16.Diagnostics for Engine Starting Failure

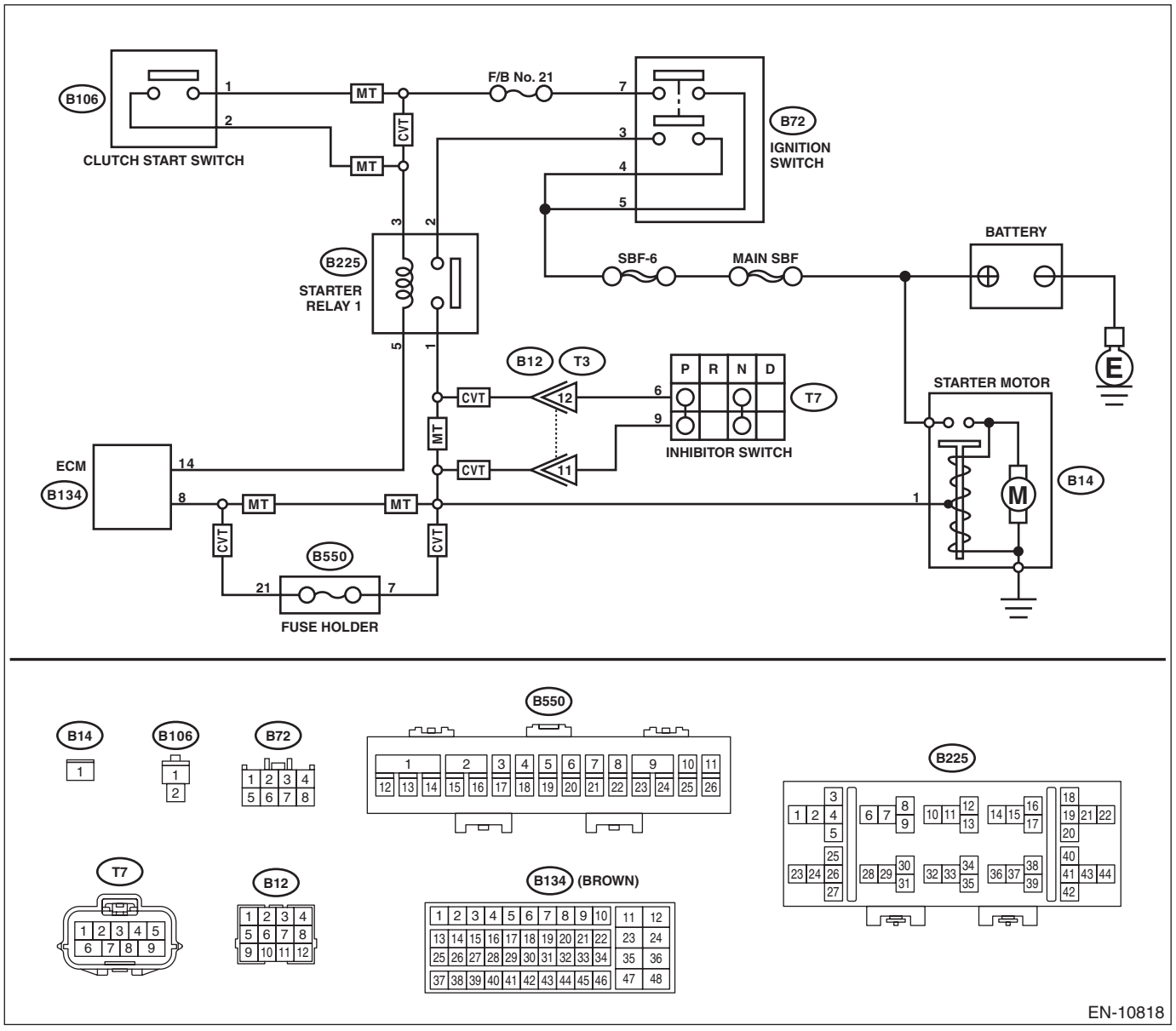
A: PROCEDURE

1. Check of the fuel amount
↓
2. Inspection of starter motor circuit <Ref. to EN(w/o STI)(diag)-67, STARTER MOTOR CIRCUIT, Diagnostics for Engine Starting Failure.>
↓
3. Inspection of ECM power supply and ground line <Ref. to EN(w/o STI)(diag)-78, CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MODULE (ECM), Diagnostics for Engine Starting Failure.>
↓
4. Inspection of ignition control system <Ref. to EN(w/o STI)(diag)-80, IGNITION CONTROL SYSTEM, Diagnostics for Engine Starting Failure.>
↓
5. Inspection of fuel pump circuit <Ref. to EN(w/o STI)(diag)-82, FUEL PUMP CIRCUIT, Diagnostics for Engine Starting Failure.>
↓
6. Inspection of fuel injector circuit <Ref. to EN(w/o STI)(diag)-83, FUEL INJECTOR CIRCUIT, Diagnostics for Engine Starting Failure.>

B: STARTER MOTOR CIRCUIT

1. MODEL WITHOUT PUSH BUTTON START

CAUTION:
After servicing or replacing faulty parts, perform Clear Memory Mode <Ref. to EN(w/o STI)(diag)-61, Clear Memory Mode.>, and Inspection Mode <Ref. to EN(w/o STI)(diag)-47, Inspection Mode.>.
WIRING DIAGRAM:
Engine Electrical System ENGINE TYPE FA (WITHOUT PUSH BUTTON START) <Ref. to WI-162, ENGINE TYPE FA (WITHOUT PUSH BUTTON START), WIRING DIAGRAM, Engine Electrical System.>



Step		Check	Yes	No
1	**CHECK BATTERY.** Check the battery. <Ref. to SC(w/o STI)-50, Battery.>	Is the battery OK?	Go to step **2**.	Charge or replace the battery. <Ref. to SC(w/o STI)-50, Battery.>
2	**CHECK OPERATION OF STARTER MOTOR.**	Does the starter motor operate?	Go to step **3**.	Go to step **4**.

