

SQRE4T15/SQRE4T15B COOLING SYSTEM

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دیجیتال خودرو

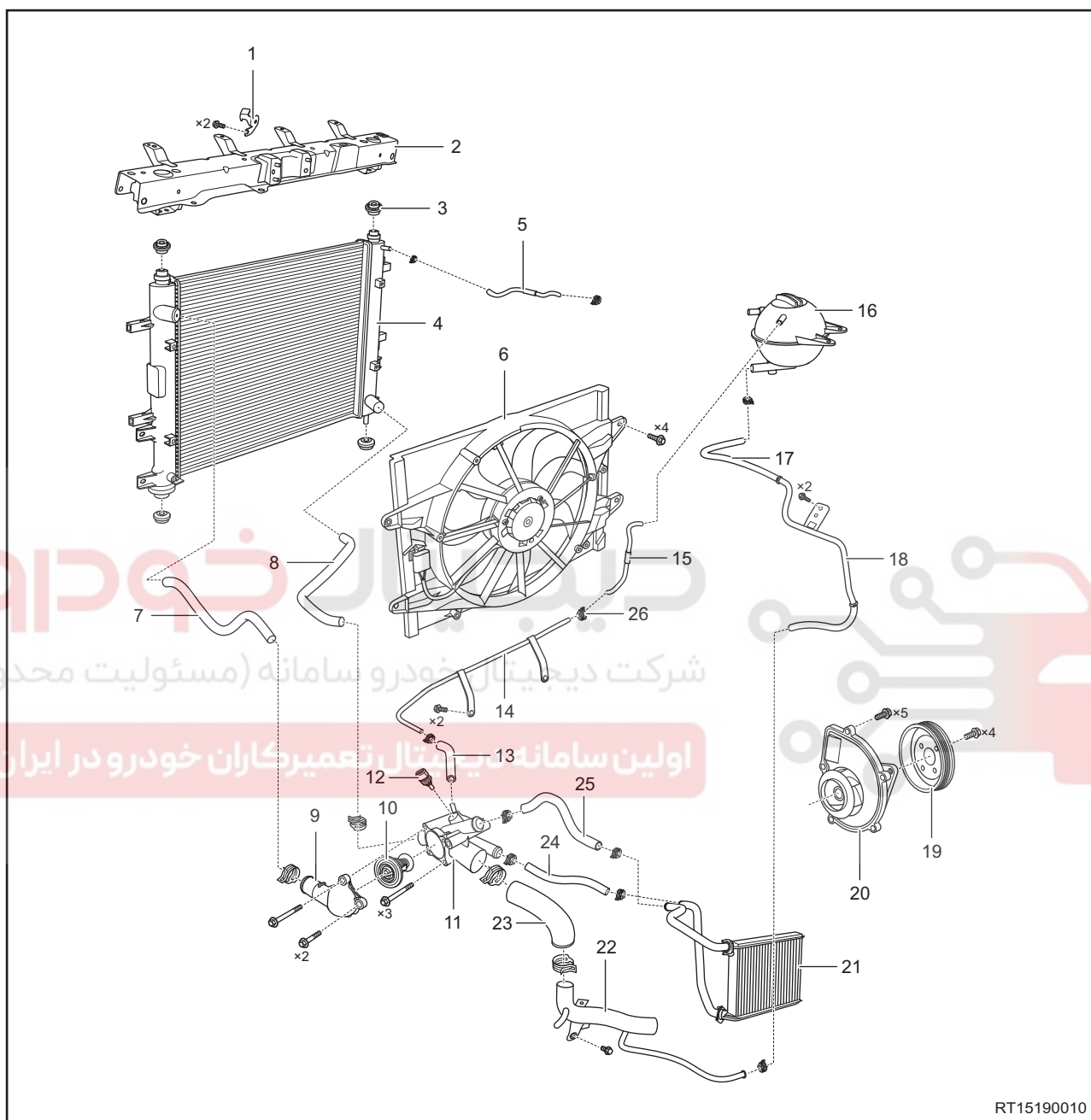
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اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



GENERAL INFORMATION

Description



20 - SQRE4T15/SQRE4T15B COOLING SYSTEM

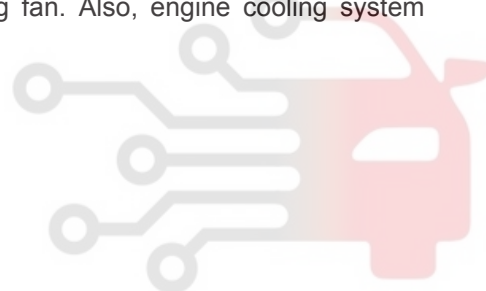
1 - Engine Hood Secondary Lock Bracket	2 - Radiator Upper Crossmember Assembly
3 - Rubber Bushing	4 - Radiator
5 - Radiator Discharge Pipe	6 - Radiator Fan
7 - Engine Outlet Hose	8 - Engine Inlet Hose
9 - Thermostat Housing	10 - Thermostat
11 - Thermostat Seat	12 - Coolant Temperature Sensor
13 - Engine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

Engine cooling system adjusts engine operating temperature by the flowing 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 the 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 the heater core in cabin to improve driving comfort.

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Specifications

Torque Specification

Description	Torque (N·m)
Expansion Tank Fixing Nut	7 ± 1
Thermostat Housing Fixing Bolt	$8 + 3$
Thermostat Seat Fixing Bolt	$8 + 3$
Coolant Temperature Sensor	14 ± 1
Cooling Fan Fixing Bolt	7 ± 1
Radiator Upper Crossmember Fixing Bolt	9 ± 1
Water Pump Fixing Bolt	8 ± 3
Coupling Bolt Between Radiator and Condenser	7 ± 1
Water Pump Pulley Fixing Bolt	20 ± 5

Coolant Capacity

Item	Capacity (L)
Cooling System	7.5 ± 0.5 (1.5TCI + 6MT)
	9.0 ± 0.5 (1.5TCI + DCT)

Coolant Concentration

G11 Additive	Soft Water
53%	47%

Coolant Freezing Point

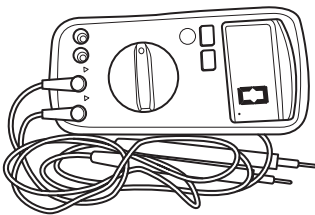
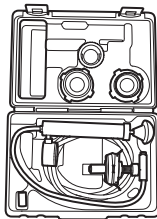
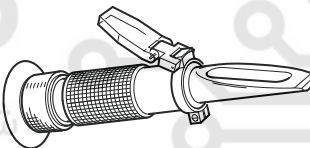
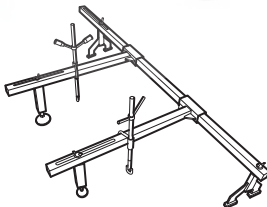
Item	Freezing Point Value (°C)
Coolant	-40

