

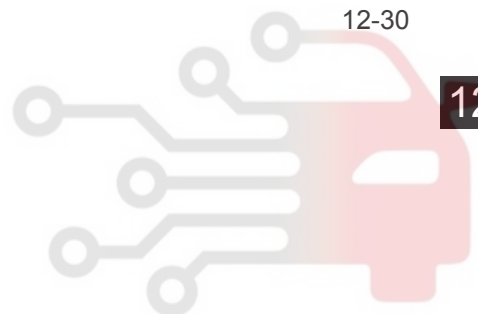
## SQRE4G15B COOLING SYSTEM

|                                        |              |                                 |              |
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دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



# دیجیتال خودرو

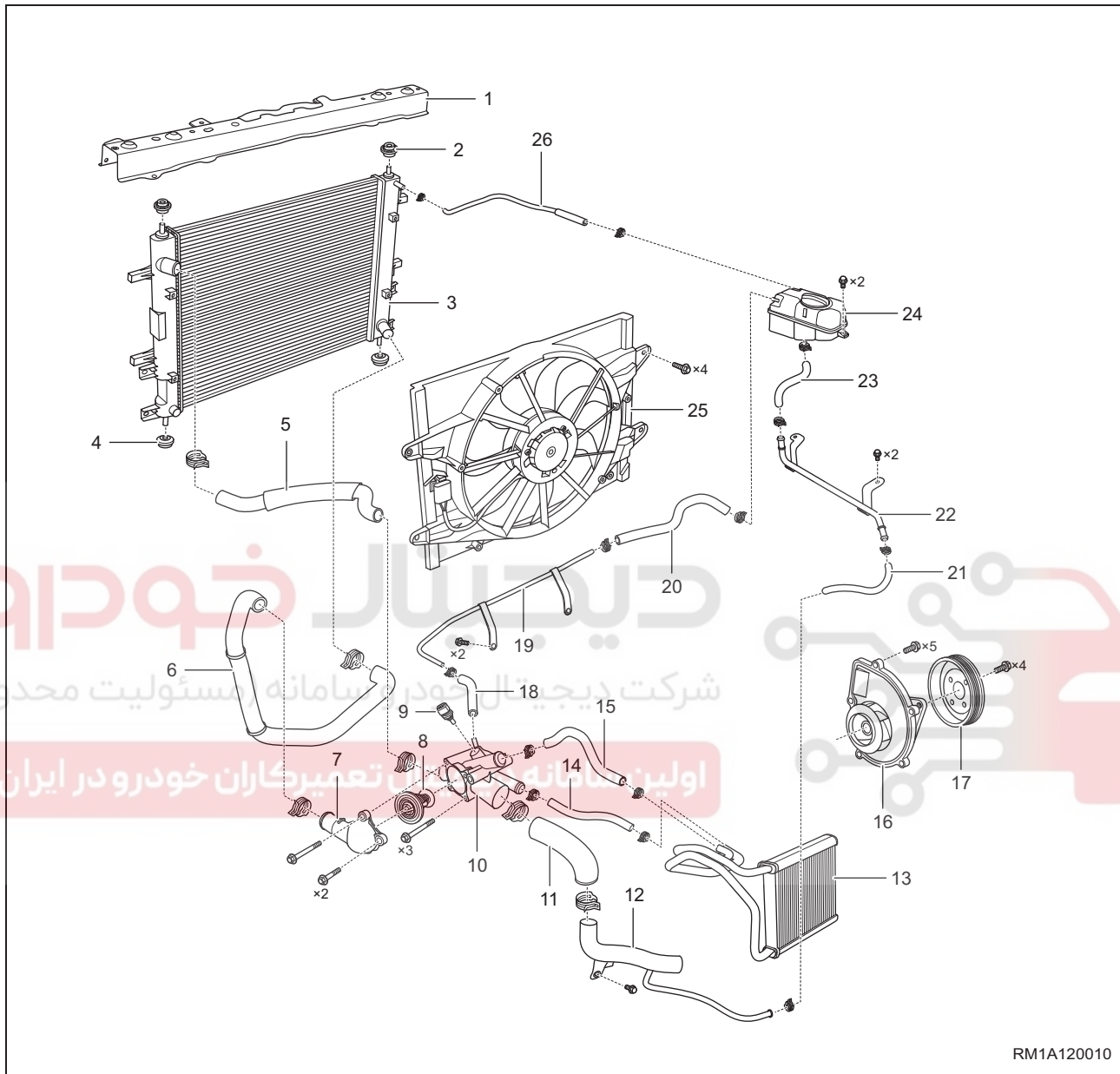
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اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



## GENERAL INFORMATION

### Description



## 12 - SQRE4G15B COOLING SYSTEM

|                                           |                                          |
|-------------------------------------------|------------------------------------------|
| 1 - Tank Upper Crossmember Assembly       | 2 - Rubber Bushing                       |
| 3 - Radiator Assembly                     | 4 - Rubber Cushion                       |
| 5 - Engine Outlet Pipe                    | 6 - Engine Inlet Pipe                    |
| 7 - Thermostat Housing Assembly           | 8 - Thermostat Assembly                  |
| 9 - Coolant Temperature Sensor            | 10 - Thermostat Seat Assembly            |
| 11 - Small Circulation Water Pipe         | 12 - Cooling Pipe Assembly I             |
| 13 - Heater                               | 14 - Heater Inlet Pipe                   |
| 15 - Heater Outlet Pipe                   | 16 - Water Pump                          |
| 17 - Water Pump Pulley                    | 18 - Discharge Hose                      |
| 19 - Discharge Steel Pipe                 | 20 - Engine Discharge Hose               |
| 21 - Expansion Tank - Water Pump Pipe III | 22 - Expansion Tank - Water Pump Pipe II |
| 23 - Expansion Tank - Water Pump Pipe I   | 24 - Expansion Tank Assembly             |
| 25 - Cooling Fan Assembly                 | 26 - Radiator Discharge Hose             |

Engine cooling system adjusts engine operating temperature by the flow of coolant and makes engine operate normally under various operating conditions.

Engine cooling system is a forced circulation system, which supplies circulation pressure for cooling system by water pump and forces coolant to circulate in engine cylinder block, and distributes excessive heat to radiator by the flowing of coolant, and radiates it to the air by cooling fan. Also, engine cooling system provides heat to heater core in cabin to improve driving comfort.



## Specifications

### Torque Specifications

| Description                                           | Torque (N·m) |
|-------------------------------------------------------|--------------|
| Hood Lock Assembly Fixing Bolt                        | 9 ± 1        |
| Tank Upper Crossmember Assembly Fixing Bolt           | 7 ± 1        |
| Expansion Tank Fixing Bolt                            | 5 ± 1        |
| Thermostat Housing Assembly Fixing Bolt               | 8 + 3        |
| Vacuum Booster Pipe Fixing Bolt                       | 8 + 3        |
| Thermostat Seat Assembly Fixing Bolt                  | 8 + 3        |
| Coolant Temperature Sensor                            | 14 ± 1       |
| Cooling Fan Assembly Fixing Bolt                      | 5 ± 1        |
| Transmission Cooling Pipe Fixing Bolt                 | 7 ± 1        |
| Coupling Bolt Between Radiator Assembly and Condenser | 7 ± 1        |
| Transmission Oil Pipe Hollow Bolt                     | 32 ± 3       |
| Water Pump Pulley Fixing Bolt                         | 20 + 5       |
| Water Pump Assembly Fixing Bolt                       | 8 + 3        |

### Coolant Capacity

| Item           | Capacity (L) |
|----------------|--------------|
| Cooling System | 7.4          |

### Coolant Concentration

| G11 Additive | Soft Water |
|--------------|------------|
| 53%          | 47%        |