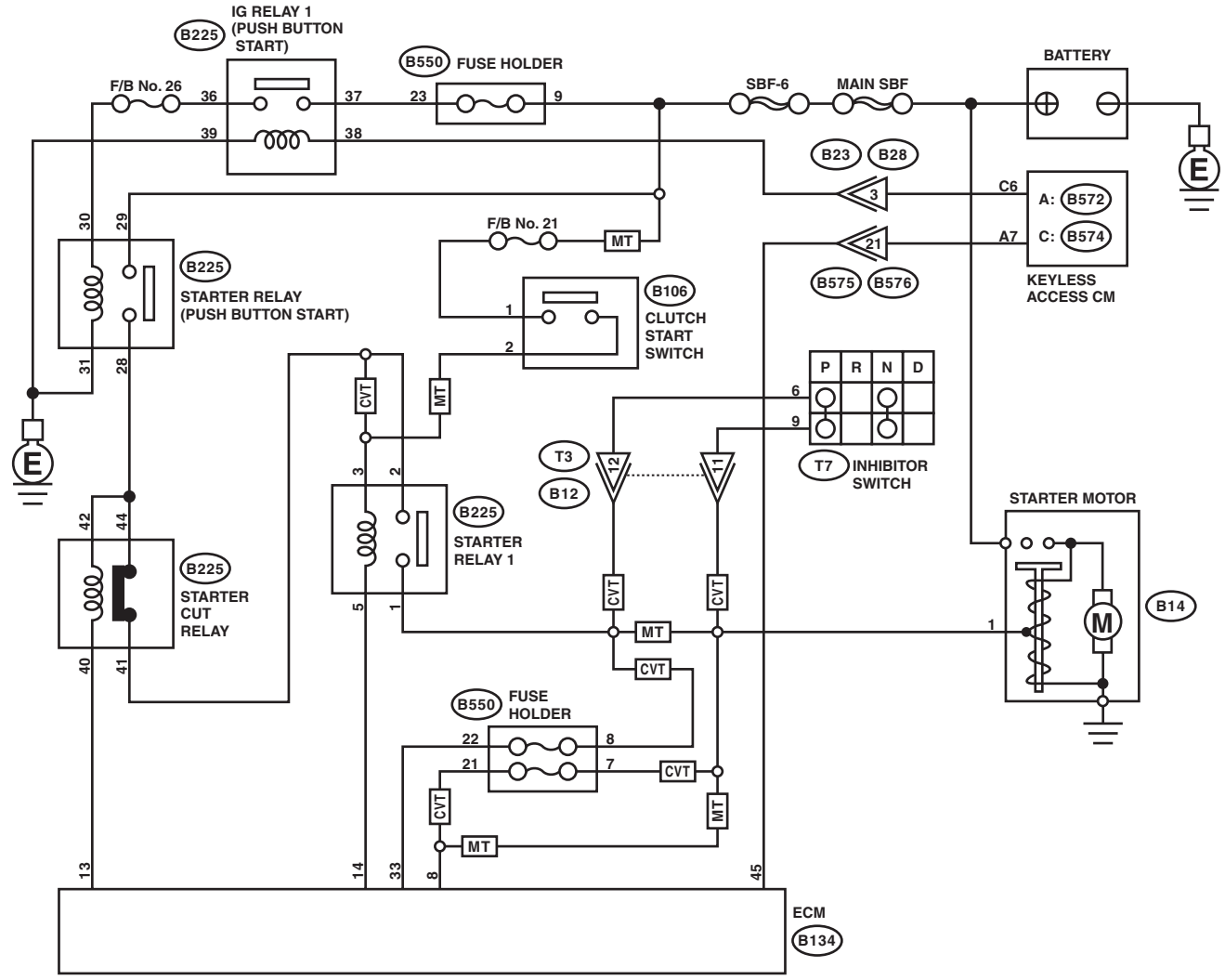
	Step	Check	Yes	No
3	**CHECK DTC.**	Is DTC displayed? <Ref. to EN(w/o STI)(diag)-46, OPERATION, Read Diagnostic Trouble Code (DTC).>	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(w/o STI)(diag)-85, List of Diagnostic Trouble Code (DTC).>	Check ignition control system. <Ref. to EN(w/o STI)(diag)-80, IGNITION CONTROL SYSTEM, Diagnostics for Engine Starting Failure.>
4	**CHECK INPUT SIGNAL FOR STARTER MOTOR.** 1) Turn the ignition switch to OFF. 2) Disconnect the connector from starter motor. 3) Turn the ignition switch to START. 4) Measure the voltage between the starter motor connector and the engine ground. ***Connector & terminal*** ***(B14) No. 1 (+) — Engine ground (–):*** NOTE: • For CVT model, place the select lever in "P" range or "N" range. • For MT model, depress the clutch pedal.	Is the voltage 10 V or more?	Check the starter motor. <Ref. to SC(w/o STI)-7, Starter.>	Go to step **5**.
5	**CHECK HARNESS BETWEEN BATTERY AND IGNITION SWITCH CONNECTOR.** 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ignition switch. 3) Measure the power supply voltage between ignition switch connector and chassis ground. ***Connector & terminal*** ***(B72) No. 4 (+) — Chassis ground (–):*** ***(B72) No. 5 (+) — Chassis ground (–):***	Is the voltage 10 V or more?	Go to step **6**.	Repair the power supply circuit.
6	**CHECK IGNITION SWITCH.** Measure the resistance between ignition switch terminals after turning the ignition switch to START position. ***Terminals*** ***No. 3 — No. 4:*** ***No. 5 — No. 7:***	Is the resistance less than 1 Ω?	Go to step **7**.	Replace the ignition switch. <Ref. to SL-64, REPLACEMENT, Ignition Key Lock.>
7	**CHECK INPUT VOLTAGE OF STARTER RELAY 1.** 1) Turn the ignition switch to OFF. 2) Remove the starter relay 1. 3) Connect the connector to ignition switch. 4) Measure the voltage between starter relay 1 connector and chassis ground after turning the ignition switch to START position. ***Connector & terminal*** ***(B225) No. 2 (+) — Chassis ground (–):***	Is the voltage 10 V or more?	Go to step **8**.	Repair the open circuit of harness between starter relay 1 and ignition switch connector.
8	**CHECK HARNESS BETWEEN ECM AND STARTER RELAY 1 CONNECTOR.** 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance of harness between ECM connector and starter relay 1 connector. ***Connector & terminal*** ***(B134) No. 14 — (B225) No. 5:***	Is the resistance less than 1 Ω?	Go to step **9**.	Repair the open circuit of harness between ECM connector and starter relay 1 connector.

