

G - TESTS W/CODES - 1.6L TBI

Article Text

1994 Suzuki Sidekick

For werest mira sakhalin russia 693013

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Friday, January 18, 2002 08:10AM

ARTICLE BEGINNING

1994 ENGINE PERFORMANCE
Suzuki - Self-Diagnostics

Sidekick - 1.6L TBI

INTRODUCTION

NOTE: Assembly Line Data Link (ALDL) connector may also be referred to as Data Link Connector (DLC). The term CHECK ENGINE light is now referred to as Malfunction Indicator Light (MIL). The MIL is displayed in instrument cluster as CHECK ENGINE.

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

TERMINOLOGY

Due to Federal government requirements, manufacturers may use names and acronyms for systems and components different than those used in previous years. The following table will help eliminate confusion when dealing with these components and systems.

SAE TERMINOLOGY TABLE

| Former Name Or Acronym | New Name Or Acronym |
|--------------------------------|---|
| ALDL | Data Link Connector (DLC) |
| Airflow Sensor (AFS) | Mass Airflow (MAF) Sensor |
| Air Temperature Sensor | Intake Air Temperature (IAT) Sensor |
| CHECK ENGINE Light | Malfunction Indicator Light (MIL) |
| Crank Angle Sensor | Camshaft Position (CMP) Sensor |
| Oxygen (O(2)) Sensor | Heated Oxygen Sensor (HO2S) |
| Pressure Sensor (PS) | Manifold Absolute Pressure (MAP) Sensor |
| Throttle Position Sensor (TPS) | Throttle Position (TP) Sensor |
| Trouble Codes | Diagnostic Trouble Codes DTC(s) |
| Water Temp. Sensor (WTS) | Engine Coolant Temp. (ECT) Sensor |

SELF-DIAGNOSTIC SYSTEM

Hard Failures

Hard failures cause Malfunction Indicator Light (MIL) to illuminate and remain on until problem is repaired. If MIL comes on and remains on (light may flash) during vehicle operation, cause of malfunction must be determined using diagnostic (code) charts. If a sensor fails, Electronic Control Module (ECM) will use a substitute value in its calculations to continue engine operation. In this condition, commonly known as limp-in mode, the vehicle runs but driveability will not be optimum.

Intermittent Failures

Intermittent failures may cause Malfunction Indicator Light (MIL) to flicker or illuminate and go out after the intermittent fault goes away. Intermittent faults will store trouble code(s) in ECM memory until power is disconnected from ECM for at least 20 seconds, with the exception of idle switch failure and ignition faults, which are erased each time ignition switch is turned off. Intermittent failures may be caused by sensor, connector or wiring related problems. See INTERMITTENTS in H - TESTS W/O CODES article in the ENGINE PERFORMANCE section.

MALFUNCTION INDICATOR LIGHT (MIL) RESET PROCEDURE

Federal Models

MIL (also known as CHECK ENGINE light) will automatically flash at 50,000, 80,000 and 100,000 mile intervals, indicating system inspection and/or system component replacement is required. After necessary services have been performed, turn off light by moving cancel switch to opposite position. Cancel switch is located below steering column lower trim panel:

- * At 50,000 Miles - Replace PCV valve and inspect EGR system.
- * At 80,000 Miles - Replace oxygen sensor.
- * At 100,000 Miles - Replace PCV valve and charcoal canister.

Inspect catalytic converter for plugging, EGR system, ECM and related sensors.

RETRIEVING CODES

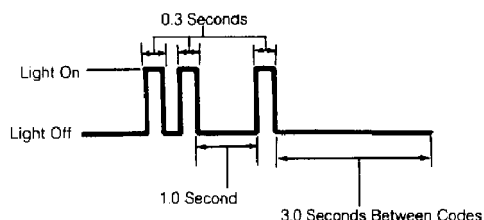
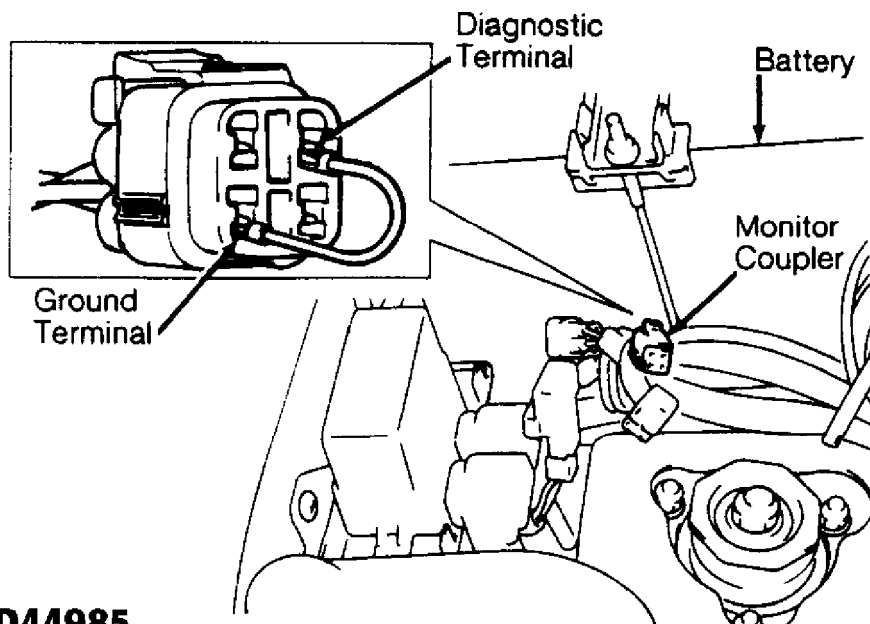


Fig. 1: Typical Code Display (Code 21 Is Shown)
Courtesy of Suzuki of America Corp.

1) Ensure Malfunction Indicator Light (MIL) (also known as CHECK ENGINE light) comes on when ignition is on and engine is not running. When engine is started, light should go off. If light remains on while engine is running, a trouble code is present.

