

ENGINE COOLING SYSTEM

2110-01/1522-18/1522-10/2110-00/2110-07

INDEX

ENGINE COOLING SYSTEM

GENERAL

1. GENERAL SPECIFICATIONS.....	3
2. FASTENER TIGHTENING SPECIFICATIONS.....	4

OVERVIEW AND OPERATION PROCESS

1. COMPONENT LOCATOR.....	5
2. DESCRIPTION AND OPERATION.....	6
3. PWM (PULSE WIDTH MODULATION) ELECTRIC FAN OPERATION.....	9

REMOVAL AND INSTALLATION

2110-01 DTC FOR PWM ELECTRIC FAN..	12
2110-01 DIAGNOSTIC INFORMATION AND PROCEDURE.....	13
2110-01 REPAIR INSTRUCTIONS ON-VEHICLE SERVICE.....	16
1522-18 WATER PUMP.....	18
1522-10 THERMOSTAT AND THERMOSTAT HOUSING ASSEMBLY.....	20
2110-00 PWM CONTROLLER UNIT.....	22
2110-07 PWM ELECTRIC FAN AND SHROUD ASSEMBLY.....	23

دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



ENGINE COOLING SYSTEM**2110-01****GENERAL****1. GENERAL SPECIFICATIONS**

Application		Unit	Gasoline Engine
Cooling System	Type	–	Water Cooling Forced Circulation
Coolant	Capacity	L	11.3
Thermostat	Type	–	Wax Pellet Type
	Initial Opening Temp.	°C (°F)	82 (180)
	Fully Opening Temp.	°C (°F)	95 (203)
	Fully Closing Temp.	°C (°F)	80 (176)
	Stroke	mm	7
Cooling Fan	Type	–	PWM
	Blades	–	5
	Diameter	mm	320
	Low Speed ON Temp.	°C (°F)	95 (203)
	Low Speed OFF Temp.	°C (°F)	90 (194)
	High Speed ON Temp.	°C (°F)	105 (221)
	High Speed OFF Temp.	°C (°F)	100 (212)
	High Speed ON Temp. (By A/C Pressure)	kPa (psi)	269.8 (1860)
Coolant	Pressure Valve Opening Pressure	kPa (psi)	118 – 147 (17.1 – 21.3)
Reservoir	Vacuum Valve Opening Pressure	kPa (psi)	9.8 (1.4)
Water Pump	Type	–	Turbo Centrifugal
	Impeller Diameter	mm	65
	Impeller Blades	–	8
Radiator	Type	–	Cross-flow
	Core Width	mm	701
	Core Height	mm	372
	Core Thickness	mm	18
Coolant Temperature Gauge	Minimum Radiation Capability	Kcal/h	45,000
	Resistance (at 50 °C (122°F))	Ω	185.2
	Resistance (at 80 °C (176°F))	Ω	47.4
	Resistance (at 105 °C (221°F))	Ω	28.2
Engine Coolant Temperature Sensor	Resistance (at 20 °C (68°F))	K Ω	3.33 – 37.8
	Resistance (at 80 °C (176°F))	K Ω	0.32 – 0.35
Anti-Freeze Agent	Type	–	ALUTEC-P78
	Mixture of Water and Good Quality Ethylene Glycol-Base Anti-Freeze	–	50 : 50

Modification basis	
Application basis	
Affected VIN	

ENGINE COOLING SYSTEM

ACTYON 2012.12

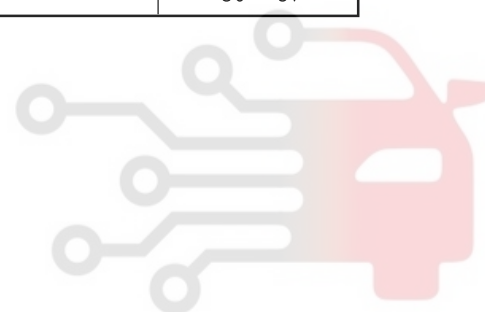
2. FASTENER TIGHTENING SPECIFICATIONS

Application		Nm	Lb-Ft	Lb-In
Automatic Transmission Oil Cooler Pipe		20	15	–
Automatic Transmission Oil Cooler Pipe Mounting Bolt		3 – 7	–	27 – 62
Coolant Drain Plug		30	22	–
Cooling Fan Bolt		9 – 11	–	80 – 97
Cooling Fan Shroud Bolt		3 – 7	–	27 – 62
Oil Cooler Pipe Line Bolt		9 – 11	–	80 – 97
Radiator Mounting Bracket Bolt		3 – 7	–	27 – 62
Tensioning Device Shock Absorber Bolt		22.5 – 27.5	16.6 – 20.3	–
Thermostat Cover Bolt		9 – 11	–	80 – 97
Thermostat Housing Bolt	M6	9 – 11	–	80 – 97
	M8	22.5 – 27.5	16.6 – 20.3	–
Viscous Clutch Mounting Bolt		40.5 – 49.5	29.8 – 36.5	–
Water Pump Housing Bolt	M6	9 – 11	–	80 – 97
	M8	22.5 – 27.5	16.6 – 20.3	–
Water Pump Pulley Bolt		9 – 11	–	80 – 97

دیجیتال خودرو

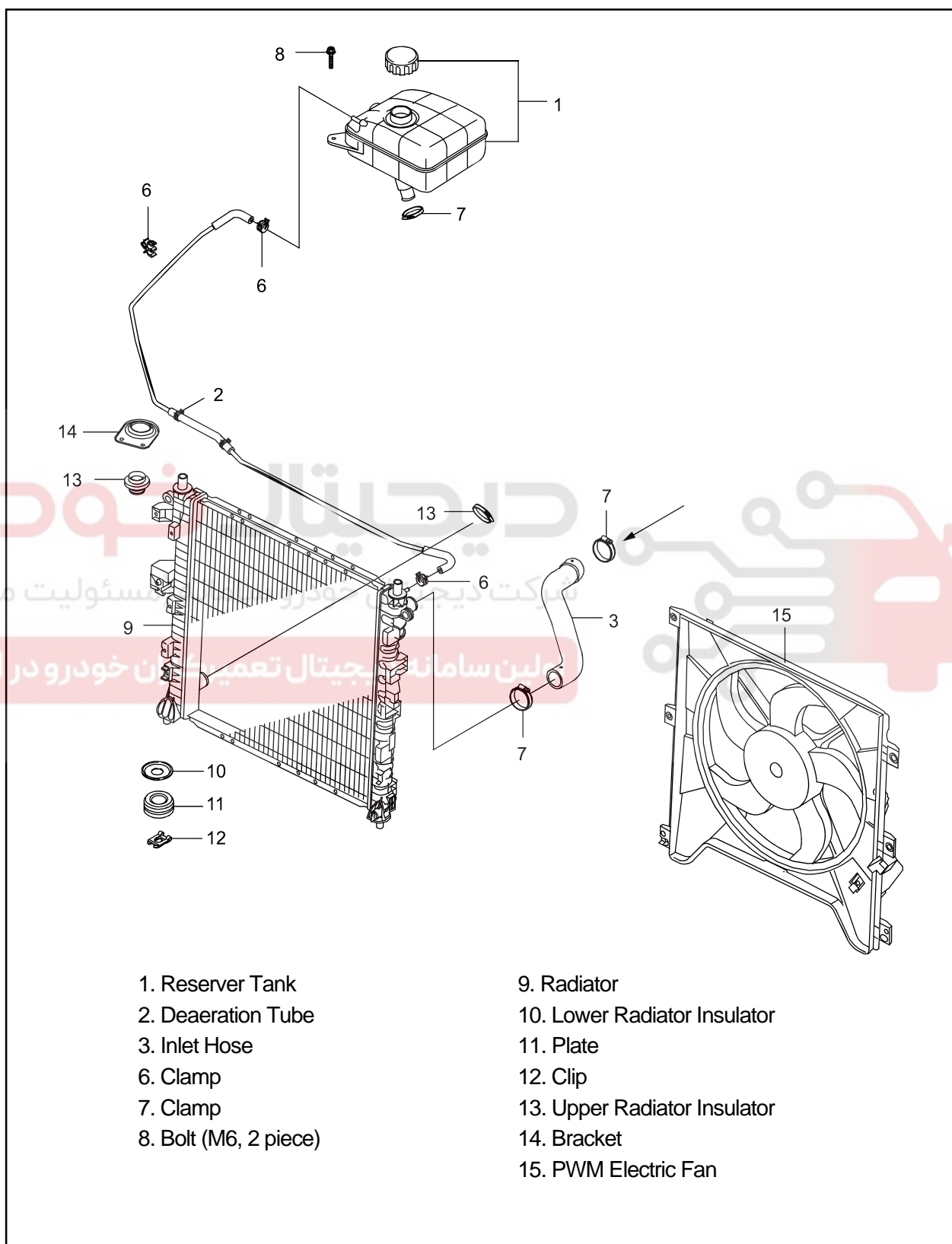
شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



