

G - TESTS W/CODES

1990 Nissan 240SX

1990 ENGINE PERFORMANCE
Self-Diagnostics

Nissan 240SX and Axxess

* PLEASE READ THIS FIRST *

NOTE: This article has been revised according to Technical Service Bulletin No. TS89-112, dated August 3, 1989.

INTRODUCTION

If no faults were found while performing F - BASIC TESTING proceed with self-diagnostics. If no fault codes or only pass codes are present after entering self-diagnostics, proceed to H - TESTS W/O CODES article for diagnosis by symptom (i.e. ROUGH IDLE, NO START, etc.).

SELF-DIAGNOSTIC SYSTEM DESCRIPTION

The self-diagnostic system is used for diagnosing malfunctions of Electronic Concentrated Control System (ECCS) sensors and actuators. The Electronic Control Unit (ECU) has a number of available diagnostic modes within the computer.

Both models have 5 diagnostic modes. Before selecting any mode of self-diagnosis, always perform F - BASIC TESTING first. This will eliminate wasted diagnostic time and invalid diagnostic results.

NOTE: When performing F - BASIC TESTING, be careful not to erase any diagnostic information stored in the ECU memory.

HARD FAILURES

Hard failures cause CHECK ENGINE light (if equipped) to illuminate and remain on until the malfunction is repaired. If light comes on and remains on (light may flash) during vehicle operation, determine cause of malfunction using diagnostic (code) charts. If a sensor fails, ECU will use a substitute value in its calculations to continue engine operation. In this condition, (fail-safe mode) the vehicle runs but driveability will not be optimum and engine speed is restricted (2000-3000 RPM depending on model).

INTERMITTENT FAILURES

Intermittent failures may cause CHECK ENGINE light (if equipped) to flicker or illuminate and go out after the intermittent fault goes away. The corresponding trouble code, however, will be retained in ECU memory. If related fault does not reoccur within 50 ignition switch operations, related trouble code will be erased from ECU memory. Intermittent failures may be caused by a faulty sensor, connector or wiring problems. See INTERMITTENTS in appropriate H - TESTS W/O CODES article.

NOTE: Follow diagnostic routine when testing ECCS. See DIAGNOSTIC ROUTINE TABLE for correct order of procedure.

DIAGNOSTIC ROUTINE TABLE

Procedure	Order
Basic Diagnostic Procedures.....	1st
Entering Diagnostics.....	2nd
Retrieving Trouble Codes.....	3rd
Symptoms (1).....	4th
Intermittents (1).....	5th

(1) - See H - TESTS W/O CODES article.

CHECK ENGINE LIGHT

California models are equipped with a CHECK ENGINE light. As a bulb check, light will illuminate when the ignition is on and engine is not running. CHECK ENGINE light will also illuminate when an ECCS fault has been detected. Not all trouble codes activate CHECK ENGINE light.

DIAGNOSTIC MODES

The self-diagnostic system can detect ECCS malfunctions and store related trouble code(s). Trouble codes, including intermittent codes, are stored in ECU memory and are available for interpretation unless codes have been cleared.

The 2 self-diagnostic systems used are based around single or dual Light Emitting Diodes (LEDs), located on ECU. For system application, see SELF-DIAGNOSTIC SYSTEM table. For ECU locations, see ECU LOCATIONS table in this article.

SELF-DIAGNOSTIC SYSTEM TABLE

Application	Check Engine Light	LED Colors (No.)
240SX & Axxess	Calif.	Red & Green (2)

DUAL LED SYSTEM (5 MODES)

Self-diagnostic system can be operated in one of 5 modes. Modes are manually changed using screwdriver through access port on ECU. With screwdriver turned fully clockwise, inspection lights will begin to flash. Count the number of flashes. First flash is mode I, second flash is mode II, etc. When desired mode has been indicated, turn screwdriver fully counterclockwise. In different modes, Red and Green LED's perform different functions.

MODE I (MALFUNCTION WARNING)

This is the normal vehicle operating mode. Green LED will indicate loop status. If LED is not blinking, vehicle is in open loop or there is a fault with the oxygen sensor or sensor circuit. If LED is blinking, vehicle is in closed loop. If a malfunction occurs in Mode I, Red LED and check engine light (if equipped) will illuminate, indicating an ECCS malfunction has occurred.

MODE II (EXHAUST GAS MONITOR)

In Mode II, both Red and Green LED's are used to monitor air/fuel mixture feedback control. Green LED will function the same as

in Mode I. In open loop, Red LED will remain on or off along with Green LED so vehicle must be in closed loop in order for Mode II results to be valid. In closed loop, Red LED will indicate if system is running rich (light off), lean (light on) or if at the ideal air/fuel ratio (blinking synchronized with Green LED).

MODE III (SELF-DIAGNOSTICS)

When Mode III is accessed, codes stored in ECU memory will be flashed by the Green and Red LED's on the side of the ECU. Red light will flash the 10's column digit, while Green LED will flash the 1's column digit. For example: 3 flashes of the Red LED, followed by 5 flashes of the Green LED would indicate a Code 35.

MODE IV (SWITCH CHECK)

This mode is used for checking ECCS switch status. When the idle switch, starter switch or vehicle speed sensor are activated, the Red LED will come on and go off as the status changes.

MODE V (TEST MODE)

Mode V represents a real-time diagnostic test of the crank angle sensor, ignition signal, airflow output signal and fuel pump. This mode is accessed for an in-bay running test of the vehicle. The Red & Green LEDs must be monitored carefully during this test, with special attention paid to the number of flashes before each pause.

The malfunction code will be displayed only once and will not be stored in memory. If Red LED blinks on and off evenly, this indicates a fault in the crank angle sensor. If the Red LED flashes twice before a pause, this indicates a fault in the airflow meter. If the Red LED blinks 3 times before a pause, this indicates a fault in the fuel pump circuit. If the Red LED blinks 4 times before a pause, this indicates a fault in the ignition signal.

ENTERING SELF-DIAGNOSTICS

NOTE: When engine is running, it is not possible to switch modes. When ignition switch is turned to OFF position, ECU will switch back to Mode 1.

DUAL LED SYSTEM (5 MODES)

1) Turn ignition switch to ON position. Use a screwdriver to turn ECU diagnostic mode selector fully clockwise.

2) Wait for inspection lights to begin flashing. At this time, inspection lights will flash the mode options (i.e. 2 flashes for Mode II, etc.). As soon as inspection light flashes the desired mode number (3 flashes for Mode III), immediately turn mode selector off.

3) If the mode selector is kept in the ON position, the mode selections will continuously cycle (Mode I to Mode II up to Mode V, then cycles to Mode I, etc.) and the process will continue. This will not erase the memory.

RETRIEVING CODES

DUAL LED SYSTEM (5 MODES)

Trouble codes are read using the Red and Green LED inspection lights on the side of the ECU. After selecting Mode III, trouble codes

corresponding to that mode will start flashing. Trouble codes are indicated by the number of flashes from the ECU Red and Green LED inspection lights. Count the number of flashes. The Red LED indicates the number of tens while the Green LED indicates the number of ones. For example, 3 flashes of the Red LED followed by 2 flashes of the Green LED would indicate code 32.

TROUBLE CODE IDENTIFICATION CHART TABLE

TROUBLE CODE IDENTIFICATION CHART

Code (1)	System Affected	Probable Cause
11	Crank Angle Sensor	Loss of signal
12	Mass Airflow Sensor	MAF signal high or low
13	Coolant Temp. Sensor	Open/shorted circuit
14	Vehicle Speed Sensor (VSS)	No VSS signal
21	No Ign. Ref. Pulse	Loss of primary signal
31	ECU	Signals out of range
32	EGR Sensor (Calif.)	No EGR action
33	O2 Sensor	Open circuit or high O2 signal
35	EGR Temp. Sensor (Calif)	Open/shorted circuit
41	Air Temp. Sensor	Open/shorted circuit
43	Throttle Sensor	Open/shorted circuit
45	Injector Leak (Calif.)	Leak at injector

(1) - Not all trouble codes will activate CHECK ENGINE light or are available on all models.

CLEARING CODES

NOTE: Ensure all diagnostic codes are extracted from the ECU memory before disconnecting battery or switching from Mode III into Mode IV.

MEMORY ERASE

Stored memory will be erased if battery is disconnected or Mode IV is selected after Mode III has been accessed. However, if mode selector switch is turned fully clockwise, diagnostic modes will continue to cycle, from Mode I to Mode V, and will keep cycling in the same order, until a certain mode is selected. This does not erase the stored memory.

