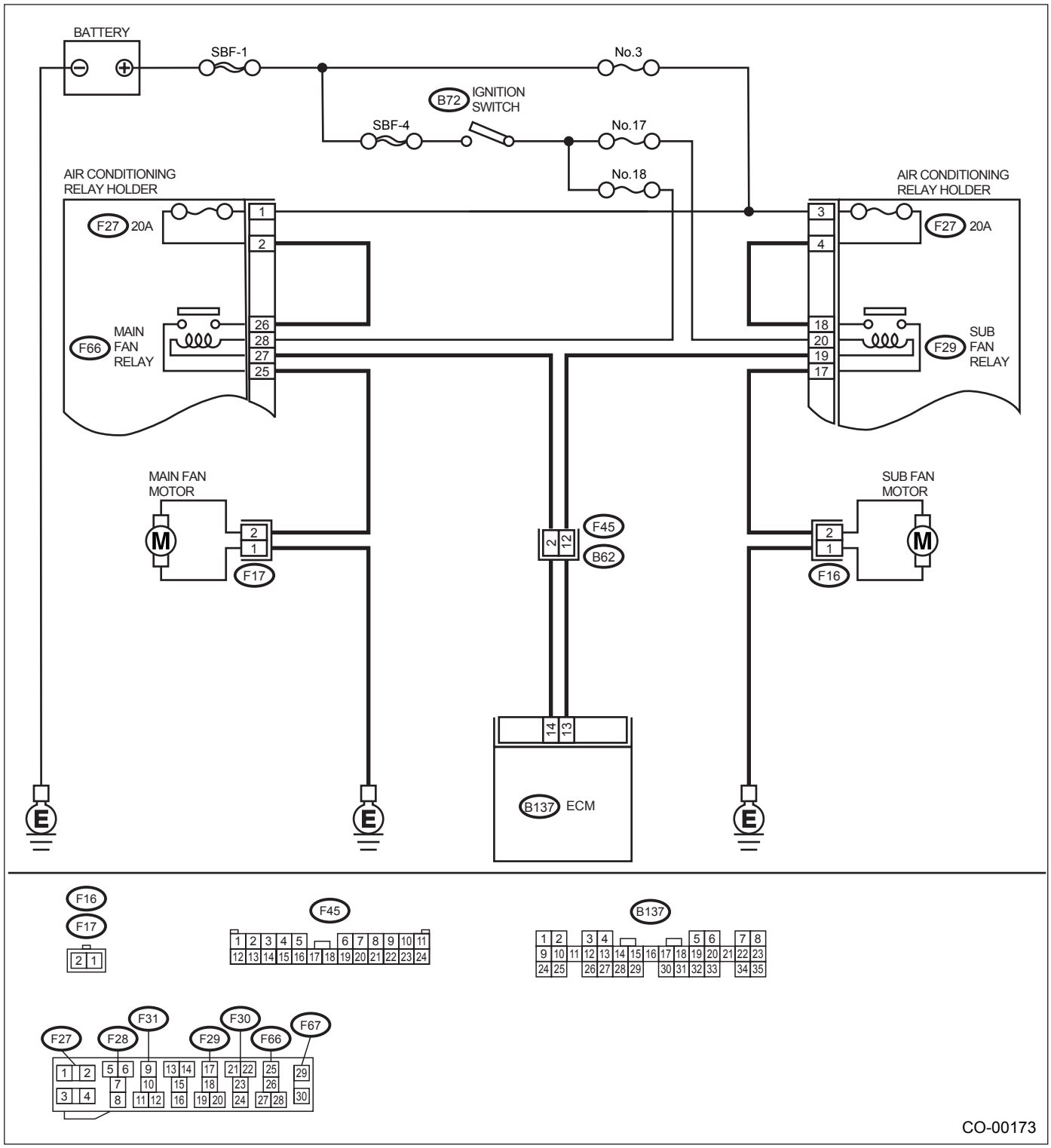
