

Cooling (WP10)

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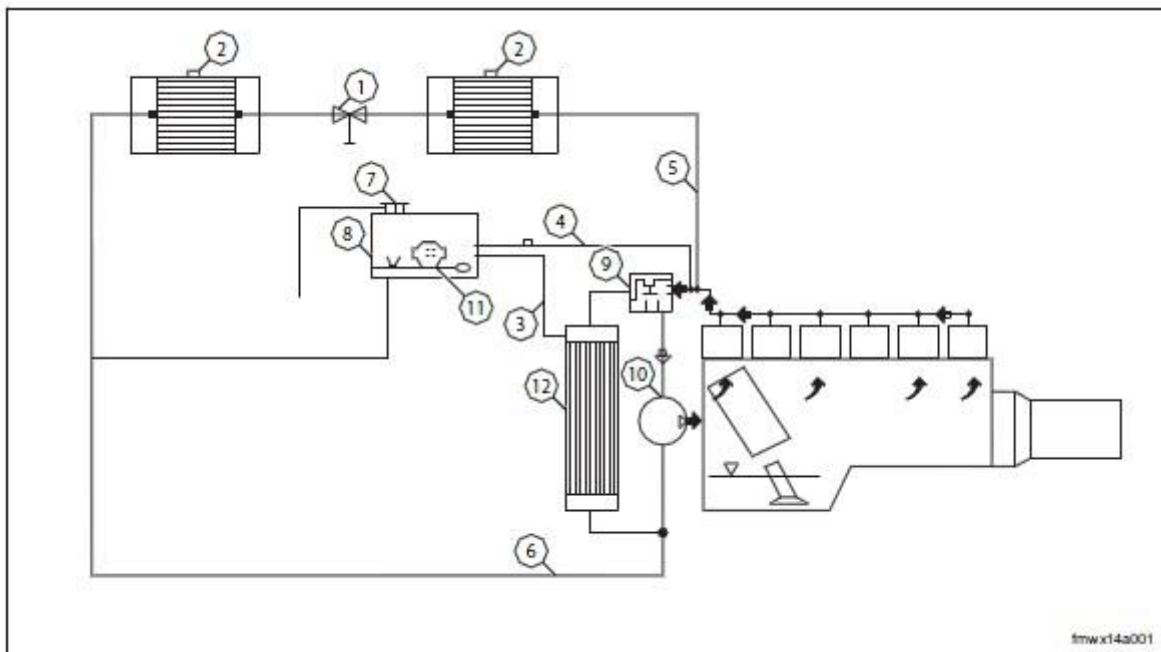
Cooling System

General

The function of the diesel engine's cooling system is to transfer outside the heat absorbed by the heated parts of the diesel engine through cooling medium – coolant, and ensure that the heated parts operate normally under allowable temperature condition. The cooling for the diesel engine shall be appropriate, not excessive. Excessive cooling will bring about the following adverse effects for the diesel engine's operation: 1. the temperature of the cylinder is too low, the ignition delay period of fuel extends, the combustion rate lowers, and heat loss due to radiation rises; 2. the diesel engine runs roughly, and its fuel consumption increases; 3. the viscosity of lubricating oil increases, which results in increase in moving parts' friction power loss, and in decrease in the diesel engine's power. Therefore, only appropriate cooling can ensure that the diesel engine operates normally and has good economy.

Do not use common water as coolant, because the thermal conductivity of the scale deposit generated by heating water is 40 times lower than that of cast iron. The scale deposit on the water jacket will lower the performance of the engine cooling system. After the scale deposit blocks the orifice on the cylinder gasket in particular, it will disturb smooth water flow and bring about various faults and damages.

The engine cooling system consists of a water pump, a radiator, a fan, a thermostat, an auxiliary water tank, cooling pipes, the water channel of the cylinder body, and the cooling water chamber of the crankcase.



1	Switch
2	Heater
3	Exhaust Pipe, Water Tank
4	Water Inlet Pipe, Auxiliary Water Tank
5	Water Inlet Pipe, Heater
6	Water Pipe

7	Pressure Limiting Valve Cover
8	Auxiliary Water Tank
9	Thermostat
10	Water Pump
11	Water Filler Cap
12	Water Tank

Water Pump

The water pump is a power unit in the forced-circulation type water cooling system. Its main function is to generate a certain pressure for coolant and force the coolant into various cooled parts of the diesel engine, in order to ensure the continuous circulation of coolant in the process of the engine's operation. For the WD615 Series diesel engine, the water pump is installed at its front end. The water coming out from the water pump goes into the right water chamber of the engine body; cooling water goes across the oil cooler, flows into the water jacket of the cylinder barrel through the right lower channel hole of the engine body, goes into the water chamber of the cylinder head through the upper water hole after cooling the cylinder barrel, and drains into the water outlet pipe from the water outlet of the cylinder head after cooling the cylinder head; the thermostat is installed at the end of the water outlet pipe. The thermostat has two outlets, one leading to the radiator and the other leading to the water pump inlet, which is small circulation. When the temperature of coolant is at 80 ± 2 °C, the thermostat starts to open and fully opens at 95 °C, and at the moment, coolant is pumped into the engine body by water pump after being cooled by the radiator. When the temperature of coolant is lower than 80 ± 2 °C, the thermostat cuts off the above channel, and coolant directly flows into the water pump inlet, which can help the diesel engine's temperature rise as soon as possible and help the diesel engine reach hot state required for operation, avoid cold scuffing, and prolong the service life of the diesel engine.

The oil chamber of the water pump is filled with 120cm³ of general purpose lithium base grease from automobile, which needs regular filling or makeup.

Radiator

The function of the radiator is to transfer the heat absorbed by coolant from the heated parts into air and then emit the heat into the atmosphere so as to lower the temperature of coolant.

Fan

The silicon oil fan clutch, adopting silicon oil as medium, transfers torque by using the high viscosity of silicon oil. The release and engagement of the fan clutch can be automatically control by the temperature sensor which detects the temperature of air behind the radiator. When the temperature is low, silicon oil does not flow, the fan clutch releases, and the fan's speed descends and basically idles. When the temperature is high, the viscosity of silicon oil engages the fan clutch, and then the fan rotates together with the water pump shaft, which plays a role in adjusting the engine's temperature.

The temperature sensing element of the silicon oil fan clutch is a bimetallic coil spring temperature sensor. Its working process is as follows:

1. When the temperature or air passing through the radiator rises, the bimetallic temperature sensor deforms as a result of heating to force the valve disc shaft to rotate and open the oil inlet on the driven plate. The silicon oil stored between the driven plate and front cover flows into the working chamber between the driving plate and driven plate, the clutch engages, and the fan's speed increases.

The higher the air temperature, the larger the oil inlet opens, and the faster the fan rotates.

2. When the temperature of air passing through the radiator falls, the bimetallic temperature sensor recovers to its original shape, the valve disc closes the oil inlet, the silicon oil returns to the oil storage chamber from the working chamber through the oil inlet under the action of centrifugal force, the clutch releases, and the fan's speed gets very low.

Thermostat

The function of the thermostat is to keep the coolant's temperature appropriate, which ensures reliable cooling for the diesel engine, and avoids lowering the power and economy of the diesel

engine in use due to too low water temperature. When the temperature of coolant is low, the big circulation valve of the thermostat closes, the small circulation valve opens, the coolant in the water return pipe of the diesel engine is directly supplied to the water pump inlet through the small circulation valve, the water pump pumps coolant into the cooling system of the diesel engine again, and the radiation water tank does not work. When the water temperature of the diesel engine rises to a certain value, the big circulation valve of the thermostat opens while the small circulation valve closes, and the coolant flows into the radiation water tank through the big circulation valve and the water return pipe of the water tank, is sucked into the water pump from the radiation water tank after being cooled, and then is pumped into the cooling circulation system of the diesel engine.

This vehicle adopts a wax and core combined thermostat. When the temperature of coolant is lower than the specified value, the refined wax in the temperature sensing element of the thermostat is solid, the thermostat valve closes the channel between the engine and radiator under the spring action, and the coolant returns to the engine through the water pump and flows within the small circulation. When the temperature of coolant rises to the specified value, the wax starts to melt and gradually changes into liquid, and it presses the rubber hose with its volume increasing and forces the hose to shrink. The rubber hose applies an upward thrust to the push rod while shrinking, and the push rod exerts a downward reverse thrust on the valve to open the valve. At the moment, the coolant passes through the radiator, thermostat valve and water pump, then returns to the engine, and flows within the big circulation. This is the principle of operation of the thermostat. Mostly, the thermostat is arranged in the water outlet pipe of the cylinder head, which has the advantages that the structure is simple and bubbles in the cooling system is easy to eliminate, but has the disadvantages that vibration is usually generated along with the frequent opening and closing of the thermostat.

