



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 service and repair.

There are various procedures, techniques, tools and parts for service as well as the skill of technicians.

Therefore, it is impossible for this manual to provide advice or caution for each case.

Accordingly, if you use a replacement part, service procedure, or tool which are not recommended by the vehicle manufacturer, make sure that neither the personal safety nor the safe operation of the vehicle is jeopardized.

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 additional 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 the vehicle in the P position.
- Place supporters against the front and rear surfaces of the tires to prepare for the vehicle suddenly 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 that the engine is not running.



Identification Number



1. Radiator cap caution
2. Fan caution

3. Battery caution

Attention

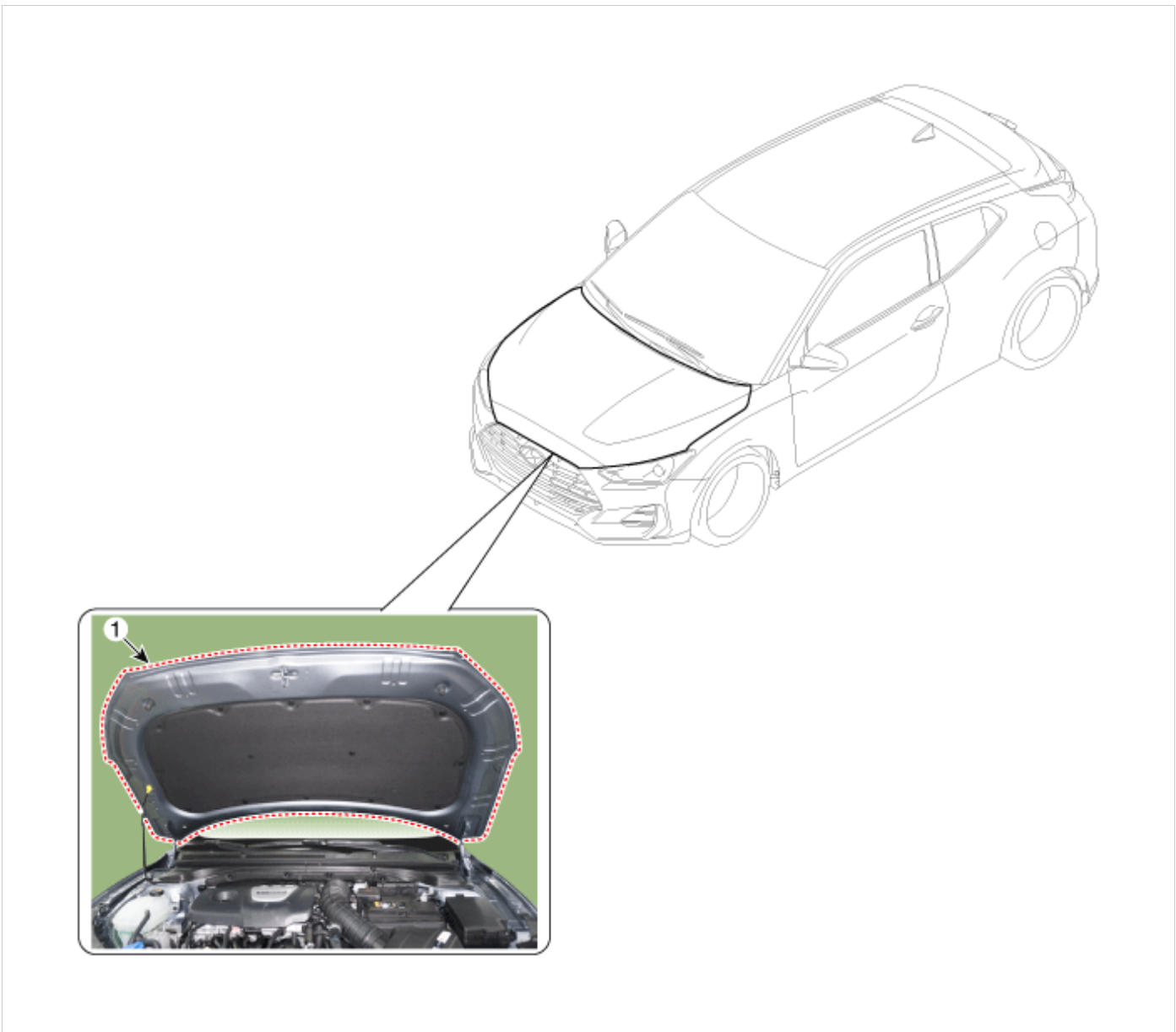
Srs Vehicle

This car is equipped with a supplemental restraint system. To provide continued reliability, certain elements of the supplemental restraint system shall be serviced or replaced by an authorized dealer ten years after vehicle label. For further information, see owner's manual.