ECU LOCATIONS TABLE

ECU LOCATIONS

Application	Location
240SX	Under Right Side Of Dash
Axxess	Under Dash, Behind Center Console

SUMMARY

If no hard fault codes (or only pass codes) are present, driveability symptoms exist or intermittent codes exist, proceed to H

- TESTS W/O CODES article for diagnosis by symptom (i.e. ROUGH IDLE, NO START, etc.) or intermittent diagnostic procedures.

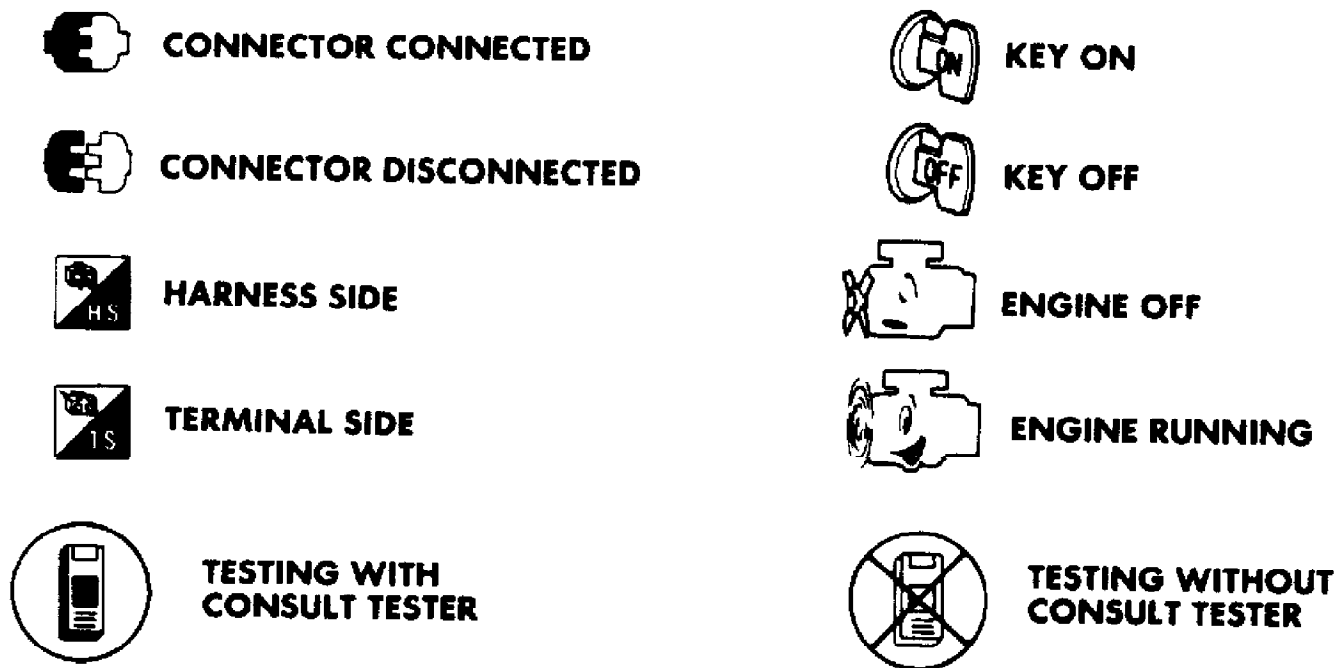


Fig. 1: Identifying Trouble Code Charts Symbols
 Courtesy of Nissan Motor Co., U.S.A.

CODE CHARTS

NOTE: When code chart step indicates CHECK COMPONENT, see indicated component in I - SYSTEM/COMP TESTS article.

FINAL STEPS FOR ALL CODE CHARTS

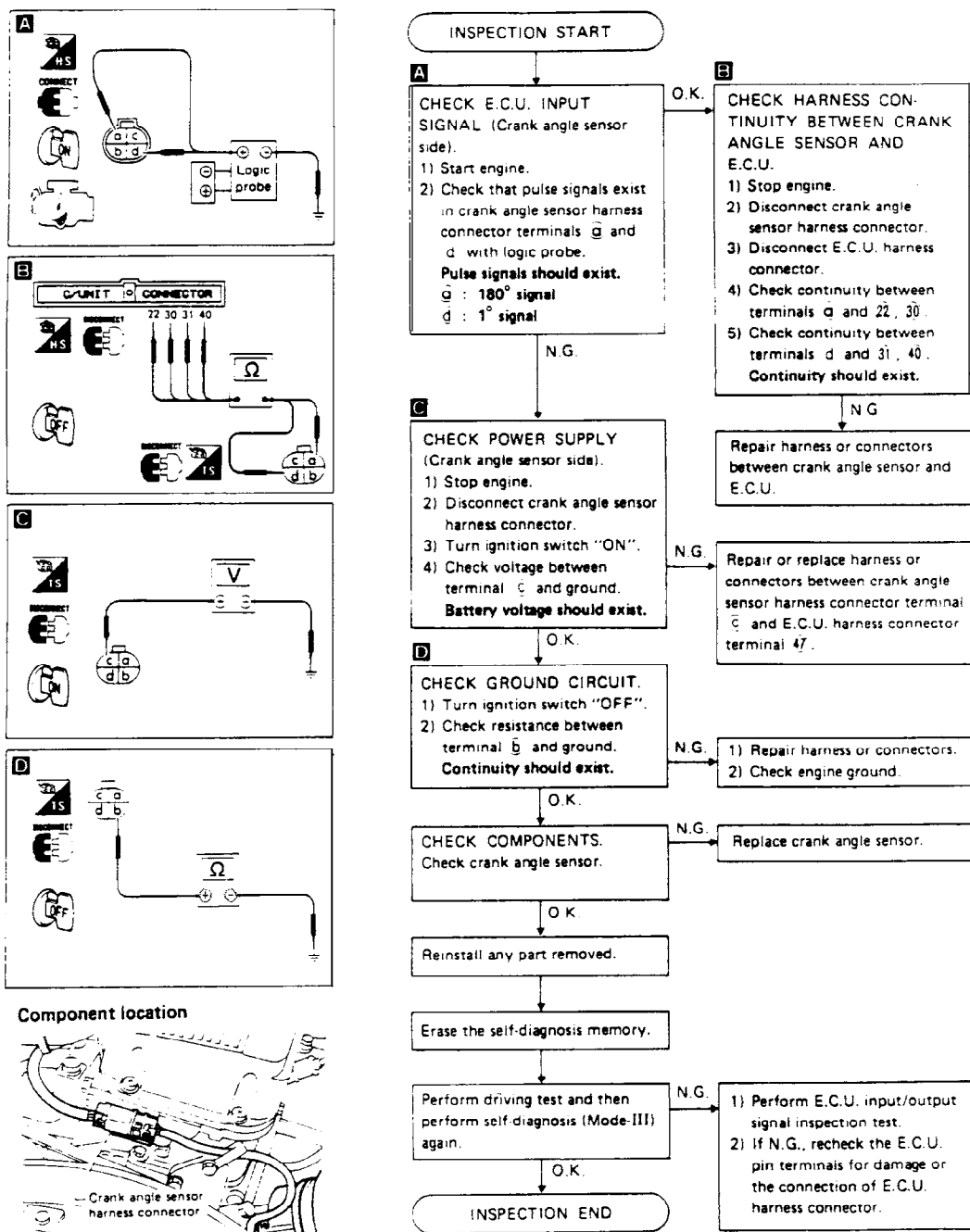
Unless otherwise instructed in code chart, perform the following steps after repair:

- * Reinstall any part removed.
- * Erase the self-diagnostic memory.
- * Ensure Code 55 (no malfunction) is displayed in self-diagnostic mode.
- * Test drive vehicle.
- * Perform self-diagnosis.

If code resets, check for damage to ECU pin terminals and connector harness.

