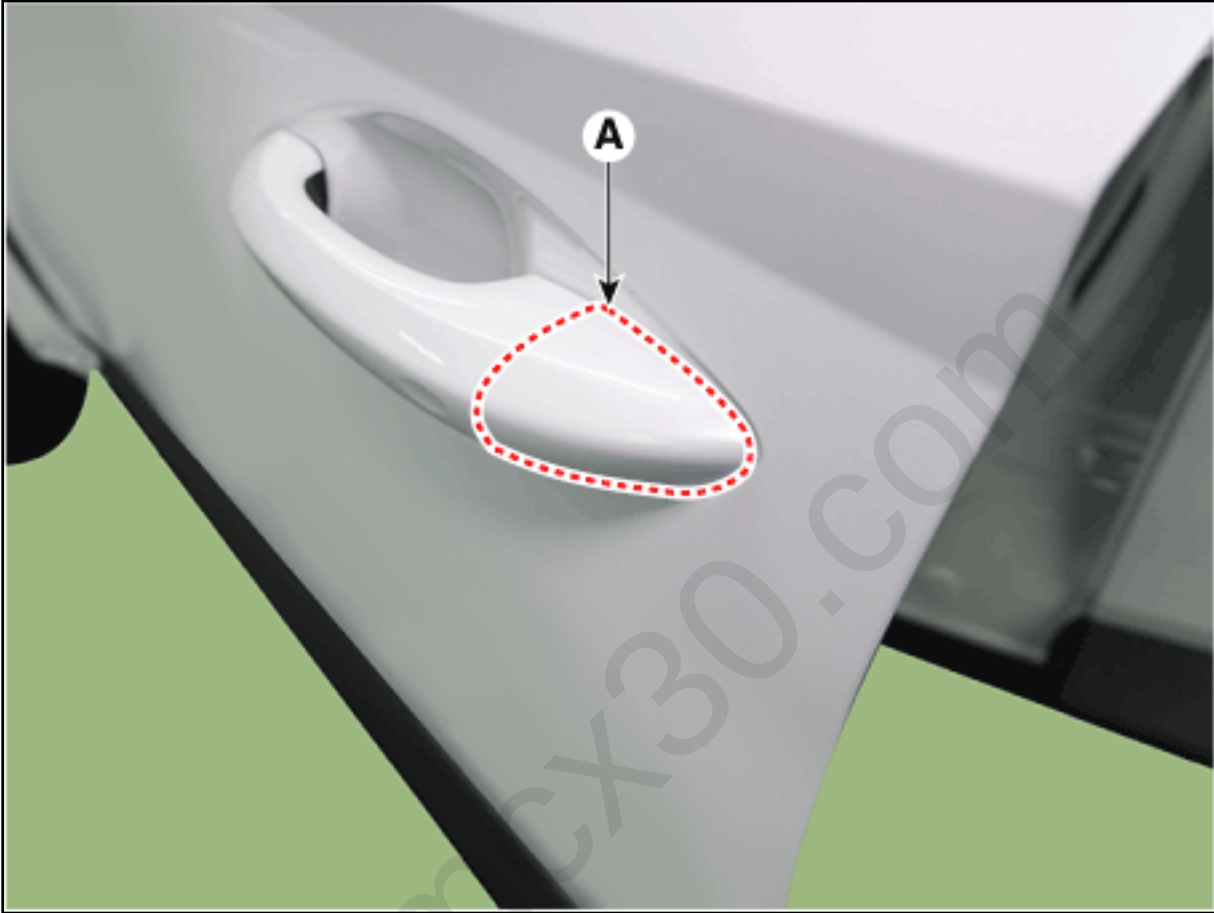


Door Outside Handle

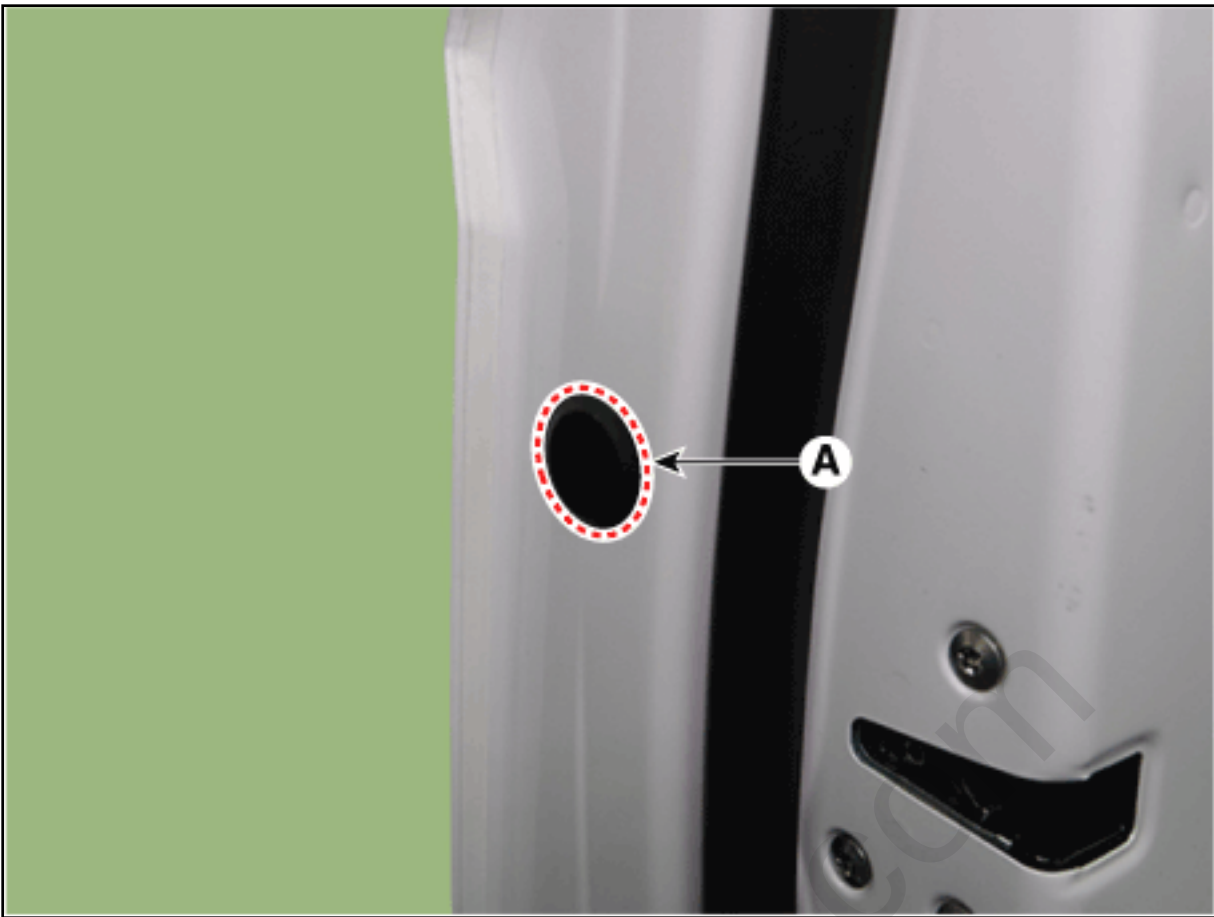


- When removing with a flat-tip screwdriver or remover, wrap protective tape around the tools to prevent damage to components.
- Put on gloves to prevent hand injuries.