Auxiliary Water Tank

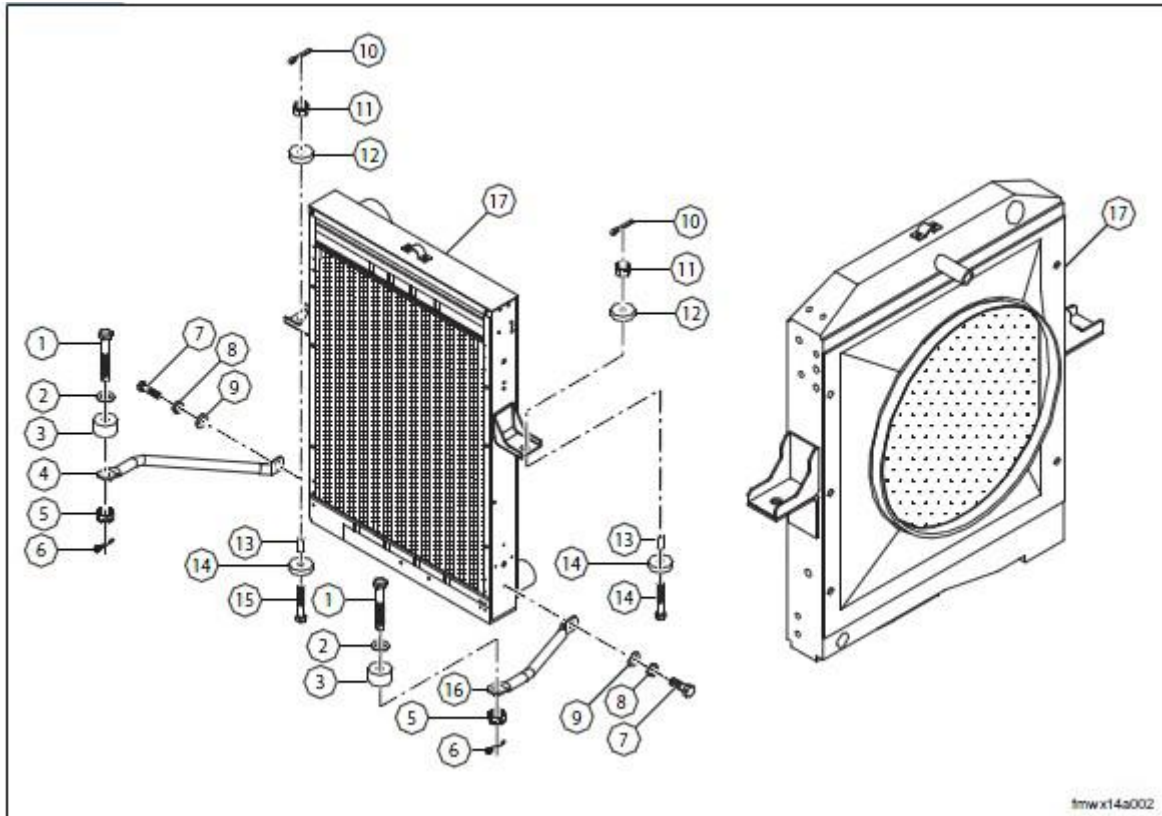
The function of the auxiliary water tank is to eliminate vapor in the low pressure part of the cooling system, which may cause air resistance, and to make up coolant. The pressure of the auxiliary water tank shall be kept at 50kPa, and its position must be 400mm higher than the diesel engine and radiator.

Various water tank caps in the cooling system shall be kept good, and it is prohibited to open them. Keeping an internal pressure in the cooling system will enhance the cooling efficiency of the cooling system, and boiling can be avoided.

Precautions

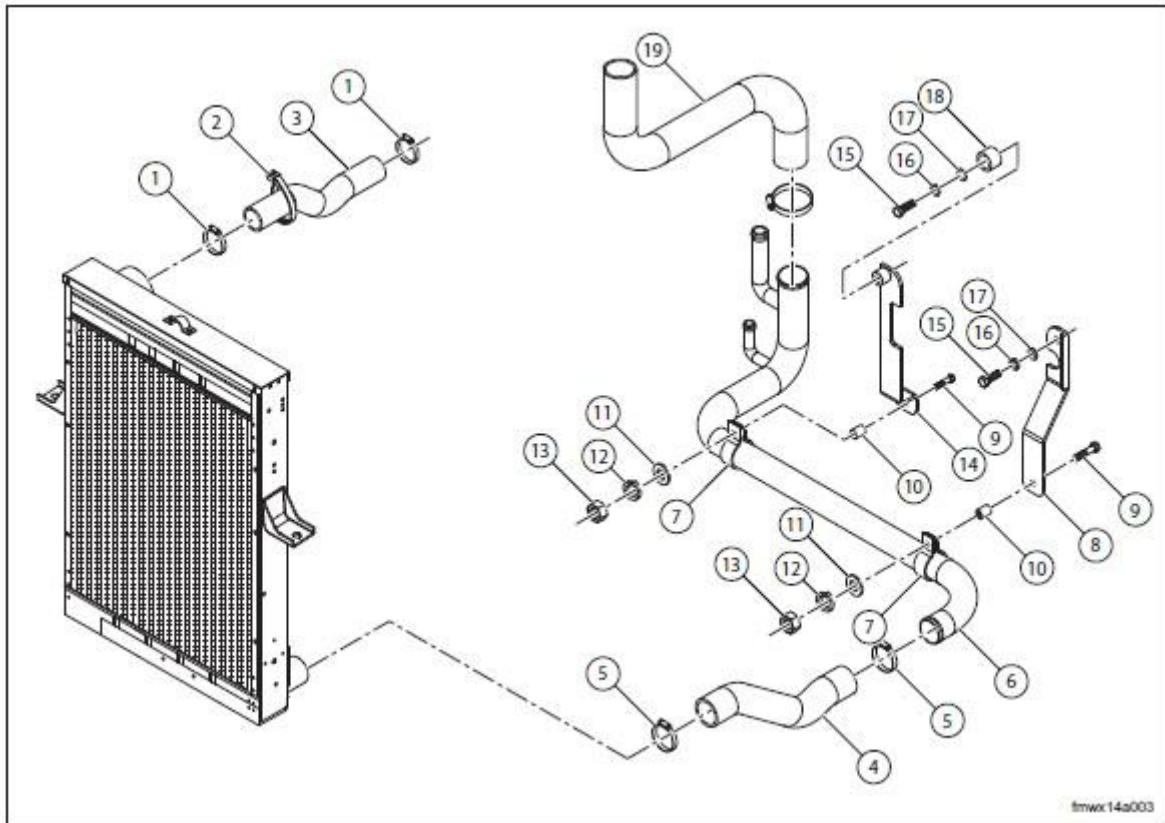
- 1. Never open the pressure cap when the engine is in hot state. The pressure cap can be opened when the temperature of coolant falls below 50°C, or hot coolant or vapor emitted may cause personal injury.**
- 2. When disconnecting the pipeline of the cooling system, collect the residual coolant with a special container. If the coolant is disused, follow the waste disposal as specified.**
- 3. When disconnecting the pipeline of the cooling system, never allow debris to go into the pipeline of the cooling system, which may damage the cooling system and engine.**
- 4. When disconnecting the pipe joint of the cooling system, in order to prevent dirt or impurities from going into the pipe, make sure to use special plug to seal the pipe orifice.**
- 5. Coolant is toxic. If disused, keep it far away from children and pets, and follow the waste disposal as specified.**
- 6. Different brands of antifreezes are based on different production formulas. If they are mixed, various additives are likely to react with each other, which will result in failure of the additives.**
- 7. The shelf life of the antifreeze is two years. Confirm whether the antifreeze is within the shelf life when filling.**
- 8. The antifreeze must be replaced regularly, generally once every two years or every 40,000km.**
- 9. Drain the old antifreeze during replacement, clean the cooling system, and then fill new antifreeze.**
- 10. Avoid mixing antifreeze with water. The traditional inorganic antifreeze can not be mixed with water, or sediment will be generated, which will seriously affect the normal function of the antifreeze. The organic antifreeze can be mixed with water, but not too much.**
- 11. When the air temperature is below 0 °C, inspect the concentration of antifreeze regularly.**
- 12. Vehicles, which usually run in the regions above 0 °C, can use water after anti-rust and scale prevention treatment as coolant. They are prohibited to use untreated water as coolant.**
- 13. When using the silicon oil clutch fan, be careful not to place the fan horizontally after dismantling it, or silicon oil will be leaked from the fit clearance of the sensor shaft, which will cause failure of the fan.**