CODE 11: CRANK ANGLE SENSOR

CODE 11 CRANK ANGLE SENSOR AXXESS & 240SX

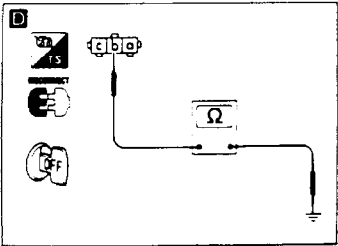
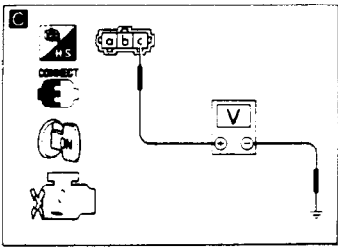
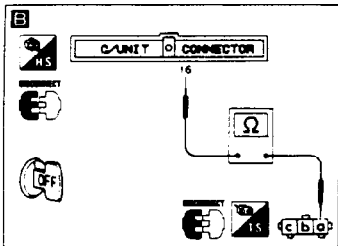
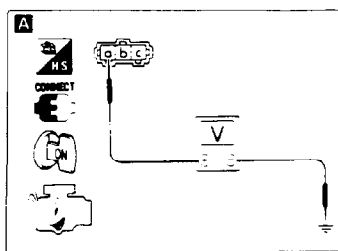


93A51466

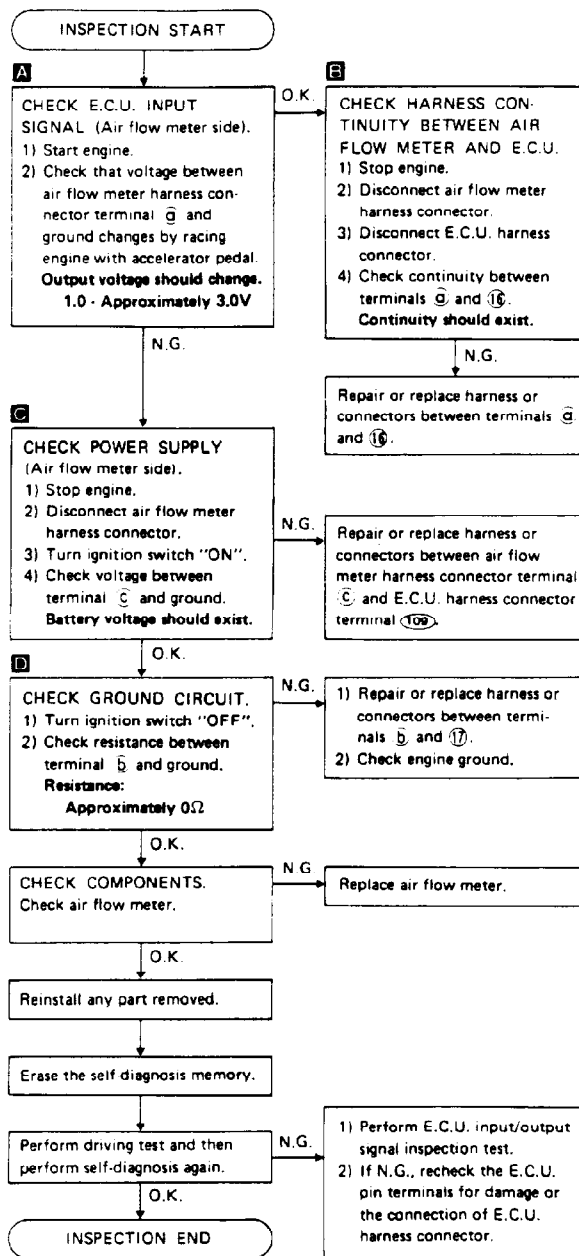
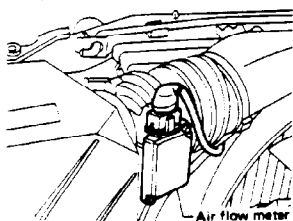
Fig. 2: Code 11: Crank Angle Sensor Test
Courtesy of Nissan Motor Co., U.S.A.

CODE 12: MASS AIRFLOW SENSOR

CODE 12 MASS AIRFLOW SENSOR AXSS & 240SX



Component location

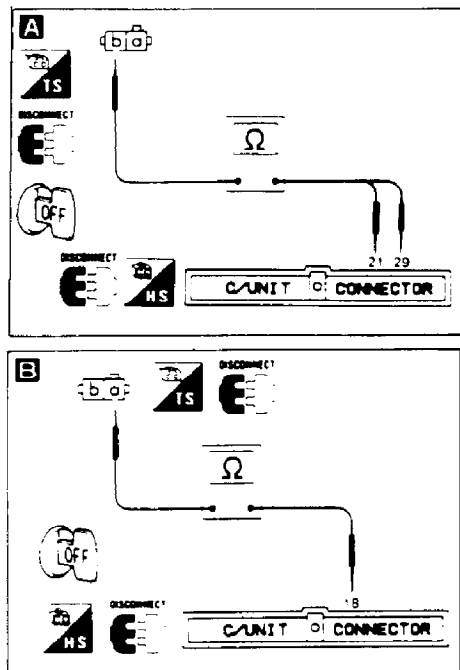


93B51467

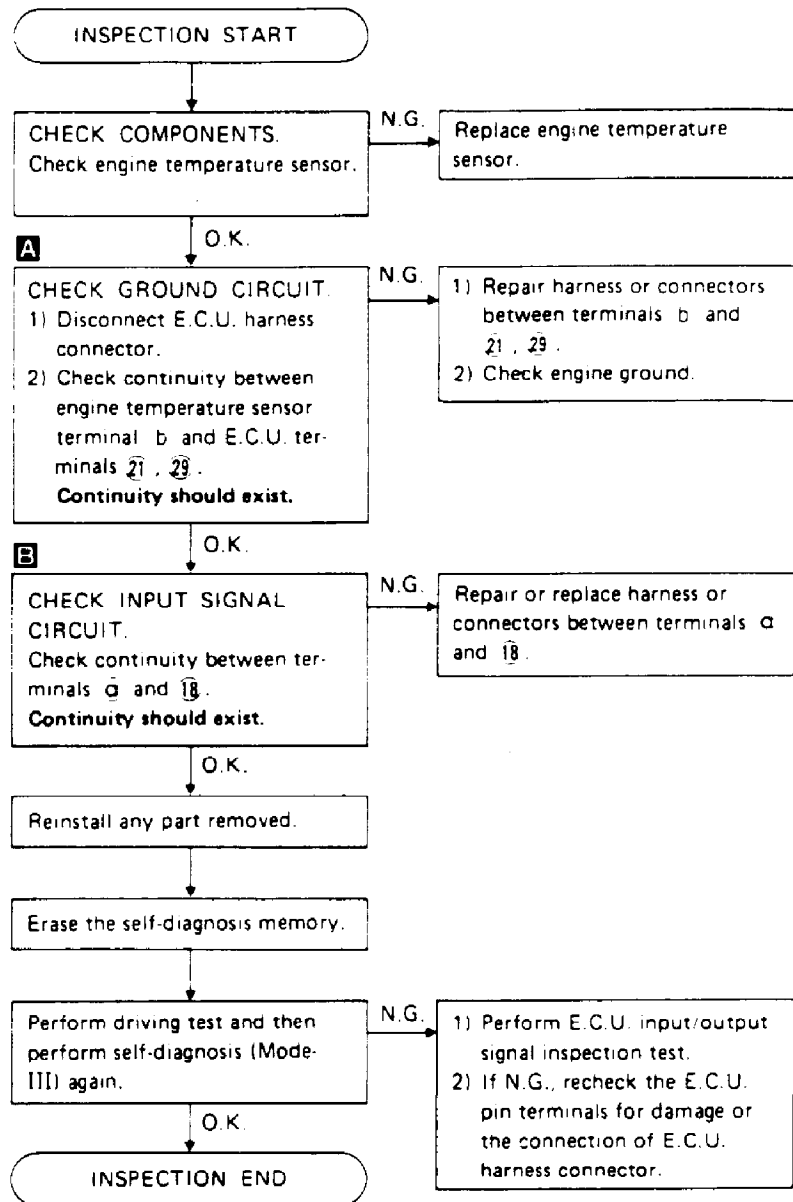
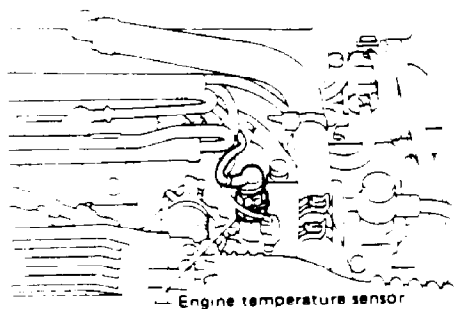
Fig. 3: Code 12: Mass Airflow Sensor Test
Courtesy of Nissan Motor Co., U.S.A.