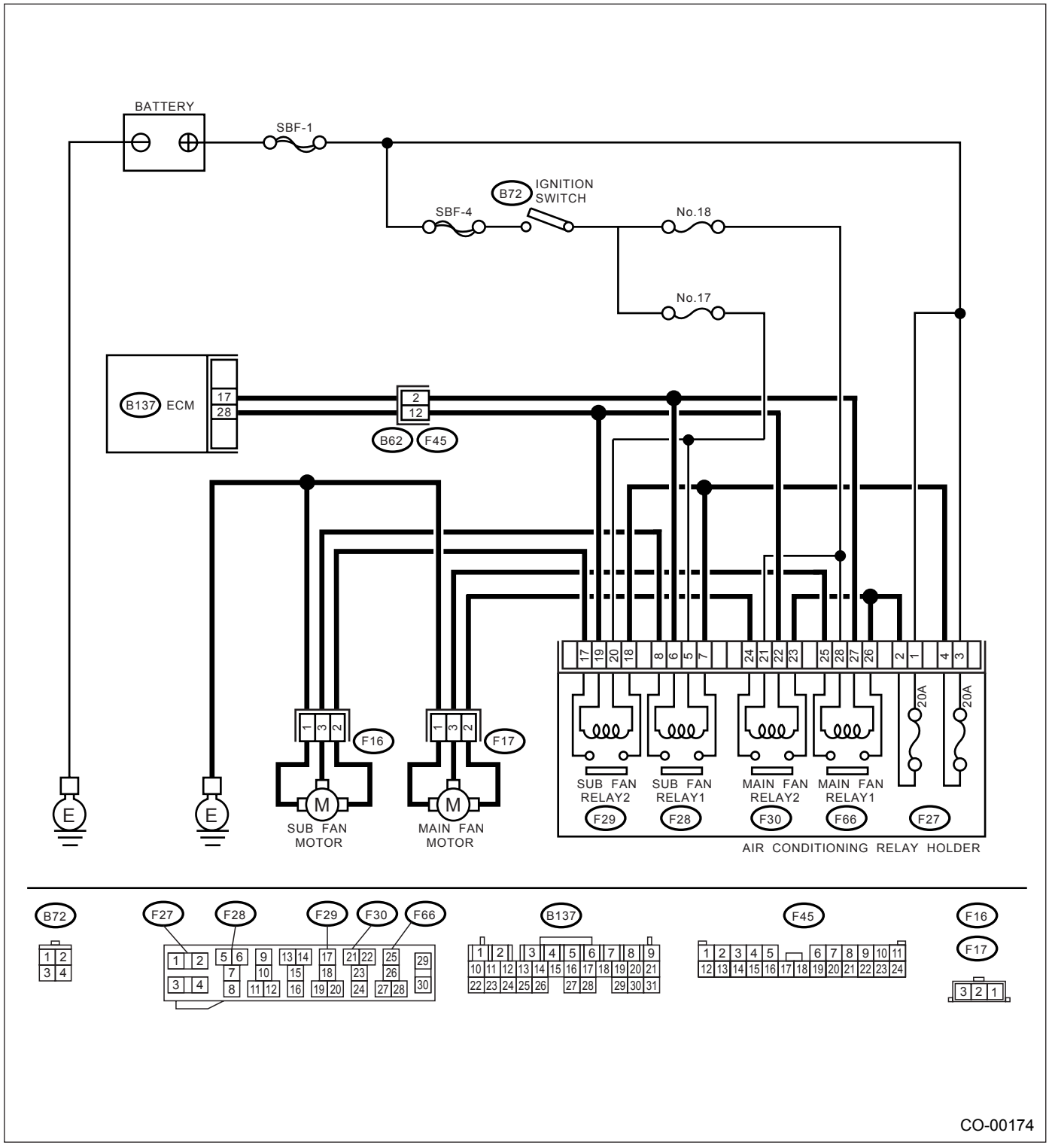
3. Radiator Sub Fan System