Side Air Bag

This vehicle is equipped with a side airbag system. To provide continued reliability, certain elements of the side airbag system shall be serviced or vehicle manufacturing date shown on the certification label. For further information, refer to the owner's manual.

Battery Caution Label Description



1. Hood assembly

Body (Interior and Exterior)



Replacement

NOTICE

- Be careful not to damage the hood and body.

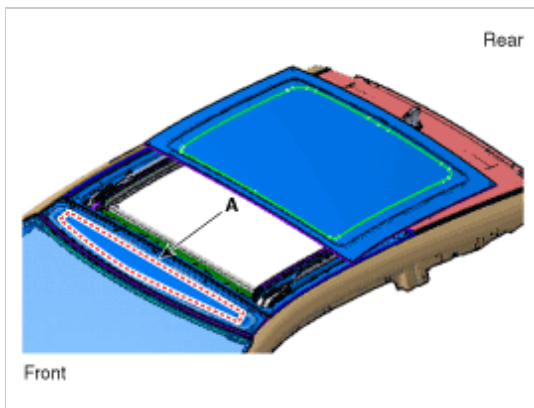
i Information

- Removing or installing the hood requires an assistant.
- When removing the clips, use a clip remover.

1. After loosening the hood hinge (A) mounting bolts, remove the hood assembly (B).

Tightening torque :

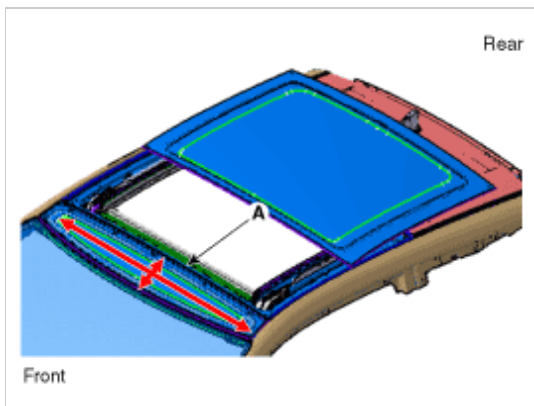
18.7 - 25.3 N.m (1.9 - 2.6 kgf.m, 13.7 - 18.8 lb-ft)



6. Check step and gap before front glass (A) is fully mounted.
7. Apply tape to around the front glass to prevent the glass from coming off.

NOTICE

- If sealant is excessively applied, it may ooze out of the body. Use alcohol or a cleaning agent to wipe off the residual sealant.



Information

- Mount front glass and set the car on a flat surface at least for 4 hours.
- If you have to drive the car, be sure to SLOWLY drive the car for at least 8 hours after mounting.
- Alert the driver to avoid driving the car aggressively for 2-3 days, or avoid driving it on irregular road surfaces.

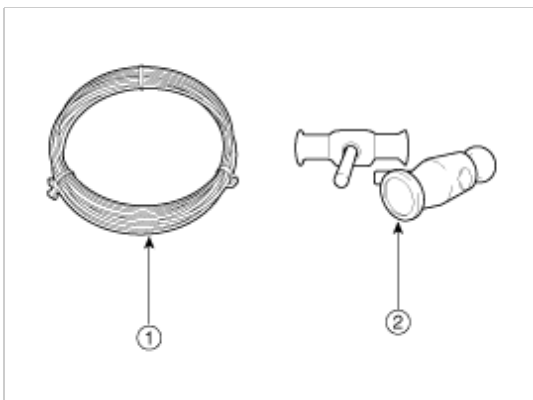
Body (Interior and Exterior)



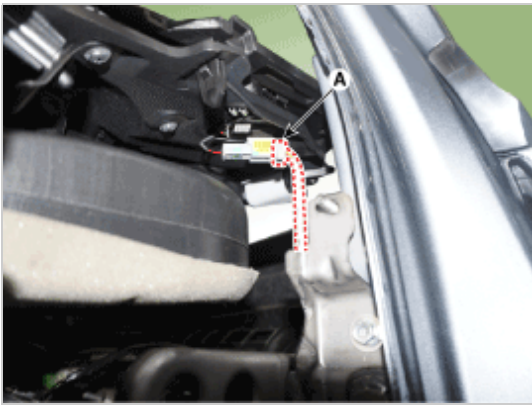
Removal

Information

- In order to remove the front glass, use the tools shown in the following figure:
[Tooling Diagram]



