General Information

Important Safety Notice

Proper service methods and repair procedures are essential for safe, reliable operation of all motor vehicles as well as personal safety of the operator. The service procedures and descriptions in this shop manual provide general directions for a service and repair.

Procedure, techniques, tools, and parts for service including the skill of the technician vary. It is impossible to provide advice or caution as to each case in this manual.

Accordingly, anyone who intends to use a replacement part, service procedure, or tool, which is not recommended by the vehicle manufacturer, must first assure thoroughly that neither their personal safety nor the safe operation of the vehicle will be first jeopardized by the replacement part, service procedure, or tool they select.

DANGER Reminds you to be especially careful in those areas where carelessness will cause death or serious injury.
WARNING Reminds you to be especially careful in those areas where carelessness may cause death or serious injury.
CAUTION Reminds you to be especially careful in those areas where carelessness may cause personal injury.
NOTICE Gives you information that will prevent you from making errors that could damage the vehicle.
Information Gives you added information that will help you complete a particular procedure.

The following list contains some general WARNINGS that you should follow while working on a vehicle.

- Always wear safety glasses for eye protection.
- Use safety stands whenever a procedure requires you to be under the vehicle.
- Make sure that the ignition switch is always in the OFF position, unless otherwise required by the procedure.
- Set the parking brake when working on the vehicle. If you have an automatic transaxle, set in park unless instructed otherwise for a specific operation.
- Place supporters against the front and rear surfaces of the tires to help prevent the vehicle from moving.
- Operate the engine only in a well-ventilated area to avoid the danger of carbon monoxide poisoning.
- Keep yourself and your clothing away from moving parts when the engine is running, especially the drive belts.
- To prevent serious burns, avoid contact with hot metal parts such as the radiator, exhaust manifold, tail pipe, catalytic converter and muffler.
- Do not smoke while working on a vehicle.
- To avoid injury, always remove rings, watches, loose hanging jewelry, and loose clothing before beginning to work on a vehicle.
- When it is necessary to work under the hood, keep hands and other objects clear of the radiator fan blades! Your vehicle may be equipped with a cooling fan that may turn on, even though the ignition switch is in the OFF position. For this reason care should be taken to ensure that the radiator fan electric motor is completely disconnected when working under the hood and the engine is not running.

General Information

Identification Numbers

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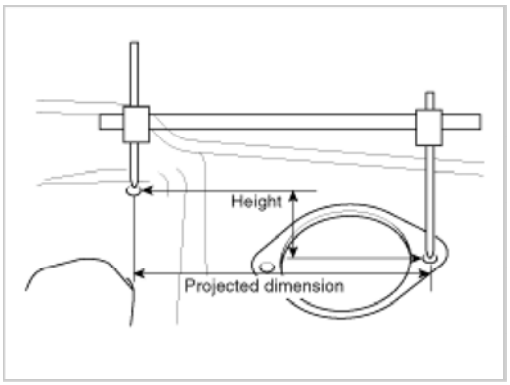
Measuring Body Dimensions

1. Basically, all measurements in this manual are taken with a tracking gauge.
2. When a measuring tape is used, check to be sure there is no elongation, twisting or bending.
3. For measuring dimensions, both projected dimensions and actual - measurement dimensions are used in this manual.

Dimensions Projected

1. These are the dimensions measured when the measurement points are projected from the vehicle's surface, and are the reference dimensions used for used for body alterations.
2. If the length of the tracking gauge probes is adjustable, measure it by lengthening one of two probes as long as the different value in height of the two surface.

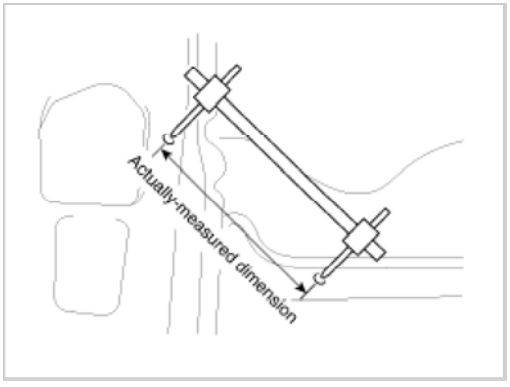


Measuring Actual Dimensions

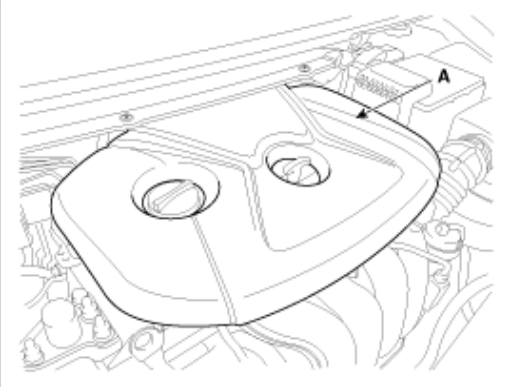
1. These dimensions indicate the actual linear distance between measurement points, and are used as the reference dimensions when a tracking gauge is used for measurement.
2. First adjust both probes to the same length (A=A') before measurement.

NOTICE

Check the probes and gauge itself to make sure there is no free play.



Measurement Point

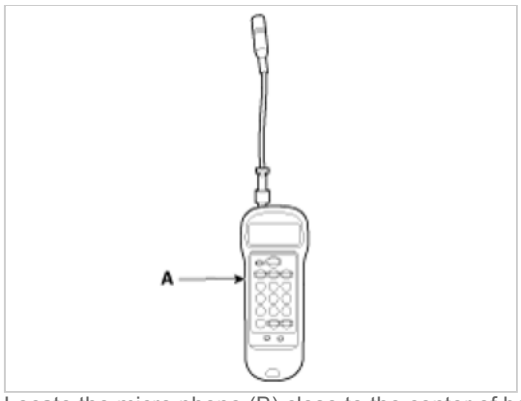


NOTICE

- To avoid damage, remove the engine cover on room temperature.
- To avoid damage of the engine cover, do not disengage both front and rear mounting point at the same time.

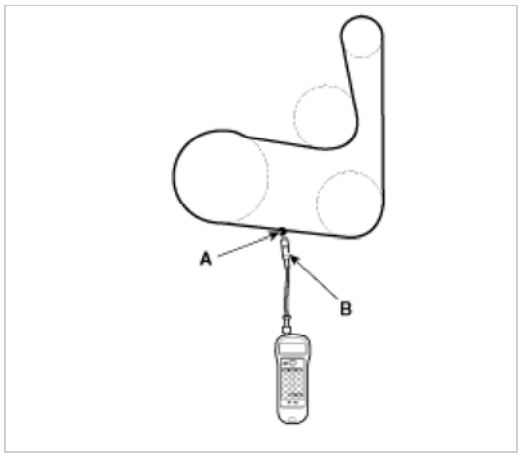
2. Install in the reverse order of removal.

Components

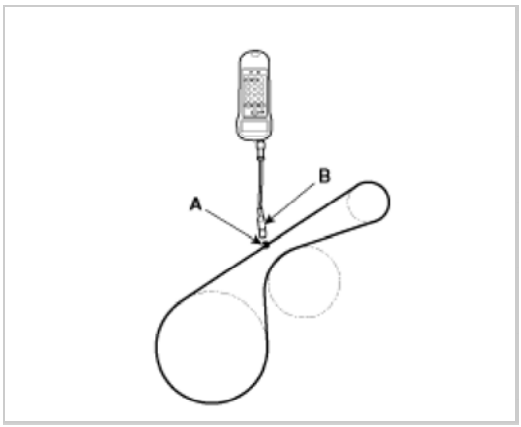


2. Locate the micro phone (B) close to the center of belt span (A) and bounce the belt by finger 2~3 times. Read a value on the display.

[With A/C]

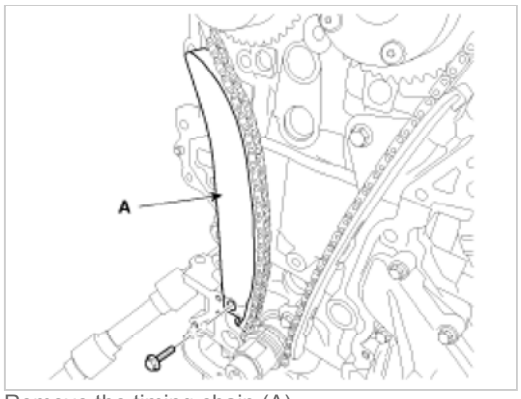


[Without A/C]

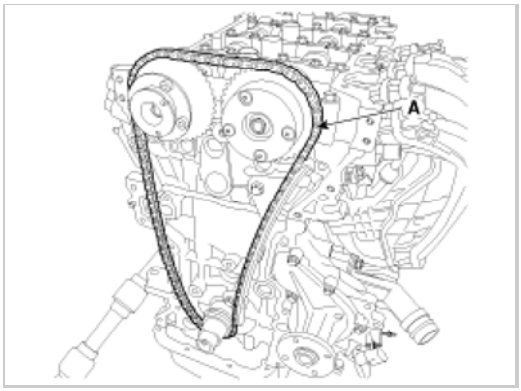


If adjustment is necessary:

1. Loosen the mounting bolts (A).
2. Tighten the adjusting bolt (B) counterclockwise in loose tension; fasten the bolt clockwise in high tension.



6. Remove the timing chain (A).



7. Remove the timing chain guide (A).

Inspection

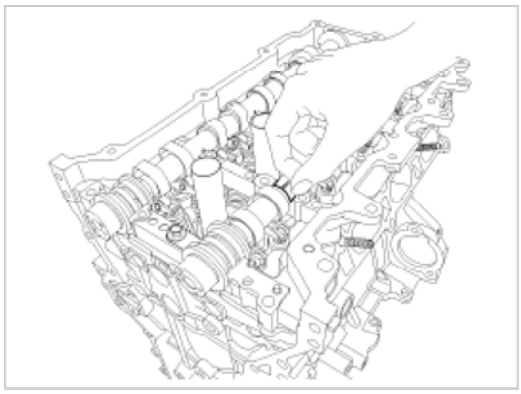
Sprockets, Chain Tensioner, Chain Guide, Chain Tensioner Arm

1. Check the CVVT sprocket and crankshaft sprocket for abnormal wear, cracks, or damage. Replace if necessary.
2. Inspect the tensioner arm and chain guide for abnormal wear, cracks, or damage. Replace if necessary.
3. Check that the tensioner piston moves smoothly.

Installation

1. The TDC marks of the intake and exhaust CVVT sprockets are slightly turned from the TDC position as shown when the timing chain is removed.

(1) Clean the bearing caps and camshaft journals.
(2) Place the camshafts on the cylinder head.
(3) Lay a strip of plastigage across each of the camshaft journal.



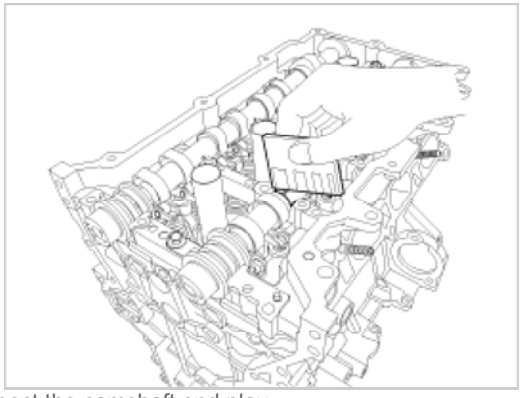
(4) Install the bearing caps and tighten the bolts with specified torque.

Tightening torque
M6 bolts:
11.8 ~ 13.7 N.m (1.2 ~ 1.4 kgf.m, 8.7 ~ 10.1 lb-ft)
M8 bolts:
18.6 ~ 22.6 N.m (1.9 ~ 2.3 kgf.m, 13.7 ~ 16.6 lb-ft)

NOTICE
Do not turn the camshaft.

(5) Remove the bearing caps.
(6) Measure the plastigage at its widest point.
If the oil clearance is greater than specification, replace the camshaft. If necessary, replace the bearing caps and cylinder head as a set.

Bearing oil clearance
Standard:
0.032 ~ 0.062 mm (0.00126 ~ 0.00244 in.)

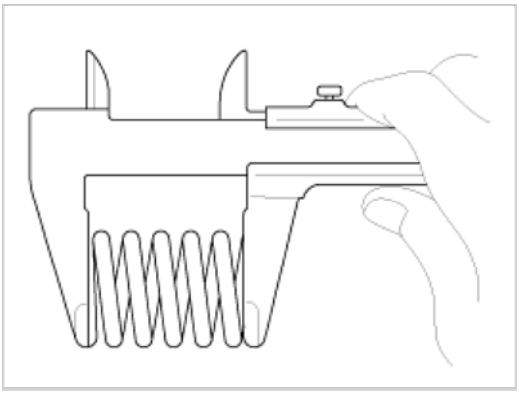


4. Inspect the camshaft end play.
(1) Install the camshaft bearing caps.
(2) Using a dial indicator, measure the end play while moving the camshaft back and forth.
If the end play is greater than specification, replace the camshaft.
If necessary, replace the bearing caps and cylinder head as a set

Camshaft end play
Standard:
0.10 ~ 0.19 mm (0.0039 ~ 0.0075 in.)

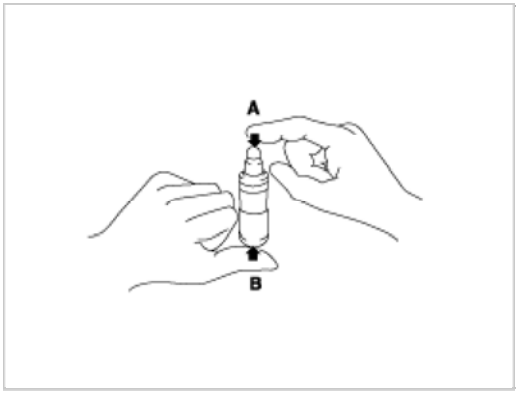
(1) Using a steel square, measure the out-of-square of valve spring.
(2) Using a vernier calipers, measure the free length of valve spring.
If the free length is not as specified, replace the valve spring.

Valve spring
[Standard]
Free height: 45.93 mm (1.8083 in.)
Out-of-square : Less than 1.5°

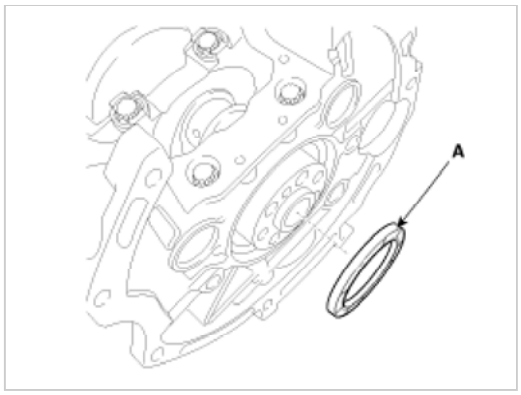


Hydraulic Lash Adjuster (HLA)

With the HLA filled with engine oil, hold A and press B by hand.
If B moves, replace the HLA.

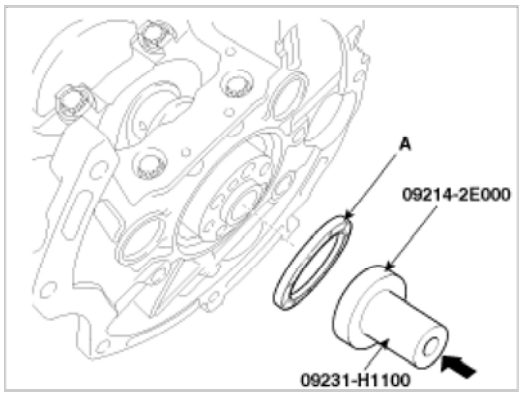


Problem	Possible cause	Action
1. Temporary noise when starting a cold engine	Normal	This noise will disappear after the oil in the engine reaches the normal pressure.
2. Continuous noise when the engine is started after parking more than 48 hours	Oil leakage of the high pressure chamber on the HLA, allowing air to get in	Noise will disappear within 15 minutes when engine runs at 2000-3000 rpm. If it doesn't disappear, refer to step 7 below.
3. Continuous noise when the engine is first started after rebuilding cylinder head	Insufficient oil in cylinder head oil gallery	
4. Continuous noise when the engine is started after excessively cranking the engine by the starter motor or band	• Oil leakage of the high-pressure chamber in the HLA, allowing air to get in • Insufficient oil in the HLA	
5. Continuous noise when the engine is running after changing the HLA		**NOTICE** Do not run engine at a speed higher than 3000 rpm, as this may damage the HLA.
6. Continuous noise during idle after high engine speed	Engine oil level too high or too low	• Check oil level. • Drain or add oil as necessary.
	Excessive amount of air in the oil at high engine speed	Check oil supply system.
	Deteriorated oil	Check oil quality. If deteriorated, replace with specified type.
	Low oil pressure	



Installation

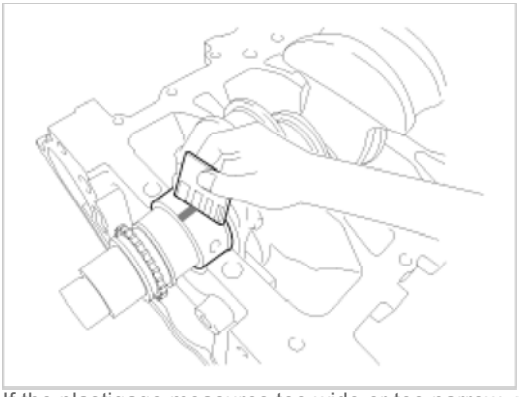
1. Install a new rear oil seal.
   (1) Apply engine oil on the edge of new oil seal.
   (2) Using SST (09231-H1100, 09214-2E000) and a hammer, tap in the oil seal (A) until the SST face is aligned with the cylinder block assembly rear face.



2. Install the other parts reverse order of removal.

Engine Mechanical System

Components



(7) If the plastigage measures too wide or too narrow, remove the upper and lower bearing and then install a new bearings with the same color mark. Recheck the oil clearance.

NOTICE

Do not file, shim, or scrape the bearings or the caps to adjust clearance.

(8) If the plastigage shows the clearance is still incorrect, try the next larger or smaller bearing. Recheck the oil clearance.

NOTICE

If the proper clearance cannot be obtained by using the appropriate larger or smaller bearings, replace the crankshaft and start over.

NOTICE

If the marks are indecipherable because of an accumulation of dirt and dust, do not scrub them with a wire brush or scraper. Clean them only with solvent or detergent.

Crankshaft Bore Identification Mark

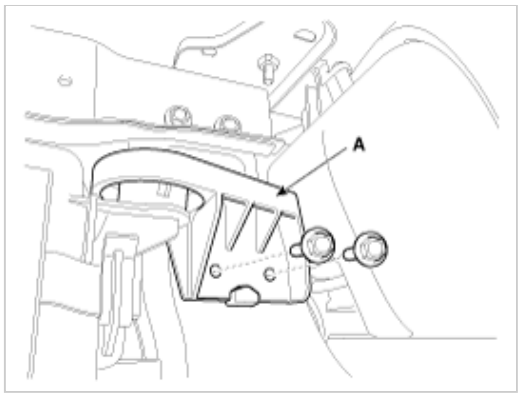
Letters have been stamped on the block as a mark for the size of each of the 5 main journal bores.

Use them, and the numbers or bar stamped on the crank (marks for main journal size), to choose the correct bearings.

Cylinder Block Specifications

Calss	Mark	Inside Diameter
a	A	59.000 ~ 59.006 mm (2.32283 ~ 2.32307 in.)
b	B	59.006 ~ 59.012 mm (2.32307 ~ 2.32330 in.)
c	C	59.012 ~ 59.018 mm (2.32330 ~ 2.32354 in.)

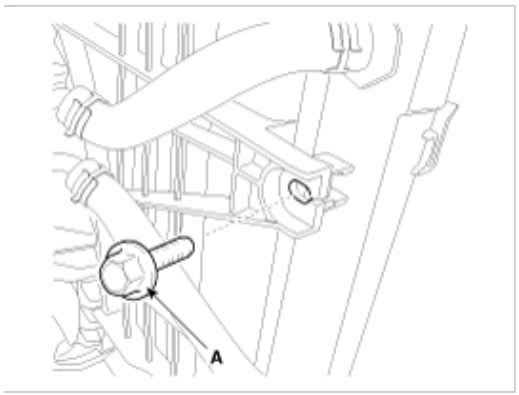
Crankshaft Journal Identification Mark



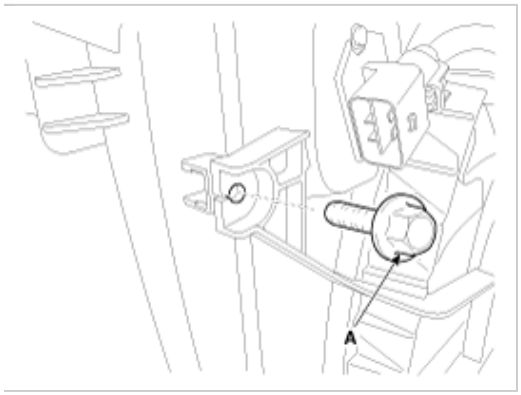
10. Remove the cooling fan assembly mounting bolts (A).

Tightening torque:
4.9 ~ 7.9 N.m (0.5 ~ 0.8 kgf.m, 3.6 ~ 5.8 lb-ft)

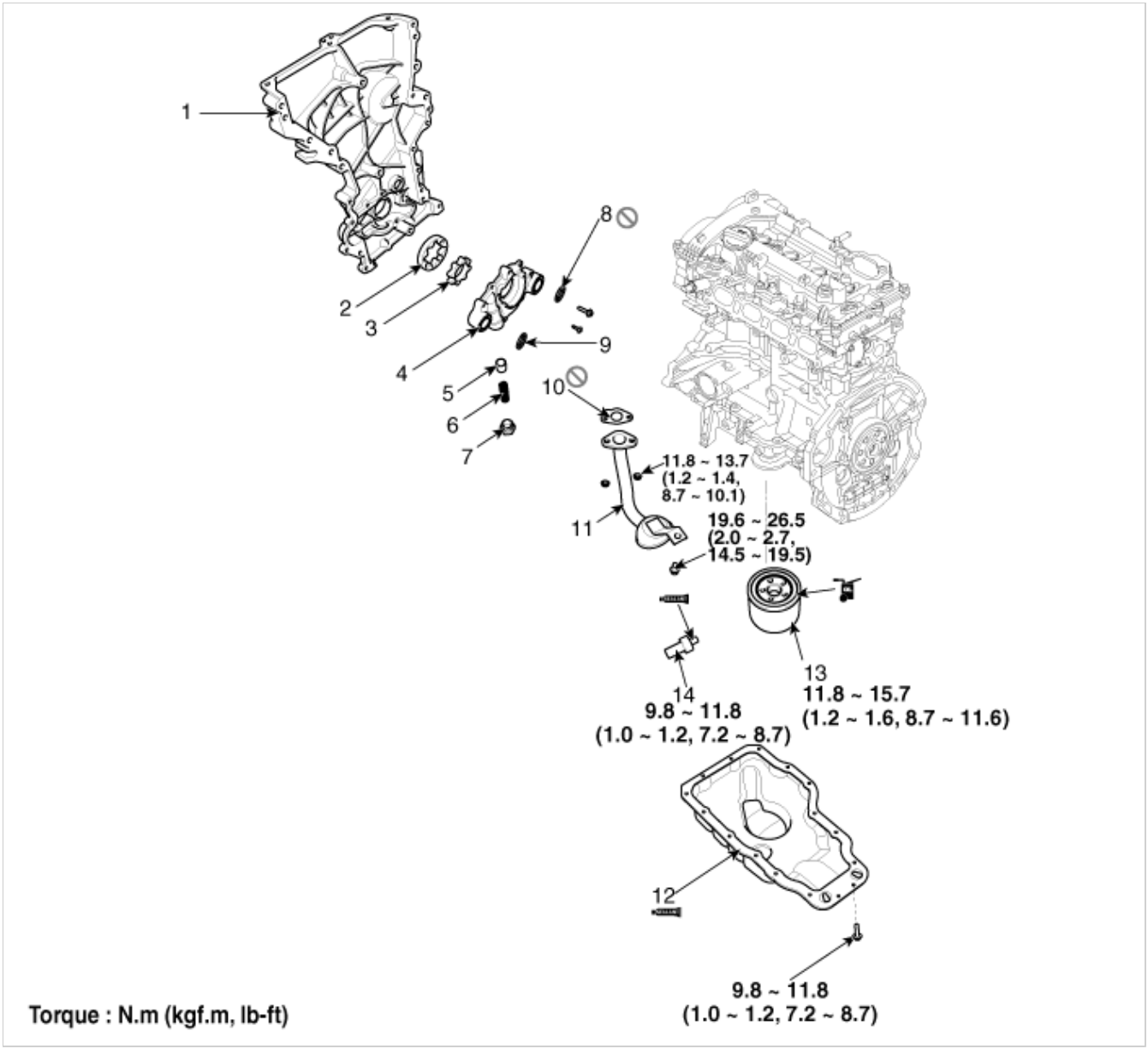
[RH]



[LH]

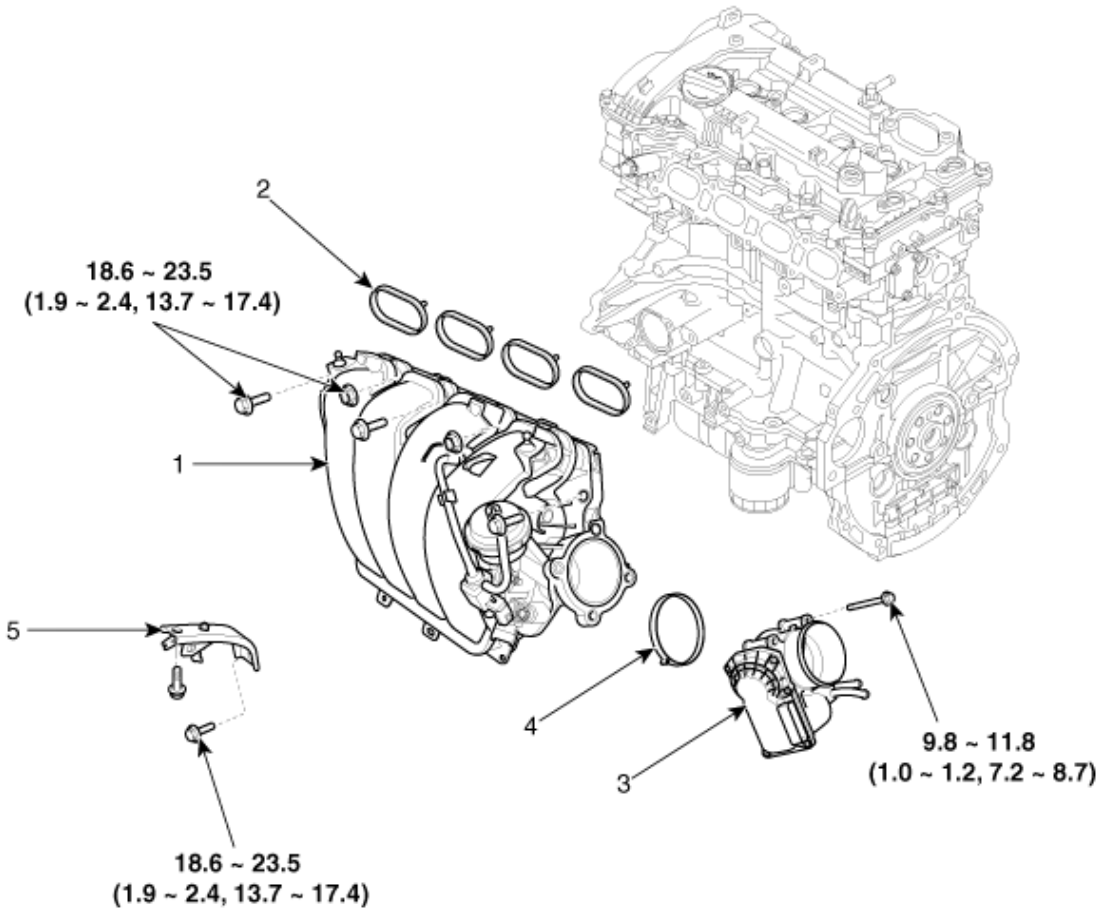


11. Remove the cooling fan (A).



1. Timing chain cover	8. O-ring (suction side)
2. Outer roter	9. O-ring (discharge side)
3. Inner roter	10. Oil screen gasket
4. Oil pump cover	11. Oil screen
5. Relief plunger	12. Oil pan
6. Relief spring	13. Oil filter
7. Relief plug	14. Oil pressure switch (OPS)

Engine Oil Schemetics



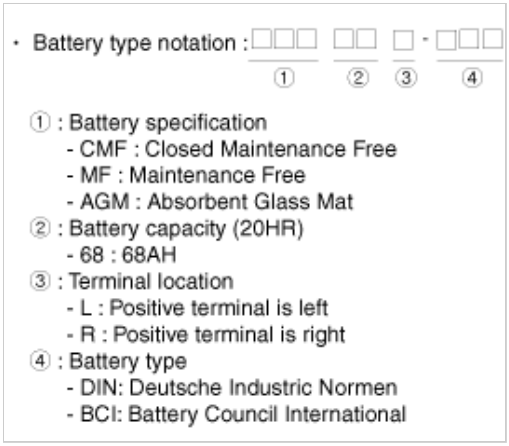
Torque : N.m (kgf.m, lb-ft)

1. Intake manifold assembly	3. Electronic throttle body
2. Intake manifold gasket	4. Intake manifold stay

Engine Mechanical System

Removal and Installation

1. Remove the engine cover.
2. Disconnect the battery negative terminal.
3. Remove the air cleaner assembly.
   (Refer to Intake And Exhasut System - "Air Cleaner")
4. Remove the engine room under cover.
   (Refer to Engine And Transaxle Assembly - "Engine Room Under Cover")
5. Disconnect the wiring connectors and harness clamps and remove the wiring protector around the intake manifold.



- Cold Cranking Ampere (CCA): Cold Cranking Amps is a rating used in the battery industry to define a battery's ability to start an engine in cold temperatures.
- The rating is the number of amps a new, fully charged battery can deliver at -18 °C(-0.4 °F) for 30 seconds, while maintaining a voltage of at least 7.2 volts for a 12 volt battery.
- The higher the CCA rating, the greater the starting power of the battery.
- RESERVE CAPACITY (RC) : Reserve Capacity is a battery industry rating, defining a battery's ability to power a vehicle with an inoperative alternator or fan belt.
- The rating is the number of minutes a battery at 26.7 °C(80 °F) can be discharged at 25 amps and maintain a voltage of 10.5 volts for a 12 volt battery.
- The higher the reserve rating, the longer your vehicle can operate should your alternator or fan belt fail.