1. Remove the door outside handle cover (A)



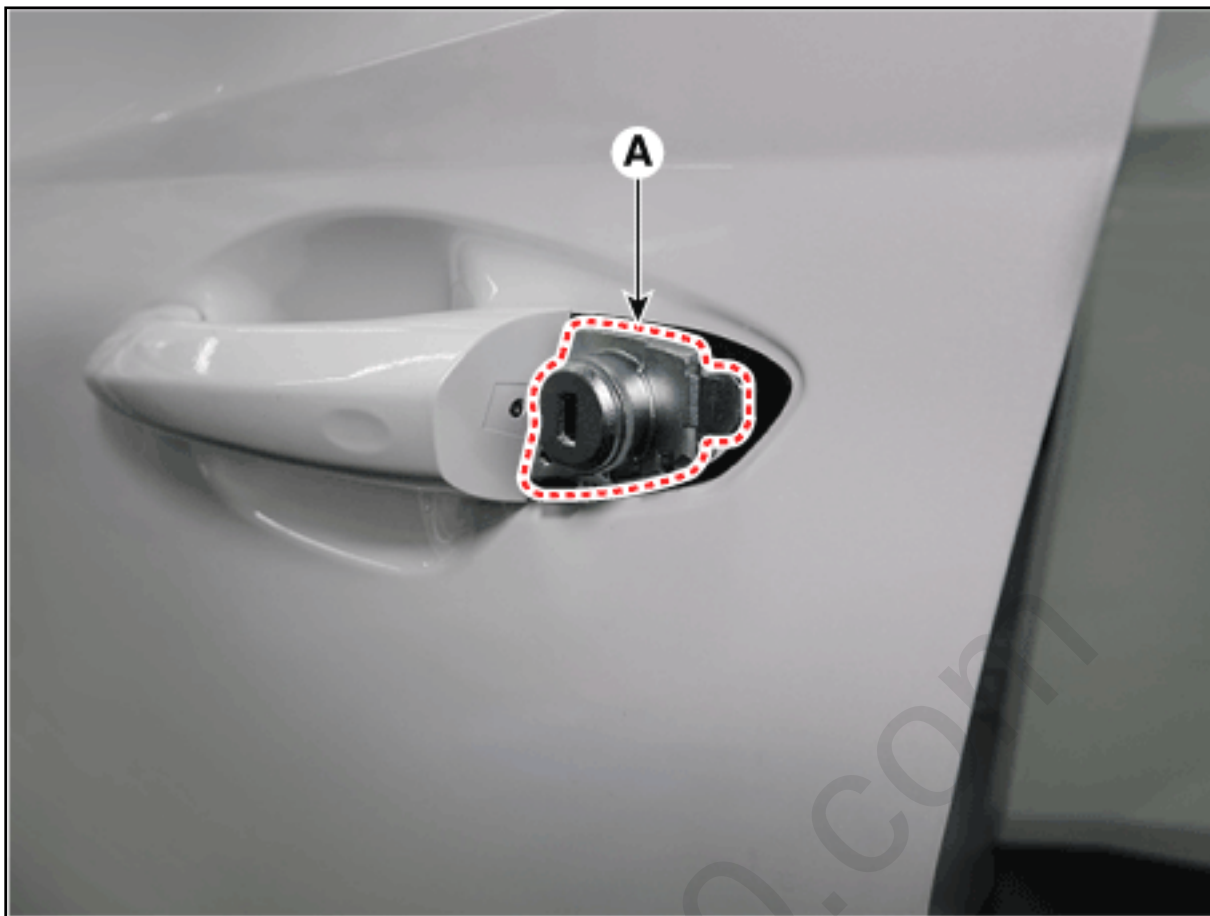
2. Remove the plug hole (A).