OVERVIEW AND OPERATION PROCESS

1. COMPONENT LOCATOR



Modification basis	
Application basis	
Affected VIN	

2. DESCRIPTION AND OPERATION

1) General Description

The cooling system maintains the engine temperature at an efficient level during all engine operating conditions.

When the engine is cold, the cooling system cools the engine slowly or not at all. This slow cooling of the engine allows the engine to warm up quickly.

The cooling system includes a radiator and recovery subsystem, cooling fans, a thermostat and housing, a water pump, and a water pump drive belt. The timing belt drives the water pump.

All components must function properly for the cooling system to operation. The water pump draws the coolant from the radiator. The coolant then circulates through water jackets in the engine block, the intake manifold, and the cylinder head. When the coolant reaches the operating temperature of the thermostat, the thermostat opens. The coolant then goes back to the radiator where it cools.

This system directs some coolant through the hoses to the heat core. This provides for heating and defrosting.

The coolant reservoir is connected to the radiator to recover the coolant displaced by expansion from the high temperatures. The coolant reservoir maintains the correct coolant level.

The cooling system for this vehicle has no radiator cap or filler neck. The coolant is added to the cooling system through the coolant reservoir.

(2) Radiator

This vehicle has a lightweight tube-and-fin aluminum radiator. Plastic tanks are mounted on the upper and the lower sides of the radiator core.

On vehicles equipped with automatic transaxles, the transaxle fluid cooler lines run through the radiator tank.

A radiator drain plug is on this radiator.

To drain the cooling system, open the drain plug.

3) Coolant Reservoir

The coolant reservoir is a transparent plastic reservoir, similar to the windshield washer reservoir.

The coolant reservoir is connected to the radiator by a hose and to the engine cooling system by another hose.

As the vehicle is driven, the engine coolant heats and expands. The portion of the engine coolant displaced by this expansion flows from the radiator and the engine into the coolant reservoir. The air trapped in the radiator and the engine is degassed into the coolant reservoir.

When the engine stops, the engine coolant cools and contracts. The displaced engine coolant is then drawn back into the radiator and the engine. This keeps the radiator filled with the coolant to the desired level at all times and increases the cooling efficiency.

Maintain the coolant level between the MIN and MAX marks on the coolant reservoir when the system is cold.

4) Water Pump

The belt-driven centrifugal water pump consists of an impeller, a drive shaft, and a belt pulley.

The impeller is supported by a completely sealed bearing.

The water pump is serviced as an assembly and, therefore, cannot be disassembled.

5) Thermostat

A wax pellet-type thermostat controls the flow of the engine coolant through the engine cooling system.

The thermostat is mounted in the thermostat housing to the front of the cylinder head.

The thermostat stops the flow of the engine coolant from the engine to the radiator to provide faster warm-up, and to regulate the coolant temperature. The thermostat remains closed while the engine coolant is cold, preventing circulation of the engine coolant through the radiator. At this point, the engine coolant is allowed to circulate only throughout the heater core to warm it quickly and evenly.

As the engine warms, the thermostat opens. This allows the engine coolant to flow through the radiator where the heat is dissipated. This opening and closing of the thermostat permits enough engine coolant to enter the radiator to keep the engine within proper engine temperature operating limits.

The wax pellet in the thermostat is hermetically sealed in a metal case. The wax element of the thermostat expands when it is heated and contracts when it is cooled.

As the vehicle is driven and the engine warms, the engine coolant temperature increases. When the engine coolant reaches a specified temperature, the wax pellet element in the thermostat expands and exerts pressure against the metal case, forcing the valve open. This allows the engine coolant to flow through the engine cooling system and cool the engine.

As the wax pellet cools, the contraction allows a spring to close the valve.

The thermostat begins to open at 82°C (180 °F) and is fully open at 95°C (203°F). The thermostat closes at 80°C (176°F).

6) Electric Cooling Fan

CAUTION

- Keep hands, tools, and clothing away from the engine cooling fans to help prevent personal injury. This fan is electric and can turn on even when the engine is not running.

CAUTION

- If a fan blade is bent or damaged in any way, no attempt should be made to repair or reuse the damaged part. A bent or damaged fan assembly should always be replaced with a new one to prevent possible injury.

Modification basis	
Application basis	
Affected VIN	

The cooling fans are mounted behind the radiator in the engine compartment. The electric cooling fans increase the flow of air across the radiator fins and across the condenser on air conditioned (A/C)-equipped vehicles.

This helps to speed cooling when the vehicle is at idle or moving at low speeds.

All models have two fans. The main fan is 320 mm (12.6 inches) in diameter with seven blades to aid the airflow through the radiator and the condenser. An electric motor attached to the radiator support drives the fan.

The auxiliary fan is 320 mm (12.6 inches) in diameter.

► A/C Off or Non-AC Model

- The cooling fans are actuated by the engine control module (ECM) using a low-speed cooling fan relay, a high-speed cooling fan relay and a cooling fan motor relay.
- The ECM will turn the cooling fans on at low speed when the coolant temperature reaches 95°C(203°F) and at high speed when the coolant temperature reaches 105°C(221°F).
The ECM will change the cooling fans from high speed to low speed at 100°C(212°F) and
- will turn the cooling fans off at 90°C (194°F).

► A/C On

- The ECM will turn the cooling fans on at low speed when the A/C system is on. The ECM will change to high speed when the high side A/C pressure reaches 1860 kPa (269.8 psi).
The cooling fans will return to low speed when the high side A/C pressure reaches 1378 kPa (199.8 psi).

7) Engine Coolant Temperature Sensor

The Engine Coolant Temperature (ECT) sensor uses a temperature to control the signal voltage to the Engine Control Module (ECM).