Starting System

Starter

Item		Specification
Rated voltage		12 V, 1.2 kW
The number of pinion teeth		13
Performance [No-load, 11 V]	Ampere	Max. 70 A
	Speed	Min. 2,400 rpm

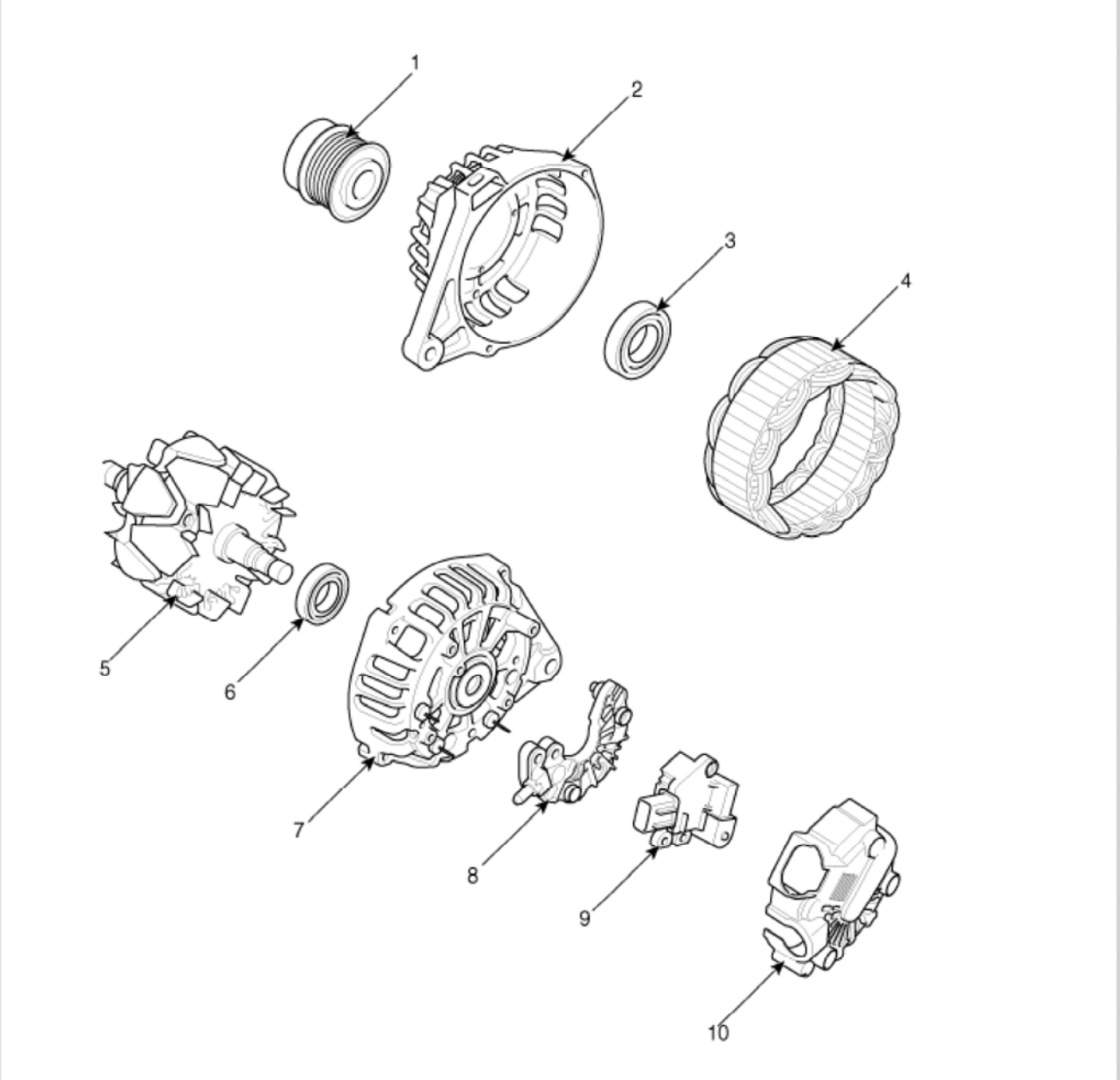
Tightening Torques

Item	N.m	kgf.m	lb-ft
Ignition coil installation bolt	9.8 ~ 11.8	1.0 ~ 1.2	7.2 ~ 8.7
Spark plug installation	14.7 ~ 24.5	1.5 ~ 2.5	10.9 ~ 18.1
Condenser bracket installation bolt	9.8 ~ 11.8	1.0 ~ 1.2	7.2 ~ 8.7
Alternator installation bolt [12 mm (0.47 in.)]	21.6 ~ 32.4	2.2 ~ 3.3	15.9 ~ 23.9
Alternator installation bolt [14 mm (0.55 in.)]	29.4 ~ 41.2	3.0 ~ 4.2	21.7 ~ 30.4
Battery (+) terminal tightening nut	7.8 ~ 9.8	0.8 ~ 1.0	5.2 ~ 8.7
Battery (-) terminal tightening nut	3.9 ~ 5.9	0.4 ~ 0.6	2.9 ~ 4.3
Battery mounting bracket bolt	9.8 ~ 14.7	1.0 ~1.5	7.2 ~10.9
Battery tray installation bolt	9.8 ~ 14.7	1.0 ~1.5	7.2 ~10.9
Battery sensor cable installation bolt	21.6 ~ 32.4	2.2 ~ 3.3	15.9 ~ 23.9
Starter installation bolt	49.0 ~ 63.7	5.0 ~ 6.5	36.2 ~ 47.0

Engine Electrical System

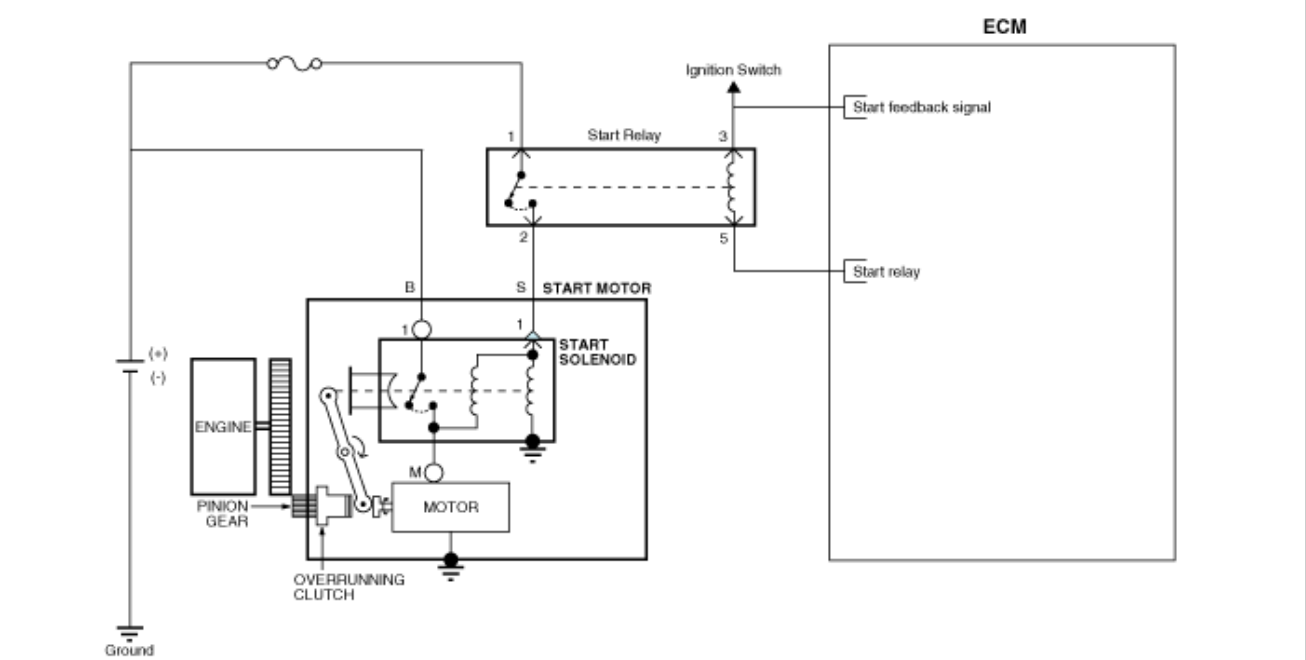
Special Service Tools

Tool (Number and name)	Illustration	Use
Alternator pulley remover wrench (09373-27000)		Removal and installation of alternator pulley



1. OAD (Overrunning Alternator Decoupler) pulley	6. Rear bearing
2. Front housing	7. Rear housing
3. Front bearing	8. Rectifier assembly
4. Stator	9. Regulator assembly
5. Rotor	10. Rear cover

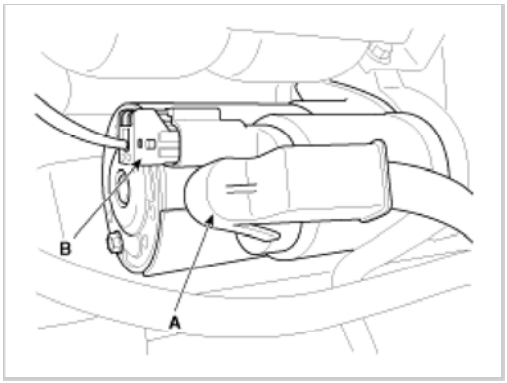
Circuit Diagram



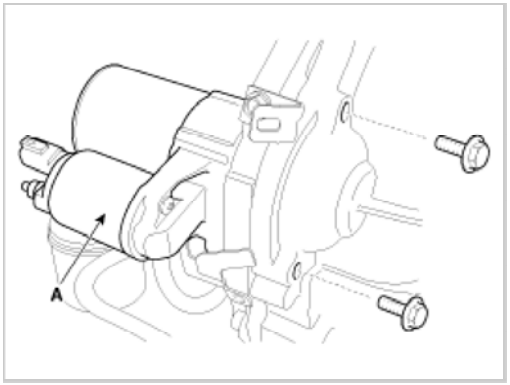
Engine Electrical System

Removal

1. Disconnect the battery negative terminal.
2. Remove the air duct and air cleaner assembly.
   (Refer to Engine Mechanical System - "Air Cleaner")
3. Disconnect the starter cable (A) from the B terminal on the solenoid then disconnect the connector from the S terminal (B).



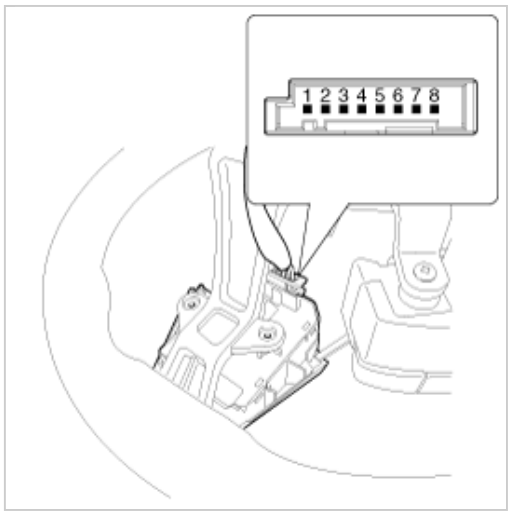
4. Remove the 2 bolts holding the starter, then remove the starter (A).



Installation

1. Install in the reverse order of removal.

1. Connect the cruise control switch connector to the control switch.



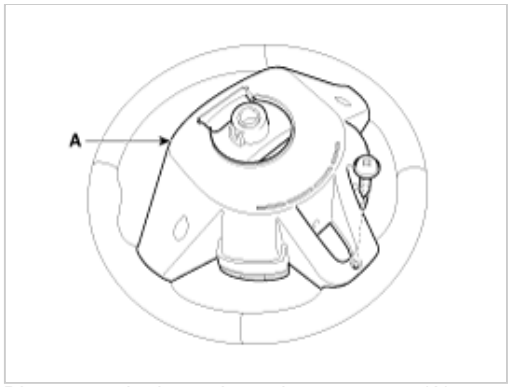
2. Measure voltage between terminals on the harness side connector when each function switch is ON (switch is depressed).

Function switch	Terminal	Voltage (V)
CANCEL	2 - 4	0.63 ~ 0.97
SET–	2 - 4	1.03 ~ 1.37
RES+	2 - 4	1.58 ~ 2.02
CRUISE	2 - 4	2.08 ~ 2.52

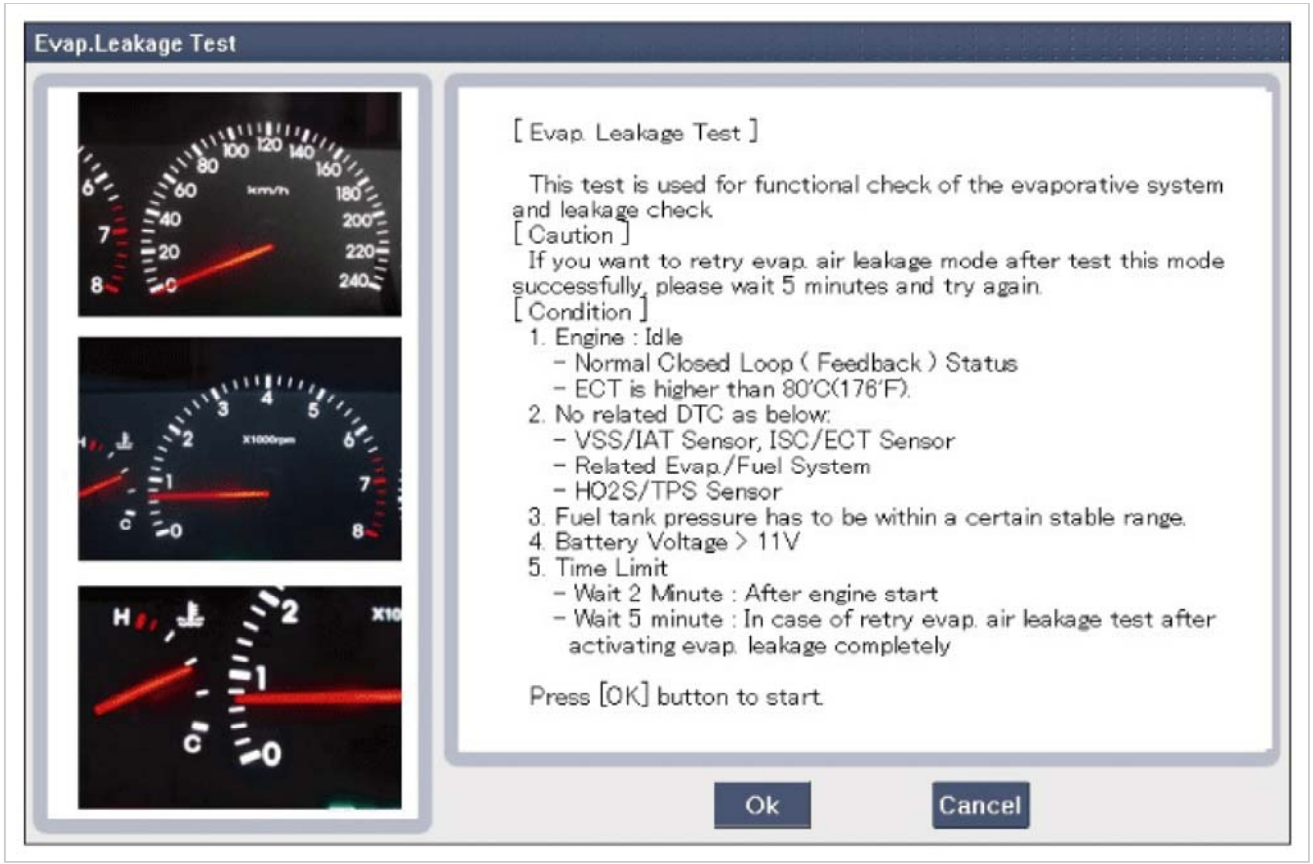
3. If not within specification, replace switch.

Removal

1. Disconnect the negative (-) battery terminal.
2. Remove the driver airbag module.
   (Refer to Restraint - "Driver Airbag (DAB) Module and Clock Spring")
3. Remove the steering wheel.
   (Refer to Steering System - "Steering Column and Shaft")
4. Remove the steering wheel cover (A) after loosening the screws.



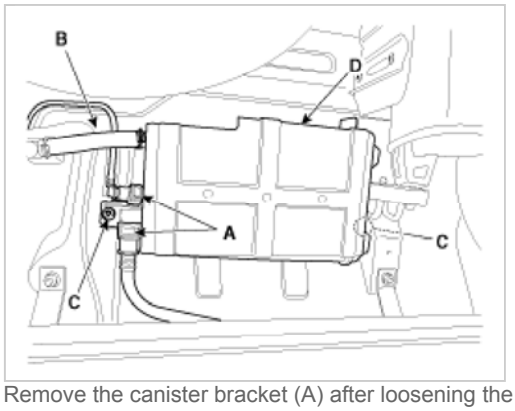
5. Disconnect the heated steering connector (A).



Emission Control System

Removal

1. Lift the vehicle.
2. Disconnect the vapor hose quick-connector (A) and ventilation hose (B).
3. Remove the protector installation bolts (C) and then remove the canister assembly (D).



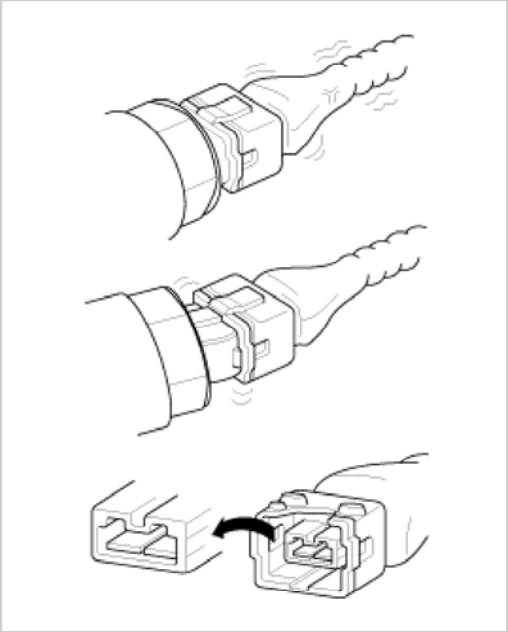
4. Remove the canister bracket (A) after loosening the mounting bolts

The measured resistance in except for ambient temperature (20°C, 68°F) is reference value.

Intermittent Problem Inspection Procedure

Sometimes the most difficult case in troubleshooting is when a problem symptom occurs but does not occur again during testing. An example would be if a problem appears only when the vehicle is cold but has not appeared when warm. In this case, the technician should thoroughly make out a "Customer Problem Analysis Sheet" and recreate (simulate) the environment and condition which occurred when the vehicle was having the issue.

1. Clear Diagnostic Trouble Code (DTC).
2. Inspect connector connection, and check terminal for poor connections, loose wires, bent, broken or corroded pins, and then verify that the connectors are always securely fastened.



3. Slightly shake the connector and wiring harness vertically and horizontally.
4. Repair or replace the component that has a problem.
5. Verify that the problem has disappeared with the road test.

● Simulating Vibration

1) Sensors and Actuators
: Slightly vibrate sensors, actuators or relays with finger.

NOTICE

Strong vibration may break sensors, actuators or relays

2) Connectors and Harness
: Lightly shake the connector and wiring harness vertically and then horizontally.

● Simulating Heat

1) Heat components suspected of causing the malfunction with a hair dryer or other heat source.

NOTICE

- DO NOT heat components to the point where they may be damaged.
- DO NOT heat the ECM directly.

● Simulating Water Sprinkling

1) Sprinkle water onto vehicle to simulate a rainy day or a high humidity condition.

NOTICE

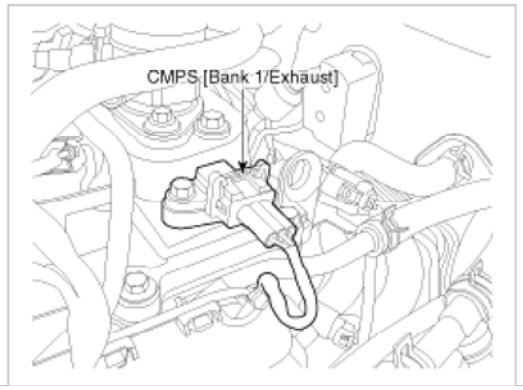
DO NOT sprinkle water directly into the engine compartment or electronic components.

● Simulating Electrical Load

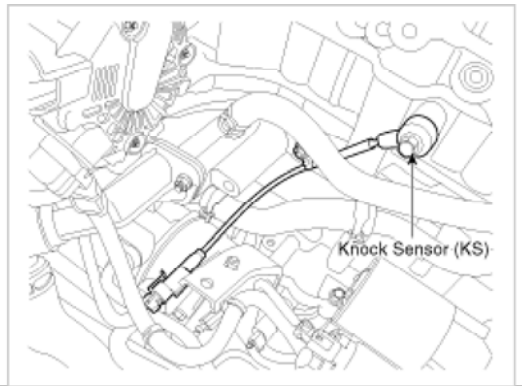
1) Turn on all electrical systems to simulate excessive electrical loads (Radios, fans, lights, rear window defogger, etc.).

Connector Inspection Procedure

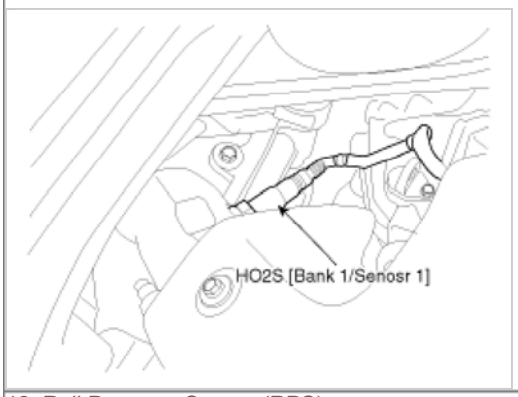
1. Handling of Connector
   A. Never pull on the wiring harness when disconnecting connectors.



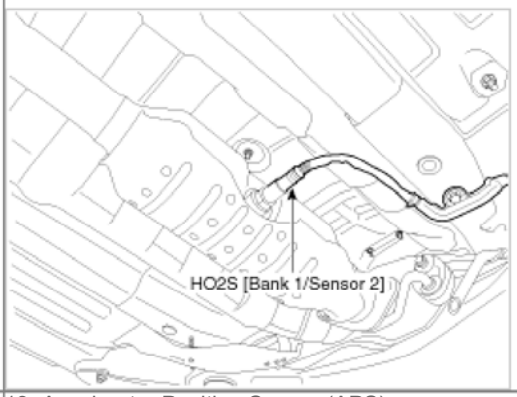
10. Heated Oxygen Sensor (HO2S) [Bank 1/Sensor 1]



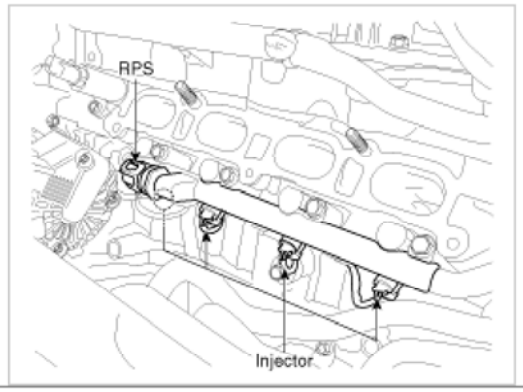
11. Heated Oxygen Sensor (HO2S) [Bank 1/Sensor 2]



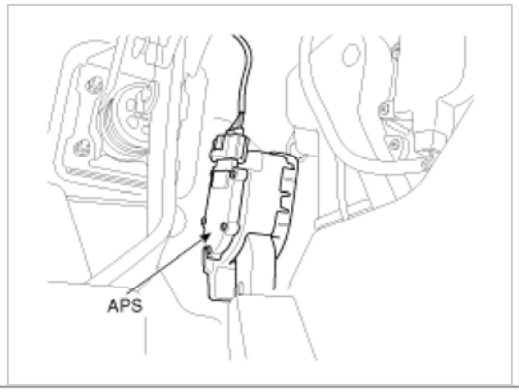
12. Rail Pressure Sensor (RPS)
18. Injector



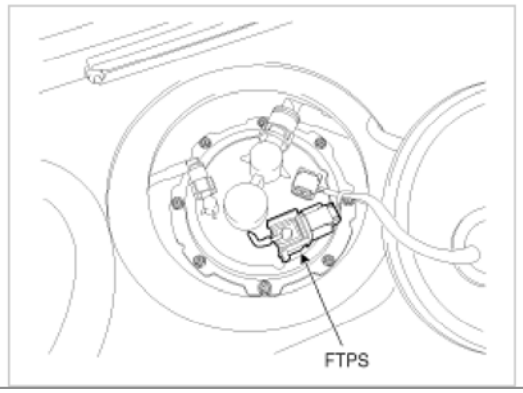
13. Accelerator Position Sensor (APS)



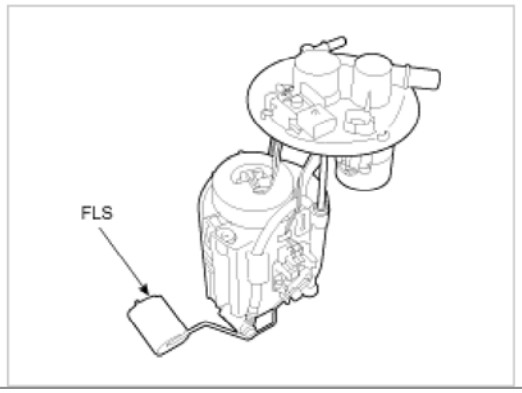
14. Fuel Tank Pressure Sensor (FTPS)



15. Fuel Level Sender (FLS)

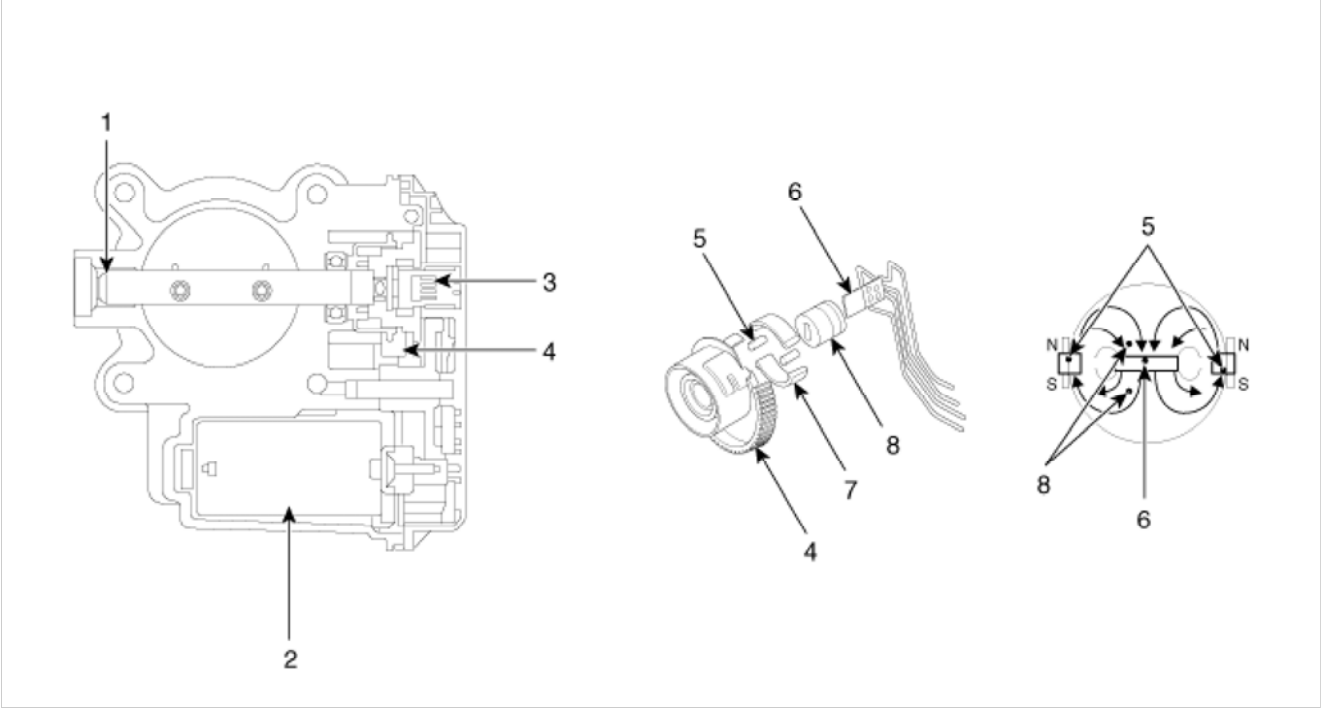


16. A/C Pressure Transducer (APT)



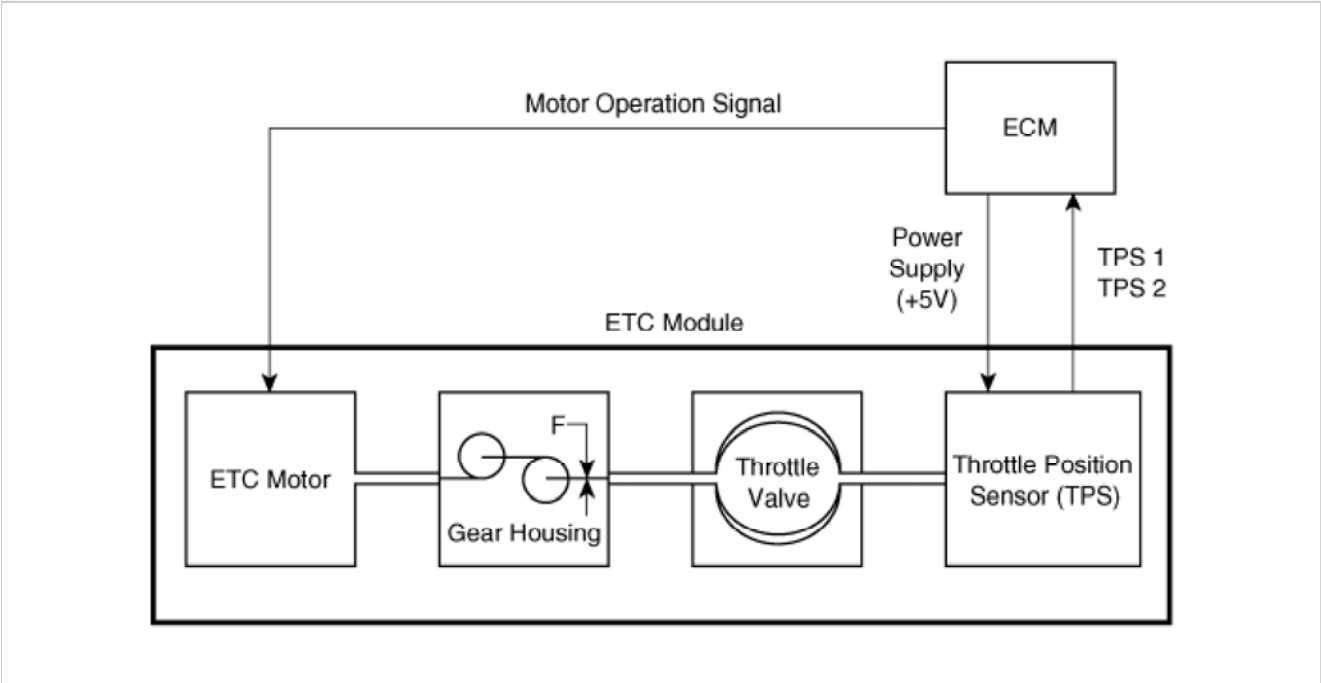
19. Purge Control Solenoid Valve (PCSV)

31	-			
32	Sensor ground	Idle	DC voltage	Max. 50mV
33	-			
34	Throttle Position Sensor (TPS) 2 signal input	Idle	Analog	0.55 ~ 4.37 V
35	-			
36	-			
37	-			
38	-			
39	-			
40	-			
41	Sensor ground	Idle	DC voltage	Max. 50mV
42	-			
43	-			
44	-			
45	-			
46	-			
47	-			
48	-			
49	-			
50	-			
51	Alternator PWM signal output	Idle	Pulse	High: Battery voltage Low: Max. 1.5V
52	-			
53	Brake switch signal input	ON OFF	DC voltage	Battery voltage Max. 2.25V
54	Accelerator Position Sensor (APS) 1 signal input	Idle	Analog	0.674 ~ 4.379 V
55	-			
56	Accelerator Position Sensor (APS) 2 signal input	Idle	Analog	0.261 ~ 2.204 V
57	-			
58	-			
59	-			
60	Sensor ground	Knocking Normal	Variable Frequency	
61	Knock Sensor (KS) signal input	Knocking Normal	Variable Frequency	
62	Sensor ground	Idle	DC voltage	Max. 50mV
63	Sensor ground	Idle	DC voltage	Max. 50mV
64	Injector (Cylinder #1) [Low] control output	Relay OFF Relay ON	DC voltage	71V Max. 1.0V
65	Injector (Cylinder #4) [Low] control output	Relay OFF Relay ON	DC voltage	71V Max. 1.0V
66	Injector (Cylinder #2) [Low] control output	Relay OFF Relay ON	DC voltage	71V Max. 1.0V
67	Injector (Cylinder #3) [Low] control output	Relay OFF Relay ON	DC voltage	71V Max. 1.0V
68	-			
69	-			
70	-			
71	-			
72	-			
73	-			
74	-			
75	-			



1. Dry bearing	5. Magnet
2. DC motor	6. Hall IC
3. Non-contact hall sensor	7. Yoke
4. Gear	8. Stator

Schematic Diagram

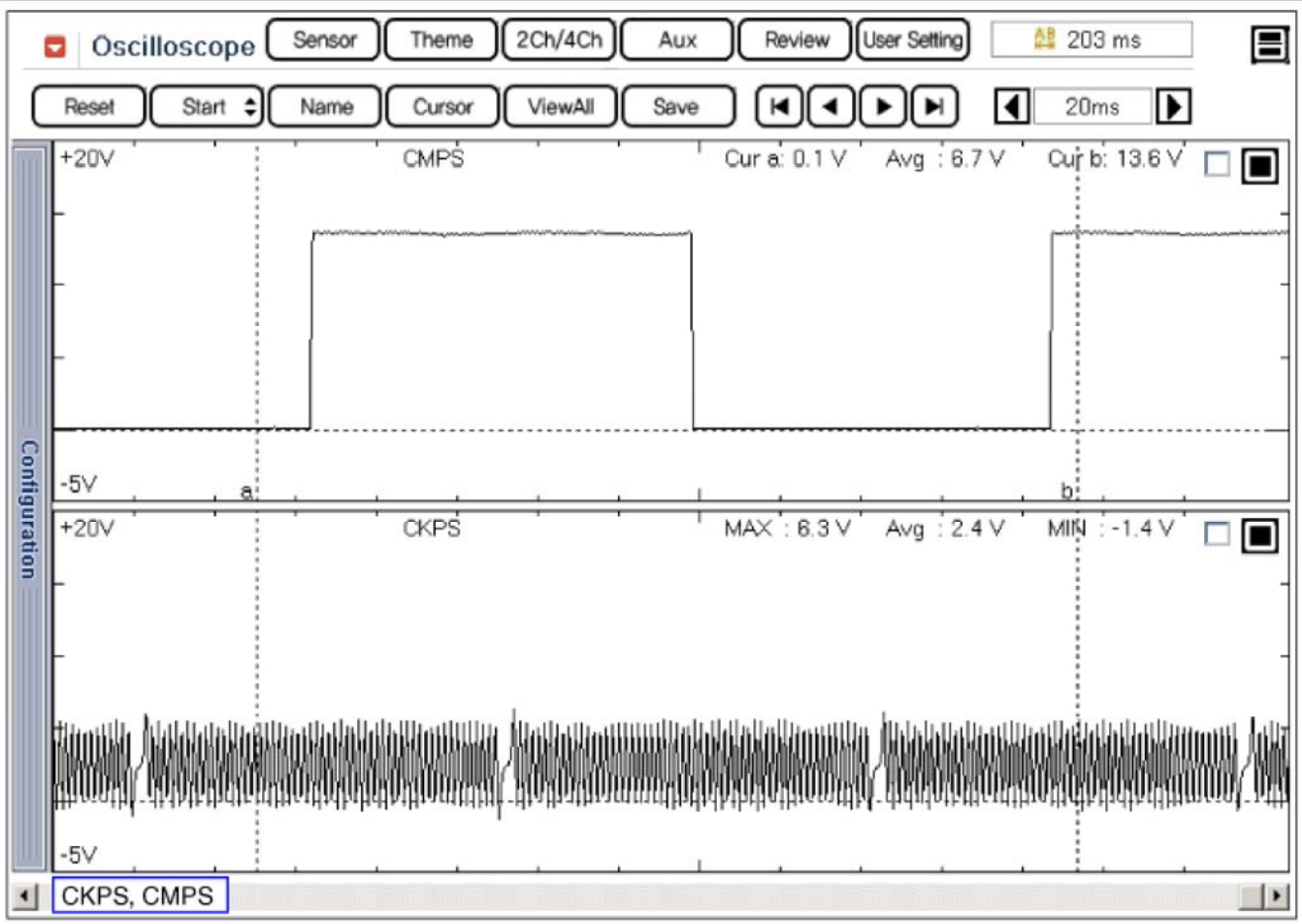


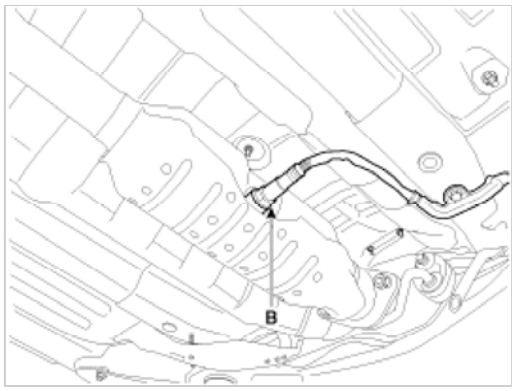
Fail-Safe Mode

Item	Fail-Safe
ETC Motor	Throttle valve stuck at 7°

Coil Resistance (Ω)	774 ~ 946 [20°C (68°F)]

Waveform





Installation

NOTICE

- Install the component with the specified torques.
- Note that internal damage may occur when the component is dropped. If the component has been dropped, inspect before installing.

NOTICE

- DON'T use a cleaner, spray, or grease to sensing element and connector of the sensor because oil component in them may malfunction the sensor performance.
- Sensor and its wiring may be damaged in case of contacting with the exhaust system (Exhaust Manifold, Catalytic Converter, and so on).

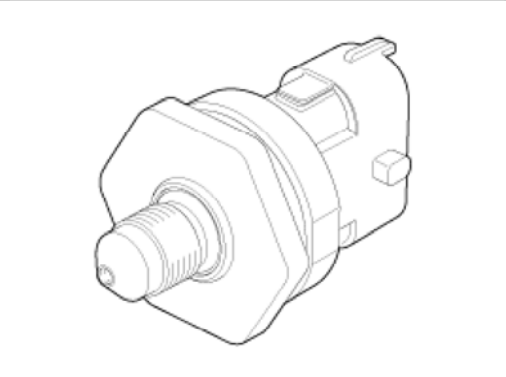
1. Install in the reverse order of removal.

Heated oxygen sensor installation:
39.2 ~ 49.1 N.m (4.0 ~ 5.0 kgf.m, 28.9 ~ 36.2 lb-ft)

Engine Control / Fuel System

Description

Rail Pressure Sensor (RPS) is installed on the delivery pipe and measures the instantaneous fuel pressure in the delivery pipe. The sensing element (Semiconductor element) built in the sensor converts the pressure to voltage signal. By using this signal, the ECM can control correct injection amount and timing and adjusts the fuel pressure with the fuel pressure regulator valve if the target pressure and the actual pressure calculated by the RPS output signal are different.