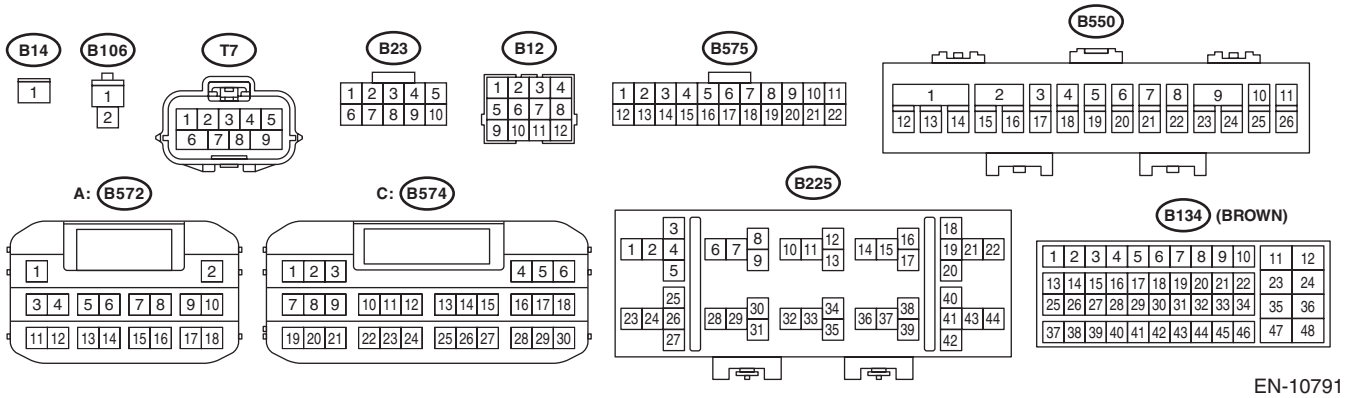
	Step	Check	Yes	No
9	**CHECK STARTER RELAY 1.** 1) Connect the battery to starter relay 1 terminals No. 3 and No. 5. 2) Measure the resistance between starter relay 1 terminals. ***Terminals*** ***No. 1 — No. 2:***	Is the resistance less than 1 Ω?	Go to step **10**.	Replace the starter relay 1. <Ref. to EN(w/o STI)(diag)-9, Electrical Component Location.>
10	**CHECK TRANSMISSION TYPE.**	Is the transmission type CVT?	Go to step **11**.	Go to step **15**.
11	**CHECK INPUT VOLTAGE OF STARTER RELAY 1.** Measure the voltage between starter relay 1 connector and chassis ground after turning the ignition switch to START position. ***Connector & terminal*** ***(B225) No. 3 (+) — Chassis ground (–):***	Is the voltage 10 V or more?	Go to step **12**.	Check the following item and repair if necessary. • Blown out of fuse • Open or short circuit to ground in harness between starter relay 1 and ignition switch connector
12	**CHECK HARNESS BETWEEN STARTER RELAY 1 AND INHIBITOR SWITCH CONNECTOR.** 1) Turn the ignition switch to OFF. 2) Disconnect the connector from inhibitor switch. 3) Measure the resistance of harness between starter relay 1 connector and inhibitor switch connector. ***Connector & terminal*** ***(B225) No. 1 — (T7) No. 6:***	Is the resistance less than 1 Ω?	Go to step **13**.	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit in harness between starter relay 1 connector and inhibitor switch connector • Poor contact of coupling connector
13	**CHECK HARNESS BETWEEN INHIBITOR SWITCH AND STARTER MOTOR.** Measure the resistance of harness between the inhibitor switch connector and starter motor. ***Connector & terminal*** ***(T7) No. 9 — (B14) No. 1:***	Is the resistance less than 1 Ω?	Go to step **14**.	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit in harness between inhibitor switch connector and starter motor • Poor contact of coupling connector
14	**CHECK INHIBITOR SWITCH.** 1) Place the select lever in “P” range and “N” range. 2) Measure the resistance between inhibitor switch terminals. ***Terminals*** ***No. 6 — No. 9:***	Is the resistance less than 1 Ω?	Check the engine control module (ECM) power supply and ground line. <Ref. to EN(w/o STI)(diag)-78, CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MODULE (ECM), Diagnostics for Engine Starting Failure.>	Replace the inhibitor switch. <Ref. to CVT(TR690)-92, Inhibitor Switch.>

	Step	Check	Yes	No
15	**CHECK INPUT VOLTAGE OF CLUTCH START SWITCH.** 1) Disconnect the connector from clutch start switch. 2) Turn the ignition switch to START. 3) Measure the voltage between the clutch start switch connector and chassis ground. ***Connector & terminal*** ***(B106) No. 1 (+) — Chassis ground (–):***	Is the voltage 10 V or more?	Go to step **16**.	Check the following item and repair if necessary. • Blown out of fuse • Open or short circuit to ground in harness between ignition switch connector and clutch start switch connector
16	**CHECK CLUTCH START SWITCH.** 1) Turn the ignition switch to OFF. 2) Measure the resistance between clutch start switch terminals while keeping the clutch pedal depressed. ***Terminals*** ***No. 1 — No. 2:***	Is the resistance less than 1 Ω?	Go to step **17**.	Replace the clutch start switch. <Ref. to CL-35, Clutch Switch.>
17	**CHECK HARNESS BETWEEN STARTER RELAY 1 AND CLUTCH START SWITCH.** Measure the resistance of harness between starter relay 1 and clutch start switch connector. ***Connector & terminal*** ***(B225) No. 3 — (B106) No. 2:***	Is the resistance less than 1 Ω?	Go to step **18**.	Repair the open circuit in harness between starter relay 1 and clutch start switch connector.
18	**CHECK HARNESS BETWEEN STARTER RELAY 1 CONNECTOR AND STARTER MOTOR CONNECTOR.** Measure the resistance of harness between starter relay 1 connector and starter motor connector. ***Connector & terminal*** ***(B225) No. 1 — (B14) No. 1:***	Is the resistance less than 1 Ω?	Check the engine control module (ECM) power supply and ground line. <Ref. to EN(w/o STI)(diag)-78, CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MODULE (ECM), Diagnostics for Engine Starting Failure.>	Repair the open circuit of the harness between starter relay 1 connector and starter motor connector.

2. MODEL WITH PUSH BUTTON START

CAUTION:
After servicing or replacing faulty parts, perform Clear Memory Mode <Ref. to EN(w/o STI)(diag)-61, OPERATION, Clear Memory Mode.>, and Inspection Mode <Ref. to EN(w/o STI)(diag)-47, PROCEDURE, Inspection Mode.>.
WIRING DIAGRAM:
Engine Electrical System ENGINE TYPE FA (WITH PUSH BUTTON START) <Ref. to WI-180, ENGINE TYPE FA (WITH PUSH BUTTON START), WIRING DIAGRAM, Engine Electrical System.>





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	Step	Check	Yes	No
1	**CHECK BATTERY.** Check the battery. <Ref. to SC(w/o STI)-50, Battery.>	Is the battery OK?	Go to step **2**.	Charge or replace the battery. <Ref. to SC(w/o STI)-50, Battery.>
2	**CHECK OPERATION OF STARTER MOTOR.**	Does the starter motor operate?	Go to step **3**.	Go to step **4**.
3	**CHECK DTC.**	Is DTC displayed? <Ref. to EN(w/o STI)(diag)-46, OPERATION, Read Diagnostic Trouble Code (DTC).>	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(w/o STI)(diag)-85, List of Diagnostic Trouble Code (DTC).>	Check ignition control system. <Ref. to EN(w/o STI)(diag)-80, IGNITION CONTROL SYSTEM, Diagnostics for Engine Starting Failure.>
4	**CHECK PUSH BUTTON IGNITION SWITCH.** Press the push button ignition switch twice with the ignition OFF (ACC OFF). NOTE: • Release the brake pedal. (CVT model) • Release the clutch pedal. (MT model)	Does the ignition turn to ON?	Go to step **5**.	Check the push button start system. <Ref. to KPS(diag)-111, POWER SUPPLY SWITCHING SYSTEM, INSPECTION, General Diagnostic Table.>
5	**CHECK PUSH BUTTON IGNITION SWITCH.** 1) Depress the brake pedal (CVT model) or clutch pedal (MT model). NOTE: For CVT model, position the select lever in "P" range. 2) Check the push button ignition switch indicator.	Does the indicator turn to green?	Go to step **6**.	Check the push button start system. <Ref. to KPS(diag)-141, ENGINE DOES NOT START, INSPECTION, Diagnostics with Phenomenon.>
6	**CHECK START SWITCH SIGNAL.** 1) Read the waveform of «Starter SW» using the Subaru Select Monitor. NOTE: For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(w/o STI)(diag)-37, Subaru Select Monitor.> 2) Press the push button ignition switch once with the brake pedal (CVT model) or clutch pedal (MT model) depressed.	Does waveform of the «Starter SW» occur?	Go to step **10**.	Go to step **7**.
7	**CHECK HARNESS BETWEEN ECM AND KEYLESS ACCESS CM.** 1) Turn the ignition to OFF. 2) Disconnect the connectors from ECM and keyless access CM. 3) Measure the resistance of harness between ECM connector and keyless access CM. ***Connector & terminal*** ***(B134) No. 45 — (B572) No. 7:***	Is the resistance less than 1 Ω?	Go to step **8**.	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between ECM connector and keyless access CM connector • Poor contact of coupling connector

