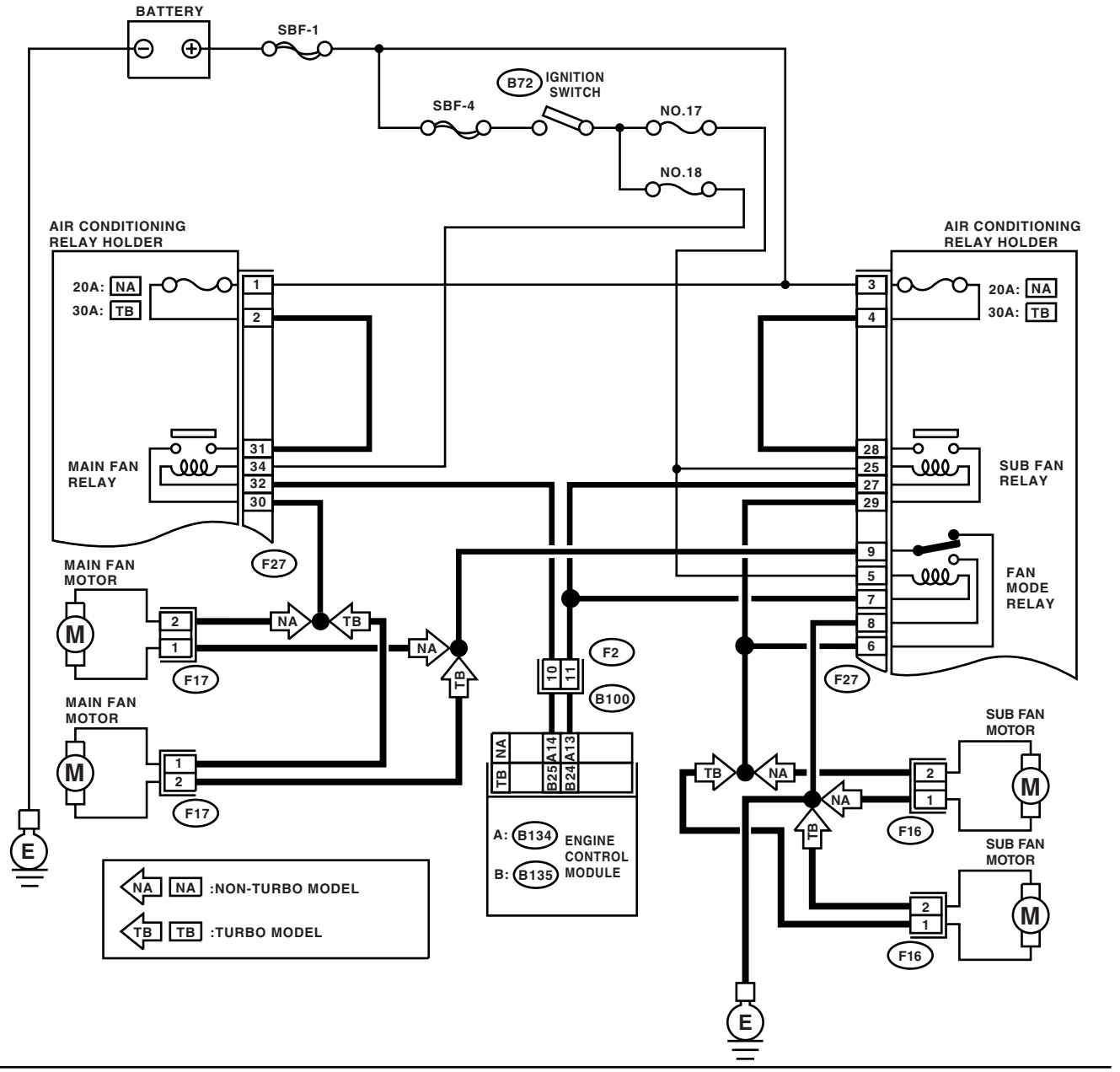
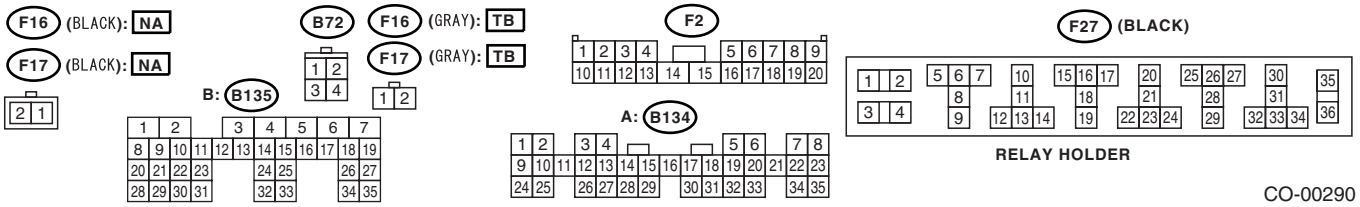
2. Radiator Fan System