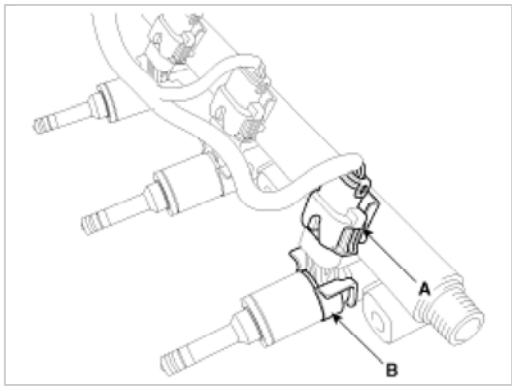


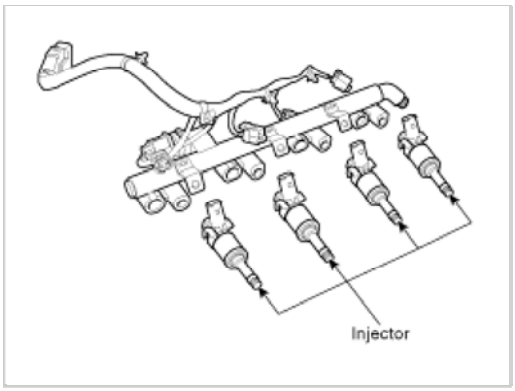
Engine Control / Fuel System

Specification

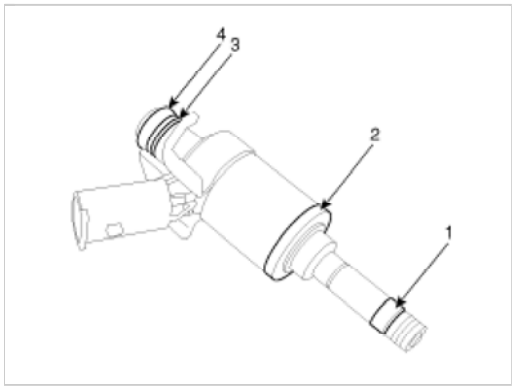
When removing the fuel pump fuse, a Diagnostic Trouble Code (DTC) may occur. Delete the code with the GDS after completion of “Release Residual Pressure in Fuel Line” work.

3. Remove the delivery pipe & injector assembly (Refer to "Delivery Pipe" in this group).
4. Remove the connector (A) and the fixing clip (B), and then separate the injector from the delivery pipe.





Installation



1. Combustion seal
2. Rubber washer
3. Support disc
4. O-ring

NOTICE

- Do not reuse the used injector fixing clip.

NOTICE

- Install the component with the specified torques.
- Note that internal damage may occur when the component is dropped. If the component has been dropped, inspect before installing.

NOTICE

- Apply engine oil to the injector O-ring.

Removal

(Refer to Fuel Delivery System - "High Pressure Fuel Pump")

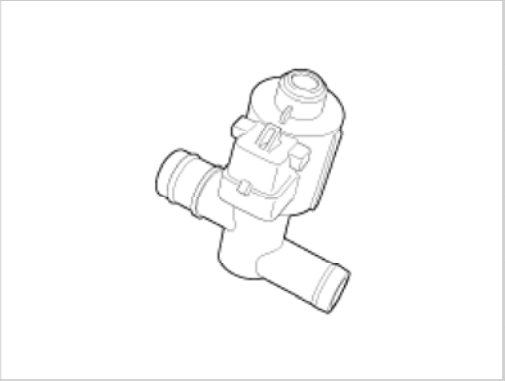
Installation

(Refer to Fuel Delivery System - "High Pressure Fuel Pump")

Engine Control / Fuel System

Description

Canister Close Valve (CCV) is normally open and is installed on the canister ventilation line. It seals evaporative emission control system by shutting the canister from the atmosphere during EVAP leak detection process.



Engine Control / Fuel System

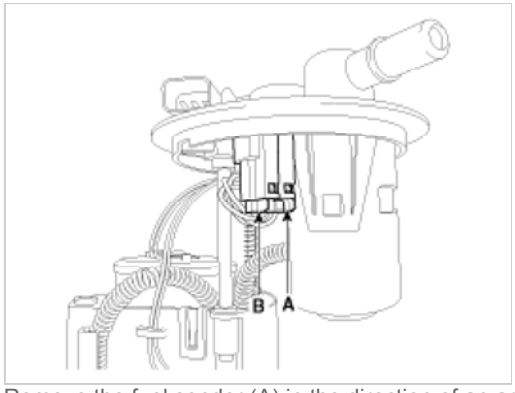
Specification

Item	Specification
Coil Resistance (Ω)	19.5 ~ 22.5 [20°C(68°F)

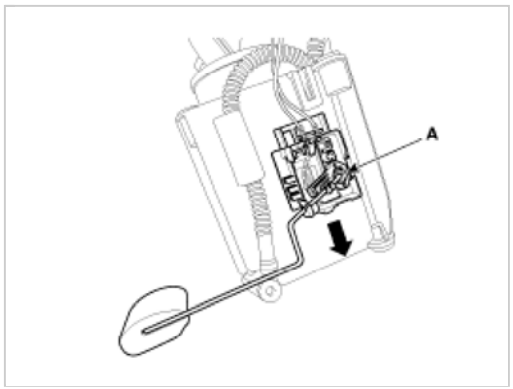
Engine Control / Fuel System

Circuit Diagram

(M/T)



3. Remove the fuel sender (A) in the direction of an arrow.



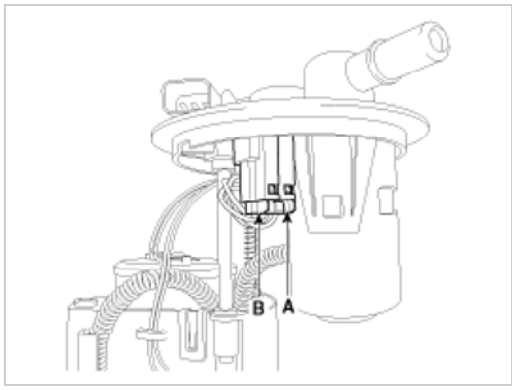
Installation

1. Install in the reverse order of removal.

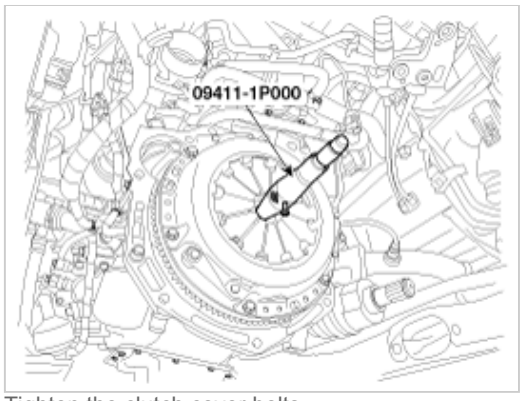
Engine Control / Fuel System

Removal

1. Remove the fuel pump (Refer to “Fuel Pump” in this group).
2. Disconnect the electric pump wiring connector (A) and the fuel sender connector (B).



3. Remove the head assembly (A) after releasing the cushion fixing clip (B).



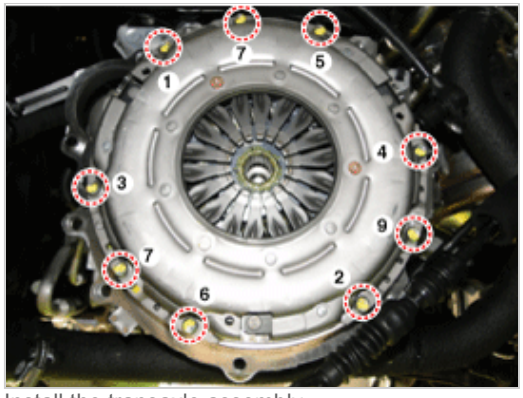
3. Tighten the clutch cover bolts.

NOTICE

Loosely tighten every clutch cover bolts and then tighten the bolt to specifications torque in a diagonal direction. This can prevent twisting, vibration of the cover, and the lifting of the pressure plate.

Tightening torque :

11.8 ~ 14.7 N.m (1.2 ~ 1.5 kgf.m, 8.7 ~ 10.8 lb-ft)



4. Install the transaxle assembly.
   (Refer to Manual Transaxle System - " Manual Transaxle")

Clutch System

Description

- **Component location :**

- **Function**

1. Clutch operation is detected through clutch switch signal. This signal enables ECM to cope with instant change of load condition.
2. Clutch switch signal is used to detect engaged gear with vehicle speed and engine speed.

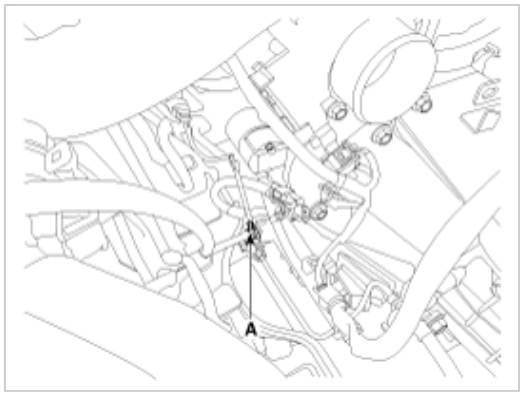
Clutch System

Specifications

Specified fluid:SAE J1703 (DOT 3 or DOT 4)

3. Loosening the plug screw, press and release the clutch pedal about 10 times.
4. Tighten the plug (A) during the clutch pedal pressed. Afterwards, raise the pedal with a hand.
5. After pressing the clutch pedal 3 times more, loosen the plug (A) and re-tighten it with the pedal pressed. Raise it again, then.
6. Repeat the step 4 two or three times.
   (until there is no bubble in the fluid)

Tightening torque:
6.8 ~ 9.8 N.m (0.7 ~ 1.0 kgf.m, 5.0 ~ 7.2 lb-ft)



7. Refill the clutch master cylinder with the specified fluid.

Specified fluid:SAE J1703 (DOT 3 or DOT 4)

Clutch System

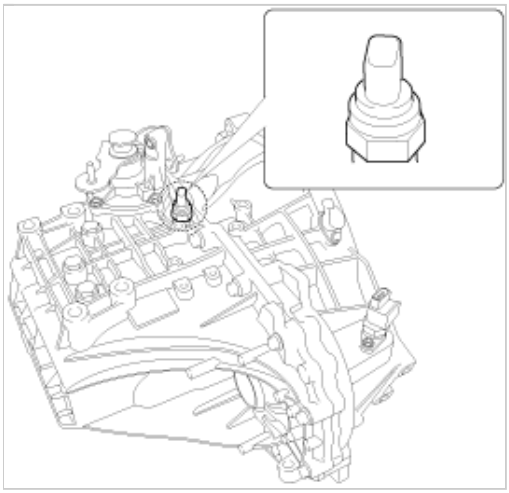
Components

1. Install in the reverse order of removal.
2. Adding manual transaxle fluid after Installing the manual transaxle.
   (Refer to Manual Transaxle System - "Manual Transaxle Fluid")

Manual Transaxle System

Description

Component location : Manual transaxle case



Operation principle : Back up lamp switch is pushed by the reverse lug sliding when select arm, and switches the back up lamp.
Function : Turn on the back up lamp when reversing.

Manual Transaxle System

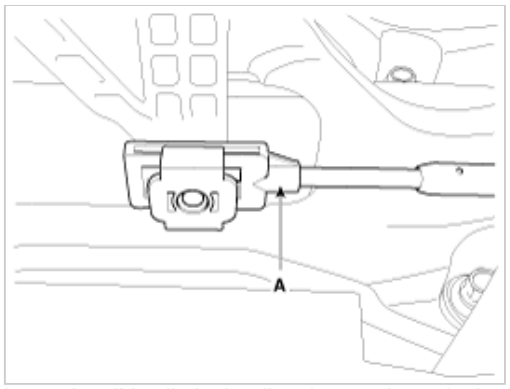
Specification

Item	Specification
Current voltage	13V
Working voltage	DC 10~15V
Operating force	3.0kg Max
Voltage drop	-0.4V
Working temperature	-30°C ~ 100°C [-30°F ~ 212°F]

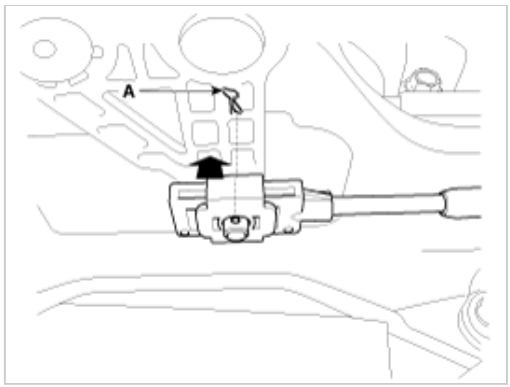
Manual Transaxle System

Inspection

1. Remove the air cleaner assembly.
   (Refer to Engine Mechanical System - "Air Cleaner")
2. Remove the battery and battery tray.
   (Refer to Engine Electrical System - "Battery")
3. Disconnect the back up lamp switch connector (A).



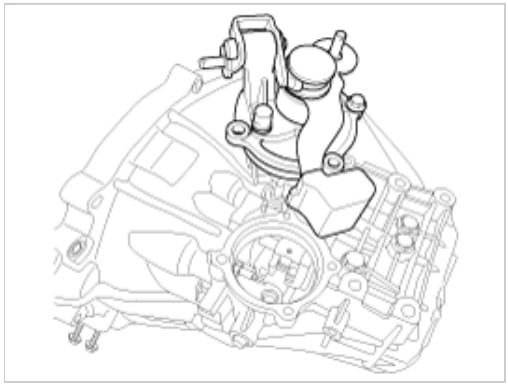
5. Insert the slide clip in the direction as shown in the illustration and then install the clip (A).



Manual Transaxle System

Description

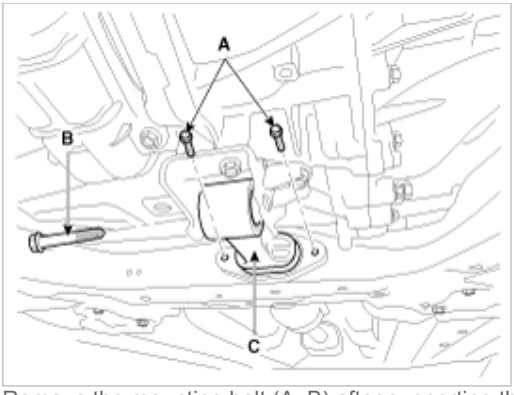
Control shaft assembly is mounted on the top of the manual transaxle, and select & shift cable are equipped.
Control shaft assembly is operated by shifting the shift lever.



Manual Transaxle System

Removal

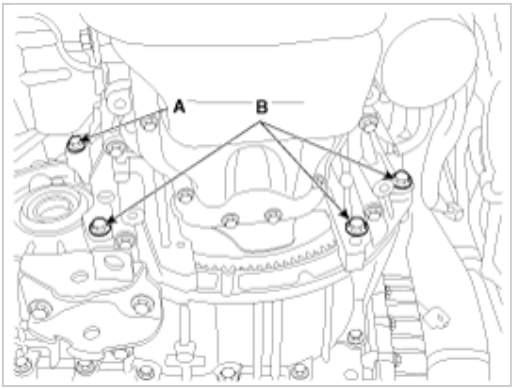
1. Remove the air cleaner assembly.
   (Refer to Engine Mechanical System - "Air Cleaner")
2. Remove the battery and battery tray.
   (Refer to Engine Electrical System - "Battery")
3. Set shift lever to N position.
4. Separate the control cable from the control shaft after remove the pin (A) and washer (B).



27. Remove the mounting bolt (A, B) after supporting the transaxle by a jack.

Tightening torque

(A) 42.2 ~ 54.0 N.m (4.3 ~ 5.5 kgf.m, 31.1 ~ 39.8 lb-ft)
(B) 42.2 ~ 48.1 N.m (4.3 ~ 4.9 kgf.m, 31.1 ~ 35.4 lb-ft)



28. Remove the transaxle while slowly lower the jack.

NOTICE

Be careful not to damage other system or parts near by when removing the transaxle assembly.

Installation

1. Install in the reverse order of removal.

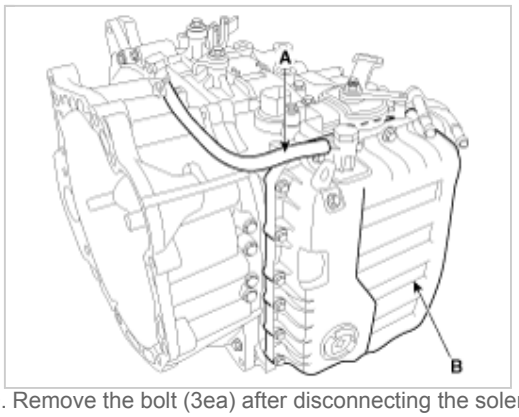
NOTICE

After replacement or reinstallation procedure of the automatic transaxle assembly, must perform procedures below.

- Adding automatic transaxle fluid.
  (Refer to Hydraulic System - "Fluid")
- If the oil seal on the transaxle case side is damaged and fluid is leaking, replace the oil seal with a new unit. When installing the new oil seal, use the specialized tool (Oil seal installer: 09453-3L241, Bar: 09231-H1100).
- After servicing the automatic transaxle or TCM, clear the diagnostic trouble codes (DTC) using the GDS tool.(DTC cannot be cleared by disconnecting the battery.)
- After replacing the automatic transaxle, reset the automatic transaxle's values by using the GDS.

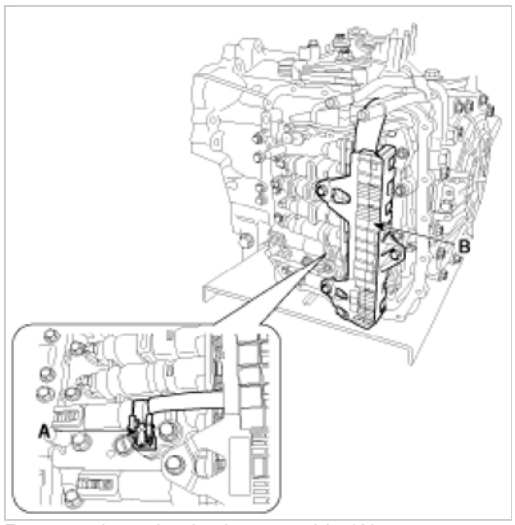
6. Remove the under cover.
   (Refer to Engine Mechanical System - "Engine Room Under Cover")
7. Replace new gasket and the plug after draining the automatic transaxle fluid by removing the drain plug.
   (Refer to Hydraulic System - "Fluid")
8. Remove thd air breather hose (A).
9. Remove the valve body cover (B).

Tightening torque:
13.7 ~ 15.7 N.m (1.4 ~ 1.6 kgf.m, 10.1 ~ 11.6 lb-ft)



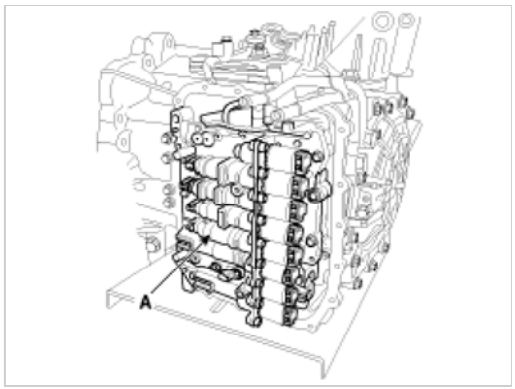
10. Remove the bolt (3ea) after disconnecting the solenoid valve (B) connector and the oil temperature sensor connector (A).

Tightening torque:
9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)

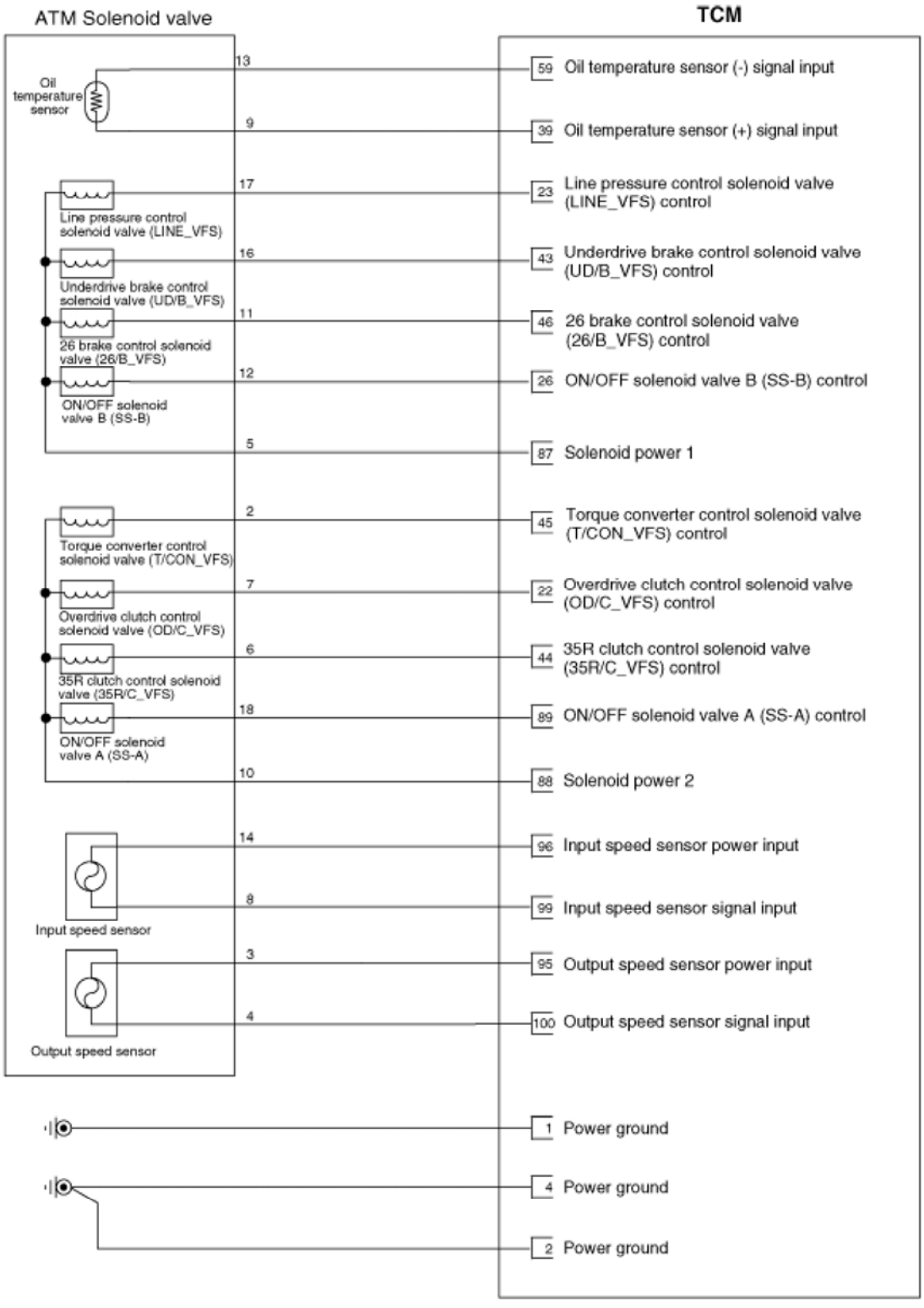


11. Remove the valve body assembly (A).

Tightening torque:
9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)



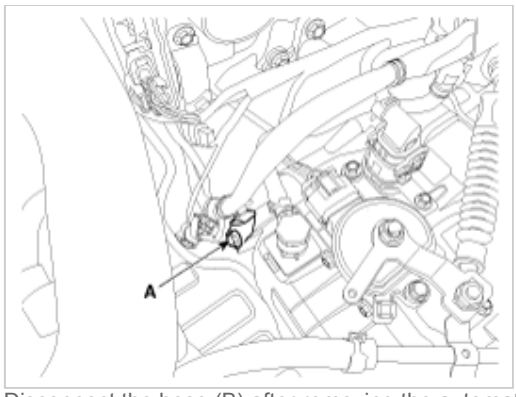
Installation



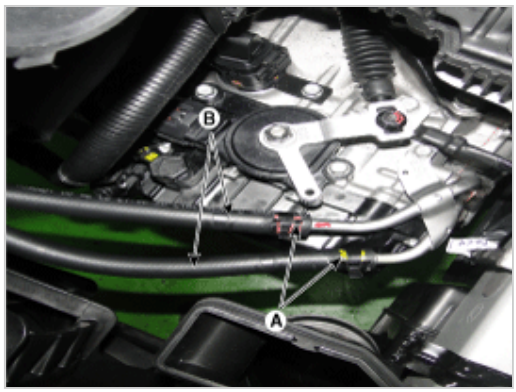
Inspection

Transaxle Control Module(TCM) Problem Inspection Procedure

1.

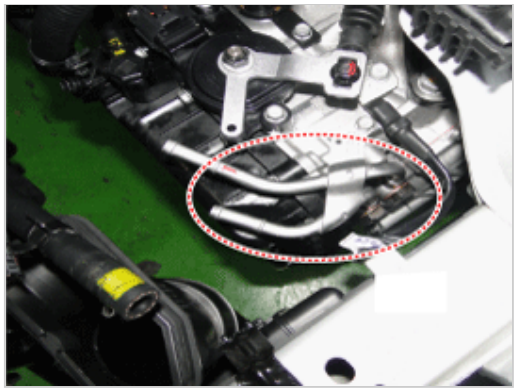


4. Disconnect the hose (B) after removing the automatic transaxle fluid cooler hose clamp (A).



5. Remove the transaxle oil pipe.

Tighten torque :
42.2 ~ 48.1 N.m (4.3 ~ 4.9 kgf.m, 31.1 ~ 35.4 lb-ft)

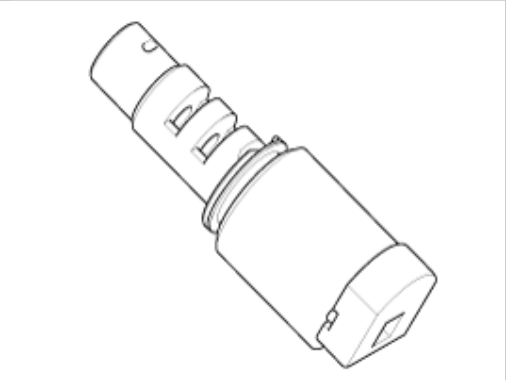


6. Remove the under cover.
(Refer to Engine Mechanical System - "Engine Room Under Cover")
7. Replace new gasket and the plug after draining the automatic transaxle fluid by removing the drain plug.
(Refer to Hydraulic System - "Fluid")
8. Remove the air breather hose (A).
9. Remove the valve body cover (B).

Tightening torque:
13.7 ~ 15.7 N.m (1.4 ~ 1.6 kgf.m, 10.8 ~ 11.6 lb-ft)

NOTICE
Remove installation bolts in the engine compartment first and then remove others under the vehicle.

Overdrive clutch control solenoid valve(OD/C_VFS) is attached to the valve body. This variable force solenoid valve directly controls the hydraulic pressure inside the overdrive clutch.



Automatic Transaxle System

Specifications

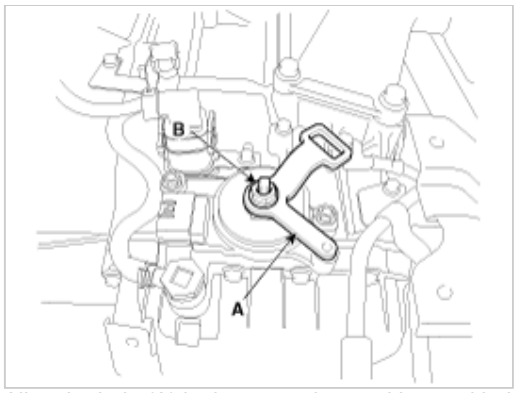
Direct control VFS[OD/C]

▷ Control type : Normal high type

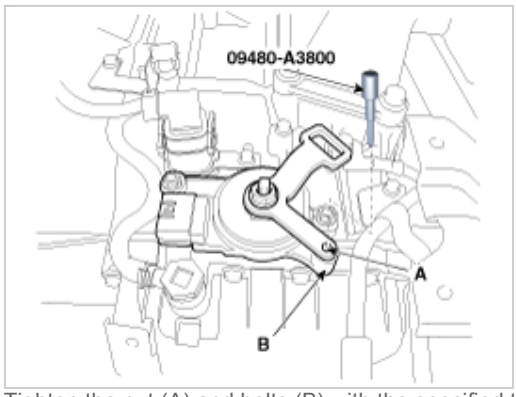
Control Pressure kpa (kgf/cm², psi)	500.14 ~ 9.81 (5.1 ~ 0.1,72.54 ~ 1.42)
Current value(mA)	50 ~ 850
Internal resistance(Ω)	5.1

Automatic Transaxle System

Circuit Diagram



4. Align the hole (A) in the manual control lever with the "N" position hole (B) of the inhibitor switch and then insert the SST inhibitor switch guide pin (09480-A3800).

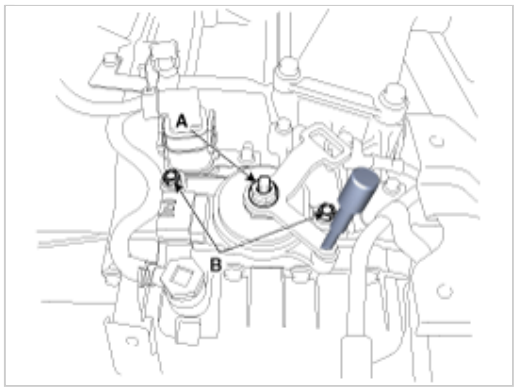


5. Tighten the nut (A) and bolts (B) with the specified torque.

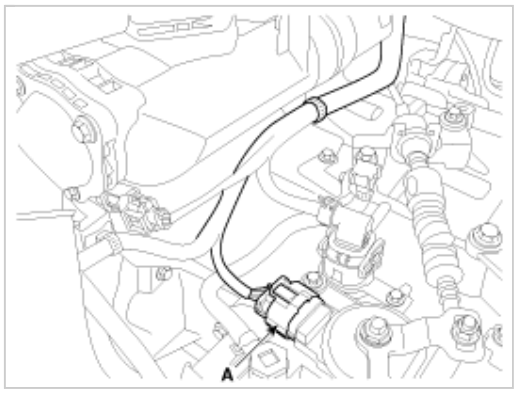
Tightening torque:

A : 17.7~24.5 N.m (1.8~ 2.5 kgf.m, 13.0 ~ 18.1 lb-ft)

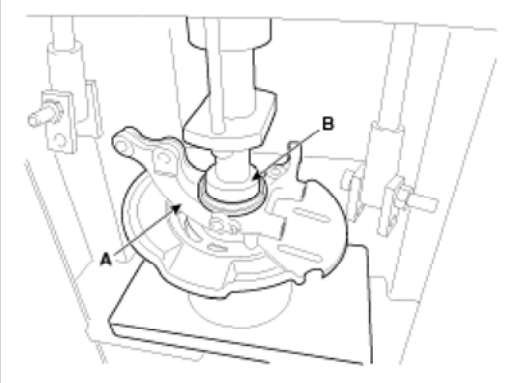
B : 9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)



6. Remove the SST (09480-A3800) from the hole.
7. Connect the inhibitor switch connector (A).



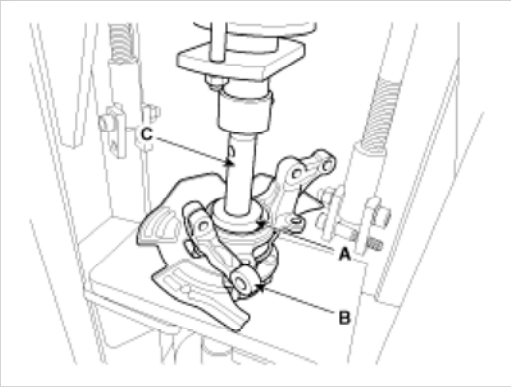
(4) Install the hub bearing to the knuckle assembly by using press.



⚠ CAUTION

- Do not press against the inner race of the hub bearing because that can cause damage to the bearing assembly.
- Always use a new wheel bearing assembly.

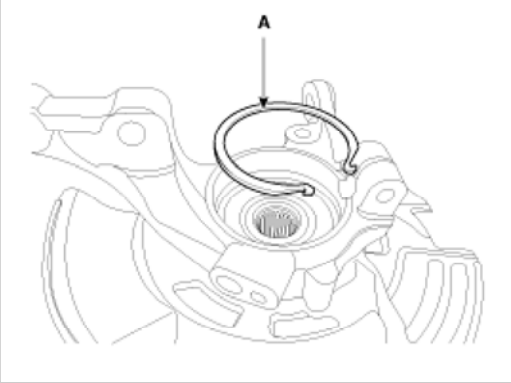
2. Install the hub assembly to the knuckle assembly.
   (1) Lay the hub assembly (A) upon a suitable adapter .
   (2) Lay the knuckle assembly (B) upon the hub assembly (A).
   (3) Lay a suitable adapter (C) upon the hub bearing.
   (4) Install the hub assembly (A) to the knuckle assembly (B) by using press.



⚠ CAUTION

Do not press against the inner race of the hub bearing because that can cause damage to the bearing assembly.

3. Install the snap ring (A).

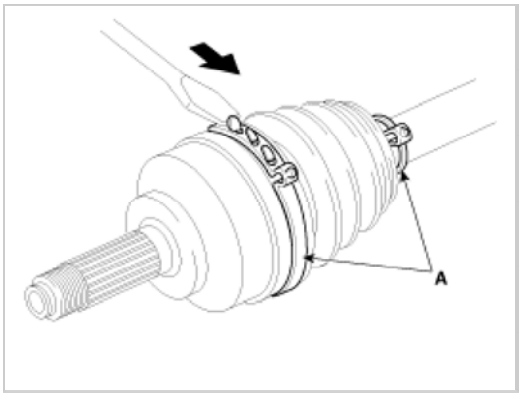


Inspection

1. Check the hub for cracks and the splines for wear.
2. Check the brake disc for scoring and damage.
3. Check the knuckle for cracks.
4. Check the bearing for cracks or damage.

(Refer to Driveshaft Assembly - “Dynamic Damper”)

4. Using a plier or flat-tipped (-) screwdriver, remove the BJ boot bands (A).



5. Remove the BJ boot.
6. Install in the reverse order of removal.

⚠ CAUTION

- Do not disassemble the BJ assembly.
- Special grease must be applied to the driveshaft joint. Do not substitute with another type of grease.
- The boot band should be replaced with a new one.

7. Check the front alignment.
(Refer to Suspension System - "Front Alignment")

Driveshaft and axle

Components

	● Is the vibration present ? → **YES** Substitute known good wheel and tire assemblies as necessary. Test the system for normal operation. → **NO** Check the driveline components. Test the system for normal operation.