### Coolant Freezing Point

| Item    | Freezing Point Value (°C) |
|---------|---------------------------|
| Coolant | -40                       |

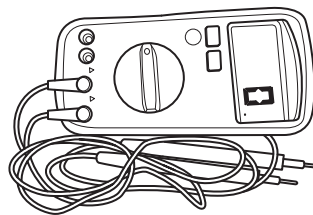
### Cooling System Test Pressure

| Item                           | Test Pressure (bar) |
|--------------------------------|---------------------|
| Cooling System (Test Pressure) | 1.3 ± 0.2           |

## Tools

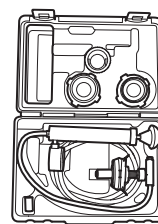
### General Tools

Digital Multimeter



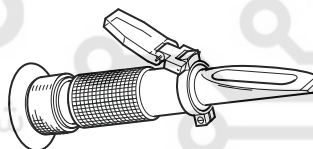
RCH0000002

Cooling System Pressure Tester



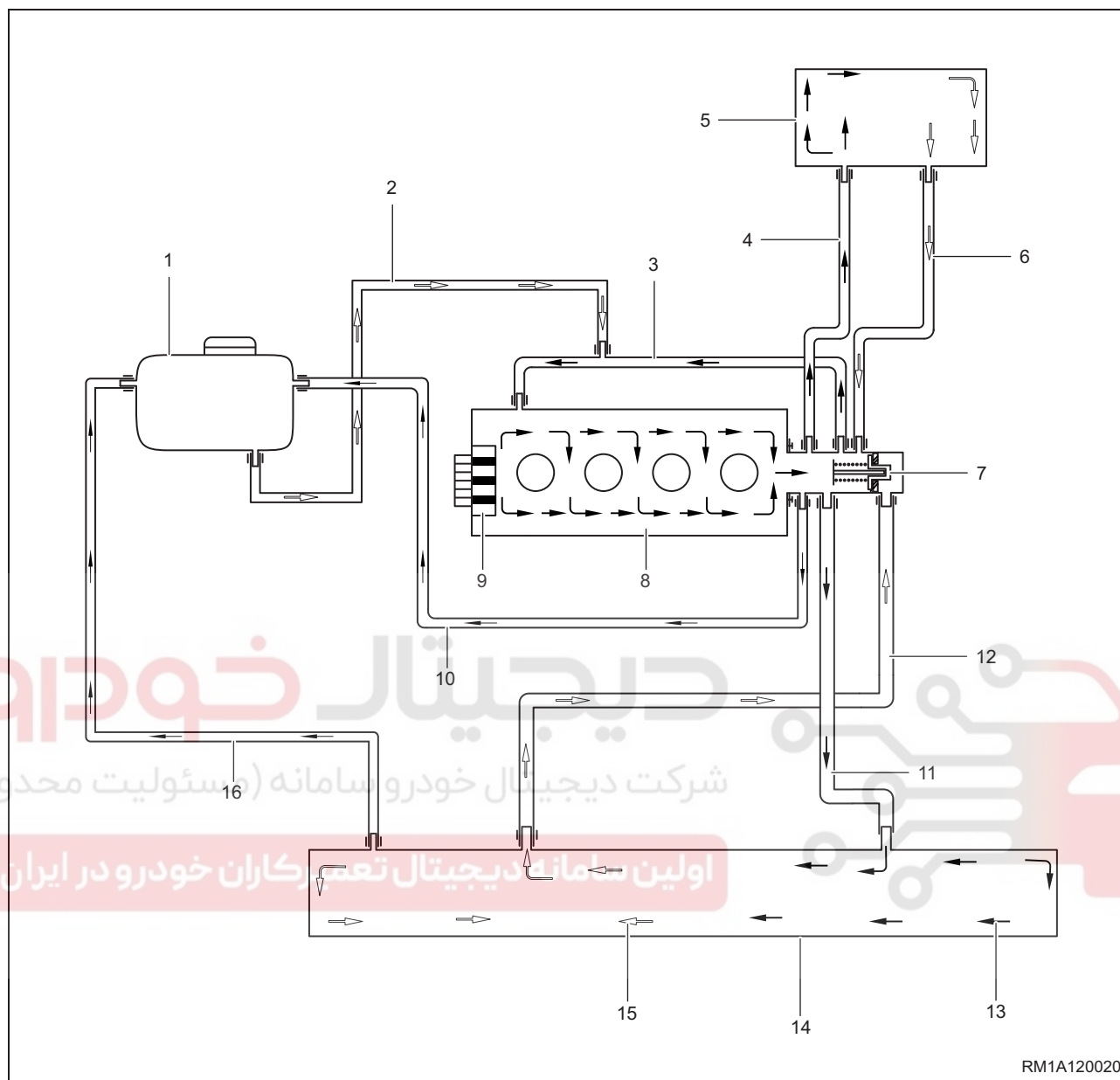
RCH0000055

Freezing Point Tester



RCH0000007

## Cooling System Operation Flowchart



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|                                                             |                                |
|-------------------------------------------------------------|--------------------------------|
| 1 - Expansion Tank                                          | 2 - Expansion Tank Outlet Pipe |
| 3 - Small Circulation Water Pipe                            | 4 - Heater Inlet Pipe          |
| 5 - Heater Core                                             | 6 - Heater Outlet Pipe         |
| 7 - Thermostat Assembly                                     | 8 - Cylinder Block             |
| 9 - Water Pump                                              | 10 - Engine Discharge Pipe     |
| 11 - Engine Outlet Pipe                                     | 12 - Engine Inlet Pipe         |
| 13 - Black Solid Arrow (Indicates High Temperature Coolant) | 14 - Radiator                  |
| 15 - Hollow Arrow (Indicates Low Temperature Coolant)       | 16 - Radiator Discharge Hose   |

## 12 - SQRE4G15B COOLING SYSTEM

Small circulation: when coolant temperature is below  $82 \pm 2^{\circ}\text{C}$ , thermostat assembly closes. Coolant only circulates inside cylinder block, and warms up other engine parts that need heat. Water pump assembly circulates engine coolant through cylinder block, electronic throttle assembly, oil cooler assembly and cylinder head. The coolant does not radiate heat through radiator.

Large circulation: when coolant temperature is higher than  $103 \pm 1^{\circ}\text{C}$ , thermostat assembly opens fully, and all coolant, which flows out of cylinder block, enters radiator for radiating. It then returns to cylinder block for circulation by water pump. Due to radiating in radiator, engine coolant temperature decreases quickly to prevent engine from overheating.

For CVT model, coolant will enter the side passage of radiator assembly under large circulation, so that temperature of transmission oil in transmission decreases.