CODE 13: ENGINE COOLANT TEMPERATURE SENSOR

CODE 13 ENGINE (COOLANT) TEMPERATURE SENSOR AXXESS & 240SX



Component location

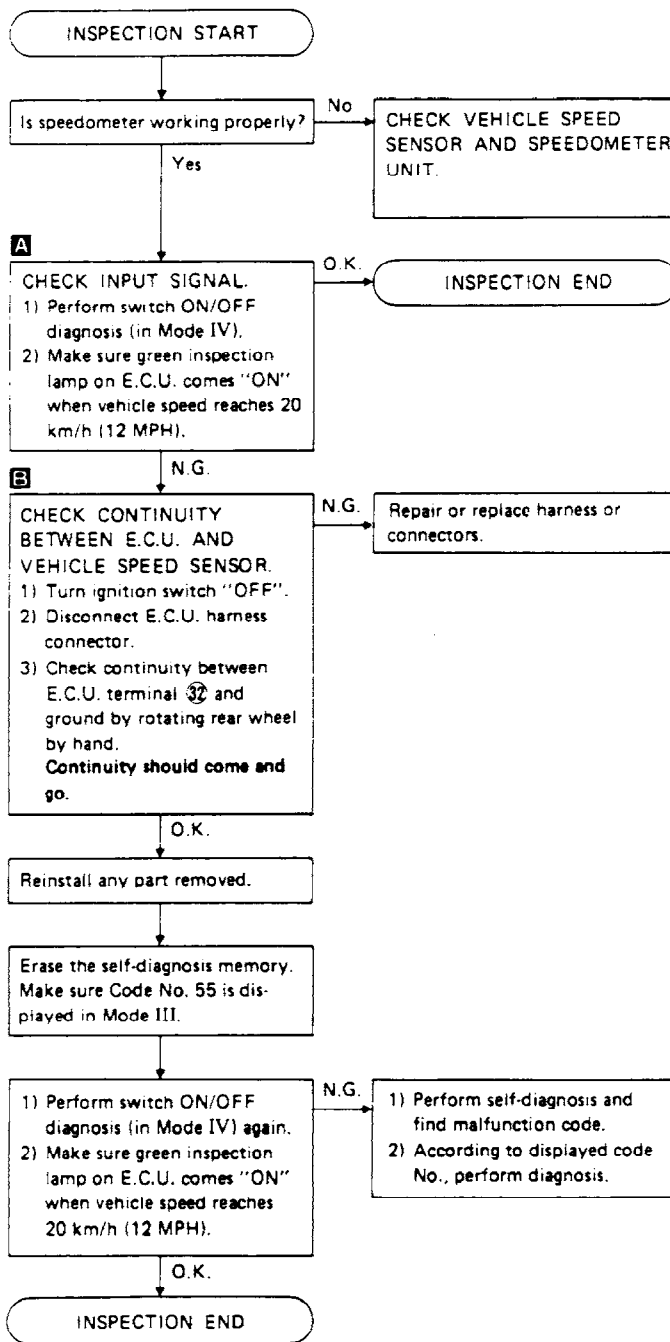
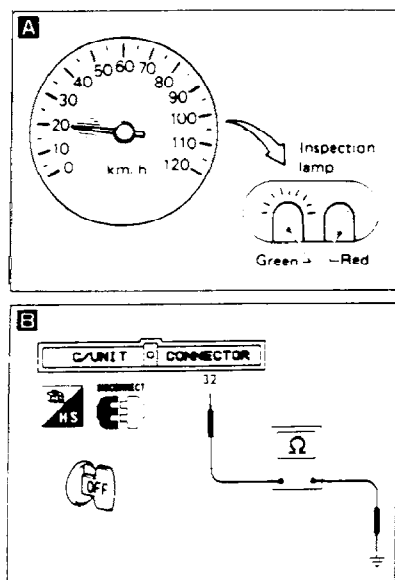


93C51468

Fig. 4: Code 13: Engine Coolant Temperature Sensor Test
Courtesy of Nissan Motor Co., U.S.A.

CODE 14: VEHICLE SPEED SENSOR

CODE 14 VEHICLE SPEED SENSOR AXXESS & 240SX



93D51469

Fig. 5: Code 14: Vehicle Speed Sensor Test
Courtesy of Nissan Motor Co., U.S.A.

CODE 21: NO IGNITION REFERENCE

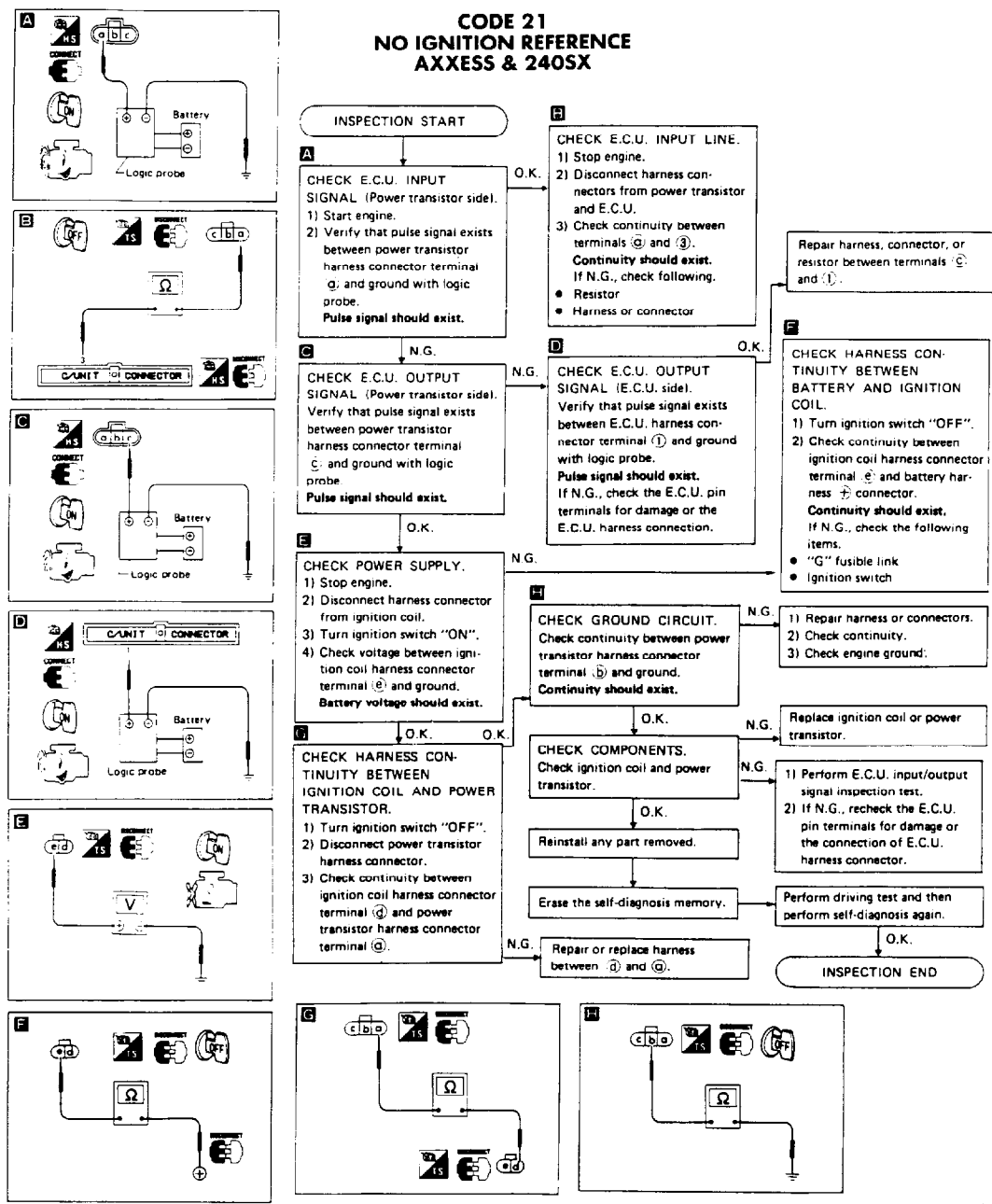


Fig. 6: Code 21: No Ignition Reference Test
Courtesy of Nissan Motor Co., U.S.A.