	Step	Check	Yes	No
8	**CHECK HARNESS BETWEEN ECM AND KEYLESS ACCESS CM.** Measure the resistance between ECM connector and chassis ground. ***Connector & terminal*** ***(B134) No. 45 — Chassis ground:***	Is the resistance 1 MΩ or more?	Go to step **9**.	Repair the short circuit to ground in harness between ECM connector and keyless access CM connector.
9	**CHECK START SWITCH SIGNAL.** 1) Connect the connector to ECM and keyless access CM. 2) Read the waveform of start switch signal using an oscilloscope. 3) Press the push button ignition switch once with the brake pedal (CVT model) or clutch pedal (MT model) depressed. ***Connector & terminal*** ***(B134) No. 45 (+) — Chassis ground (–):***	Does waveform of the start switch signal occur?	Repair the poor contact of ECM connector.	Repair the poor contact of keyless access CM connector.
10	**CHECK INPUT SIGNAL FOR STARTER MOTOR.** 1) Turn the ignition to OFF. 2) Disconnect the connector from starter motor. 3) Set the select lever in "P" range or "N" range (CVT model), or the shift lever in neutral. (MT model) 4) Press the push button ignition switch once with the brake pedal (CVT model) or clutch pedal (MT model) depressed. 5) Measure the voltage between the starter motor connector and the engine ground. ***Connector & terminal*** ***(B14) No. 1 (+) — Engine ground (–):***	Is the voltage 10 V or more?	Check the starter motor. <Ref. to SC(w/o STI)-7, Starter.>	Go to step **11**.
11	**CHECK IG RELAY 1 (PUSH BUTTON START) POWER SUPPLY.** 1) Remove the IG relay 1 (push button start). 2) Turn the ignition to ON. 3) Measure the voltage between the IG relay 1 (push button start) connector and chassis ground. ***Connector & terminal*** ***(B225) No. 37 (+) — Chassis ground (–):*** ***(B225) No. 38 (+) — Chassis ground (–):***	Is the voltage 10 V or more?	Go to step **12**.	Check the following item and repair or replace if necessary. • Blown out of fuse • Open circuit or short circuit to ground in harness between IG relay 1 (push button start) connector and keyless access CM connector • Open circuit or short circuit to ground in harness between IG relay 1 (push button start) connector and battery • Poor contact of coupling connector

	Step	Check	Yes	No
12	**CHECK HARNESS BETWEEN IG RELAY 1 (PUSH BUTTON START) CONNECTOR AND CHASSIS GROUND.** 1) Turn the ignition to OFF. 2) Measure the resistance of harness between the IG relay 1 (push button start) connector and chassis ground. ***Connector & terminal*** ***(B225) No. 39 — Chassis ground:***	Is the resistance less than 5 Ω?	Go to step **13**.	Repair the open circuit in harness between the IG relay 1 (push button start) connector and chassis ground.
13	**CHECK IG RELAY 1 (PUSH BUTTON START).** 1) Connect the battery to IG relay 1 (push button start) terminals No. 38 and No. 39. 2) Measure the resistance between IG relay 1 (push button start) terminals. ***Terminals*** ***No. 36 — No. 37:***	Is the resistance less than 1 Ω?	Go to step **14**.	Replace the IG relay 1 (push button start). <Ref. to SL-110, IG Relay1 (Push Button Start).>
14	**CHECK STARTER RELAY (PUSH BUTTON START) POWER SUPPLY.** 1) Install the IG relay 1 (push button start). 2) Remove the starter relay (push button start). 3) Turn the ignition to ON. 4) Measure the voltage between starter relay (push button start) connector and chassis ground. ***Connector & terminal*** ***(B225) No. 29 (+) — Chassis ground (–):*** ***(B225) No. 30 (+) — Chassis ground (–):***	Is the voltage 10 V or more?	Go to step **15**.	Check the following item and repair or replace if necessary. • Blown out of fuse (F/B No. 26) • Open circuit or short circuit to ground in harness between starter relay (push button start) connector and IG relay 1 (push button start) connector • Open circuit or short circuit to ground in harness between starter relay (push button start) connector and battery
15	**CHECK HARNESS BETWEEN STARTER RELAY (PUSH BUTTON START) CONNECTOR AND CHASSIS GROUND.** 1) Turn the ignition to OFF. 2) Measure the resistance of harness between starter relay (push button start) connector and chassis ground. ***Connector & terminal*** ***(B225) No. 31 — Chassis ground:***	Is the resistance less than 5 Ω?	Go to step **16**.	Repair the open circuit in harness between starter relay (push button start) connector and chassis ground.
16	**CHECK STARTER RELAY (PUSH BUTTON START).** 1) Connect the battery to starter relay (push button start) terminals No. 30 and No. 31. 2) Measure the resistance between starter relay (push button start) terminals. ***Terminals*** ***No. 28 — No. 29:***	Is the resistance less than 1 Ω?	Go to step **17**.	Replace the starter relay (push button start). <Ref. to SL-108, Starter Relay (Push Button Start).>

	Step	Check	Yes	No
17	**CHECK HARNESS BETWEEN STARTER RELAY (PUSH BUTTON START) CONNECTOR AND STARTER CUT RELAY CONNECTOR.** 1) Remove the starter cut relay. 2) Measure the resistance of harness between starter relay (push button start) connector and starter cut relay connector. ***Connector & terminal*** ***(B225) No. 28 — (B225) No. 42:*** ***(B225) No. 28 — (B225) No. 44:***	Is the resistance less than 1 Ω?	Go to step **18**.	Repair the open circuit in harness between starter relay (push button start) connector and starter cut relay connector.
18	**CHECK HARNESS BETWEEN ECM AND STARTER CUT RELAY CONNECTOR.** 1) Disconnect the connector from ECM. 2) Measure the resistance between starter cut relay connector and chassis ground. ***Connector & terminal*** ***(B225) No. 40 — Chassis ground:***	Is the resistance 1 MΩ or more?	Go to step **19**.	Repair the short circuit to ground in harness between ECM connector and starter cut relay connector.
19	**CHECK STARTER CUT RELAY.** Measure the resistance between starter cut relay terminals. ***Terminals*** ***No. 41 — No. 44:***	Is the resistance less than 1 Ω?	Go to step **20**.	Replace the starter cut relay. <Ref. to SL-116, Starter Cut Relay.>
20	**CHECK HARNESS BETWEEN STARTER CUT RELAY CONNECTOR AND STARTER RELAY 1 CONNECTOR.** 1) Remove the starter relay 1. 2) Measure the resistance of harness between starter cut relay connector and starter relay 1 connector. ***Connector & terminal*** ***(B225) No. 41 — (B225) No. 2:***	Is the resistance less than 1 Ω?	Go to step **21**.	Repair the open circuit of harness between starter cut relay connector and starter relay 1 connector.
21	**CHECK HARNESS BETWEEN ECM AND STARTER RELAY 1 CONNECTOR.** Measure the resistance of harness between ECM connector and starter relay 1 connector. ***Connector & terminal*** ***(B134) No. 14 — (B225) No. 5:***	Is the resistance less than 1 Ω?	Go to step **22**.	Repair the open circuit of harness between ECM connector and starter relay 1 connector.
22	**CHECK STARTER RELAY 1.** 1) Connect the battery to starter relay 1 terminals No. 3 and No. 5. 2) Measure the resistance between starter relay 1 terminals. ***Terminals*** ***No. 1 — No. 2:***	Is the resistance less than 1 Ω?	Go to step **23**.	Replace the starter relay 1. <Ref. to EN(w/o STI)(diag)-9, LOCATION, Electrical Component Location.>
23	**CHECK TRANSMISSION TYPE.**	Is the transmission type CVT?	Go to step **26**.	Go to step **24**.
24	**CHECK HARNESS BETWEEN STARTER RELAY 1 CONNECTOR AND CLUTCH START SWITCH CONNECTOR.** Measure the resistance of harness between starter relay 1 connector and clutch start switch connector. ***Connector & terminal*** ***(B225) No. 3 — (B106) No. 2:***	Is the resistance less than 1 Ω?	Go to step **25**.	Repair the open circuit in harness between starter relay 1 connector and clutch start switch connector.