DETAILED TEST E : DRIFT LEFT OR RIGHT

CONDITIONS	DETAILS/RESULTS/ACTIONS
E1. CHECK THE TIRES	
	Inspect the tires for excessive wear or damage. ● Are the tires excessively worn or damaged ? → **YES** Install new tires. → **NO** Go to**E2.**
E2. CHECK THE STEERING LINKAGE	
	1. Raise and support the vehicle. 2. Check the steering components for indications of excessive wear or damage. See ST group - specification. ● Is there an indication of excessive wear or damage ? → **YES** Repair or Install new components as necessary. → **NO** Go to**E3.**
E3. CHECK THE VEHICLE ALIGNMENT	
	1. Place the vehicle on an alignment rack. Check the vehicle alignmnt. ● Is the alignment within specification ? → **YES** Go to**E4.** → **NO** Adjust the alignment as necessary.
E4. BRAKE DRAG DIAGNOSIS	
	Apply the brakes while driving. ● Does drift or pull occur when the brakes are applied ? → **YES** See BR group - specification. → **NO** If the steering wheel is in the center, the vehicle is OK. If the steering wheel is off-center, Go to Detailed Test**F.**

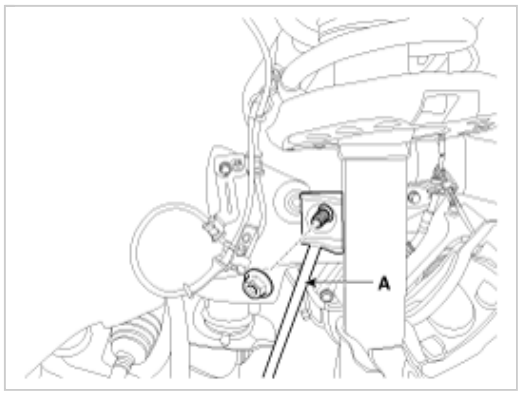
DETAILED TEST F : STEERING WHEEL OFF-CENTER

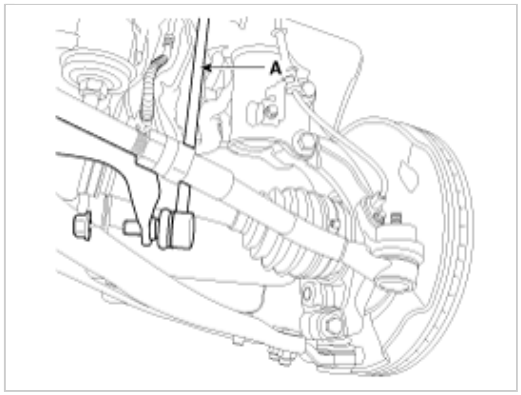
CONDITIONS	DETAILS/RESULTS/ACTIONS
F1. CHECK THE CLEAR VISION	
	Place the vehicle on an alignment rack. ● Is the clear vision within specification ?

• Be careful not to damage to the hub bolts when removing the front wheel and tire (A).

3. Remove the stabilizer link (A) loosening the nut.

Tightening torque :
98.1 ~ 117.7N.m(10.0 ~ 12.0kgf.m, 72.3 ~ 86.8lb-ft)



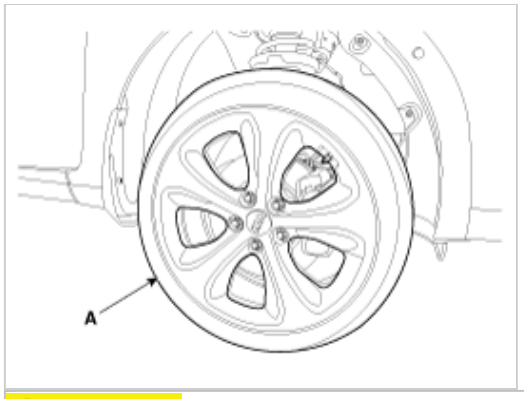


Suspension System

Replacement

1. Loosen the wheel nuts slightly.
   Raise the vehicle, and make sure it is securely supported.
2. Remove the front wheel and tire (A) from front hub.

Tightening torque :
88.2 ~ 107.8 N.m (9.0 ~ 11.0 kgf.m, 65.0 ~ 79.5 lb-ft)



⚠ CAUTION

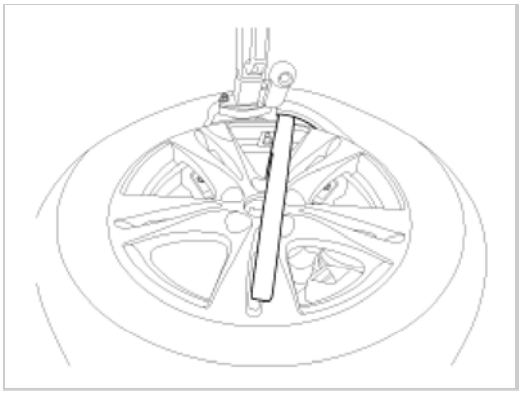
• Be careful not to damage to the hub bolts when removing the front wheel and tire (A).

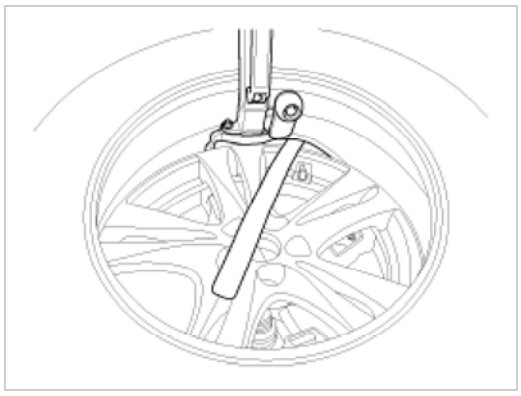
3. Disconnect the stabilizer link (A) from the front strut assembly after loosening the nut.

Tightening torque :
98.1 ~ 117.7N.m(10.0 ~ 12.0kgf.m, 72.3~86.8lb-ft)

- The tire bead should be broken approx. 90° from the valve side of the wheel. The bead breaker should not be set too deep.
- Avoid tire/tool contact with the valve on dismount.
- Dismount should end near the valve.

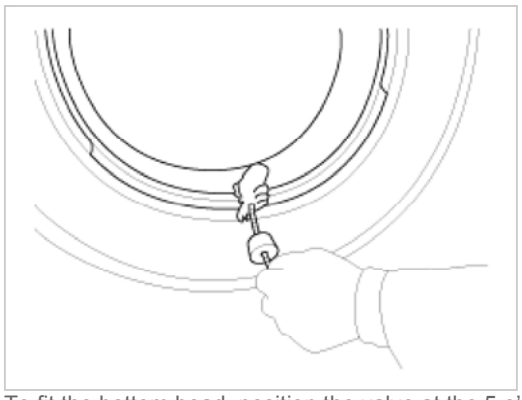
3. Rotate the wheel clockwise.



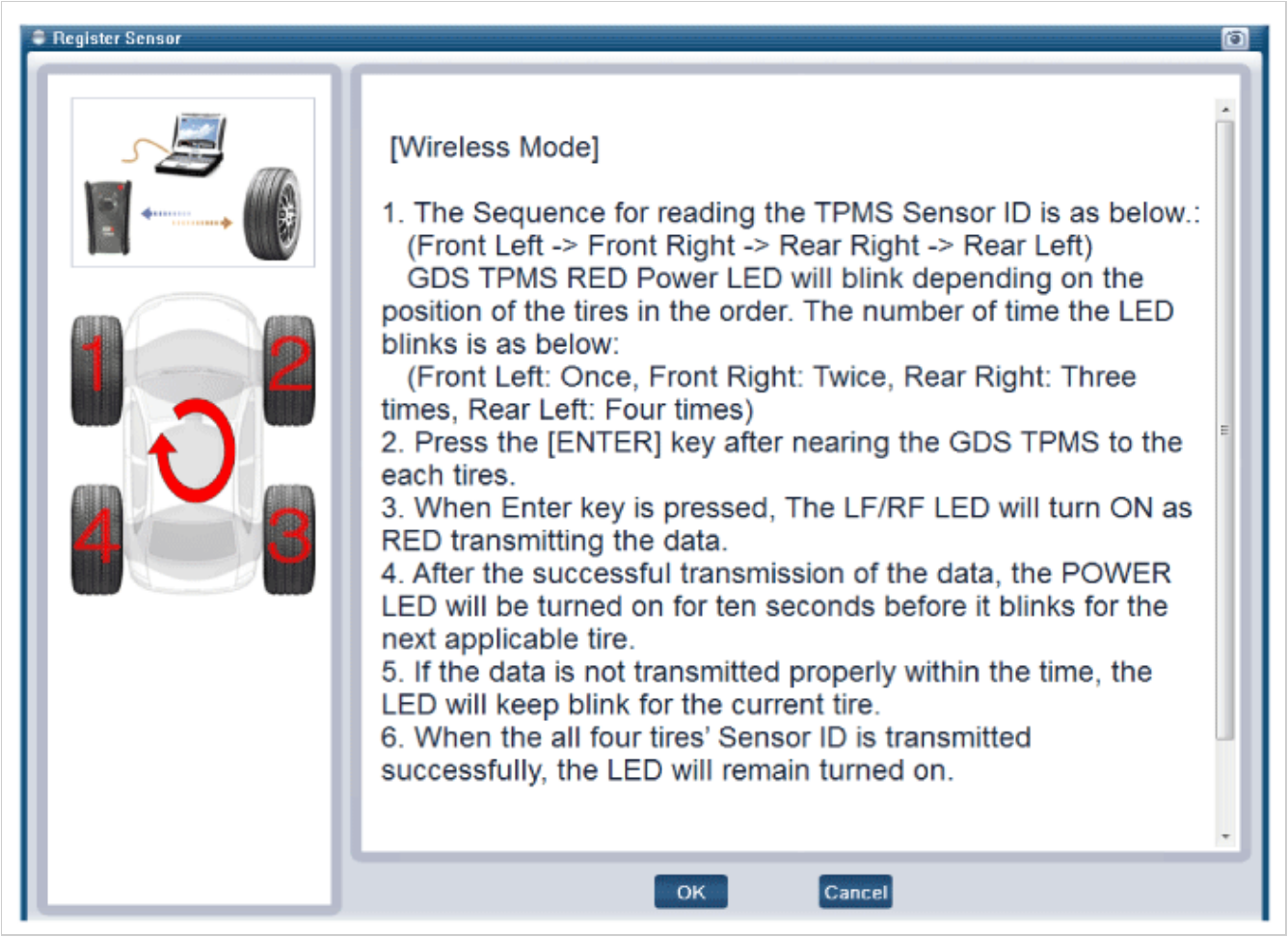


Installation

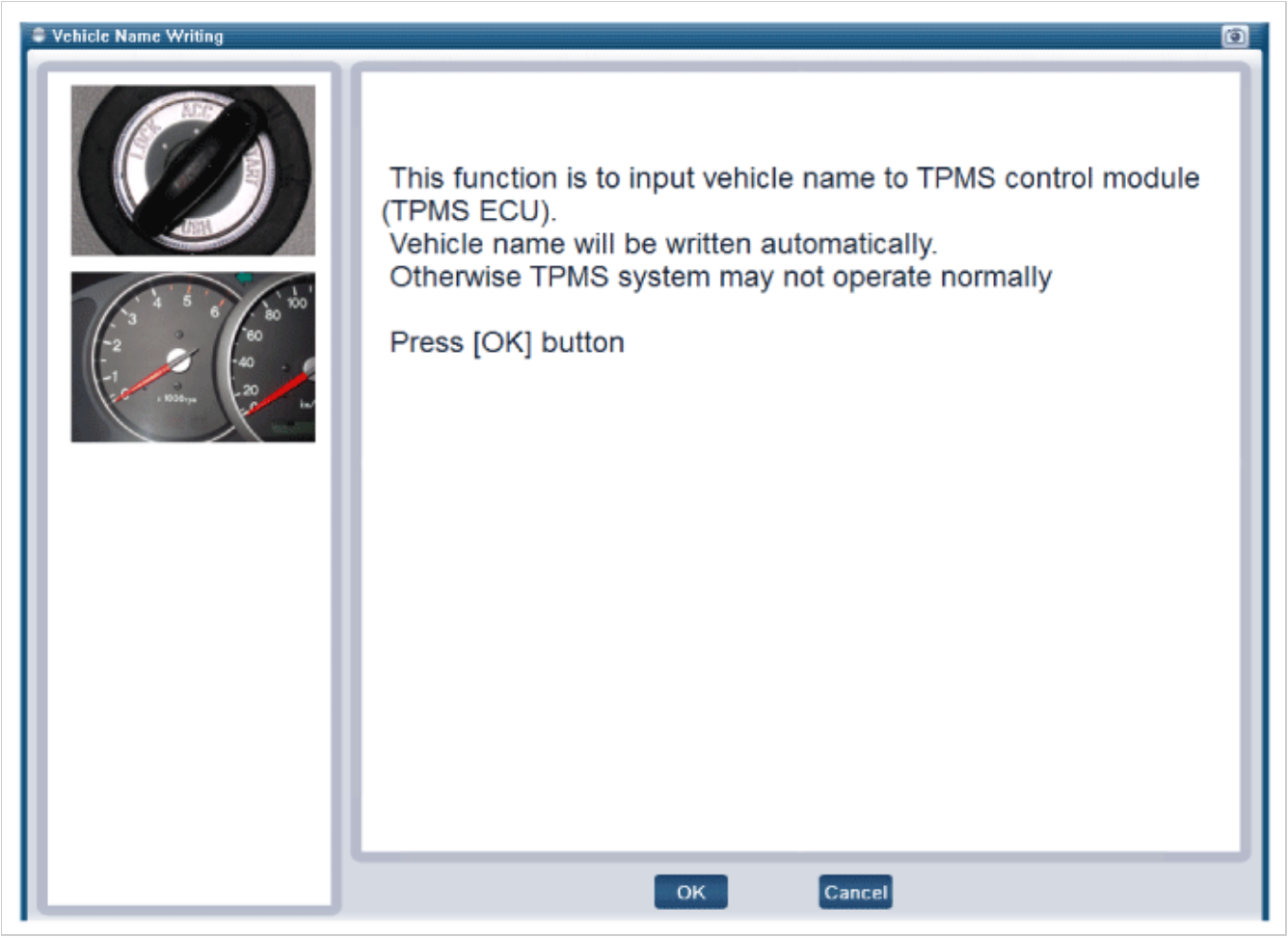
1. Apply tire soap or lubrication to the top and bottom tire beads.



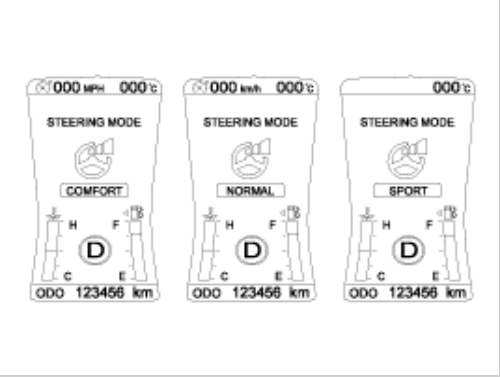
2. To fit the bottom bead, position the valve at the 5 o’clock position relative to the head on the tire changing machine.



[Sensor register method 3]



[Vehicle Name Writing 2]



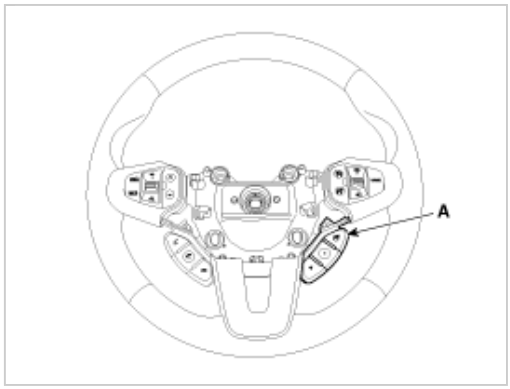
• Three steering modes

COMRORT : For the elder and the female drivers: it is mainly used for city driving and stop & parking, and a little lighter power steering.
NORMAL : Basic mode
SPORT : It is mainly used for highway driving, and a little heavy power steering.

Steering System

Replacement

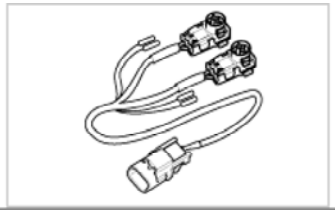
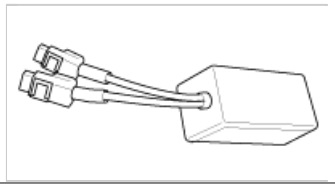
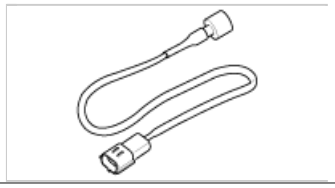
1. Disconnect the negative (-) battery terminal.
2. Remove the driver airbag module.
   (Refer to Restraint - "Driver Airbag (DAB) Module and Clock Spring")
3. Remove the steering wheel.
   (Refer to Steering System - "Steering Column and Shaft")
4. Disengage the steering wheel remote control switch assembly. (Refer to Steering System - "Steering Wheel")
5. Loosen the screw and then remote control switch assembly (A) from the steering wheel body.



6. Install in the reverse order of removal.

Steering System

Components

		
Dummy 0957A-38200		Simulator to check the resistance of each wiring harness.
Dummy adapter 0957A-2W200		Use with dummy (SAB)
Dummy adapter 0957A-2G000		Use with dummy (DAB, PAB, CAB, BPT)

DAB : Driver Airbag
PAB : Passenger Airbag
SAB : Side Airbag
CAB : Curtain Airbag
BPT : Seat Belt Pretensioner

Restraint

Precautions

General Precautions

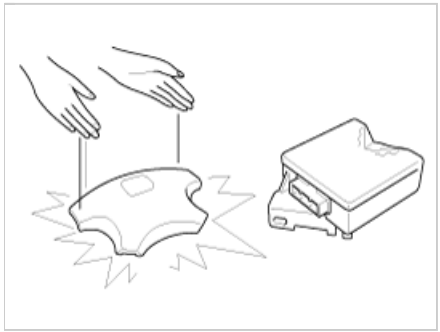
Please read the following precautions carefully before performing the airbag system service.
Observe the instructions described in this manual, or the airbags could accidentally deploy and cause damage or injuries.

- Except when performing electrical inspections, always turn the ignition switch OFF and disconnect the negative cable from the battery, and wait at least three minutes before beginning work.

NOTICE

The contents in the memory are not erased even if the ignition switch is turned OFF or the battery cables are disconnected from the battery.

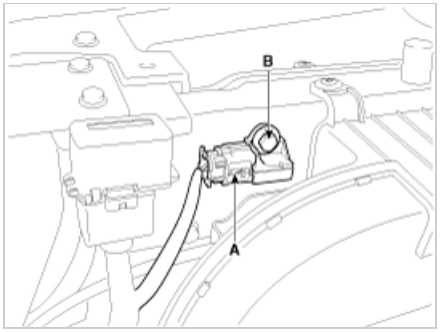
- Use the replacement parts which are manufactured to the same standards as the original parts and quality.
  Do not install used SRS parts from another vehicle. Use only new parts when making SRS repairs.
- Carefully inspect any SRS part before you install it. Do not install any part that shows signs of being dropped or improperly handled, such as dents, cracks or deformation.



- Before removing any of the SRSCM parts (including the disconnection of the connectors), always disconnect the SRSCM connector.

Airbag Handling and Storage

Do not disassemble the airbags; it has no serviceable parts. Once an airbag has been deployed, it cannot be repaired or reused.



3. Remove the front impact sensor mounting bolt (B).

Installation

⚠ CAUTION

- Do not turn the ignition switch ON and do not contact the battery cable while replacing the front impact sensor.

1. Install the new front impact sensor.
2. Tighten the front impact sensor mounting bolt.

Tightening torque :
8.0 ~ 12.0 N.m (0.82 ~ 1.22 kgf.m, 5.9 ~ 8.9 lb-ft)

3. Connect the front impact sensor connector.
4. Reconnect the battery negative cable.
5. After installing the Front Impact Sensor, confirm proper system operation:
   A. Turn the ignition switch ON; the SRS indicator light should be turned on for about six seconds and then go off.

Restraint

Description

Side Impact Sensor (SIS) system consists of two P-SIS which are installed at each center of the front door module (LH and RH) and two SIS which are installed at each center pillar nearby (LH and RH).

Side Pressure Sensor is also called P-SIS because it detects pressure due to collision at its mounting location.

Side Impact Sensor is also called A-SIS because it detects acceleration.

SRSCM decides deployment of the airbag and the time of deployment through the collision signal of the SIS when the collision occurred.

Restraint

Components

6. Push the tool's deployment switch. The airbag should deploy (deployment is both highly audible and visible: a loud noise and rapid inflation of the bag, followed by slow deflation)
7. Dispose of the complete airbag. No parts can be reused. Place it in a sturdy plastic bag and seal it securely.

Deploying the airbag out of the vehicle

If an intact airbag has been removed from a scrapped vehicle, or has been found defective or damage during transit, storage or service, it should be deployed as follows:

1. Confirm that the special tool is functioning properly by following the check procedure on this page.
2. Position the airbag facing up and EFD (Emergency Fastening Device) and Active Hood Actuator must be placed in piled up, at least, 5 tires, outdoors on flat ground at least thirty feet (10meters) from any obstacles or people.
3. Connect a 12 volt battery to the tool.
4. Push the tool's deployment switch. The airbag should deploy (deployment is both highly audible and visible: a loud noise and rapid inflation of the bag, followed by slow deflation)
5. Dispose of the complete airbag. No parts can be reused. Place it in a sturdy plastic bag and seal it securely.

⚠ CAUTION

- When EFD and Active Hood Actuator are deployed, broken parts are exploded and scattered.
- EFD and Active Hood Actuator must be placed in the piled up 5 tires to avoid exploded broken parts.
- Technicians should wear an eye protector and extremely be cautions of exploded broken parts.

Disposal of damaged airbag

1. If installed in a vehicle, follow the removal procedure of driver's airbag front passenger's and side airbag.
2. In all cases, make a short circuit by twisting together the two airbag inflator wires.
3. Package the airbag in exactly the same packing that the new replacement part come in.

Restraint

Description

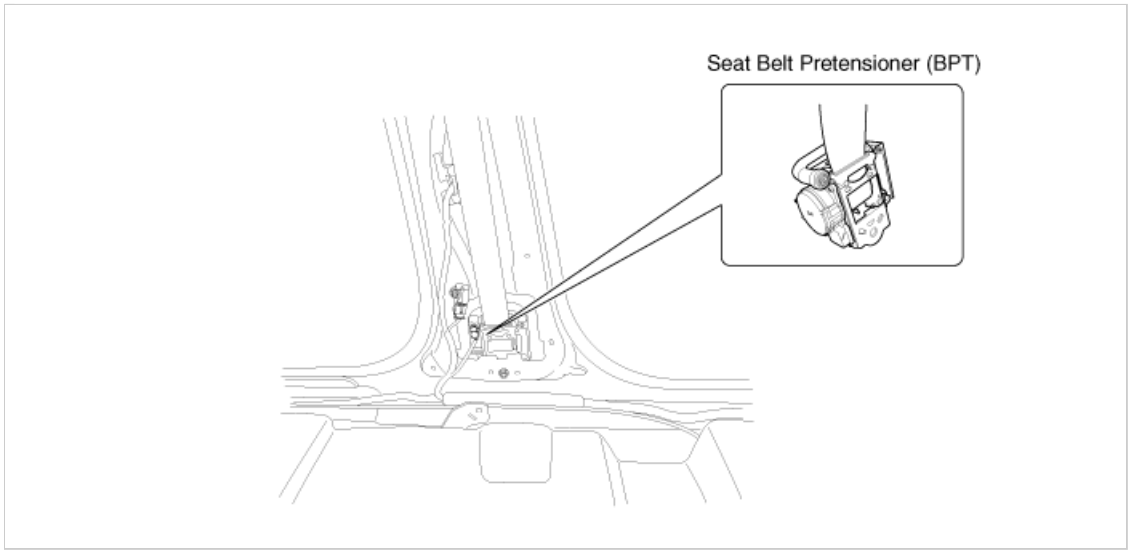
The Seat Belt Pretensioners (BPT) are installed inside Center Pillar (LH & RH). When a vehicle crashes with a certain degree of frontal impact, the pretensioner seat belt helps to reduce the severity of injury to the front seat occupants by retracting the seat belt webbing. This prevents the front occupants from thrusting forward and hitting the steering wheel or the instrument panel when the vehicle crashes.

⚠ CAUTION

Never attempt to measure the circuit resistance of the Seat Belt Pretensioner (BPT) even if you are using the specified tester. If the circuit resistance is measured with a tester, the pretensioner will be ignited accidentally. This will result in serious personal injury.

Restraint

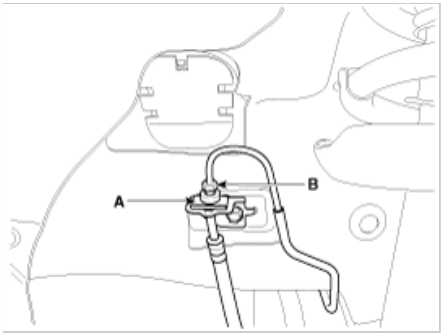
Components



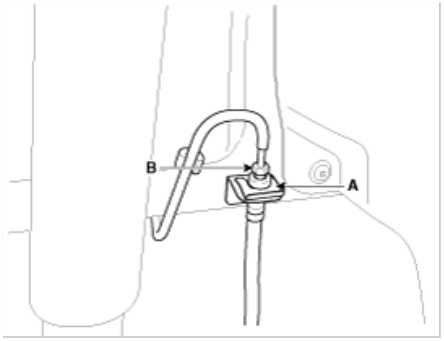
Restraint

Removal

1. Disconnect the battery negative cable, and wait for at least thirty seconds before beginning work.
2. Remove the center pillar trim.
   (Refer to Body - "Center pillar trim")
3. Remove the upper anchor bolt.
4. Disconnect the seat belt pretensioner connector (A).



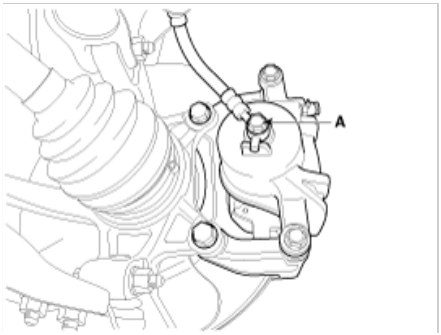
Rear



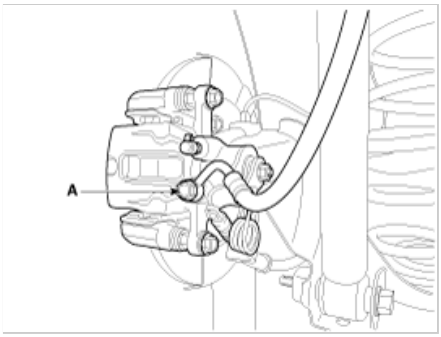
5. Remove the brake hose clip (A).
6. Disconnect the brake hose from the brake caliper by loosening the bolt (A).

Tightening torque:
24.5 ~ 29.4 N.m (2.5 ~ 3.0 kgf.m, 18.1 ~ 21.7 lb-ft)

Front



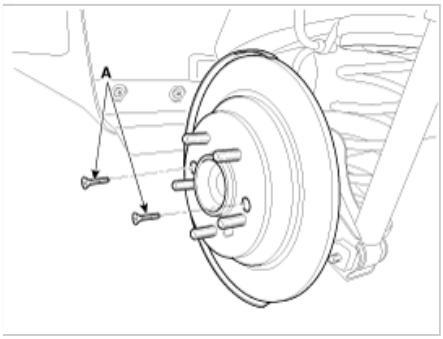
Rear



Inspection

1. Check the brake tubes for cracks, crimps and corrosion.
2. Check the brake hoses for cracks, damage and fluid leakage.
3. Check the brake tube flare nuts for damage and fluid leakage.
4. Check brake hose mounting bracket for crack or deformation.

Tightening torque:
4.9 ~ 5.9 N.m (0.5 ~ 0.6 kgf.m, 3.6 ~ 4.3 lb-ft)

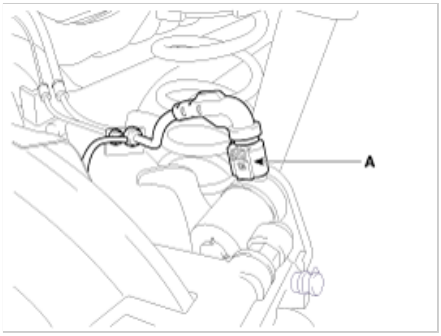


Removal [With EPB]

1. Remove the rear wheel & tire.

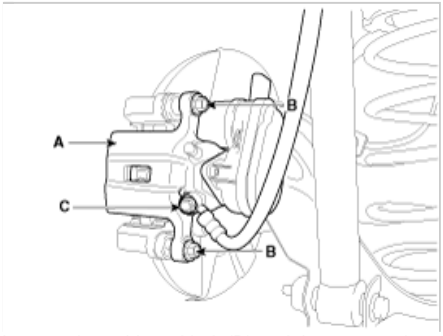
Tightening torque:
88.3 ~ 107.9 N.m (9.0 ~ 11.0 kgf.m, 65.1 ~ 79.6 lb-ft)

2. Release the parking brake.
3. Disconnect the EPB actuator connector (A).



4. Disconnect the brake hose from the brake caliper by loosening the bolt (C).

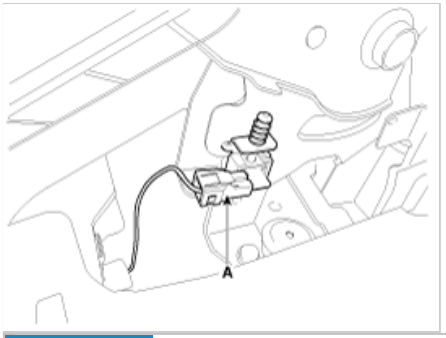
Tightening torque:
24.5 ~ 29.4 N.m (2.5 ~ 3.0 kgf.m, 18.1 ~ 21.7 lb-ft)



5. Loosen the guide rod bolt (B) and the remove the rear caliper body (A).

Tightening torque:
21.6 ~ 31.4 N.m (2.2 ~ 3.2 kgf.m, 15.9 ~ 23.1 lb-ft)

6. Remove the pad return sprign (D).
   Remove the pad retainers (C) and brake pads (B) in the caliper carrier (A).



NOTICE

Inspect the continuity of parking brake switch.

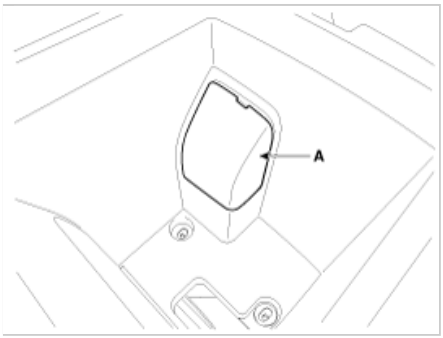
When the brake lever is pulled: continuity
When the brake lever is released: no continuity

10. Install the floor console.
    (Refer to Body group - "Floor console")

Adjustment

Parking Brake Lever Stroke Adjustment

1. Remove the storage service cover (A).

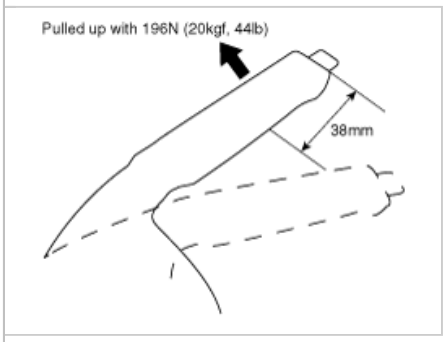


2. Apply the brake pedal 20 times with the force of 10kgf after bleeding. Then, for the cable to settle in, apply the parking brake full stroke more than 3 times.
3. Install the parking brake cable adjuster, then adjust the parking brake lever stroke by turning adjusting nut (A).