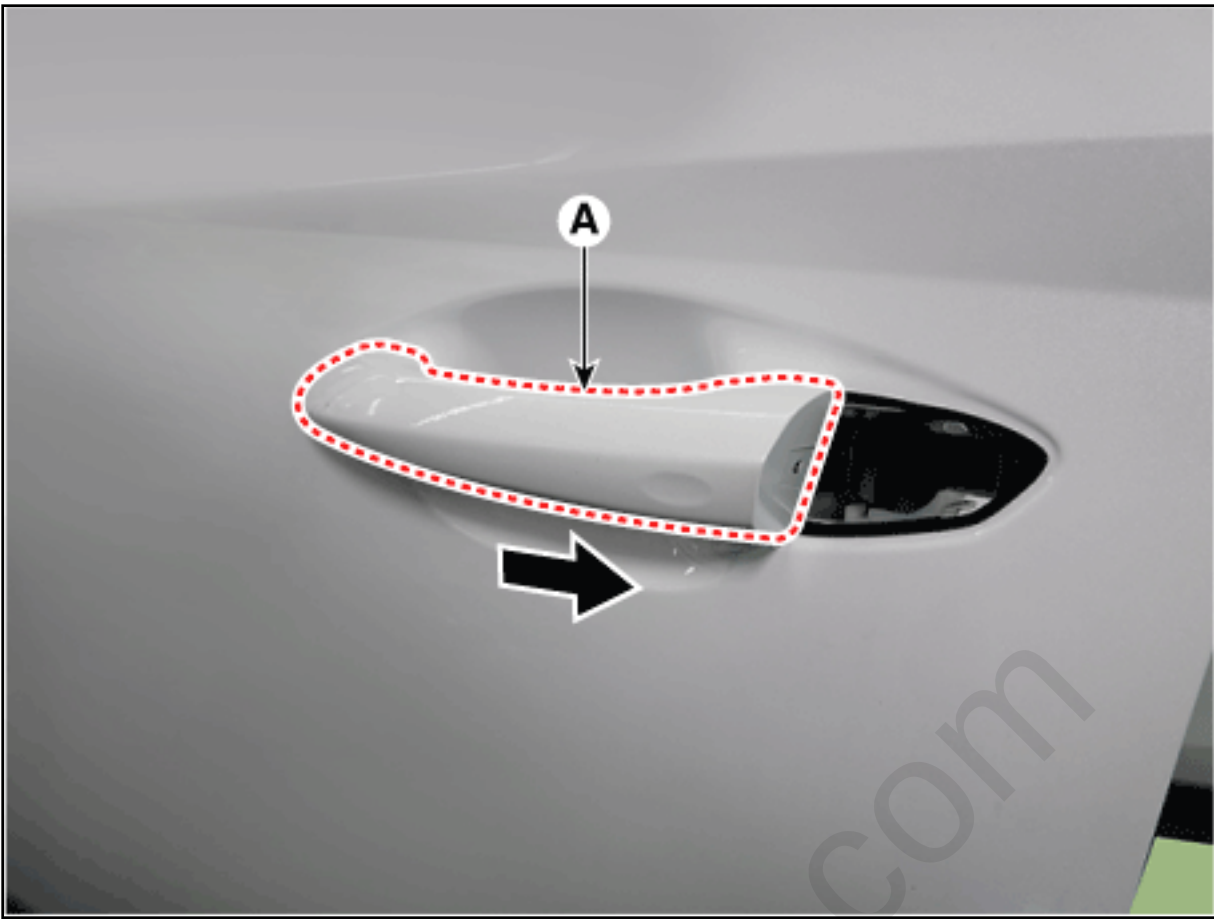
3. Loosen the mounting bolt (A).