Cooling System Test Pressure

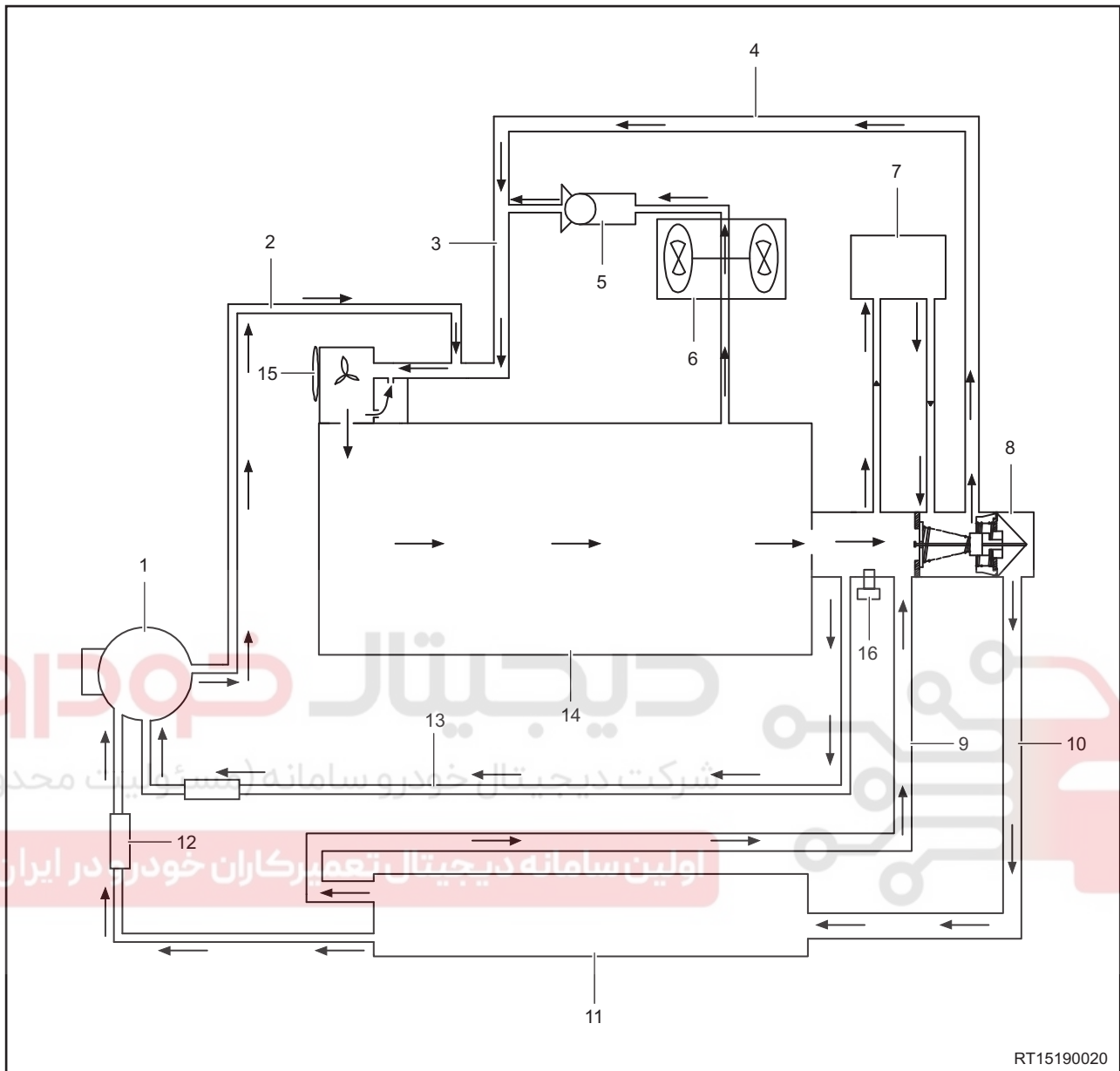
Item	Test Pressure (bar)
Cooling System (Test Pressure)	1.2

Tools

General Tools

Digital Multimeter	 RCH0000002
Cooling System Pressure Tester	 RCH0000055
Freezing Point Tester	 RCH0000007
Engine Hoist	 RCH0000026

Cooling System Operation Flowchart



1 - Expansion Tank	2 - Expansion Tank Outlet Hose
3 - Coolant Assembling Integrated Pipe	4 - Small Circulation Water Pipe
5 - Electronic Water Pump Assembly	6 - Turbocharger
7 - Heater Core Assembly	8 - Thermostat Assembly
9 - Engine Inlet Pipe	10 - Engine Outlet Pipe
11 - Radiator Assembly	12 - Shutoff Valve
13 - Engine Discharge Pipe	14 - Cylinder Block
15 - Water Pump Assembly	16 - Coolant Temperature Sensor

Small circulation: when coolant temperature is below $82 \pm 2^{\circ}\text{C}$, thermostat assembly closes with coolant only circulating inside the 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, turbocharger and cylinder head. The coolant can radiate heat not through radiator.

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Large circulation: when coolant temperature is higher than 95°C, thermostat assembly opens fully and all coolant flowing out from cylinder block enters radiator to radiate heat. The heat-radiated coolant returns to cylinder block for circulation by water pump. Because radiator can bring some heat, engine coolant temperature decreases quickly to prevent engine from overheating.

Fan Control Logic

1. Fan control logic when engine runs normally:

Different fan speeds are determined and controlled by ECU according to coolant temperature, A/C pressure signal and vehicle speed signal.

Vehicle speed limit valve values when fan stops operating under various conditions are as follows:

- a. Low speed fan operates when coolant temperature is higher than 96° and vehicle speed is less than 80; low speed fan stops operating when coolant temperature is less than 93°.
- b. High speed fan operates when coolant temperature is higher than 103° and vehicle speed is less than 80; high speed fan stops operating when coolant temperature is less than 100°.
- c. High speed fan operates when coolant temperature is higher than 110° and vehicle speed is higher than 80; high speed fan stops operating when coolant temperature is less than 107°.

2. Fan control logic after engine stalling:

- a. After engine stalling, fan operates when engine coolant temperature exceeds 101°C and fan stops operating when coolant temperature drops to 98°C.
- b. After engine stalling, fan operates when engine intake temperature exceeds 70°C and fan stops operating when intake temperature drops to 67°C.

HINT:

Allowable maximum operating time for fan after engine stalling is 40s. Fan will stop operating after it operates for more than 40s.