8) Coolant Temperature Gauge

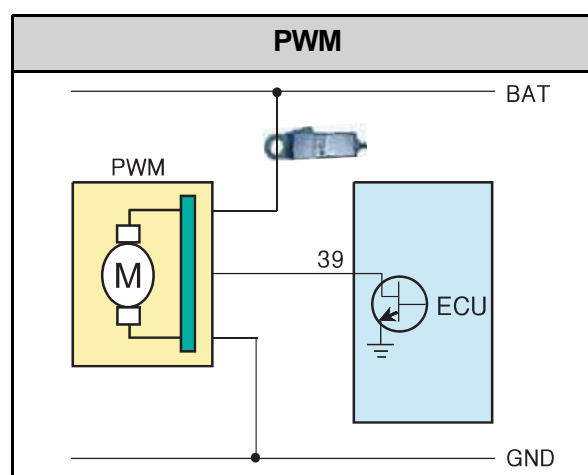
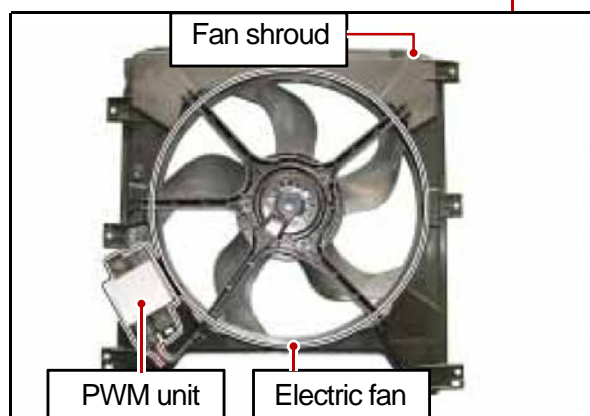
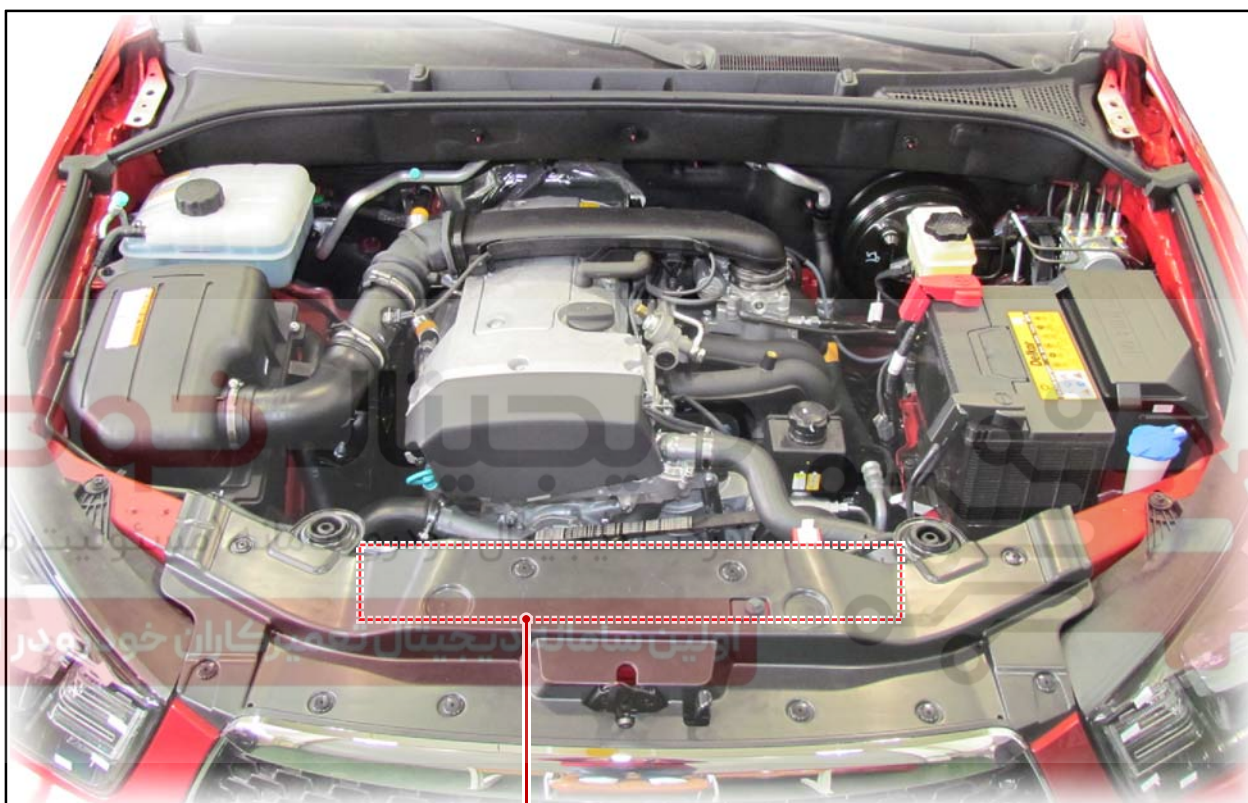
The coolant temperature gauge controls the instrument panel temperature indicator. The coolant temperature gauge is located with ECT sensor.

3. PWM (PULSE WIDTH MODULATION) ELECTRIC FAN OPERATION

1) Function

The PWM (Pulse Width Modulation) high capacity electric fan is installed instead of electric condenser fan to enhance the durability and controllability and reduce noise.

2) Mounting Location



Modification basis	
Application basis	
Affected VIN	

3) PWM Electric Fan

(1) Advantages and Disadvantages of the PWM Electric Fan



► Advantages

- Enhanced A/C performance: at low speed, at idling, driving in city
- Reduction of vibration/noise: fan activated by PWM only when necessary
- Reduction of engine consuming power (V/Fan driving force) by 4 Hp - Cost saving

► Disadvantage

- Poor engine cooling performance at low and high rpm

4) PWM (Pulse Width Modulation) Unit



It controls the time of the output voltage to control the fan motor speed independently.

► Internal functions

- Motor power shutting-off function when overcurrent is applied
- Adverse voltage prevention function
- Detection function for the motor lock
- Temperature detecting function: The electric fan operates at FULL speed to cool down the PWM unit when the interior temperature of PWM unit is over 120~150°C.
- Communication function when failing: The fail signal is transmitted to the ECU when the PWM unit is malfunctioning.
- Soft start function: The motor speed is gradually increased when the motor is initially operated.

5) Shutting-off Condition of the A/C Compressor

► Coolant temperature

- When coolant temperature is below 20°C or over 115°C, engine speed is below 650 rpm or over 4500 rpm for 4 seconds after engine starting, abrupt acceleration and A/C refrigerant pressure sensor detecting the followings
- A/C compressor is turned off when the refrigerant pressure is below 2.0 kg/cm² and then is turned on when the refrigerant pressure is over 2.4 kg/cm².
- A/C compressor is turned off when the refrigerant pressure is over 30 kg/cm² and then is turned on when the refrigerant pressure is below 21.4 kg/cm².

دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



Modification basis	
Application basis	
Affected VIN	

REMOVAL AND INSTALLATION

2110-01 DTC FOR PWM ELECTRIC FAN

Related item	DTC	Trouble	Help	Engine CHECK warning lamp
Cooling fan system (PWM electric fan)	P0480	PWM electric fan – Short circuit to power supply	Condition – The cooling fan's output wiring has a short circuit to power supply. Actions 1. Inspect the circuit and the terminal of No. 39 ECU pin. 2. Inspect the power supply. 3. Inspect the cooling fan. 4. Check the ECU.	
		PWM electric fan – Open/Short circuit to ground	Condition – The cooling fan's output wiring has a short circuit to power supply. Actions 1. Inspect the circuit and the terminal of No. 39 ECU pin. 2. Inspect the power supply. 3. Inspect the cooling fan. 4. Check the ECU.	
	P0483	PWM electric fan – Motor overloaded	Condition – The cooling fan's output wiring has a short circuit to power supply. Actions 1. Inspect the circuit and the terminal of No. 39 ECU pin. 2. Inspect the power supply. 3. Inspect the cooling fan. 4. Check the ECU.	
	P0484	PWM electric fan – Motor stalled	Condition – The cooling fan's output wiring has a short circuit to power supply. Actions 1. Inspect the circuit and the terminal of No. 39 ECU pin. 2. Inspect the power supply. 3. Inspect the cooling fan. 4. Check the ECU.	
	P0485	PWM electric fan – Short circuit	Condition – The cooling fan's output wiring has a short circuit to power supply. Actions 1. Inspect the circuit and the terminal of No. 39 ECU pin. 2. Inspect the power supply. 3. Inspect the cooling fan. 4. Check the ECU.	

S.G.N.

2110-01 DIAGNOSTIC INFORMATION AND PROCEDURE**1) Cooling System Diagnosis****(1) Engine Overheats**

Checks	Action
Check for a loss of the coolant	Add the coolant.
Check for a weak coolant solution.	Confirm that the coolant solution is a 50/50 mixture of ethylene glycol and water.
Check the front of the radiator for any dirt, any leaves, or any insects.	Clean the front of the radiator.
Check for leakage from the hoses, the water pump, the heater, the thermostat housing, the radiator, the core plugs, or the head gasket.	Replace any damaged components.
Check for a faulty thermostat.	Replace a damaged thermostat.
Check for retarded ignition timing.	Perform an ECM code diagnosis. Confirm the integrity of the timing chain.
Check for an improperly operating electric cooling fan.	Replace the electric cooling fan.
Check for radiator hoses that are plugged or rotted.	Replace any damaged radiator hoses.
Check for a faulty water pump.	Replace a faulty water pump.
Check for a faulty coolant reservoir cap.	Replace a faulty coolant reservoir cap.
Check for a cylinder head or an engine block that is cracked or plugged.	Repair the damaged cylinder head or the damage engine block.

(2) Loss of Coolant

Checks	Action
Check for a leak in the radiator.	Replace a damaged radiator.
Check for a leak in the following locations: • Coolant reservoir. • Hose.	Replace the following parts, as needed. • Coolant reservoir. • Hose.
Check for loose or damaged radiator hoses, heater hoses, and connections.	Reseat the hoses. Replace the hoses or the clamps.
Check for leaks in the water pump seal.	Replace the water pump seal.
Check for leaks in the water pump gasket.	Replace the water pump gasket.
Check for an improper cylinder head torque.	Tighten the cylinder head bolts to specifications. Replace the cylinder head gasket, if needed.
Check for leaks in the following locations: • Intake manifold. • Cylinder head gasket. • Cylinder block plug. • Heater core. • Radiator drain plug.	Repair or replace any components, as needed, to correct the leak.

(3) Engine Fails to Reach Normal Operating Temperature or Cool Air from the Heater

Checks	Action
Check to determine if the thermostat is stuck open or is the wrong type of thermostat.	Install a new thermostat of the correct type and heat range.
Check the coolant level to determine if it is below the LOW mark on the coolant reservoir.	Add sufficient coolant to raise the fluid to the specified mark on the coolant reservoir.

Modification basis	
Application basis	
Affected VIN	

2) System Leakage Test



► Tools Required

A9921 0012A (124 589 15 21 00) Leakage Tester

► Test Procedure

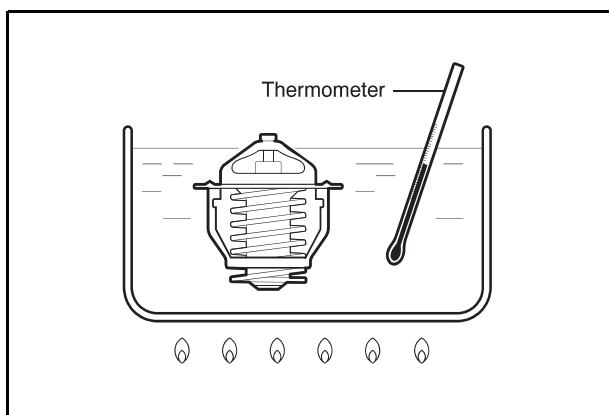
1. Loosen the cap a little and release pressure and remove the cap.

⚠ CAUTION

- For the risk of scalding, cap must not be opened unless the coolant temperature is below 90 °C (194 °F).

2. Fill coolant up to upper edge (arrow) of reservoir.
3. Connect the leakage tester A9921 0012A (124 589 15 21 00) to the reservoir filler cap and apply 1.4 bar of pressure.
4. If the pressure on the tester drops, check leakage at the all coolant hoses and pipes and each connections. Replace or retighten if necessary.

3) Thermostat Test



► Test Procedure

1. Remove the thermostat from the vehicle. Refer to "Thermostat" in this section.
2. Make sure the valve spring is tight when the thermostat is closed. If the spring is not tight, replace the thermostat.
3. Suspend the thermostat and a thermometer in a pan of 50/50 mixture of ethylene glycol and water. Do not let the thermostat or the thermometer rest on the bottom of the pan. The uneven concentration of heat on the bottom could result in inaccurate temperature measurements.
Heat the pan on a burner.
4. Use the thermometer to measure the
5. temperature of the heated solution.
The thermostat should begin to open at
6. 82°C (180°F) and it should be fully open at 95°C (203°F).
If it does not open at these temperatures, replace the thermostat.

Modification basis	
Application basis	
Affected VIN	

2110-01 REPAIR INSTRUCTIONS ON-VEHICLE SERVICE

1) Coolant Drain and Fill Up



► Draining & Filling up Procedure

1. Loosen the cap a little and release pressure and remove the cap.

⚠ CAUTION

- For the risk of scalding, the cap must not be opened unless the coolant temperature is below 90 °C (194 °F).



2. Loosen the radiator lower drain cock and drain the coolant.

⚠ CAUTION

- Collect coolant by using a proper container.

3. Drain the coolant from the crankcase by inserting a hose (dia. 14 mm) onto the drain bolt on the side of crankcase (exhaust manifold) and by loosening the plug.

⚠ CAUTION

- Just loosen the drain plug to drain the coolant and do not remove the plug completely. Collect coolant by using proper container.



4. After complete draining of the coolant, remove the hose connector to drain plug and reinstall the drain plug.

Tightening torque 30 Nm (22 lb-ft)

5. Tighten the radiator lower drain cock.
6. Remove the de-aeration hose clamp in the coolant pump and remove the de-aeration hose.
7. Fill up the coolant through the coolant reservoir tank.

