ENGINE SECTION 3

This service manual has been prepared to provide SUBARU service personnel with the necessary information and data for the correct maintenance and repair of SUBARU vehicles.
This manual includes the procedures for maintenance, disassembling, reassembling, inspection and adjustment of components and diagnostics for guidance of experienced mechanics.
Please peruse and utilize this manual fully to ensure complete repair work for satisfying our customers by keeping their vehicle in optimum condition. When replacement of parts during repair work is needed, be sure to use SUBARU genuine parts.

All information, illustration and specifications contained in this manual are based on the latest product information available at the time of publication approval.

COOLING

CO(H6DO)

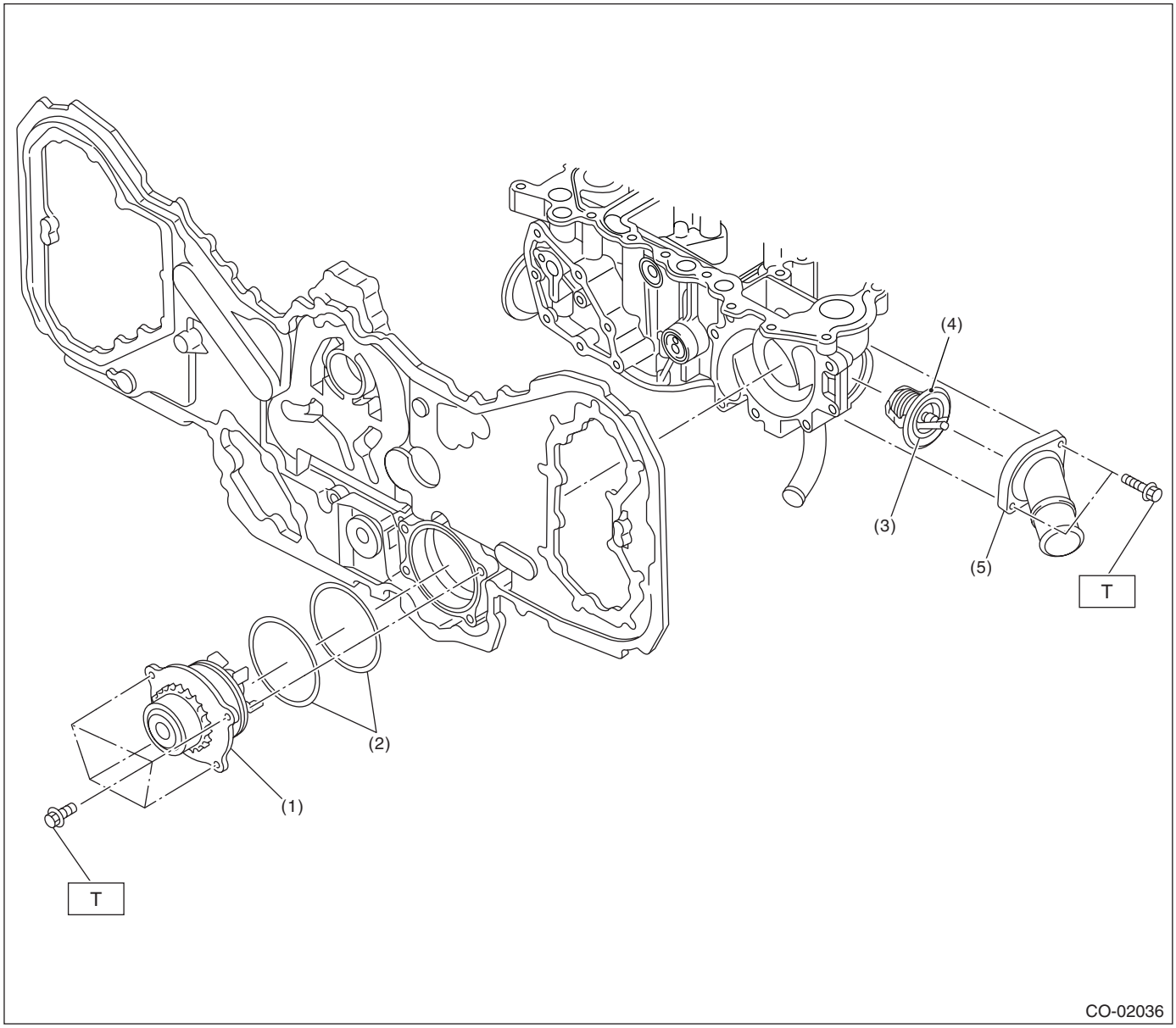
1. General Description

A: SPECIFICATION

Cooling system			Electric fan + Forced engine coolant circulation system
Total engine coolant capacity ℓ (US qt, Imp qt)		Model with ATF warmer (LHD)	Approx. 7.7 (8.1, 6.8)
		Model with ATF warmer (RHD)	Approx. 7.8 (8.2, 6.9)
		Model without ATF warmer	Approx. 7.2 (7.6, 6.3)
Water pump	Type		Centrifugal impeller type
	Discharge performance I	Discharge amount ℓ (US gal, Imp gal)/min	320 (84.5, 70.4)
		Pump speed — Discharge pressure	5,500 rpm — 176.5 kPa (18 mAq)
		Engine coolant temperature	80°C (176°F)
	Impeller diameter mm (in)		73.2 (2.88)
	Number of impeller vanes		6
	Number of pump sprocket teeth		22
Thermostat	Type		Wax pellet type
	Starting temperature to open		80 — 84°C (176 — 183°F)
	Fully opens		95°C (203°F)
	Valve lift mm (in)		9.0 (0.354) or more
	Valve bore mm (in)		35 (1.38)
Radiator fan	Motor input	Main fan W	160
		Sub fan W	160
	Fan diameter / Blades	Main fan	320 mm (12.60 in) /5
		Sub fan	320 mm (12.6 in) /7
Radiator	Type		Down flow, pressure type
	Core dimensions	Width × Height × Thickness mm (in)	690 × 349 × 16 (27.17 × 13.74 × 0.63)
	Pressure range in which cap valve is open	kPa (kg/cm^2, psi)	Above: 108±15 (1.1±0.15, 16±2) Below: −1.0 — −4.9 (−0.01 — −0.05, −0.1 — −0.7)
	Fins		Corrugated fin type
Reservoir tank	Capacity ℓ (US qt, Imp qt)		0.5 (0.5, 0.4)

B: COMPONENT

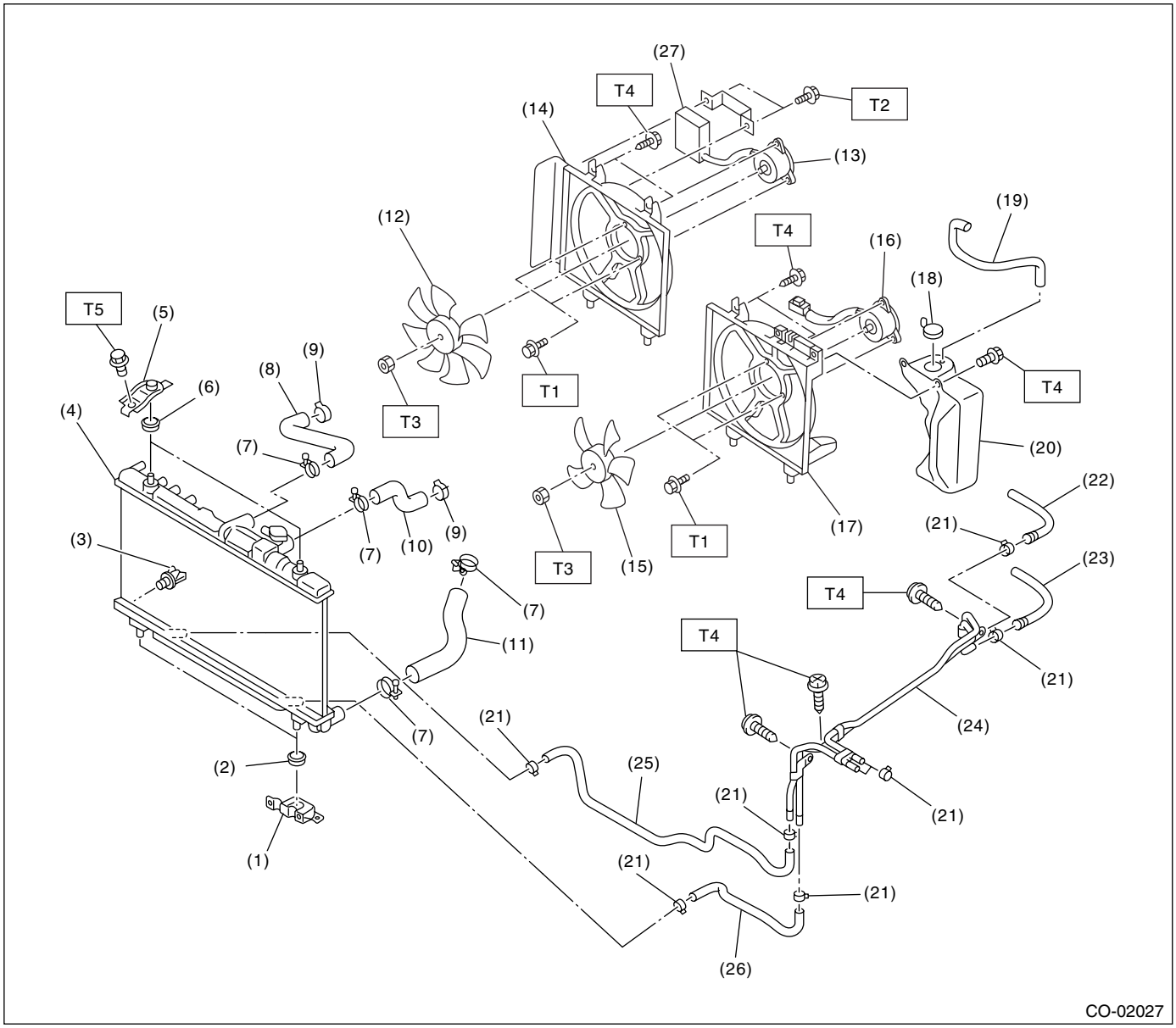
1. WATER PUMP



(1) Water pump ASSY
(2) O-ring
(3) Thermostat
(4) Gasket
(5) Thermostat cover

Tightening torque: N·m (kgf-m, ft-lb)
T: 6.4 (0.65, 4.7)