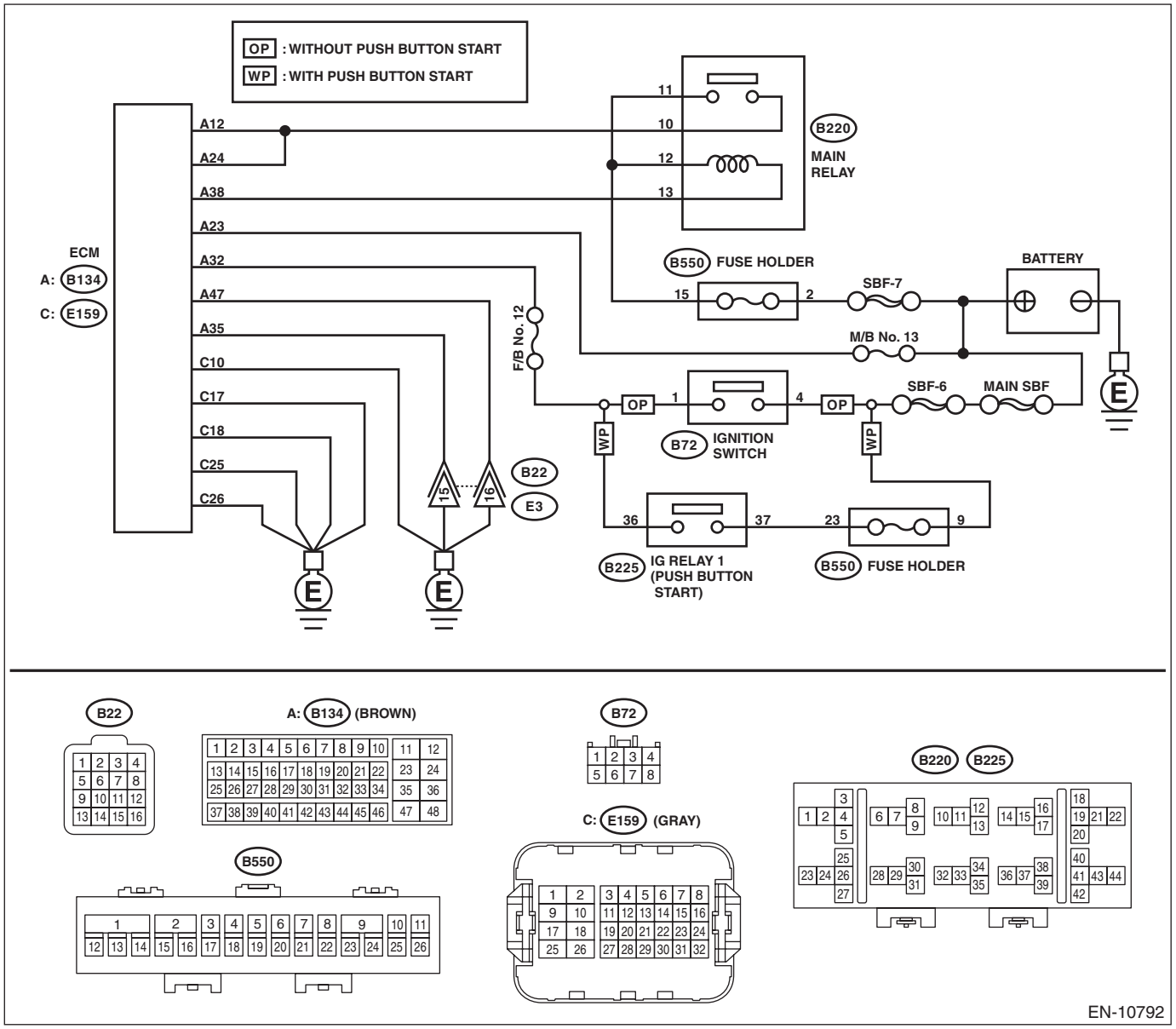
	Step	Check	Yes	No
25	**CHECK HARNESS BETWEEN STARTER RELAY 1 CONNECTOR AND STARTER MOTOR CONNECTOR.** Measure the resistance of harness between starter relay 1 connector and starter motor connector. ***Connector & terminal*** ***(B225) No. 1 — (B14) No. 1:***	Is the resistance less than 1 Ω?	Check the engine control module (ECM) power supply and ground line. <Ref. to EN(w/o STI)(diag)-78, CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MODULE (ECM), Diagnostics for Engine Starting Failure.>	Repair the open circuit of the harness between starter relay 1 connector and starter motor connector.
26	**CHECK HARNESS BETWEEN STARTER CUT RELAY CONNECTOR AND STARTER RELAY 1 CONNECTOR.** Measure the resistance of harness between starter cut relay connector and starter relay 1 connector. ***Connector & terminal*** ***(B225) No. 41 — (B225) No. 3:***	Is the resistance less than 1 Ω?	Go to step **27**.	Repair the open circuit of harness between starter cut relay connector and starter relay 1 connector.
27	**CHECK HARNESS BETWEEN STARTER RELAY 1 CONNECTOR AND INHIBITOR SWITCH CONNECTOR.** 1) Disconnect the connector from inhibitor switch. 2) Measure the resistance of harness between starter relay 1 connector and inhibitor switch connector. ***Connector & terminal*** ***(B225) No. 1 — (T7) No. 6:***	Is the resistance less than 1 Ω?	Go to step **28**.	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit in harness between starter relay 1 connector and inhibitor switch connector • Poor contact of coupling connector
28	**CHECK INHIBITOR SWITCH.** 1) Place the select lever in “P” range or “N” range. 2) Measure the resistance between inhibitor switch terminals. ***Terminals*** ***No. 6 — No. 9:***	Is the resistance less than 1 Ω?	Go to step **29**.	Replace the inhibitor switch. <Ref. to CVT(TR690)-92, Inhibitor Switch.>
29	**CHECK HARNESS BETWEEN ECM AND INHIBITOR SWITCH CONNECTOR.** 1) Disconnect the connector from ECM. 2) Measure the resistance of harness between ECM connector and inhibitor switch connector. ***Connector & terminal*** ***(B134) No. 33 — (T7) No. 6:***	Is the resistance less than 1 Ω?	Go to step **30**.	Repair the harness and connector. NOTE: In this case, repair the following item: • Blown out of fuse • Open circuit in harness between ECM connector and inhibitor switch connector • Poor contact of coupling connector