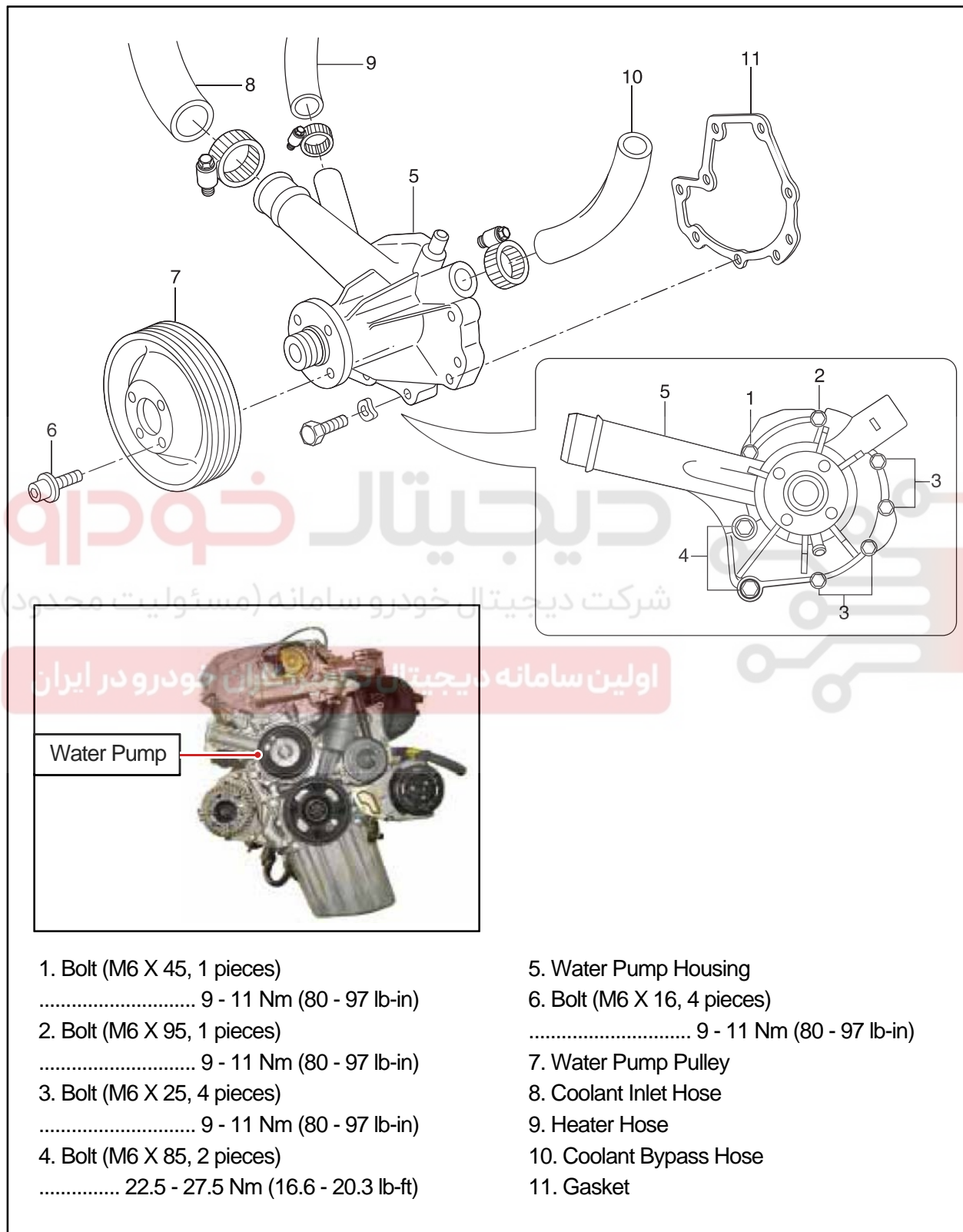
CAUTION

- Match the anti-freeze and the water ratio to 50 : 50.
- Supplement the coolant until the coolant overflows to the de-aeration hose.

8. Insert the de-aeration hose and completely tighten the clamp.
9. Check the coolant level in the coolant reservoir tank.
10. Warm up (until thermostat is opened) the engine and recheck the coolant level in the reservoir tank and fill up the coolant if necessary.

Modification basis	
Application basis	
Affected VIN	

S.G.N.

1522-18 WATER PUMP**Preceding work** 1. Removal of viscous clutch



⚠ CAUTION

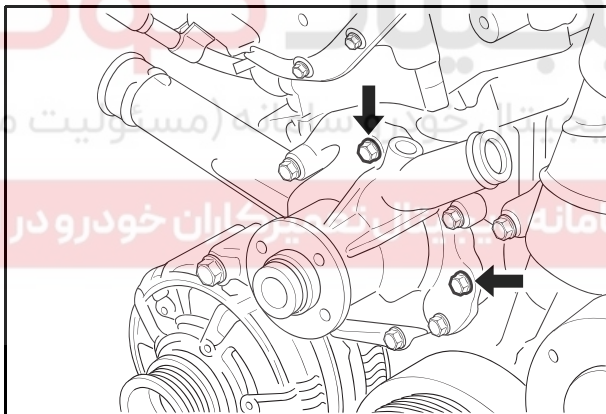
- Tools Required
A9910 0150A (603 589 00 40 00) Fan Clutch Holder

1. Drain the coolant.
2. Disconnect the coolant hoses (8, 9, 10).
3. Tak off the drive belt.
4. Unscrew the four bolts (6) from water pump pulley and remove the pulley (7).

Tightening torque 9 – 11 Nm

(80 – 97 lb-in)

Hold the pulley with fan clutch holder A9910 0150A (603 589 00 40 00) while removing the pulley.



5. Unscrew the bolts (1, 2, 3, 4) from water pump housing (5) and remove the water pump.

Tightening torque	(1, 2, 3)	9 - 11 Nm (80 - 97 lb-in)
	(4)	22.5 - 27.5 Nm (16.6 - 20.3 lb-ft)

6. Clean the sealing surface.
7. Replace the gasket with new one.

⚠ CAUTION

- Apply the sealant when the sealing surface of water pump housing and coolant mounting area is clean.