When engine operates properly, cooling fan operates under following conditions:

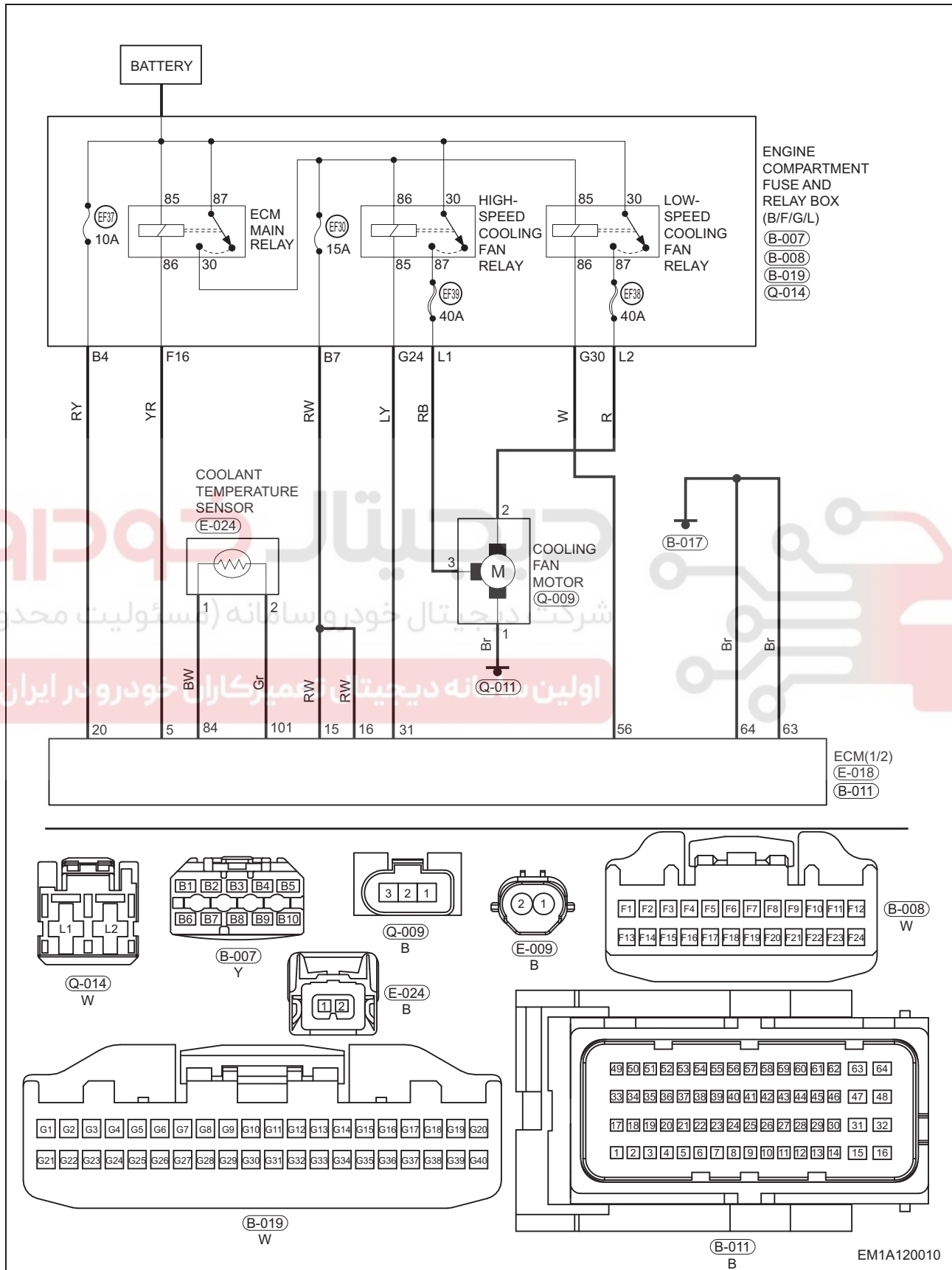
- If engine coolant temperature sensor malfunctions, cooling fan keeps rotating when engine operates properly.
- When A/C compressor is operating, cooling fan operates at low speed.
- When A/C compressor is operating and receives request from A/C pressure switch, cooling fan operates at high speed.
- When coolant temperature is higher than  $96^{\circ}\text{C}$ , cooling fan starts to operate at low speed.
- When coolant temperature is higher than  $102^{\circ}\text{C}$ , cooling fan starts to operate at high speed.
- When coolant temperature is below  $99^{\circ}\text{C}$ , cooling fan stops operating at high speed.
- When coolant temperature is below  $93^{\circ}\text{C}$ , cooling fan stops operating at low speed.





# Circuit Diagram

## Cooling System



## DIAGNOSIS & TESTING

### Problem Symptoms Table

**HINT:**

Use symptoms table below to help determine cause of problem. Check each suspected area in sequence. Repair or adjust faulty components, or replace as necessary.

| Symptom                                            | Suspected Area                                                          | See page |
|----------------------------------------------------|-------------------------------------------------------------------------|----------|
| Insufficient coolant                               | Coolant pipe (deterioration and leakage)                                | -        |
|                                                    | Expansion tank (leakage)                                                | 12-18    |
|                                                    | Radiator (leakage)                                                      | 12-27    |
|                                                    | Heater (leakage)                                                        | 30-49    |
|                                                    | Thermostat assembly (improperly sealed)                                 | 12-20    |
|                                                    | Thermostat seat assembly (cracked and damaged)                          | 12-22    |
|                                                    | Water pump (leakage)                                                    | 12-29    |
|                                                    | Engine cylinder head gasket (damaged)                                   | 07-49    |
|                                                    | Engine cylinder head (cracked and leaked)                               | 07-46    |
|                                                    | Engine cylinder block (water jacket leakage and cylinder block cracked) | 07-66    |
| Engine overheating                                 | Low coolant level                                                       | 12-14    |
|                                                    | Air resistance exists in pipe                                           | -        |
|                                                    | Expansion tank cap (damaged)                                            | -        |
|                                                    | Engine Control Module (ECM) failure                                     | 06-290   |
|                                                    | Cooling fan                                                             | 12-24    |
|                                                    | Radiator                                                                | 12-27    |
|                                                    | Thermostat assembly                                                     | 12-20    |
| Unable to reach normal engine temperature          | Cooling fan (continuously operating)                                    | 12-24    |
|                                                    | Thermostat assembly                                                     | 12-20    |
| Cooling fan does not operate or abnormal air speed | Cooling fan relay box                                                   | 54-32    |
|                                                    | Cooling fan                                                             | 12-24    |
|                                                    | Wire harness                                                            | -        |
|                                                    | Engine Control Module (ECM) failure                                     | 06-290   |

## Cooling System Leakage Test

### WARNING

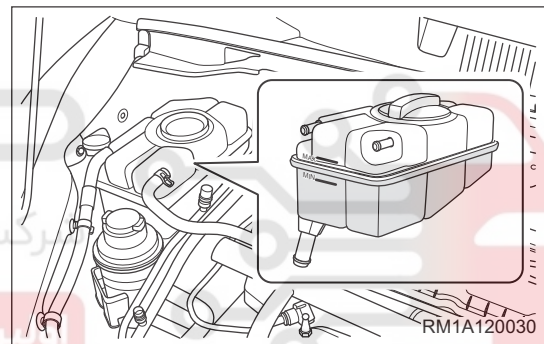
- Always make sure engine is in low temperature before operating cooling system. Never open expansion tank cap or remove drain cock plug, when engine is operating or cooling system overheats. High-pressurized hot engine coolant and steam may flow out and cause serious personal injury.

### CAUTION

- When testing cooling system, please pressurize system to specified pressure. Otherwise, it may damage system components.
- Before testing cooling system, do not perform operation until coolant temperature drops to normal level. Otherwise, it may cause scald.

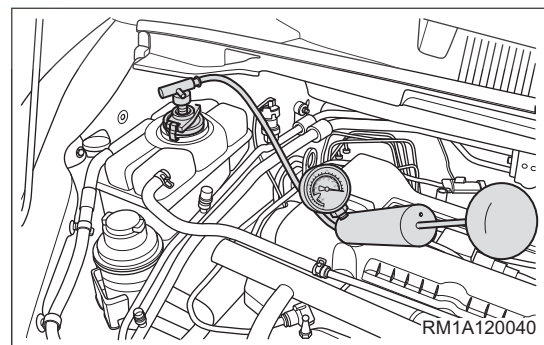
### Test Procedures

1. Turn off all electrical equipment and the ignition switch.
2. Check if coolant level is between "MAX" and "MIN" lines.  
If coolant level is below "MIN" line, add coolant.



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3. Connect cooling system pressure tester to coolant pressure release cap opening (expansion tank cap opening) and tighten it slowly.