Part Drawing



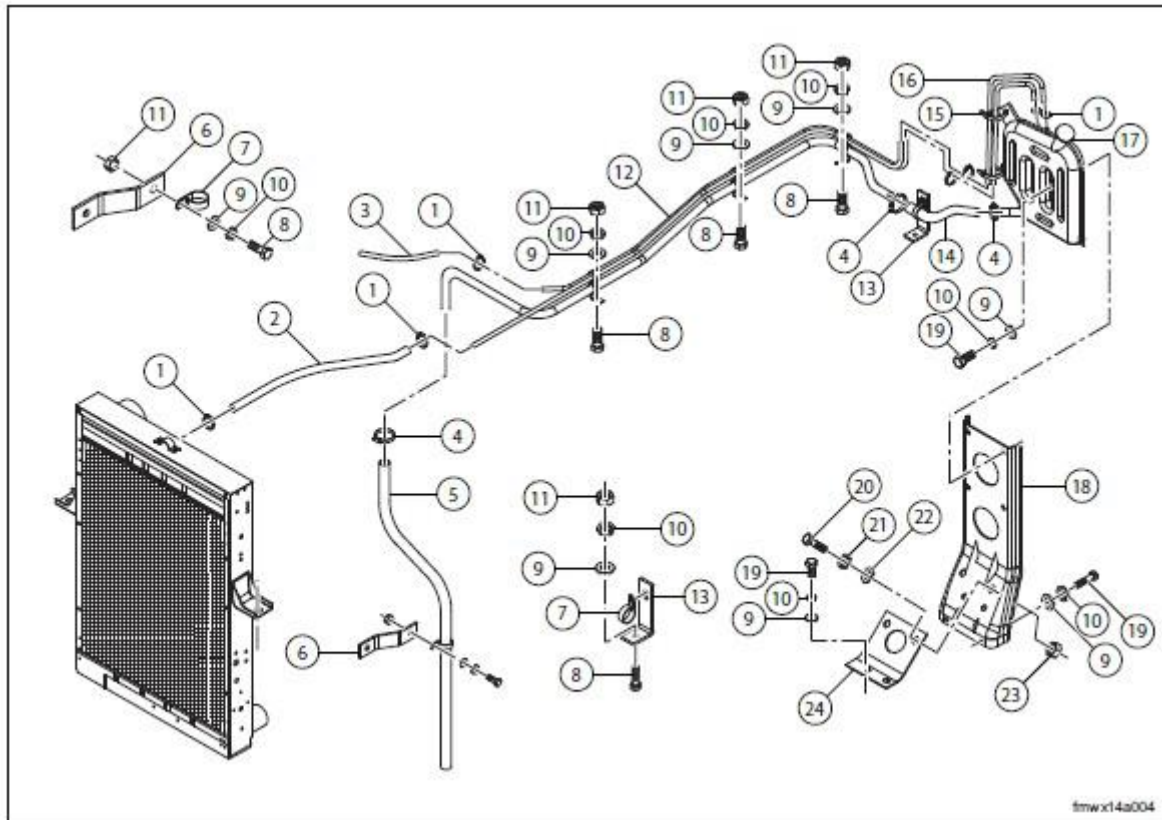
1	Hex Bolt with Split Pin Hole on Shank
2	Big Washer
3	Cushion, Radiator Tie Rod
4	Right Tie Rod, Radiator (symmetrical with the left part)
5	Hex Thin Slotted Nut
6	Cotter Pin
7	Hex Head Bolt
8	Spring Washer
9	Flat Washer

10	Cotter Pin
11	Hex Slotted Nut, Style 1 – Fine Pitch Thread
12	Upper Cushion, Radiator
13	Sleeve
14	Cushion, Radiator
15	Hex Bolt with Split Pin Hole on Shank
16	Left Tie Rod, Radiator
17	Radiator with Cowl Assembly



1	Worm Drive Type Hose Hoop, Type A
2	Plastic Strap
3	Water Inlet Hose, Radiator
4	Water Outlet Hose, Radiator
5	Worm Drive Type Hose Hoop, Type A
6	Engine Water Inlet Pipe Welding Assembly
7	Clamp
8	Fixing Bracket, Water Pipe
9	Hex Head Bolt
10	Limiting Sleeve, Water Pipe

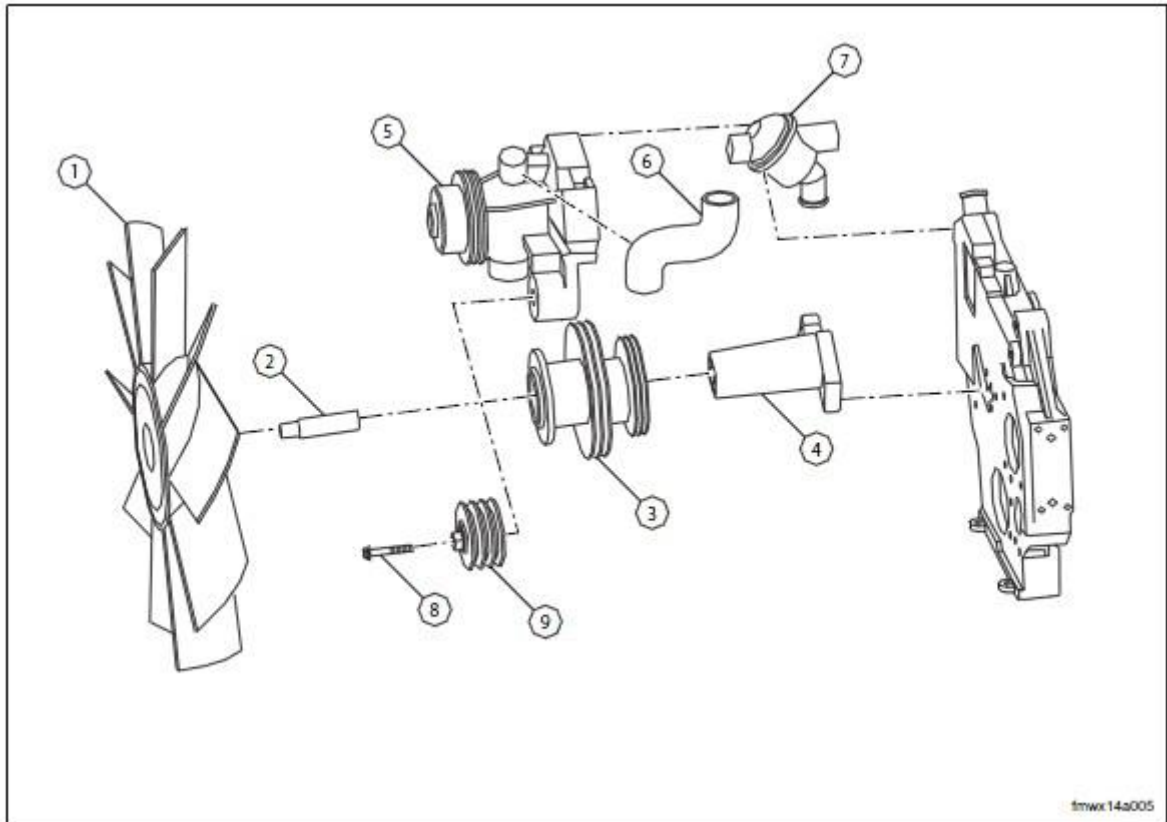
11	Flat Washer
12	Spring Washer
13	Hex Nut, Style 1
14	Bracket, Water Pipe Welding Assembly
15	Hex Head Bolt
16	Spring Washer
17	Flat Washer
18	Cushion block
19	Water Inlet Hose, Engine



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1	Worm Drive Type Hose Hoop, Type A
2	Exhaust Hose, Radiator
3	Exhaust Hose, Engine
4	Worm Drive Type Hose Hoop, Type A
5	Water Outlet Pipe, Auxiliary Water Tank
6	Bracket, Engine Water Make-up Pipe
7	Single Pipe Clamp
8	Hex Head Bolt
9	Flat Washer
10	Spring Washer
11	Hex Nut, Style 1
12	Combined Cooling Water Pipe