	Step	Check	Yes	No
30	**CHECK NEUTRAL POSITION SWITCH SIGNAL.** 1) Connect all relays and connectors to their proper positions. 2) Read the value of «Neutral Position Switch» using the Subaru Select Monitor. NOTE: For detailed operation procedures, refer to “READ CURRENT DATA FOR ENGINE”. <Ref. to EN(w/o STI)(diag)-37, Subaru Select Monitor.> 3) Turn the ignition to ON. 4) Place the select lever in “P” range or “N” range.	Is «Neutral» displayed?	Check the engine control module (ECM) power supply and ground line. <Ref. to EN(w/o STI)(diag)-78, CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MODULE (ECM), Diagnostics for Engine Starting Failure.>	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit in harness between inhibitor switch connector and starter motor connector • Poor contact of coupling connector

C: CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MODULE (ECM)

CAUTION:
After servicing or replacing faulty parts, perform Clear Memory Mode <Ref. to EN(w/o STI)(diag)-61, OPERATION, Clear Memory Mode.>, and Inspection Mode <Ref. to EN(w/o STI)(diag)-47, PROCEDURE, Inspection Mode.>.
WIRING DIAGRAM:

- Engine Electrical System ENGINE TYPE FA (WITHOUT PUSH BUTTON START) <Ref. to WI-162, ENGINE TYPE FA (WITHOUT PUSH BUTTON START), WIRING DIAGRAM, Engine Electrical System.>
- Engine Electrical System ENGINE TYPE FA (WITH PUSH BUTTON START) <Ref. to WI-180, ENGINE TYPE FA (WITH PUSH BUTTON START), WIRING DIAGRAM, Engine Electrical System.>