### CAUTION

- Make sure there is no leakage in connecting part of coolant system pressure tester, in order to avoid pressure leakage during test.

## 12 - SQRE4G15B COOLING SYSTEM

- Pressurize cooling system to  $1.3 \pm 0.2$  bar with cooling system pressure tester, and then observe pressure changes. If system pressure does not drop within 2 minutes, it indicates there is no leakage in system. If pressure changes greatly, it indicates that there is a leakage in system; find leaking area and perform troubleshooting.

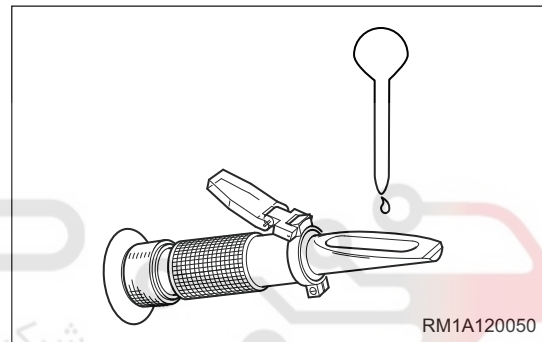
## Coolant Freezing Point Test

**CAUTION**

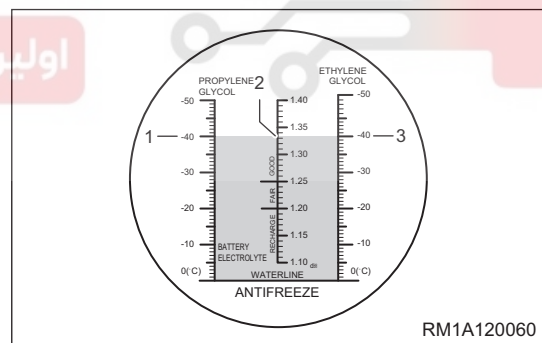
- DO NOT mix different colors or types of coolant.
- Please select coolant which is suitable for local climate in different areas.
- Please read measured value at the scale line. In order to distinguish scale line more clearly, drip a drop of water on the glass of freezing point tester with a pipette, then scale line can be clearly distinguished via a "waterline".

## Test Procedures

- As shown in illustration, drip a drop of coolant on the glass of freezing point tester with a pipette, and then observe freezing point value of coolant.



- As shown in illustration, observe scale 3 of freezing point tester to read ethylene glycol coolant freezing point value. Freezing point value must be kept at  $-40^{\circ}\text{C}$  or lower.



If freezing point is beyond specified value, replace coolant.

**HINT:**

Scale 1 is used to measure freezing point value of propylene glycol coolant, and scale 2 is used to measure density of battery electrolyte.

## ON-VEHICLE SERVICE

### Coolant Replacement

#### Coolant Draining

##### WARNING

- Always make sure engine is in low temperature before operating cooling system. Never open expansion tank cap or remove drain cock plug, when engine is operating or cooling system overheats. High-pressurized hot engine coolant and steam may flow out and cause serious personal injury.
- If your body contacts coolant accidentally, clean it with water immediately. If it is serious, please go to hospital.

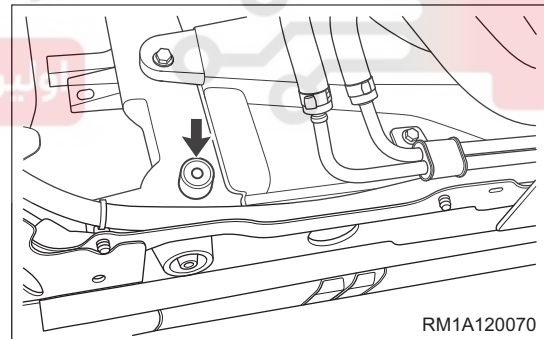
##### CAUTION

- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove expansion tank cap when engine temperature and radiator temperature are low.
4. Remove the front bumper lower protector (See page 49-20).
5. Put a coolant collector under vehicle, rotate radiator drain cock plug (arrow) and drain coolant in radiator and expansion tank.

##### HINT:

Put a drainage device or similar tool at radiator outlet, so that coolant can flow into collector smoothly.



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6. After coolant stops flowing, retighten radiator drain cock plug.

##### CAUTION

- Tighten drain cock plug to prevent leakage.

##### ENVIRONMENTAL PROTECTION

- Wasted coolant should be handled by the specialized department according to local laws and regulations. Never discard it at will.

## 12 - SQRE4G15B COOLING SYSTEM

**Coolant Adding**

Only use coolant that meets Chery specifications.

**Coolant Capacity**

| Item           | Capacity (L) |
|----------------|--------------|
| Cooling System | 7.4          |

**Coolant Concentration**

| G11 Additive | Soft Water |
|--------------|------------|
| 53%          | 47%        |

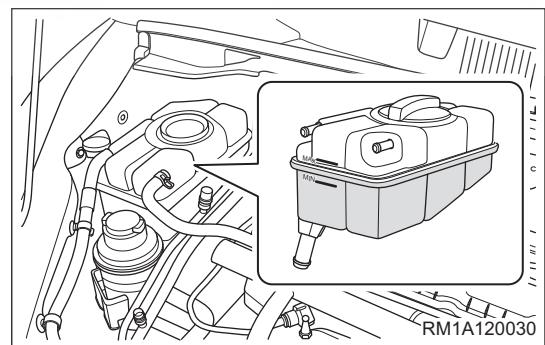
**⚠ WARNING**

- If it is necessary to add coolant when engine is hot, loosen expansion tank cap slightly first to release internal pressure and loosen cap completely after waiting for a while, and then add coolant.
- If your body contacts coolant accidentally, clean it with water immediately. If it is serious, please go to hospital.

**👁 CAUTION**

- DO NOT use inferior coolant.
- DO NOT mix different colors or types of coolant.
- Be careful when adding coolant; avoid spilling coolant on any area of engine.

1. Open expansion tank cap and add coolant until coolant level reaches "MAX" line.



2. Tighten expansion tank cap, start and run engine. Maintain engine speed between 2000 and 2500 rpm to warm up engine until cooling fan operates.

**CAUTION**

- If there is no coolant in expansion tank after engine just starts, perform the followings:
  - Stop engine;
  - Wait until coolant cools down;
  - Add coolant to "MAX" line on expansion tank.
- Run the engine at 2500 rpm until coolant level becomes stable.

3. Stop engine and wait until coolant temperature drops to ambient temperature. Check that coolant level is between "MAX" and "MIN" lines. If coolant level is below "MIN" line, repeat all above procedures. If coolant level is above "MAX" line, drain coolant until level is between "MAX" and "MIN" lines.

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## Tank Upper Crossmember Assembly

### Removal

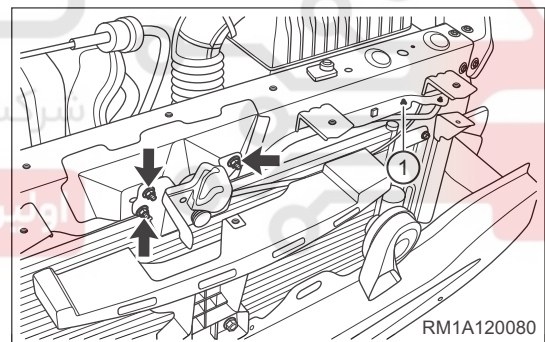
#### WARNING

- Perform removal procedures with engine compartment at low temperature, after cooling fan stops completely; otherwise rotating cooling fan or hot components of engine compartment may cause serious injury.