A: WIRING DIAGRAM





CO-00290

B: INSPECTION

DETECTING CONDITION:

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

TROUBLE SYMPTOM:

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

	Step	Check	Yes	No
1	**CHECK OPERATION OF RADIATOR FAN.** 1) Connect the test mode connector. 2) Turn the ignition switch to ON. 3) Using SUBARU Select Monitor, check the compulsory operation of radiator fan. NOTE: • With SUBARU Select Monitor When checking the compulsory operation of radiator fan, the radiator main and sub fan repeat the rotation in order of following: low speed rotation → high speed rotation → off. • SUBARU Select Monitor Refer to Compulsory Valve Operation Check Mode for detail procedures. <Ref. to EN(H4SO)-50, Compulsory Valve Operation Check Mode.>	Do the radiator main and sub fans rotate at low speed?	Go to step **2.**	Go to step **3.**
2	**CHECK OPERATION OF RADIATOR FAN.** 1) Connect the test mode connector. 2) Turn the ignition switch to ON. 3) Using SUBARU Select Monitor, check the compulsory operation of radiator fan. NOTE: • With SUBARU Select Monitor When checking the compulsory operation of radiator fan, the radiator main and sub fan repeat the rotation in order of following: low speed rotation → high speed rotation → off. • SUBARU Select Monitor Refer to Compulsory Valve Operation Check Mode for detail procedures. <Ref. to EN(H4SO)-50, Compulsory Valve Operation Check Mode.>	Do the radiator main and sub fans rotate at high speed?	Radiator main fan system is okay.	Go to step **32.**
3	**CHECK POWER SUPPLY TO FAN RELAY 1.** 1) Turn the ignition switch to OFF. 2) Remove the fan relay 1 from A/C relay holder. 3) Measure the voltage between fan relay 1 terminal and chassis ground. ***Connector & terminal*** ***(F27) No. 31 (+) — Chassis ground (–):***	Is the voltage more than 10 V?	Go to step **4.**	Go to step **5.**
4	**CHECK POWER SUPPLY TO FAN RELAY 1.** 1) Turn the ignition switch to ON. 2) Measure the voltage between fan relay 1 terminal and chassis ground. ***Connector & terminal*** ***(F27) No. 34 (+) — Chassis ground (–):***	Is the voltage more than 10 V?	Go to step **8.**	Go to step **7.**
5	**CHECK FUSE.** 1) Remove the 20 A fuse (Non-turbo model) or 30 A fuse (Turbo model) from A/C relay holder. 2) Check the condition of fuse.	Is the fuse blown out?	Replace the fuse.	Go to step **6.**

	Step	Check	Yes	No
6	**CHECK HARNESS OF FAN RELAY 1 TERMINAL AND THE 20A FUSE TERMINAL (NON-TURBO MODEL) OR 30A FUSE TERMINAL (TURBO MODEL).** 1) Turn the ignition switch to OFF. 2) Measure the resistance between 20 A fuse terminal (Non-turbo model) or 30 A fuse terminal (Turbo model) and fan relay 1 terminal. ***Terminal*** ***No. 2 — No. 31:***	Is the resistance less than 1 Ω?	Repair the power supply line.	Repair the open harness.
7	**CHECK FUSE.** 1) Turn the ignition switch to OFF 2) Remove the fuse No. 18. 3) Check the condition of fuse.	Is the fuse blown out?	Replace the fuse.	Repair the power supply line.
8	**CHECK FAN RELAY 1.** 1) Turn the ignition switch to OFF. 2) Measure the resistance between fan relay 1 terminals. ***Terminal*** ***No. 30 — No. 31:***	Is the resistance more than 1 MΩ?	Go to step **9.**	Replace the fan relay 1.
9	**CHECK FAN RELAY 1.** 1) Connect the battery to fan relay 1 terminals No. 32 and No. 34. 2) Measure the resistance between fan relay 1 terminals. ***Terminal*** ***No. 30 — No. 31:***	Is the resistance less than 1 Ω?	Go to step **10.**	Replace the fan relay 1.
10	**CHECK HARNESS BETWEEN FAN RELAY 1 TERMINAL AND MAIN FAN MOTOR CONNECTOR.** 1) Disconnect the connector from main fan motor. 2) Measure the resistance of harness between fan relay 1 terminal and main fan motor connector. ***Connector & terminal*** ***Non-turbo model*** ***(F17) No. 2 — (F27) No. 30:*** ***Turbo model*** ***(F17) No. 1 — (F27) No. 30:***	Is the resistance less than 1 Ω?	Go to step **11.**	Repair the open harness between fan relay 1 terminal and main fan motor connector.
11	**CHECK HARNESS BETWEEN MAIN FAN MOTOR CONNECTOR AND FAN MODE RELAY CONNECTOR.** 1) Remove the fan mode relay from A/C relay holder. 2) Measure the resistance of harness between main fan motor connector and fan mode relay connector. ***Connector & terminal*** ***Non-turbo model*** ***(F17) No. 1 — (F27) No. 9:*** ***Turbo model*** ***(F17) No. 2 — (F27) No. 9:***	Is the resistance less than 1 Ω?	Go to step **12.**	Repair the open harness between main fan motor connector and fan mode relay connector.
12	**CHECK POOR CONTACT.** Check poor contact in main fan motor connector.	Is there poor contact in main fan motor connector?	Repair poor contact in main fan motor connector.	Go to step **13.**

