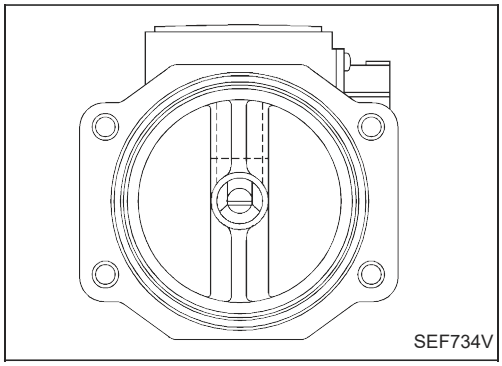

SEF734V

Mass Air Flow Sensor (MAFS)

COMPONENT DESCRIPTION

The mass air flow sensor is placed in the stream of intake air. It measures the intake air flow rate by measuring a part of the entire intake air flow. It consists of a hot wire that is supplied with electric current from the ECM. The temperature of the hot wire is controlled by the ECM a certain amount. The heat generated by the hot wire is reduced as the intake air flows around it. The more air, the greater the heat loss.

Therefore, the ECM must supply more electric current to the hot wire as air flow increases. This maintains the temperature of the hot wire. The ECM detects the air flow by means of this current change.

CONSULT REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
MAS AIR/FL SE	● Engine: After warming up ● Air conditioner switch: “OFF” ● Shift lever: “N” ● No-load	Idle	1.6 - 2.0V

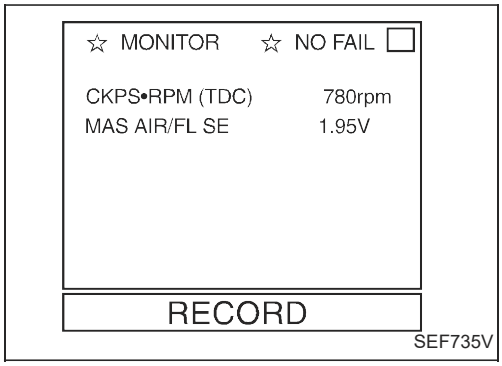
ECM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values, and are measured between each terminal and ㊸ (ECCS ground) with a voltmeter.

TER-MINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC voltage)
35	R	Mass air flow sensor	Engine is running. (Warm-up condition) └ Idle speed	1.6 - 2.0V
50	B	Sensors’ ground	Engine is running. (Warm-up condition) └ Idle speed	Approximately 0V

ON BOARD DIAGNOSIS LOGIC

Diagnostic Trouble Code No.	Malfunction is detected when ...	Check Items (Possible Cause)
12	● An excessively high or low voltage from the sensor is sent to ECM.	● Harness or connectors (The sensor circuit is open or shorted.) ● Mass air flow sensor



Mass Air Flow Sensor (MAFS) (Cont’d)

DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCEDURE

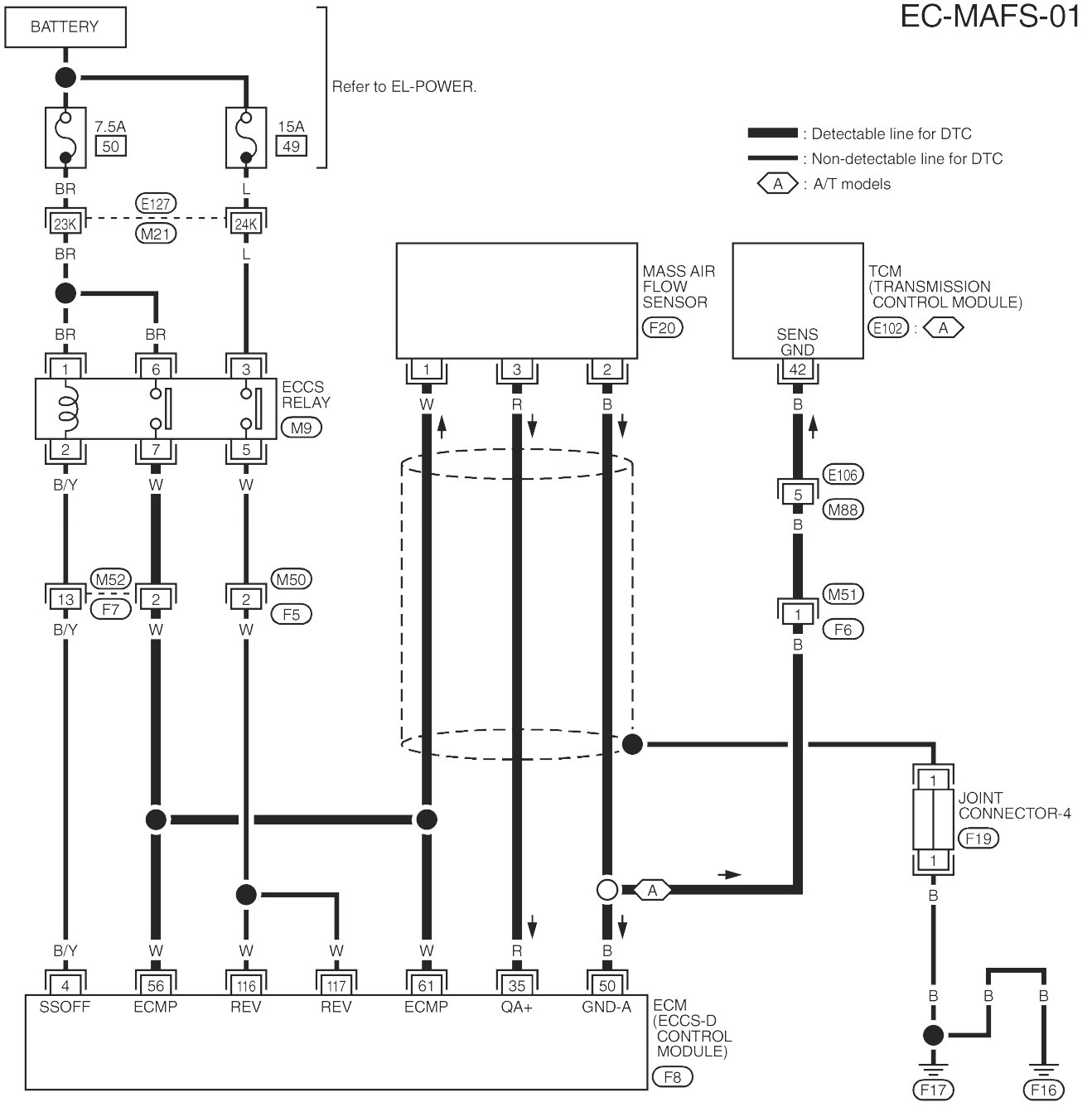
1) Turn ignition switch “ON”, and wait at least 6 seconds.
2) Select “DATA MONITOR” mode with CONSULT.
3) Start engine and wait at least 3 seconds.

OR

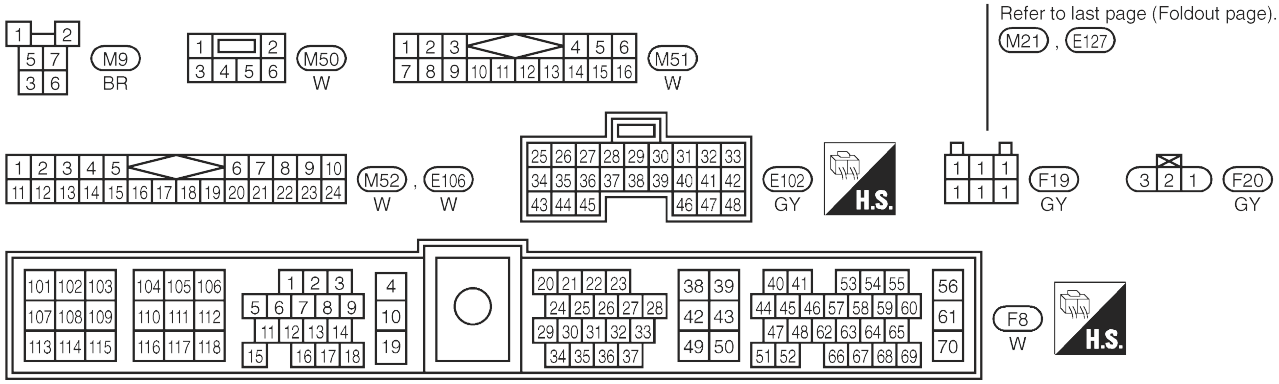
1) Turn ignition switch “ON”, and wait at least 6 seconds.
2) Start engine and wait at least 3 seconds.
3) Turn ignition switch “OFF”, wait at least 5 seconds and then turn “ON”.
4) Perform “Diagnostic Test Mode II (Self-diagnostic results)” with ECM.