A: SCHEMATIC

1. NON-TURBO MODEL



2. TURBO MODEL



B: INSPECTION

1. NON-TURBO MODEL

NOTE:
System for A/C equipped vehicles only.

DETECTING CONDITION:

Condition (1):

- Engine coolant temperature is below 95°C (203°F).
- A/C switch is turned ON.
- Vehicle speed is below 19 km/h (12 MPH).

Condition (2):

- Engine coolant temperature is above 100°C (212°F).
- A/C switch is turned OFF.
- Vehicle speed is below 19 km/h (12 MPH).

TROUBLE SYMPTOM:

- Radiator sub fan does not rotate under conditions (1) and (2) above.

	Step	Check	Yes	No
1	**CHECK POWER SUPPLY TO SUB FAN MOTOR.** **CAUTION:** **Be careful not to overheat engine during repair.** 1)Turn the ignition switch to OFF. 2)Disconnect the connector from the sub fan motor and main fan motor. 3)Start the engine, and warm it up until engine coolant temperature increases over 100°C (212°F). 4)Stop the engine and turn the ignition switch to ON. 5)Measure the voltage between sub fan motor connector and chassis ground. ***Connector & terminal*** ***(F16) No. 2 (+) — Chassis ground (−):*** Is the measured value more than the specified value?	10 V	Go to step **2.**	Go to step **5.**
2	**CHECK GROUND CIRCUIT OF SUB FAN MOTOR.** 1)Turn the ignition switch to OFF. 2)Measure the resistance between sub fan motor connector and chassis ground. ***Connector & terminal*** ***(F16) No. 1 — Chassis ground:*** Is the measured value less than the specified value?	5 Ω	Go to step **3.**	Repair the open circuit in harness between sub fan motor connector and chassis ground.
3	**CHECK POOR CONTACT.** Check poor contact in sub fan motor connector. Is there poor contact in sub fan motor connector?	There is a poor contact.	Repair the poor contact in sub fan motor connector.	Go to step **4.**
4	**CHECK SUB FAN MOTOR.** Connect the battery positive (+) terminal to terminal No. 2, and negative (−) terminal to terminal No. 1 of sub fan motor connector. Does the sub fan rotate?	The sub fan rotates.	Repair the poor contact in sub fan motor connector.	Replace the sub fan motor with a new one.

	Step	Check	Yes	No
5	**CHECK POWER SUPPLY TO SUB FAN RELAY.** 1)Turn the ignition switch to OFF. 2)Remove the sub fan relay from A/C relay holder. 3)Measure the voltage between sub fan relay terminal and chassis ground. ***Connector & terminal*** ***(F29) No. 18 (+) — Chassis ground (−):*** Is the measured value more than the specified value?	10 V	Go to step **6.**	Go to step **7.**
6	**CHECK POWER SUPPLY TO SUB FAN RELAY.** 1)Turn the ignition switch to ON. 2)Measure the voltage between sub fan relay terminal and chassis ground. ***Connector & terminal*** ***(F29) No. 20 (+) — Chassis ground (−):*** Is the measured value more than the specified value?	10 V	Go to step **10.**	Go to step **9.**
7	**CHECK 20 A FUSE.** 1)Remove the 20 A fuse from A/C relay holder. 2)Check the condition of fuse. Is the fuse blown-out?	The fuse is blown out.	Replace the fuse.	Go to step **8.**
8	**CHECK POWER SUPPLY TO A/C RELAY HOLDER 20 A FUSE TERMINAL.** Measure the voltage of harness between A/C relay holder 20 A fuse terminal and chassis ground. ***Connector & terminal*** ***(F27) No. 3 (+) — Chassis ground (−):*** Is the measured value more than the specified value?	10 V	Repair the open circuit in harness between 20 A fuse and sub fan relay terminal.	Repair the open circuit in harness between main fuse box connector and 20 A fuse terminal.
9	**CHECK FUSE.** 1)Turn the ignition switch to OFF. 2)Remove the fuse No. 17 from joint box. 3)Check the condition of fuse. Is the fuse blown-out?	The fuse is blown out.	Replace the fuse.	Repair the open circuit in harness between sub fan relay and ignition switch.
10	**CHECK SUB FAN RELAY.** 1)Turn the ignition switch to OFF. 2)Measure the resistance of sub fan relay. ***Terminal*** ***No. 17 — No. 18:*** Is the measured value more than the specified value?	1 MΩ	Go to step **11.**	Replace the sub fan relay.
11	**CHECK SUB FAN RELAY.** 1)Connect the battery to terminals No. 20 and No. 19 of sub fan relay. 2)Measure the resistance of sub fan relay. ***Terminal*** ***No. 17 — No. 18:*** Is the measured value less than the specified value?	1 Ω	Go to step **12.**	Replace the sub fan relay.