Parking brake lever stroke :
6 ~ 8 clicks (Pull the lever with 196N (20 kgf, 44 lbf))

NOTICE

After repairing the parking brake shoe, adjust the brake shoe clearance, and then adjust the parking brake lever stroke. (Refer to "Parking brake shoe installation")



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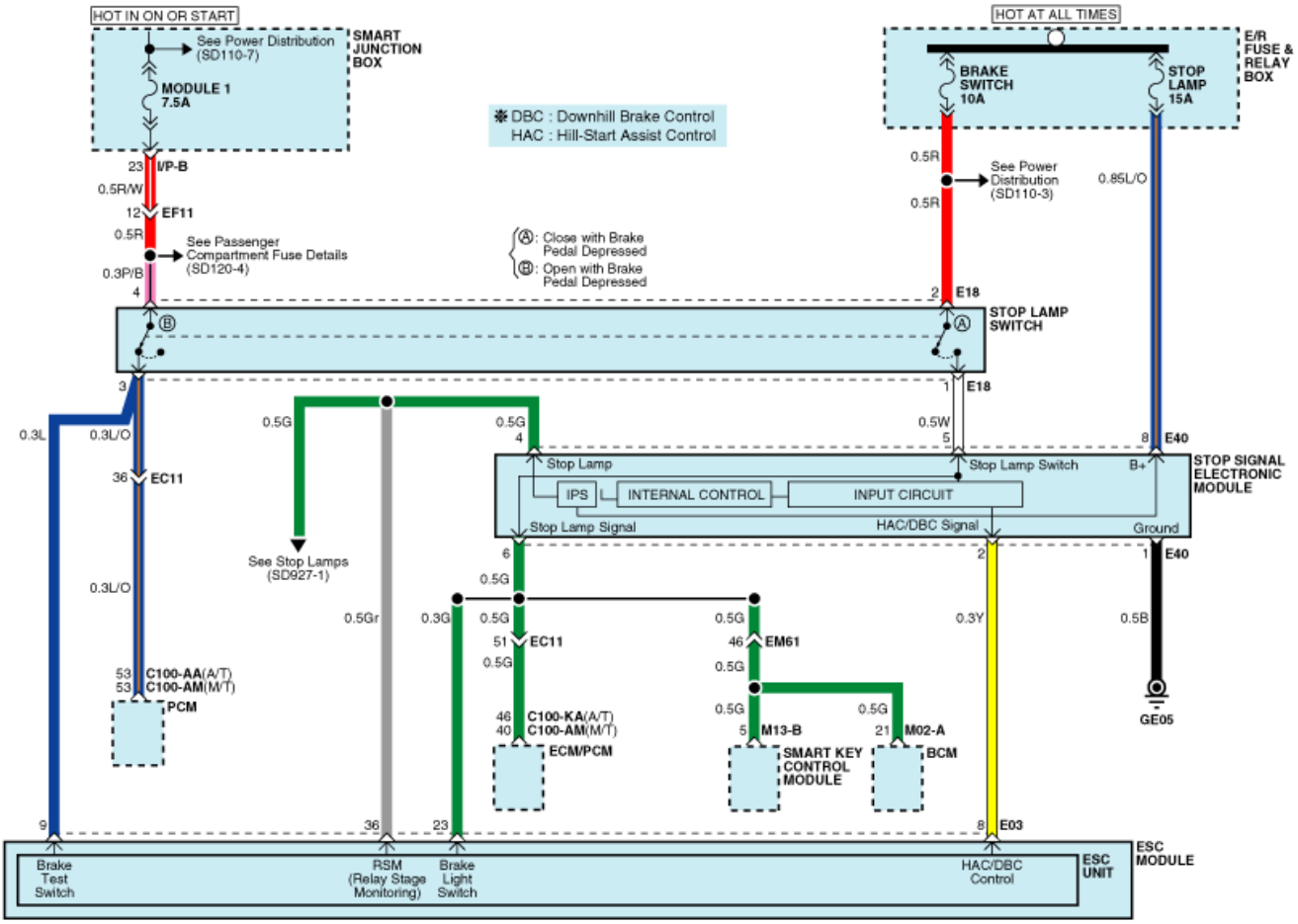
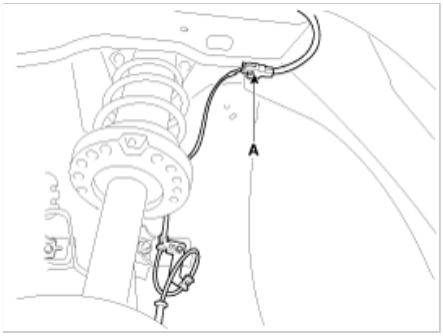


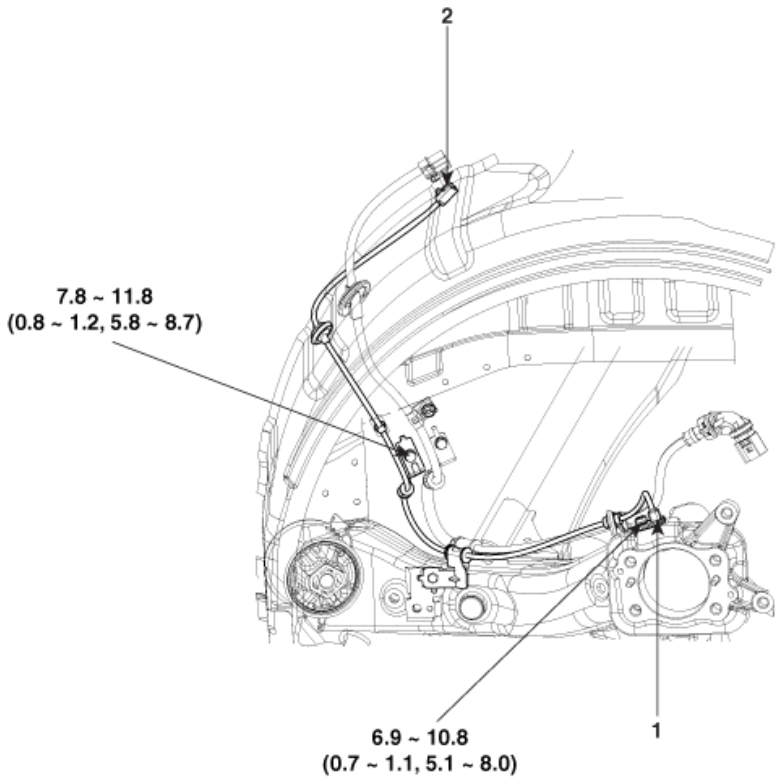
Circuit Diagram - ESC (4)



4. Install in the reverse order of removal.

Brake System

Components



Torque : N.m (kgf.m, lb-ft)

1. Rear wheel speed sensor
2. Rear wheel speed sensor connector

Brake System

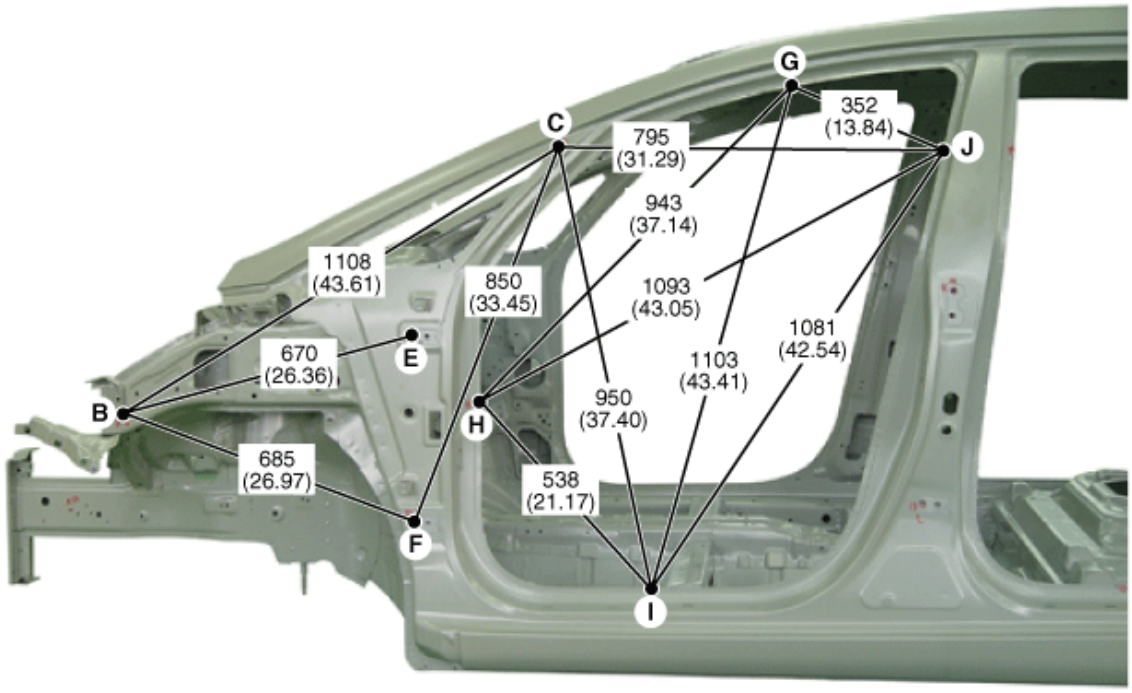
Removal

1. Remove the rear wheel and tire.

   Tightening torque:

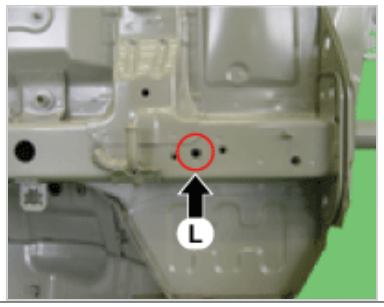
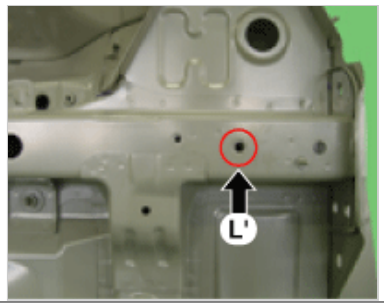
   88.3 ~ 107.9 N.m (9.0 ~ 11.0 kgf.m, 65.1 ~ 79.6 lb-ft)
2. Remove the rear wheel speed sensor mounting bolt (A).

   Tightening torque:

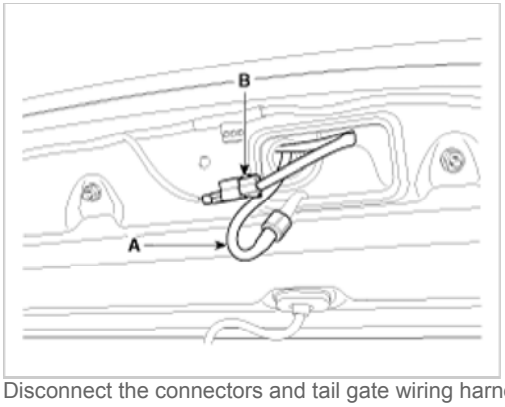


* These dimensions indicated in this figure are actual-measurement dimensions. [Unit : mm (inch)]

Side Body C

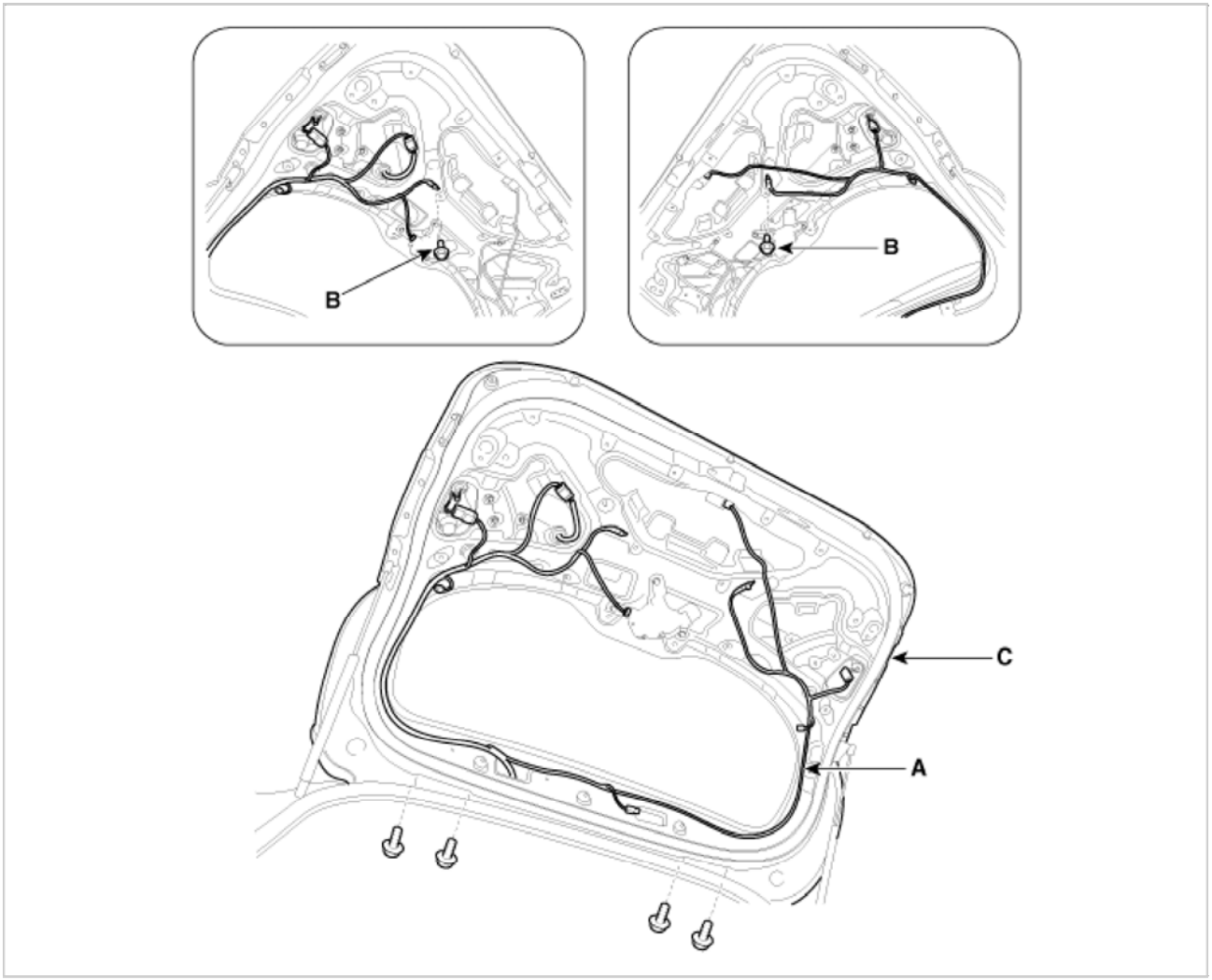
		
Rear floor side member tooling hole (Ø10)	Rear floor side member tooling hole (Ø14)	

Front Cross Member



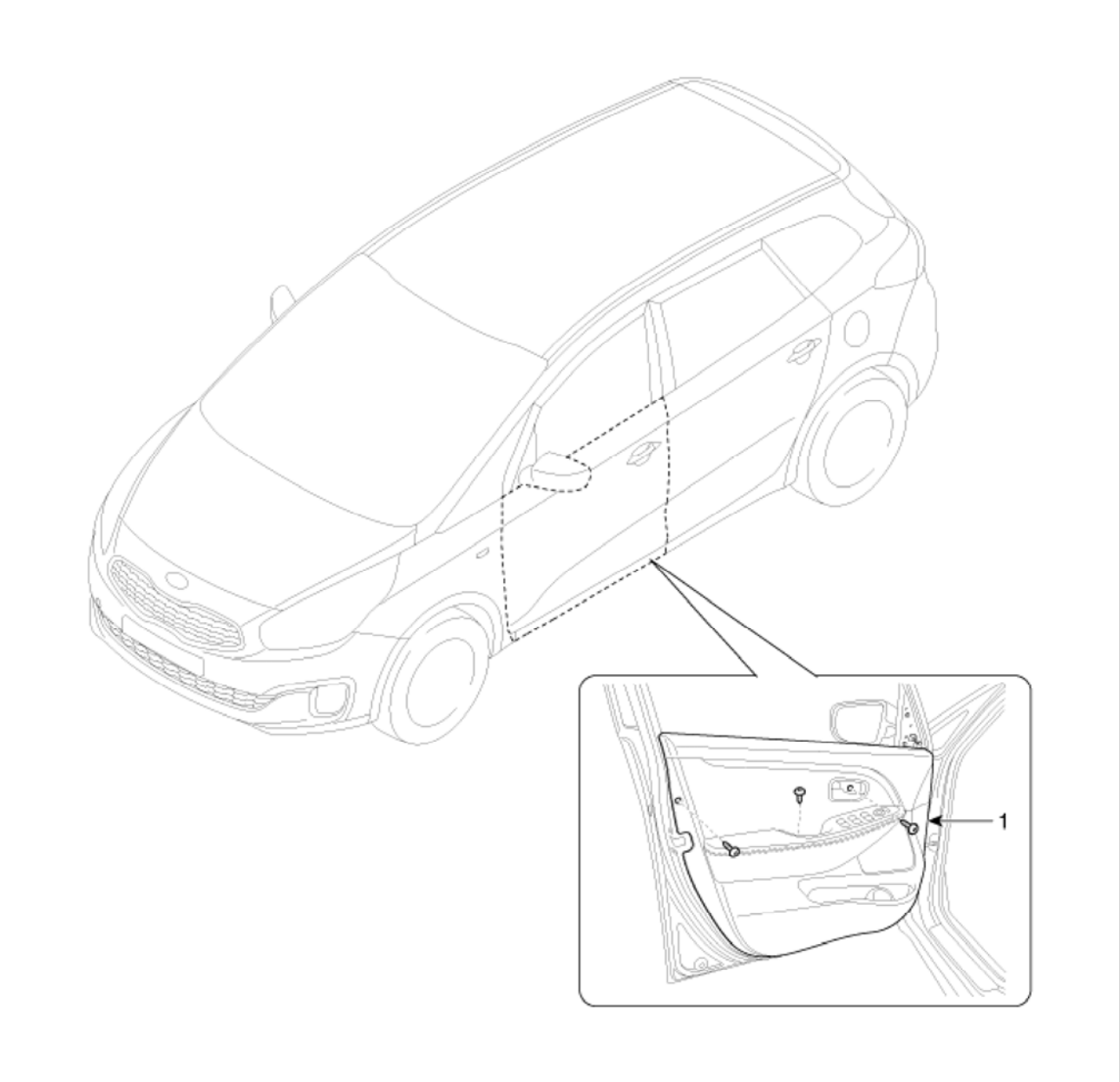
5. Disconnect the connectors and tail gate wiring harness (A).
6. Loosen the ground bolts (B).
7. After loosening the mounting bolts, then remove the tail gate assembly (C).

Tightening torque :
21.6~26.5 N.m (2.2~2.7 kgf.m, 15.9~19.5 lb-ft)



8. After loosening the mounting bolts, then remove the tail gate lifter (A).

Tightening torque :
6.9~10.8 N.m (0.7~1.1 kgf.m, 5.1~8.0 lb-ft)



1. Front door trim	

Body (Interior and Exterior)

Replacement

CAUTION

- Put on gloves to protect your hands.

NOTICE

- When prying with a flat-tip screwdriver, wrap it with protective tape, and apply protective tape around the related parts, to prevent damage.
- Be careful not to scratch the door trim and other parts.

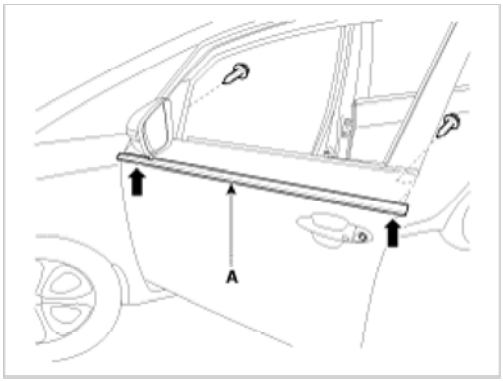
1. Using a screwdriver or remover, remove the front door quadrant inner cover (A).

Replace any damaged clips.

Body (Interior and Exterior)

Replacement

1. Pull down front door window glass by pressing the power window glass switch.
2. After loosening the mounting screws, then remove the front door belt outside weatherstrip (A).



3. Install in the reverse order of removal.

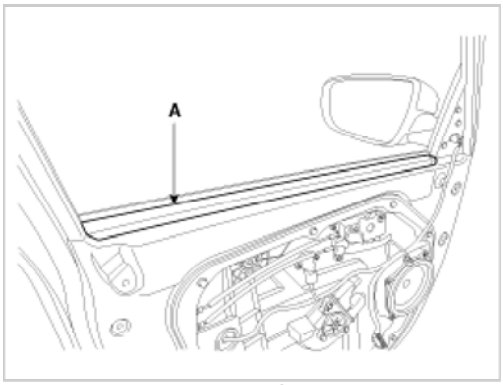
Information

- Replace any damaged clips.

Body (Interior and Exterior)

Replacement

1. Remove the front door trim.
   (Refer to Front Door - "Front Door Trim")
2. Remove the front door belt inside weatherstrip (A).



3. Install in the reverse order of removal.

Information

- Replace any damaged clips.

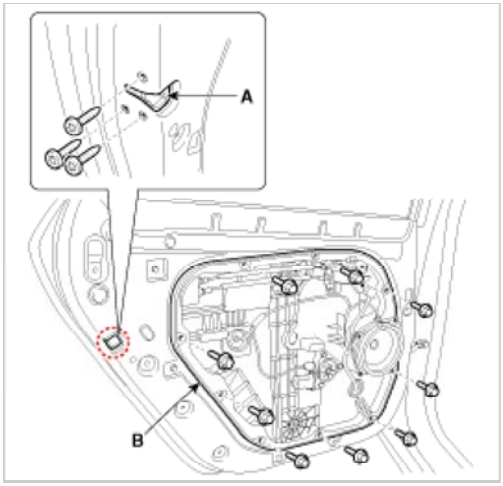
Body (Interior and Exterior)

Replacement

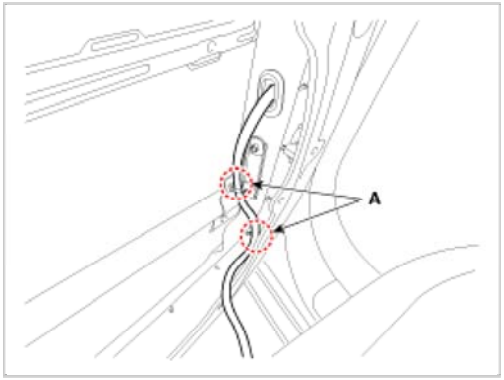
1. Loosen the front door checker (B) mounting bolt.

Tightening torque :
19.6 ~ 29.4 N.m (2.0 ~ 3.0 kgf.m,14.5 ~ 21.7 lb-ft)

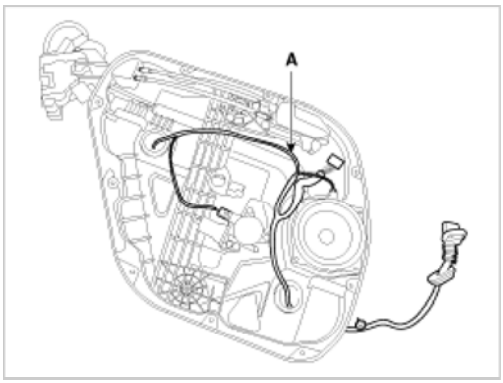
2. Detach the clips, then remove the front door side weatherstrip (A).



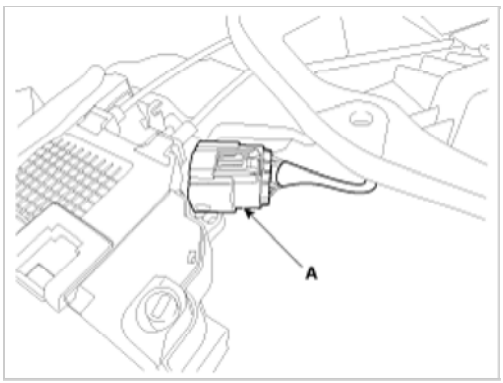
8. Remove the rear door main connector mounting clips (A).



9. Disconnect the connectors and rear door module wiring harness (A).



10. Disconnect the rear door latch connector (A).

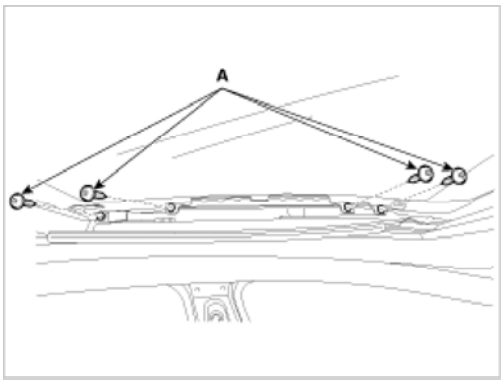


11. Remove the rear door latch assembly.
    (Refer to Rear Door - "Rear Door Latch")
12. Reomove the rear speaker .

4. Completely close the movable glass using the panorama sunroof switch.
5. Adjust the height of the glass by slighty loosening the screws (A).

NOTICE

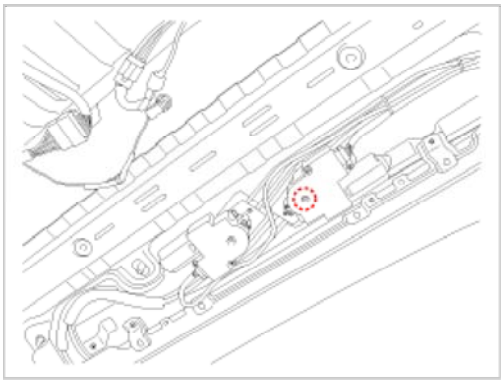
- Be careful not to damage the screw.



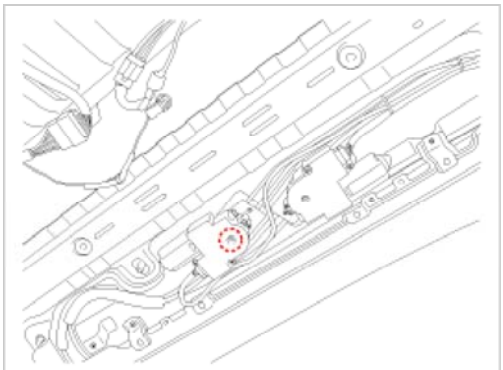
Emergency operation

1. Use the panorama sunroof emergency operation only when you have to open or close the sunroof when there is a problem with the engine.
2. Use a hexagon wrench to open or close the panorama sunroof after removing the roof trim. Do not apply too much force when opening or closing the panorama sunroof.

[Movable Glass Motor]



[Roller Blind Motor]

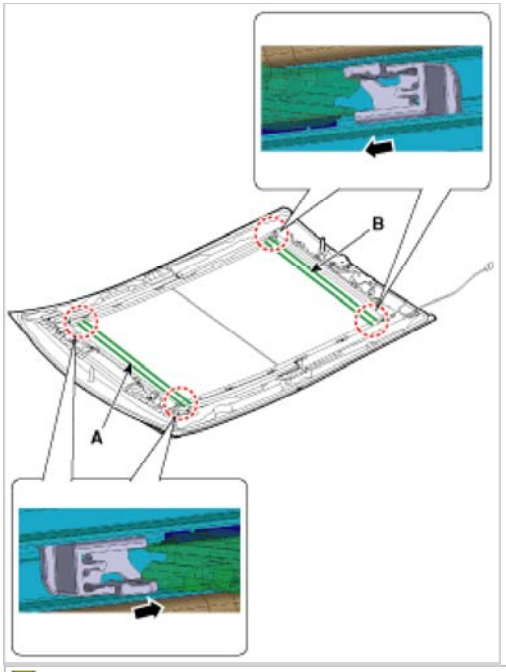


3. If needed reset the panorama sunroof according to the reset method.

Body (Interior and Exterior)

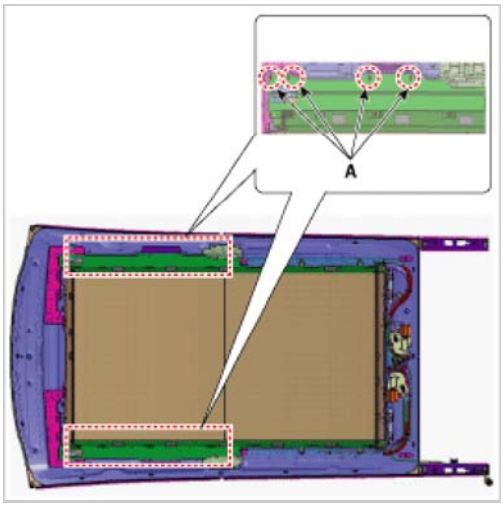
Replacement

1. Completely open the movable glass using the panorama sunroof switch.
2. Remove both sides of the decoration cover (A) by pulling it in the direction of the arrow.

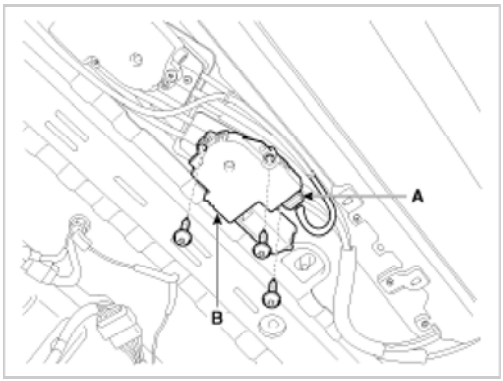


Information

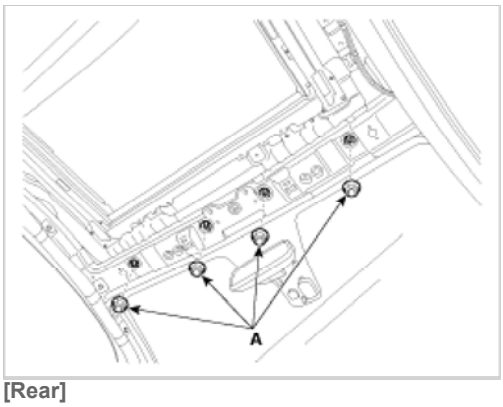
- When installing the front roller blind, slightly loosen the screws (A).



4. Tighten the mounting screws after installing the roller blind motor (B).
5. Install the roller blind motor connetor (A).



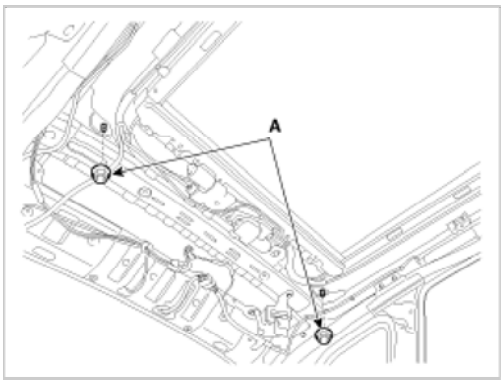
6. Install the roof trim.
7. Completely close the movable glass using the panorama sunroof switch.



[Rear]

Tightening torque :

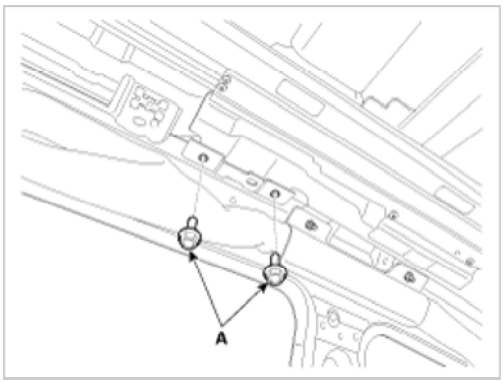
6.9 ~ 10.8 N.m (0.7 ~ 1.1 kgf.m, 5.1 ~ 8.0 lb-ft)



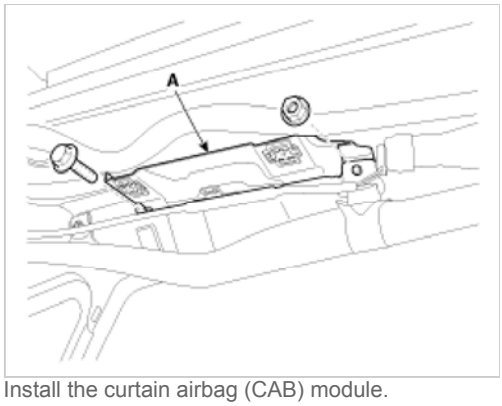
9. Tighten panorama sunroof side mounting bolts (A).

Tightening torque :

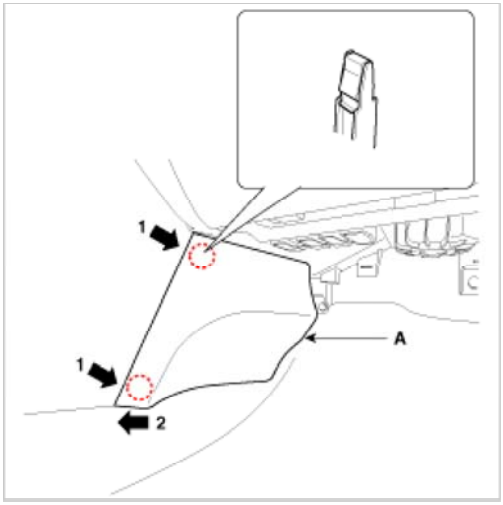
7.8 ~ 11.8 N.m (0.8 ~ 1.2 kgf.m, 5.8 ~ 8.7 lb-ft)



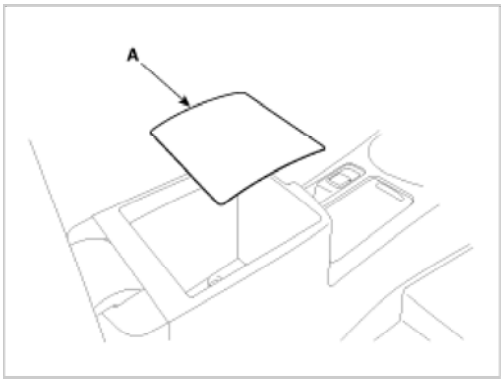
10. Tighten assist handle bracket (A) mounting bolt and nut.
    (Assist handle bracket: 1 on passenger seat, 2 on rear seat)



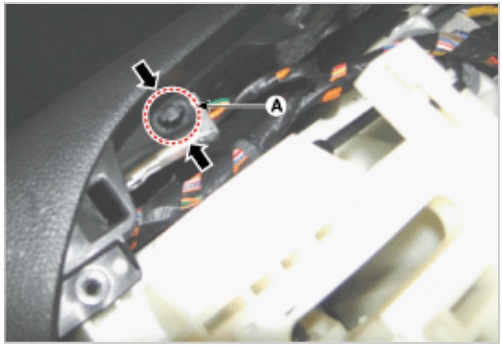
11. Install the curtain airbag (CAB) module.



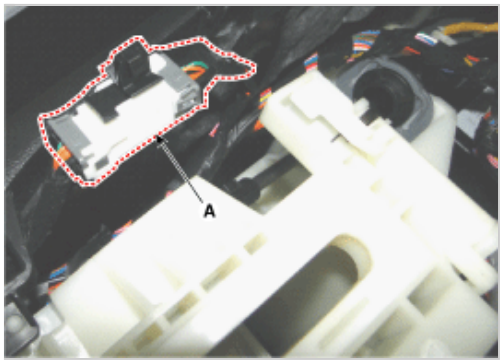
7. Remove the console armrest met (A).



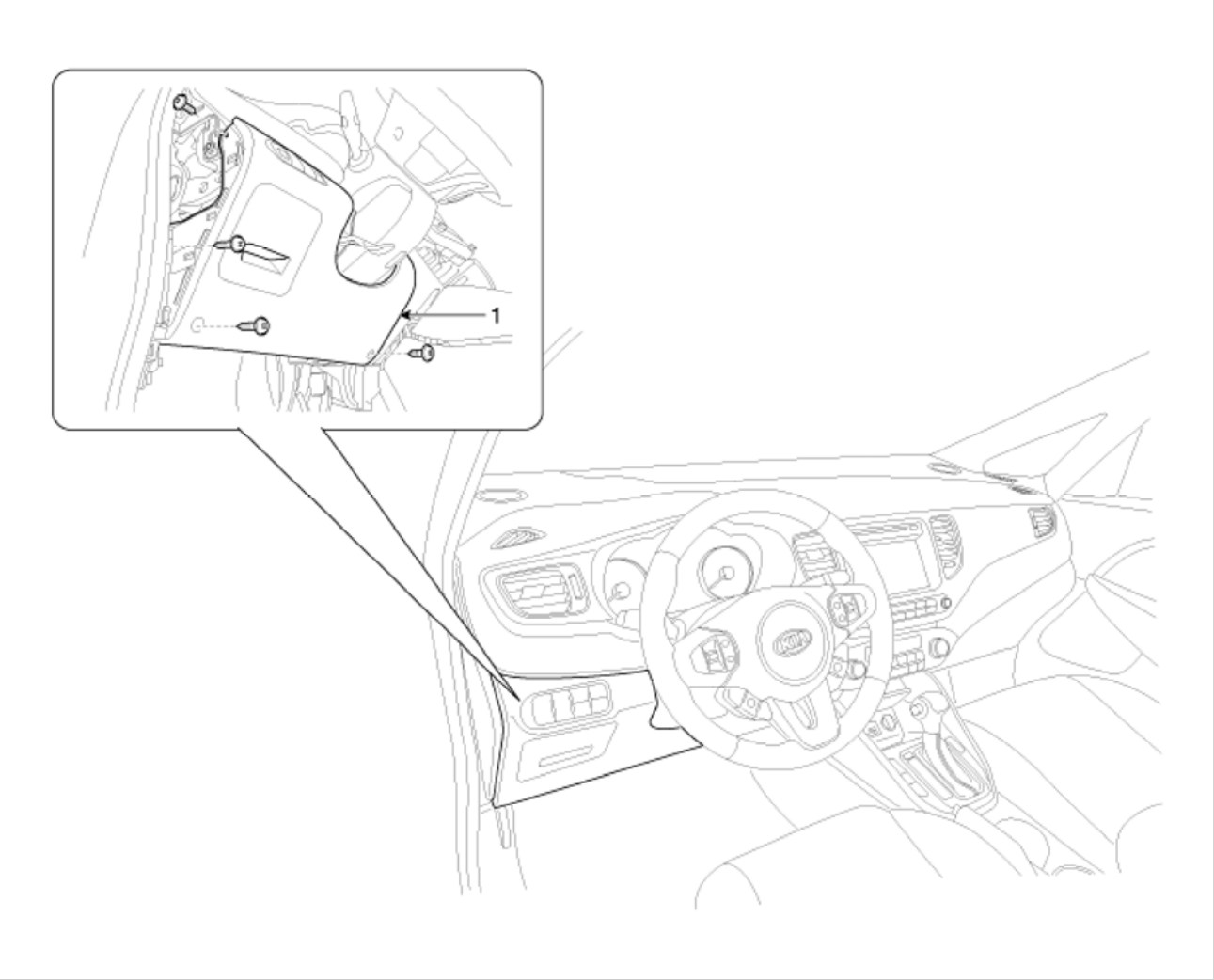
8. Disconnect the rear power outlet connector mounting clip (A).