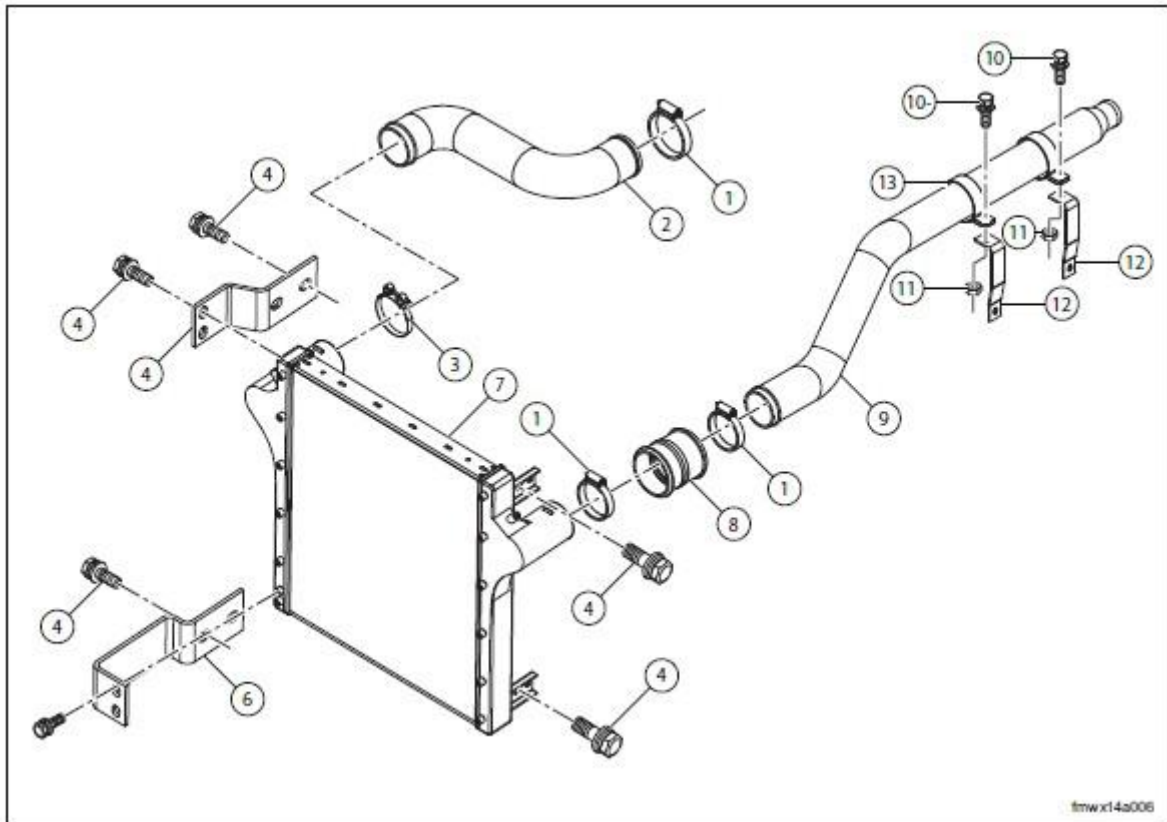
13	Bracket, Cooling Water Hose
14	Water Outlet Pipe, Auxiliary Water Tank
15	Plastic Strap
16	Exhaust Hose
17	Plastic Auxiliary Water Tank
18	Bracket, Auxiliary Water Tank
19	Hex Head Bolt
20	Hex Head Bolt
21	Spring Washer
22	Flat Washer
23	Hex Nut, Style 1
24	Support Plate, Auxiliary Water Tank



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1	Silicon Oil Clutch Fan
2	Shaft
3	Pulley
4	Fan Bracket
5	Wave Pump Assembly

6	Shaped Hose
7	Thermostat Assembly
8	Hex Flange Bolt
9	Tension Pulley Assembly



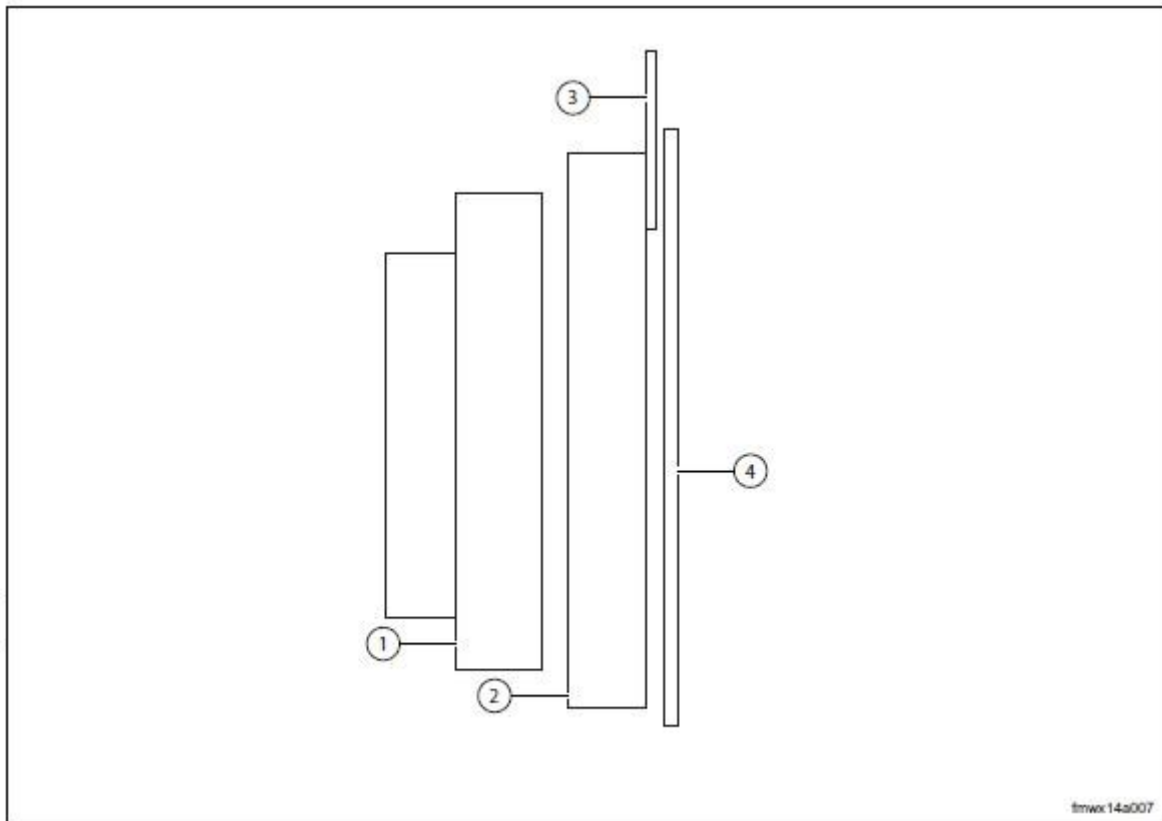
1	Clamp
2	Exhaust Pipe, Intercooler
3	T-clamp
4	Hex Head Bolt, Spring Washer and Flat Washer Assembly
5	Fixing Bracket, Intercooler
6	Fixing Bracket, Intercooler
7	Intercooler assembly

8	Connecting hose
9	Intake Pipe, Intercooler
10	Hex Head Bolt, Spring Washer and Flat Washer Assembly
11	Hex Flange Nut
12	Bracket, Intercooler Pipe
13	Clamp, Intercooler Pipe

Testing & Adjustment

Fan

Manual test method: Start the engine, run it for several minutes and then shut down; pull the fan by hand. If the clutch is released and the fan can rotate, it shows that the silicon oil fan is good. There are, however, exceptions that the fan can not rotate at low temperature because silicon oil can not return at once, which does not always show that the silicon fan is damaged. Start the engine to continue the test, run it at middle speed and low temperature for 1~2 minutes and then shut down; pull the fan by hand. If the fan can rotate and operate flexibly, it shows that the silicon fan is good. When the temperature rises to 88 °C, shut the engine down, and pull the fan by hand. If the fan does not move, it shows that the silicon fan is normal; if not, it shows that the silicon fan is defective.



1	Fan
2	Radiator

3	Thermometer
4	Baffle Plate

Dynamic test: Place the thermometer with a range of -18~105 °C ahead of the radiator. Put a fixed plastic plate ahead of the radiator to prevent air from passing through the radiator, and ensure that it can prevent air passage. If an air conditioner is equipped, the A/C switch must be turned off. Use a timing lamp to point to the fan blades, start the engine and run it at a speed of 2400r/min. The air temperature showed by dial thermometer shall reach 88 °C within 10 minutes. The ideal engagement of the fan clutch shall be before 88 °C. Observe the increase in the fan's speed. When the air temperature rises to 88 °C, take away the plastic plate, and the air temperature starts to fall. The ideal silicon oil fan clutch can lower the air temperature by 11 °C or more, and at the same time, you can hear that the air flow sound of the fan reduces. If the fan clutch fails to meet the above requirement, replace the silicon oil fan clutch assembly.

Water Pump

In case that the cooling system leaks, you can smell hot antifreeze. But you have to do inspection, and find out whether the cooling water is leaked from the shaft seal of the water pump. You can use a small mirror and a lamp to inspect whether the air bleed hole of the water pump leaks water.