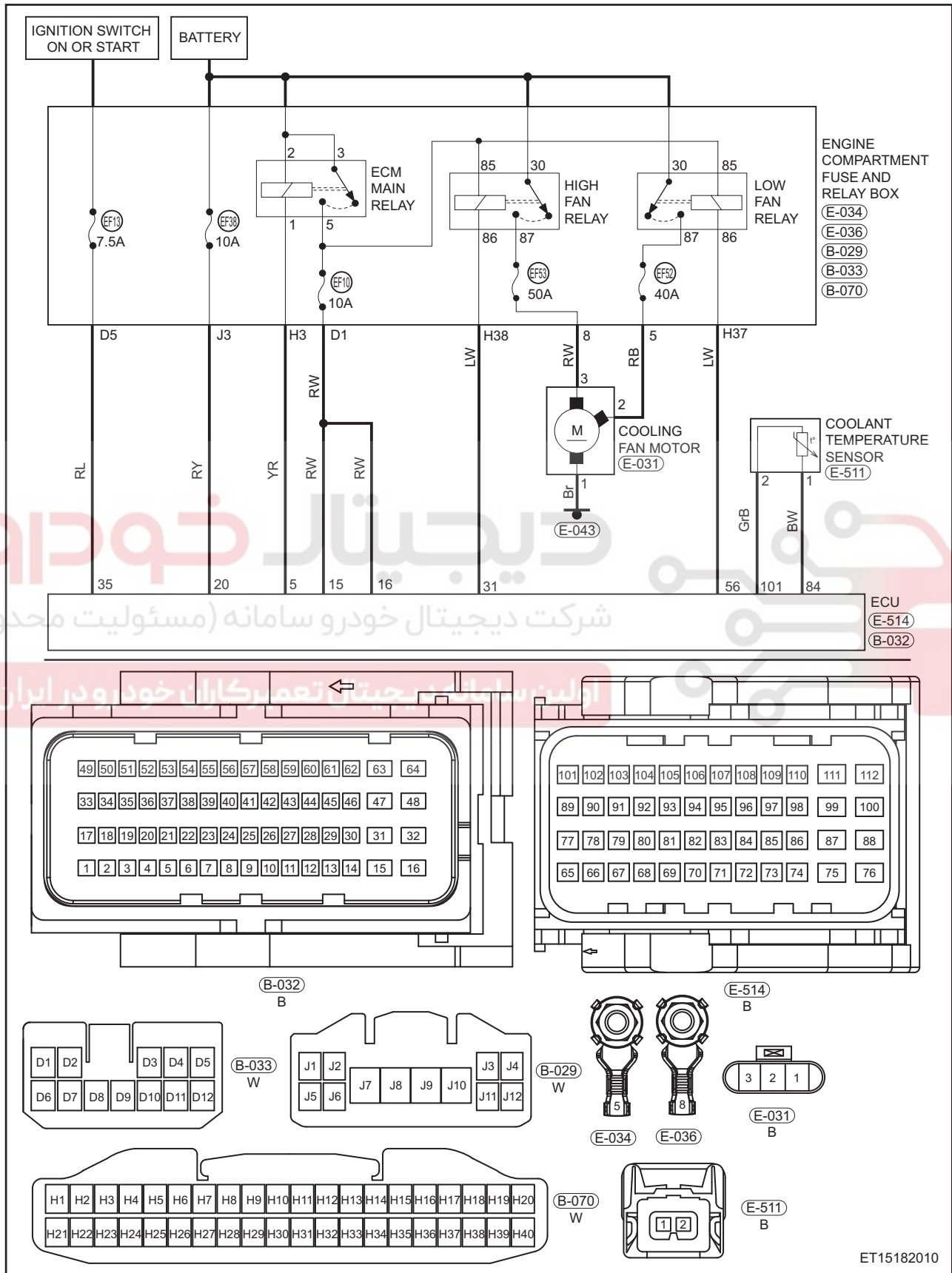


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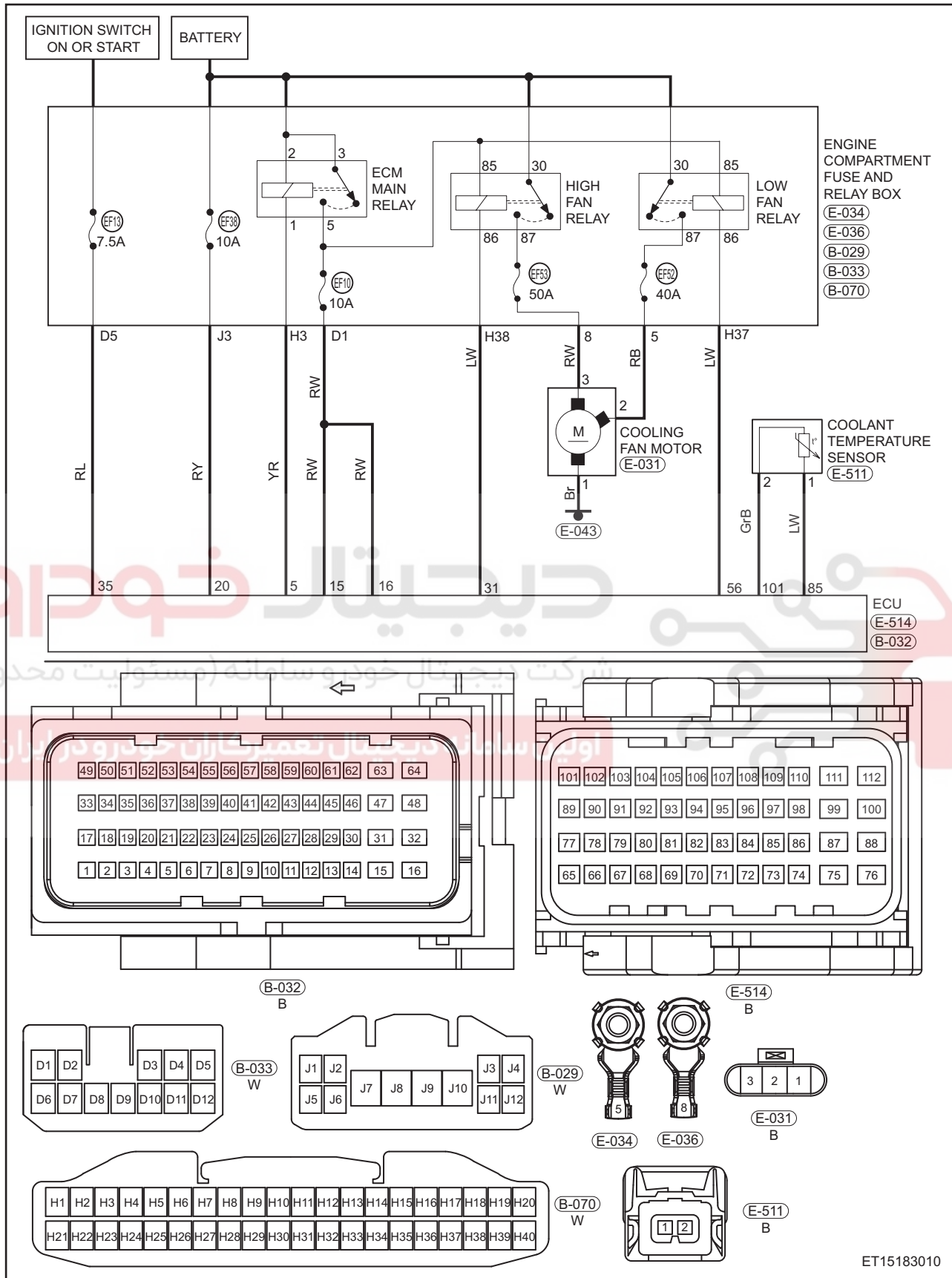
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Circuit Diagram

Cooling System (1.5 TCI + 6MT) (Page 1 of 2)



Cooling System (1.5 TCI + DCT) (Page 2 of 2)



ET15183010

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 (deteriorated and leaked)	-
	Expansion tank (leaked)	20-18
	Radiator (leaked)	20-31
	Heater core (leaked)	44-101
	Thermostat assembly improperly sealed	20-20
	Thermostat seat assembly (cracked and damaged)	20-24
	Water pump (leaked)	20-33
	Engine cylinder head gasket (damaged)	10-52
	Engine cylinder head (cracked and leaked)	10-52
	Engine cylinder block (water jacket leaked and cylinder block cracked)	10-88
Engine overheating	Low coolant level	20-15
	Air resistance exists in pipe	-
	Expansion tank cap damaged	-
	Engine Control Module (ECM) failure	07-308
	Cooling fan	20-29
	Radiator	20-31
	Thermostat assembly	20-20
Unable to reach normal engine operating temperature	Cooling fan (constantly operating)	20-29
	Thermostat assembly	20-20
Cooling fan does not operate or air speed is abnormal	Cooling fan controller	-
	Cooling fan	20-29
	Wire harness	-
	Engine Control Module (ECM) failure	07-308

Cooling System Leakage Test

⚠ WARNING

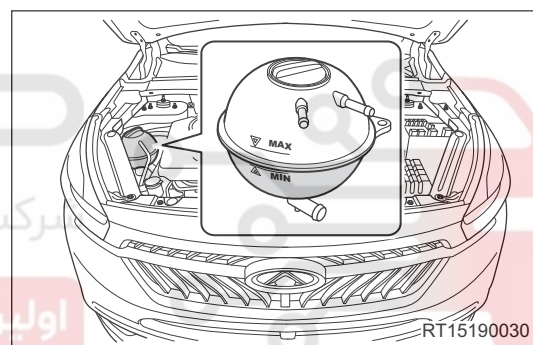
- Always make sure engine is cold before operating cooling system. Never open expansion tank cap or remove drain cock plug, when engine is operating or cooling system overheats. The overheated engine coolant and steam with high-pressure may flow out and cause serious personal injury.

👁 CAUTION

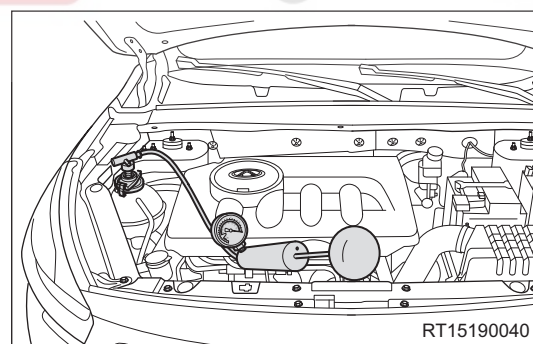
- When testing cooling system, please pressurize the system to specified pressure. Otherwise, it may damage system components.
- Before testing cooling system, do not perform operation until coolant temperature drops to normal level. Otherwise, it may cause scald.