	Step	Check	Yes	No
13	**CHECK MAIN FAN MOTOR.** Connect the battery positive (+) terminal to terminal No.2 (Non-turbo model) or No.1 (Turbo model), and ground (–) terminal to terminal No.1 (Non-turbo model) or No.2 (Turbo model) of main fan motor.	Does the main fan rotate?	Go to step **14.**	Replace the main fan motor with new one.
14	**CHECK FAN MODE RELAY.** Measure the resistance of fan mode relay. ***Terminal*** ***No. 6 — No. 9:***	Is the resistance less than 1 Ω?	Go to step **15.**	Replace the fan mode relay.
15	**CHECK HARNESS BETWEEN FAN MODE RELAY TERMINAL AND SUB FAN MOTOR CONNECTOR.** 1) Disconnect the connector from sub fan motor. 2) Measure the resistance of harness between fan mode relay terminal and sub fan motor connector. ***Connector & terminal*** ***Non-turbo model*** ***(F16) No. 2 — (F27) No. 6:*** ***Turbo model*** ***(F16) No. 1 — (F27) No. 6:***	Is the resistance less than 1 Ω?	Go to step **16.**	Repair the open harness between fan mode relay terminal and sub fan motor connector.
16	**CHECK SUB FAN MOTOR AND GROUND CIRCUIT.** Measure the resistance between sub fan motor connector and chassis ground. ***Connector & terminal*** ***Non-turbo model*** ***(F16) No. 1 — Chassis ground:*** ***Turbo model*** ***(F16) No. 2 — Chassis ground:***	Is the resistance less than 5 Ω?	Go to step **17.**	Repair the open harness between sub fan motor connector and chassis ground.
17	**CHECK POOR CONTACT.** Check poor contact in sub fan motor connector.	Is there poor contact in sub fan motor connector?	Repair poor contact in sub fan motor connector.	Go to step **18.**
18	**CHECK SUB FAN MOTOR.** Connect the battery positive (+) terminal to terminal No.2 (Non-turbo model) or No.1 (Turbo model), and ground (–) terminal to terminal No.1 (Non-turbo model) or No.2 (Turbo model) of sub fan motor.	Does the sub fan rotate?	Go to step **19.**	Replace the sub fan motor with new one.
19	**CHECK HARNESS BETWEEN FAN RELAY 1 AND ECM.** 1) Disconnect the connector from ECM. 2) Measure the resistance between fan relay 1 terminal and ECM connector. ***Connector & terminal*** ***Non-turbo model:*** ***(B134) No. 14 — (F27) No. 32:*** ***Turbo model:*** ***(B135) No. 25 — (F27) No. 32:***	Is the resistance less than 1 Ω?	Go to step **20.**	Repair the open harness between fan relay 1 terminal and ECM.
20	**CHECK POOR CONTACT.** Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	Contact with SOA Service Center.