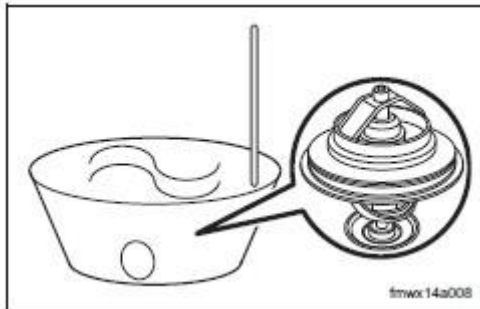
Conduct the regular maintenance, and pay attention to inspecting the consumption of coolant in the water tank.

Do not underestimate the problem of leakage in the cooling system, which will cause air sucked in to destroy the preset coolant flow mode and result in generation of hotspots, and greatly aggravate corrosion to the water pump.

If the amount of coolant is insufficient for a long time, it will cause the engine to overheat, and steam corrosion may occur, which may damage the radiator and cause other problems of the water pump. When the color of coolant is rusty, it may be the problem of impeller corrosion. At the moment, it is necessary to inspect the circulation condition of the water pump coolant. Discharge part of the coolant in the radiator and keep the lever right above the pipe, and warm up the engine to let the thermostat stay in full opening position. When the engine's speed is 3,000r/min, you shall see a good water circulation.

Thermostat

The safe life of the wax thermostat is generally for a range of 50,000km, and the wax thermostat shall be replaced regularly according to its safe life.



1. Inspect the thermostat

- (a). The thermostat and thermometer can be put in hot water.
- (b). Inspect the opening temperature of the main valve of the thermostat.
- (c). Inspect the sealing ring of the thermostat.
- (d). Replace the thermostat if either of the items fails to meet the specified value.

Opening Temperature	Full-opening Temperature
$80 \pm 2 \text{ }^{\circ}\text{C}$	$95 \text{ }^{\circ}\text{C}$

Water Pipe

Inspect whether the clogging, bulging, aging or cracking of water pipes occurs, and whether the connection of water pipe joints is secure.

Auxiliary Water Tank

Inspect whether there are cracks on the auxiliary water tank, whether the bulging, aging or cracking of the auxiliary water tank occurs, and whether the auxiliary water tank cap is in perfect condition.

Coolant

When the engine idles and warms up to the normal operating temperature, the level of coolant in the bottle shall be between the lowest graduation line and highest graduation line, as shown on the bottle. Test the concentration of coolant by a freezing point tester.

Radiator

Fill water into the radiator, and observe whether water flow is smooth. If not smooth, it shows that the radiator inside is clogged. Rinse the radiator outside, and wash the radiator inside with hot water. If the scale deposit can not be eliminated still after the radiator is washed, use a soft metal cleaning rod to remove the scale deposit, and then wash with the above method. Remove the radiating fin of the damaged radiating pipe by needle nose pliers, then cut off the damaged radiating pipe, insert the cleaning rod from the end of the core, pass it through the upper orifice and lower orifice of the cut part and straighten, cut the same usable radiating pipe from a waste radiator, and solder the upper and lower joints. Insert the resistance heater into the radiating pipe to be replaced, and supply 24V power. After resistance wires are hot, the radiating pipe releases as its soldering tin melts. Cut off the power, take out the radiating pipe and resistance heater together, and change with the new radiating pipe and solder securely. Install the radiator tester on the radiator cap opening,

and inspect the cooling system for leakage. Pressurize the radiator to 176kPa, inspect the leakage of coolant at normal operating temperature, and repair if any.

Intercooler

This vehicle is of a turbocharged intercooled type. The intercooler is installed on the front of the diesel engine, i.e. the front end of the water tank, and it sucks the air from the fan and the headwind of the vehicle during driving for cooling. Foreign matters such as oil sludge and colloid, which are usually attached to the internal pipe of the intercooler, not only narrow the air channel to reduce the heat exchange capacity, but also lower air intake because dirt clogs the air channel, which cause the problems that the diesel engine's power falls, the exhaust gas is white, and even the vehicle can not run normally.

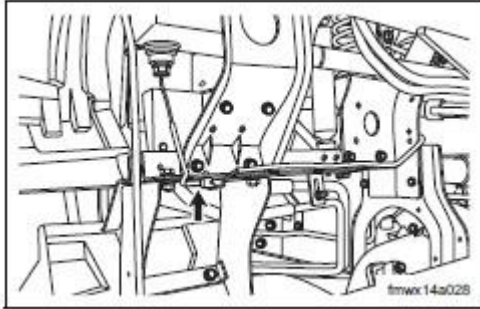
Fill water into the intercooler, and observe whether water flow is smooth. If not smooth, it shows that the intercooler is clogged. Wash the intercooler with hot water. If the scale deposit can not be eliminated after washing, replace the intercooler.

Auxiliary Water Tank

Overhaul

Hint:

Part Drawing, refer to Chapter 14A Cooling – Cooling System, Part Drawing



1. Dismantle the auxiliary water tank

- (a). Disconnect the wiring harness of the auxiliary water tank.

- (b). Open the auxiliary water tank cap.

Caution:

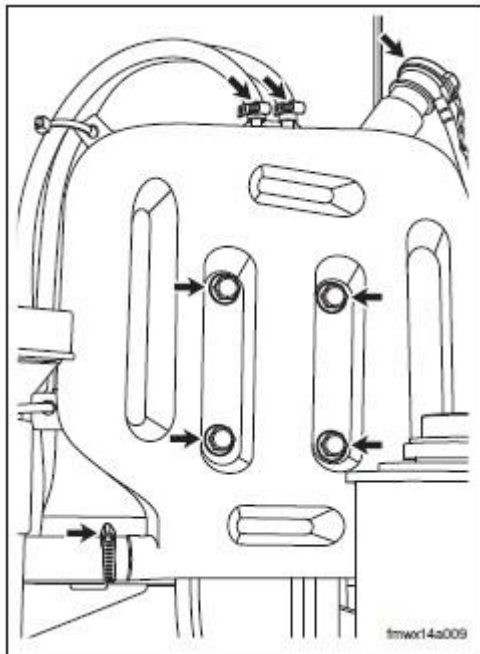
Never open the pressure cap when the engine is in hot state. The pressure cap can be opened when the temperature of coolant falls below 50°C, or hot coolant or vapor emitted may cause personal injury.

- (c). Disconnect the pipe of the auxiliary water tank.

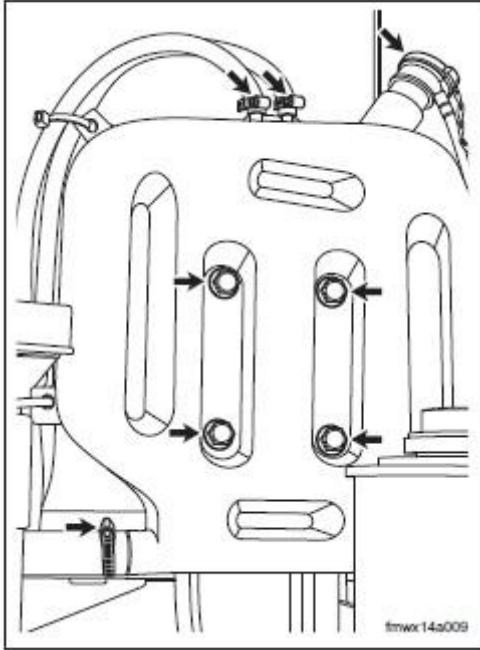
Caution:

When disconnecting the pipe joint of the cooling system, in order to prevent dirt or impurities from going into the pipe, make sure to use special plug to seal the pipe orifice.

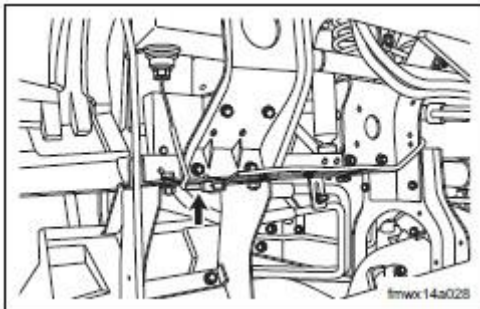
- (d). Dismantle the fixing bolts of the auxiliary water tank.



2. Inspect the auxiliary water tank. Refer to Chapter 14A Cooling – Cooling System, Testing & Adjustment.

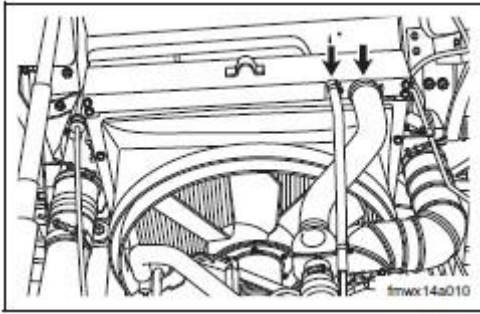


- 3. Install the auxiliary water tank**
- (a). Install the fixing bolts of the auxiliary water tank.
Torque: 20N.m
 - (b). Connect the pipe of the auxiliary water tank.
 - (c). Fill coolant.
 - (d). Close the auxiliary water tank cap.