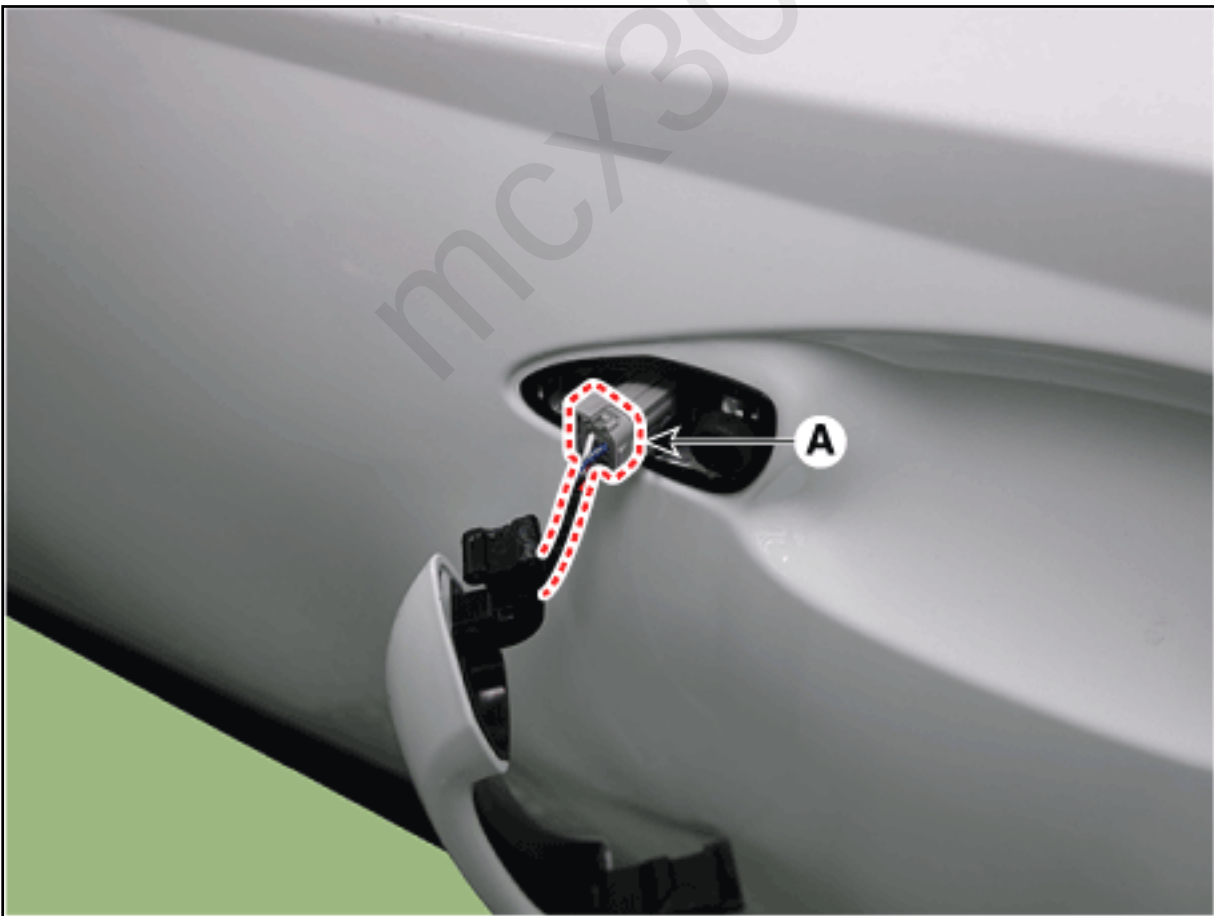
4. Remove the front door lock assembly (A).



5. Remove the front door outside handle (A) by sliding it forward.



6. Disconnect the front door outside handle connector (A).



Installation

Interior 1 Antenna

1. Install the interior 1 antenna.
2. Install the ecall unit.
3. Install the negative (-) battery terminal and check the smart key system.

Interior 2 Antenna

1. Install the interior 2 antenna.
2. Install the console rear complete assembly.
3. Install the negative (-) battery terminal and check the smart key system.

Tailgate Antenna

1. Install the tailgate Antenna.
2. Install the rear transverse trim.
3. Install the luggage floor tray.
4. Install the luggage mat.
5. Install the negative (-) battery terminal and check the smart key system.

Exterior Bumper Antenna

1. Install the exterior bumper antenna.
2. Install the rear bumper assembly.
3. Install the negative (-) battery terminal and check the smart key system.

Door Outside Handle

1. Install the outside handle.
2. Install the front door trim.
3. Install the negative (-) battery terminal and check the smart key system.

Tailgate Open Switch

1. Install the tailgate open switch.
2. Install the tailgate back panel molding.
3. Install the negative (-) battery terminal and check the smart key system.

Door Antenna

1. Install the door antenna.
2. Install the front door trim.
3. Install the negative (-) battery terminal and check the smart key system.

Front Antenna

1. Install the front antenna.
2. Install the front bumper assembly.
3. Install the negative (-) battery terminal and check the smart key system.