93G51470

CODE 31: ENGINE CONTROL UNIT (ECU)

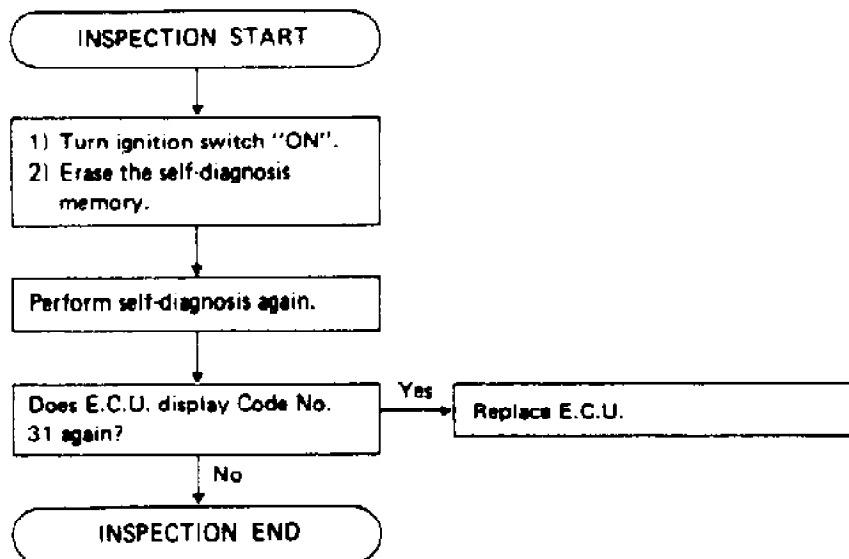
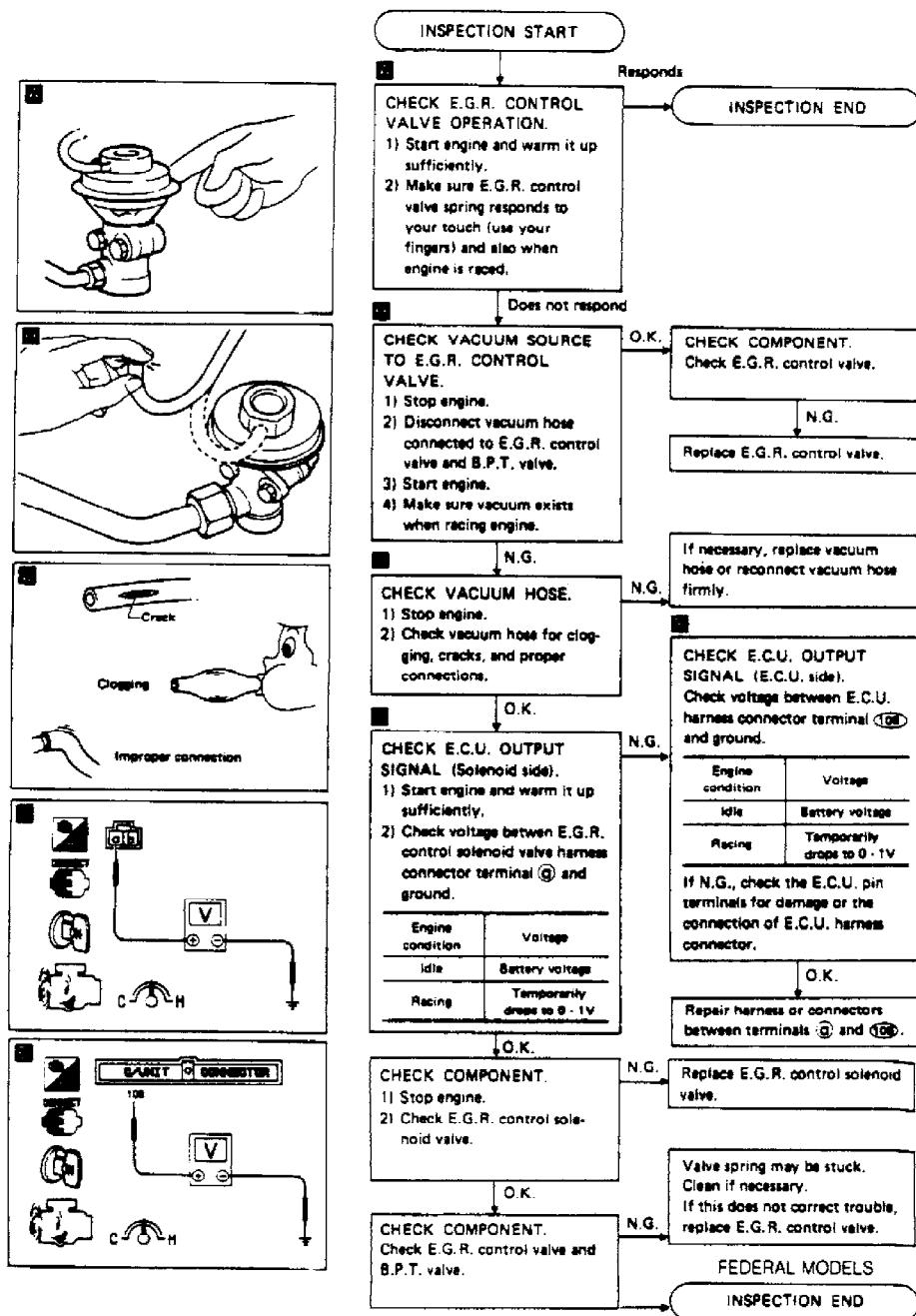


Fig. 7: Code 31: Engine Control Unit (ECU) Test
Courtesy of Nissan Motor Co., U.S.A.

CODE 32: EGR SENSOR (CALIF)

**CODE 32
EGR SENSOR
240SX**



CALIFORNIA VEHICLES CONTINUED ON NEXT PAGE

Fig. 8: Code 32: EGR Sensor 240SX (Calif) (1 of 2)
Courtesy of Nissan Motor Co., U.S.A.

CODE 32 EGR SENSOR 240SX (Cont.)

Test condition

Drive vehicle under the following conditions with a suitable shift position.

- Engine speed:
3,100±300 rpm (A/T)
3,000±400 rpm (M/T)
- Intake manifold vacuum:
-42.7±8.0 kPa
(-320±60 mmHg, -12.50±2.38 inHg)

Driving mode

A : Test condition
B : 16 seconds or more

1 Start engine and warm it up sufficiently.
2 Turn off ignition switch and keep it off until green and red inspection lamps go off.
3 Start engine and make sure that air conditioner switch and rear defogger are turned "OFF" during driving test.
4 Shift to suitable gear position and drive in "Test condition" for at least 16 seconds.
5 Decrease engine revolution to less than 2,000 rpm.
6 Repeat steps 4 through 5 at least 1 time.

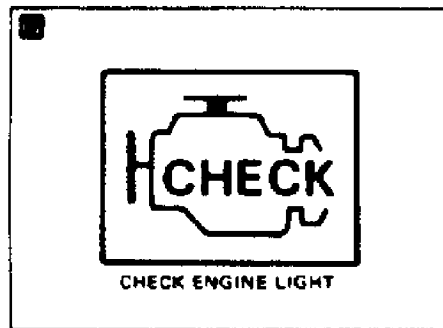
CONTINUED TESTING (CALIFORNIA MODELS ONLY)

Check resistance of exhaust gas temperature sensor.

Reinstall any part removed.

Erase the self-diagnosis memory. Make sure Code No. 55 is displayed in Mode III.

Perform driving test under the following conditions.
1) Warm up engine sufficiently.
2) Use test driving modes indicated in figure 9.