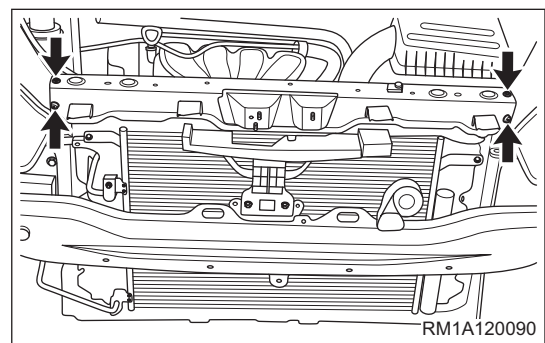
#### CAUTION

- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove the front bumper assembly (See page 49-8).
4. Remove the air direct pipe assembly (See page 10-11).
5. Remove the tank upper crossmember assembly.
  - a. Remove 3 fixing bolts (arrow) from hood lock assembly.  
(Tightening torque:  $9 \pm 1$  N·m)
  - b. Remove hood lock cable fixing clip (1) from tank upper crossmember.

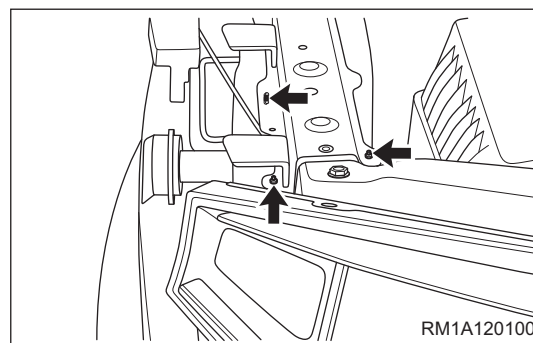


- c. Remove 4 fixing bolts (arrow) from tank upper crossmember assembly.  
(Tightening torque:  $9 \pm 1$  N·m)

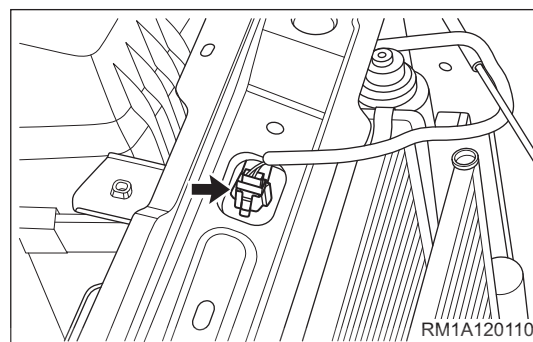




- d. Remove engine compartment contact switch fixing clips (arrow) from tank upper crossmember.

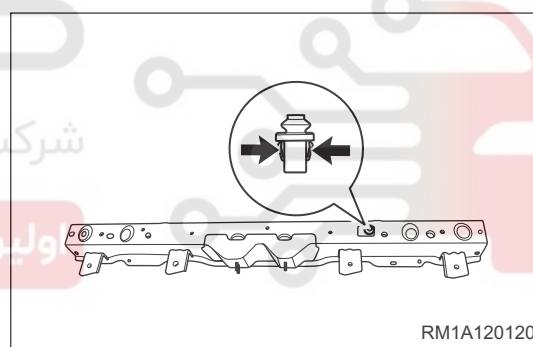


- e. Turn over tank upper crossmember, and disconnect engine compartment contact switch connector (arrow).



- f. Remove the tank upper crossmember assembly.

6. Remove engine compartment contact switch (arrow) from tank upper crossmember in direction of arrow as shown in illustration.



## Installation

Installation is in the reverse order of removal.

## Expansion Tank

### Removal

#### ⚠ WARNING

- Always make sure engine is in low temperature before operating cooling system. Never open expansion tank cap or remove drain cock plug, when engine is operating or cooling system overheats. High-pressurized hot engine coolant and steam may flow out and cause serious personal injury.
- If your body contacts coolant accidentally, clean it with water immediately. If it is serious, please go to hospital.

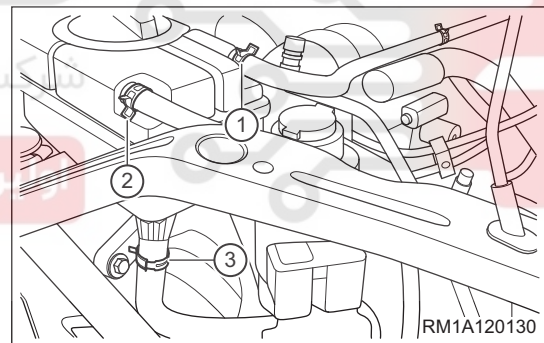
#### 👁 CAUTION

- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.

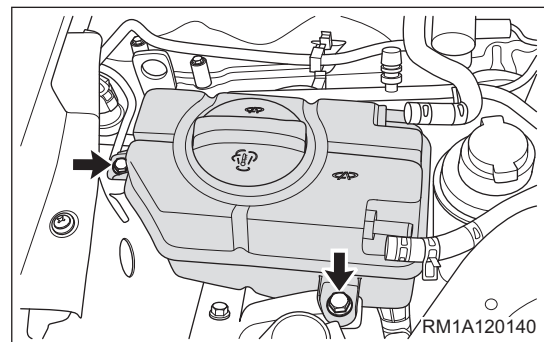
1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Drain the coolant (See page 12-13).
4. Remove the expansion tank.

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- a. Loosen elastic clamp (1) and disconnect connection between expansion tank and engine discharge hose.
- b. Loosen elastic clamp (2) and disconnect connection between expansion tank and radiator discharge hose.
- c. Loosen elastic clamp (3) and disconnect connection between expansion tank and expansion tank outlet hose.



- d. Remove 2 fixing bolts (arrow) from expansion tank. (Tightening torque:  $5 \pm 1$  N·m)



- e. Remove expansion tank from expansion tank bracket.

## Installation

Installation is in the reverse order of removal.

### CAUTION

- Check that coolant has been added to specified level after installation.



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## Thermostat Assembly

### Removal

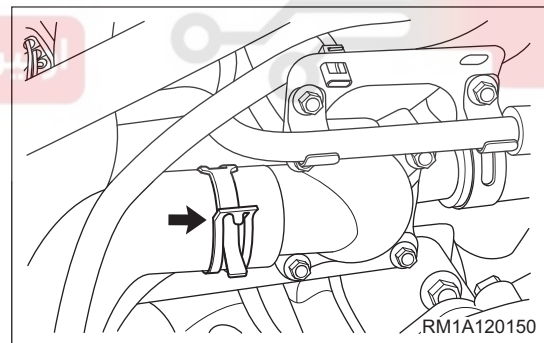
#### ⚠ WARNING

- Always make sure engine is in low temperature before operating cooling system. Never open expansion tank cap or remove drain cock plug, when engine is operating or cooling system overheats. High-pressurized hot engine coolant and steam may flow out and cause serious personal injury.
- If your body contacts coolant accidentally, clean it with water immediately. If it is serious, please go to hospital.

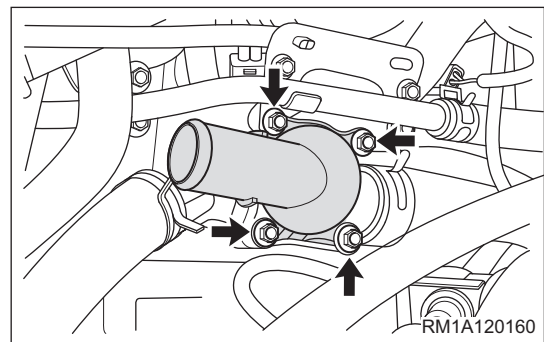
#### 👁 CAUTION

- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove the engine trim cover.
4. Remove the battery (See page 16-7).
5. Remove the battery tray bracket (See page 16-9).
6. Drain the coolant (See page 12-13).
7. Remove the thermostat assembly.
  - a. Loosen elastic clamp (arrow) and disconnect connection between engine inlet hose and thermostat housing assembly.