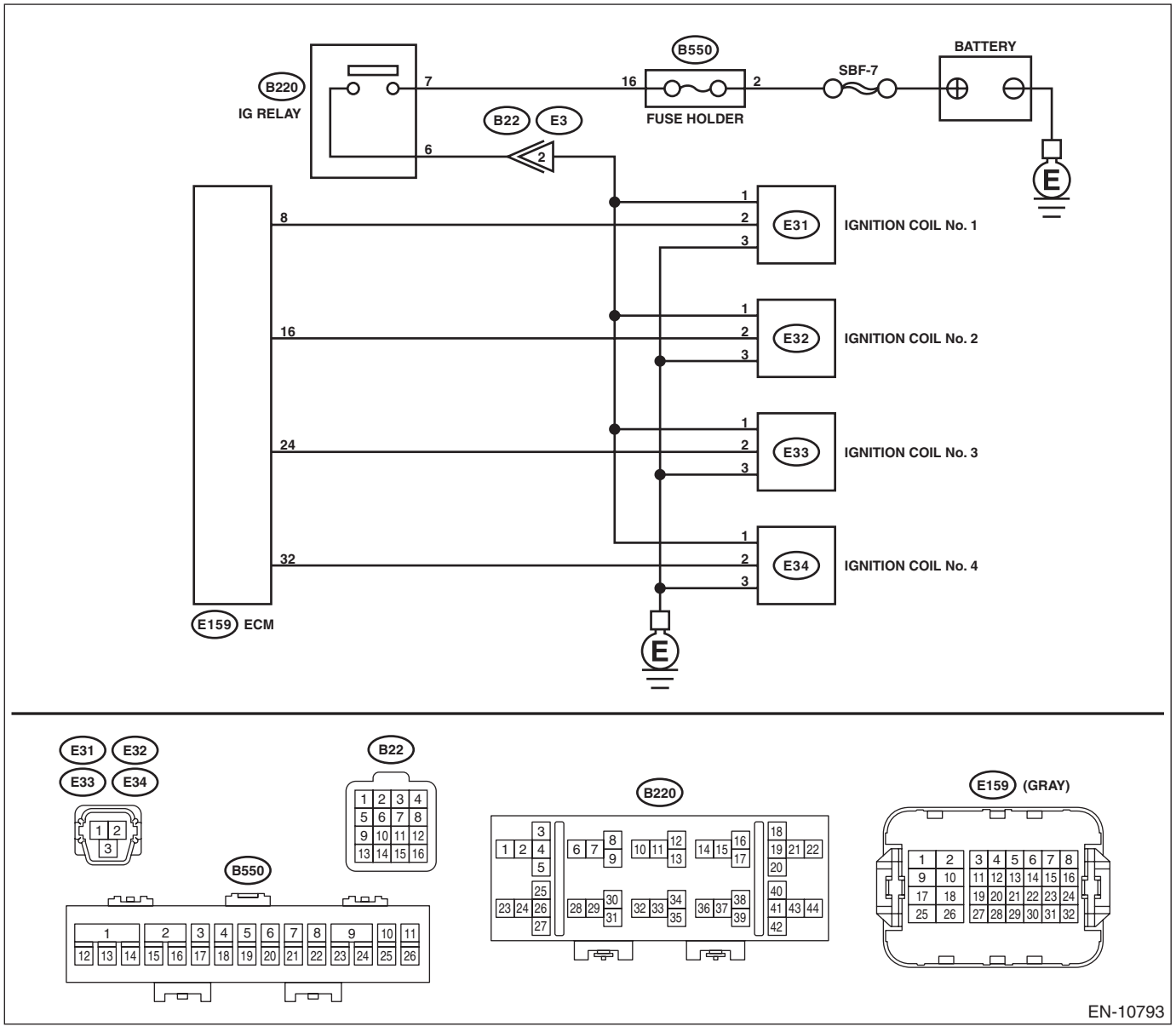


	Step	Check	Yes	No
1	**CHECK MAIN RELAY.** 1) Turn the ignition switch to OFF. 2) Remove the main relay. 3) Connect the battery to main relay terminals No. 12 and No. 13. 4) Measure the resistance between main relay terminals. ***Terminals*** ***No. 10 — No. 11:***	Is the resistance less than 1 Ω?	Go to step **2**.	Replace the main relay. <Ref. to FU(w/o STI)-135, Main Relay.>
2	**CHECK GROUND CIRCUIT FOR ECM.** 1) Disconnect the connector from ECM. 2) Measure the resistance of harness between ECM connector and chassis ground. ***Connector & terminal*** ***(B134) No. 35 — Chassis ground:*** ***(B134) No. 47 — Chassis ground:*** ***(E159) No. 10 — Chassis ground:*** ***(E159) No. 17 — Chassis ground:*** ***(E159) No. 18 — Chassis ground:*** ***(E159) No. 25 — Chassis ground:*** ***(E159) No. 26 — Chassis ground:***	Is the resistance less than 5 Ω?	Go to step **3**.	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between ECM connector and engine ground terminal • Poor contact of coupling connector
3	**CHECK INPUT VOLTAGE OF ECM.** 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM connector and chassis ground. ***Connector & terminal*** ***(B134) No. 23 (+) — Chassis ground (–):*** ***(B134) No. 32 (+) — Chassis ground (–):***	Is the voltage 10 V or more?	Go to step **4**.	Repair the open or ground short circuit of harness of power supply circuit.
4	**CHECK INPUT VOLTAGE OF MAIN RELAY.** Measure the voltage between main relay connector and chassis ground. ***Connector & terminal*** ***(B220) No. 11 (+) — Chassis ground (–):*** ***(B220) No. 12 (+) — Chassis ground (–):***	Is the voltage 10 V or more?	Go to step **5**.	Repair the open or ground short circuit of harness of power supply circuit.
5	**CHECK INPUT VOLTAGE OF ECM.** 1) Turn the ignition switch to OFF. 2) Install the main relay. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM connector and chassis ground. ***Connector & terminal*** ***(B134) No. 38 (+) — Chassis ground (–):***	Is the voltage 10 V or more?	Go to step **6**.	Repair the open circuit of harness between ECM connector and main relay connector.
6	**CHECK INPUT VOLTAGE OF ECM.** 1) Turn the ignition switch to OFF. 2) Connect the connector to ECM. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM connector and chassis ground. ***Connector & terminal*** ***(B134) No. 12 (+) — Chassis ground (–):*** ***(B134) No. 24 (+) — Chassis ground (–):***	Is the voltage 10 V or more?	Check ignition control system. <Ref. to EN(w/o STI)(diag)-80, IGNITION CONTROL SYSTEM, Diagnostics for Engine Starting Failure.>	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit in harness between ECM connector and main relay connector • Poor contact of main relay connector • Poor contact of ECM connector

D: IGNITION CONTROL SYSTEM

CAUTION:
After servicing or replacing faulty parts, perform Clear Memory Mode <Ref. to EN(w/o STI)(diag)-61, OPERATION, Clear Memory Mode.>, and Inspection Mode <Ref. to EN(w/o STI)(diag)-47, PROCEDURE, Inspection Mode.>.
WIRING DIAGRAM:

- Engine Electrical System ENGINE TYPE FA (WITHOUT PUSH BUTTON START) <Ref. to WI-162, ENGINE TYPE FA (WITHOUT PUSH BUTTON START), WIRING DIAGRAM, Engine Electrical System.>
- Engine Electrical System ENGINE TYPE FA (WITH PUSH BUTTON START) <Ref. to WI-180, ENGINE TYPE FA (WITH PUSH BUTTON START), WIRING DIAGRAM, Engine Electrical System.>



Step		Check	Yes	No
1	**CHECK SPARK PLUG CONDITION.** 1) Remove the spark plug. <Ref. to IG(w/o STI)-4, REMOVAL, Spark Plug.> 2) Check the spark plug condition. <Ref. to IG(w/o STI)-8, INSPECTION, Spark Plug.>	Is the spark plug condition normal?	Go to step **2**.	Replace the spark plug. <Ref. to IG(w/o STI)-4, Spark Plug.>

	Step	Check	Yes	No
2	**CHECK IGNITION SYSTEM FOR SPARKS.** 1) Connect the spark plug to ignition coil. 2) Release the fuel pressure. <Ref. to FU(w/o STI)-146, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.> 3) Contact the spark plug thread portion to engine. 4) While opening the throttle valve fully, crank the engine to check that spark occurs at each cylinder.	Does spark occur at each cylinder?	Check fuel pump system. <Ref. to EN(w/o STI)(diag)-82, FUEL PUMP CIRCUIT, Diagnostics for Engine Starting Failure.>	Go to step **3**.
3	**CHECK IGNITION COIL POWER SUPPLY CIRCUIT.** 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ignition coil. 3) Turn the ignition switch to ON. 4) Measure the voltage between ignition coil connector and engine ground. ***Connector & terminal*** ***(E31) No. 1 (+) — Engine ground (–):*** ***(E32) No. 1 (+) — Engine ground (–):*** ***(E33) No. 1 (+) — Engine ground (–):*** ***(E34) No. 1 (+) — Engine ground (–):***	Is the voltage 10 V or more?	Go to step **4**.	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit or short circuit to ground in power supply circuit • Poor contact of coupling connector • Blown out of fuse
4	**CHECK HARNESS OF IGNITION COIL GROUND CIRCUIT.** 1) Turn the ignition switch to OFF. 2) Measure the resistance of harness between ignition coil connector and engine ground. ***Connector & terminal*** ***(E31) No. 3 — Engine ground:*** ***(E32) No. 3 — Engine ground:*** ***(E33) No. 3 — Engine ground:*** ***(E34) No. 3 — Engine ground:***	Is the resistance less than 5 Ω?	Go to step **5**.	Repair the open circuit in harness between ignition coil connector and engine grounding terminal.
5	**CHECK HARNESS BETWEEN ECM AND IGNITION COIL CONNECTOR.** 1) Disconnect the connector from ECM. 2) Measure the resistance of harness between ECM connector and ignition coil connector. ***Connector & terminal*** ***(E159) No. 8 — (E31) No. 2:*** ***(E159) No. 16 — (E32) No. 2:*** ***(E159) No. 24 — (E33) No. 2:*** ***(E159) No. 32 — (E34) No. 2:***	Is the resistance less than 1 Ω?	Go to step **6**.	Repair the open circuit in harness between ECM connector and ignition coil connector.
6	**CHECK HARNESS BETWEEN ECM AND IGNITION COIL CONNECTOR.** Measure the resistance of harness between ECM connector and engine ground. ***Connector & terminal*** ***(E159) No. 8 — Engine ground:*** ***(E159) No. 16 — Engine ground:*** ***(E159) No. 24 — Engine ground:*** ***(E159) No. 32 — Engine ground:***	Is the resistance 1 MΩ or more?	Go to step **7**.	Repair the ground short circuit of harness between ECM connector and ignition coil connector.
7	**CHECK FOR POOR CONTACT.** Check for poor contact of ECM connector.	Is there poor contact of ECM connector?	Repair the poor contact of ECM connector.	Replace the ignition coil. <Ref. to IG(w/o STI)-11, Ignition Coil.>