2) If light does not come on with key on and engine off, check MIL circuit before continuing. See CHART A-1 and CHART A-2 under CODE CHARTS for MIL diagnosis. If light operates and a no start condition exists, see CHART A-3 under CODE CHARTS.

3) To retrieve codes, locate monitor coupler connector, near battery. Using a jumper wire, connect diagnostic terminal to ground terminal. See Fig. 2.



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Fig. 2: Identifying Diagnostic Terminals
Courtesy of Suzuki of America Corp.

4) For example, Code 21 is identified by a flash, flash, pause and flash. See Fig. 1. Each code is displayed 3 times, and then the next code is flashed.

5) If engine control system is operating properly (with no faults), a Code 12 should exist with ignition on and engine off. This indicates diagnostic system is capable of storing codes. Ensure engine is in sound mechanical condition.

6) Once all codes are displayed, record codes and proceed to CODE CHARTS for repair procedure. Remove jumper wire from diagnostic terminal.

7) After repairs, erase codes by disconnecting battery cable for 60 seconds. Repeat code retrieval procedure to check for new or returning trouble codes.

CAUTION: Ensure ignition is off when disconnecting or reconnecting power supply for ECM.

After repairs are performed, clear ECM memory of all stored trouble codes. To clear memory, turn ignition off. Disconnect negative battery cable for at least 60 seconds.

ECM LOCATION

ECM LOCATION TABLE

| Model | Location |
|----------|---------------------------------------|
| Sidekick | Upper Left Corner Of Instrument Panel |

TROUBLE CODE DEFINITION

TROUBLE CODE IDENTIFICATION TABLE

| Code | System Affected | Probable Cause |
|------------|------------------------------|---|
| 12 | System Normal | System Normal |
| 13 | Heated Oxygen Sensor | Sensor Or Circuit, ECM |
| 14 | (1) ECT Sensor | Sensor Or Circuit, ECM |
| 15 | (2) ECT Sensor | Sensor Or Circuit, ECM |
| 21 | (3) Throttle Position Sensor | Sensor Or Circuit, ECM |
| 22 | (4) Throttle Position Sensor | Sensor Or Circuit, ECM |
| 23 (5) | (1) IAT Sensor | Sensor Or Circuit, ECM |
| 24 | Vehicle Speed Sensor | Sensor Or Circuit, ECM |
| 25 (5) | (2) IAT Sensor | Sensor Or Circuit, ECM |
| 31 (5) | (3) MAP Sensor | Sensor Or Circuit, ECM |
| 32 (5) | (4) MAP Sensor | Sensor Or Circuit, ECM |
| 33 (6) | (3) MAF Sensor | Sensor Or Circuit, ECM |
| 34 (6) | (4) MAF Sensor | Sensor Or Circuit, ECM |
| 41 (7) | Ignition Signal Circuit | Ignition Coil, Ignitor, Wiring, ECM |
| 42 (8) | Crank Angle Sensor | Sensor, Wiring, ECM |
| 44 (8) | Idle Switch Circuit Open | TPS, Wiring, ECM |
| 45 | Idle Switch Circuit Shorted | TPS, Wiring, ECM |
| 51 (9) | EGR System | ECM, EGR, Modulator, Wiring, EGR Temp. Sensor, Vacuum Switching Valve |
| 52 (6) (9) | Fuel System | Injectors, ECM |
| 53 (5) (9) | ECM Ground Circuit | Wiring, ECM |

(1) - Low temperature is indicated.

- (2) - High temperature is indicated.
- (3) - High voltage is indicated.
- (4) - Low voltage is indicated.
- (5) - Sidekick TBI only.
- (6) - Sidekick MFI only.
- (7) - Code 41 is not stored in ECM memory. To check code when engine fails to start, crank engine, and then, with ignition still on, install fuse in diagnostic terminal of fuse block.
- (8) - When code occurs, ECM will not activate CHECK ENGINE light while engine is running. When problem is fixed, memory of defective area will automatically be erased from ECM.
- (9) - California models only.

AA

CODE CHARTS

NOTE: The following figures are courtesy of Suzuki of America Corp.

CHART A-1 - ECM POWER & GROUND CIRCUIT CHECK (DOES NOT START)