- b. Remove 4 fixing bolts (arrow) from thermostat housing assembly.  
(Tightening torque: 8 + 3 N·m)



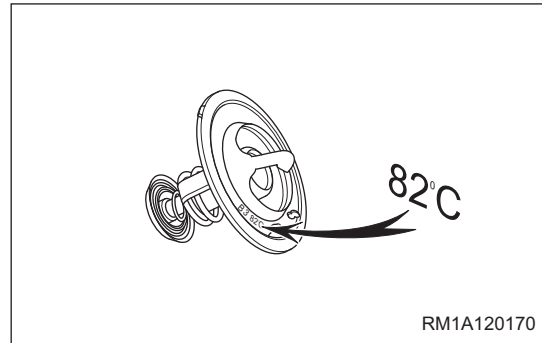
- c. Remove thermostat housing assembly and remove thermostat assembly from thermostat seat assembly.

## Inspection

1. Check opening temperature and maximum lift of thermostat assembly.

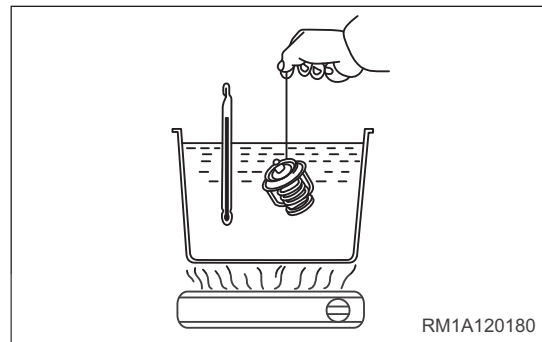
### HINT:

Valve opening temperature is engraved in thermostat assembly.



- a. Soak thermostat assembly in water, heat water gradually and perform inspection.

- Opening temperature of thermostat assembly is 82°C.
- Maximum lift of thermostat assembly is no less than 8 mm.
- Temperature is 95°C when thermostat assembly opens fully.



- b. Check that thermostat assembly closes when thermostat assembly temperature is low (5°C lower than opening temperature).
- c. If above conditions are not met, replace thermostat assembly.

## Installation

Installation is in the reverse order of removal.

### CAUTION

- Check that coolant has been added to specified level after installation.

## Thermostat Seat Assembly

### Removal

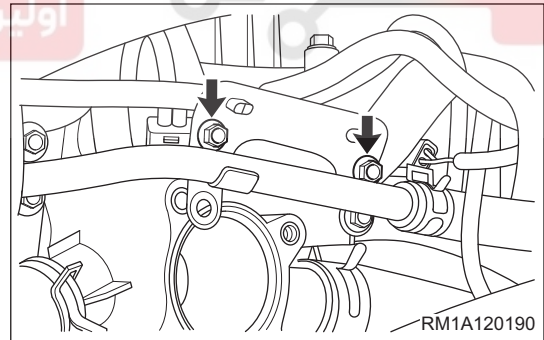
#### ⚠ WARNING

- Always make sure engine is in low temperature before operating cooling system. Never open expansion tank cap or remove drain cock plug, when engine is operating or cooling system overheats. High-pressurized hot engine coolant and steam may flow out and cause serious personal injury.
- If your body contacts coolant accidentally, clean it with water immediately. If it is serious, please go to hospital.

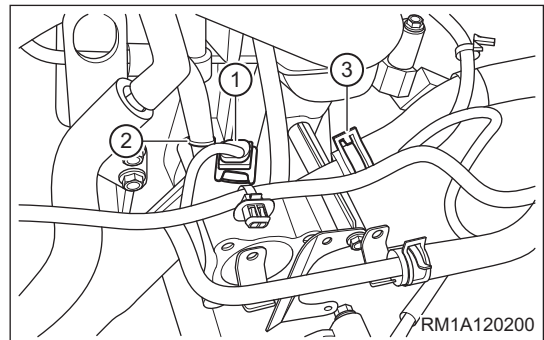
#### 👁 CAUTION

- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove the engine trim cover.
4. Remove the battery (See page 16-7).
5. Remove the battery tray (See page 16-9).
6. Drain the coolant (See page 12-13).
7. Remove the thermostat assembly (See page 12-20).
8. Remove the thermostat seat assembly.
  - a. Remove 2 fixing bolts (arrow) from vacuum booster pipe.  
(Tightening torque:  $8 + 3 \text{ N}\cdot\text{m}$ )

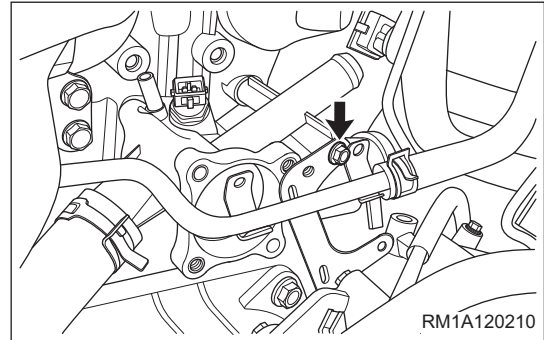


- b. Disconnect the coolant temperature sensor connector (1).
- c. Loosen elastic clamp (2) and disconnect connection between engine discharge hose and thermostat seat assembly.
- d. Loosen elastic clamp (3) and disconnect connection between heater outlet hose and thermostat seat assembly.

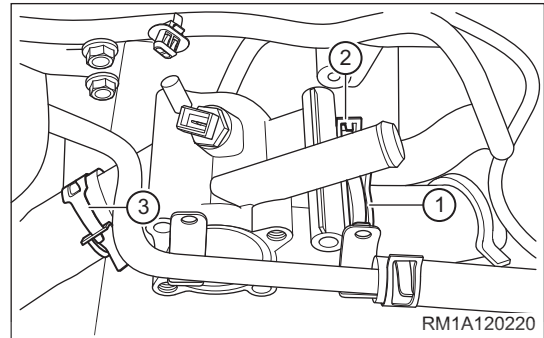


## 12 - SQRE4G15B COOLING SYSTEM

- e. Remove fixing bolt (arrow) from thermostat seat assembly.  
(Tightening torque:  $8 + 3 \text{ N}\cdot\text{m}$ )

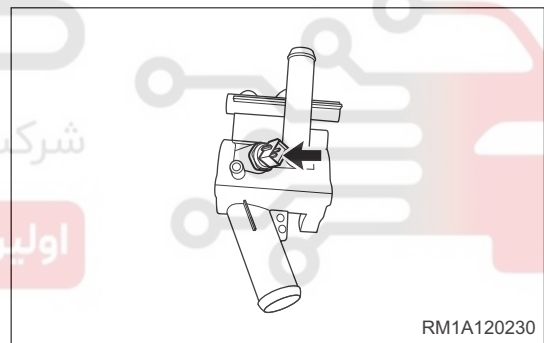


- f. Loosen hose clamp (1) and disconnect connection between small circulation outlet hose and thermostat seat assembly.  
g. Loosen hose clamp (2) and disconnect connection between heater inlet hose and thermostat seat assembly.  
h. Loosen elastic clamp (3) and disconnect connection between engine outlet hose and thermostat seat assembly.



- i. Remove thermostat seat and thermostat seat O-ring.

9. Remove coolant temperature sensor (arrow) from thermostat seat assembly.  
(Tightening torque:  $14 \pm 1 \text{ N}\cdot\text{m}$ )



12

## Installation

Installation is in the reverse order of removal.

### CAUTION

- Check that coolant has been added to specified level and removed area for leakage after installation.
- Replace thermostat seat O-ring with a new one during installation, and removed thermostat seat O-ring cannot be reused.