8. Installation should follow the removal procedure in the reverse order.
9. Check for leaks by starting the engine.

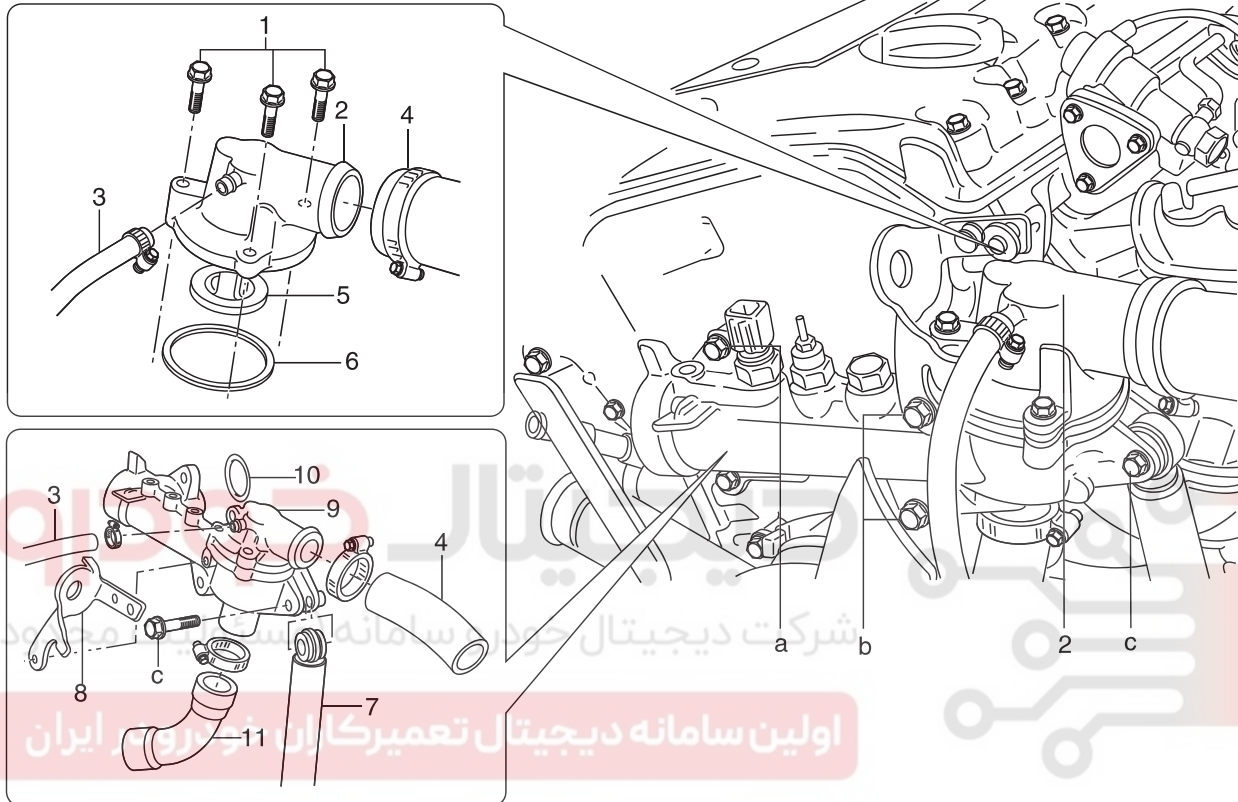
Modification basis	
Application basis	
Affected VIN	

S.G.N.
1522-10

THERMOSTAT AND THERMOSTAT HOUSING ASSEMBLY

Preceding work

1. Removal of viscous clutch



- 1. Bolt (M6 X 25, 3 pieces)
..... 9 - 11 Nm (80-97 lb-in)
- 2. Thermostat Cover
- 3. De-aeration Hose
- 4. Coolant Outlet Hose
- 5. Thermostat
- 6. O-ring
- 7. Tensioning Device Shock Absorber
..... 22.5 - 27.5 Nm (16.6-20.3 lb-in)
- 8. Engine Hanger Bracket

- 9. Thermostat Housing Assembly
- 10. O-ring
- 11. Coolant Bypass Hose
- a. Bolt (M6 X 95, 2 pieces)
..... 9 - 11 Nm (80 - 97 lb-in)
- b. Bolt (M8 X 75, 2 pieces)
..... 22.5 - 27.5 Nm (16.6 - 20.3 lb-ft)
- c. Bolt (M8 X 35, 1 piece)
..... 22.5 - 27.5 Nm (16.6 - 20.3 lb-ft)

Modification basis	
Application basis	
Affected VIN	

1. Drain the coolant.
2. Remove the de-aeration hose (3), coolant outlet hose (4) and coolant bypass hose (11).
3. Disconnect the engine coolant temperature sensor connector and coolant temperature gauge connector.
4. Unscrew the three bolts (1) and remove the thermostat cover assembly from thermostat housing.
Do not separate the thermostat cover and thermostat.
Replace the O-ring if necessary.
5. Unscrew the bolt (c) and pry off the tensioning device shock absorber (7).
6. Unscrew the bolts (a, b) and remove the engine hanger bracket and thermostat housing.
7. Replace the O-ring with new one.
8. Installation should follow the removal procedure in the reverse order.
9. Check for leaks in cooling system.
- 10.