9. Disconnect the rear power outlet connector (A).



10. After loosening the mounting screws and bolts, then remove the floor console assembly (A).



1. Crash pad lower panel	

Replacement

CAUTION

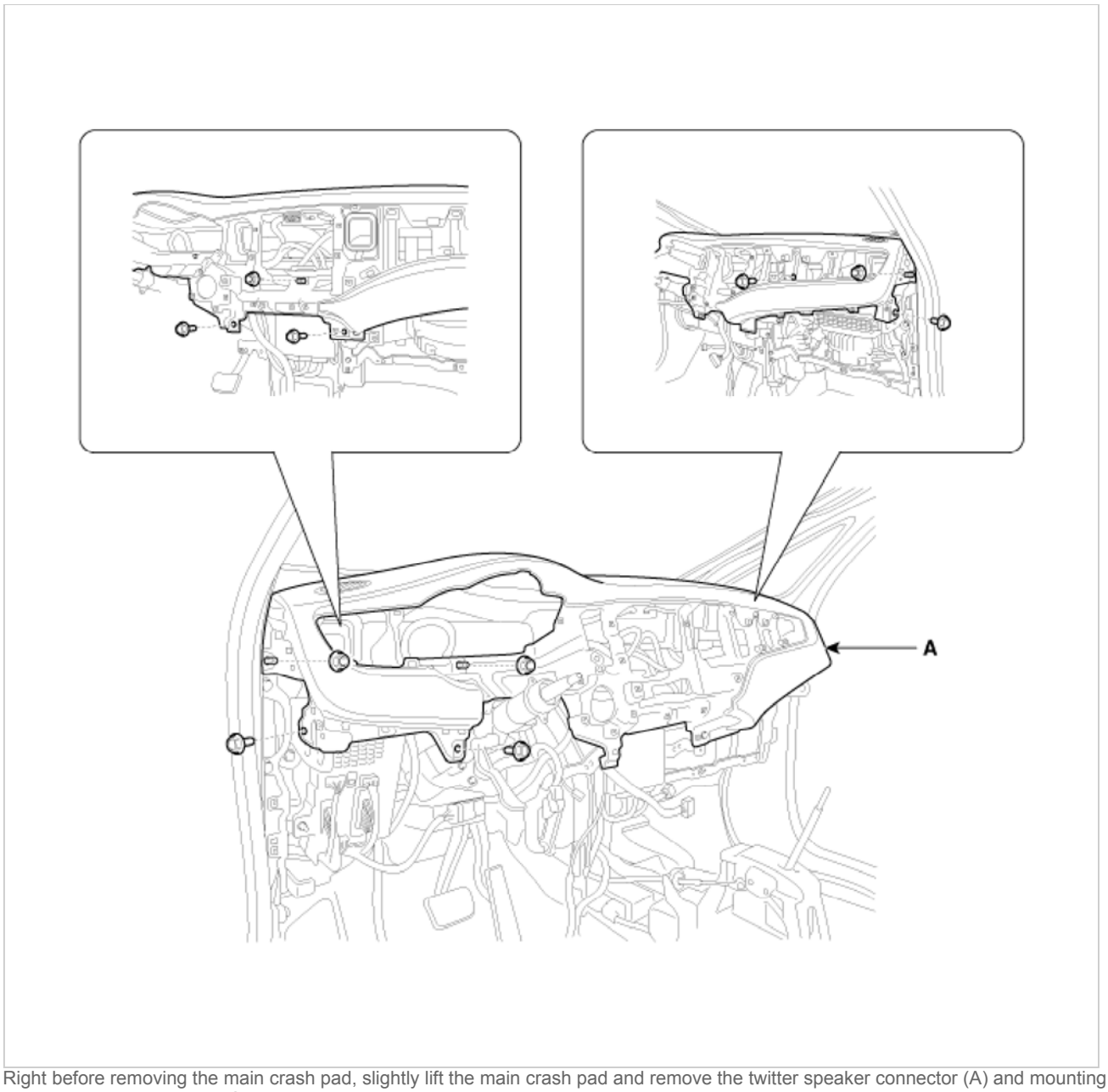
- Put on gloves to protect your hands.

Information

- When prying with a flat-tip screwdriver, wrap it with protective tape, and apply protective tape around the related parts, to prevent damage.
- Use a plastic panel removal tool to remove interior trim pieces to protect from marring the surface.
- Take care not to bend or scratch the trim and panels.

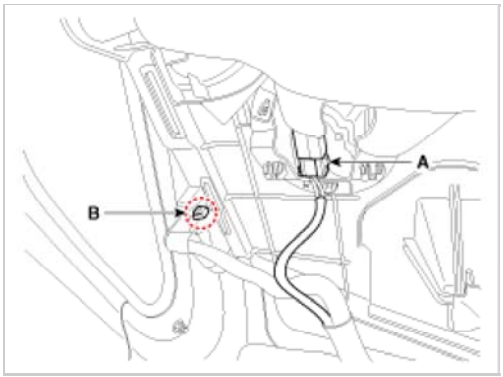
1. Using a screwdriver or remover, remove the crash pad side cover [LH] (A).

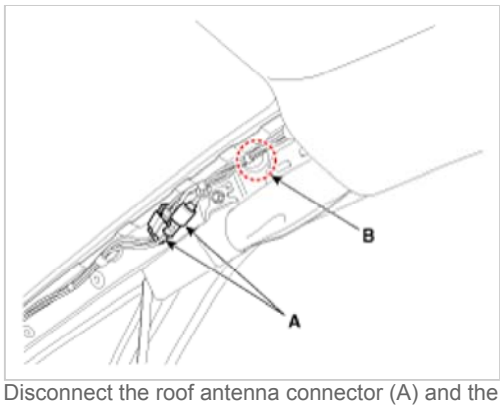
16. After loosening the mounting bolts and nuts, then remove the main crash pad assembly (A).



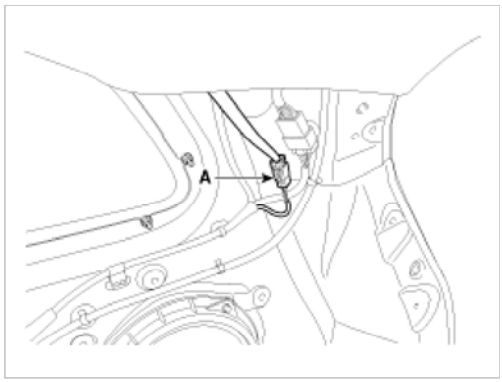
17. Right before removing the main crash pad, slightly lift the main crash pad and remove the twitter speaker connector (A) and mounting clip (B) located at the end of both side.

[LH]

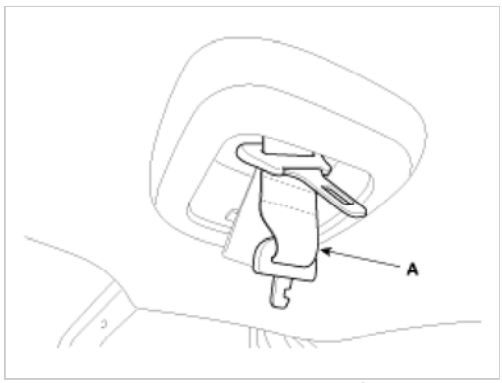




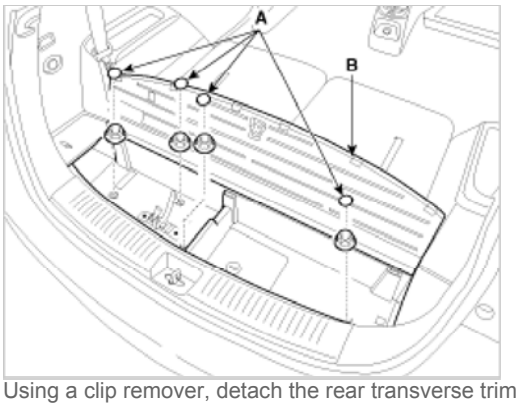
16. Disconnect the roof antenna connector (A) and the mounting clips in the rear pillar.
[RH]



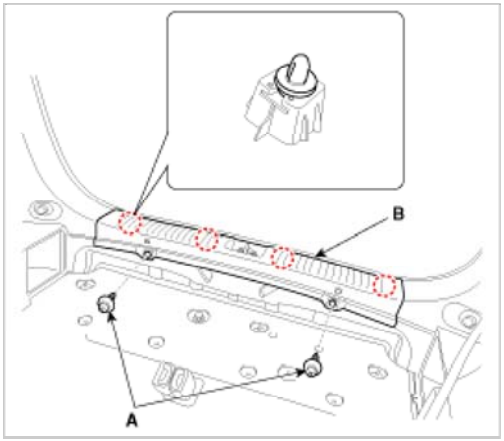
17. Push the lower anchor (A) of second center row seat belt into the second center row seat belt cover.



18. Using a clip remover, detach the roof trim assembly mounting clips (A).



3. Using a clip remover, detach the rear transverse trim mounting clips (A).
4. Using a screwdriver or remover, remove the rear transverse trim (B).

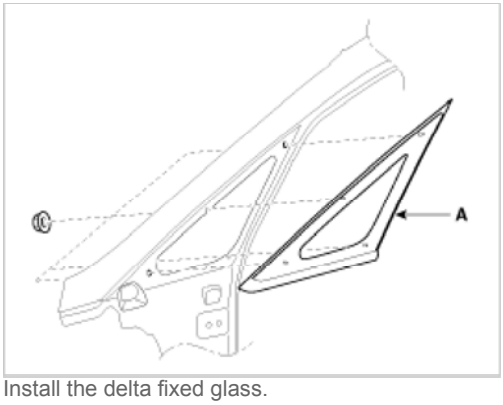


5. Install in the reverse order of removal.

Information

- Replace any damaged clips.

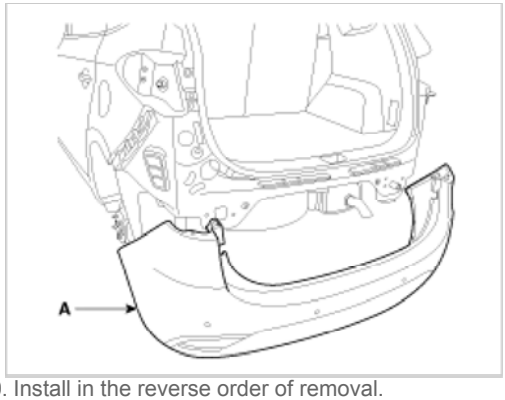
Component Location



6. Install the delta fixed glass.
7. Let the adhesive dry for at least one hour, then spray water over the delta fixed glass and check for leaks. Mark the leaking areas, let the delta fixed glass dry, then seal with sealant. Let the vehicle stand for at least four hours after delta fixed glass.
8. Reinstall all remaining removed parts.
9. Install the front pillar trim.

Body (Interior and Exterior)

Component Location



10. Install in the reverse order of removal.

Information

- Make sure the connector is plugged in properly.
- Replace any damaged clips.

Body (Interior and Exterior)

Component Location

Replacement

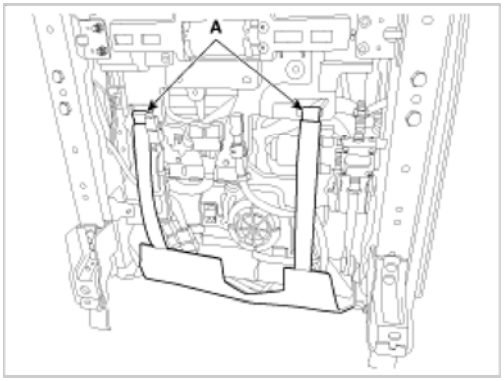
CAUTION

- Put on gloves to protect your hands.

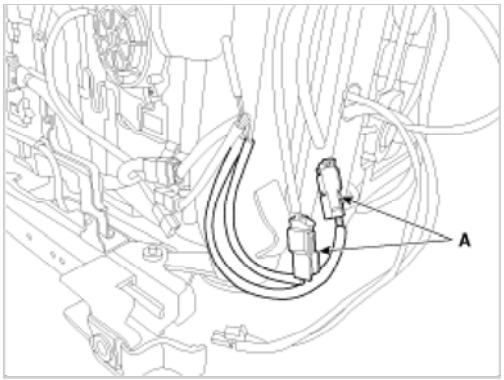
NOTICE

- When prying with a flat-tip screwdriver, wrap it with protective tape, and apply protective tape around the related parts, to prevent damage.
- Use a plastic panel removal tool to remove interior trim pieces to protect from marring the surface.
- Take care not to bend or scratch the trim and panels.

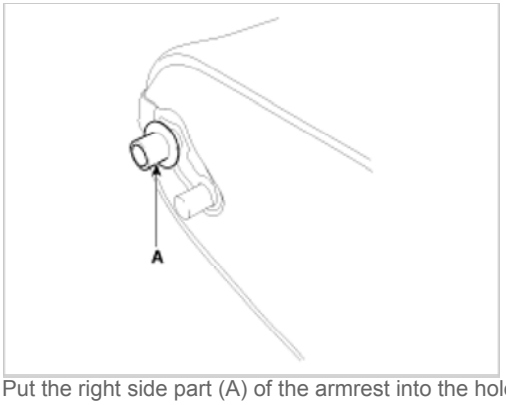
1. Remove the front seat shield inner cover.
   (Refer to Front Seat - "Front Seat Shield Inner Cover")
2. Remove the front seat shield outer cover.
   (Refer to Front Seat - "Front Seat Shield Outer Cover")
3. Remove the front seat lower protector (A).



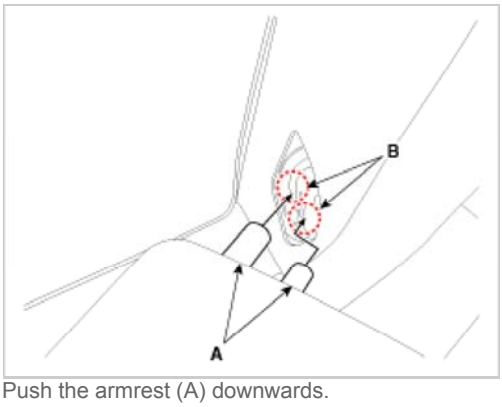
4. Disconnect the front seat heater connectors (A).



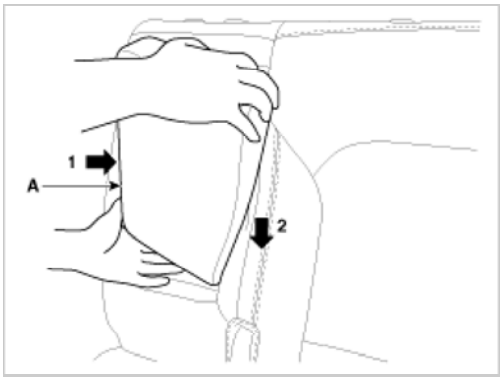
5. To remove the air ventilation seat cushion duct (A), widen the both sides of the clips (B) as the direction of the arrow and then pull down the air ventilation seat cushion duct.



(2) Put the right side part (A) of the armrest into the hole (B).

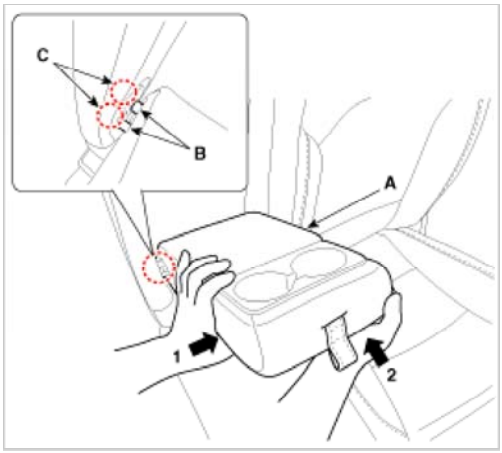


(3) Push the armrest (A) downwards.



(4) Push the armrest sidewards in the direction of the arrow, and then install it.

(5) Install the armrest (A) by putting in the left part (B) of the armrest into the hole (C).



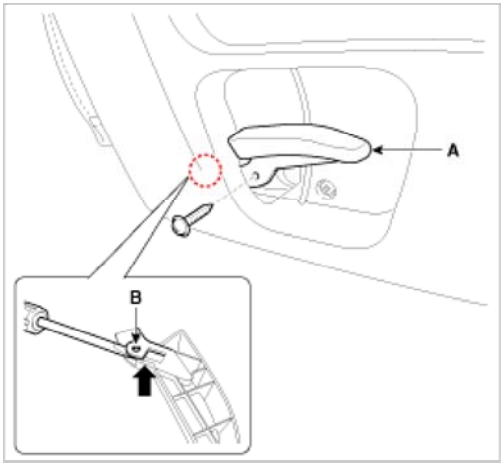
(6) Push in the lock hook (B) right side part of the rear armrest (A).

- Put on gloves to protect your hands.

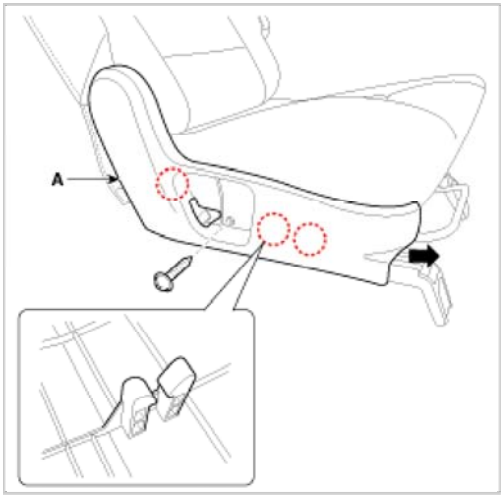
NOTICE

- When prying with a flat-tip screwdriver, wrap it with protective tape, and apply protective tape around the related parts, to prevent damage.
- Use a plastic panel removal tool to remove interior trim pieces to protect from marring the surface.
- Take care not to bend or scratch the trim and panels.

1. Remove the second row seat assembly [RH].
   (Refer to Rear Seat - "Rear Seat Assembly")
2. Loosen the rear seat recliner lever mounting screw.
3. To remove the rear seat recliner lever (A), and then remove the rear seat recliner lever after pushing the lock pin (B).

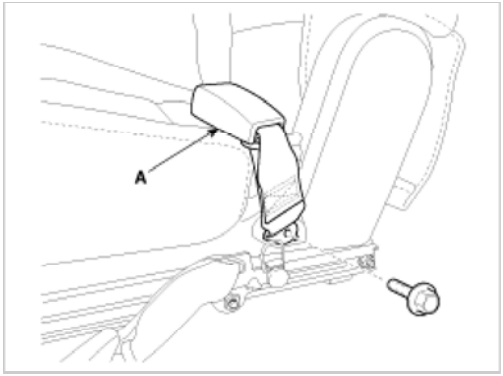


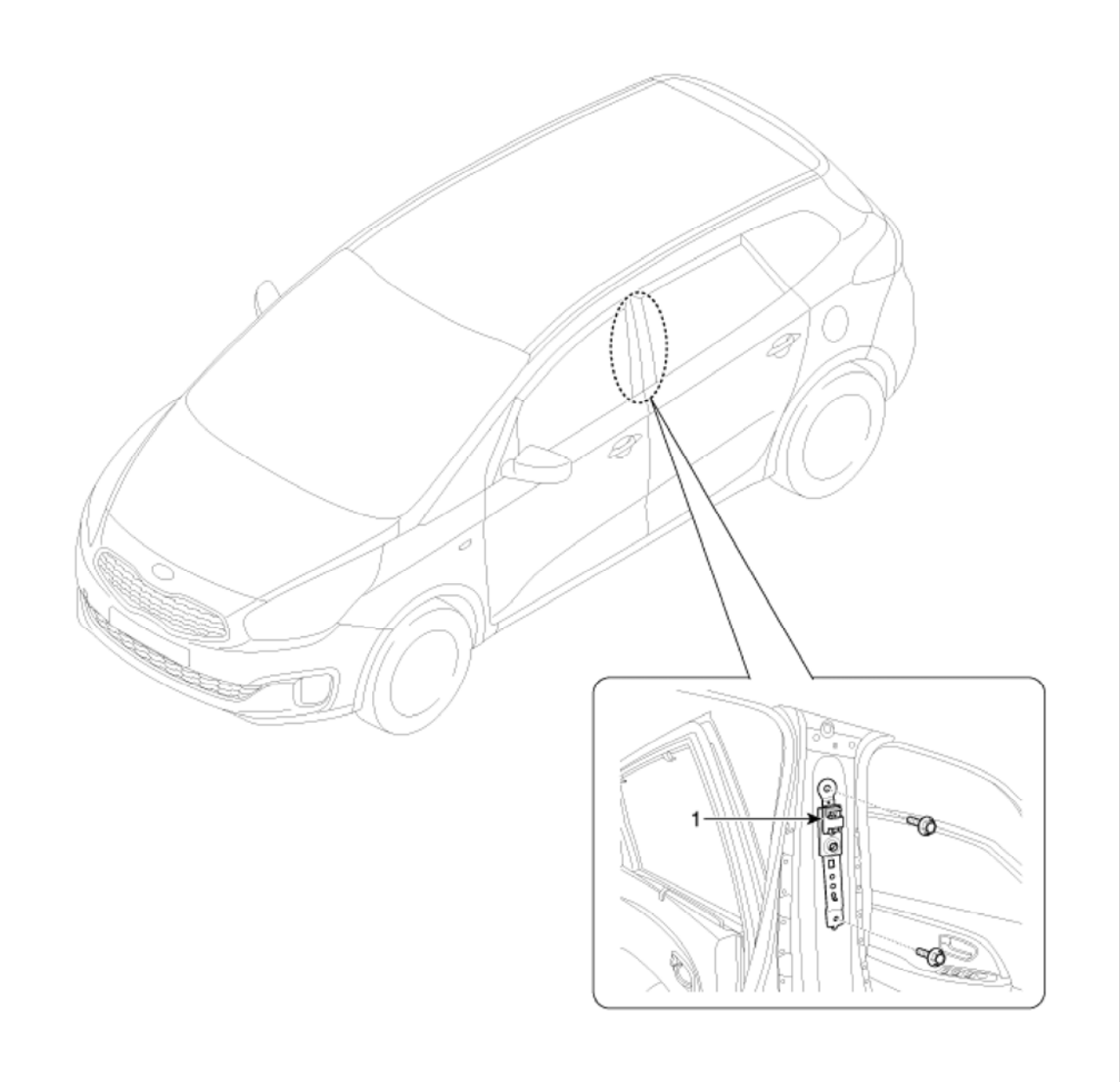
4. After loosening the mounting screw, then remove the rear seat shield outer cover (A).



5. After loosening the mounting bolt, then remove the second row seat belt buckle [RH] (A).

Tightening torque :
39.2 ~ 53.9 N.m (4.0 ~ 5.5 kgf.m, 28.8 ~ 39.8 lb-ft)





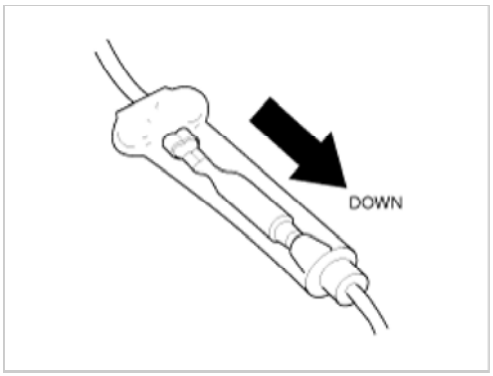
1. Height adjust	

Body (Interior and Exterior)

Replacement

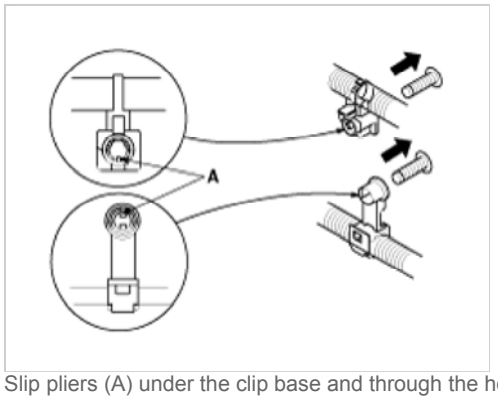
1. Remove the front seat belt upper anchor.
   (Refer to Front Seat Belt - "Front Seat Belt Pretensioner")
2. After loosening the mounting bolts, then remove the height adjust (A).

Tightening torque :
39.2 ~ 53.9 N.m (4.0 ~ 5.5kgf.m, 28.9 ~ 39.8 lb-ft)

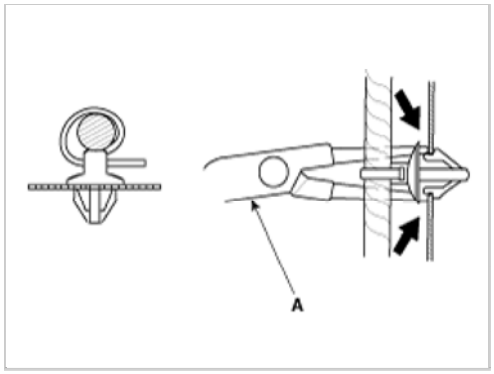


Handling Wires And Harnesses

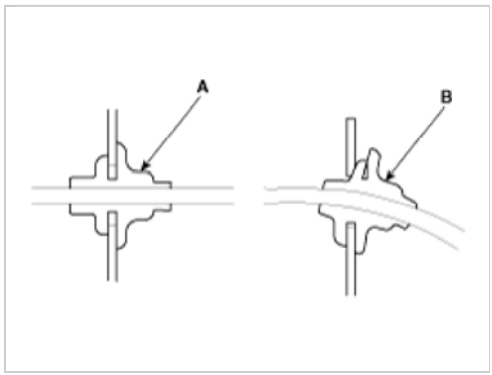
1. Secure wires and wire harnesses to the frame with their respective wire ties at the designated locations.
2. Remove clips carefully; don't damage their locks (A).

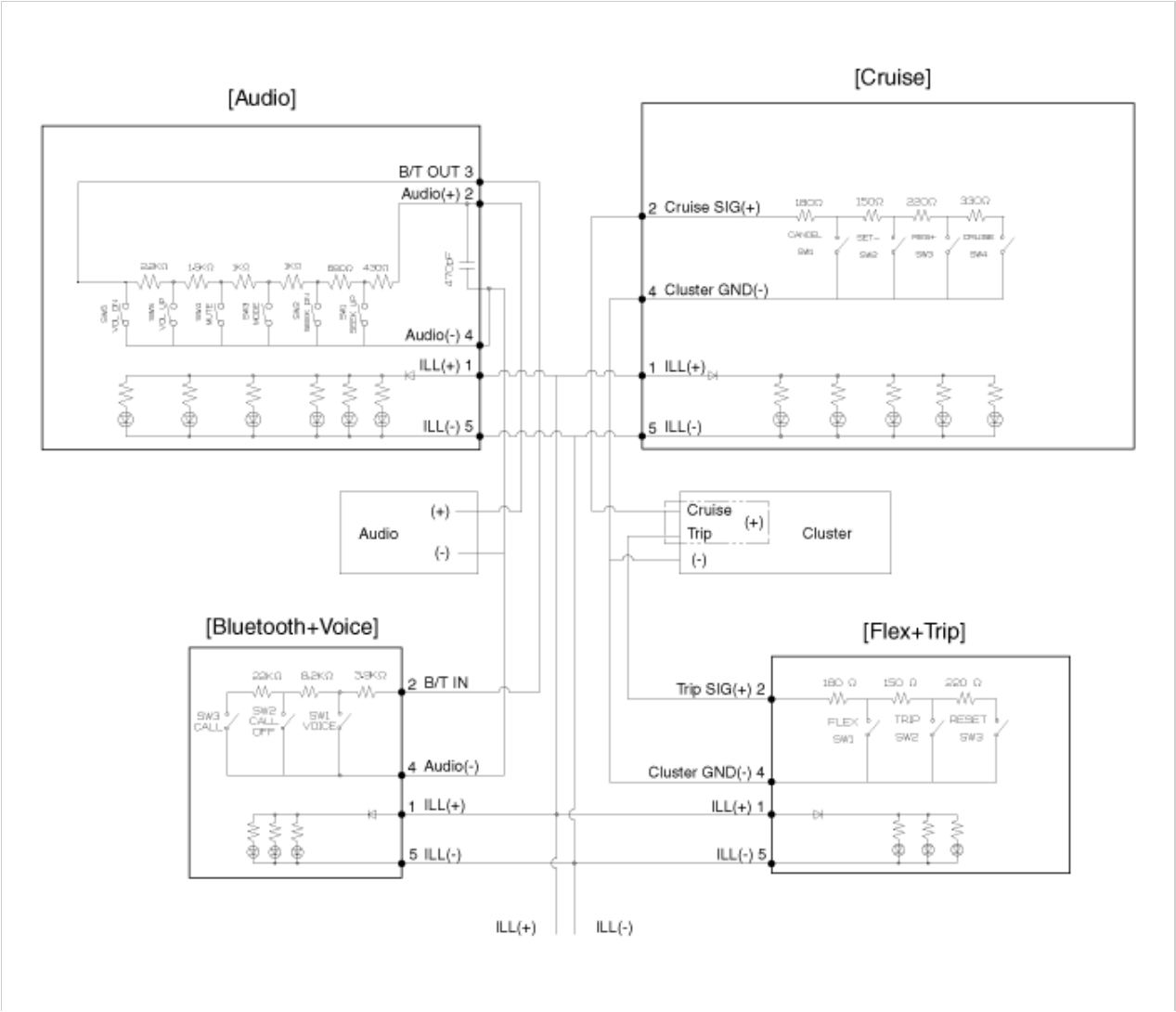


3. Slip pliers (A) under the clip base and through the hole at an angle, and then squeeze the expansion tabs to release the clip.

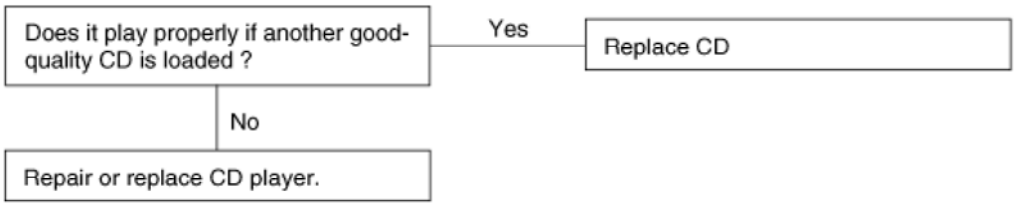


4. After installing harness clips, make sure the harness doesn't interfere with any moving parts.
5. Keep wire harnesses away from exhaust pipes and other hot parts, from sharp edges of brackets and holes, and from exposed screws and bolts.
6. Seat grommets in their grooves properly (A). Do not leave grommets distorted (B).