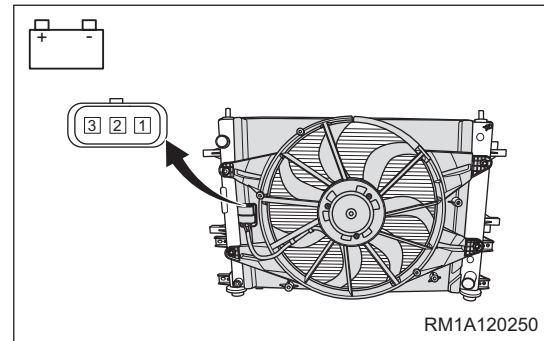
## Cooling Fan Assembly

### On-vehicle Inspection

1. Apply battery voltage to specified connector terminals of cooling fan respectively according to table below, and check that cooling fan operates smoothly when applying battery voltage.

| Measurement Condition                                                  | Condition | Specified Condition |
|------------------------------------------------------------------------|-----------|---------------------|
| Battery positive (+) - Terminal 2<br>Battery negative (-) - Terminal 1 | Always    | Operates smoothly   |
| Battery positive (+) - Terminal 3<br>Battery negative (-) - Terminal 1 | Always    | Operates smoothly   |

If inspection result is not as specified, replace cooling fan assembly (See page 12-24, 12-25).



### Removal

12

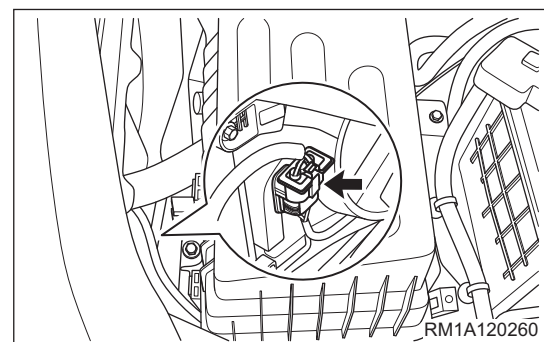
#### ⚠ WARNING

- Perform removal procedures with engine compartment at low temperature after cooling fan stops completely, to prevent accidents.

#### 👁 CAUTION

- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.

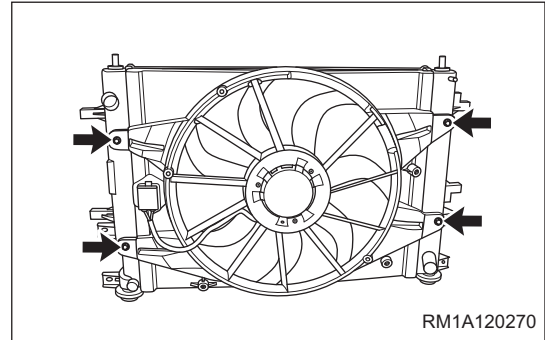
1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove the air direct pipe assembly (See page 10-11).
4. Remove the cooling fan assembly (for MT model).
  - a. Disconnect the cooling fan connector (arrow).



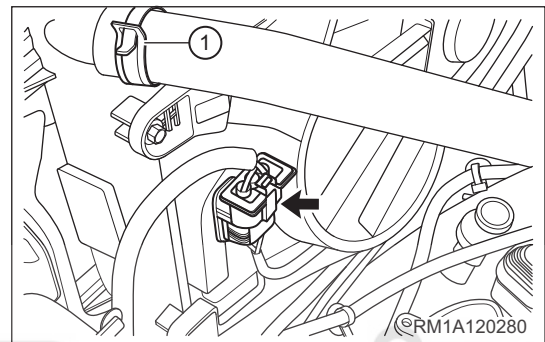


## 12 - SQRE4G15B COOLING SYSTEM

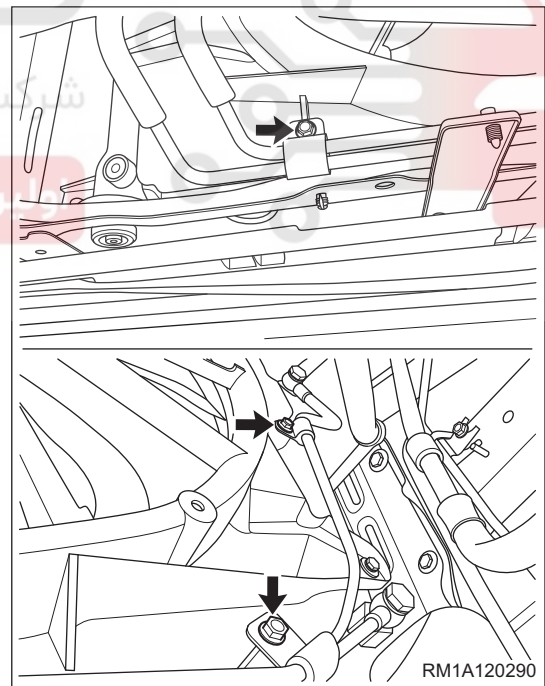
- b. Remove 4 fixing bolts (arrow) from cooling fan assembly.  
(Tightening torque:  $5 \pm 1$  N·m)



- c. Remove cooling fan assembly from radiator assembly.
5. Remove the cooling fan assembly (for CVT model).
- a. Drain the coolant (See page 12-13).
- b. Loosen elastic clamp (1) and disconnect connection between engine outlet hose and radiator.
- c. Disconnect the cooling fan connector (arrow).

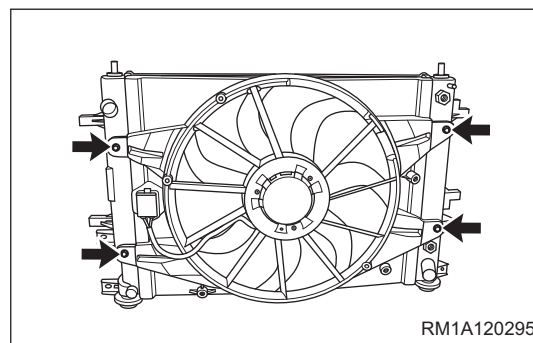


- d. Remove 3 fixing bolts (arrow) of transmission cooling pipe from cooling fan assembly.  
(Tightening torque:  $7 \pm 1$  N·m)



## 12 - SQRE4G15B COOLING SYSTEM

- e. Remove 4 fixing bolts (arrow) from cooling fan assembly.  
(Tightening torque:  $7 \pm 1$  N·m)



- f. Remove cooling fan assembly from radiator assembly.

**Installation**

Installation is in the reverse order of removal.

**CAUTION**

- Check that coolant has been added to specified level after installation.



## Radiator Assembly

### Removal

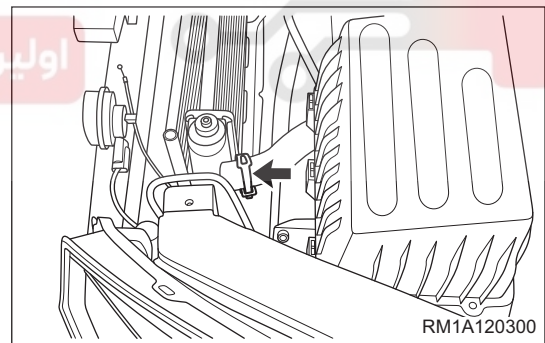
#### WARNING

- Always make sure engine is in low temperature before operating cooling system. Never open expansion tank cap or remove drain cock plug, when engine is operating or cooling system overheats. High-pressurized hot engine coolant and steam may flow out and cause serious personal injury.
- If your body contacts coolant accidentally, clean it with water immediately. If it is serious, please go to hospital.