دیجیتال خودرو
شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



Modification basis	
Application basis	
Affected VIN	

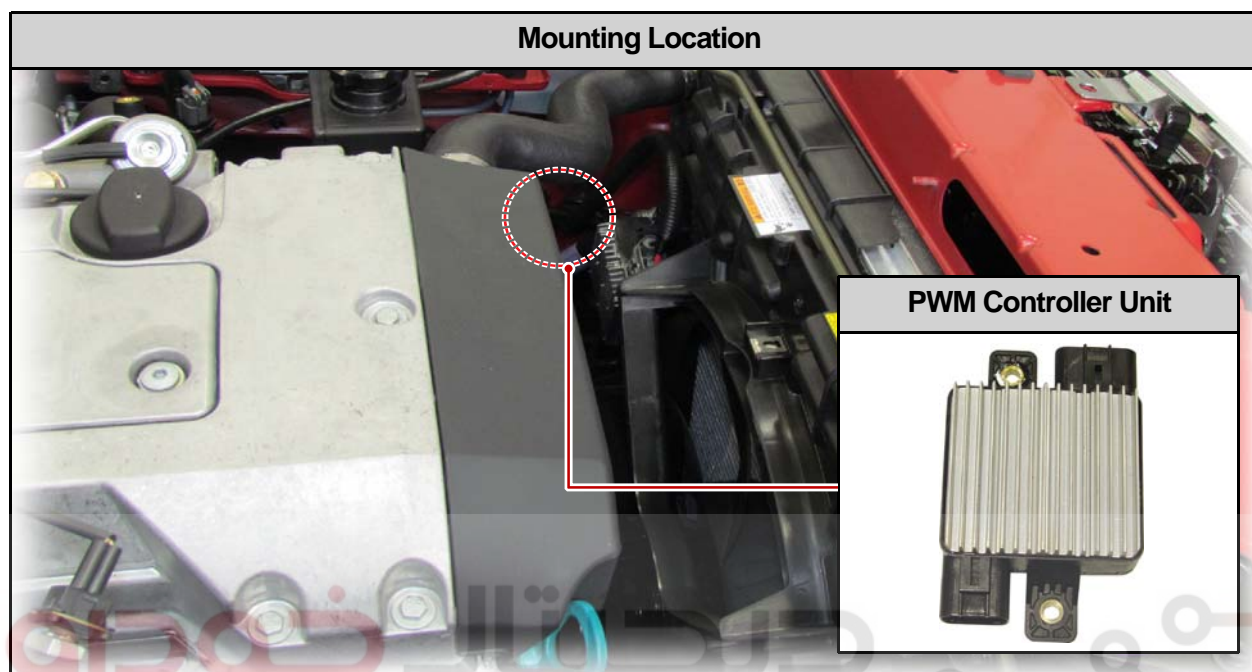
06-22 2110-00

ACTYON

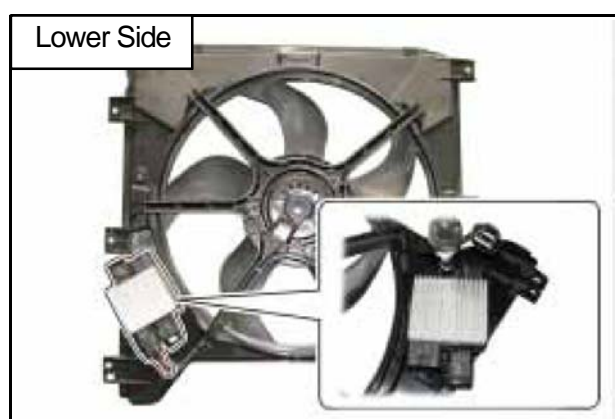
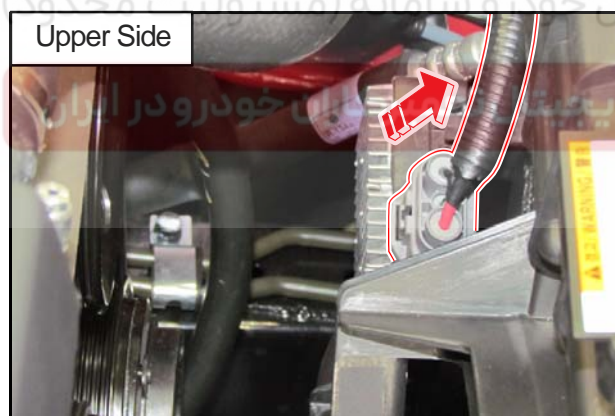
S.G.N.

2110-00 PWM CONTROLLER UNIT

Preceding work 1. Disconnect the negative battery cable to prevent the abrupt operation of PWM electric fan.



1. Disconnect the PWM controller unit's connector.



2. Remove two mounting bolts and remove the PWM controller unit.

ENGINE COOLING SYSTEM

ACTYON 2012.12

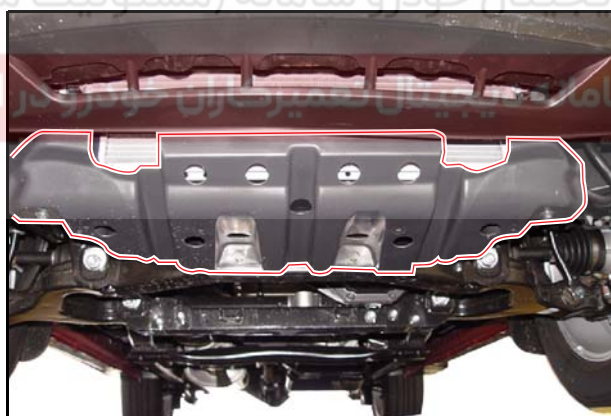
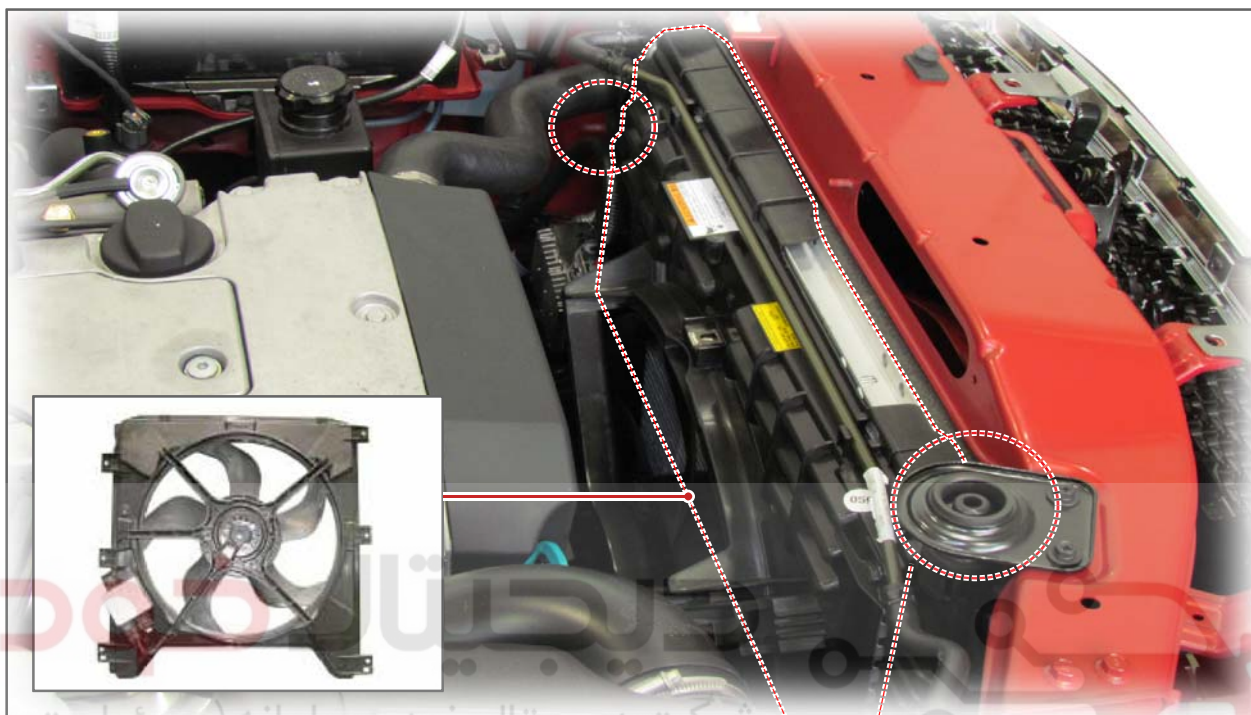
Modification basis	
Application basis	
Affected VIN	

S.G.N.

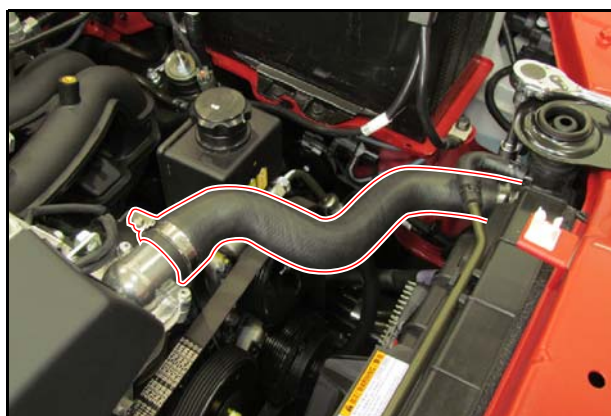
2110-07 PWM ELECTRIC FAN AND SHROUD ASSEMBLY

Preceding work

1. Disconnect the negative battery cable or remove the key switch.



1. Unscrew four mounting bolts to remove the front center undershield assembly.



2. Disconnect the upper coolant hose of the radiator.

CAUTION

- When disconnecting the coolant upper hose, be careful not to spill the coolant.

Modification basis	
Application basis	
Affected VIN	

ENGINE COOLING SYSTEM

ACTYON 2012.12

3. Disconnect the upper connector of the PWM unit and unscrew the fan shroud mounting bolt.



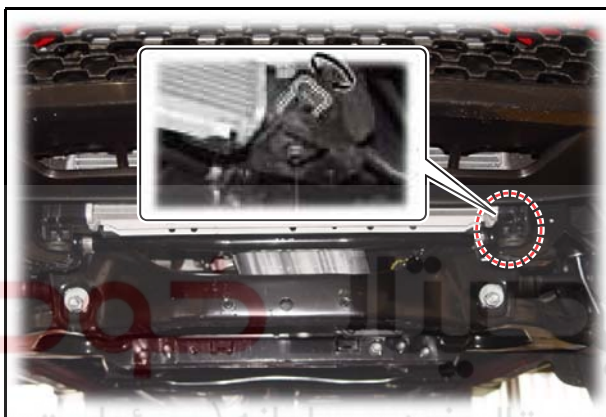
4. Remove the PWM electric fan and the fan shroud from the vehicle with care.