① Square wire



21. To install, reverse removal procedure.

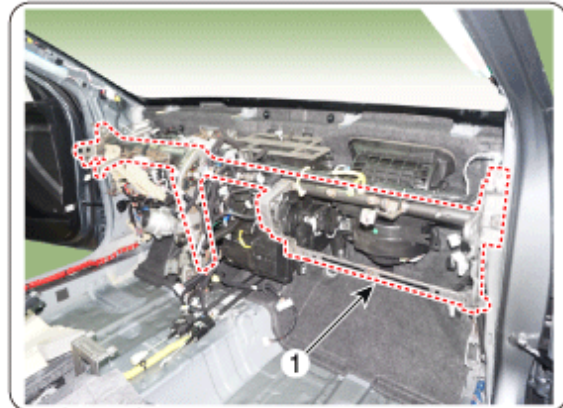
i Information

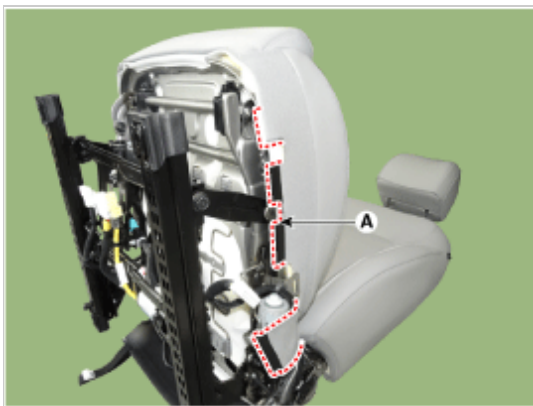
- Make sure the crash pad fits onto the guide pins correctly.
- Before tightening the bolts, make sure the crash pad wire harnesses are not pinched.
- Make sure the connectors are plugged in properly, and the antenna lead is connected properly.
- Make sure that each of the assembly components operates properly.
- Replace any damaged clips (or pin-type retainers).

Body (Interior and Exterior)



Component Location

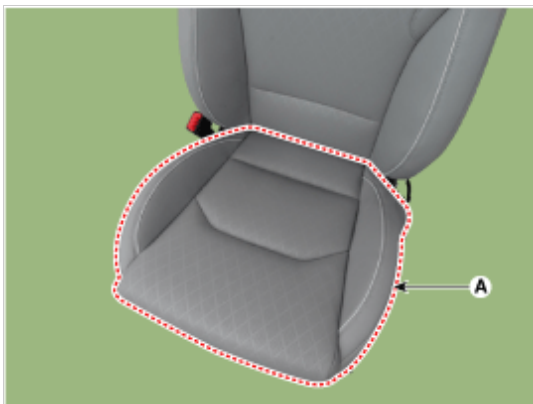




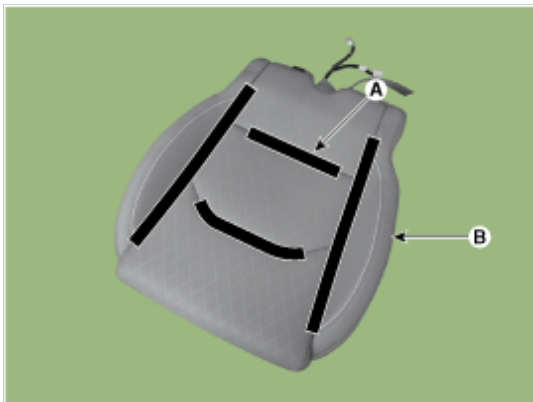
[RH]



7. Remove the front seat cushion cover (A) from the front seat cushion frame.




8. After removing the Velcro tape (A) inside the front seat cushion cover, remove the seat cushion cover (B).



9. Remove the front seat cushion cover (A) from the front seat cushion pad.

GDS Update TSB MORE ▶



Fault Code Searching

ECU Upgrade

DTC Analysis

Data Analysis

Actuation Test

Flight Record

S/W Management


Multi Data Analysis

Recorded Data

Digital Before Service

Measurement

OBD- II

 **HYUNDAI** NEW THINKING. NEW POSSIBILITIES.

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



Inspection

⚠ CAUTION

- Wrap tin foil around the end of the voltmeter test lead to prevent damaging the heater line. Apply pressure on the tin foil with hand and move the tin foil along the grid line to check for open circuits.