Test Procedures

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



3. Connect the 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.

4. Pressurize cooling system to 1.2 bar with the cooling system pressure tester, and then observe the 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 the leaking area and perform troubleshooting.

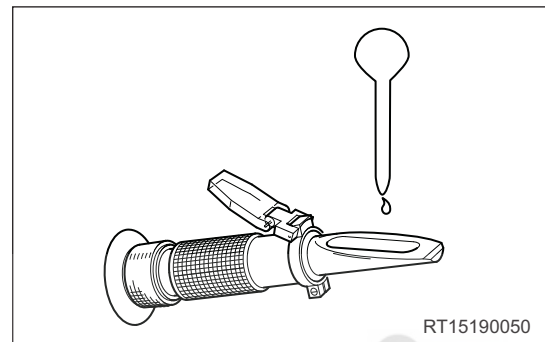
Coolant Freezing Point Test

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 the scale line more clearly, drip a drop of water on the glass of freezing point tester with a pipette, then the scale line can be clearly distinguished via a "waterline".

Test Procedures

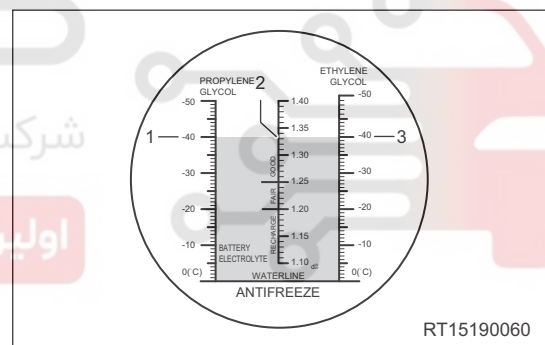
1. As shown in illustration, drip a drop of coolant on the glass of freezing point tester with a pipette, and then observe freezing point value of coolant.



2. As shown in illustration, observe scale 3 of freezing point tester to read ethylene glycol coolant freezing point value. The freezing point value must be kept at about -40°C (value varies with geography, climate, or freezing point). If freezing point is beyond the specified value, replace the coolant.

HINT:

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



ON-VEHICLE SERVICE

Coolant Replacement

Coolant Draining

WARNING

- Always make sure engine is cold before operating cooling system. Never open expansion tank cap or remove drain cock plug, when engine is operating or cooling system overheats. The overheated engine coolant and steam with high-pressure 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.

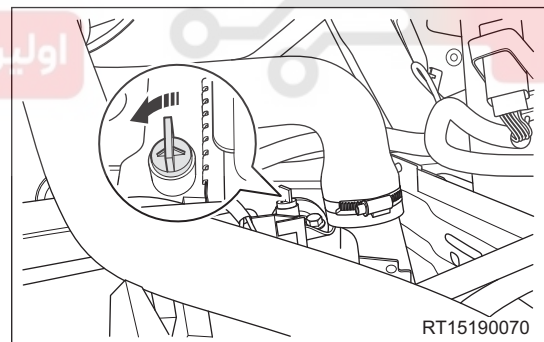
CAUTION

- 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 engine switch.
2. Disconnect the negative battery cable.
3. Remove the expansion tank cap when engine temperature and radiator temperature are low.
4. Remove the engine lower protector assembly.
5. Put a coolant collector under the vehicle, rotate the radiator drain cock plug (arrow) and drain the coolant in radiator and expansion tank.

HINT:

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



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6. After coolant stops flowing, retighten the 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.

Coolant Adding

Only use coolant that meets Chery specifications.

Coolant Capacity

Item	Capacity (L)
Cooling System	7.5 ± 0.5 (1.5TCI + 6MT) 9.0 ± 0.5 (1.5TCI + DCT)

Coolant Concentration

G11 Additive	Soft Water
53%	47%

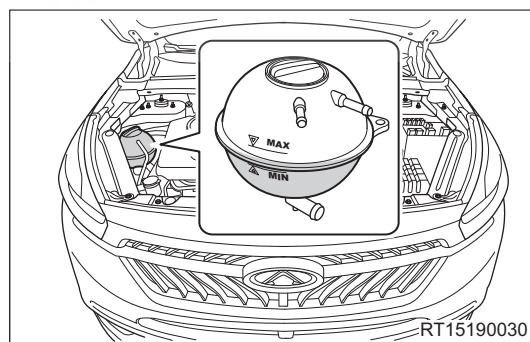
WARNING

- If it is necessary to add coolant when engine is hot, loosen expansion tank cap slightly first to release internal pressure and loosen the 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 the expansion tank cap and add coolant until coolant level reaches the "MAX" line.



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2. Tighten the expansion tank cap, start and run the engine. Maintain engine speed between 2000 and 2500 rpm to warm up the 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 the engine and wait until coolant temperature drops to the ambient temperature. Check that coolant level is between "MAX" and "MIN" lines. If coolant level is below the "MIN" line, repeat all the above procedures. If coolant level is above "MAX" line, drain coolant until the level is between "MAX" and "MIN" lines.

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Tank Upper Crossmember Assembly

Removal

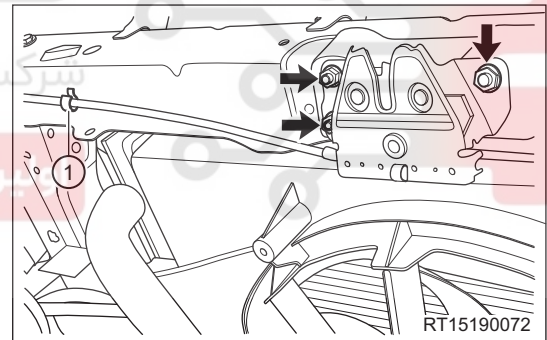
⚠ WARNING

- 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.

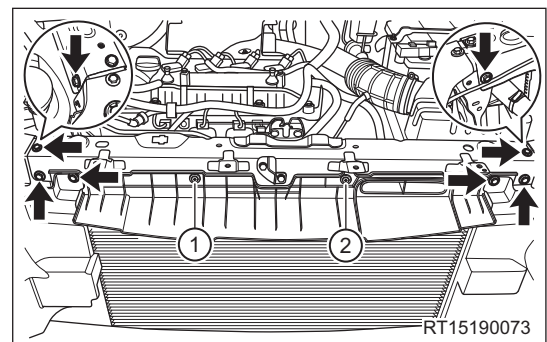
👁 CAUTION

- 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 engine switch.
2. Disconnect the negative battery cable.
3. Remove the front bumper assembly (See page 63-6).
4. Remove the air direct pipe assembly (See page 16-13).
5. Remove the tank upper crossmember assembly.
 - a. Remove 3 fixing bolts (arrow) from engine hood lock assembly.
(Tighten torque: $9 \pm 1 \text{ N}\cdot\text{m}$)
 - b. Remove the engine hood lock cable fixing clip (1) from tank upper crossmember.



- c. Remove 6 fixing bolts (arrow) from tank upper crossmember assembly.
(Tighten torque: $9 \pm 1 \text{ N}\cdot\text{m}$)
- d. Remove 2 fixing bolts (arrow), clip (1) and clip (2) from upper air deflector assembly.
(Tighten torque: $9 \pm 1 \text{ N}\cdot\text{m}$)



- e. Remove the upper air deflector assembly.
- f. Remove the tank upper crossmember assembly.

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Installation

Installation is in the reverse order of removal.

Expansion Tank

Removal

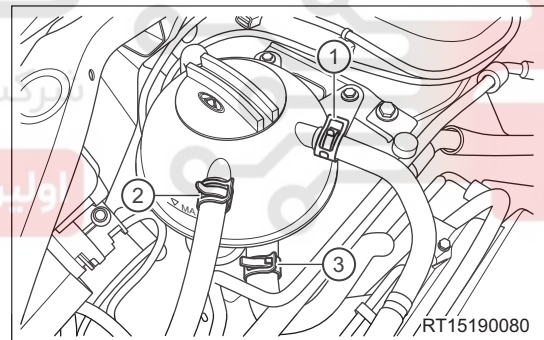
⚠ WARNING

- Always make sure engine is cold before operating cooling system. Never open expansion tank cap or remove drain cock plug, when engine is operating or cooling system overheats. The overheated engine coolant and steam with high-pressure 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.