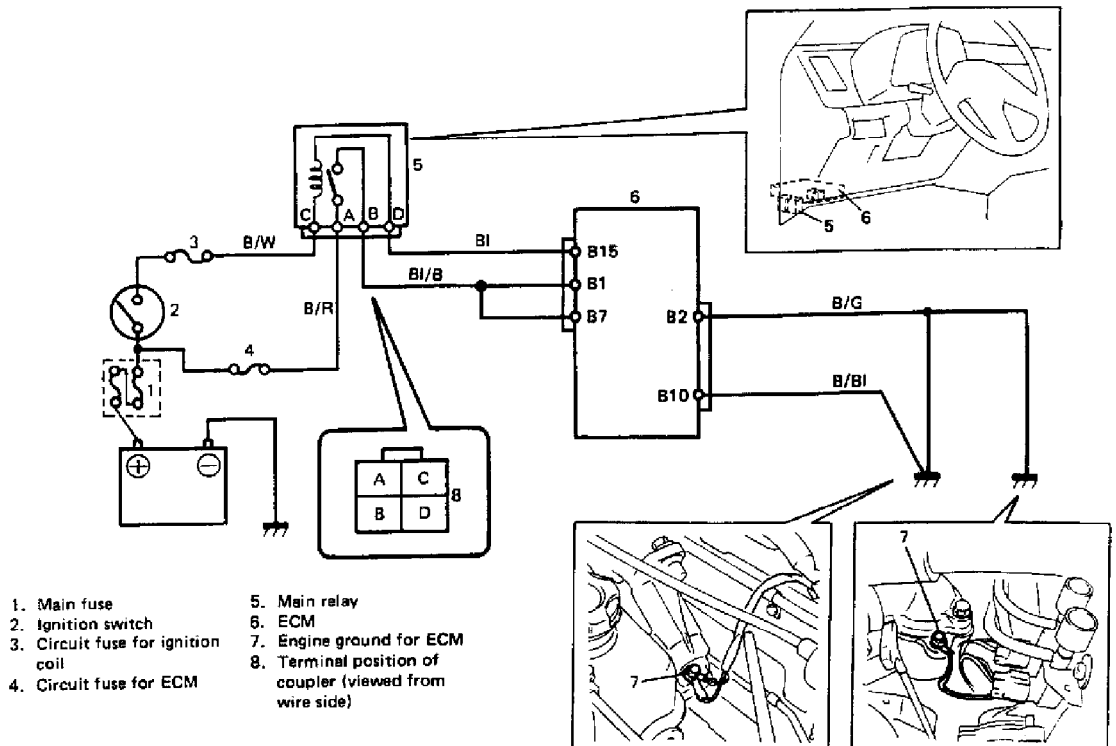


Fig. 3: Chart A1, Schematic - ECM Power & Ground Circuit Check (No Start)

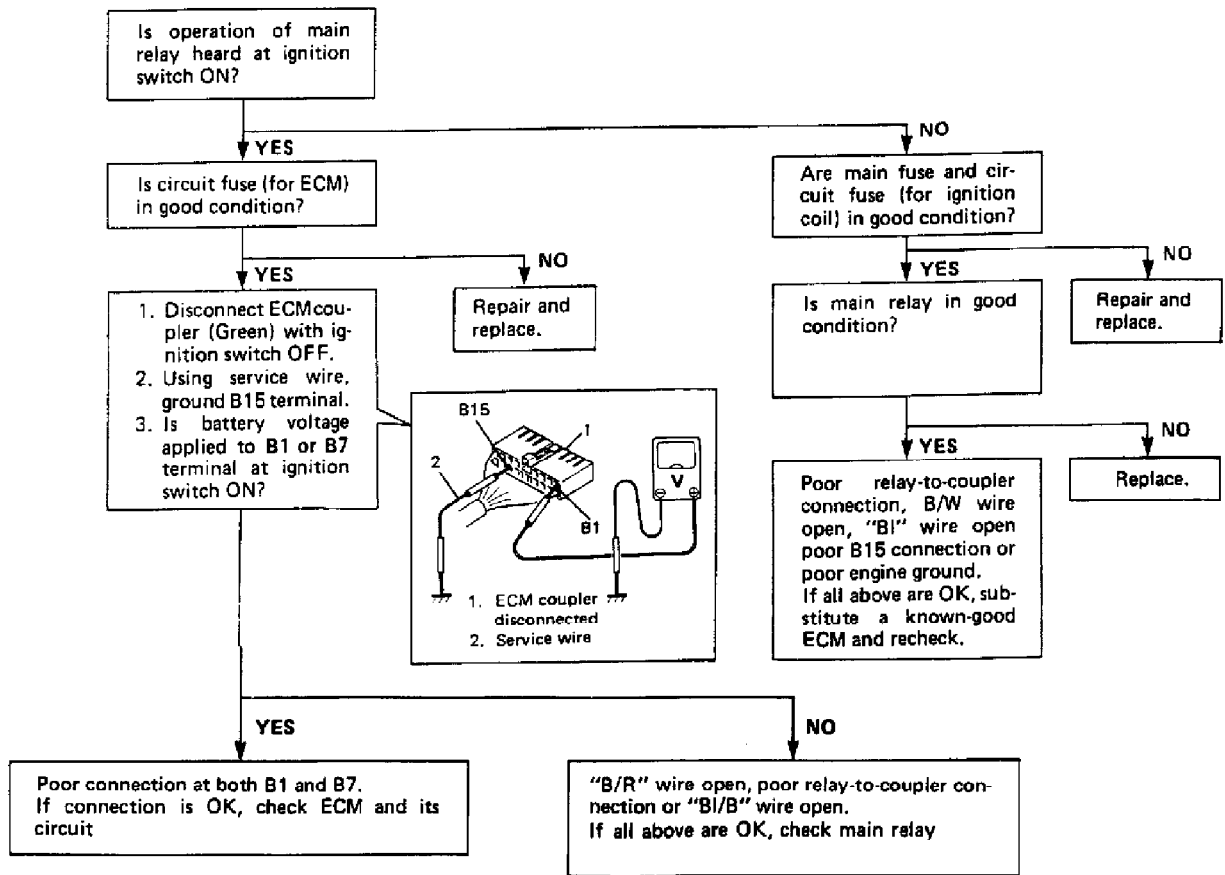


Fig. 4: Chart A1, Flow Chart - ECM Power & Ground Circuit Check (No Start)

CHART A-2 - CHECK ENGINE LIGHT INOPERATIVE (ENGINE STARTS)