1. Turn on the defogger switch and use a voltmeter to measure the voltage of each heater line in the central part of the glass. If the voltmeter indicates 6V for a conductive line, the line of the rear window is considered to be in good condition.
2. If a conductive line is burned out within the area between the central part and (+) terminal, the voltmeter will indicate 12V.
3. If a conductive line is burned out within the area between the central part and (-) terminal, the voltmeter will indicate 0V.
4. To check for open circuits, Slowly move the test lead toward the section where open circuits seem to exist. Try to find a point where the voltage turns to 0V. The point where the voltage has changed is the open-circuit point.
5. Use an ohmmeter to measure the resistance of each heater line between a terminal and the center of a grid line, and between the same terminal and the center of one adjacent heater line. The section with a broken heater line will have a resistance twice that in other sections. In the affected section, move the test lead to a position where the resistance sharply changes.

Repair Of Broken Heater Line

Prepare the following items :

1. Conductive paint.
2. Paint thinner.
3. Masking tape.
4. Silicone remover.
5. Using a thin brush :

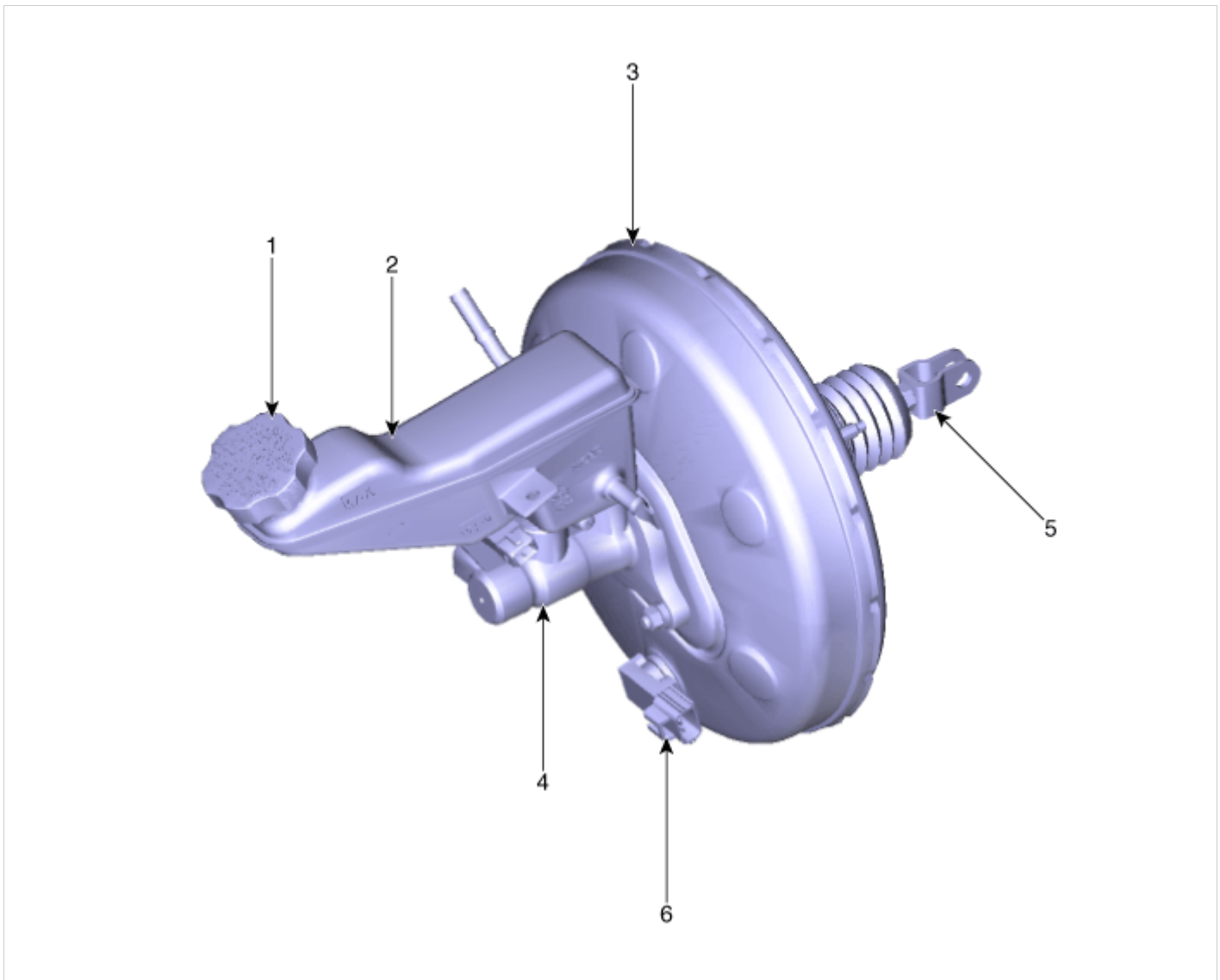
Wipe the glass adjacent to the broken heater line, clean with silicone remover and attach the masking tape as shown. Shake the conductive paint container well, and apply three coats with a brush at intervals of about 15 minutes apart. Remove the tape and allow sufficient time for drying before applying power. For a better finish, scrape away excess paint with a knife after the paint has completely dried. (Allow 24 hours).