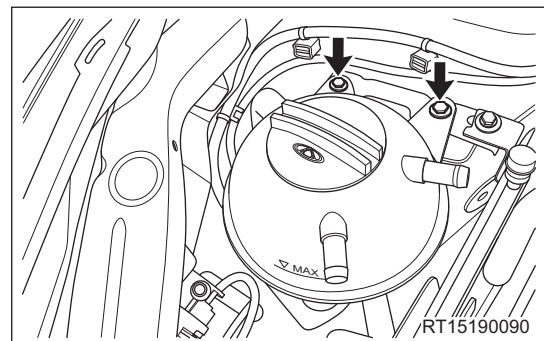
👁 CAUTION

- 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 engine switch.
2. Drain the coolant (See page 20-14).
3. Remove the expansion tank.
 - a. Loosen the elastic clamp (1) and disconnect the connection between expansion tank and engine discharge hose.
 - b. Loosen the elastic clamp (2) and disconnect the connection between expansion tank and radiator discharge hose.
 - c. Loosen the elastic clamp (3) and disconnect the connection between expansion tank and outlet hose.



- d. Remove 2 fixing bolts (arrow) from expansion tank.
(Tighten torque: $7 \pm 1 \text{ N}\cdot\text{m}$)



- e. Remove the expansion tank assembly.

Installation

Installation is in the reverse order of removal.

CAUTION

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

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Thermostat Assembly (1.5 TCI + 6MT)

Removal

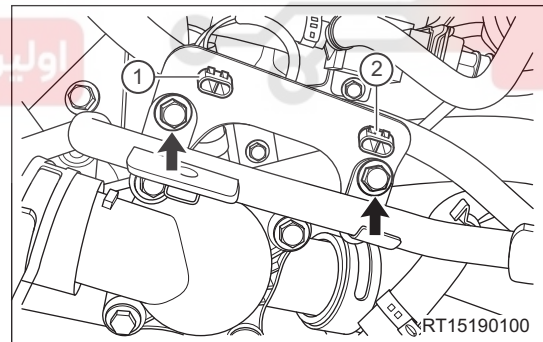
WARNING

- Always make sure engine is cold before operating cooling system. Never open expansion tank cap or remove drain cock plug, when engine is operating or cooling system overheats. The overheated engine coolant and steam with high-pressure 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.

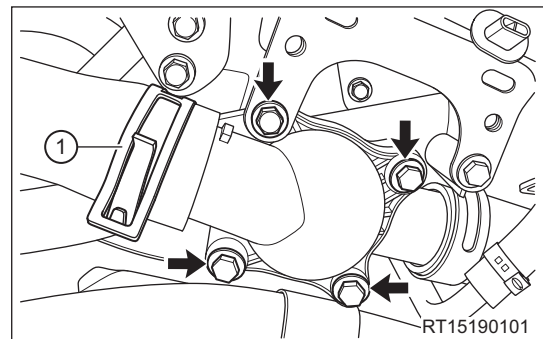
CAUTION

- 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 engine switch.
2. Disconnect the negative battery cable.
3. Remove the engine trim cover.
4. Remove the intake hose assembly (See page 16-14).
5. Drain the coolant (See page 20-14).
6. Remove the thermostat assembly.
 - a. Pry out 2 engine wire harness fixing clips (1) and (2) from bracket with tools.
 - b. Remove 2 brake booster connecting line fixing bolts (arrow) from bracket.
(Tightening torque: $8 + 3 \text{ N}\cdot\text{m}$)

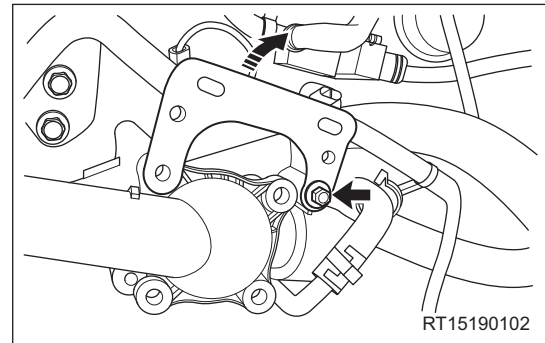


- c. Loosen the elastic clamp (1) and disconnect the connection between engine outlet hose and thermostat housing assembly.
- d. Remove 4 fixing bolts (arrow) from thermostat housing assembly.
(Tightening torque: $8 + 3 \text{ N}\cdot\text{m}$)



- e. Loosen another coupling bolt (arrow) between bracket and thermostat seat without removing it. Just loosen it.

Place the bracket near the front side of vehicle and move it (arrow) clockwise upward ($20^{\circ} \sim 30^{\circ}$).



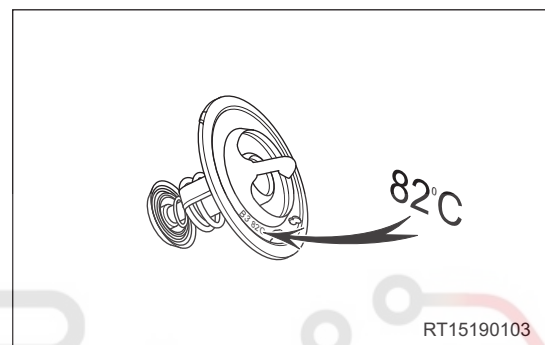
- f. Remove thermostat housing and take thermostat assembly out of thermostat seat assembly.

Inspection

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

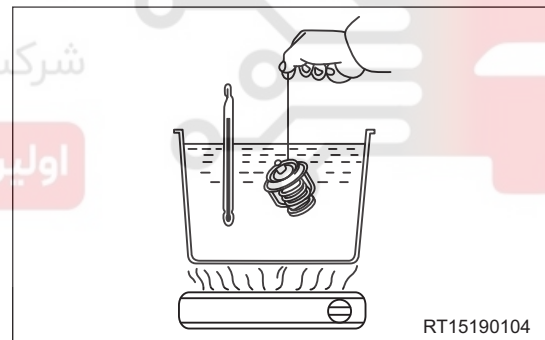
HINT:

Valve opening temperature is engraved in the thermostat assembly.



- a. Soak the 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 8.5 mm.
- Temperature is 95°C when thermostat 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 the thermostat assembly.

Installation

Installation is in the reverse order of removal.

CAUTION

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

Thermostat Assembly (1.5 TCI + DCT)

Removal

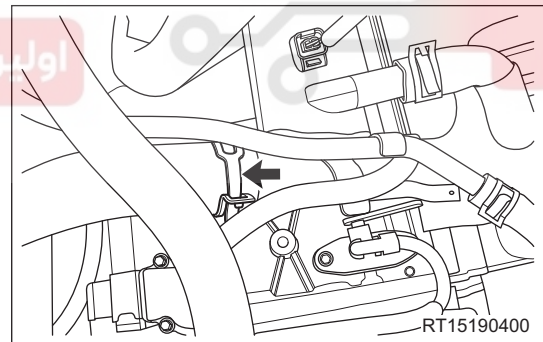
WARNING

- Always make sure engine is cold before operating cooling system. Never open expansion tank cap or remove drain cock plug, when engine is operating or cooling system overheats. The overheated engine coolant and steam with high-pressure 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

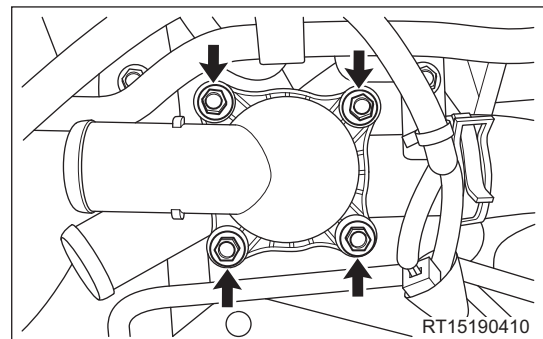
- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.