	Step	Check	Yes	No
21	**CHECK POWER SUPPLY TO FAN RELAY 2.** 1) Turn the ignition switch to OFF. 2) Remove the fan relay 2 from A/C relay holder. 3) Measure the voltage between fan relay 2 terminal and chassis ground. ***Connector & terminal*** ***(F27) No. 28 (+) — Chassis ground (–):***	Is the voltage more than10 V?	Go to step **22.**	Go to step **23.**
22	**CHECK POWER SUPPLY TO FAN RELAY 2.** 1) Turn the ignition switch to ON. 2) Measure the voltage between fan relay 2 terminal and chassis ground. ***Connector & terminal*** ***(F27) No. 25 (+) — Chassis ground (–):***	Is the voltage more than10 V?	Go to step **26.**	Go to step **25.**
23	**CHECK FUSE.** 1) Remove the 20 A fuse (Non-turbo model) or 30 A fuse (Turbo model) from A/C relay holder. 2) Check the condition of fuse.	Is the fuse blown out?	Replace the fuse.	Go to step **24.**
24	**CHECK HARNESS OF FAN RELAY 2 TERMINAL AND THE 20A FUSE TERMINAL (NON-TURBO MODEL) OR 30A FUSE TERMINAL (TURBO MODEL).** 1) Turn the ignition switch to OFF. 2) Measure the resistance between 20 A fuse terminal (Non-turbo model) or 30 A fuse terminal (Turbo model) and fan relay 2 terminal. ***Terminal*** ***No. 4 — No. 28:***	Is the resistance less than 1 Ω?	Repair the power supply line.	Repair the open harness.
25	**CHECK FUSE.** 1) Turn the ignition switch to OFF. 2) Remove the fuse No. 17. 3) Check the condition of fuse.	Is the fuse blown out?	Replace the fuse.	Repair the power supply line.
26	**CHECK FAN RELAY 2.** 1) Turn the ignition switch to OFF. 2) Remove the fan relay 2 from A/C relay holder. 3) Measure the resistance of fan relay 2. ***Terminal*** ***No. 28 — No. 29:***	Is the resistance more than 1 MΩ?	Go to step **27.**	Replace the fan relay 2.
27	**CHECK FAN RELAY 2.** 1) Connect the battery to terminals No. 25 and No. 27 of fan relay 2. 2) Measure the resistance between fan relay 2 terminals. ***Terminal*** ***No. 28 — No. 29:***	Is the resistance less than 1 Ω?	Go to step **28.**	Replace the fan relay 2.
28	**CHECK HARNESS BETWEEN FAN RELAY 2 TERMINAL AND SUB FAN MOTOR CONNECTOR.** 1) Disconnect the connector from sub fan motor. 2) Measure the resistance of harness between fan relay 2 terminal and sub fan motor connector. ***Connector & terminal*** ***Non-turbo model*** ***(F16) No. 2 — (F27) No. 29:*** ***Turbo model*** ***(F16) No. 1 — (F27) No. 29:***	Is the resistance less than 1 Ω?	Go to step **30.**	Repair the open harness between fan relay 2 terminal and sub fan motor connector.

	Step	Check	Yes	No
29	**CHECK HARNESS BETWEEN FAN RELAY 2 AND ECM.** 1) Disconnect the connector from ECM. 2) Measure the resistance between fan relay 2 terminal and ECM connector. ***Connector & terminal*** ***Non-turbo model:*** ***(B134) No. 13 — (F27) No. 27:*** ***Turbo model:*** ***(B135) No. 24 — (F27) No. 27:***	Is the resistance less than 1 Ω?	Go to step **30.**	Repair the open harness between fan relay 2 terminal and ECM.
30	**CHECK HARNESS BETWEEN FAN MODE RELAY AND ECM.** Measure the resistance between fan mode relay terminal and ECM connector. ***Connector & terminal*** ***Non-turbo model:*** ***(B134) No. 13 — (F27) No. 27:*** ***Turbo model:*** ***(B135) No. 24 — (F27) No. 27:***	Is the resistance less than 1 Ω?	Go to step **31.**	Repair the open harness between fan mode relay terminal and ECM.
31	**CHECK POOR CONTACT.** Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Contact with your SOA Service Center.
32	**CHECK OPERATION OF RADIATOR FAN.**	Does the radiator main fan rotate when the radiator main and sub fan do not rotate at high speed?	Go to step **21.**	Go to step **33.**
33	**CHECK GROUND CIRCUIT OF FAN MODE RELAY.** 1) Remove the fan mode relay from A/C relay holder. 2) Measure the resistance between fan mode relay terminal and chassis ground. ***Connector & terminal*** ***(F27) No. 8 — Chassis ground:***	Is the resistance less than 1 Ω?	Go to step **34.**	Repair the open harness between fan mode relay and chassis ground.
34	**CHECK POWER SUPPLY TO FAN MODE RELAY.** 1) Turn the ignition switch to ON. 2) Measure the voltage between fan mode relay terminal and chassis ground. ***Connector & terminal*** ***(F27) No. 5 (+) — Chassis ground (–):***	Is the voltage more than 10 V?	Go to step **35.**	Repair the power supply line.
35	**CHECK FAN MODE RELAY.** 1) Turn the ignition switch to OFF. 2) Remove the fan mode relay. 3) Measure the resistance of fan mode relay. ***Terminal*** ***(F27) No. 8 — (F27) No. 9:***	Is the resistance more than 1 MΩ?	Go to step **36.**	Replace the fan mode relay.
36	**CHECK FAN MODE RELAY.** 1) Connect the battery to terminals No. 5 and No. 7 of fan mode relay. 2) Measure the resistance of fan mode relay. ***Terminal*** ***(F27) No. 8 — (F27) No. 9:***	Is the resistance less than 1 Ω?	Go to step **29.**	Replace the fan mode relay.

NOTE:
Inspection by your SOA Service Center is required, because probable cause is deterioration of multiple parts.