Inspection

Diagnosis with GDS

1. In the body electrical system, failure can be quickly diagnosed by using the vehicle diagnostic system (GDS).
The diagnostic system (GDS) provides the following information.
 - (1) Fault Code Searching : Checking failure and code number (DTC)
 - (2) Data Analysis : Checking the system input/output data state
 - (3) Actuation test : Checking the system operation condition
 - (4) S/W Management : Controlling other features including system option setting and zero point adjustment
2. Select the 'Data Analysis' and 'Car model'.



1. Reservoir cap
2. Reservoir
3. Brake booster

4. Master cylinder
5. Push rod
6. Brake booster vacuum pressure sensor

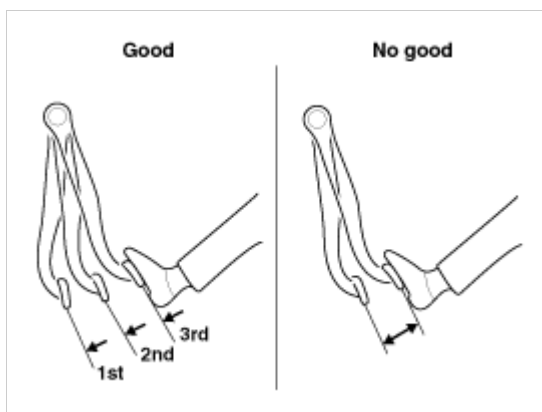
Brake System



Brake Booster Operating Test

For simple checking of the brake booster operation, carry out the following tests.

1. Run the engine for one or two minutes, and then stop it. If the pedal depresses fully the first time but gradually becomes higher when depressed succeeding times, the booster is operating properly, if the pedal height remains unchanged, the booster is inoperative.



2. With the engine stopped, step on the brake pedal several times.

Clutch System



Specifications

Item		Specification
Clutch operation method		Hydraulic type
Clutch cover assembly	Type	Diaphragm spring
Clutch disc	Type	Dry single plate
	Facing diameter (Outer × inner)	Ø239 ± 1 × Ø170(- 1.0 +1.5) mm (Ø9.3701 - Ø9.4488 × Ø6.6535 - Ø6.7520 in.)
Clutch disc thickness [When free]		8.85 ± 0.3mm (0.3484 ± 0.012in.)
Clutch disc rivet depth		1.0 mm Min (0.0394in.)
Clutch disc rivet depth(Service Standard)		0.3 mm (0.0118 in.)

Tightening Torques

Item	N.m	kgf.m	lb-ft
Clutch pedal mounting bolt & nut	16.7 - 28.4	1.7 - 2.9	12.3 - 21.0
Concentric slave cylinder assembly mounting bolt	11.8 - 14.7	1.2 - 1.5	8.7 - 10.8
Ignition lock & clutch switch mounting bolt	2.0 - 5.9	0.2 - 0.6	1.4 - 4.3
Clutch tube (Clutch regulator side)	12.7 - 16.7	1.3 - 1.7	9.4 - 12.3
Clutch tube bracket mounting bolt	7.8 - 9.8	0.8 - 1.0	5.8 - 7.2
Clutch cover mounting bolt	24.5 - 34.3	2.5 - 3.6	18.1 - 26.0

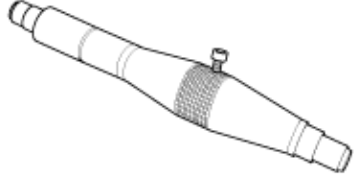
Lubricants

Items		Specified lubricants	Quantity
Concentric slave cylinder assembly		Brake fluid DOT 4	As required
Clutch pedal assembly	Contact area bush-hinge-spring	PDLV-1	0.2 - 2.0g
	Contact area switch-pin		0.1 -1.0g
	Member side spring equip portion		
	Arm side spring equip portion		
Input shaft spline		CASMOLY L9508	0.2 g

Clutch System



Special Service Tools

Tool number	Tool name	Illustration	Use
09411-1P000	Clutch disc guide		Installation of the clutch disc.