1. Turn off all electrical equipment and the engine switch.
2. Disconnect the negative battery cable.
3. Remove the engine trim cover.
4. Remove the intake hose assembly (See page 16-14).
5. Drain the coolant (See page 20-14).
6. Remove the thermostat assembly.
 - a. Loosen the elastic clamp (arrow) and disconnect the connection between engine outlet pipe and thermostat.

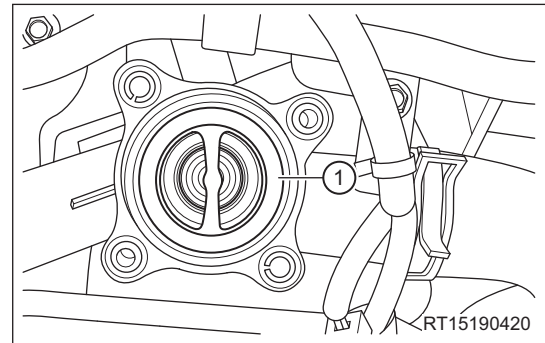


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- b. Remove 4 fixing bolts (arrow) from thermostat housing.
(Tightening torque: 8 + 3 N·m)



- c. Remove the thermostat housing and remove the thermostat assembly (1) from thermostat seat.

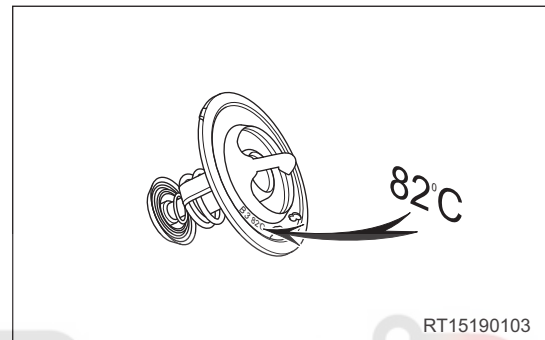


Inspection

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

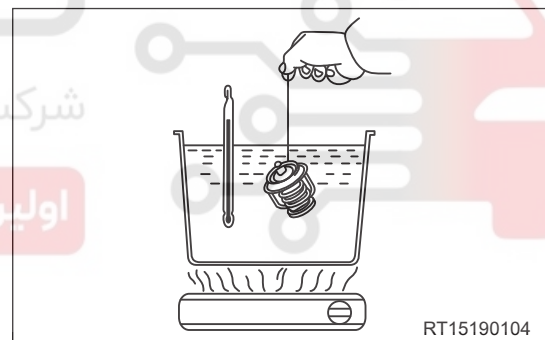
HINT:

Valve opening temperature is engraved in the thermostat assembly.



- a. Soak the 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 8.5 mm.
- Temperature is 95°C when thermostat 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 the thermostat assembly.

Installation

Installation is in the reverse order of removal.

CAUTION

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

Thermostat Seat Assembly (1.5 TCI + 6MT)

Removal

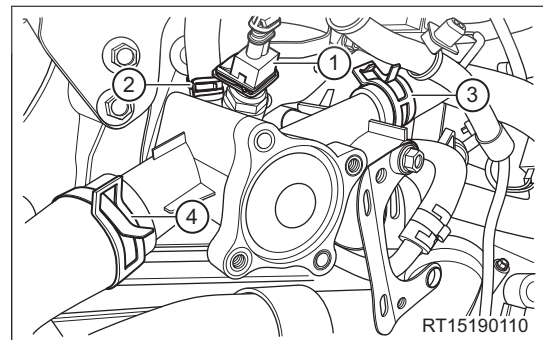
WARNING

- Always make sure engine is cold before operating cooling system. Never open expansion tank cap or remove drain cock plug, when engine is operating or cooling system overheats. The overheated engine coolant and steam with high-pressure 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

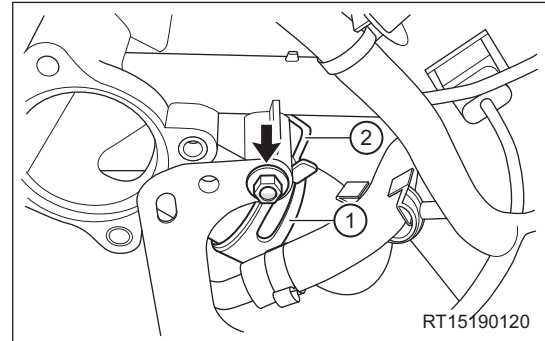
- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.

1. Turn off all electrical equipment and the engine switch.
2. Disconnect the negative battery cable.
3. Remove the engine trim cover.
4. Remove the battery (See page 28-7).
5. Remove the battery tray (See page 28-9).
6. Drain the coolant (See page 20-14).
7. Remove the air filter intake hose assembly (See page 16-12).
8. Remove the thermostat assembly (See page 20-20).
9. Remove the thermostat seat assembly.
 - a. Disconnect the coolant temperature sensor connector (1).
 - b. Loosen the elastic clamp (2) and disconnect the connection between engine discharge hose and thermostat seat assembly.
 - c. Loosen the elastic clamp (3) and disconnect the connection between heater core outlet hose and thermostat seat assembly.
 - d. Loosen the elastic clamp (4) and disconnect the connection between engine inlet hose and thermostat seat assembly.

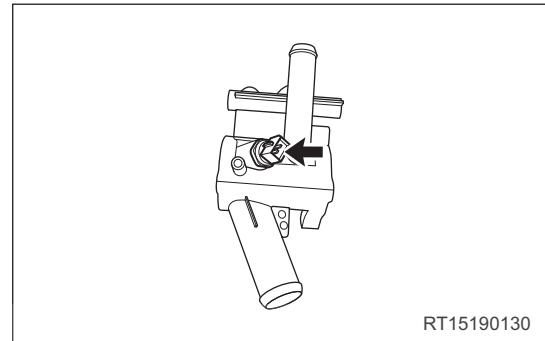


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- e. Loosen the elastic clamp (1) and disconnect the connection between small circulation water pipe and thermostat seat assembly.
- f. Loosen the elastic clamp (2) and disconnect the connection between heater core inlet hose and thermostat seat assembly.
- g. Remove the fixing bolt (arrow) from thermostat seat assembly.
(Tightening torque: $8 + 3 \text{ N}\cdot\text{m}$)



- h. Remove the thermostat seat and thermostat seat O-ring.
- i. Remove the coolant temperature sensor (arrow) from thermostat seat assembly.
(Tightening torque: $14 \pm 1 \text{ N}\cdot\text{m}$)



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.

Thermostat Seat Assembly (1.5 TCI + DCT)

Removal

WARNING

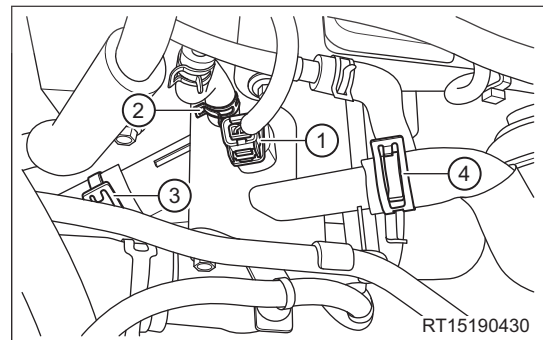
- Always make sure engine is cold before operating cooling system. Never open expansion tank cap or remove drain cock plug, when engine is operating or cooling system overheats. The overheated engine coolant and steam with high-pressure may flow out and cause serious personal injury.
- If your body contacts 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.