Mass Air Flow Sensor (MAFS) (Cont'd)

EC-MAFS-01



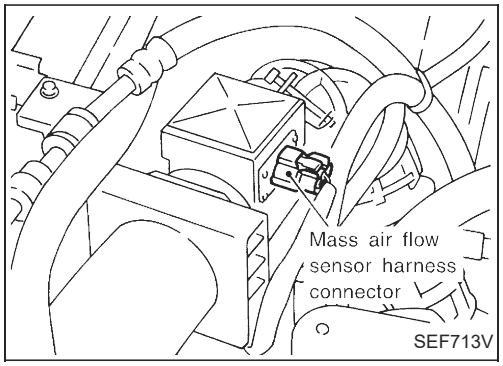
Refer to last page (Foldout page).
M21 , E127



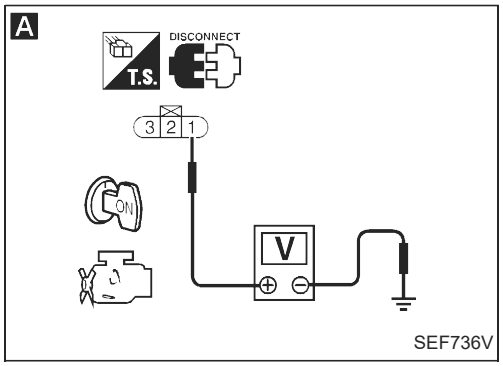
TEC424

Mass Air Flow Sensor (MAFS) (Cont'd)

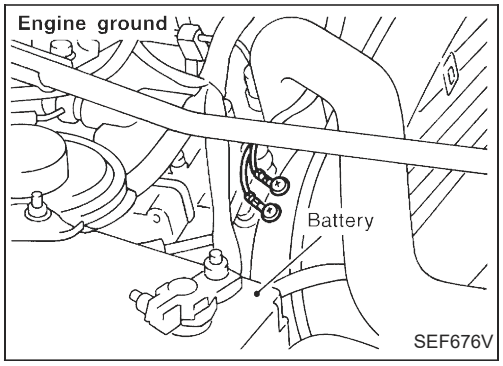
DIAGNOSTIC PROCEDURE



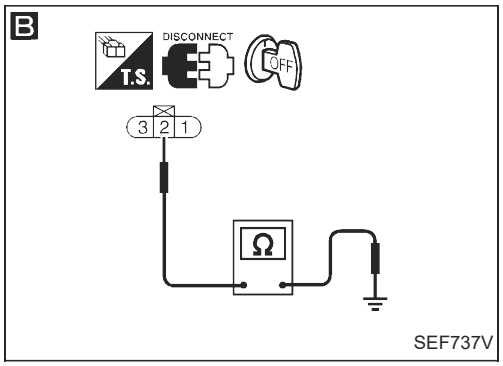
SEF713V



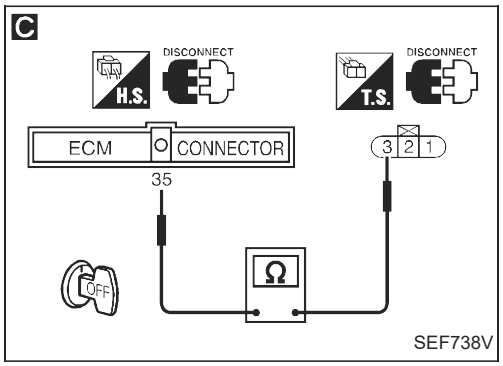
SEF736V



SEF676V



SEF737V



SEF738V

INSPECTION START

A

CHECK POWER SUPPLY.
1. Turn ignition switch "OFF".
2. Disconnect mass air flow sensor harness connector.
3. Turn ignition switch "ON".
4. Check voltage between terminal ① and ground with CONSULT or tester.
   Voltage: Battery voltage