2. RADIATOR AND RADIATOR FAN



CO-02027

(1) Radiator lower bracket
(2) Radiator lower cushion
(3) Engine coolant drain cock
(4) Radiator
(5) Radiator upper bracket
(6) Radiator upper cushion
(7) Clamp
(8) Radiator inlet hose A
(9) Clamp
(10) Radiator inlet hose B
(11) Radiator outlet hose
(12) Radiator sub fan
(13) Radiator sub fan motor
(14) Radiator sub fan shroud
(15) Radiator main fan
(16) Radiator main fan motor
(17) Radiator main fan shroud
(18) Engine coolant reservoir tank cap
(19) Over flow hose
(20) Engine coolant reservoir tank
(21) ATF hose clamp
(22) ATF inlet hose A
(23) ATF outlet hose A
(24) ATF pipe
(25) ATF inlet hose B
(26) ATF outlet hose B
(27) Radiator fan control unit

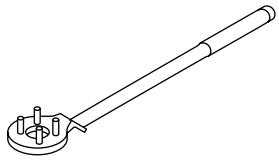
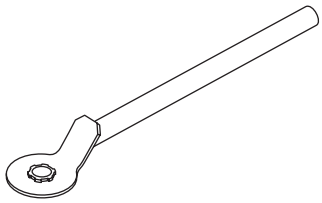
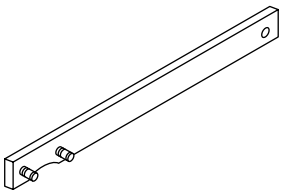
Tightening torque: N·m (kgf-m, ft-lb)	
T1:	***3.8 (0.39, 2.8)***
T2:	***5.4 (0.55, 4.0)***
T3:	***6.2 (0.63, 4.6)***
T4:	***7.5 (0.76, 5.5)***
T5:	***12 (1.2, 8.7)***

C: CAUTION

• Wear work clothing, including a cap, protective goggles and protective shoes during operation.
• Remove contamination including dirt and corrosion before removal, installation or disassembly.
• Keep the disassembled parts in order and protect them from dust and dirt.
• Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly and replacement.
• Be careful not to burn yourself, because each part on the vehicle is hot after running.
• Be sure to tighten fasteners including bolts and nuts to the specified torque.
• Place shop jacks or rigid racks at the specified points.
• Before disconnecting electrical connectors of sensors or units, be sure to disconnect the ground cable from battery.

D: PREPARATION TOOL

1. SPECIAL TOOL

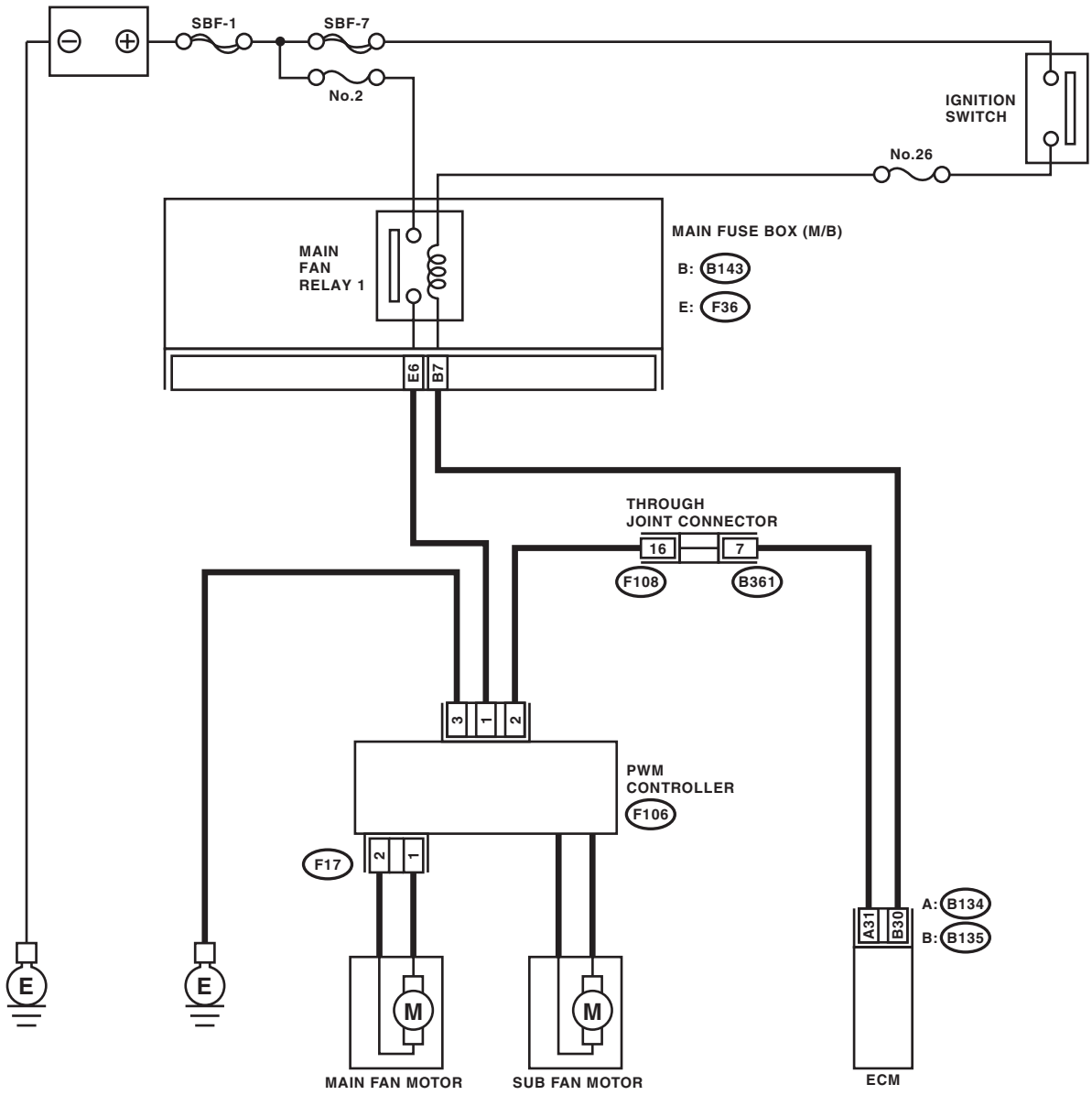
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-499977100	499977100	CRANK PULLEY WRENCH	Used for stopping crank pulley when loosening and tightening crank pulley bolts.
 ST-499977500	499977500	CAM SPROCKET WRENCH	Used for removing and installing intake cam sprocket.
 ST18231AA020	18231AA020	CAM SPROCKET WRENCH	Used for removing and installing exhaust cam sprocket.

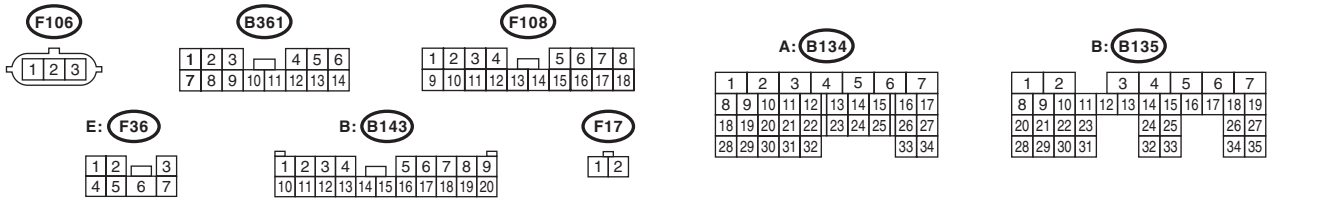
2. GENERAL TOOL

TOOL NAME	REMARKS
Radiator cap tester	Used for measuring pressure.