► Radiator Assembly

Removal & installation procedure

1. Drain the A/C refrigerant using the refrigerant collector.



2. Drain coolant from the radiator.
3. Remove the each coolant hoses.



4. Remove the upper and lower automatic transmission oil cooling pipes from radiator.

Tightening torque 25 – 35 Nm
(18 – 26 lb-ft)

5. Remove the mounting bolt from the automatic transmission oil cooler pipe and then disconnect the cooler pipe.

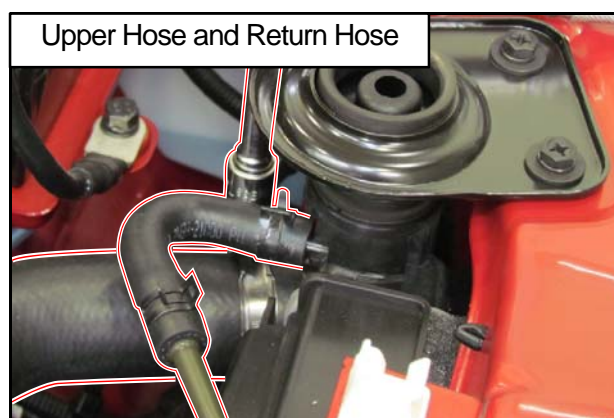
Tightening torque 3 – 7 Nm
(27 – 62 lb-ft)



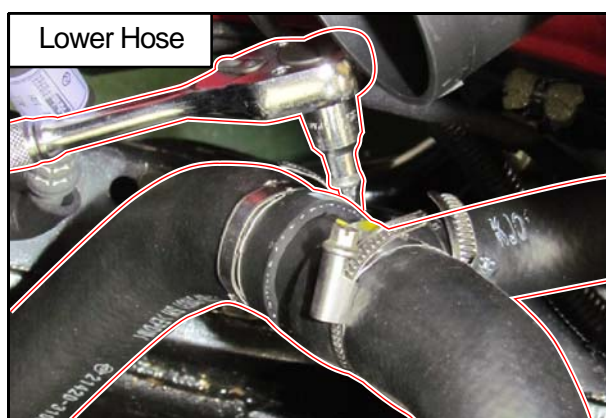
6. Disconnect the right and left mounting clips of the radiator.

Modification basis	
Application basis	
Affected VIN	

7. Disconnect the upper coolant hose, the return hose and the lower coolant hose from the radiator.

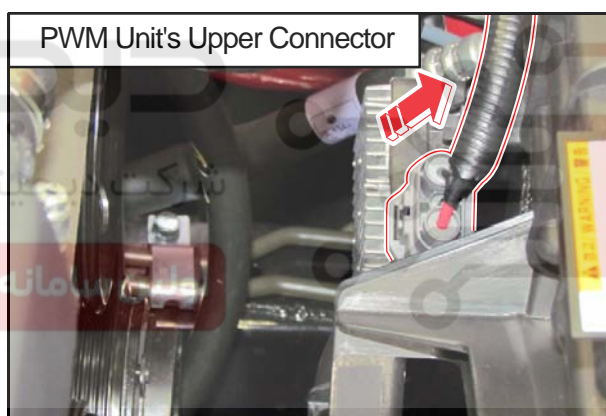
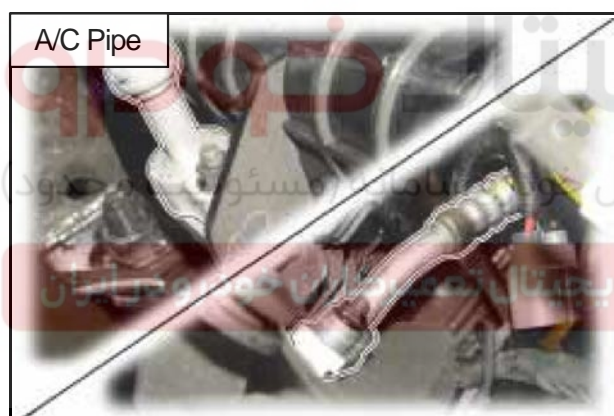


· Be careful of the coolant leaks.

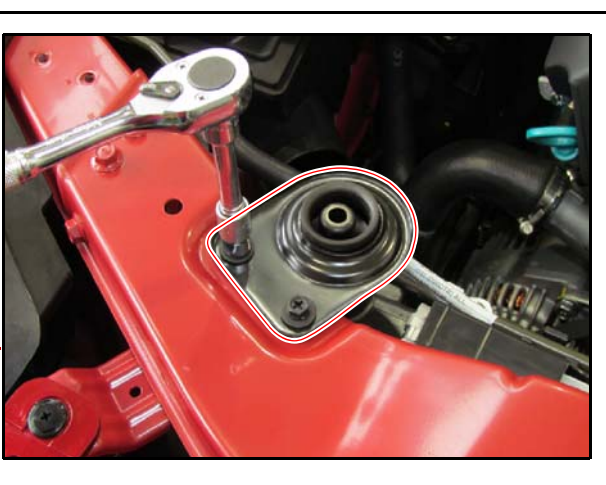
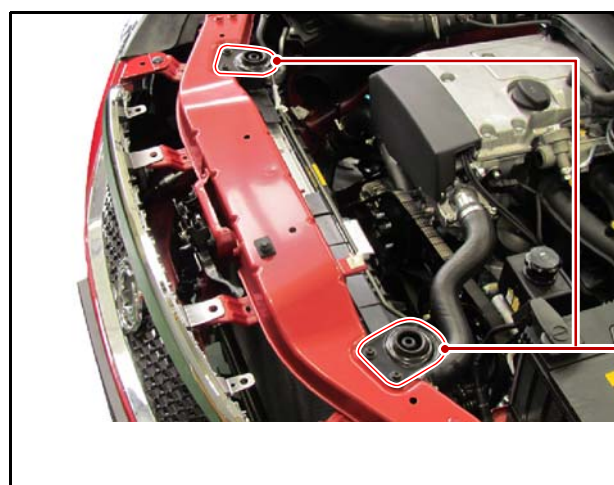


· Be careful of the coolant leaks.

8. Disconnect the A/C pipe from the radiator and disconnect the upper connector of the PWM unit.



9. Remove the upper mounting bracket of the radiator.



10. Unscrew the right and left mounting bolts of the radiator.



11. Remove the radiator assembly from the vehicle. (The front upper mounting can be removed before for easier removal.)

ENGINE
ASSEMBLENGINE
FUELENGINE
INTAKEENGINE
EXHAUSTENGINE
LUBRICATENGINE
COOLINGENGINE
ELECTRICRUISE
CONTROLENGINE
CONTROL

Modification basis	
Application basis	
Affected VIN	

12.Remove the A/C cooler from the radiator assembly.



اولین سامانه دیجیتال تعمیرکاران خودرو در ایران