Clutch System



Troubleshooting

Trouble symptom	Suspect area	Remedy
Clutch slipping <ul style="list-style-type: none"> • Car will not respond to engine speed during acceleration • Insufficient vehicle speed • Lack of power during uphill driving 	Insufficient pedal free play	Adjust
	Clogged hydraulic system	Correct or replace parts
	Excessive wear of clutch disc facing	Replace
	Hardened clutch disc facing, or oil on surface	Replace
	Damaged pressure plate or flywheel	Replace
	Weak or broken pressure spring	Replace
Difficult gear shifting (gear noise during shifting)	Excessive pedal free play	Adjust
	Hydraulic system fluid leaks, air trapping or clogging	Repair or replace parts
	Unusual wear or corrosion of the clutch disc spline	Replace



Installation

⚠ CAUTION

- Install the component with the specified torques.
- Note that internal damage may occur when the component is dropped. In this case, use it after inspecting.

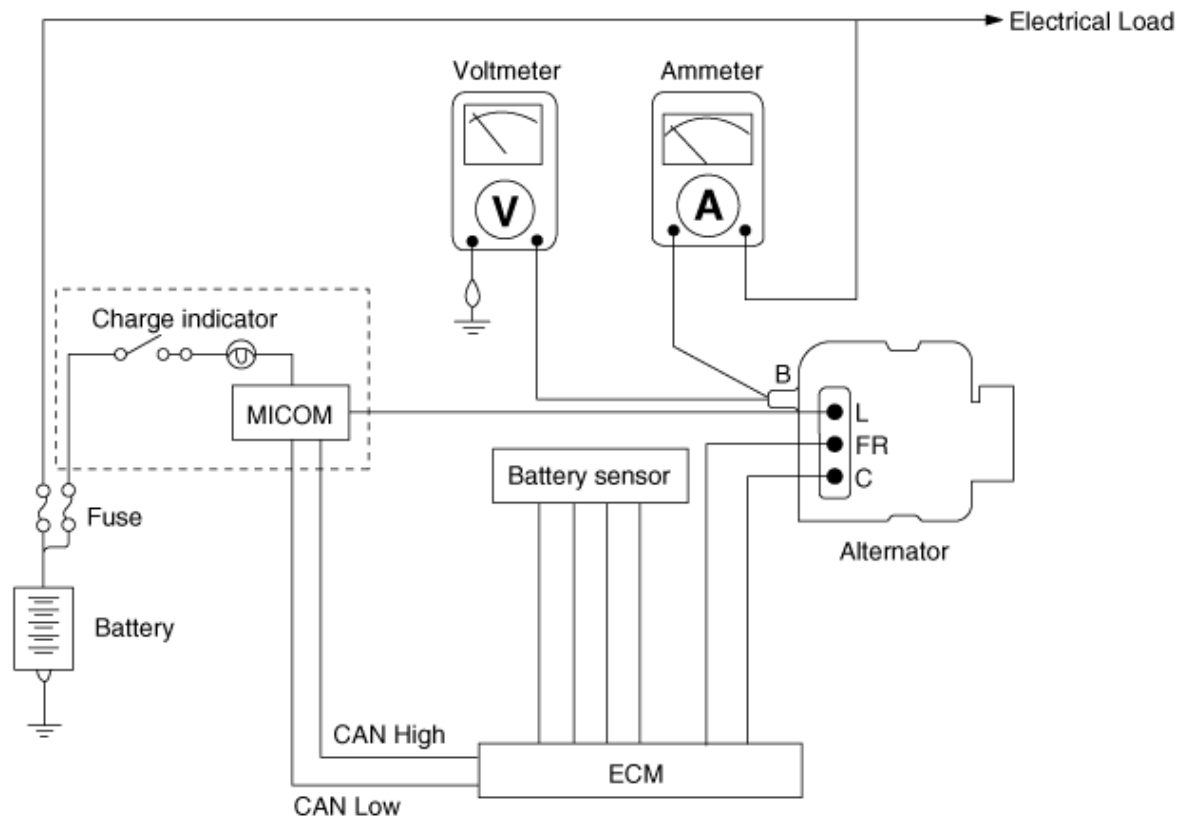
1. Installation is reverse of removal.

Engine Control / Fuel System



Components Location

[With "FR" terminal / With "L" terminal]



(2) Test

- Check to see that the voltmeter reads the same value as the battery voltage. If the voltmeter reads 0V, open circuit in the wire between alternator "B" terminal and battery (+) terminal or poor grounding is suspected.
- Start the engine and turn on the headlamps.
- Set the headlamps to high beam and the heater blower switch to HIGH, quickly increase the engine speed to 2,500 rpm and read the maximum output current value indicated by the ammeter.

NOTICE

- After the engine start up, the charging current quickly drops. Therefore, the above operation must be done quickly to read the maximum current value correctly.