2. Radiator Fan System

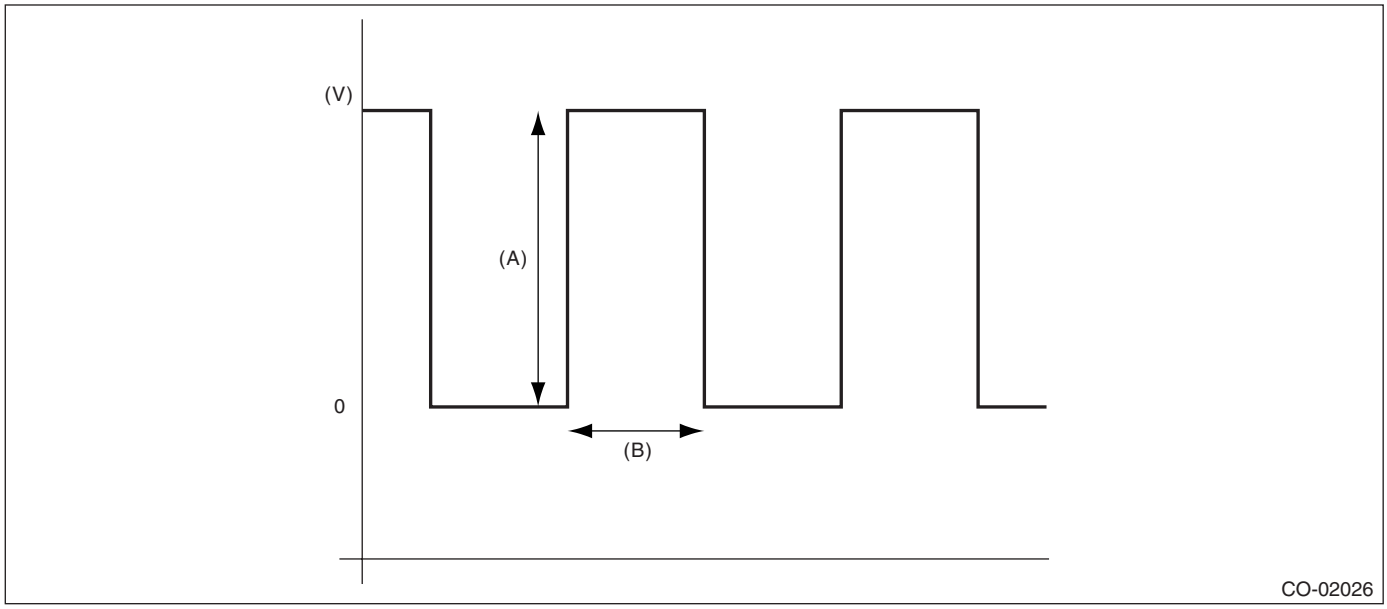
A: WIRING DIAGRAM





CO-02028

B: RADIATOR FAN CONTROL OUTPUT WAVEFORM



(A) 5 V (B) 2 ms

C: INSPECTION

DETECTING CONDITION:

- Engine coolant temperature is more than 93°C (199°F).
- A/C switch is OFF.
- Vehicle speed is below 19 km/h (12 MPH).

TROUBLE SYMPTOMS:

Radiator main fan and sub fan do not rotate under the above conditions.

	Step	Check	Yes	No
1	**CHECK MAIN FAN RELAY 1.** 1) Turn the ignition switch to OFF. 2) Remove the main fan relay 1 from A/C relay holder. 3) Measure the resistance of terminal in main fan relay 1 switch.	Is the resistance more than 1 MΩ?	Go to step **2.**	Replace the main fan relay 1.
2	**CHECK MAIN FAN RELAY 1.** 1) Connect the terminal of main fan relay 1 coil to battery. 2) Measure the resistance between terminals of main fan relay 1 switch.	Is the resistance less than 1 Ω?	Go to step **3.**	Replace the main fan relay 1.
3	**CHECK POWER SUPPLY TO ECM.** 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM terminal and chassis ground. ***Connector & terminal*** ***(B135) No. 30 (+) — Chassis ground (−):***	Is the voltage more than 10 V?	Go to step **4.**	Repair the power supply line.

	Step	Check	Yes	No
4	**CHECK POWER SUPPLY TO RADIATOR FAN CONTROL UNIT.** 1) Turn the ignition switch to OFF. 2) Connect the connector to ECM. 3) Disconnect the connector from radiator fan control unit. 4) Turn the ignition switch to ON. 5) Measure the voltage between radiator fan control unit terminal and chassis ground. ***Connector & terminal*** ***(F106) No. 1 (+) — Chassis ground (–):***	Is the voltage more than 10 V?	Go to step **5.**	Repair the power supply line.
5	**CHECK HARNESS BETWEEN ECM AND RADIATOR FAN CONTROL UNIT.** 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance between radiator fan control unit and ECM connector. ***Connector & terminal*** ***(B134) No. 31 — (F106) No. 2:***	Is the resistance less than 1 Ω?	Go to step **6.**	Repair the open circuit in harness between ECM and radiator fan control unit.
6	**CHECK RADIATOR FAN CONTROL UNIT AND GROUND CIRCUIT.** 1) Connect the connector to ECM and radiator fan control unit. 2) Measure the resistance between radiator fan control unit connector and chassis ground. ***Connector & terminal*** ***(F106) No. 3 — Chassis ground:***	Is the resistance less than 5 Ω?	Go to step **7.**	Repair the open circuit in harness between radiator fan control unit connector and chassis ground.
7	**CHECK FAN MOTOR.** 1) Disconnect the connector from radiator fan control unit. 2) Connect the battery positive (+) terminal to terminal No. 1, and the ground (–) terminal to terminal No. 3 of radiator fan control unit.	Does the fan motor rotate?	Go to step **8.**	Replace the fan motor which does not rotate.
8	**CHECK ECM OUTPUT SIGNAL.** 1) Turn the ignition switch to OFF. 2) Connect the test mode connector. 3) Turn the ignition switch to ON. 4) Using the oscilloscope, check the output signal. <Ref. to CO(H6DO)-7, RADIATOR FAN CONTROL OUTPUT WAVEFORM, Radiator Fan System.> ***Connector & terminal*** ***(B134) No. 31 (+) — Chassis ground (–):***	Is the waveform output?	Replace the radiator fan control unit. <Ref. to CO(H6DO)-23, Radiator Fan Control Unit.>	Replace the ECM. <Ref. to FU(H6DO)-34, Engine Control Module (ECM).>

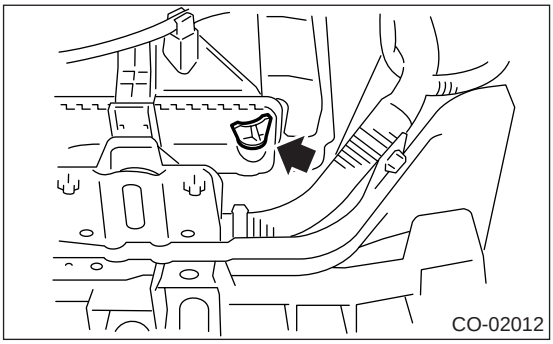
3. Engine Coolant

A: REPLACEMENT

1. DRAINING OF ENGINE COOLANT

1) Lift-up the vehicle.
2) Remove the under cover.
3) Remove the drain plug to drain engine coolant into container.

NOTE:
Remove the coolant filler tank cap so that engine coolant will drain faster.



4) Install the drain plug.

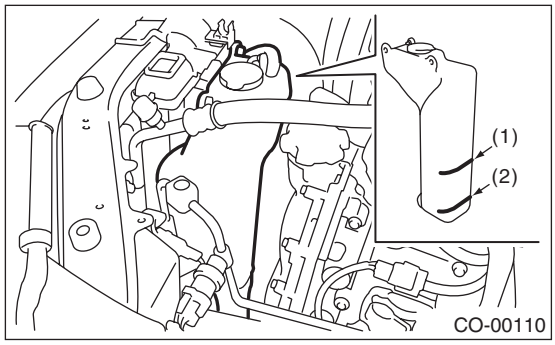
2. FILLING OF ENGINE COOLANT

1) Fill engine coolant into coolant filler tank up to the filler neck position.

Coolant capacity (fill up to "FULL" level):
Model with ATF warmer (LHD)
Approx. 7.7 ℓ (8.1 US qt, 6.8 Imp qt)
Model with ATF warmer (RHD)
Approx. 7.8 ℓ (8.2 US qt, 6.9 Imp qt)
Model without ATF warmer
Approx. 7.2 ℓ (7.6 US qt, 6.3 Imp qt)

NOTE:
SUBARU Genuine Coolant containing anti-freeze and anti-rust agents is especially made for SUBARU engine, which has an aluminum crankcase. Always use SUBARU Genuine Coolant, since other coolant may cause corrosion.

2) Fill engine coolant into the reservoir tank up to "FULL" level.



(1) FULL
(2) LOW

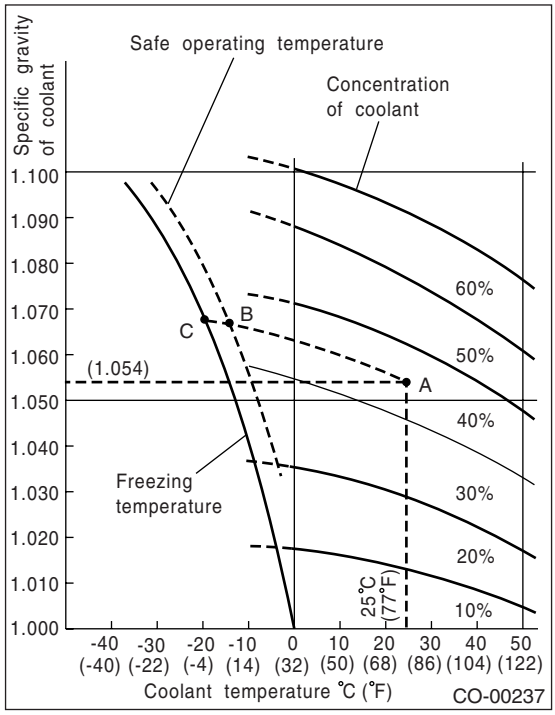
3) Warm-up the engine completely for more than five minutes at 2,000 to 3,000 rpm.
4) If the engine coolant level drops in coolant filler tank, add engine coolant to filler neck position.
5) If the engine coolant level drops from "FULL" level of reservoir tank, add engine coolant to "FULL" level.
6) Attach the coolant filler tank cap and reservoir tank cap properly.