- (e). Disconnect the wiring harness of the auxiliary water tank.

Coolant Replacement



1. Drain coolant

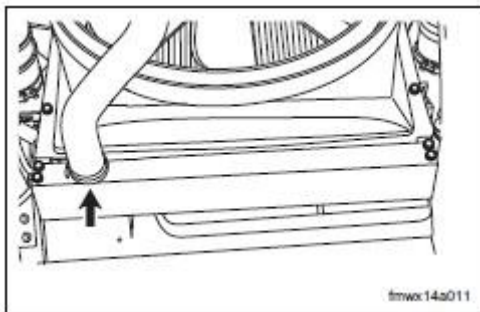
- (a). Disconnect the water inlet hose and exhaust pipe of the radiator.

Caution:

Never open the pressure cap when the engine is in hot state. The pressure cap can be opened when the temperature of coolant falls below 50°C, or hot coolant or vapor emitted may cause personal injury.

Caution:

When disconnecting the pipe joint of the cooling system, in order to prevent dirt or impurities from going into the pipe, make sure to use special plug to seal the pipe orifice.



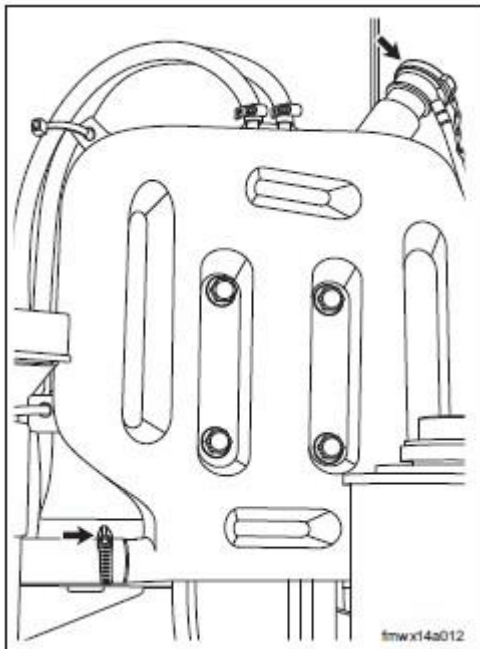
- (b). Disconnect the water outlet hose of the radiator.

Caution:

When disconnecting the pipe joint of the cooling system, in order to prevent dirt or impurities from going into the pipe, make sure to use special plug to seal the pipe orifice.

Caution:

Coolant is toxic. If disused, keep it far away from children and pets, and follow the waste disposal as specified.



- (c). Unscrew the auxiliary water tank cap.

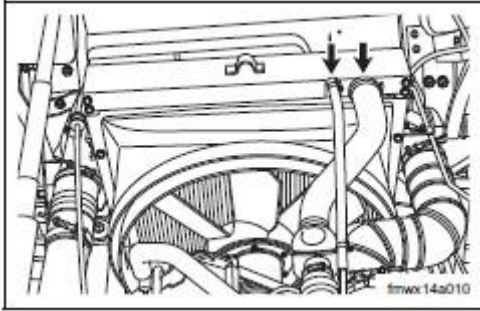
- (d). Disconnect the water pipe of the auxiliary water tank.

Caution:

When disconnecting the pipe joint of the cooling system, in order to prevent dirt or impurities from going into the pipe, make sure to use special plug to seal the pipe orifice.

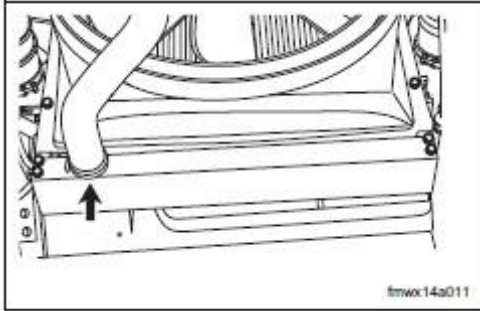
Caution:

Coolant is toxic. If disused, keep it far away from children and pets, and follow the waste disposal as specified.

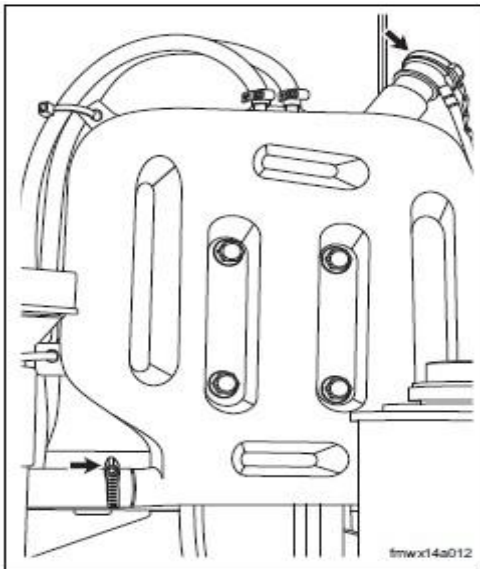


2. Fill coolant

(a). Connect the water inlet hose and exhaust pipe of the radiator.



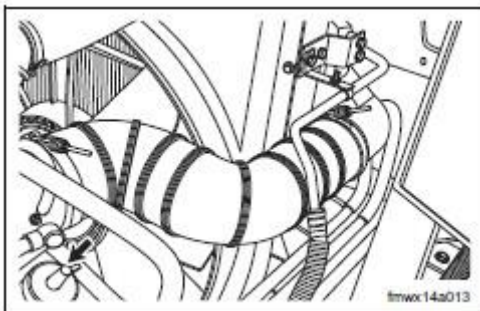
(b). Connect the water outlet hose of the radiator.



(c). Connect the water pipe of the auxiliary water tank.

(d). Fill coolant.

(e). Tighten the auxiliary water tank cap.



(f). Fill coolant from the engine water filler.

Caution:

Different brands of antifreezes are based on different production formulas. If they are mixed, various additives are likely to react with each other, which will result in failure of the additives.

Caution:

The shelf life of the antifreeze is two years. Confirm whether the antifreeze is within the shelf life when filling.

3. Inspect the coolant level

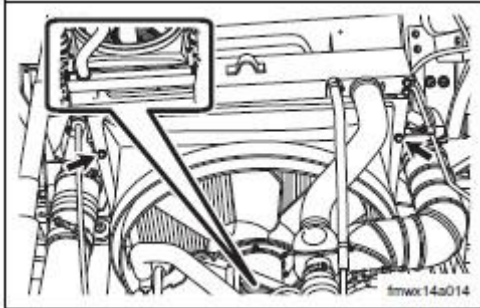
- (a). Run the engine, and inspect the engine coolant level.
- (b). If the level is too low, continue to fill coolant.

Radiator Overhaul

Hint:

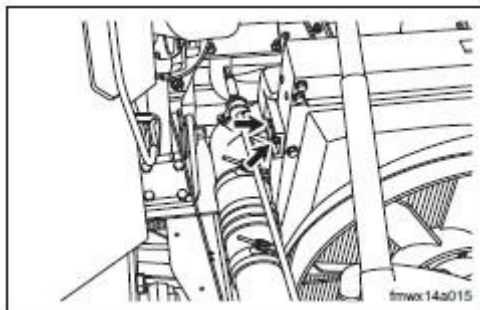
Part Drawing, refer to Chapter 14A Cooling – Cooling System, Part Drawing

1. Drain coolant. Refer to Chapter 14A Cooling – Coolant, Replacement.

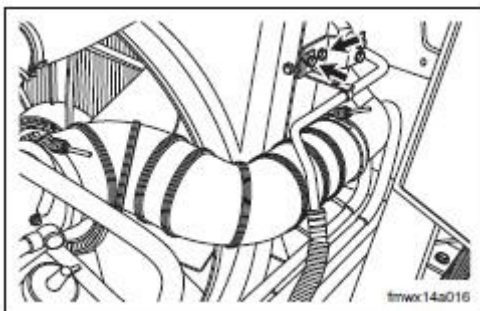


2. Dismantle the radiator

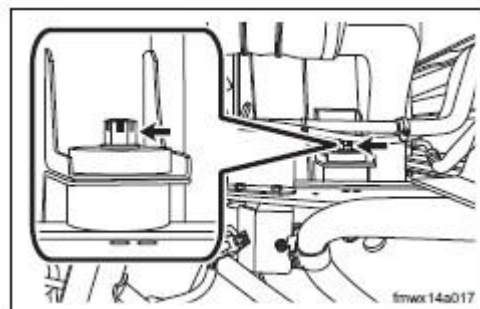
(a). Loosen the shroud.