E: FUEL PUMP CIRCUIT

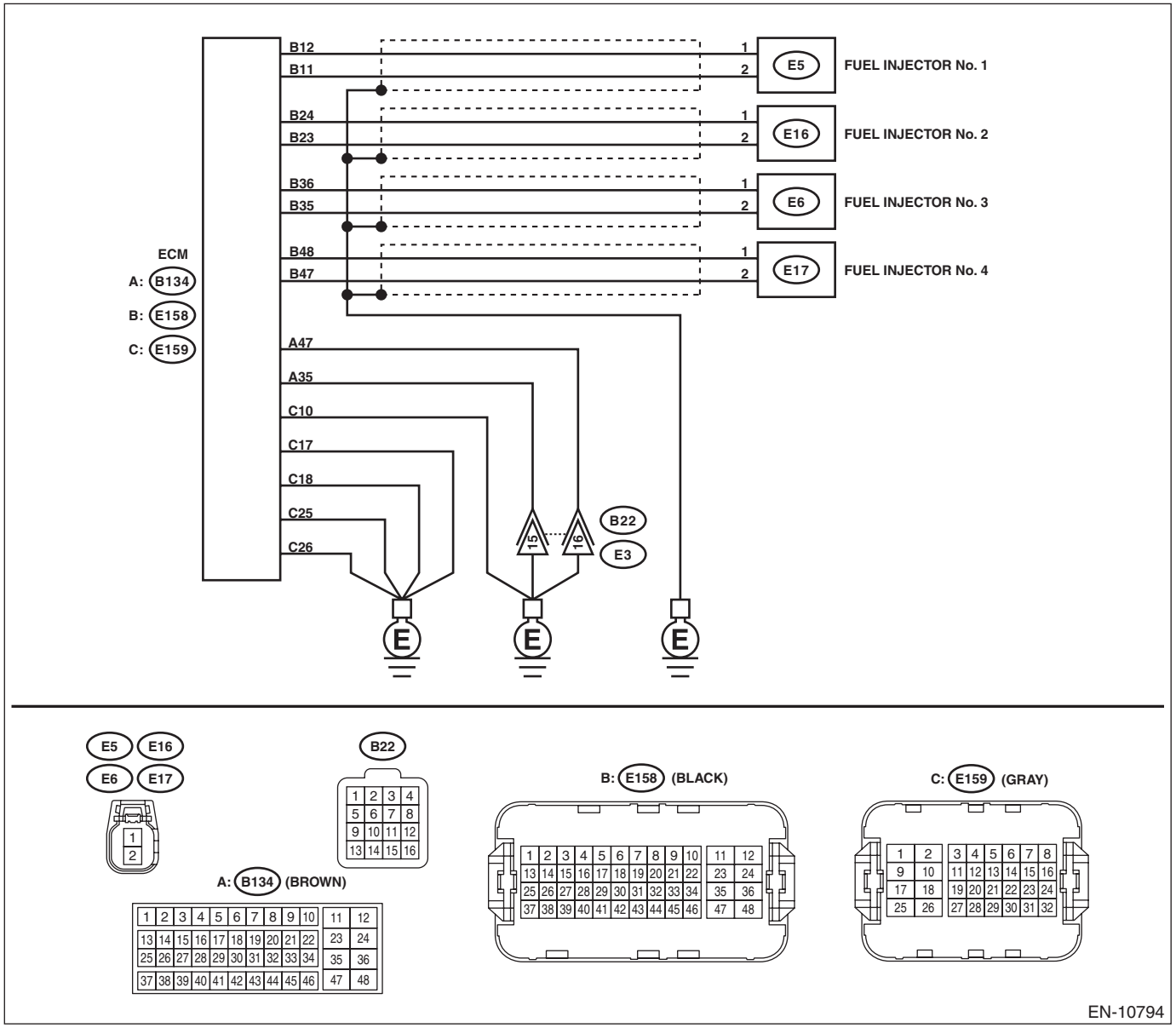
CAUTION:
After servicing or replacing faulty parts, perform Clear Memory Mode <Ref. to EN(w/o STI)(diag)-61, OPERATION, Clear Memory Mode.>, and Inspection Mode <Ref. to EN(w/o STI)(diag)-47, PROCEDURE, Inspection Mode.>.

	Step	Check	Yes	No
1	**CHECK OPERATING SOUND OF FUEL PUMP.** Make sure that the fuel pump operates for two seconds when turning the ignition switch to ON. NOTE: Fuel pump operation can be executed using Subaru Select Monitor. For detailed procedures, refer to "SYSTEM OPERATION CHECK MODE". <Ref. to EN(w/o STI)(diag)-62, System Operation Check Mode.>	Does the fuel pump emit operating sound?	Check the fuel injector circuit. <Ref. to EN(w/o STI)(diag)-83, FUEL INJECTOR CIRCUIT, Diagnostics for Engine Starting Failure.>	Display the DTC. <Ref. to EN(w/o STI)(diag)-46, OPERATION, Read Diagnostic Trouble Code (DTC).>

F: FUEL INJECTOR CIRCUIT

CAUTION:
- **Check or repair only faulty parts.**
- **After servicing or replacing faulty parts, perform Clear Memory Mode <Ref. to EN(w/o STI)(diag)-61, OPERATION, Clear Memory Mode.>, and Inspection Mode <Ref. to EN(w/o STI)(diag)-47, PROCEDURE, Inspection Mode.>.**

WIRING DIAGRAM:
- Engine Electrical System ENGINE TYPE FA (WITHOUT PUSH BUTTON START) <Ref. to WI-162, ENGINE TYPE FA (WITHOUT PUSH BUTTON START), WIRING DIAGRAM, Engine Electrical System.>
- Engine Electrical System ENGINE TYPE FA (WITH PUSH BUTTON START) <Ref. to WI-180, ENGINE TYPE FA (WITH PUSH BUTTON START), WIRING DIAGRAM, Engine Electrical System.>



Step		Check	Yes	No
1	**CHECK OPERATION OF EACH FUEL INJECTOR.** While cranking the engine, check each fuel injector emits operating sound. Use a sound scope or listen by attaching a screwdriver to the injector for this check.	Does the fuel injector emit operating sound?	Check the fuel pressure. <Ref. to ME(w/o STI)-31, INSPECTION, Fuel Pressure.>	Go to step **2**.

	Step	Check	Yes	No
2	**CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.** 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance of harness between ECM connector and fuel injector connector. ***Connector & terminal*** ***#1 (E158) No. 12 — (E5) No. 1:*** ***#1 (E158) No. 11 — (E5) No. 2:*** ***#2 (E158) No. 24 — (E16) No. 1:*** ***#2 (E158) No. 23 — (E16) No. 2:*** ***#3 (E158) No. 36 — (E6) No. 1:*** ***#3 (E158) No. 35 — (E6) No. 2:*** ***#4 (E158) No. 48 — (E17) No. 1:*** ***#4 (E158) No. 47 — (E17) No. 2:***	Is the resistance less than 1 Ω?	Go to step **3**.	Repair the open circuit of the harness between the ECM connector and fuel injector connector.
3	**CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.** Measure the resistance of harness between ECM connector and chassis ground. ***Connector & terminal*** ***#1 (E158) No. 12 — Chassis ground:*** ***#1 (E158) No. 11 — Chassis ground:*** ***#2 (E158) No. 24 — Chassis ground:*** ***#2 (E158) No. 23 — Chassis ground:*** ***#3 (E158) No. 36 — Chassis ground:*** ***#3 (E158) No. 35 — Chassis ground:*** ***#4 (E158) No. 48 — Chassis ground:*** ***#4 (E158) No. 47 — Chassis ground:***	Is the resistance 1 MΩ or more?	Go to step **4**.	Repair the short circuit to ground in harness between ECM connector and fuel injector connector.
4	**CHECK EACH FUEL INJECTOR.** Check each fuel injector. <Ref. to FU(w/o STI)-70, INSPECTION, Fuel Injector.>	Are fuel injectors OK?	Go to step **5**.	Replace the faulty fuel injector. <Ref. to FU(w/o STI)-51, Fuel Injector.>
5	**CHECK FOR POOR CONTACT.** Check for poor contact of ECM connector.	Is there poor contact of ECM connector?	Repair the poor contact of ECM connector.	Inspection using “General Diagnostic Table”. <Ref. to EN(w/o STI)(diag)-493, INSPECTION, General Diagnostic Table.>