B: INSPECTION

1. RERATIONSHIP OF SUBARU COOLANT CONCENTRATION AND FREEZING TEMPERATURE

Concentration and safe operating temperature of SUBARU coolant is shown in the diagram. Measuring the temperature and specific gravity of the coolant will provide this information.

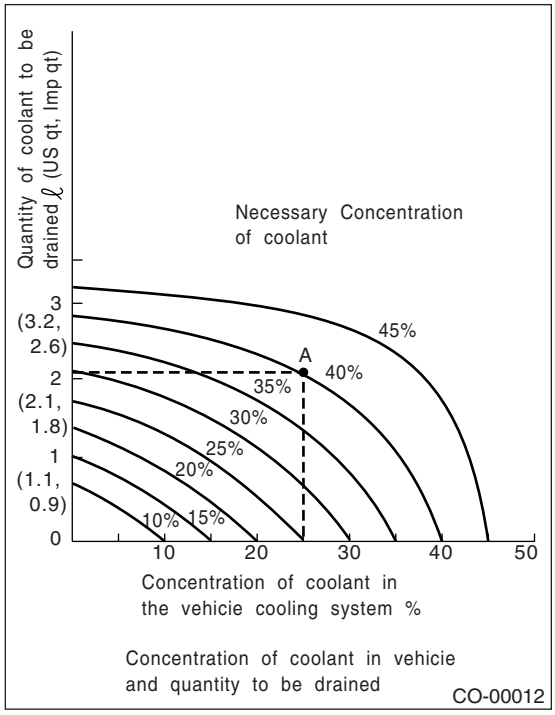
[Example]
If the coolant temperature is 25°C (77°F), its specific gravity is 1.054, the concentration is 45% (point A), the safe operating temperature is −14°C (7°F) (point B), and the freezing temperature is −20°C (−4°F) (point C).



2. PROCEDURE TO ADJUST THE CONCENTRATION OF THE COOLANT

To adjust the concentration of coolant according to temperature, find the proper fluid concentration in the above diagram and replace the necessary amount of coolant with an undiluted solution of SUBARU genuine coolant (concentration 50%).
The amount of coolant that should be replaced can be determined using the diagram.
[Example]
Assume that the coolant concentration must be increased from 25% to 40%. Find point A, where the 25% line of coolant concentration intersects with the 40% curve of the necessary coolant concentration, and read the scale on the vertical axis of the graph at height A. The quantity of coolant to be drained is 2.1 ℓ (2.2 US qt, 1.8 Imp qt). Drain 2.1 ℓ (2.2 US qt, 1.8 Imp qt) of coolant from the cooling system and add 2.1 ℓ (2.2 US qt, 1.8 Imp qt) of the undiluted solution of SUBARU coolant.

If a coolant concentration of 50% is needed, drain all the coolant and refill with the undiluted solution only.

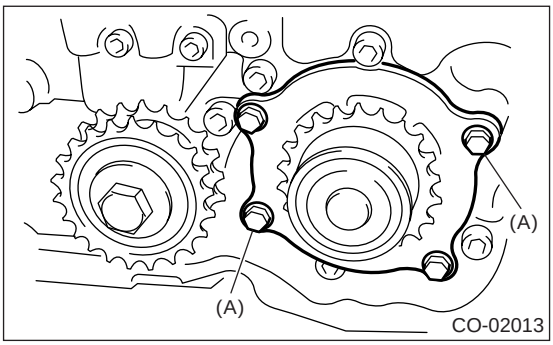


4. Water Pump

A: REMOVAL

1) Remove the radiator. <Ref. to CO(H6DO)-13, REMOVAL, Radiator.>
2) Remove the V-belts.
<Ref. to ME(H6DO)-33, REMOVAL, V-belt.>
3) Remove the front chain cover.
<Ref. to ME(H6DO)-43, REMOVAL, Front Chain Cover.>
4) Remove the timing chain assembly.
<Ref. to ME(H6DO)-45, REMOVAL, Timing Chain Assembly.>
5) Remove the water pump.

NOTE:
When the water pump cannot be removed easier, screw-in the bolts (A) to screw part to remove water pump.



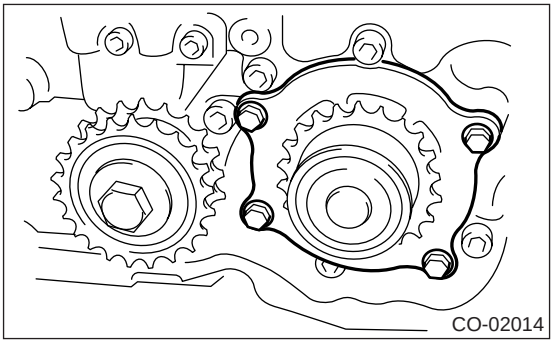
B: INSTALLATION

1) Install the water pump to rear chain cover.

NOTE:
Apply engine coolant to O-ring.

Tightening torque
6.4 N·m (0.65 kgf-m, 4.7 ft-lb)

NOTE:
- Use new O-rings.
- Apply engine coolant to O-ring to install water pump easier.



2) Install the timing chain assembly.
<Ref. to ME(H6DO)-46, INSTALLATION, Timing Chain Assembly.>
3) Install the front chain cover.
<Ref. to ME(H6DO)-43, INSTALLATION, Front Chain Cover.>
4) Install the V-belts.
<Ref. to ME(H6DO)-33, INSTALLATION, V-belt.>
5) Install the radiator. <Ref. to CO(H6DO)-14, INSTALLATION, RADIATOR.>
6) Fill with engine coolant. <Ref. to CO(H6DO)-9, FILLING OF ENGINE COOLANT, REPLACEMENT, Engine Coolant.>

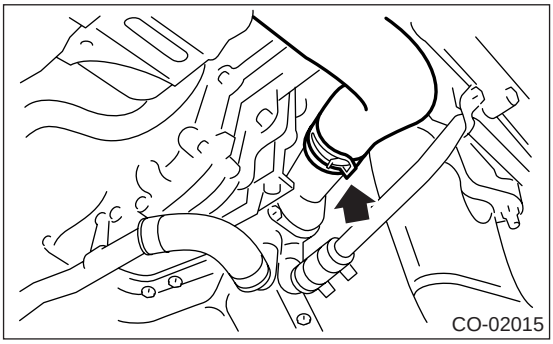
C: INSPECTION

1) Check the water pump bearing for smooth rotation.
2) Check the water pump sprocket for abnormalities.

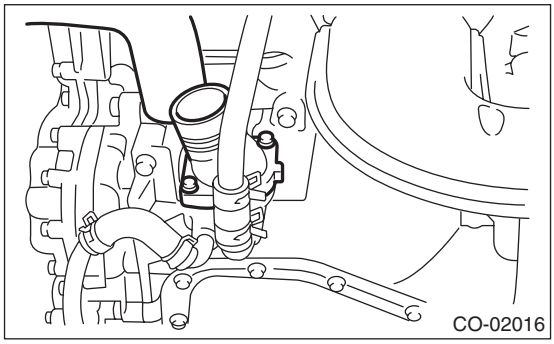
5. Thermostat

A: REMOVAL

1) Set the vehicle on a lift.
2) Lift-up the vehicle.
3) Remove the under cover.
4) Drain engine coolant completely.
<Ref. to CO(H6DO)-9, DRAINING OF ENGINE COOLANT, REPLACEMENT, Engine Coolant.>
5) Disconnect the radiator outlet hose from thermostat cover.



6) Remove the thermostat cover and then remove the thermostat.



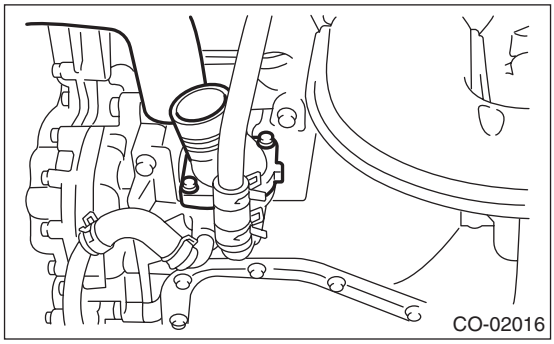
B: INSTALLATION

1) Install the gasket to thermostat.

NOTE:
Use a new gasket.

2) Install the thermostat and thermostat cover.

NOTE:
The thermostat must be installed with the jiggle pin facing upward.



Tightening torque:
6.4 N·m (0.65 kgf-m, 4.7 ft-lb)

3) Connect the radiator outlet hose to thermostat cover.
4) Install the under cover.
5) Lower the vehicle.
6) Fill with engine coolant. <Ref. to CO(H6DO)-9, FILLING OF ENGINE COOLANT, REPLACEMENT, Engine Coolant.>

C: INSPECTION

Replace the thermostat if the valve does not close completely at an ambient temperature or if the following test shows unsatisfactory results.