(3) Result

- The ammeter reading must be higher than the limit value. If it is lower despite the alternator output wire is in good condition, remove the alternator from the vehicle and test it.

Limit value :60% of the current rate

Information

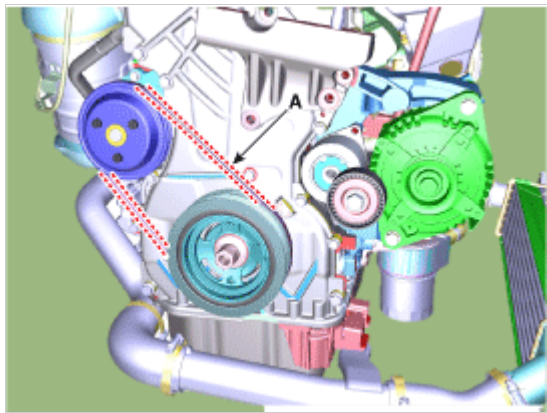
- The nominal output current value is shown on the nameplate affixed to the alternator body.

NOTICE

- The output current value changes with the electrical load and the temperature of the alternator itself. Therefore, the nominal output current may not be obtained. If such is the case, keep the headlamps on to discharge the battery or use lights of other vehicles to increase the electrical load.

The nominal output current may not be obtained if the temperature of the alternator itself or ambient temperature is too high. In such a case, reduce the temperature before testing again.

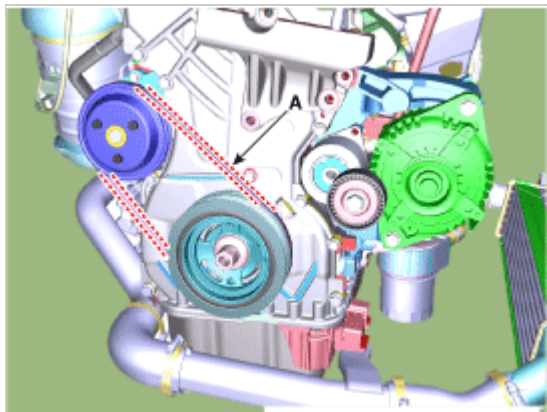
- Upon completion of the output current test, lower the engine speed to idle and turn off the ignition switch
- Disconnect the battery negative (-) terminal.



Installation

1. Install the water pump belt.

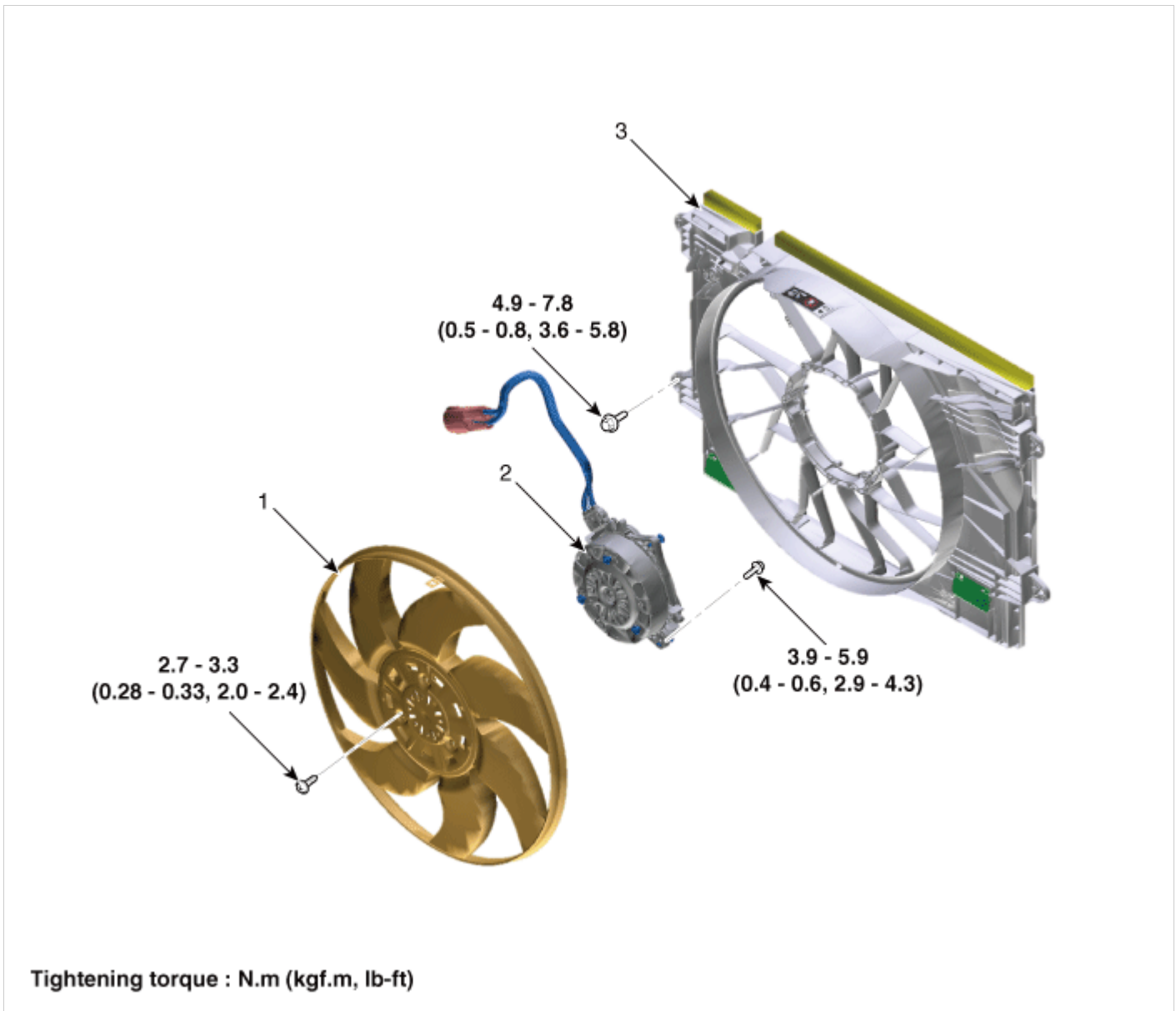
- (1) Insert the SST (09252-C1000) between the water pump pulley and the water pump belt.
- (2) Install the water pump belt (A) by turning the crankshaft damper pulley clockwise.