NG → Check the following.
- Harness connectors (M52), (F7)
- Harness for open or short between mass air flow sensor and ECM
- Harness for open or short between mass air flow sensor and ECCS relay

If NG, repair harness or connector.

OK ↓

B

CHECK GROUND CIRCUIT.
1. Turn ignition switch "OFF".
2. Loosen and retighten engine ground screws.
3. Check harness continuity between terminal ② and engine ground.
   Continuity should exist.
   If OK, check harness for short to ground and short to power.

NG → Check the following.
- Harness connectors (E106), (M88)
- Harness connectors (M51), (F6)
- Harness for open or short between mass air flow sensor and ECM
- Harness for open or short between mass air flow sensor and TCM

If NG, repair open circuit or short to ground or short to power in harness or connectors.

OK ↓

C

CHECK INPUT SIGNAL CIRCUIT.
1. Disconnect ECM harness connector.
2. Check harness continuity between terminal ③ and ECM terminal (35).
   Continuity should exist.
   If OK, check harness for short to ground and short to power.

NG → Repair open circuit or short to ground or short to power in harness or connectors.

OK ↓

CHECK COMPONENT
(Mass air flow sensor).
Refer to "COMPONENT INSPECTION" on next page.

NG → Replace mass air flow sensor.

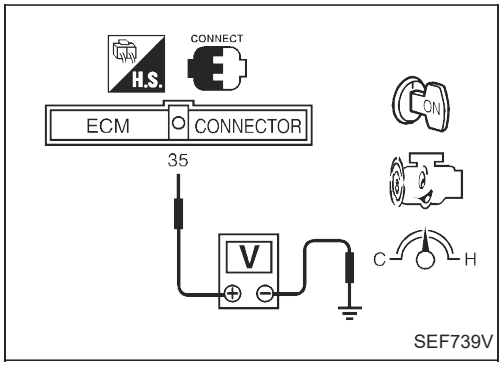
OK ↓

Disconnect and reconnect harness connectors in the circuits. Then retest.

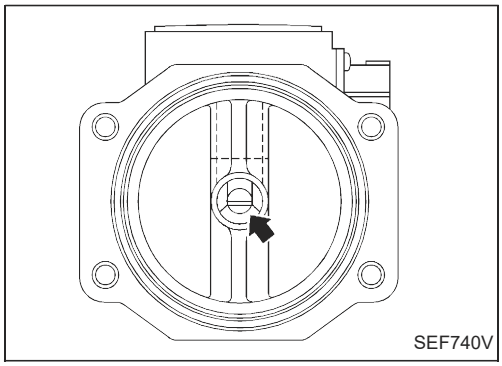
Trouble is not fixed. ↓

Check ECM pin terminals for damage and check the connection of ECM harness connector. Reconnect ECM harness connector and retest.

INSPECTION END



SEF739V


SEF740V

Mass Air Flow Sensor (MAFS) (Cont’d)

COMPONENT INSPECTION

Mass air flow sensor

1. Start engine and warm it up to normal operating temperature.
2. Check voltage between ECM terminal ㉟ and ground under the following condition.

Conditions	Voltage V
Ignition switch “ON” (Engine stopped.)	Less than 1.0
Idle (Engine is warmed-up sufficiently.)	1.0 - 1.7
2,500 rpm	Approximately 2.1
Idle to about 4,000 rpm*	1.0 - 1.7 to Approx. 4.0

*: Check for linear voltage rise in response to increase to about 4,000 rpm in engine speed.

3. If NG, remove mass air flow sensor from air duct. Check hot wire for damage and dust.