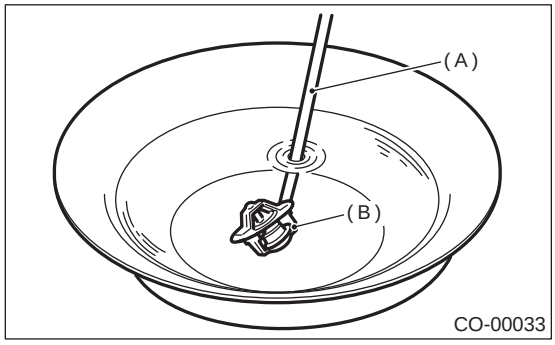
- Inspection method

Immerse the thermostat and a thermometer in water. Raise water temperature gradually, and measure the temperature and valve lift when the valve begins to open and when the valve is fully opened. During the test, agitate the water for even temperature distribution. The measurement should conform to the specification.

Starting temperature to open:
80 — 84°C (176 — 183°F)

Fully opens:
95°C (203°F)

Valve lift:
9.0 mm (0.354 in) or more



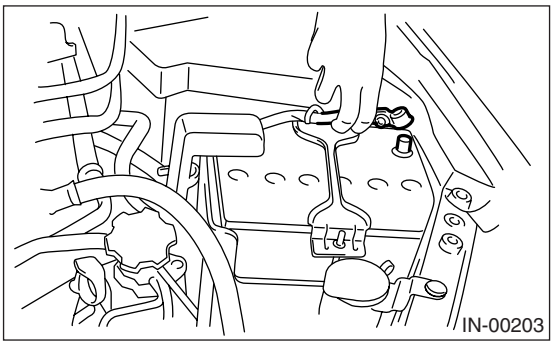
(A) Thermometer
(B) Thermostat

6. Radiator

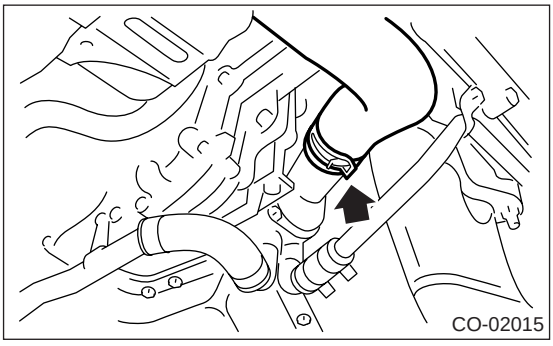
A: REMOVAL

WARNING:
The radiator is pressurized. Wait until engine cools down before working on the radiator.

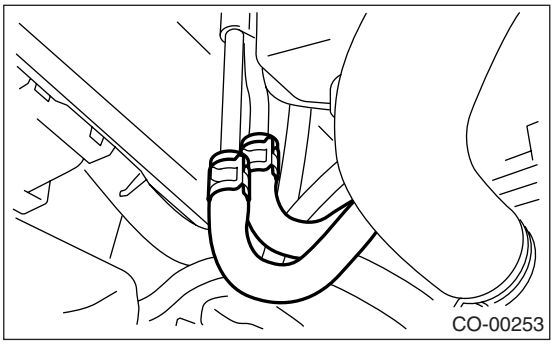
1) Set the vehicle on a lift.
2) Remove the collector cover.
3) Disconnect the ground cable from battery.



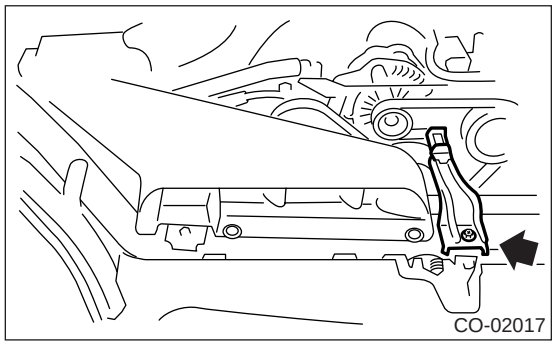
4) Lift-up the vehicle.
5) Remove the under cover.
6) Drain engine coolant completely.
<Ref. to CO(H6DO)-9, DRAINING OF ENGINE COOLANT, REPLACEMENT, Engine Coolant.>
7) Disconnect the outlet hose from radiator.



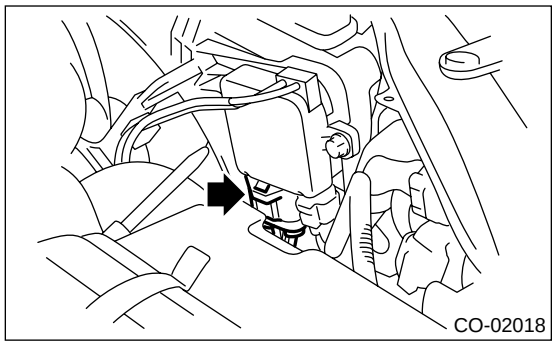
8) Disconnect the ATF cooler hose from radiator. (model without ATF warmer)



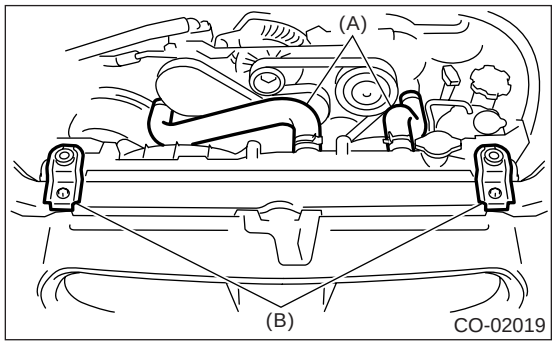
9) Lower the vehicle.
10) Remove the hood stay holder.



11) Remove the air intake duct. **<Ref. to IN(H6DO)-8,** REMOVAL**, Air Intake Duct.>**
12) Disconnect the connector from radiator fan control unit.



13) Remove the reservoir tank. <Ref. to CO(H6DO)-22, REMOVAL, Reservoir Tank.>
14) Disconnect the inlet hose from radiator.
15) Remove the radiator upper brackets.

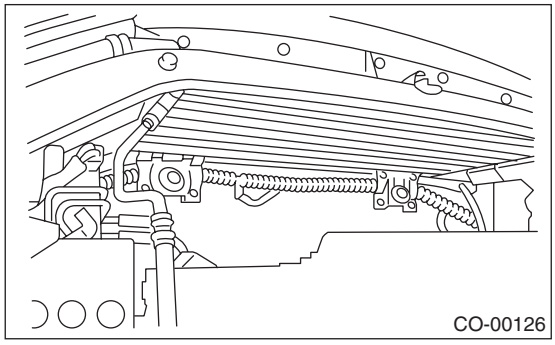


(A) Radiator inlet hose
(B) Radiator upper bracket

16) Lift the radiator up and away from vehicle.

B: INSTALLATION

1) Attach the radiator lower cushions to holes on the vehicle.



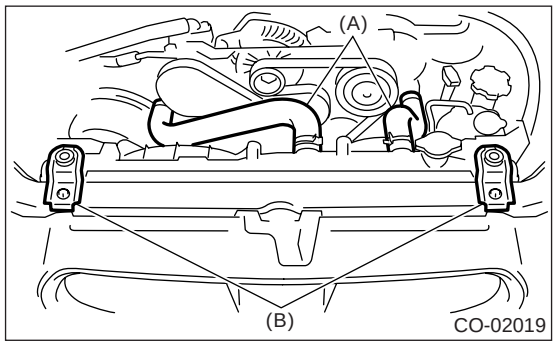
2) Install the radiator to vehicle.

NOTE:
Make pins on the lower side of radiator be fitted into the radiator lower cushions on body side.

3) Install the radiator upper brackets and tighten the bolts.

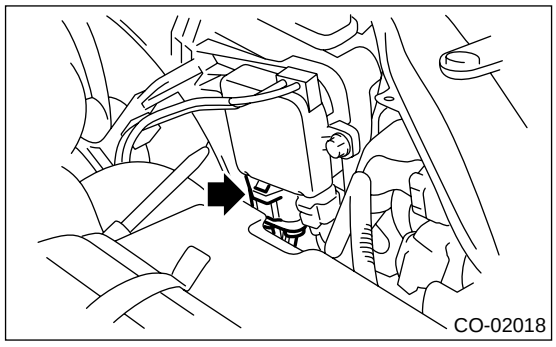
Tightening torque:
12 N·m (1.2 kgf-m, 8.7 ft-lb)

4) Connect the radiator inlet hose.

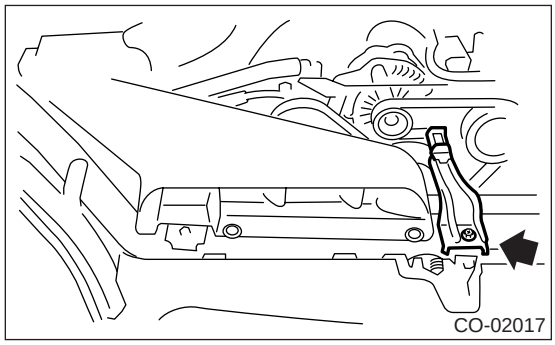


(A) Radiator inlet hose
(B) Radiator upper bracket

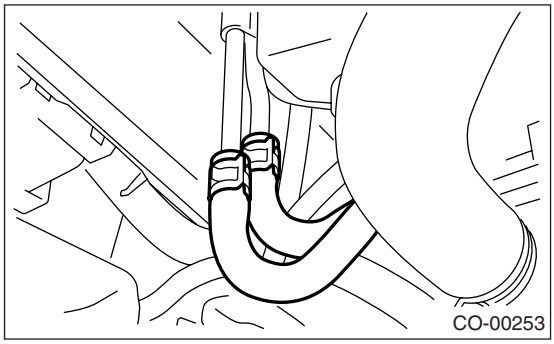
5) Install the reservoir tank. <Ref. to CO(H6DO)-22, INSTALLATION, Reservoir Tank.>
6) Connect the connector to radiator fan control unit.