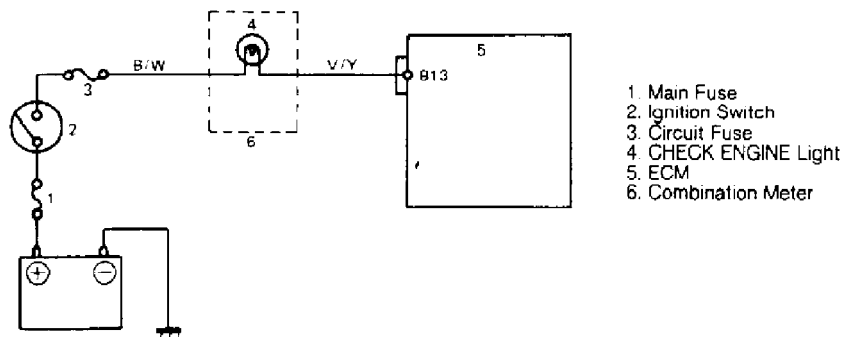
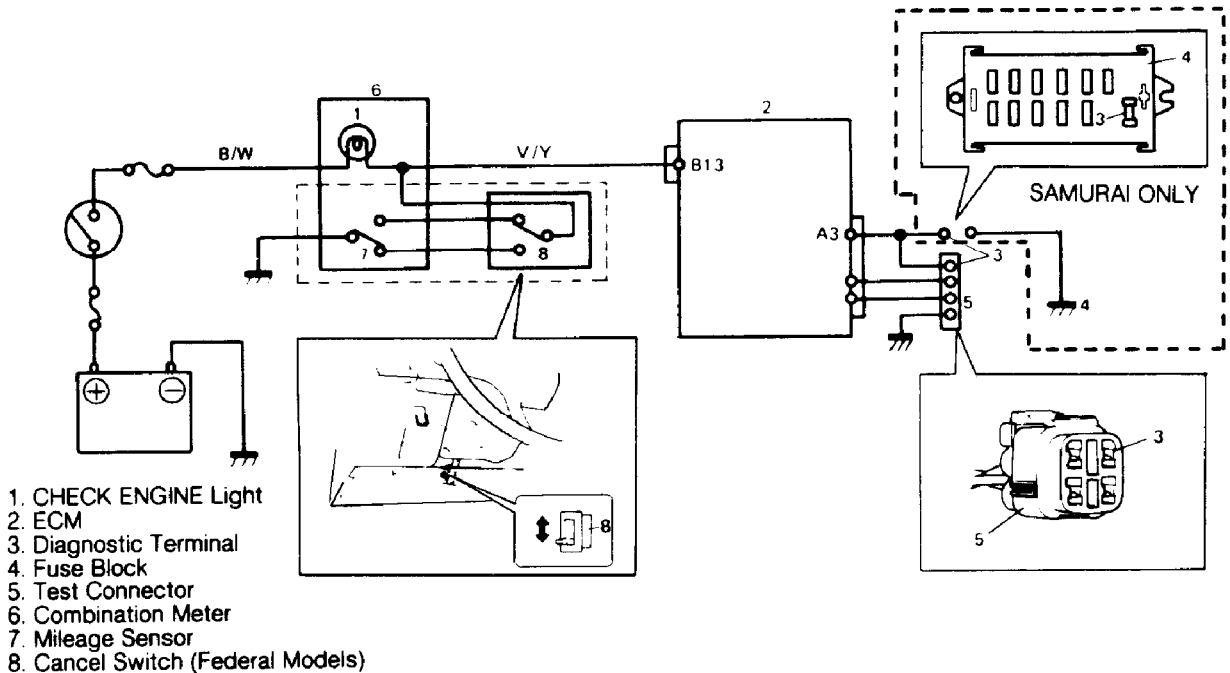


Fig. 5: Chart A2 - Check Engine Light Inoperative (Starts)
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CHART A-3 - CHECK ENGINE LIGHT STAYS ON - WON'T FLASH

CHART A-3 - CHECK ENGINE LIGHT STAYS ON - WON'T FLASH (1 OF 2)



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Fig. 6: Chart A3, Schematic - Check Engine Light Stays On, Won't Flash