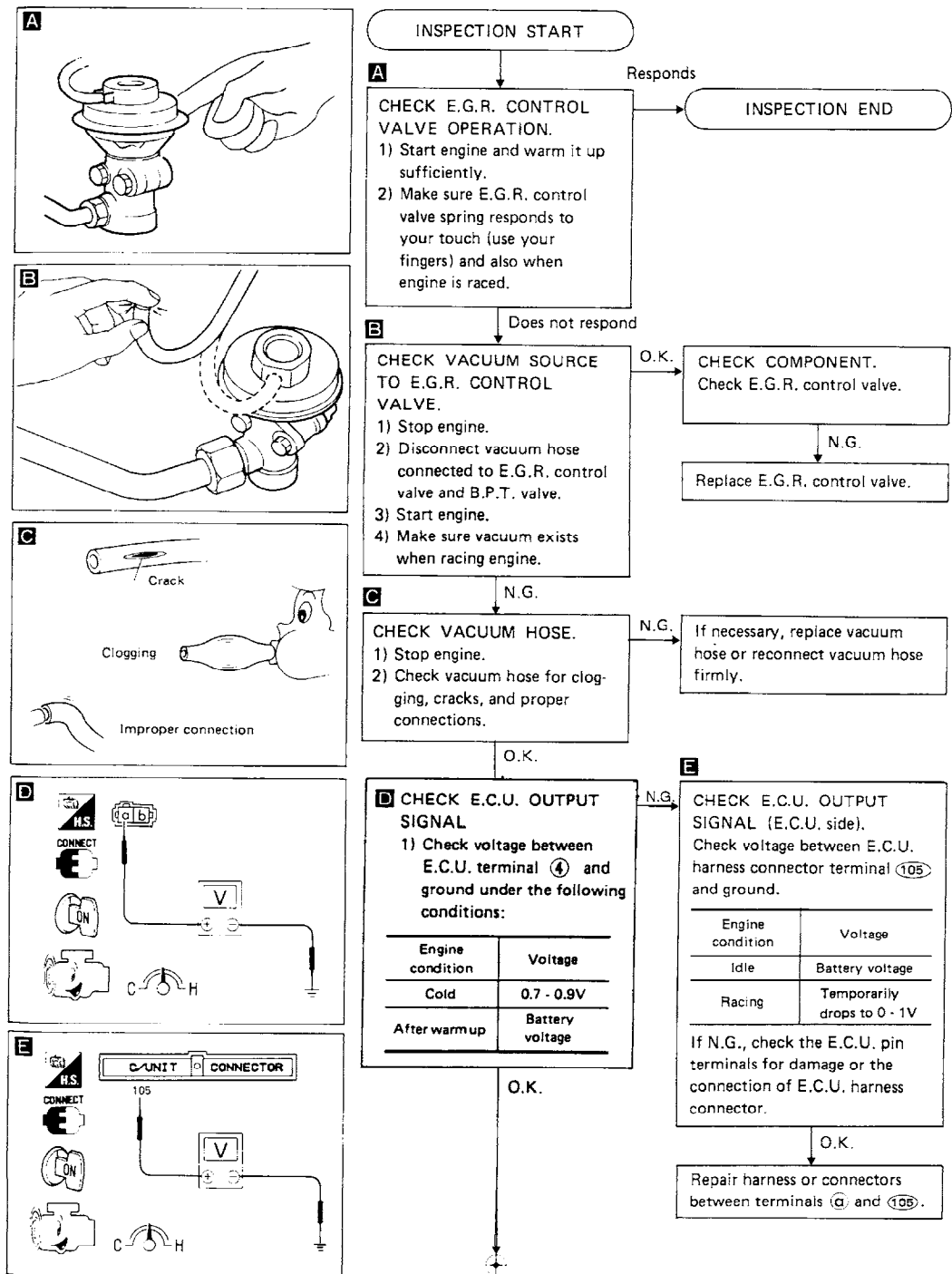


Make sure check engine light does not come "ON" during driving test.

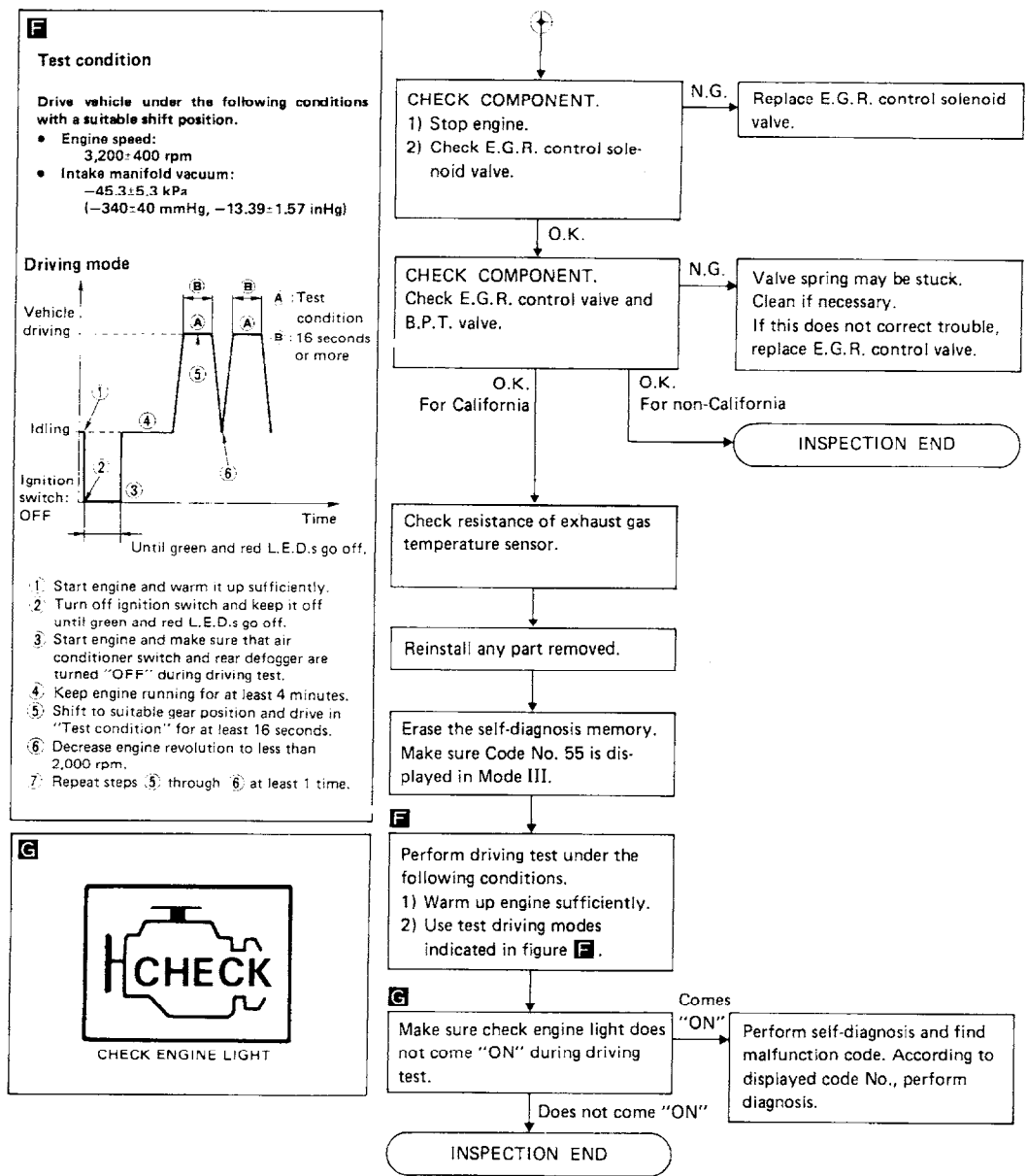
Comes "ON" → Perform self-diagnosis and find malfunction code. According to displayed code No., perform diagnosis.

Does not come "ON" → INSPECTION END

Fig. 9: Code 32: EGR Sensor 240SX (Calif) (2 of 2)
Courtesy of Nissan Motor Co., U.S.A.



93I51464
 Fig. 10: Code 32: EGR Sensor Axxess (Calif) (Revised per TS89-112) (2 of 2)
 Courtesy of Nissan Motor Co., U.S.A.



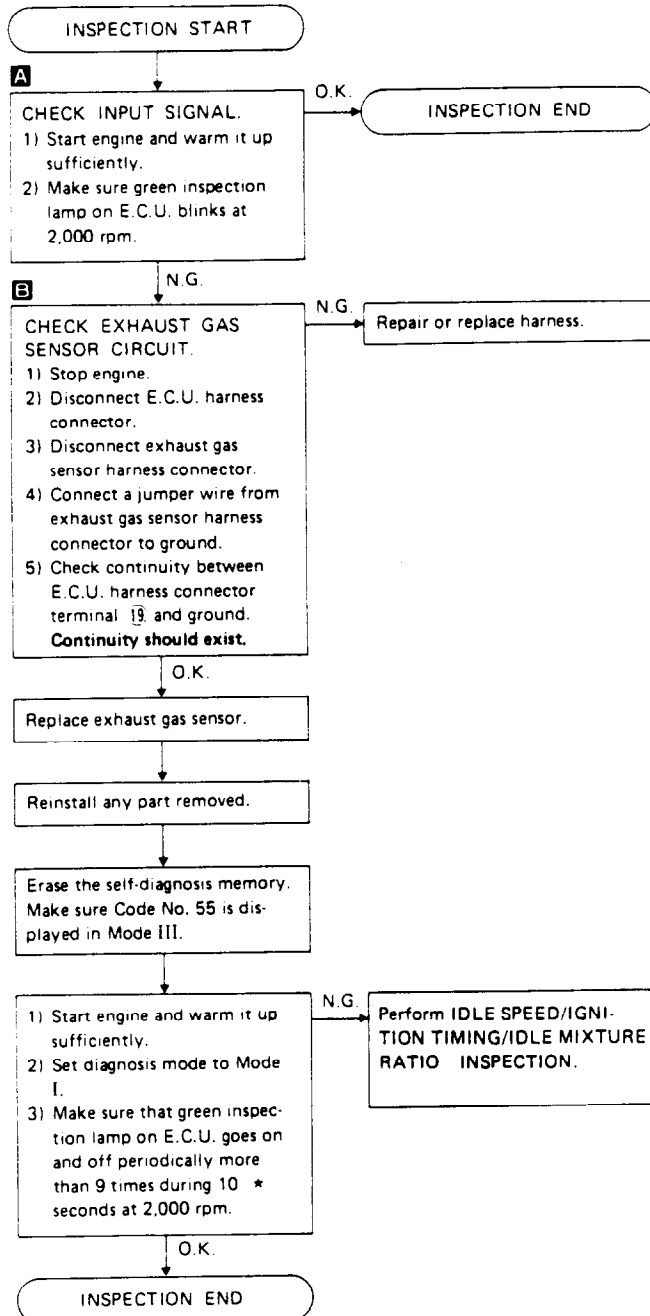
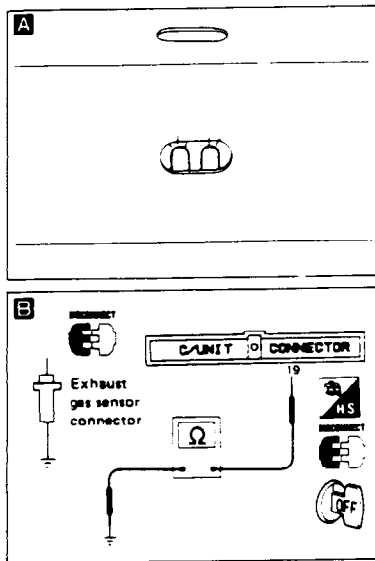
93J51465

Fig. 11: Code 32: EGR Sensor Axxess (Calif) (2 of 2)
Courtesy of Nissan Motor Co., U.S.A.