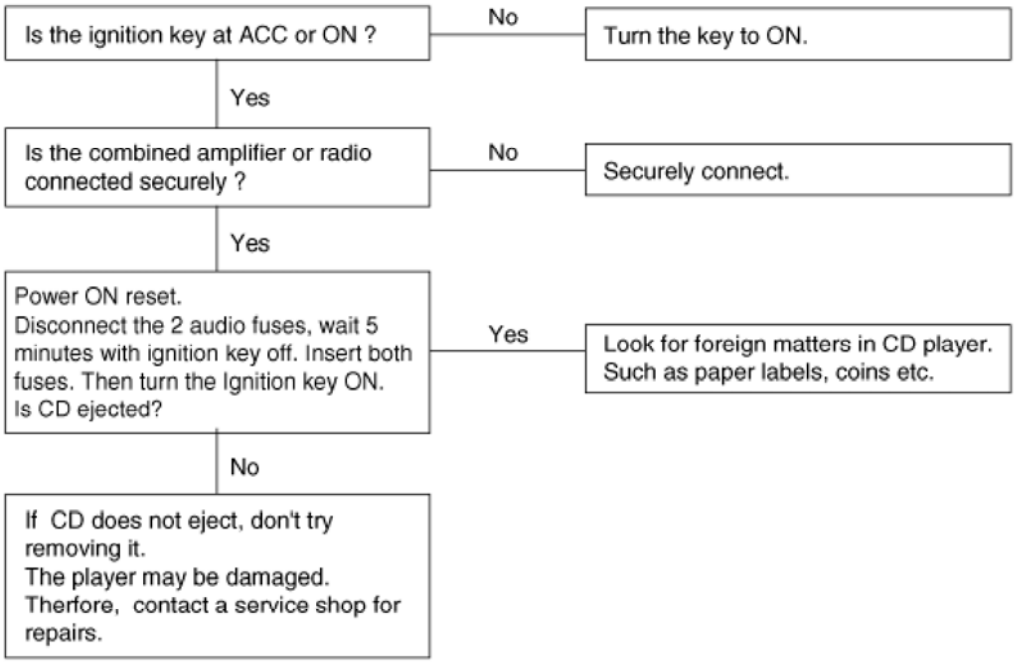



[Audio]
[Cruise]
B/T OUT 3
Audio(+) 2
Audio(-) 4
ILL(+) 1
ILL(-) 5
2 Cruise SIG(+)
4 Cluster GND(-)
1 ILL(+)
5 ILL(-)
Audio
(+)
(-)
Cruise
Trip
(+)
(-)
Cluster
[Bluetooth+Voice]
2 B/T IN
4 Audio(-)
1 ILL(+)
5 ILL(-)
[Flex+Trip]
Trip SIG(+) 2
Cluster GND(-) 4
ILL(+) 1
ILL(-) 5
ILL(+)
ILL(-)

4. SOUND QUALITY IS POOR



5. CD WILL NOT EJECT



6. NO SOUND FROM ONE SPEAKER

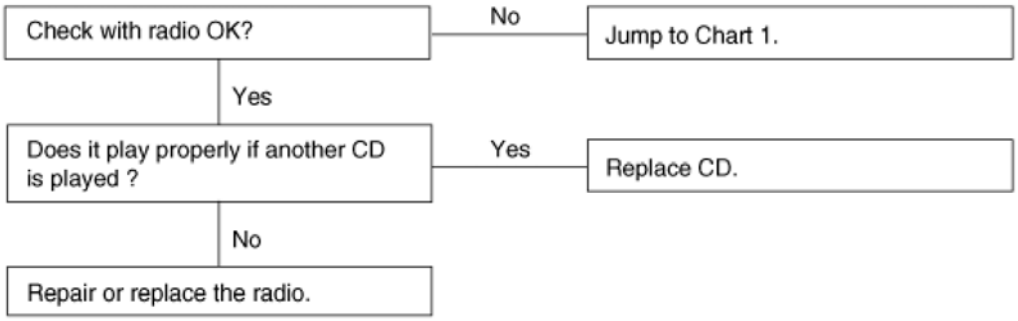
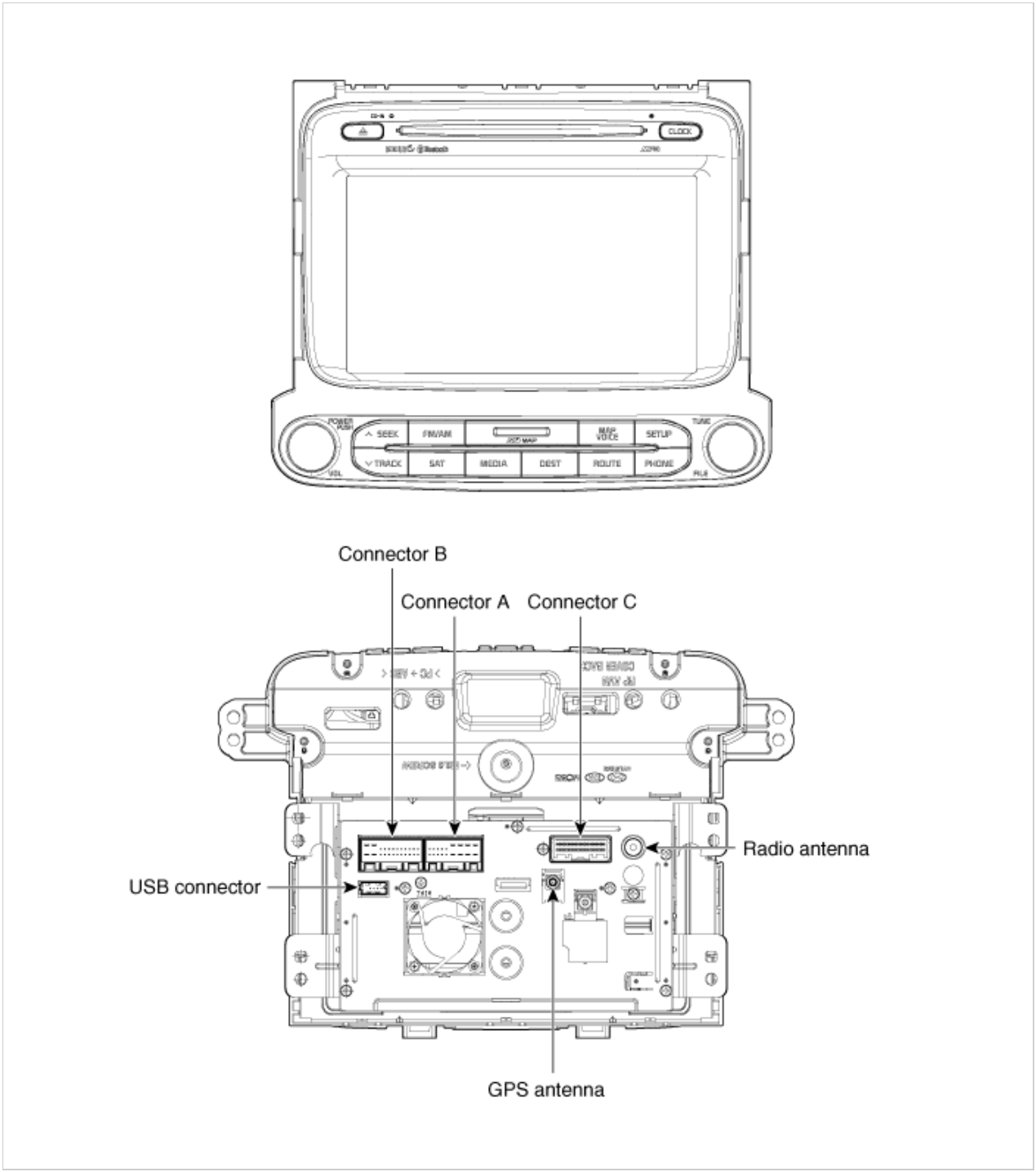


Chart 5



AVN (A/V & Navigation) Head Unit Connector

Items	Specification
Rated voltage	DC 12V
Operating voltage	DC 9 ~ 16V
Operating temperature	-22°F ~ 167°F (-30°C ~ 75°C)
Load	Max. 2.9mA (When welcome light function off) (When welcome light function on, increase 2mA-60 days average)

RF Receiver

Items	Specification
Frequency	433 Mhz
Antenna type	FSK (Frequency Shift Keying)

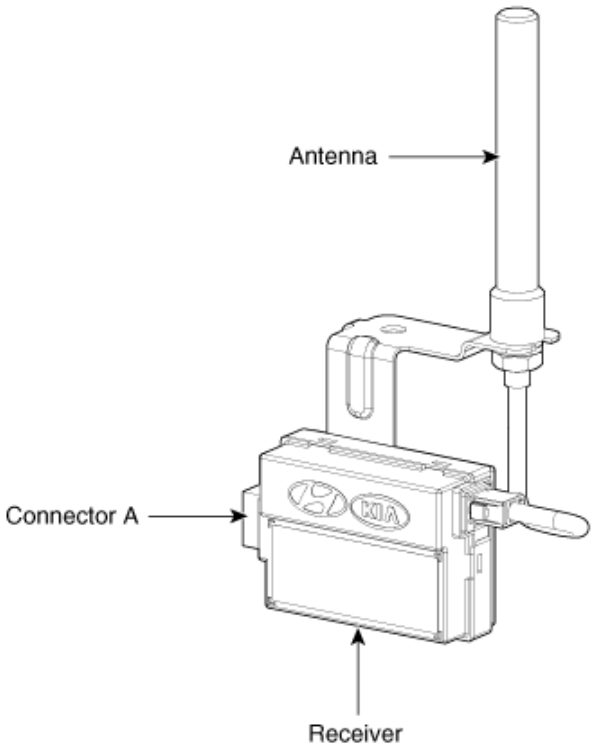
Smart Key Fob

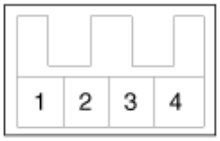
Items	Specification
Battery	Lithium battery 3V 1EA (CR2032)
Distance	30m from vehicle, RF : 30m, Passive(LF) : 0.7m
Battery life	More than 2 years (10 times / a day) **⚠ WARNING** An inappropriately disposed battery can be harmful to the environment and human health. Dispose the battery according to your local law(s) or regulation.
Push buttons	4 (Door lock / unlock, Tailgat, Panic)
Frequency(Rx)	125 kHz
Frequency(Tx)	433 MHz
Numbers	2EA

Antenna

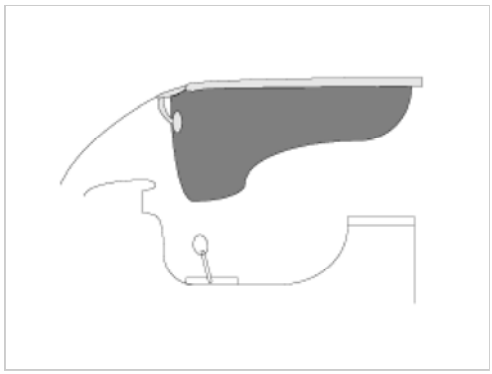
Items	Specification
Rated voltage	DC 12V
Operating voltage	DC 9 ~ 16V
Operating temperature	-22°F ~ 167°F (-30°C ~ 75°C)
Frequency	125kHz
Numbers	Interior(3EA), Door(2EA), Bumper(1EA)

Component Location (1)

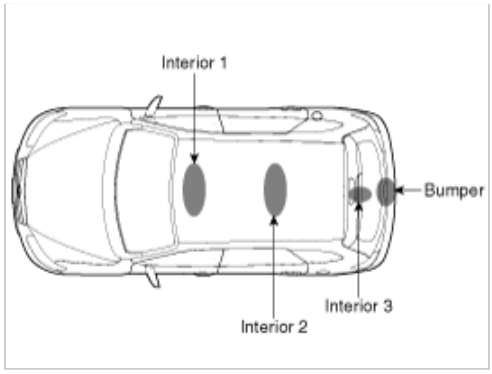


Connector A	
	
No.	**Description**
1	Data
2	-
3	Power
4	Ground

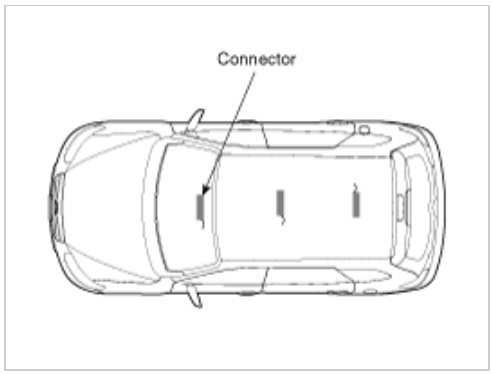
Circuit Diagram



2. If the ignition is ON, the antenna runs normal.
3. Check the interior antenna ignition mode.
4. Set the smart key in the following shade area and actuate the antenna. Check the LED of smart key is blinking.



5. If the LED of smart key is not blinking, check the antenna in shade area.

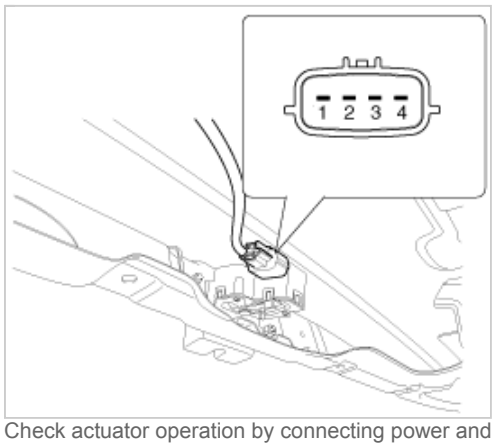


FOB Status Check

1. Connect the cable of GDS to the data link connector in driver side crash pad lower panel.
2. After IGN ON, select the "FOB KEY STATUS INFO".

Tailgate Lock Module Inspection

1. Remove the tailgate trim.
   (Refer to Body - "Tailgate Trim")
2. Disconnect the 4P connector from the actuator.

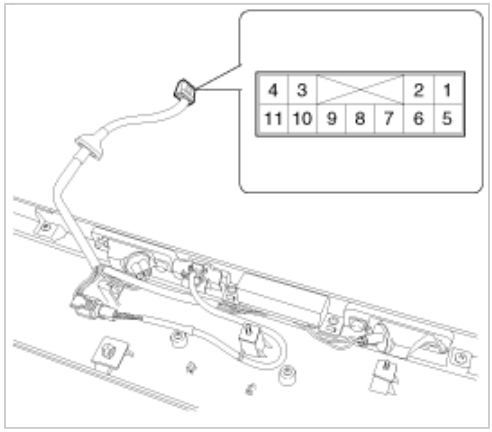


3. Check actuator operation by connecting power and ground according to the table. To prevent damage to the actuator, apply battery voltage only momentarily.

Terminal / Position	3	4
Unlock	⊕	⊖
Lock		

Tailgate Open Switch

1. Remove the tailgate trim.
   (Refer to Body - "Tailgate Trim")
2. Disconnect the connector from the actuator.

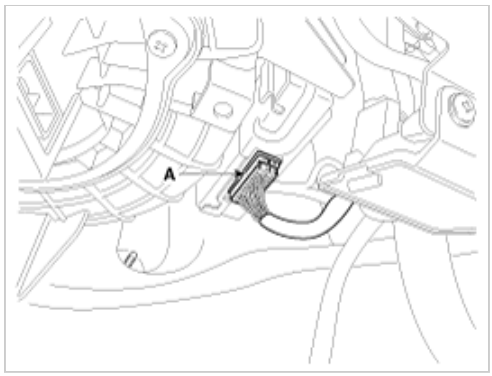


3. Check for continuity between the terminals in each switch position according to the table.

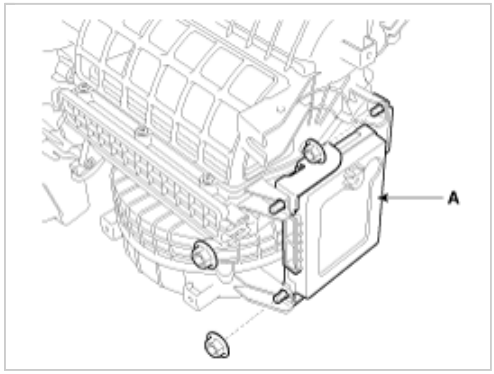
Terminal / Position	7	9
Unlock		
Lock	○———	———○

Hood Switch

1. Disconnect the connector (A) and bolts from the hood switch.



4. Remove the body control module (A) after loosening the mounting nuts.

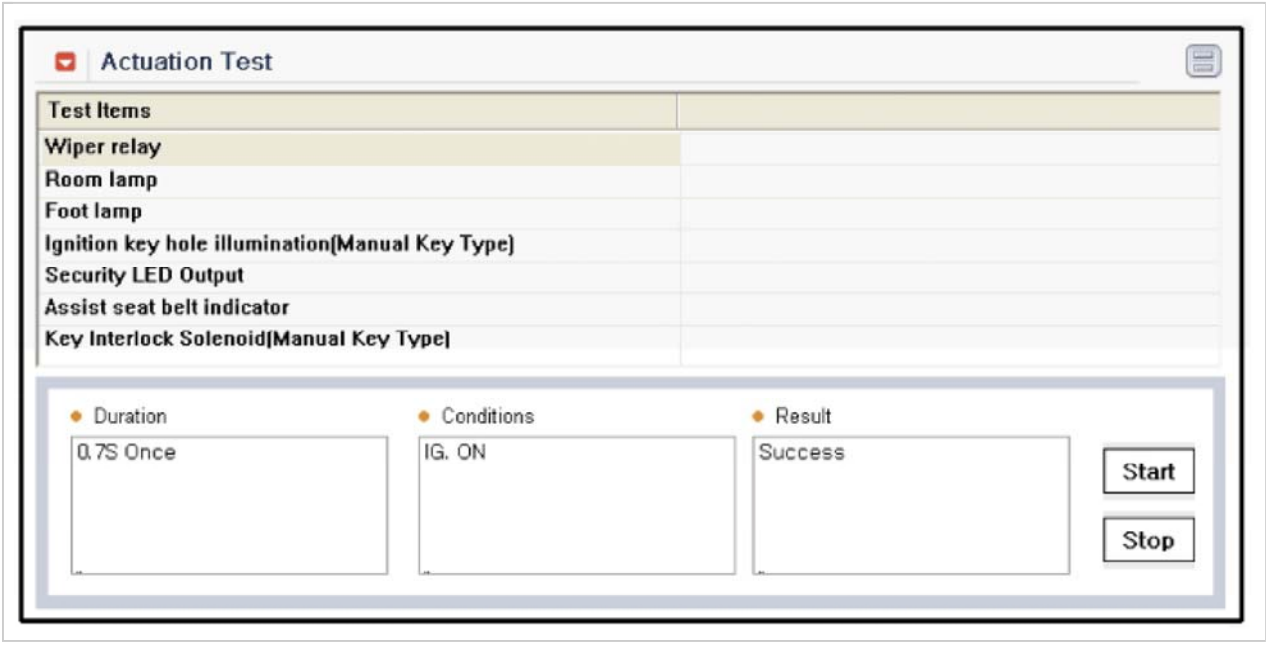


Installation

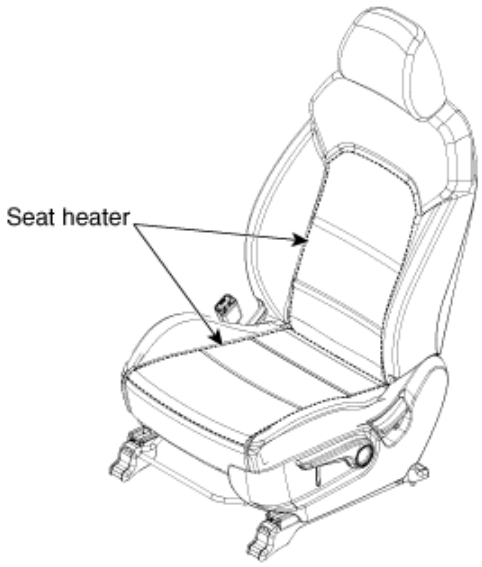
1. Install the body control module.
2. Connect the body control module.
3. Install the glove box housing.

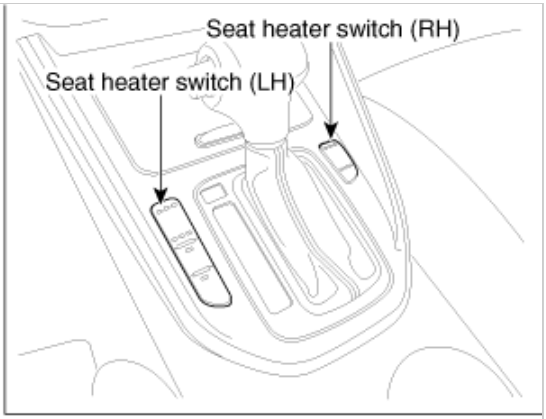
BCM Diagnosis With GDS

1. The body control module can diagnose by using the GDS more quickly.
   The BCM communicates with the GDS and then reads the input/output value and drives the actuator.
2. To diagnose the BCM function, select the menu of model and body control module.
3. Select "Input/output monitoring", if you will check current data of body network system. It provides input/output status of each module.
   A. BCM service data, CLU service data, SJB service data
4. If you will check each module data operation forcefully, select "Actuation test".

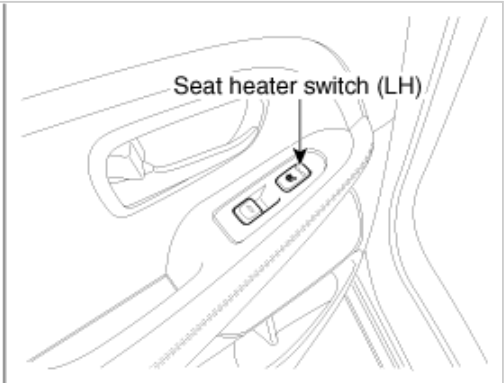


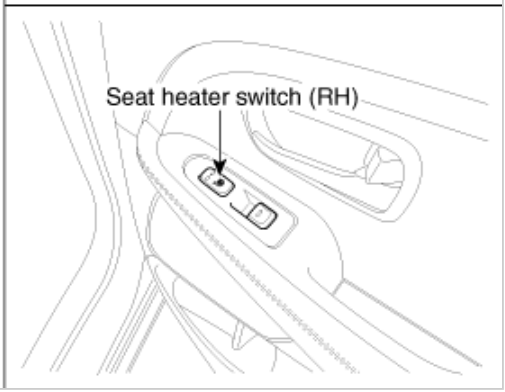
[First Row Seat]





[Second Row Seat]



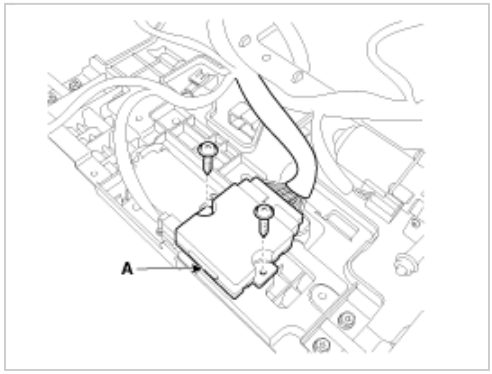


Body Electrical System

Circuit Diagram

[First Row Seat]

(Refer to Body - "Front Seat Assembly")
2. Remove the air ventilation unit (A) after loosening the screws and disconnecting the connector.



Installation

Cushion Blower

1. Install the cushion blower.
2. Install the front seat assembly.

Back Blower

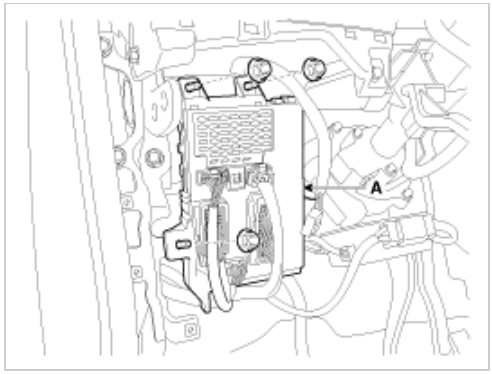
1. Install the back blower.
2. Install the front seat back cover.
3. Install the front seat assembly.

Air Ventilation Unit

1. Install the air ventilation unit.
2. Install the front seat assembly.

Component Location

1. Disconnect the negative(-) battery terminal.
2. Remove the crash pad lower panel.
   (Refer to Body - "Crash Pad Lower Panel")
3. Disconnect the connectors from the fuse side of the smart junction box.
4. Remove the smart junction box (A) after loosening the mounting nuts.



5. Disconnect the connectors from the back side of the smart junction box.

Installation

1. Install the smart junction box.
2. Install the crash pad lower panel.
3. Check that all system operates normally.

Body Electrical System

Component

					IGN ON & rheostat up to max position
A21	Battery	Input	Hardwire	9 ~ 16	Always
A22	ILL+	Input	Hardwire	9 ~ 16	Tail lamp switch ON
A23	Airbag	Input	CAN	-	
A24	-				
A25	Signal GND	Input	Hardwire	~1	Always
A26	Speed input (-) (M/T)	Input	Hardwire		IGN Switch ON
A27	C CAN high	Input	CAN	-	
A28	C CAN low	Input	CAN	-	
A29	MM CAN high	Input	CAN	-	
A30	MM CAN low	Input	CAN	-	
A31	Fuel GND	Input	Hardwire	~ 1	Always
A32	Fuel	Input	Hardwire	~ 1.3 7.68 ~	Gauge is FULL Gauge is EMPTY
A33	Trip switch 1	Input	Hardwire	Trip switch input power	IGN switch ON & control the trip switch
A34	Trip switch 2	Input	Hardwire	Trip switch input power	IGN switch ON & control the trip switch
A35	-				
A36	N output	Output	Hardwire	6 ~ 15	IGN ON & shift the lever in N
A37	R output	Output	Hardwire	6 ~ 15	IGN ON & shift the lever in R
A38	P output	Output	Hardwire	6 ~ 15	IGN ON & shift the lever in P
A39	ALT L output (ISG only)	Input	Hardwire	~ 2.7	IGN switch ON, warning lamp ON
A40	Illumination GND	Input	Hardwire	~ 1	Always

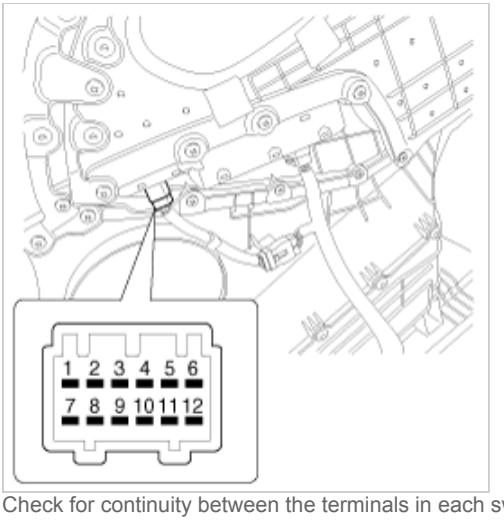
4. Communication information with another units.

Transmission	Reception	Communication	Remarks
Cluster	BCM	C-CAN	Fuel supply signal Instantaneous fuel consumption LFW lamp ON signal Vehicle setting Illumination setting
Cluster	EMS	C-CAN	Active ECO mode
Cluster	MDPS	C-CAN	Flex steering switch
Cluster	ACU	C-CAN	Air bag
ACU	Cluster	CAN	Air bag warning control
BCM	Cluster	CAN	Hood warning
DATC	Cluster	CAN	Outside temperature
EHPS	Cluster	CAN	Warning message control
EMS	Cluster	CAN	Tachometer control Temperature gauge control Engine warning simbol, CRUISE, SET warning control, GSI (Gear Shift Indicator)
ESC	Cluster	CAN	Warning control
BCM	Cluster	CAN	Vehicle setting control Warning and buzzer indicate, PAS control
LDWS	Cluster	CAN	LDWS warning lamp, message indicate
SMK	Cluster	CAN	Smart key indicate
TCS	Cluster	CAN	ESC OFF switch information SCC control the brake lamp and indicate
TCU	Cluster	CAN	Shift lever information (AT)
TPMS	Cluster	CAN	TPMS information

5. The other information about the cluster

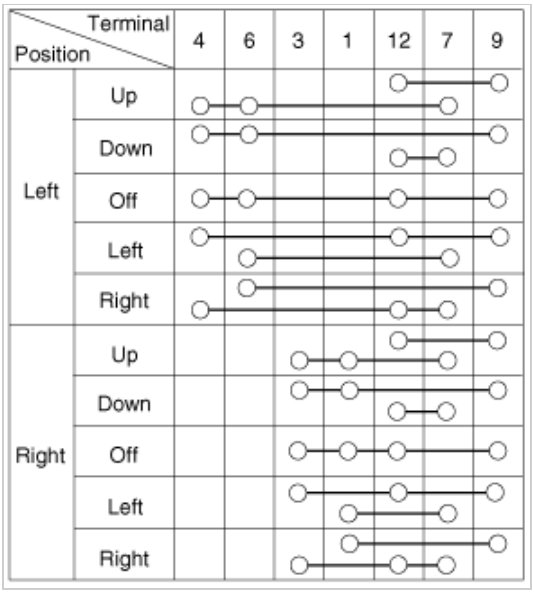
(1) USM (User Setting Mode)

A. USM is set using the steering wheel remote control button.

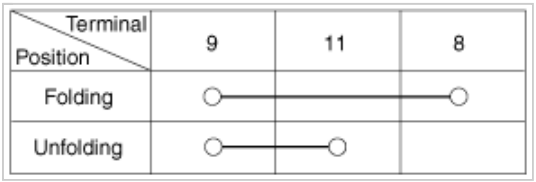


3. Check for continuity between the terminals in each switch position according to the table.

[Power Mirror Switch]



[Power Folding Mirror Switch]

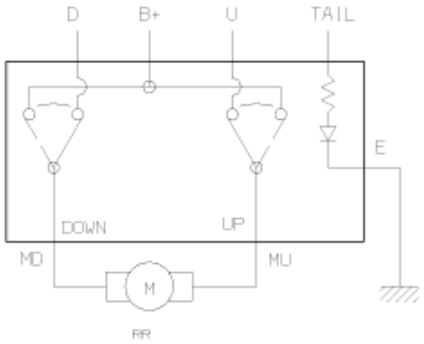


Inspection

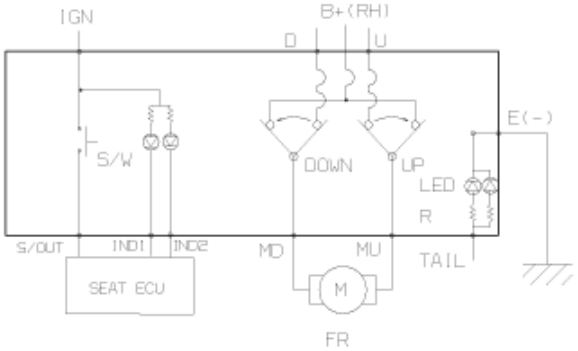
1. Disconnect the negative (-) battery terminal.
2. Remove the front door quadrant cover (A).

[Without seat heater switch]

[Manual]

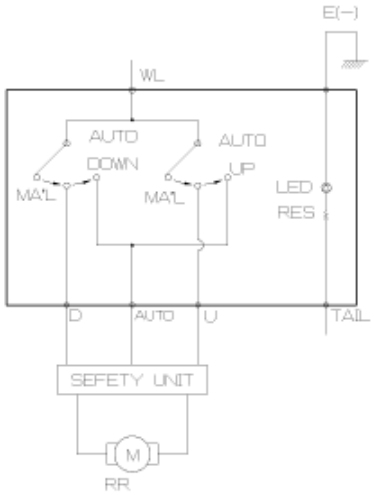


[Auto]

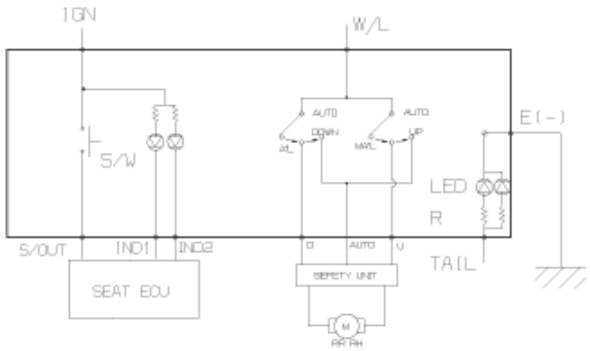


[With seat heater switch]

[Manual]



[Auto]



Body Electrical System

Inspection

Power Window Main Switch Inspection

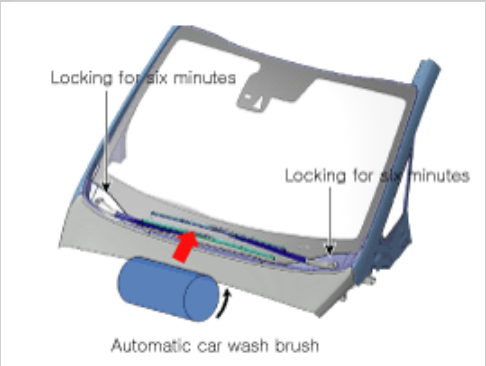
1. Disconnect the negative (-) battery terminal.
2. Remove the front door trim.
   (Refer to Body - "Front Door Trim")
3. Disconnect the connector from the power window switch module.

Wiper arm lock function during an automatic car wash

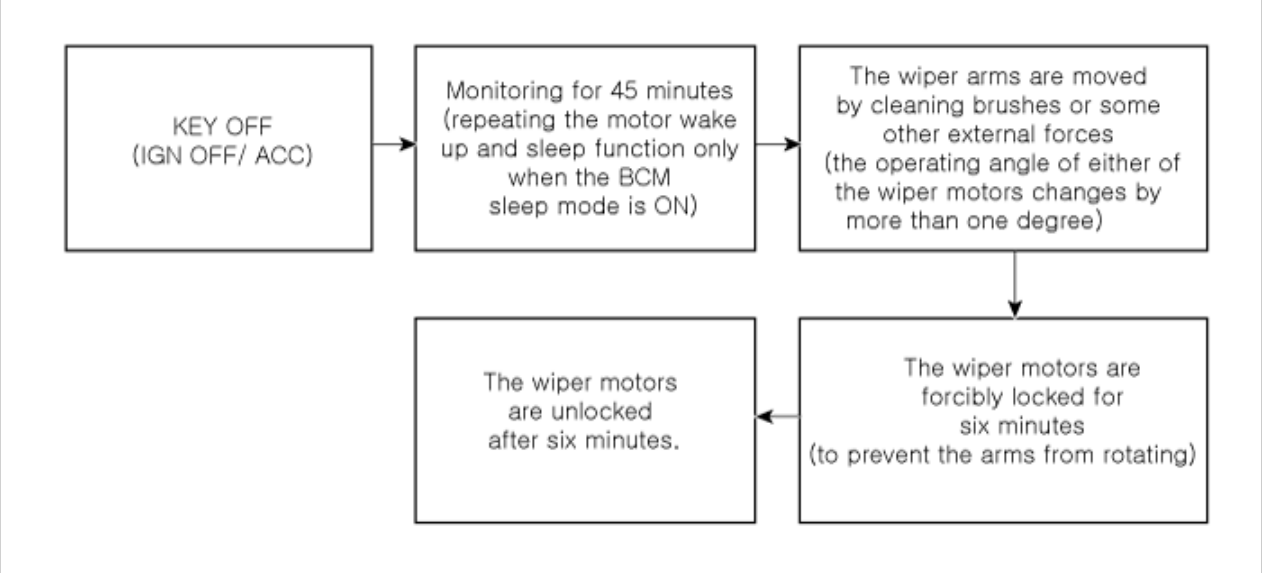
1. This function locks the wiper motors for six minutes when external forces are exerted on the vehicle. For example, the function is activated when the vehicle goes through an automatic wash with the IGN OFF and the ACC ON because the force of the cleaning brushes may move the wiper arms and blades.
   It is also activated when an external force is exerted on the vehicle within 45 minutes after IGN OFF and ACC ON.

   Information

   The external force here means an external influence that can change the operating angle of the wiper motor by more than one degree.
2. The lock function is activated only once when you turn the ignition key to ON and then OFF. It is deactivated after six minutes.



3. Operation logic



Information

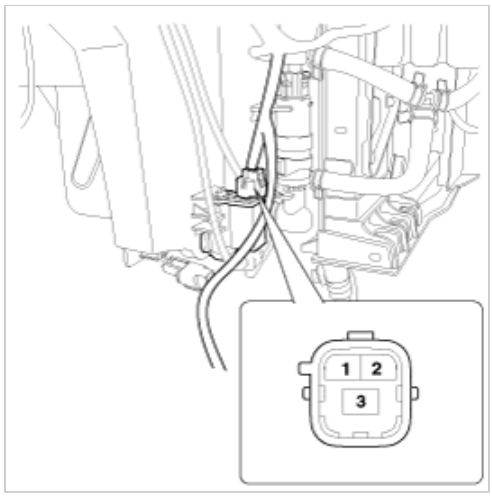
The wiper arms and blades may move out of their normal positions while the vehicle goes through an automatic car wash with the IGN OFF. After the car wash is finished, turn on the ignition and start the wipers. The wipers will return to their normal positions.

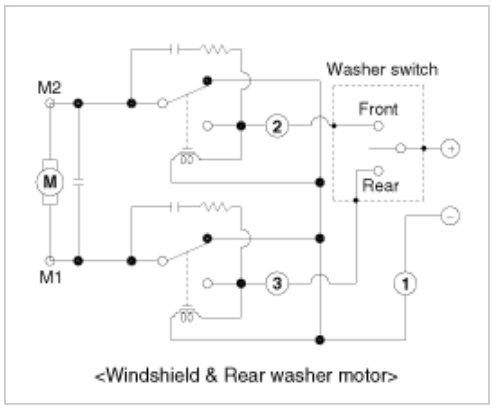
If the vehicle goes through an automatic car wash with the IGN ON, the wiper motors are automatically locked. As a result, the wipers do not return to their normal positions as they do in the above case.

Troubleshooting wiper misplacement and driver/passenger side blade up-down misalignment

; Proceed as follows if the assembled wiper arm and blade have moved from the normal position due to external effects.

1. If the wiper arm and blade are out of the standstill (setting) position
   (1) If the wiper arm is moved by an unnatural external force
   ; If the wiper arm is moved by the cleaning brushes from an automatic car wash with the IGN OFF and the ACC ON
   (2) If the driver/passenger side blade is upside down
2. Troubleshooting
   (1) Abnormal positioning by an unnatural external force
   a. With the IGN ON, activate the wiper multifunction switch. (MIST/ HIGH/ INT)
   b. The wipers move to the setting position.