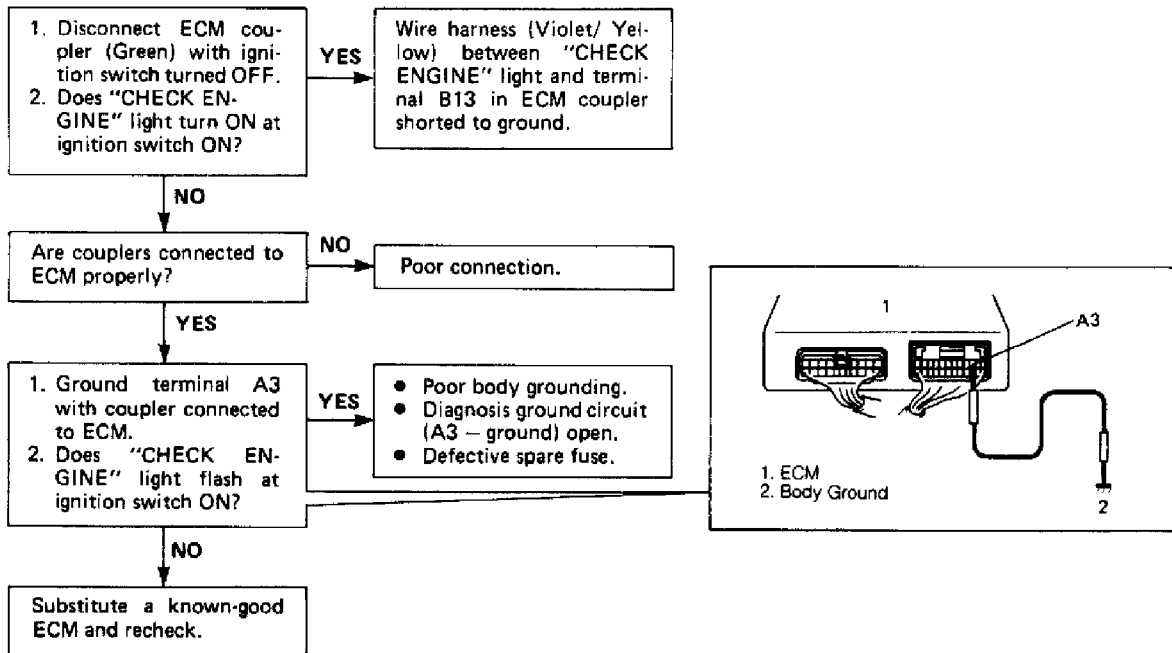


Fig. 7: Chart A3, Flow Chart - Check Engine Light Stays On, Won't Flash

CODE 13 - HEATED OXYGEN SENSOR CIRCUIT

- 1. ECM
- 2. ECM Coupler
- 3. Oxygen Sensor
- 4. Oxygen Sensor Coupler

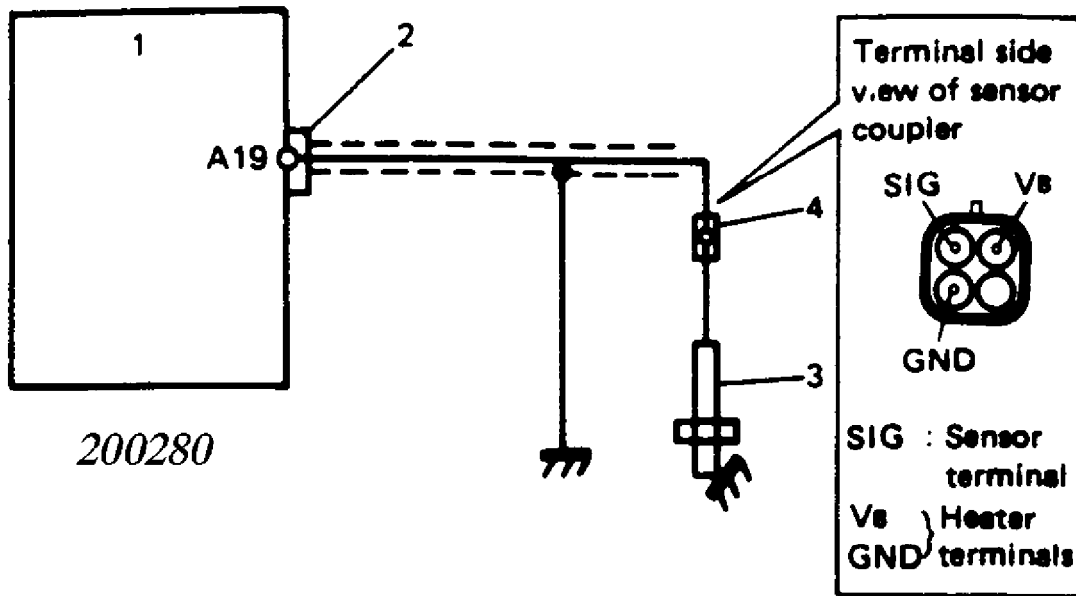
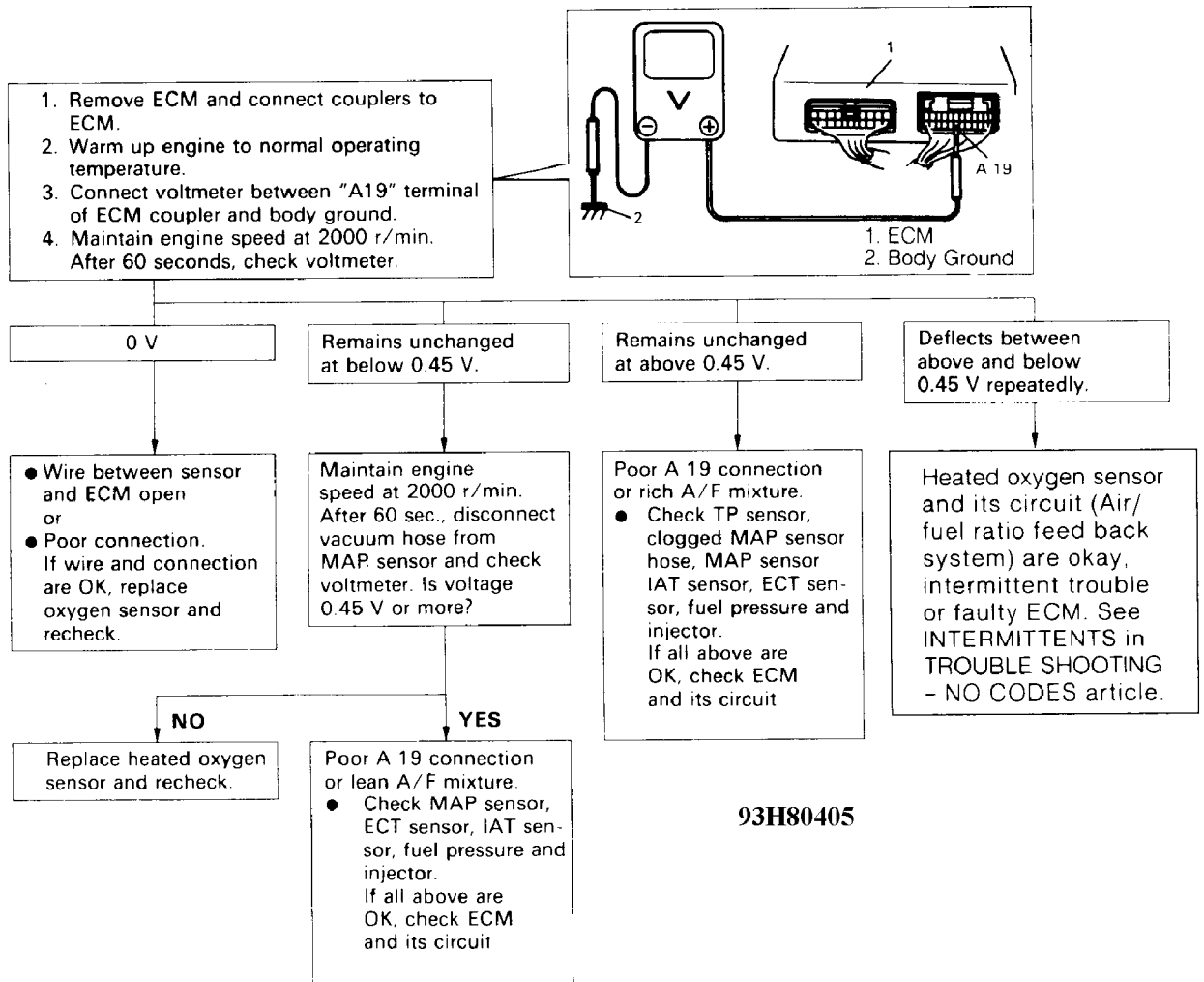