CODE 33: OXYGEN SENSOR

NOTE: On Axxess, inspection lamp should go on and off at least 5 times in 10 seconds.

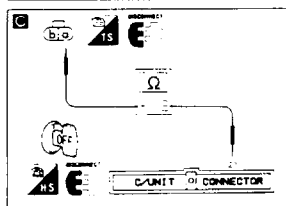
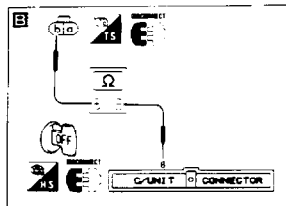
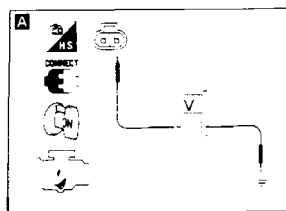
CODE 33 OXYGEN SENSOR AXXESS & 240SX



93H51471

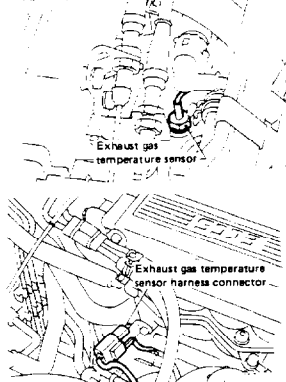
Fig. 12: Code 33: Oxygen Sensor Test
Courtesy of Nissan Motor Co., U.S.A.

CODE 35: EGR TEMP. SENSOR (CALIF.)

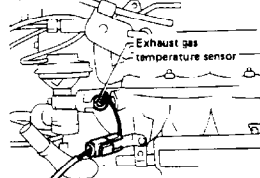


Component location

A/T model



M/T model



**CODE 35
EGR TEMP. SENSOR (CALIF.)
AXXESS & 240SX**

INSPECTION START

A

CHECK INPUT SIGNAL
(Exhaust gas temperature sensor side).

- 1) Start engine and warm it up sufficiently.
- 2) Keep engine speed at approximately 2,000 rpm.
- 3) Check voltage between exhaust gas temperature sensor harness connector terminal b and ground under the following conditions.

Condition	Voltage
When vacuum is not applied to E.G.R control valve	1.0 - 2.0V
When vacuum is applied to E.G.R control valve	0 - 1.0V

A sufficient vacuum applied with a hand vacuum pump may cause the engine to stall.

B

CHECK HARNESS CONTINUITY BETWEEN E.C.U. AND EXHAUST GAS TEMPERATURE SENSOR

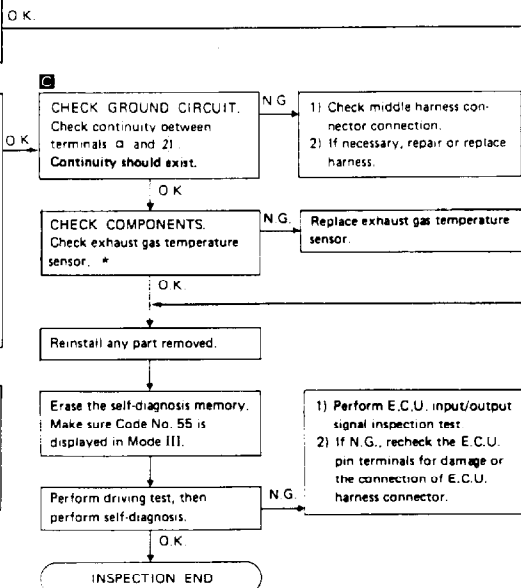
- 1) Stop engine.
- 2) Disconnect E.C.U. harness connector.
- 3) Disconnect exhaust gas temperature sensor harness connector.
- 4) Check continuity between terminals b and 8. Continuity should exist.

C

CHECK GROUND CIRCUIT. Check continuity between terminals a and 21. Continuity should exist.

D

CHECK COMPONENTS. Check exhaust gas temperature sensor. *

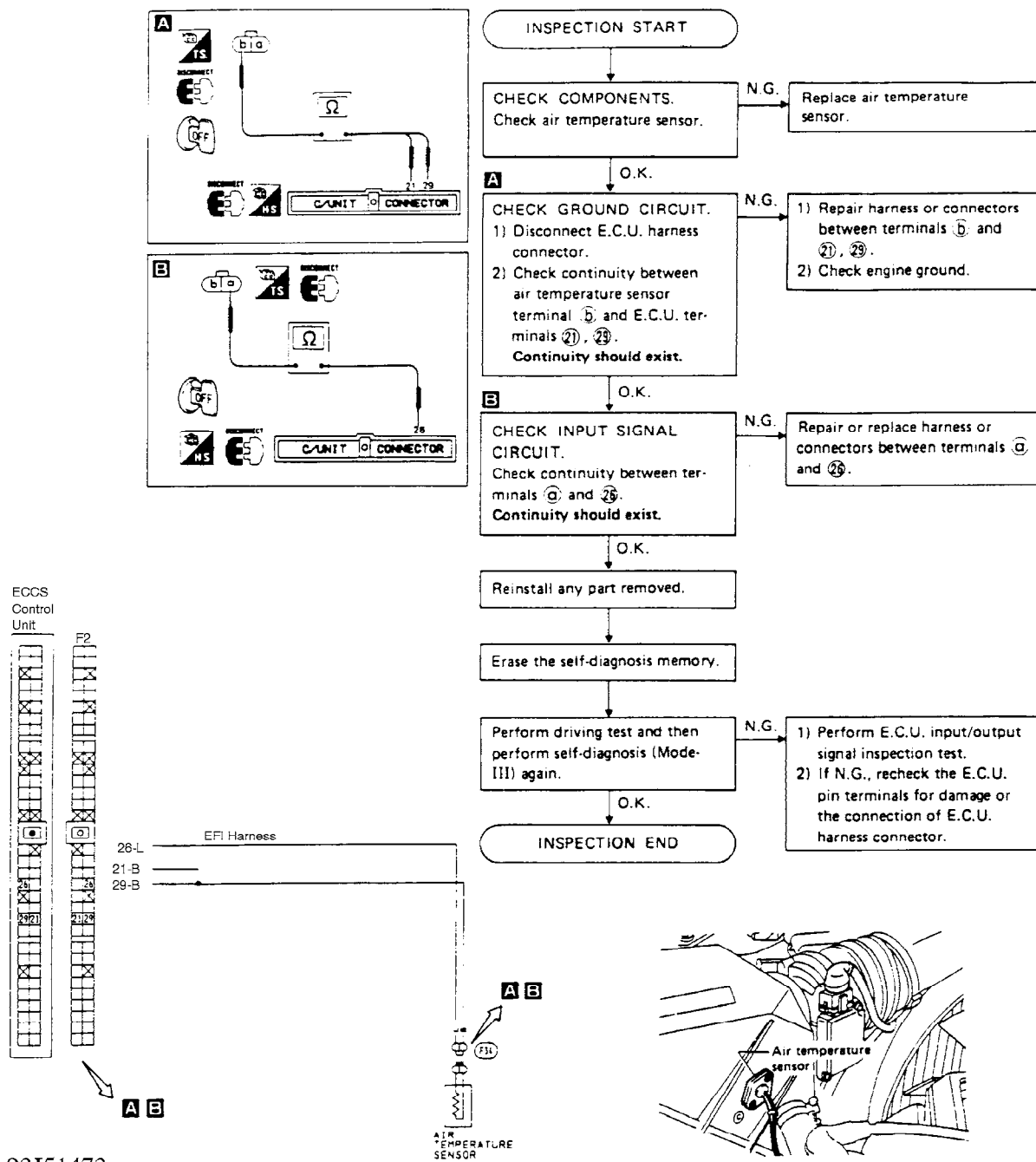


* See SYSTEMS & COMPONENT TESTING article.