(b). Loosen the intercooler.



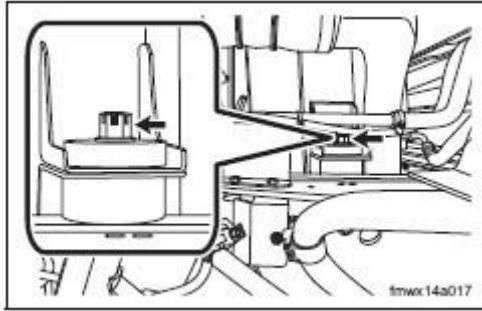
(c). Dismantle the fixing bracket of the A/C pipe.



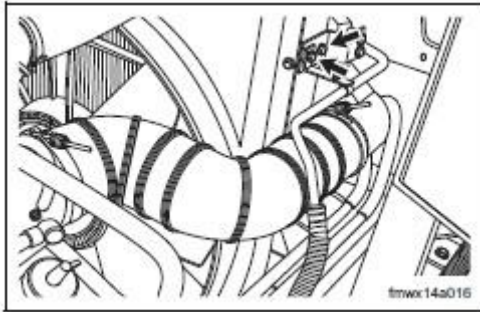
(d). Dismantle the radiator.

- Dismantle the cotter pin.
- Dismantle the slotted nuts of the radiator.
- Take out the radiator upward.

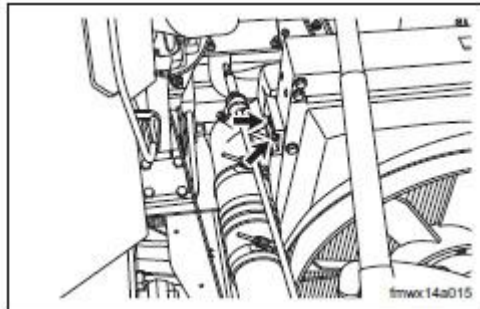
3. Inspect the radiator. Refer to Chapter 14A Cooling – Cooling System, Testing & Adjustment.



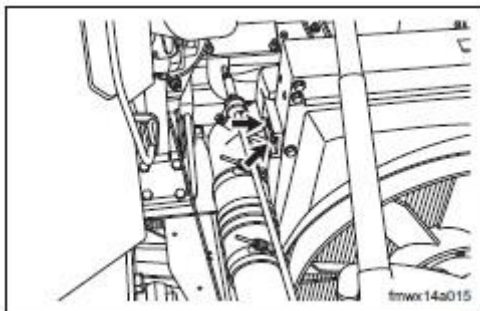
- 4. Install the radiator**
- (a). Install the radiator.
- Put radiator downward.
 - Install the slotted nuts of the radiator.
Torque: 70N.m
 - Install the cotter pin.



- (b). Install the fixing bracket of the A/C pipe.



- (c). Tighten the intercooler.
Torque: 23±2N.m



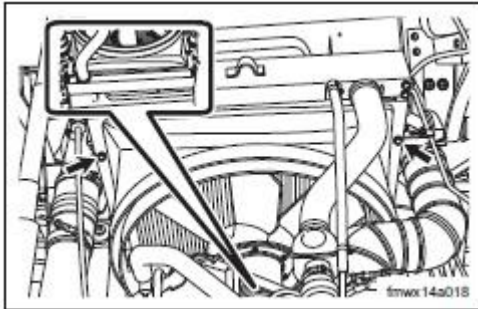
- (d). Tighten the shroud.
Torque: 20N.m

5. Fill coolant. Refer to Chapter 14A Cooling – Coolant, Replacement.

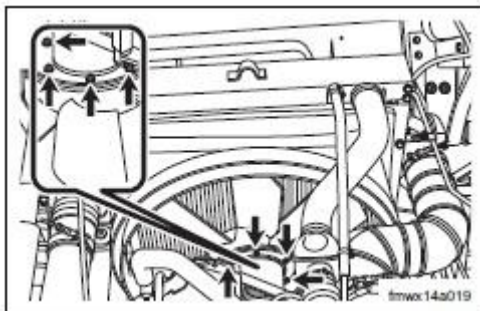
Cooling Fan Overhaul

Hint:

Part Drawing, refer to Chapter 14A Cooling – Cooling System, Part Drawing

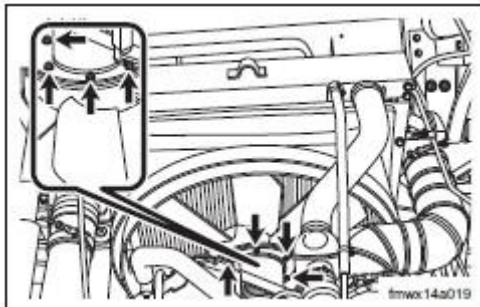


1. **Dismantle the cooling fan**
 - (a). Loosen the shroud.

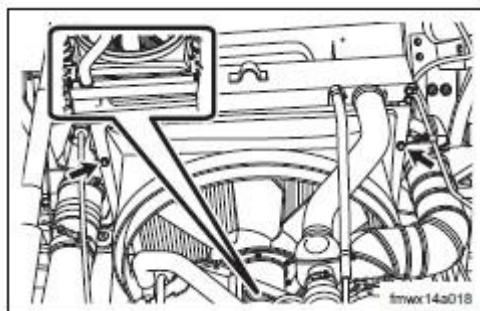


- (b). Disconnect the silicon oil temperature sensor of the cooling fan.
- (c). Dismantle the cooling fan.

2. Inspect the cooling fan. Refer to Chapter 14A Cooling – Cooling System, Testing & Adjustment.



3. **Install the cooling fan**
 - (a). Install the cooling fan.
Torque: 20N.m



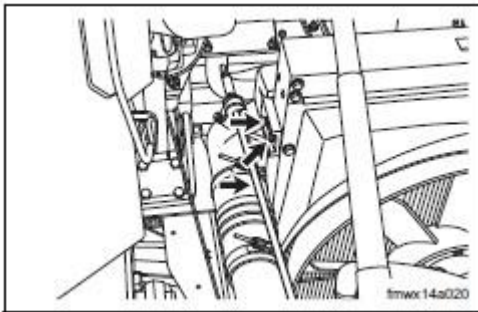
- (b). Tighten the shroud.
Torque: 20N.m
- (c). Connect the silicon oil temperature sensor of the cooling fan.

Intercooler

Overhaul

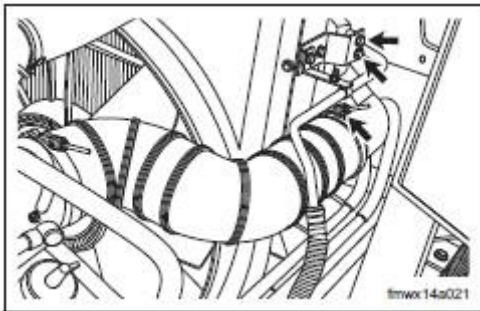
Hint:

Part Drawing, refer to Chapter 14A Cooling – Cooling System, Part Drawing

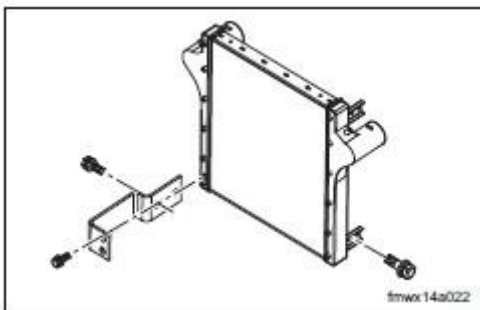


1. Dismantle the intercooler

- (a). Dismantle the intake pipe of the intercooler.
- (b). Dismantle the fixing bolts of the intercooler.

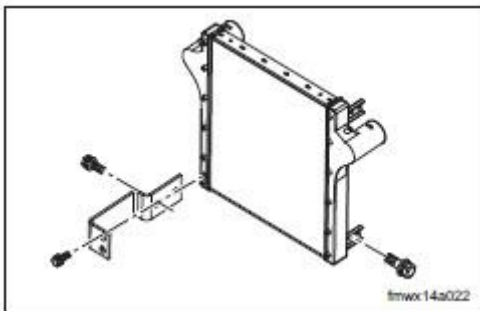


- (c). Dismantle the exhaust pipe of the intercooler.
- (d). Dismantle the fixing bracket of the intercooler.



- (e). Dismantle the fixing bolts of the intercooler.
- (f). Dismantle the fixing bolts of the intercooler.