	Step	Check	Yes	No
12	**CHECK HARNESS BETWEEN SUB FAN RELAY TERMINAL AND SUB FAN MOTOR CONNECTOR.** Measure the resistance of harness between sub fan motor connector and sub fan relay terminal. ***Connector & terminal*** ***(F16) No. 2 — (F29) No. 17:*** Is the measured value less than the specified value?	1 Ω	Go to step **13.**	Repair the open circuit in harness between sub fan motor and sub fan relay connector.
13	**CHECK HARNESS BETWEEN SUB FAN RELAY AND ECM.** 1)Turn the ignition switch to OFF. 2)Disconnect the connector from ECM. 3)Measure the resistance of harness between sub fan relay connector and ECM connector. ***Connector & terminal*** ***(F29) No. 19 — (B137) No. 13:*** Is the measured value less than the specified value?	1 Ω	Go to step **14.**	Repair the open circuit in harness between sub fan relay and ECM.
14	**CHECK POOR CONTACT.** Check poor contact in connnector between sub fan and ECM. Is there poor contact in connector between sub fan motor and ECM?	There is a poor contact.	Repair poor contact connector.	Contact with SOA (distributor) service.

NOTE:
Inspection by SOA (distributor) service is required, because probable cause is deterioration of multiple parts.

2. TURBO MODEL

DETECTING CONDITION:
Condition:
- Engine coolant temperature is above 96°C (205°F).
- A/C compressor is rotated.
- Vehicle speed is below 19 km/h (12 MPH).

TROUBLE SYMPTOM:
- Radiator sub fan does not rotate under the above conditions.
- Radiator sub fan does not rotate at high speed when the following conditions are both met:
  (1) Engine coolant temperature is above 90°C (194°F)
  (2) A/C is ON

	Step	Check	Yes	No
1	**CHECK OPERATION OF RADIATOR.** 1)Run the engine at idle. (Vehicle stationary) 2)Turn the A/C switch to OFF. 3)Warm the engine coolant temperature over 96°C (205°F). Does the radiator sub fan rotate?	The sub fan rotates.	Go to step **2.**	Go to step **3.**
2	**CHECK OPERATION OF RADIATOR.** 1)Turn the A/C switch ON at condition of step 1. Does the radiator sub fan rotate at high speed when A/C compressor is operated?	The fan rotates at high speed.	Radiator main fan system is okay.	Go to step **17.**
3	**CHECK POWER SUPPLY TO SUB FAN MOTOR.** **CAUTION:** **Be careful not to overheat engine during repair.** 1)Turn the ignition switch to OFF. 2)Disconnect the connector from sub fan motor. 3)Start the engine, and warm it up until engine coolant temperature increases over 96°C (205°F). 4)Stop the engine and turn the ignition switch to ON. 5)Measure the voltage between sub fan motor connector and chassis ground. ***Connector & terminal*** ***(F16) No. 3 (+) — Chassis ground (−):*** Is the measured value more than the specified value?	10 V	Go to step **4.**	Go to step **7.**
4	**CHECK GROUND CIRCUIT OF SUB FAN MOTOR.** 1)Turn the ignition switch to OFF. 2)Measure the resistance between sub fan motor connector and chassis ground. ***Connector & terminal*** ***(F16) No. 1 — Chassis ground:*** Is the measured value less than the specified value?	5 Ω	Go to step **5.**	Repair the open circuit in harness between sub fan motor connector and chassis ground.
5	**CHECK POOR CONTACT.** Check poor contact in sub fan motor connector. Is there poor contact in sub fan motor connector?	There is a poor contact.	Repair the poor contact in sub fan motor connector.	Go to step **6.**