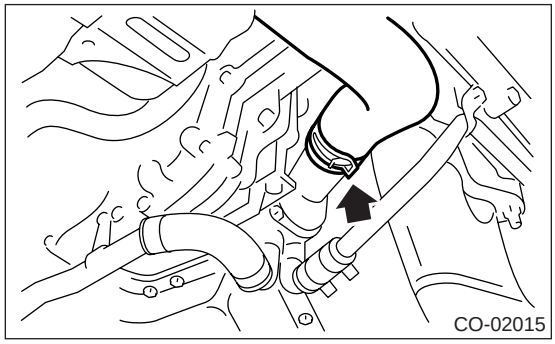
7) Install the air intake duct.
<Ref. to IN(H6DO)-8, INSTALLATION, Air Intake Duct.>
8) Install the hood stay holder.



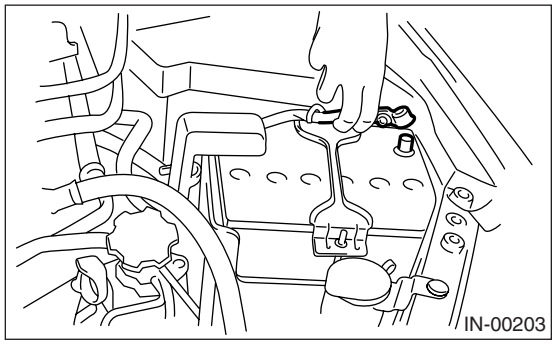
9) Lift-up the vehicle.
10) Connect the ATF cooler hoses. (model without ATF warmer)



11) Connect the radiator outlet hose.



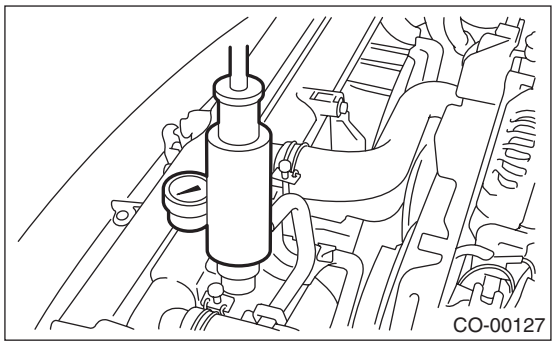
12) Install the under cover.
13) Lower the vehicle.
14) Connect the battery ground cable to battery.



15) Fill with engine coolant.
<Ref. to CO(H6DO)-9, FILLING OF ENGINE COOLANT, REPLACEMENT, Engine Coolant.>
16) Check the ATF level.
<Ref. to 5AT-27, INSPECTION, Automatic Transmission Fluid.>
17) Install the collector cover.

C: INSPECTION

1) Remove the radiator cap, top off the radiator with coolant, and then attach the tester in place of cap.



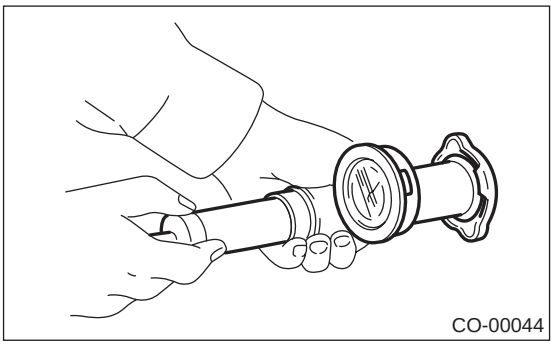
2) Apply a pressure of 157 kPa (1.6 kg/cm^2, 23 psi) to the radiator to check if:
- Engine coolant leaks at/around radiator.
- Engine coolant leaks at/around hoses or connections.

CAUTION:
- **Engine should be turned off.**
- **Wipe engine coolant from check points in advance.**
- **Be careful to prevent engine coolant from spurting out when removing tester.**
- **Be careful not to deform the filler neck of radiator when installing or removing the tester.**

7. Radiator Cap

A: INSPECTION

1) Attach the radiator cap to tester.



2) Increase pressure until the tester gauge pointer stops. Radiator cap is functioning properly if it holds the service limit pressure for five to six seconds.

Standard pressure:
93 — 123 kPa (0.95 — 1.25 kg/cm^2, 14 — 18 psi)

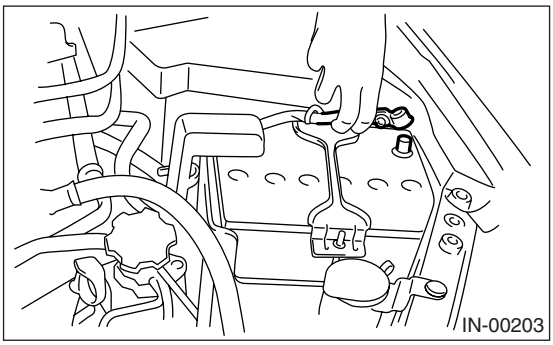
Service limit pressure:
83 kPa (0.85 kg/cm^2, 12 psi)

CAUTION:
• Be sure to remove foreign matter and rust from the cap in advance, otherwise results of pressure test will be incorrect.
• Do not confuse the cap of coolant filler tank with cap of radiator.

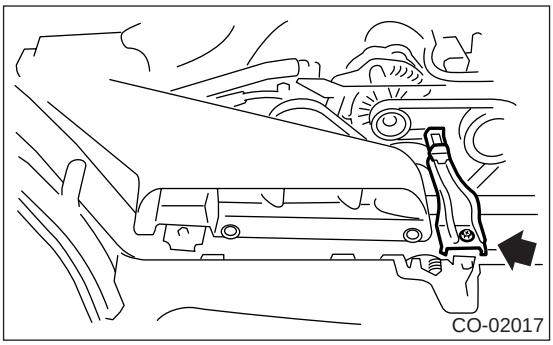
8. Radiator Main Fan and Fan Motor

A: REMOVAL

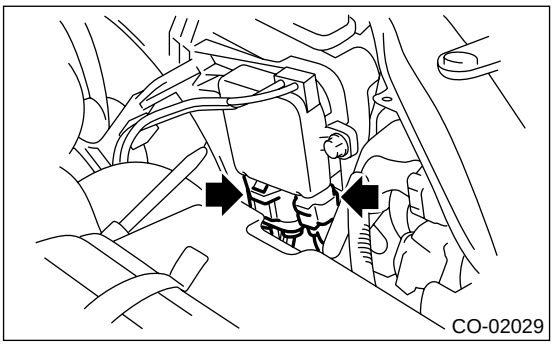
1) Set the vehicle on a lift.
2) Remove the collector cover.
3) Disconnect the ground cable from battery.



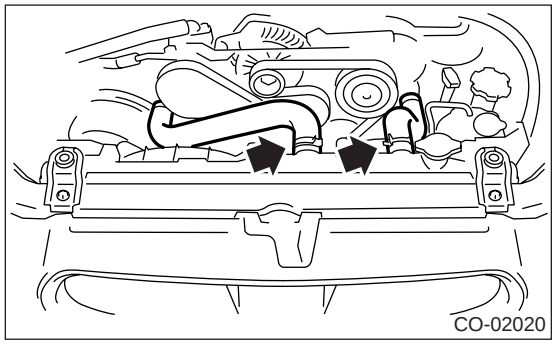
4) Remove the hood stay holder.



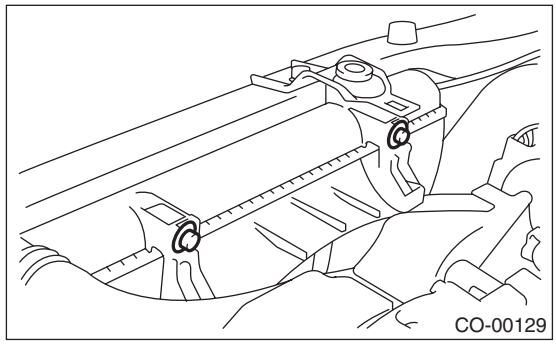
5) Remove the air intake duct. **<Ref. to IN(H6DO)-8,** REMOVAL**, Air Intake Duct.>**
6) Disconnect the connector from radiator fan control unit.



7) Lift-up the vehicle.
8) Remove the under cover.
9) Drain engine coolant completely.
<Ref. to CO(H6DO)-9, DRAINING OF ENGINE COOLANT, REPLACEMENT, Engine Coolant.>
10) Disconnect the ATF hose from the clip of radiator main fan shroud. (model without ATF warmer)
11) Remove the radiator main fan motor harness from clip.
12) Lower the vehicle.
13) Remove the reservoir tank. <Ref. to CO(H6DO)-22, REMOVAL, Reservoir Tank.>
14) Disconnect the inlet hose from radiator.