Fig. 8: Code 13, Schematic - Oxygen Sensor Circuit



G - TESTS W

Fig. 9: Code 13, Flow Chart - Oxygen Sensor Circuit

CODE 14 - ECT SENSOR, LOW TEMPERATURE INDICATED

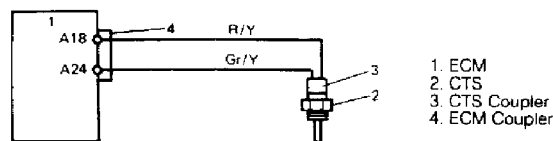


Fig. 10: Code 14, Schematic - ECT Sensor Indication Low

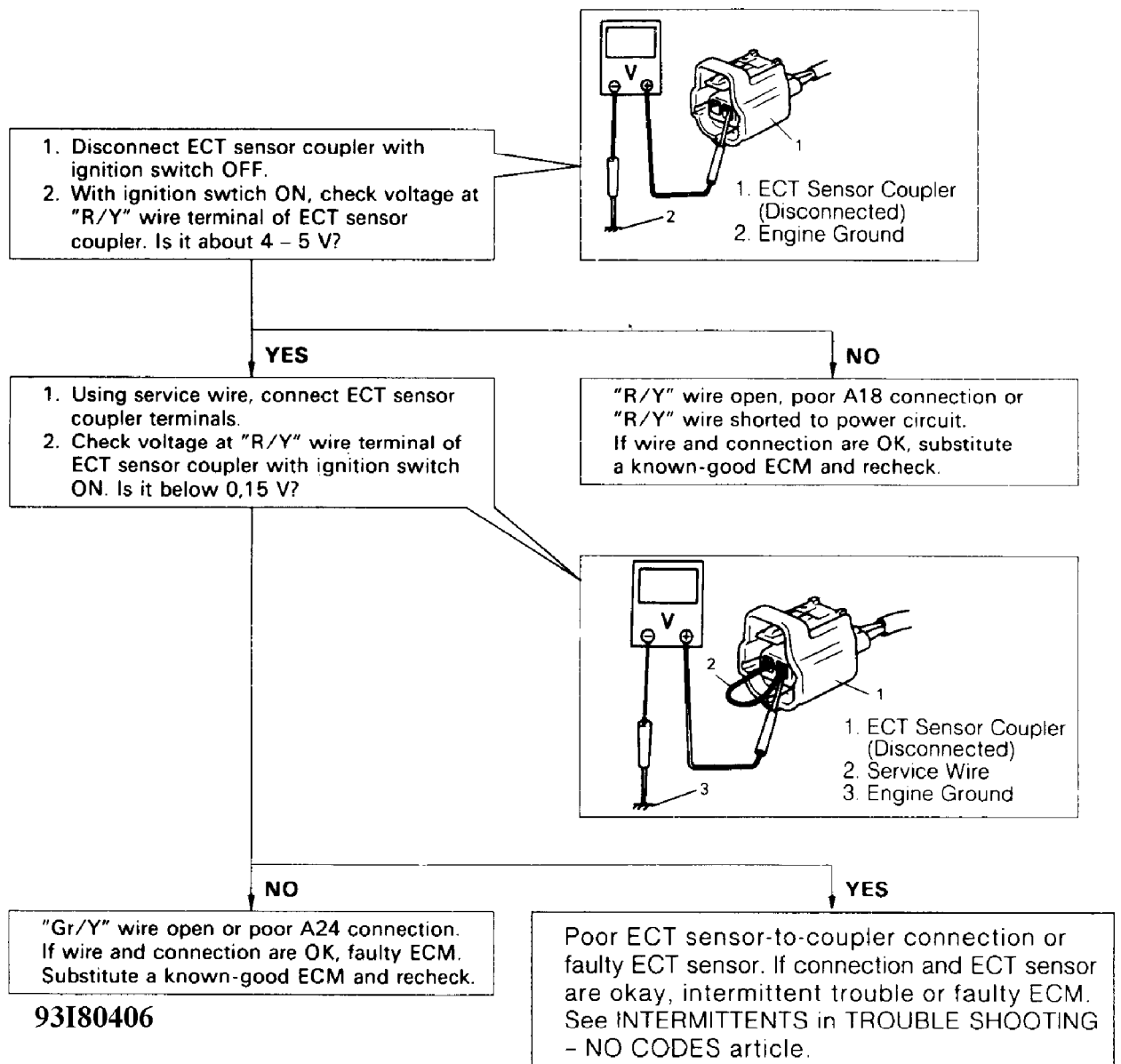


Fig. 11: Code 14, Flow Chart - ECT Sensor Indication Low

CODE 15 - ECT SENSOR, HIGH TEMPERATURE INDICATED