CAUTION

- Install the water pump belt while being careful not to damage the water pump belt caused by water pump pulley mounting bolts (B).

2. For release the tension, turn the drive belt tensioner counterclockwise then install the drive belt (A).



1. Cooling fan

2. Fan motor

3. Cooling fan shroud

Engine Mechanical System



Removal and Installation

Cooling Fan Assembly

1. Disconnect the battery negative terminal.
2. Remove the air duct and air cleaner assembly.
(Refer to Intake And Exhaust System - "Air Cleaner")
3. Remove the engine room under cover.
(Refer to Engine And Transaxle Assembly - "Engine Room Under Cover")
4. Drain the engine coolant.
(Refer to Cooling System - "Coolant")
5. Disconnect the radiator lower hose (A).

NOTICE

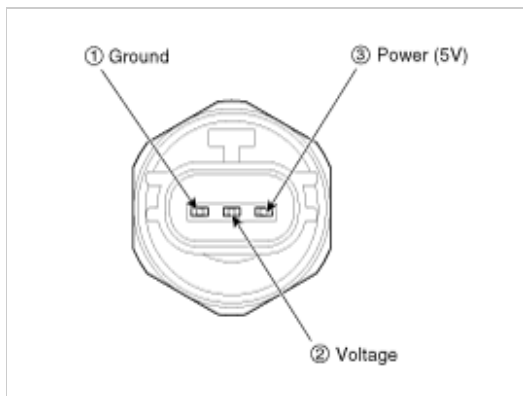
- Always replace the receiver-drier and bottom cap at the same time.
- Be careful not to damage the radiator and condenser fins when installing the condenser.
- Charge the system, and test its performance.
- Replace the O-rings (A) with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them. Be sure to use the right O-rings (A) for R - 134a to avoid leakage.

**Heating, Ventilation and Air Conditioning****Description**

The A/C Pressure Transducer (APT) converts the pressure value of high pressure line into voltage value after measuring it. By converted voltage value, engine ECU controls the cooling fan by operating it high speed or low speed. Engine ECU stops the operation of the compressor when the temperature of refrigerant line is very high or very low irregularly to optimize air conditioning system.

Heating, Ventilation and Air Conditioning**Inspection**

1. Measure the pressure of high pressure line by measuring voltage output between terminal "1" and "2".



2. Inspect the voltage value whether it is sufficient to be regular value or not.

$$\text{Voltage} = 0.00878835 * \text{Pressure} + 0.37081095$$

3. If the measured voltage value is not within specification, replace the A/C pressure transducer.

Replacement

1. Disconnect the negative (-) battery terminal.
2. Recover the refrigerant with a recovery / charging station.
3. Disconnect the A/C pressure transducer connector (A).