	Step	Check	Yes	No
6	**CHECK MAIN FAN MOTOR.** Connect the battery positive (+) terminal to terminal No. 3, and negative (−) terminal to terminal No. 1 of sub fan motor connector. Does the main fan rotate?	The main fan rotates.	Repair the poor contact in sub fan motor connector.	Replace the sub fan motor with a new one.
7	**CHECK POWER SUPPLY TO SUB FAN RELAY1.** 1)Turn the ignition switch to OFF. 2)Remove the sub fan relay1 from A/C relay holder. 3)Measure the voltage between sub fan relay1 terminal and chassis ground. ***Connector & terminal*** ***(F28) No. 7 (+) — Chassis ground (−):*** Is the measured value more than the specified value?	10 V	Go to step **8.**	Go to step **9.**
8	**CHECK POWER SUPPLY TO SUB FAN RELAY1.** 1)Turn the ignition switch to ON. 2)Measure the voltage between sub fan relay1 terminal and chassis ground. ***Connector & terminal*** ***(F28) No. 5 (+) — Chassis ground (−):*** Is the measured value more than the specified value?	10 V	Go to step **12.**	Go to step **11.**
9	**CHECK 20 A FUSE.** 1)Remove the 20 A fuse from A/C relay holder. 2)Check the condition of fuse. Is the fuse blown-out?	The fuse is blown out.	Replace the fuse.	Go to step **10.**
10	**CHECK POWER SUPPLY TO A/C RELAY HOLDER 20 A FUSE TERMINAL.** Measure the voltage of harness between A/C relay holder 20 A fuse terminal and chassis ground. ***Connector & terminal*** ***(F27) No. 3 (+) — Chassis ground (−):*** Is the measured value more than the specified value?	10 V	Repair the open circuit in harness between 20 A fuse and sub fan relay terminal.	Repair the open circuit in harness between sub fuse box connector and 20 A fuse terminal.
11	**CHECK FUSE.** 1)Turn the ignition switch to OFF. 2)Remove the fuse No. 17 from joint box. 3)Check the condition of fuse. Is the fuse blown-out?	The fuse is blown out.	Replace the fuse.	Repair the open circuit in harness between sub fan relay1 and ignition switch.
12	**CHECK SUB FAN RELAY1.** 1)Turn the ignition switch to OFF. 2)Remove the main fan relay1. 3)Measure the resistance of sub fan relay1. ***Terminal*** ***No. 7 — No. 8:*** Is the measured value more than the specified value?	1 MΩ	Go to step **13.**	Replace the sub fan relay1.
13	**CHECK SUB FAN RELAY1.** 1)Connect the battery to terminals No. 6 and No. 5 of sub fan relay1. 2)Measure the resistance of sub fan relay. ***Terminal*** ***No. 7 — No. 8:*** Is the measured value less than the specified value?	1 Ω	Go to step **14.**	Replace the sub fan relay1.

	Step	Check	Yes	No
14	**CHECK HARNESS BETWEEN SUB FAN RELAY1 TERMINAL AND SUB FAN MOTOR CONNECTOR.** Measure the resistance of harness between sub fan motor connector and sub fan relay1 terminal. ***Connector & terminal*** ***(F16) No. 3 — (F28) No. 8:*** Is the measured value less than the specified value?	1 Ω	Go to step **15.**	Repair the open circuit in harness between sub fan motor connector and sub fan relay1 terminal.
15	**CHECK HARNESS BETWEEN SUB FAN RELAY1 AND ECM.** 1)Turn the ignition switch to OFF. 2)Disconnect the connector from ECM. 3)Measure the resistance of harness between sub fan relay1 connector and ECM connector. ***Connector & terminal*** ***(F28) No. 6 — (B137) No. 17:*** Is the measured value less than the specified value?	1 Ω	Go to step **16.**	Repair the open circuit in harness between sub fan relay1 and ECM.
16	**CHECK POOR CONTACT.** Check poor contact in connector between sub fan and ECM. Is there poor contact in connector between sub fan motor and ECM?	There is a poor contact.	Repair poor contact connector.	Contact with SOA (distributor) service.
17	**CHECK POWER SUPPLY TO SUB FAN MOTOR.** **CAUTION:** **Be careful not to overheat engine during repair.** 1)Turn the ignition switch to OFF. 2)Disconnect the connector from sub fan motor. 3)Start the engine, and warm it up until engine coolant temperature increases over 96°C (205°F). 4)Turn the A/C switch ON. 5)Measure the voltage while A/C compressor is rotating. 6)Measure the voltage between sub fan motor connector and chassis ground. ***Connector & terminal*** ***(F16) No. 2 (+) — Chassis ground (–):*** Is the measured value more than the specified value?	10 V	Go to step **18.**	Go to step **20.**
18	**CHECK POOR CONTACT.** Check the poor contact in sub fan motor connector. Is there poor contact in sub fan motor connector?	There is a poor contact.	Repair the poor contact in sub fan motor connector.	Go to step **19.**
19	**CHECK SUB FAN MOTOR.** Connect the battery positive (+) terminal to terminal No. 2, and negative (–) terminal to terminal No. 1 of sub fan motor connector. Does the main fan rotate?	The main fan rotates.	Repair the poor contact in sub fan motor connector.	Replace the sub fan motor with a new one.