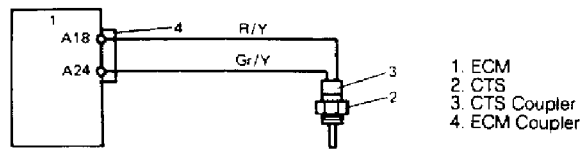


Fig. 12: Code 15, Schematic - ECT Sensor Indication High

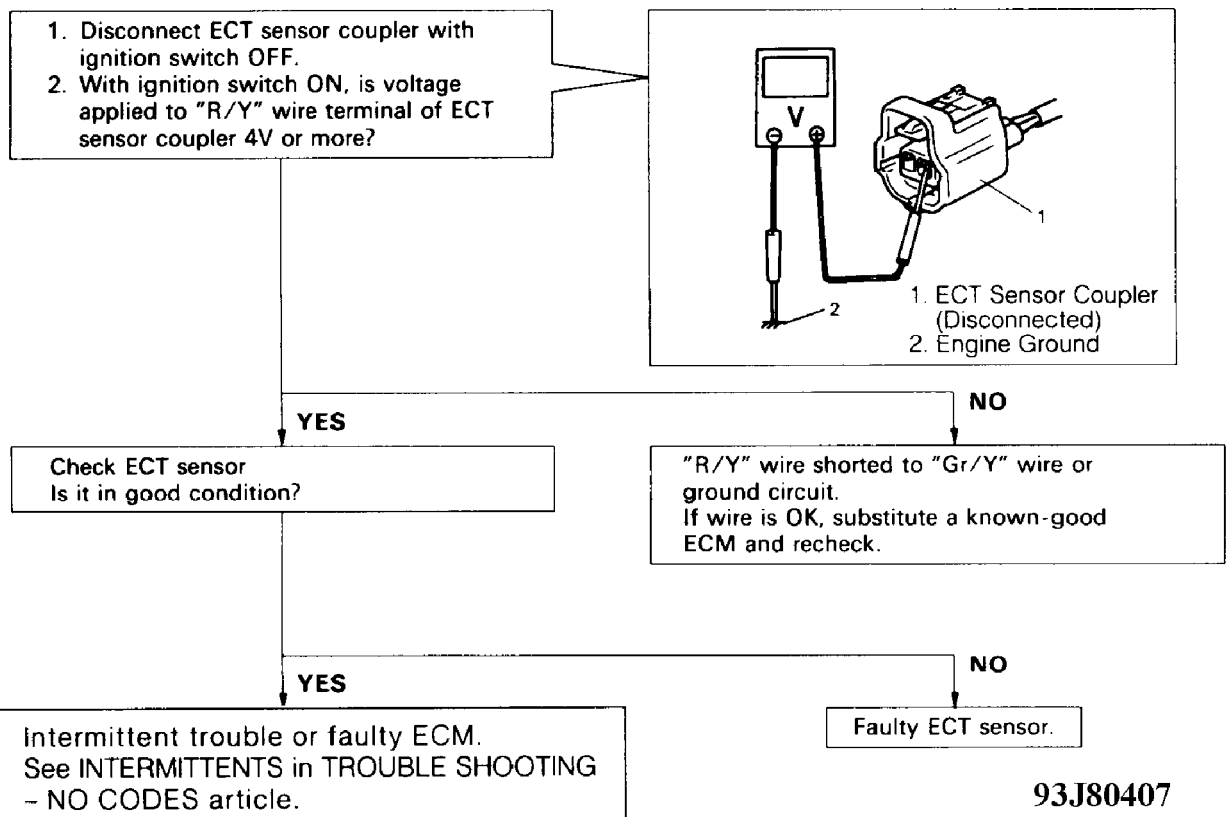
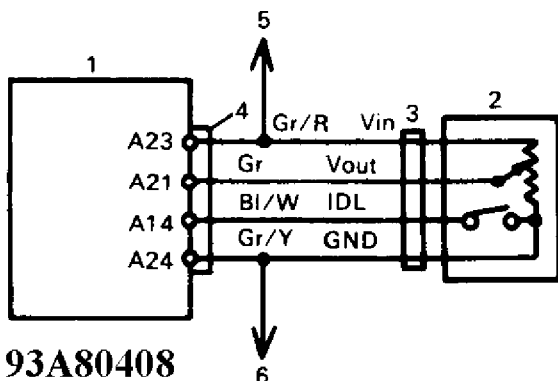


Fig. 13: Code 15, Flow Chart - ECT Sensor Indication High

CODE 21 - TPS CIRCUIT, SIGNAL VOLTAGE HIGH



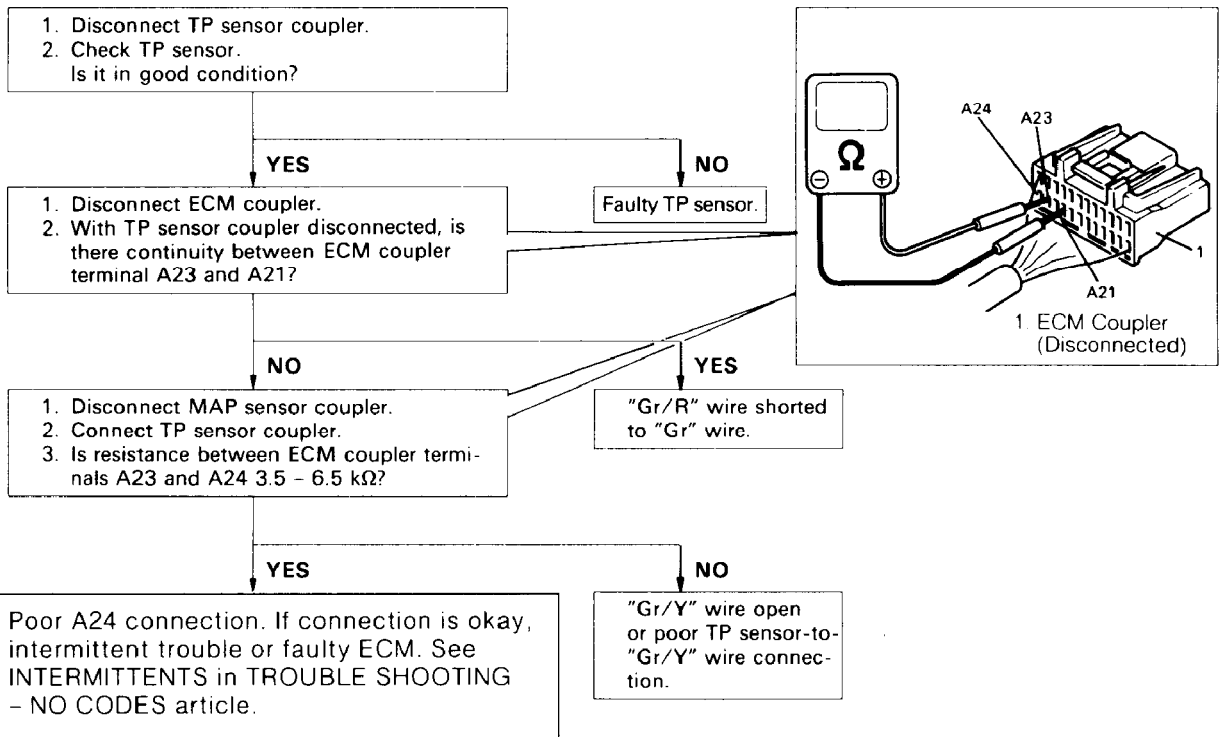
1. ECM
2. Throttle Position (TP) Sensor
3. TP Coupler
4. ECM Coupler
5. To MAP Sensor
6. To Other Sensors