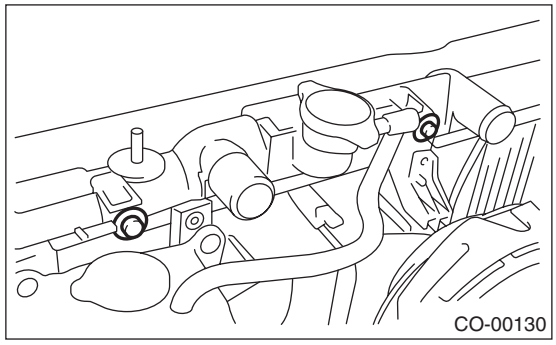


15) Remove the radiator sub fan motor assembly.



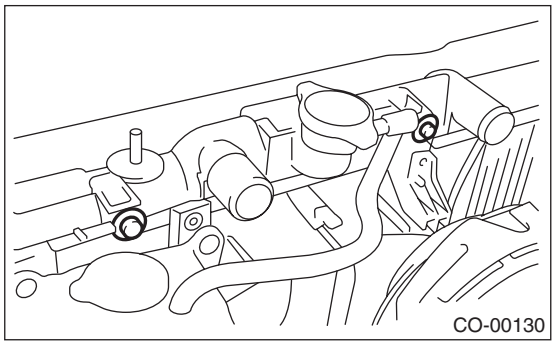
16) Remove the radiator main fan motor assembly.

NOTE:
When removing the main fan assembly with lifting it up, the main fan shroud contacts to inlet part of engine coolant. To avoid contacting it, move the main fan assembly to sub fan assembly side before removal.

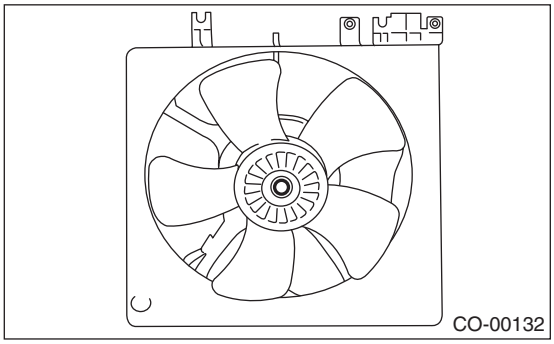


B: INSTALLATION
Install in the reverse order of removal.

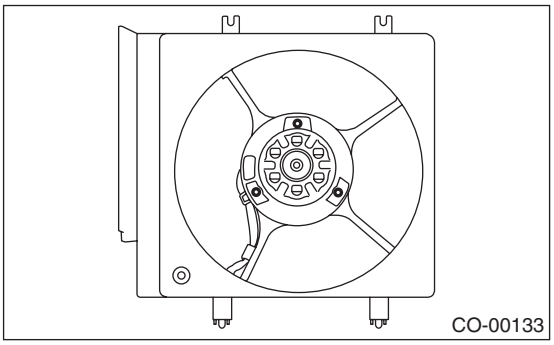
Tightening torque:
7.5 N·m (0.76 kgf-m, 5.5 ft-lb)



C: DISASSEMBLY
1) Remove the nut which holds fan itself onto fan motor and shroud assembly.

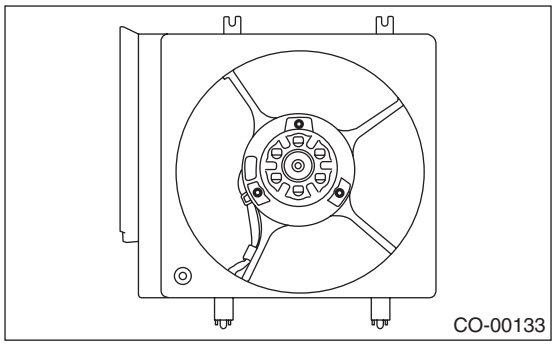


2) Remove the screws which hold the fan motor onto shroud.

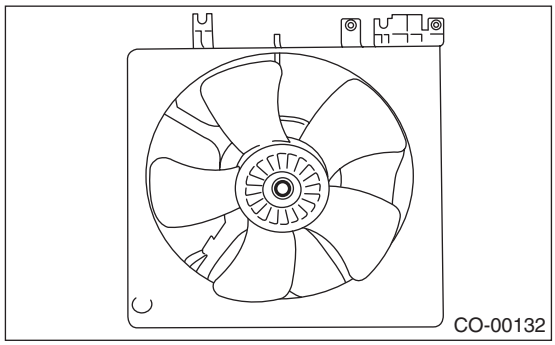


D: ASSEMBLY
Assemble in the reverse order of disassembly.

Tightening torque:
3.8 N·m (0.39 kgf-m, 2.8 ft-lb)

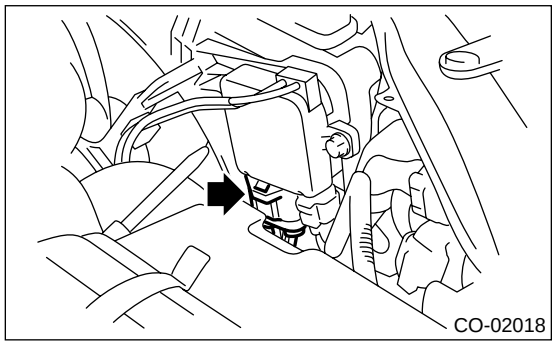


Tightening torque:
6.2 N·m (0.63 kgf-m, 4.6 ft-lb)

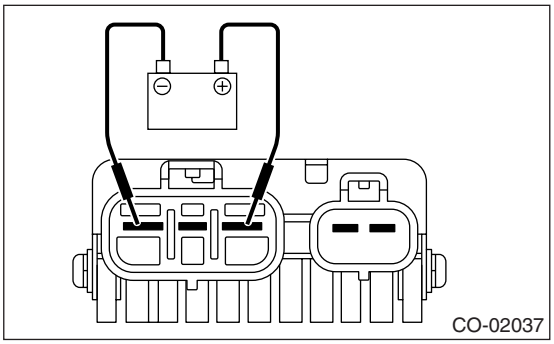


E: INSPECTION
1) Disconnect the connector from radiator fan control unit.

NOTE:
Do not remove the main fan motor harness connector.



2) Connect the battery to radiator fan control unit as shown in the figure.

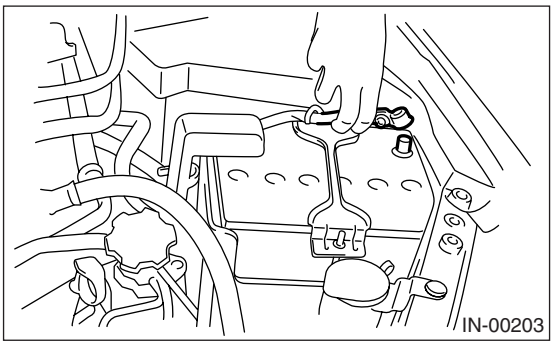


3) Check the fan motor for operations. If it does not operate, replace the fan motor.

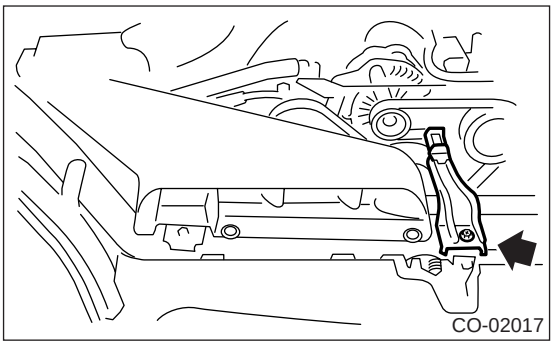
9. Radiator Sub Fan and Fan Motor

A: REMOVAL

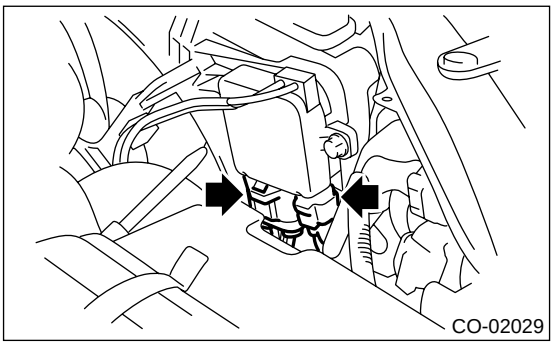
1) Set the vehicle on a lift.
2) Remove the collector cover.
3) Disconnect the ground cable from battery.



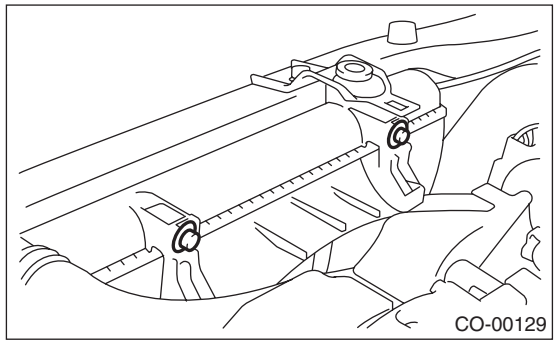
4) Remove the hood stay holder.



5) Remove the air intake duct. **<Ref. to IN(H6DO)-8,** REMOVAL**, Air Intake Duct.>**
6) Disconnect the connector from radiator fan control unit.