	Step	Check	Yes	No
20	**CHECK POWER SUPPLY TO SUB FAN RELAY2.** 1)Turn the ignition switch to OFF. 2)Remove the sub fan relay2 from A/C relay holder. 3)Measure the voltage between sub fan relay2 terminal and chassis ground. ***Connector & terminal*** ***(F29) No. 18 (+) — Chassis ground (−):*** Is the measured value more than the specified value?	10 V	Go to step **21.**	Go to step **22.**
21	**CHECK POWER SUPPLY TO SUB FAN RELAY2.** 1)Turn the ignition switch to ON. 2)Measure the voltage between sub fan relay2 terminal and chassis ground. ***Connector & terminal*** ***(F29) No. 20 (+) — Chassis ground (−):*** Is the measured value more than the specified value?	10 V	Go to step **23.**	Go to step **24.**
22	**CHECK 20 A FUSE.** 1)Remove the 20 A fuse from A/C relay holder. 2)Check the condition of fuse. Is the fuse blown-out?	The fuse is blown out.	Replace fuse.	Go to step **23.**
23	**CHECK POWER SUPPLY TO A/C RELAY HOLDER 30 A FUSE TERMINAL.** Measure the voltage of harness between A/C relay holder 20 A fuse terminal and chassis ground. ***Connector & terminal*** ***(F27) No. 3 (+) — Chassis ground (−):*** Is the measured value more than the specified value?	10 V	Repair the open circuit in harness between 20 A fuse and sub fan relay terminal.	Repair the open circuit in harness between sub fuse box connector and 20 A fuse terminal.
24	**CHECK FUSE.** 1)Turn the ignition switch to OFF. 2)Remove the fuse No. 17 from joint box. 3)Check the condition of fuse. Is the fuse blown-out?	The fuse is blown out.	Replace the fuse.	Repair the open circuit in harness between sub fan relay and ignition switch.
25	**CHECK SUB FAN RELAY2.** 1)Turn the ignition switch to OFF. 2)Remove the sub fan relay2. 3)Measure the resistance of sub fan relay2. ***Terminal*** ***No. 18 — No. 17:*** Is the measured value more than the specified value?	1 MΩ	Go to step **26.**	Replace the sub fan relay2.
26	**CHECK MAIN FAN RELAY2.** 1)Connect the battery to terminals No. 19 and No. 20 of sub fan relay2. 2)Measure the resistance of sub fan relay2. ***Terminal*** ***No. 18 — No. 17:*** Is the measured value less than the specified value?	1 Ω	Go to step **27.**	Replace the sub fan relay2.

	Step	Check	Yes	No
27	**CHECK HARNESS BETWEEN SUB FAN RELAY2 TERMINAL AND SUB FAN MOTOR CONNECTOR.** Measure the resistance of harness between sub fan motor connector and sub fan relay2 terminal. ***Connector & terminal (F16) No. 2 — (F29) No. 17:*** Is the measured value less than the specified value?	1 Ω	Go to step **28.**	Repair the open circuit in harness between sub fan motor connector and sub fan relay2 terminal.
28	**CHECK HARNESS BETWEEN SUB FAN RELAY2 AND ECM.** 1)Turn the ignition switch to OFF. 2)Disconnect the connector from ECM. 3)Measure the resistance of harness between sub fan relay2 connector and ECM connector. ***Connector & terminal (F29) No. 19 — (B137) No. 28:*** Is the measured value less than the specified value?	1 Ω	Go to step **29.**	Repair the open circuit in harness between sub fan relay2 and ECM.
29	**CHECK POOR CONTACT.** Check the poor contact in connector between sub fan and ECM. Is there poor contact in connector between sub fan motor and ECM?	There is a poor contact.	Repair the poor contact connector.	Contact with SOA (distributor) service.

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