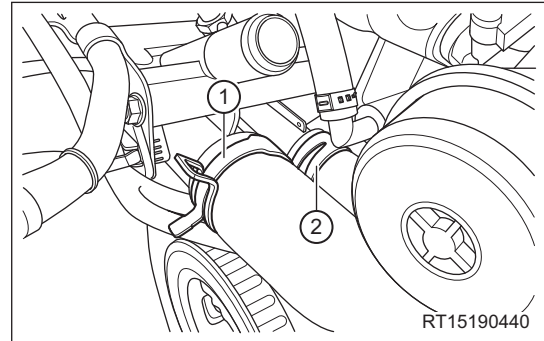
1. Turn off all electrical equipment and the engine switch.
2. Disconnect the negative battery cable.
3. Remove the engine trim cover.
4. Remove the battery (See page 28-7).
5. Remove the battery tray (See page 28-9).
6. Drain the coolant (See page 20-14).
7. Remove the air filter intake hose assembly (See page 16-12).
8. Remove the thermostat assembly (See page 20-20).
9. Remove the thermostat seat assembly.

- a. Disconnect the coolant temperature sensor connector (1).
- b. Loosen the elastic clamp (2) and disconnect the connection between engine discharge hose and thermostat seat assembly.
- c. Loosen the elastic clamp (3) and disconnect the connection between engine inlet hose and thermostat seat assembly.
- d. Loosen the elastic clamp (4) and disconnect the connection between heater core outlet hose and thermostat seat assembly.

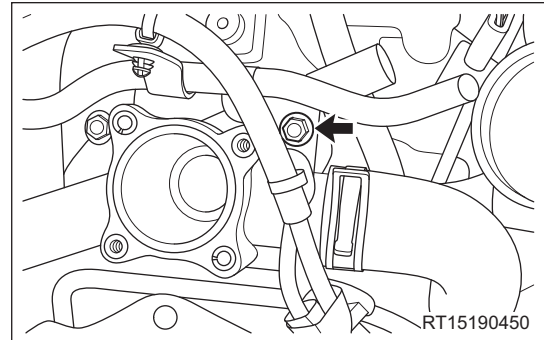


20 - SQRE4T15/SQRE4T15B COOLING SYSTEM

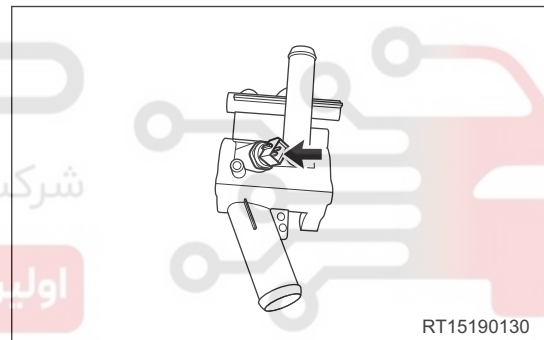
- e. Loosen the elastic clamp (1) and disconnect the connection between small circulation water pipe and thermostat seat assembly.
- f. Loosen the elastic clamp (2) and disconnect the connection between heater core inlet hose and thermostat seat assembly.



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



- h. Remove the thermostat seat and thermostat seat O-ring.
- i. Remove the coolant temperature sensor (arrow) from thermostat seat assembly.
(Tightening torque: $15 \pm 1 \text{ N}\cdot\text{m}$)



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.

Discharge Steel Pipe Assembly (1.5 TCI + DCT)

Removal

WARNING

- Always make sure engine is cold before operating cooling system. Never open expansion tank cap or remove drain cock plug, when engine is operating or cooling system overheats. The overheated engine coolant and steam with high-pressure 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.

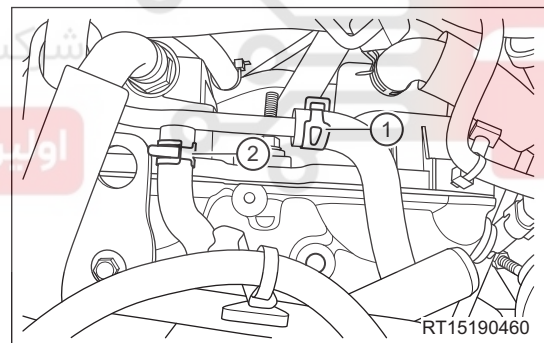
CAUTION

- 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 engine switch.
2. Disconnect the negative battery cable.
3. Remove the engine trim cover.
4. Remove the discharge steel pipe assembly.

a. Loosen the elastic clamp (1) and disconnect the connection between discharge hose I and discharge steel pipe assembly.

b. Loosen the elastic clamp (2) and disconnect the connection between discharge hose II and discharge steel pipe assembly.

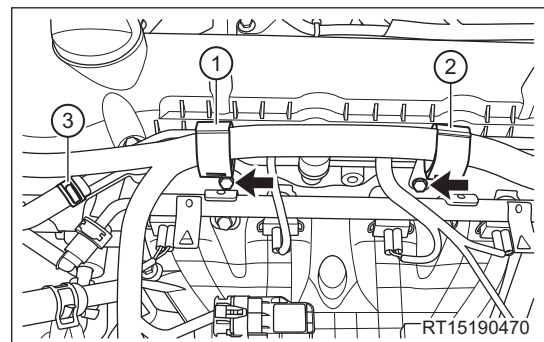


c. Disconnect the engine wire harness fixing clip (1) and clip (2) from discharge steel pipe assembly.

d. Loosen the elastic clamp (3) and disconnect the connection between discharge hose III and discharge steel pipe assembly.

e. Remove 2 fixing bolts (arrow) from discharge steel pipe assembly.

(Tightening torque: 8 + 3 N·m)



f. Remove the discharge steel pipe assembly.

Installation

Installation is in the reverse order of removal.

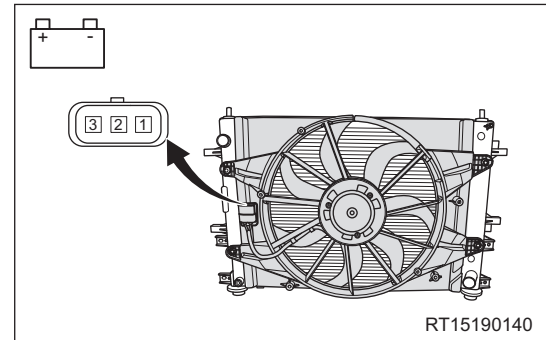
Cooling Fan Assembly

On-vehicle Inspection

1. Measure the cooling fan resistance value with a digital multimeter.

a. Cooling fan

Measurement Condition	Condition	Specification (Ω)
Terminal 1 - Terminal 2	Normal temperature (20°C)	0.8 ± 0.1
Terminal 1 - Terminal 3	Normal temperature (20°C)	0.6 ± 0.1

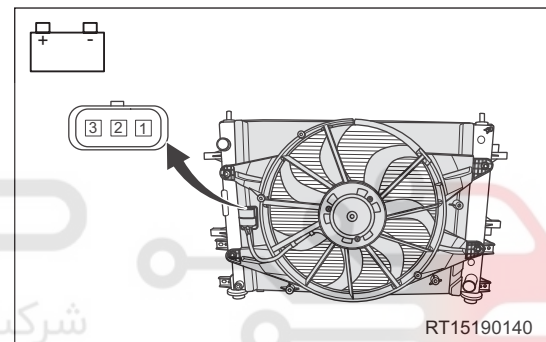


If inspection result is not as specified, replace the cooling fan assembly (See page 20-29).

2. Connect the battery positive (+) and negative (-) terminals to cooling fan connector terminals as shown in table below to observe whether cooling fan is running smoothly.

a. Cooling fan

Measurement Condition	Condition	Specified Condition
Battery positive (+) - Terminal B	Always	Running at low speed
Battery negative (-) - Terminal A		
Battery positive (+) - Terminal C	Always	Running at high speed
Battery negative (-) - Terminal A		



If inspection result is not as specified, replace the cooling fan assembly (See page 20-29).