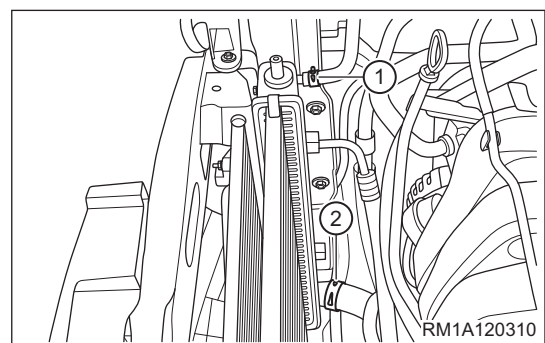
#### CAUTION

- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove the front bumper assembly (See page 49-8).
4. Remove the tank upper crossmember assembly (See page 12-16).
5. Drain the coolant (See page 12-13).
6. Remove the cooling fan assembly (See page 12-24).
7. Remove the radiator assembly (for MT model).
  - a. Loosen elastic clamp (arrow) and disconnect connection between engine outlet hose and radiator assembly.

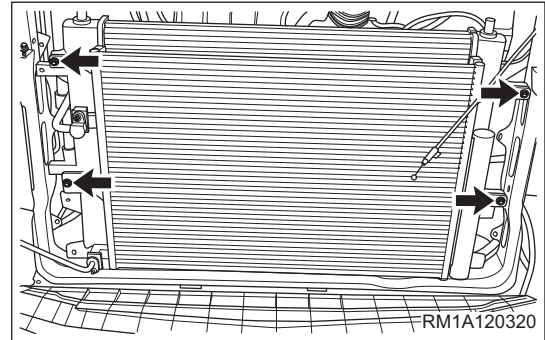


- b. Loosen elastic clamp (1) and disconnect connection between radiator discharge pipe and radiator assembly.
- c. Loosen elastic clamp (2) and disconnect connection between engine inlet pipe and radiator assembly.



## 12 - SQRE4G15B COOLING SYSTEM

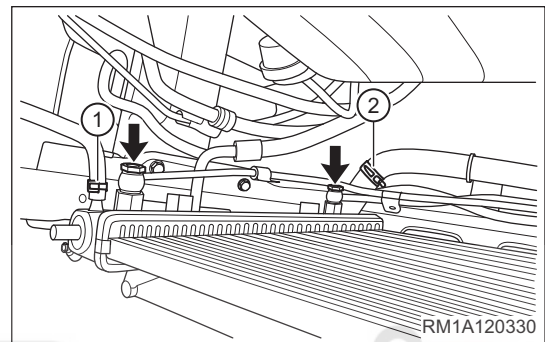
- d. Remove 4 coupling bolts (arrow) between radiator assembly and condenser.  
(Tightening torque:  $7 \pm 1$  N·m)



- e. Remove the radiator assembly.

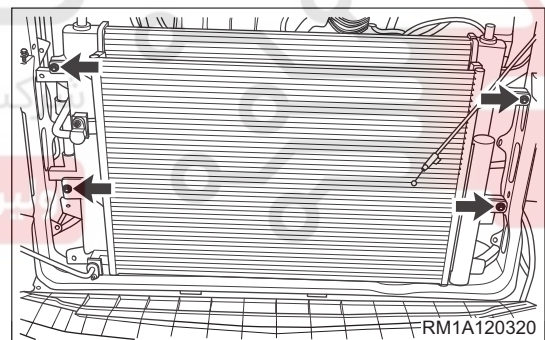
8. Remove the radiator assembly (for CVT model).

- a. Loosen and remove 2 hollow bolts (arrow) on transmission oil pipe.  
(Tightening torque:  $32 \pm 3$  N·m)
- b. Loosen elastic clamp (1) and disconnect connection between radiator discharge hose and radiator assembly.
- c. Loosen elastic clamp (2) and disconnect connection between engine inlet hose and radiator assembly.



12

- d. Remove 4 coupling bolts (arrow) between radiator assembly and condenser.  
(Tightening torque:  $7 \pm 1$  N·m)



- e. Remove the radiator assembly.

## Installation

Installation is in the reverse order of removal.

## Water Pump Assembly

### Removal

#### WARNING

- Always make sure engine is in low temperature before operating cooling system. Never open expansion tank cap or remove drain cock plug, when engine is operating or cooling system overheats. High-pressurized hot engine coolant and steam may flow out and cause serious personal injury.
- If your body contacts coolant accidentally, clean it with water immediately. If it is serious, please go to hospital.

#### CAUTION

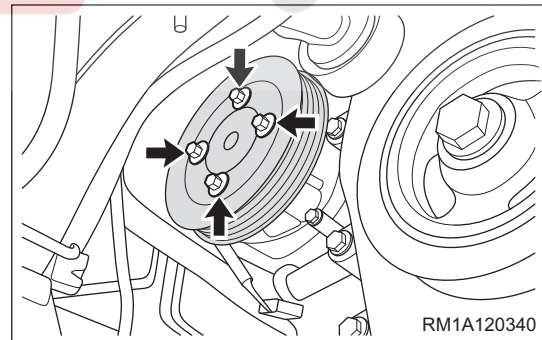
- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove the engine trim cover.
4. Remove the front bumper lower protector (See page 49-20).
5. Drain the coolant (See page 12-13).
6. Move away the accessory drive belt (See page 07-20).

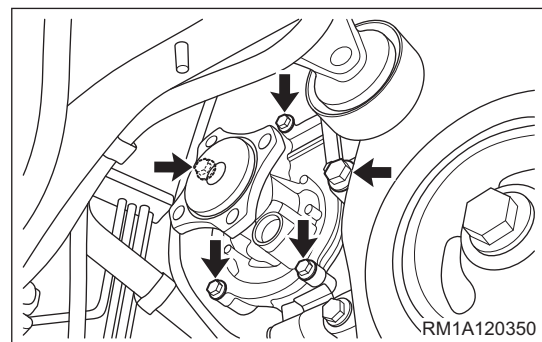
#### HINT:

Loosen water pump pulley fixing bolts with a wrench, before moving away accessory drive belt.

7. Remove the water pump assembly.
  - a. Remove 4 fixing bolts (arrow) from water pump pulley, and remove water pump pulley. (Tightening torque:  $20 + 5 \text{ N}\cdot\text{m}$ )



- b. Remove 5 fixing bolts (arrow) from water pump assembly. (Tightening torque:  $8 + 3 \text{ N}\cdot\text{m}$ )



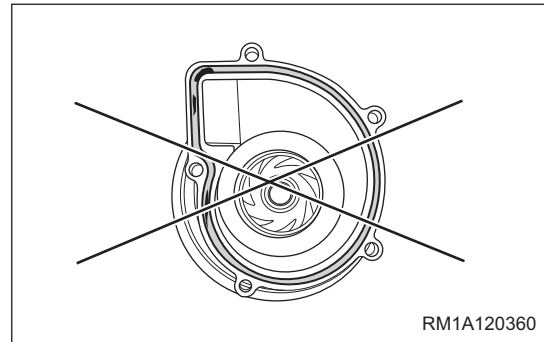
## 12 - SQRE4G15B COOLING SYSTEM

- c. Remove water pump assembly and seal ring.

**Inspection**

1. Check the water pump seal ring.

Check water pump seal ring for wear or deterioration. If wear or deterioration is found, replace seal ring.



2. Check the water pump assembly.

Check water pump assembly carefully. If any of the following occurs, replace water pump assembly immediately:

- Contact surface between water pump assembly and oil filter module assembly is uneven.
- Impeller of water pump assembly is damaged.
- Bearing of water pump assembly is loose.
- There is abnormal noise when water pump assembly works.

**Installation**

Installation is in the reverse order of removal.

**CAUTION**

- Clean installation surface of water pump assembly.
- If water pump is damaged, replace rather than attempt to repair it.
- Check that coolant has been added to specified level after installation.
- Perform cooling system pressure test after adding coolant, to check cooling system for leakage.