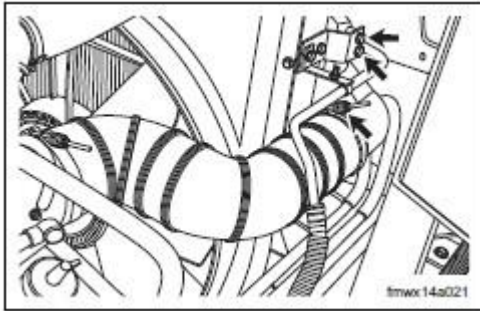
2. Inspect the intercooler. Refer to Chapter 14A Cooling – Cooling System, Testing & Adjustment.



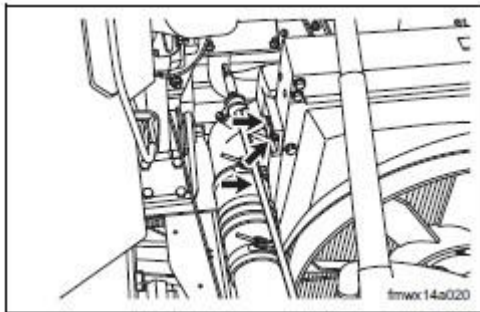
3. Install the intercooler

- (a). Install the fixing bolts of the intercooler.
- (b). Install the fixing bolts of the intercooler.

Torque: 23 ± 3 N.m



- (c). Install the exhaust pipe of the intercooler.
 - (d). Install the fixing bracket of the intercooler.
- Torque: $23 \pm 3 \text{N.m}$**



- (e). Install the intake pipe of the intercooler.
- (f). Install the fixing bolts of the intercooler.

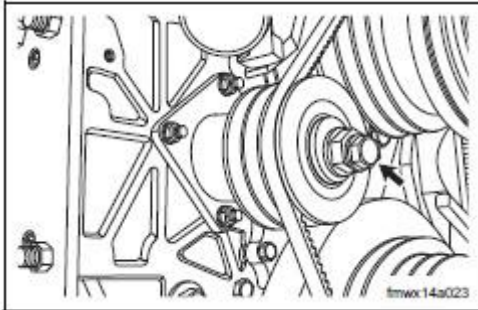
Water Pump

Overhaul

Hint:

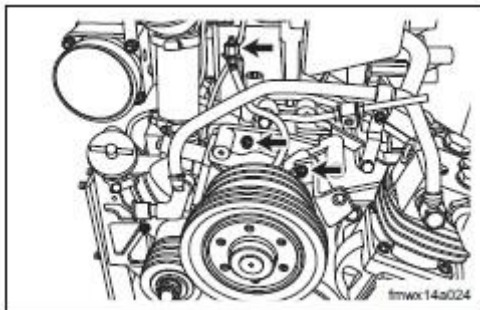
Part Drawing, refer to Chapter 14A Cooling – Cooling System, Part Drawing

1. Drain coolant. Refer to Chapter 14A Cooling – Coolant, Replacement.



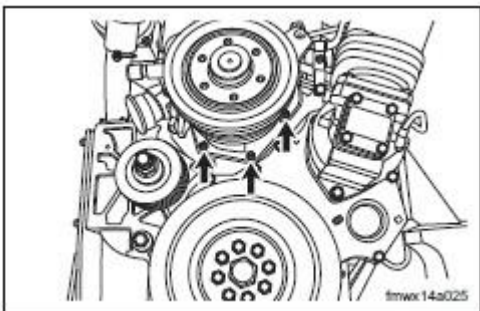
2. Dismantle the belt

- (a). Loosen the tension pulley.
- (b). Remove the belt.

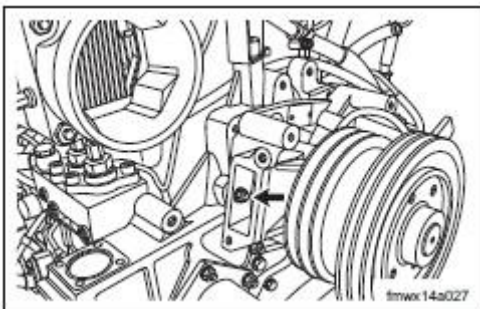


3. Dismantle the water pump

- (a). Dismantle the grease nipple and fixing nuts of the water pump.

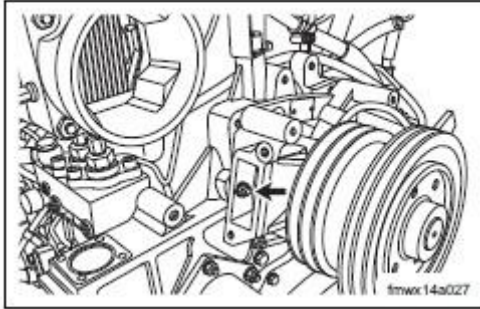


- (b). Dismantle the fixing nuts of the water pump.



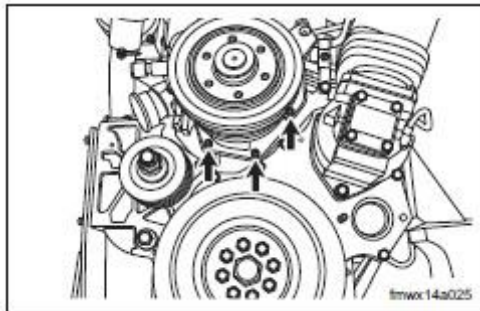
- (c). Dismantle the fixing nuts of the water pump.
 - Dismantle the thermostat and water filler.

4. Inspect the water pump. Refer to Chapter 14A Cooling – Cooling System, Part Drawing.

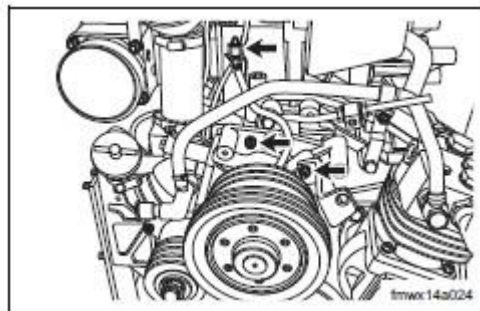


5. Install the water pump

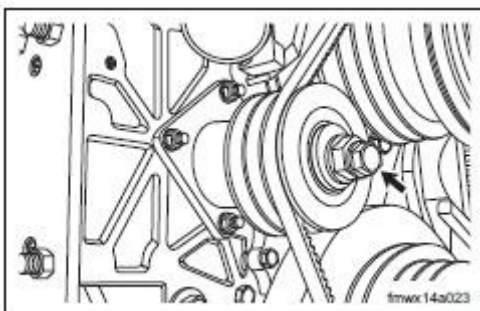
- (a). Install the fixing nuts of the water pump.
Torque:63N.m
- (b). Install the thermostat and water filler.



- (c). Install the fixing nuts of the water pump.
Torque:63N.m



- (d). Install the grease nipple and fixing nuts of the water pump.
Torque:63N.m



6. Install the belt

- (a). Put the belt on the tension pulley.
- (b). Tighten the tension pulley.

7. Fill coolant. Refer to Chapter 14A Cooling – Coolant, Replacement.

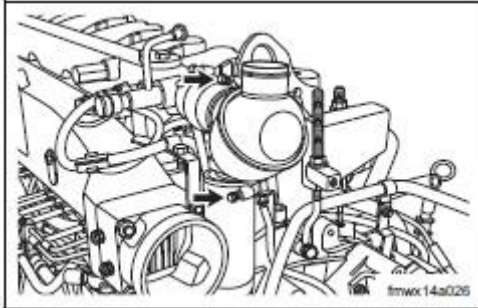
Thermostat

Overhaul

Hint:

Part Drawing, refer to Chapter 14A Cooling – Cooling System, Part Drawing

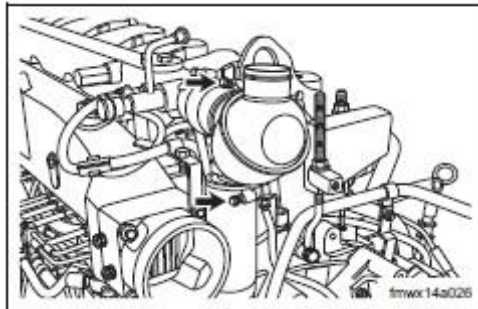
1. Drain coolant. Refer to Chapter 14A Cooling – Coolant, Replacement.



2. Dismantle the thermostat

- (a). Dismantle the cooling water pipe.
- (b). Dismantle the thermostat.

3. Inspect the thermostat. Refer to Chapter 14A Cooling – Cooling System, Testing & Adjustment.



4. Install the thermostat

- (a). Install the thermostat.
- (b). Install the cooling water pipe.

5. Fill coolant. Refer to Chapter 14A Cooling – Coolant, Replacement.