93151472
Fig. 13: Code 35: EGR Temp Sensor Test (Calif)
Courtesy of Nissan Motor Co., U.S.A.

CODE 41: AIR TEMP. SENSOR

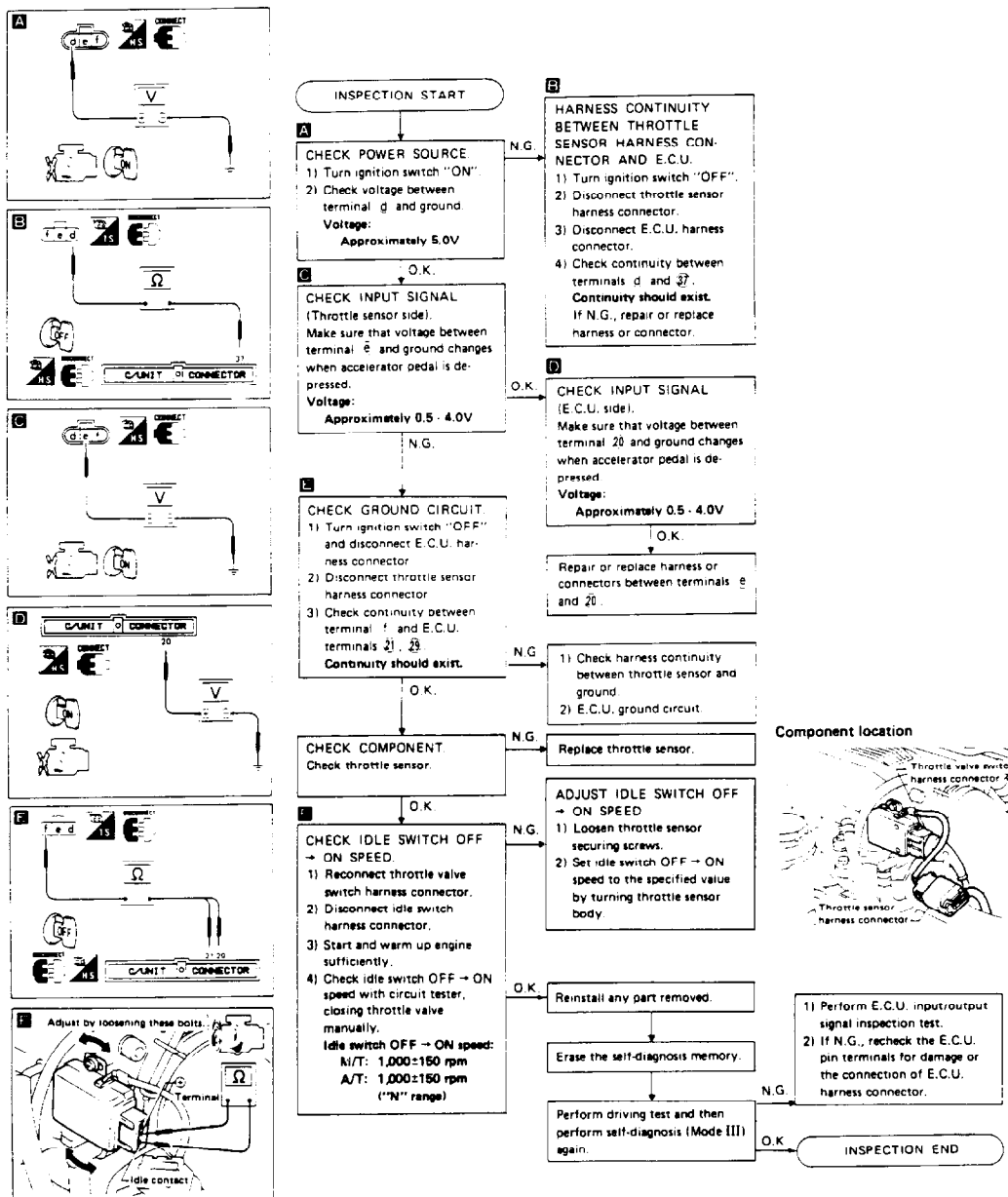
**CODE 41
AIR TEMP. SENSOR
AXXESS & 240SX**



93J51473

Fig. 14: Code 41: Air Temp. Sensor Test
Courtesy of Nissan Motor Co., U.S.A.

CODE 43: THROTTLE POSITION SENSOR

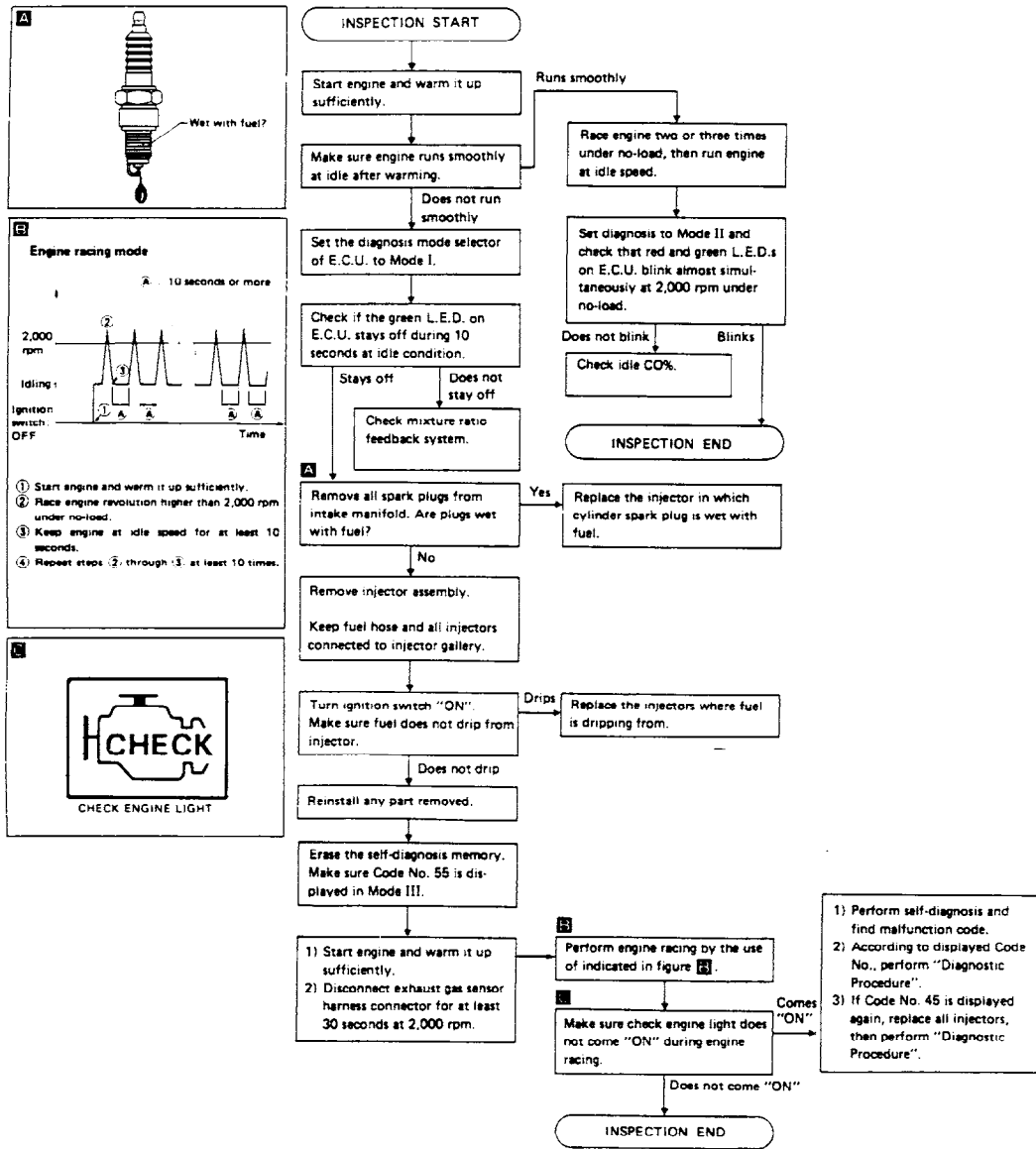


93A51474

Fig. 15: Code 43: Throttle Position Sensor Test
Courtesy of Nissan Motor Co., U.S.A.

CODE 45: INJECTION LEAK

**CODE 45
 INJECTION LEAK
 AXCESS, MAXIMA & 240SX**



93B51475
 Fig. 16: Code 45: Injection Leak
 Courtesy of Nissan Motor Co., U.S.A.