Removal

⚠ WARNING

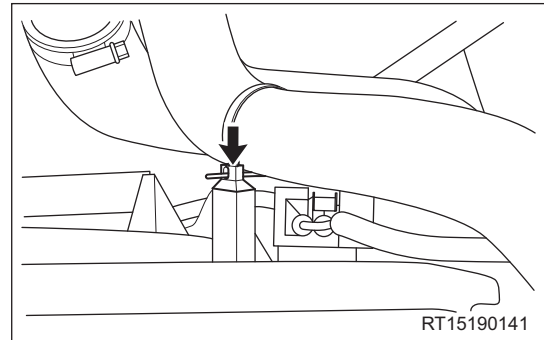
- Perform removal procedures with engine compartment at low temperature after cooling fan stops completely, to prevent accidents.

👁 CAUTION

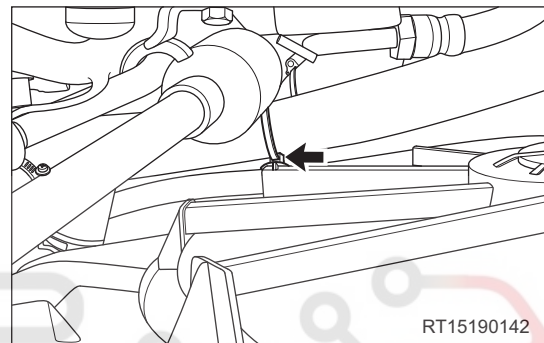
- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.

20 - SQRE4T15/SQRE4T15B COOLING SYSTEM

1. Turn off all electrical equipment and the engine switch.
2. Disconnect the negative battery cable.
3. Remove the air filter and intake hose assembly (See page 16-13).
4. Remove the cooling fan assembly.
 - a. Remove the engine outlet pipe fixing clip (arrow) from cooling fan.

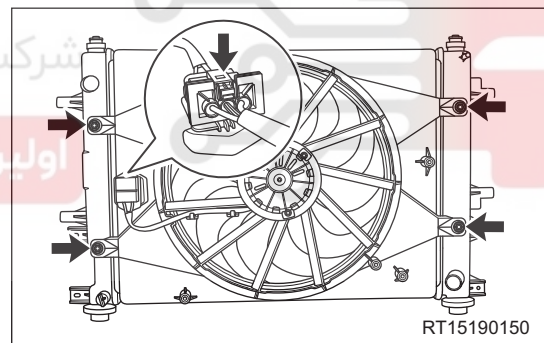


- b. Remove the engine inlet pipe fixing clip (arrow) from cooling fan.



- c. Disconnect the cooling fan connector (arrow).
 - d. Remove 4 fixing bolts (arrow) from cooling fan assembly.

(Tightening torque: $7 \pm 1 \text{ N}\cdot\text{m}$)



- e. Remove the cooling fan assembly.

Installation

20

Installation is in the reverse order of removal.

CAUTION

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

Radiator Assembly

Removal

WARNING

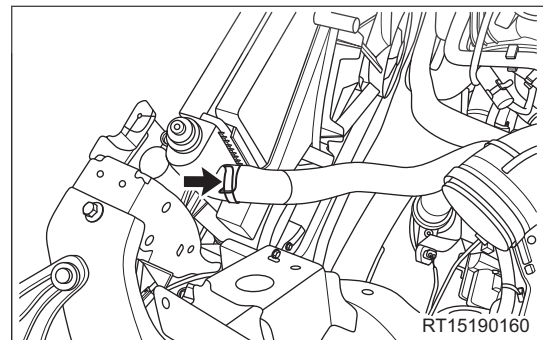
- Always make sure engine is cold before operating cooling system. Never open expansion tank cap or remove drain cock plug, when engine is operating or cooling system overheats. The overheated engine coolant and steam with high-pressure may flow out and cause serious personal injury.
- If your body contacts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

CAUTION

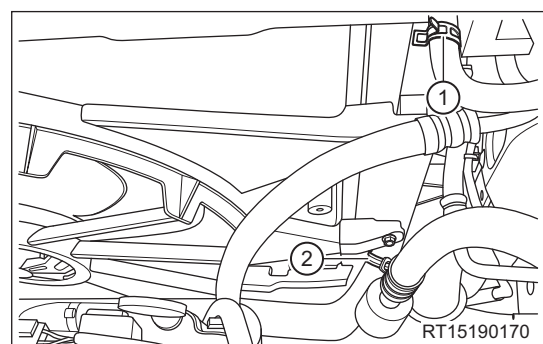
- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.

1. Turn off all electrical equipment and the engine switch.
2. Disconnect the negative battery cable.
3. Remove the front bumper assembly (See page 63-6).
4. Remove the tank upper crossmember assembly (See page 20-17).
5. Remove the left and right air deflector assembly.
6. Drain the coolant (See page 20-14).
7. Remove the cooling fan assembly (See page 20-29).
8. Remove the intercooler assembly (See page 16-17).
9. Remove the radiator assembly (1.5 TCI + 6MT).

- a. Loosen the elastic clamp (arrow) and disconnect the connection between engine outlet hose and radiator assembly.

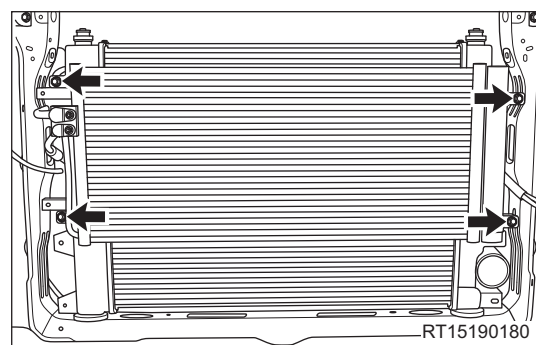


- b. Loosen the elastic clamp (1) and disconnect the connection between radiator discharge pipe and radiator assembly.
- c. Loosen the elastic clamp (2) and disconnect the connection between engine inlet pipe and radiator assembly.



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- d. Remove 4 fixing bolts (arrow) between radiator assembly and condenser.
(Tightening torque: 7 ± 1 N·m)



- e. Remove the radiator assembly.

Installation

Installation is in the reverse order of removal.

دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



Water Pump Assembly

Removal

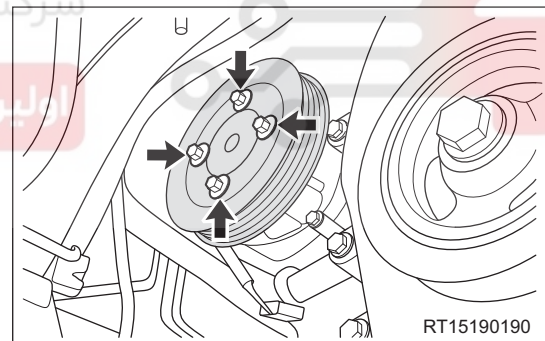
⚠ WARNING

- Always make sure engine is cold before operating cooling system. Never open expansion tank cap or remove drain cock plug, when engine is operating or cooling system overheats. The overheated engine coolant and steam with high-pressure 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.

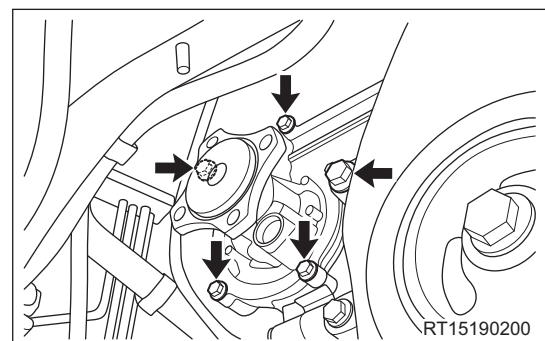
👁 CAUTION

- 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 engine switch.
2. Disconnect the negative battery cable.
3. Drain the coolant (See page 20-14).
4. Move away the accessory drive belt (See page 10-22).
5. Remove the water pump assembly.
 - a. Remove 4 fixing bolts (arrow) and water pump pulley.
(Tighten torque: $20 \pm 5 \text{ N}\cdot\text{m}$)



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



- c. Remove the water pump assembly.

HINT:

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

Inspection

1. Check for water pump bearing excessive looseness. If so, replace the water pump assembly.

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 the specified level after installation.
- Perform cooling system pressure test after adding coolant, to check cooling system for leakage.

دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