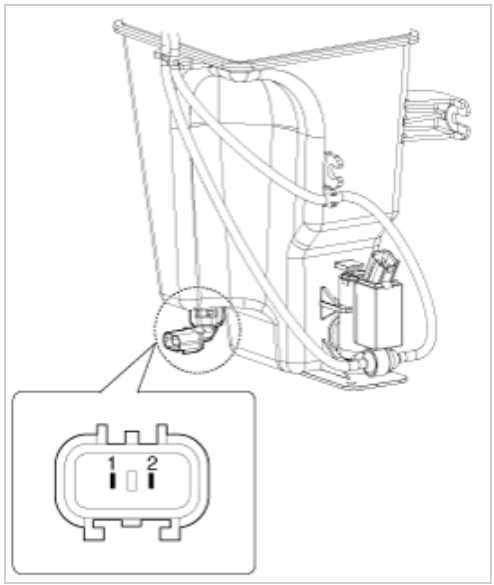


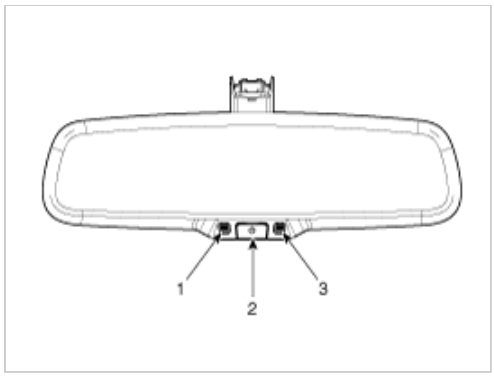
<Windshield & Rear washer motor>

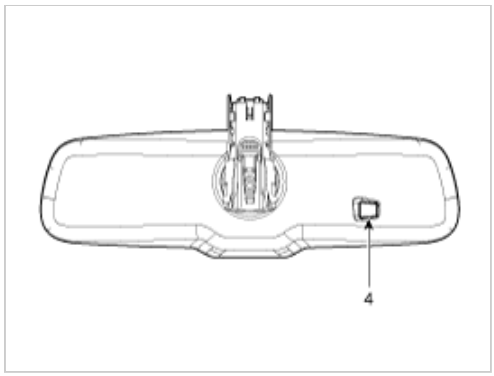
Washer Fluid Level Sensor Switch

1. Disconnect the negative(-) battery terminal.
2. Drain the washer fluid less than 650 cc.
3. Check for continuity between the No. 1 and No.2 terminal in each float position.
   There should be continuity when the float is down.
   There should be no continuity when the float is up.
4. If the continuity is not as specified, replace the washer fluid level switch.

[Standard Type]







Automatic-dimming Function

To protect your vision during nighttime driving, your mirror will automatically dim upon detecting glare from the vehicles traveling behind you. The auto-dimming function can be controlled by the Dimming ON/OFF Button :

1. Pressing and holding the Feature Control button for more than 3 but less than 6 seconds turns the auto-dimming function OFF which is indicated by the green Status Indicator LED turning off.
2. Pressing and holding the Feature Control button again for more than 3 but less than 6 seconds turns the auto-dimming function ON which is indicated by the green Status Indicator LED turning on.

NOTICE

The mirror defaults to the "ON" position each time the vehicle is started.

Inspection

Check it by the procedure below to see if the function of the ECM is normal.

1. Turn the ignition key to the "ON" position.
2. Cover the forward facing sensor.
3. Head a light to the rearward looking sensor.
4. The ECM should be darkened as soon as the rearward looking sensor detects the light.

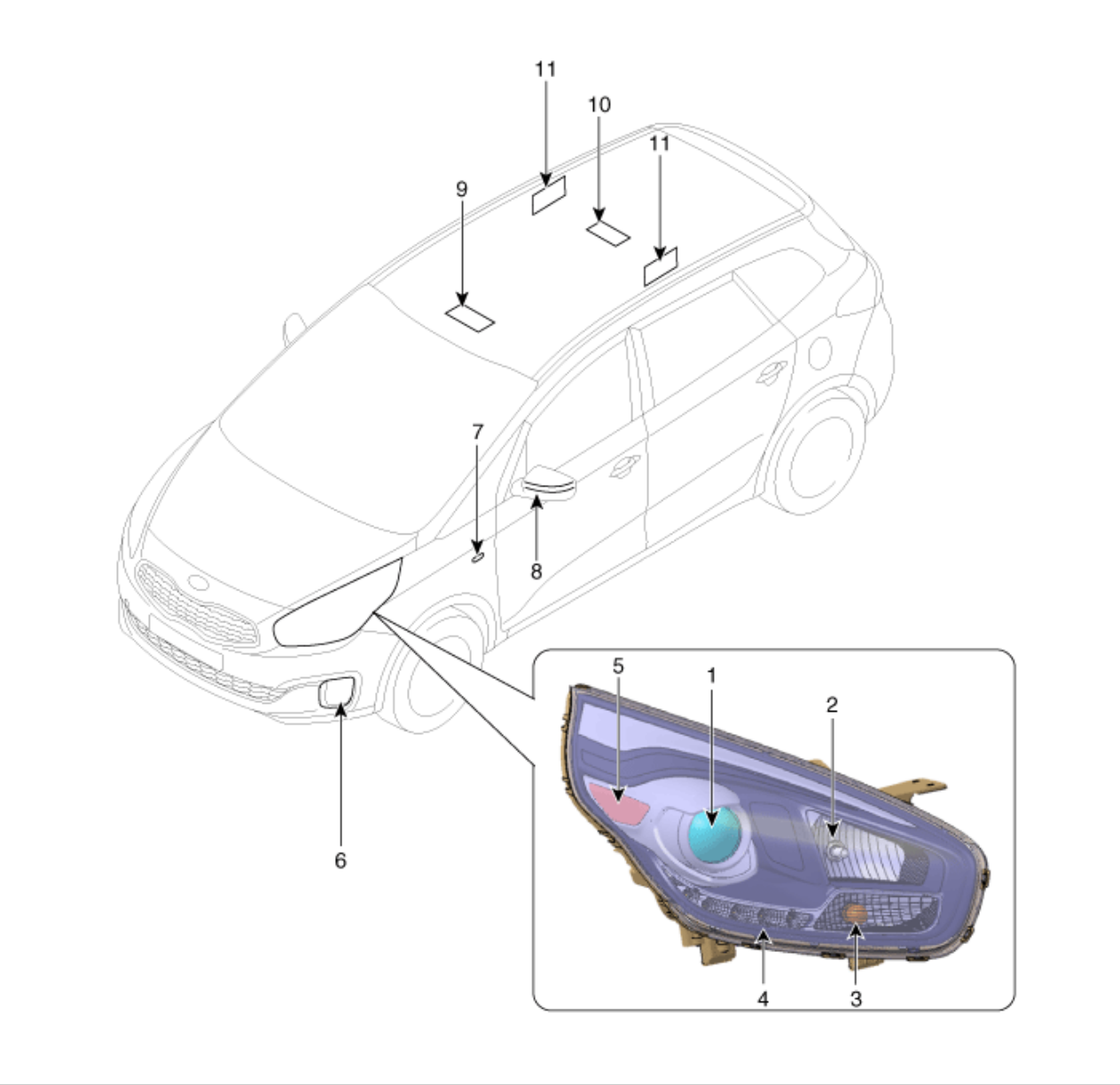
NOTICE

If this test is performed in daytime, the ECM may be darkened as soon as the forward facing sensor is covered.

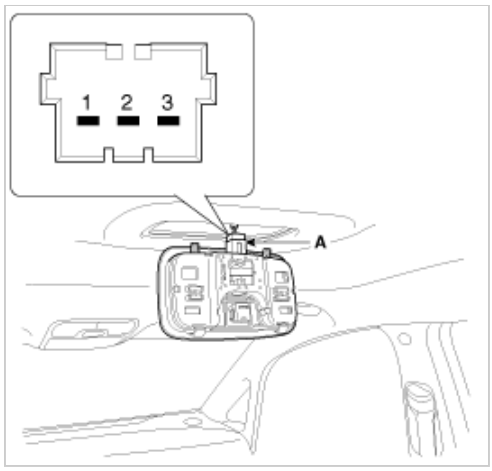
5. When the reverse gear is engaged, the ECM should not be darkened.
   When heading lights to both the forward facing and rearward looking sensors, the ECM should not be darkened.

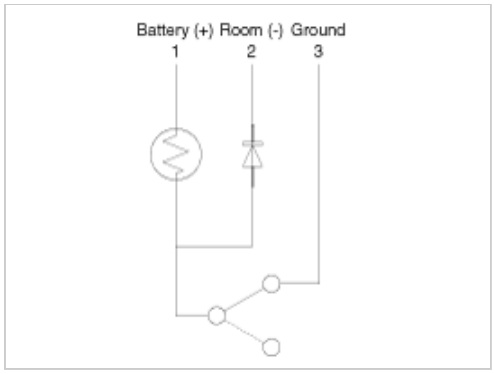
Removal

1. Remove the mirror wiring cover (A).

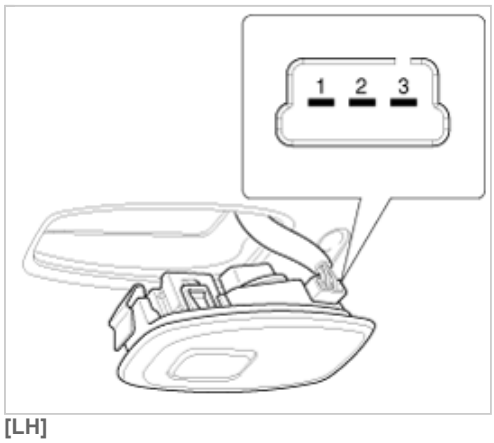


1. Head lamp (Low)	7. Side repeater lamp
2. Head lamp (High)	8. Turn signal lamp (Door mirror) (Option)
3. Turn signal lamp / Position lamp	9. Over head console lamp
4. LED DRL	10. Room lamp
5. Side marker	11. Personal lamp (Option)
6. Front fog lamp (Option)	

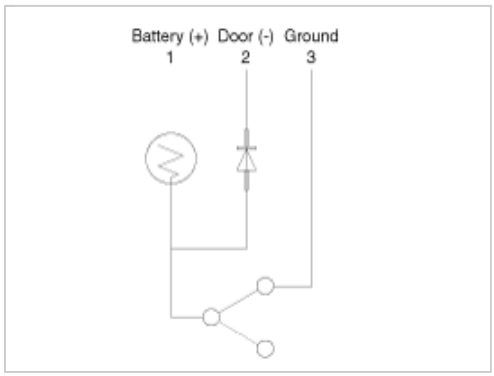




Personal Lamp



[LH]



[RH]

Back up lamps do not light	Bulb burned out	Replace bulb
	Back up lamp fuse (10A) blown	Check for short and replace fuse
	Back up lamp switch (M/T) faulty	Check switch
	Transaxle range switch (A/T) faulty	Check switch
	Wiring or ground faulty	Repair if necessary
Room lamp does not light	Bulb burned out	Replace bulb
	Room lamp fuse (10A) blown	Check for short and replace fuse
	Room lamp switch faulty	Check switch
	Wiring or ground faulty	Repair if necessary
Front fog lamps do not light	Bulb burned out	Replace bulb
	Front fog lamp fuse (15A) blown	Check for short and replace fuse
	Front fog lamp relay faulty	Check relay
	Front fog lamp switch faulty	Check switch
	Wiring or ground faulty	Repair if necessary
Wiring or ground faulty	Repair if necessary	
Map lamp does not light	Bulb burned out	Replace bulb
	Room lamp fuse (10A) blown	Check for short and replace fuse
	Map lamp switch faulty	Check switch
	Wiring or ground faulty	Repair if necessary
Trunk room lamp does not light	Bulb burned out	Replace bulb
	Room lamp fuse (10A) blown	Check for short and replace fuse
	Trunk room lamp switch faulty	Check switch
	Wiring or ground faulty	Repair if necessary

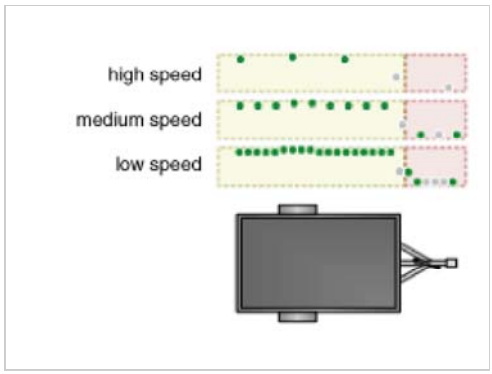
Body Electrical System

Specifications

Items		Specifications
Rated voltage		5V
Load		Max. 1mA (When head lamp lighting)
Illuminations (LUX)	50	1.42 ± 0.31V
	100	2.63 ± 0.58V
	150	3.84 ± 0.84V

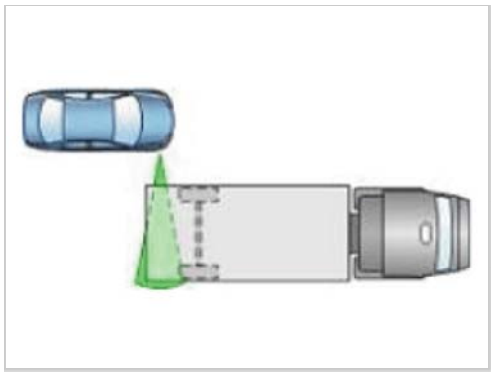
Body Electrical System

Component Location



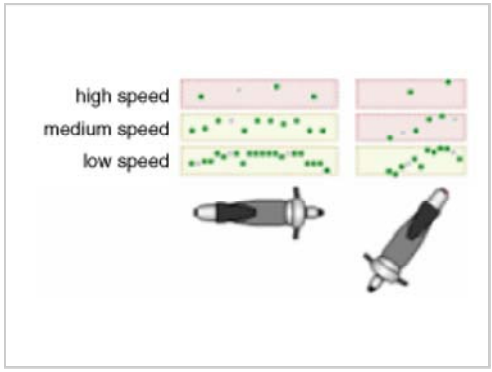
4. A truck in the parking lot

   Because of the height of deck (floor) in truck, it cannot be detected correctly by the side sensor while searching the parking space. Therefore, a driver has to watch out to avoid the collision.



5. 2 wheeler in the parking lot

   In case that 2 wheeler such as motor cycle or bicycle, the side sensor cannot recognize full shape. Furthermore, if it is located with oblique angle, it is much more difficult to detect it.

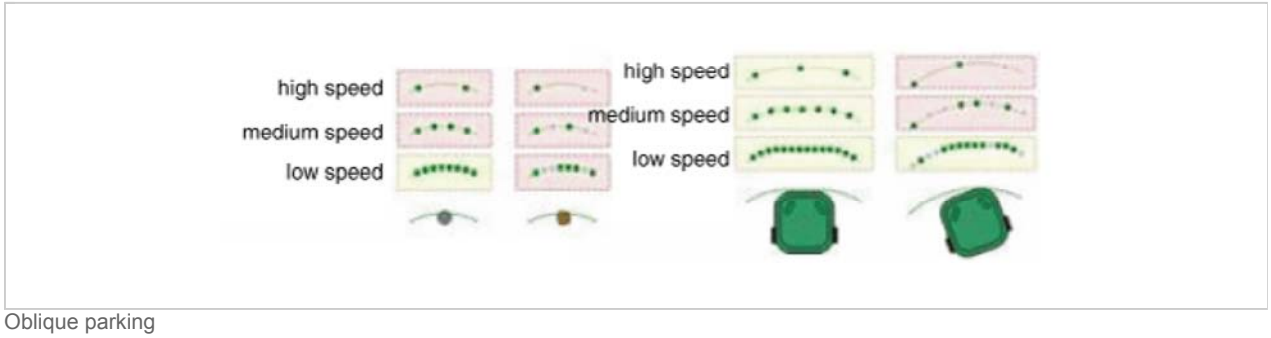


6. Snow, Rain or Wind

   Due to the fact that the sensor uses sonic wave, the medium (snow, rain) may affect to the wave transferring. Also a strong wind can distort the ultrasonic wave therefore it can result in abnormal parking.

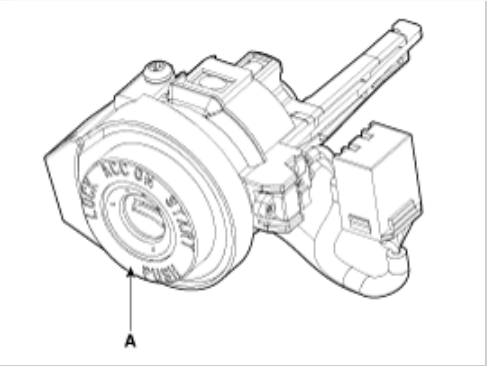
7. Trash can or circular objects

   Right side picture shows that the location of points is irregular in case of the construction with circular shape.



8. Oblique parking
9. Parking at the slope way

It is located directly in front of the steering handle lock.



Body Electrical System

Teaching Procedures

1. Key Teaching Procedure

   Key teaching must be done after replacing a defective PCM(ECM) or when providing additional keys to the vehicle owner.

   The procedure starts with an PCM(ECM) request for vehicle specific data (PIN code: 6digits) from the tester. The "virgin" PCM(ECM) stores the vehicle specific data and the key teaching can be started. The "learnt" PCM(ECM) compares the vehicle specific data from the tester with the stored data. If the data are correct, the teaching can proceed.

   If incorrect vehicle specific data have been sent to the PCM(ECM) three times, the PCM(ECM) will reject the request of key teaching for one hour. This time cannot be reduced by disconnecting the battery or any other manipulation. After reconnecting the battery, the timer starts again for one hour.

   The key teaching is done by ignition on with the key and additional tester commands. The PCM(ECM) stores the relevant data in the EEPROM and in the transponder. Then the PCM(ECM) runs the authentication required for confirmation of the teaching process. The successful programming is then confirmed by a message to the tester.

   If the key is already known to the PCM(ECM) from a previous teaching, the authentication will be accepted and the EEPROM data are updated. There is no changed transponder content (this is impossible for a learnt transponder).

   The attempt to repeatedly teach a key, which has been taught already during the same teaching cycle, is recognized by the PCM(ECM). This rejects the key and a message is sent to the tester.

   The PCM(ECM) rejects invalid keys, which are presented for teaching. A message is sent to the tester. The key can be invalid due to faults in the transponder or other reasons, which result from unsuccessful programming of data. If the PCM(ECM) detects different authenticators of a transponder and an PCM(ECM), the key is considered to be invalid.

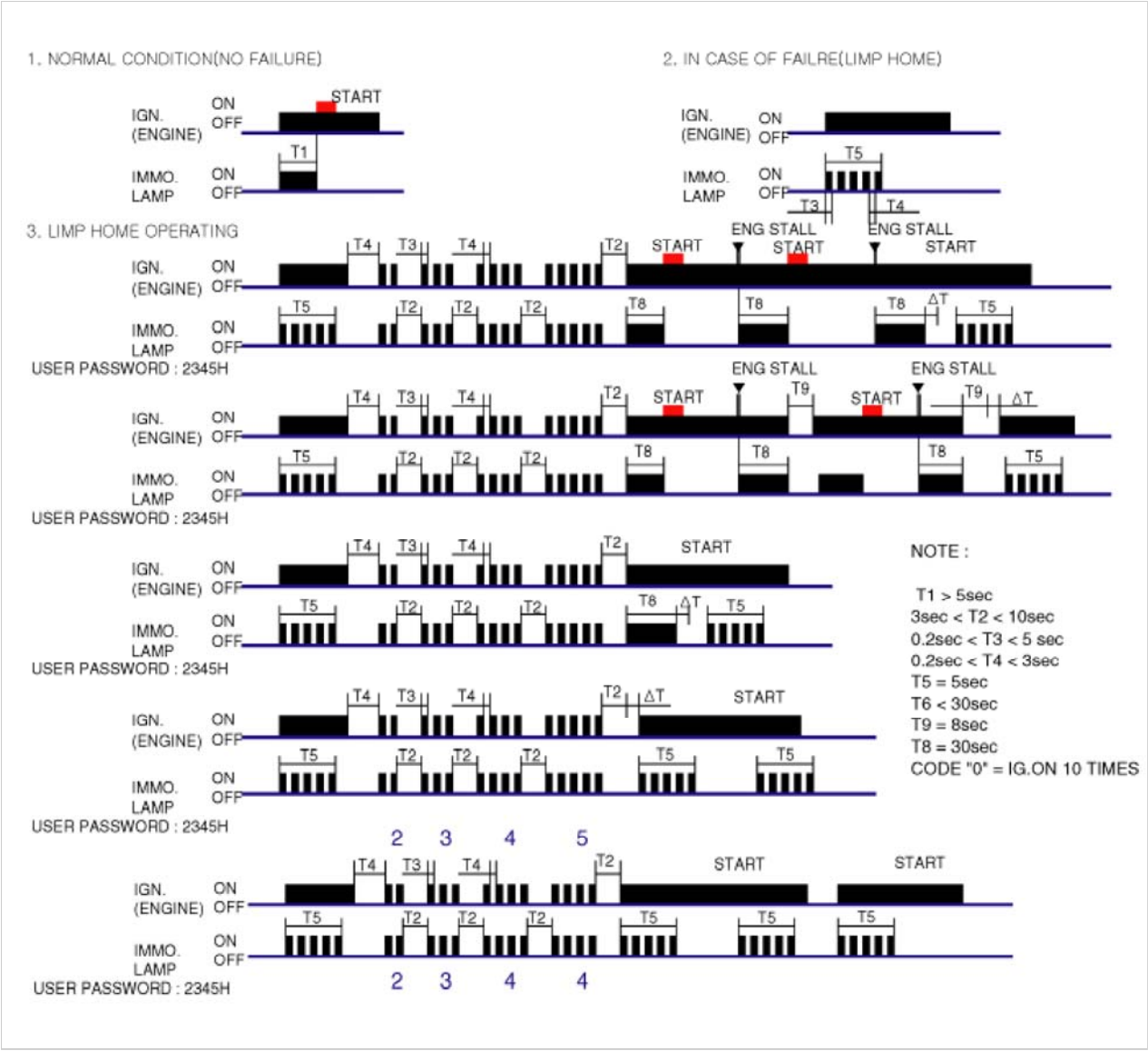
   The maximum number of taught keys is 8

   If an error occurs during the Immobilizer Service Menu, the PCM(ECM) status remains unchanged and a specific fault code is stored.

   If the PCM(ECM) status and the key status do not match for teaching of keys, the tester procedure will be stopped and a specific fault code will be stored at PCM(ECM).

   NOTICE

   When teaching the 1st key, Smartra regists at the same time.



Replacement

Problems And Replacement Parts:

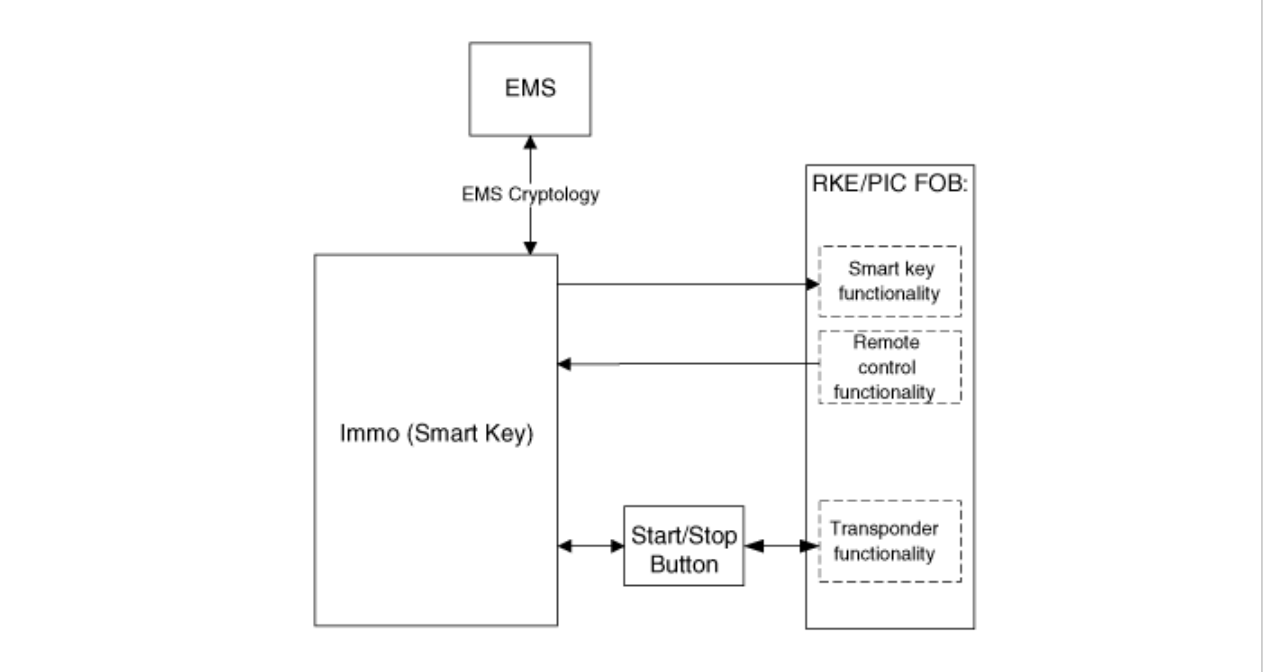
Problem	Part set	GDS required?
All keys have been lost	Blank key (4)	YES
Antenna coil unit does not work	Antenna coil unit	NO
ECM does not work	PCM(ECM)	YES
Ignition switch does not work	Ignition switch with Antenna coil unit	YES
Unidentified vehicle specific data occurs	Key, PCM(ECM)	YES
SMARTRA unit does not work	SMARTRA unit	YES

Replacement Of ECM And Smartra

In case of a defective ECM, the unit has to be replaced with a "virgin" or "neutral" ECM. All keys have to be taught to the new ECM. Keys, which are not taught to the ECM, are invalid for the new ECM (Refer to key teaching procedure). The vehicle specific data have to be left unchanged due to the unique programming of transponder.

In case of a defective SMARTRA, it needs teaching the smartra. A new SMARTRA device replaces the old one and smartra need teaching.

1. Things to remember before a replacement (PCM(ECM))



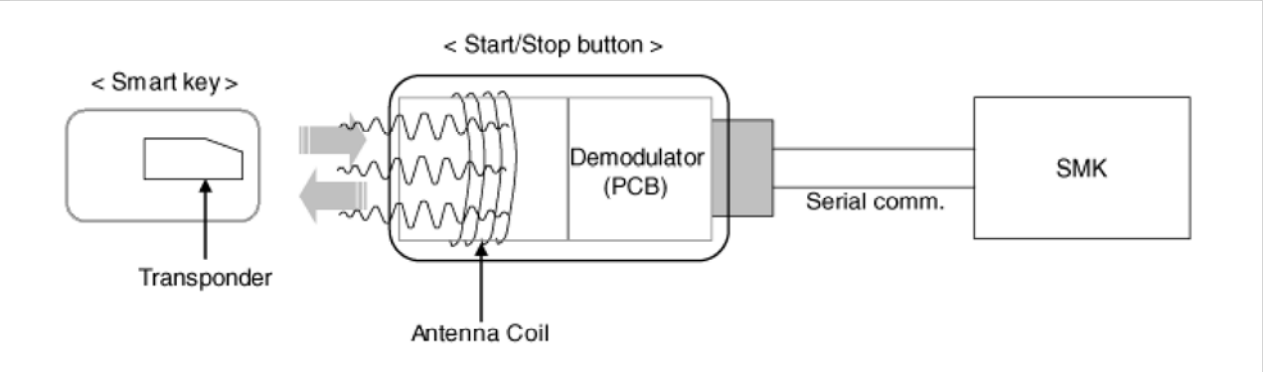
The unit behaves as Master role in the whole system.

In case of SMART KEY application, for example “Passive Access”, “Passive Locking” and “Passive Authorization are integrated for Terminal switching Operations”.

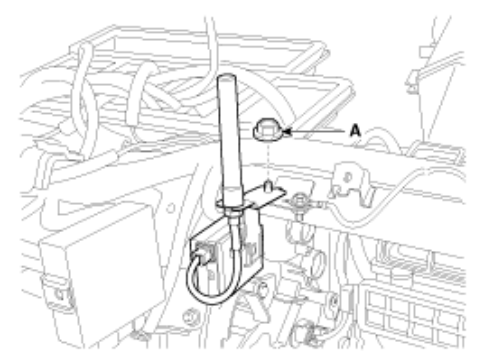
It collects information about vehicle status from other modules (vehicle speed, alarm status, driver door open...), read the inputs (e.g. SSB, Lock Button and PARK position Switch), controls the outputs (e.g. exterior and interior antennas), and communicates with others devices via the CAN network as well as a single line interfaces.

The diagnosis and learning of the components of the BES System are also handled by the SMK.

Transponder



External Receiver(SRX)



The data transmitted by the RKE or Smart key Fob is received by an external RF receiver called as SRX. This receiver will be same as that one for the SMK applications, with respect to electronics, housing, connector and software.

[Standard instrument cluster]

Alarm level		No Alarm	Front (Blinking)	Rear (Blinking)
Indicator display	Left	-		
	Right	-		
	Center	-		

[Supervision instrument cluster]

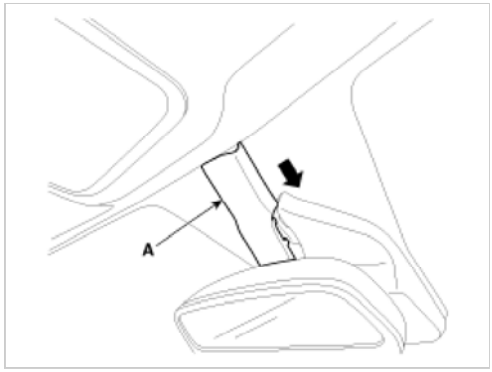
Alarm level		No Alarm	Front (Blinking)	Rear (Blinking)
Indicator display	Left	-		
	Right	-		
	Center	-		

* Indicator blinks every 1 second.

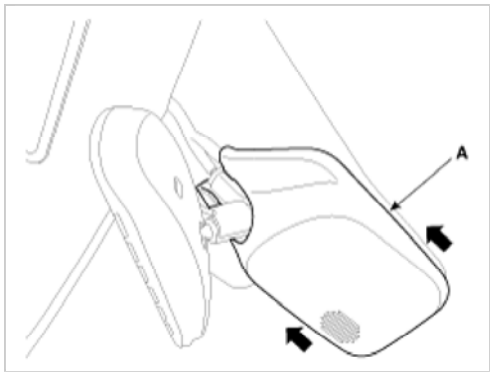
Communication Standard

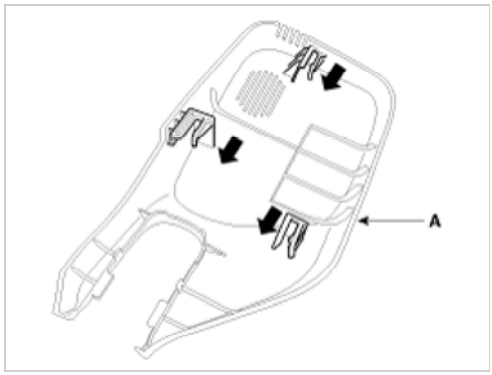
This section defines the communication between RPAS and BCM.
RPAS send a detecting result of object and sensor diagnosis result to BCM according to this document, and BCM takes a role to alarm.
Indicator shows the transmitted position and alarm data, in alarm case, it finds the nearest DATA and alarms the nearest DATA first.
(Ex. In case, RL is first step alarm and RR is third step, RR alarm has priority.)

Circuit Diagram

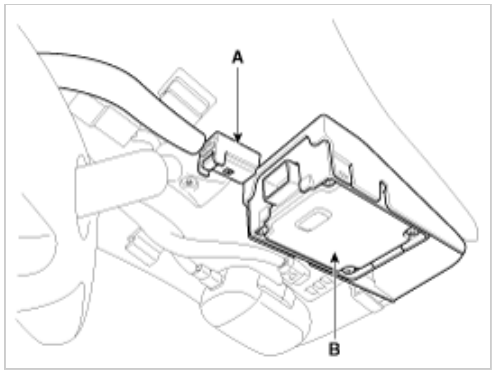


3. Push the ECM mirror base up to remove the auto defog sensor & rain sensor cover (A).





4. Remove the LDWS unit (B) after disconnecting the connector (A).



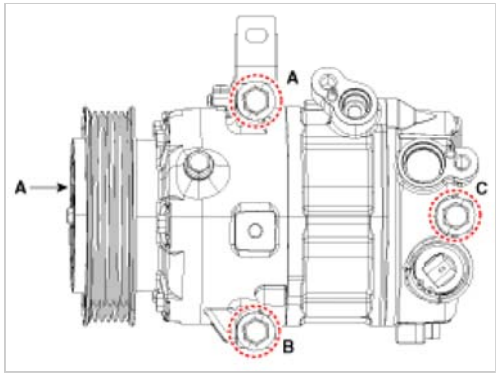
Installation

1. Install the LDWS unit.
2. Install the LDWS unit cover.

⚠ CAUTION

After replacing the LDWS unit, It is necessary to operate the Variant Coding procedure and Calibration procedure.

1) Using the GDS tool, select the Variant Coding menu of LDWS and select the RHD or LHD.
2) Using the GDS tool, operate the Calibration menu of LDWS.

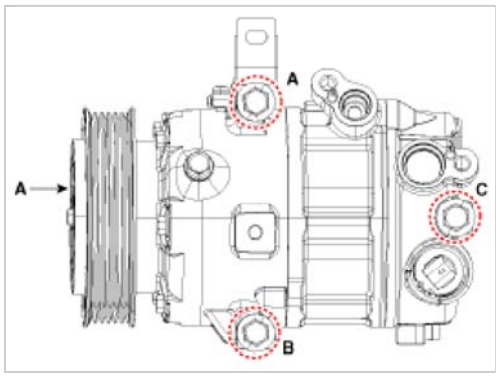


Installation

1. Make sure the compressor (A) mounting bolt with the correct length is screwed in. Tighten the mounting bolts with the specified tightening order.

Tightening torque :

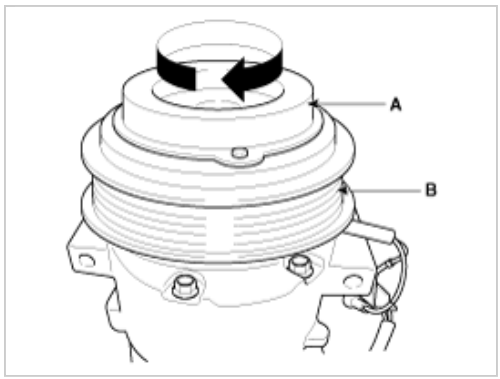
20.00~32.95 N.m(2.04 ~ 3.36 kgf.m, 14.75~24.30 lb-ft)



2. Install in the reverse order of removal.
   A. If you install a new compressor, drain all the refrigerant oil from the removed compressor and measure its volume. Subtract the volume of drained oil from the original capacity. The result is the amount of oilcompressor oil you should drain from the new compressor (through the suction fitting).
   B. Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them. Be sure to use the right O-rings for R-134a to avoid leakage.
   C. To avoid contamination, do not return the oil to the container once dispensed, and never mix it with other refrigerant oils.
   D. Immediately after using the oil, replace the cap on the container and seal it to avoid moisture absorption.

Inspection

1. Check the plated parts of the limiter & hub assembly (A) for color changes, peeling or other damage. If there is damage, replace the assembly.
2. Check the pulley (B) bearing play and drag by rotating the pulley by hand. Replace the pulley with a new one if it is noisy or has excessive play/drag.



External Control Valve Compressor Inspection (GDS)

Compressor type: Fixed type compressor, External control valve, Internal control valve.

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