7) Remove the bolts which hold sub fan shroud to radiator.

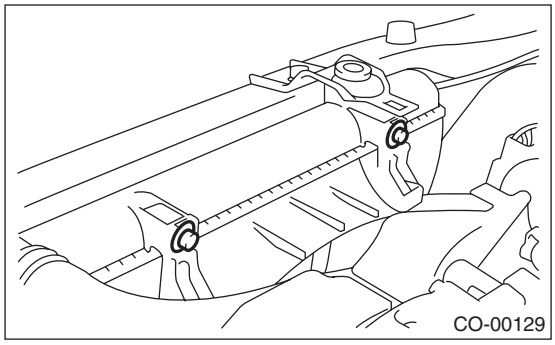


8) Lift-up the vehicle.
9) Remove the under cover.
10) Remove the radiator sub fan shroud through the under side of vehicle.

B: INSTALLATION

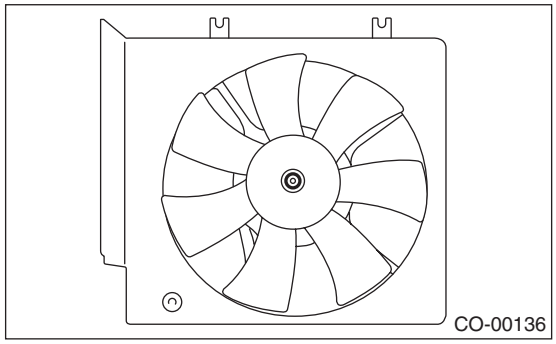
Install in the reverse order of removal.

Tightening torque:
7.5 N·m (0.76 kgf-m, 5.5 ft-lb)

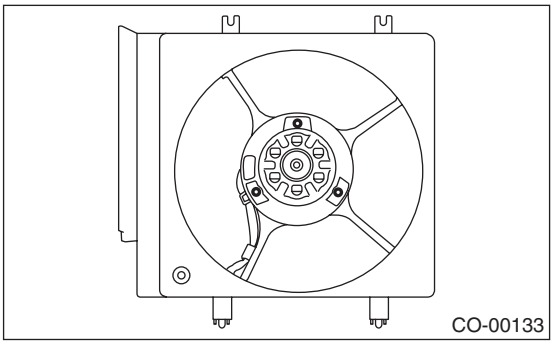


C: DISASSEMBLY

1) Remove the nut which holds fan itself onto fan motor and shroud assembly.



2) Remove the screws which hold the fan motor onto shroud.



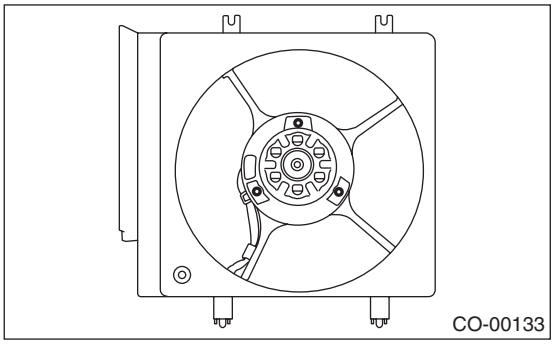
3) Remove the bolts which hold the radiator fan control unit onto shroud.

D: ASSEMBLY

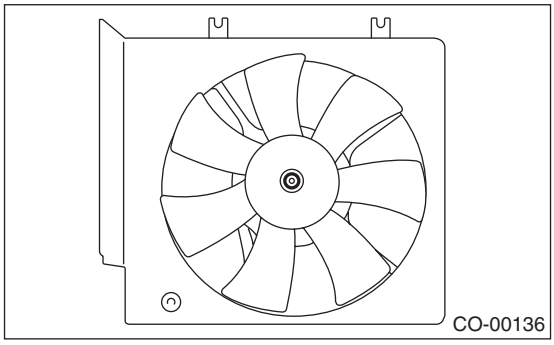
Assemble in the reverse order of disassembly.

Radiator fan control unit bolt tightening torque:
5.4 N·m (0.55 kgf-m, 4.0 ft-lb)

Tightening torque:
3.8 N·m (0.39 kgf-m, 2.8 ft-lb)



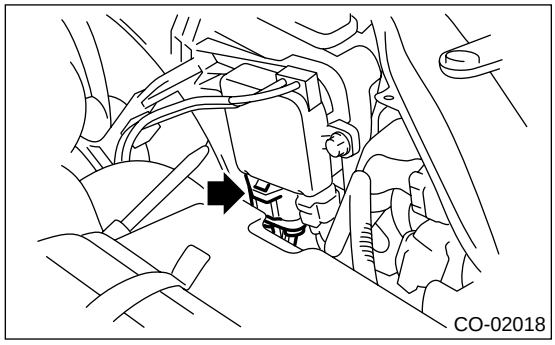
Tightening torque:
6.2 N·m (0.63 kgf-m, 4.6 ft-lb)



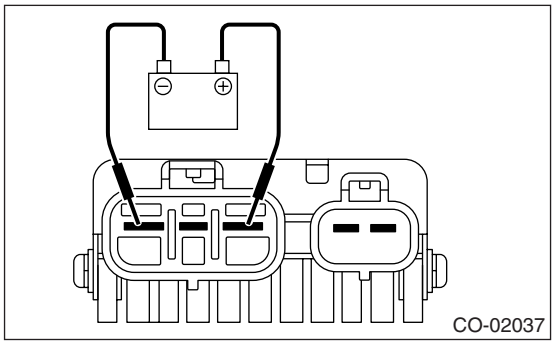
E: INSPECTION

1) Disconnect the connector from radiator fan control unit.

NOTE:
Do not remove the main fan motor harness connector.



2) Connect the battery to radiator fan control unit as shown in the figure.

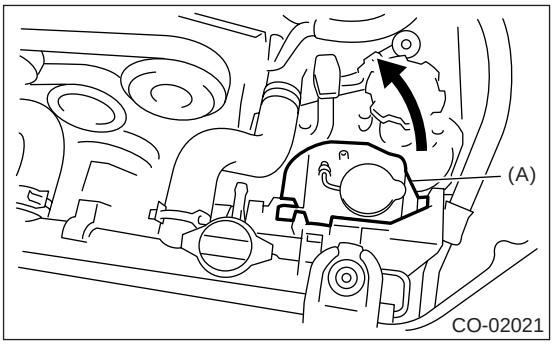


3) Check the fan motor for operations. If it does not operate, replace the fan motor.

10.Reservoir Tank

A: REMOVAL

1) Disconnect the over flow hose.
2) Pull out the reservoir tank to the direction of arrow while pushing the pawl (A).



B: INSTALLATION

Install in the reverse order of removal.

C: INSPECTION

Make sure the engine coolant level is between “FULL” and “LOW”.

11.Radiator Fan Control Unit

A: SPECIFICATION

Radiator fan control unit forms a unit with radiator sub fan motor. Refer to “Radiator Sub Fan and Fan Motor” for removal and installation.
<Ref. to CO(H6DO)-20, REMOVAL, Radiator Sub Fan and Fan Motor.> <Ref. to CO(H6DO)-20, INSTALLATION, Radiator Sub Fan and Fan Motor.> <Ref. to CO(H6DO)-20, DISASSEMBLY, Radiator Sub Fan and Fan Motor.> <Ref. to CO(H6DO)-21, ASSEMBLY, Radiator Sub Fan and Fan Motor.>

12.Engine Cooling System Trouble in General

A: INSPECTION

Trouble	Possible cause	Corrective action
Over-heating	a. Insufficient engine coolant	Replenish engine coolant, inspect for leakage, and repair it if necessary.
	b. Defective thermostat	Replace.
	c. Malfunction of water pump	Replace.
	d. Clogged engine coolant passage	Clean.
	e. Improper ignition timing	Inspect and repair ignition control system. <Ref. to EN(H6DO)(diag)-2, PROCEDURE, Basic Diagnostic Procedure.>
	f. Clogged or leaking radiator	Clean, repair or replace.
	g. Improper engine oil in engine coolant	Replace engine coolant.
	h. Air/fuel mixture ratio too lean	Inspect and repair fuel injection system. <Ref. to EN(H6DO)(diag)-2, PROCEDURE, Basic Diagnostic Procedure.>
	i. Excessive back pressure in exhaust system	Clean or replace.
	j. Insufficient clearance between piston and cylinder	Adjust or replace.
	k. Slipping clutch	Correct or replace.
	l. Dragging brake	Adjust.
	m. Faulty transmission gear oil	Replace.
	n. Malfunction of radiator fan	Inspect radiator fan relay, engine coolant temperature sensor or fan motor, and replace them.
Over-cooling	a. Ambient temperature extremely low	Partly cover radiator front area.
	b. Defective thermostat	Replace.
Engine coolant leaks	a. Loosened or damaged connecting units on hoses	Correct or replace.
	b. Leakage from water pump	Replace.
	c. Leakage from water pipe	Correct or replace.
	d. Leakage around cylinder head gasket	Retighten cylinder head bolts or replace gasket.
	e. Damaged or cracked cylinder head and crankcase	Correct or replace.
	f. Damaged or cracked thermostat case	Correct or replace.
	g. Leakage from radiator	Correct or replace.
Noise	a. Defective drive belt	Replace.
	b. Defective radiator fan	Replace.
	c. Defective water pump bearing	Replace water pump.
	d. Defective water pump mechanical seal	Replace water pump.