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Fig. 14: Code 21, Schematic - TPS Circuit Indication High

NOTE:

Be sure to turn OFF ignition switch for this check.

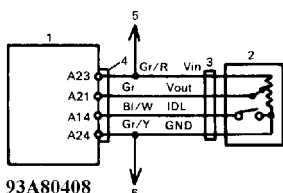


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Fig. 15: Code 21, Flow Chart - TPS Circuit Indication High

CODE 22 - TPS CIRCUIT, SIGNAL VOLTAGE LOW

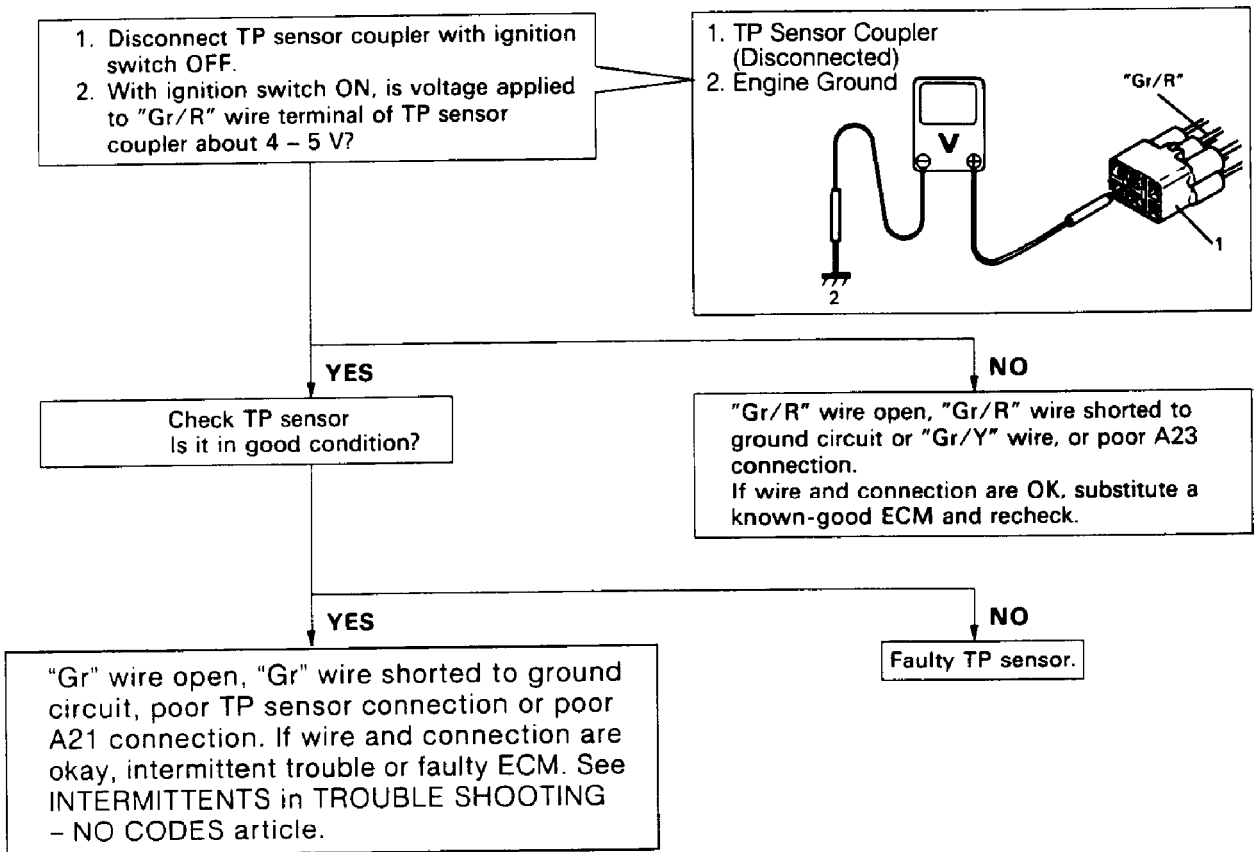
G - TESTS W



1. ECM
2. Throttle Position (TP) Sensor
3. TP Coupler
4. ECM Coupler
5. To MAP Sensor
6. To Other Sensors

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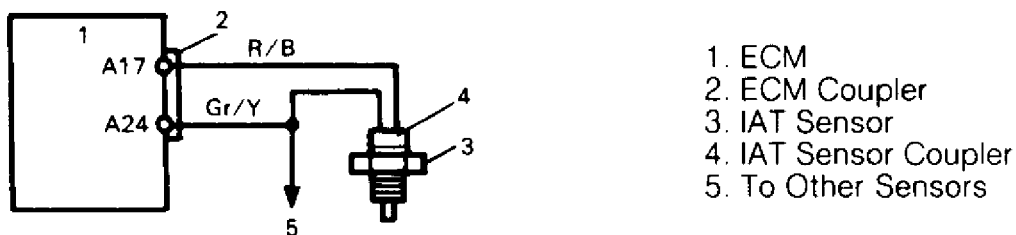
Fig. 16: Code 22, Schematic - TPS Circuit Indication Low



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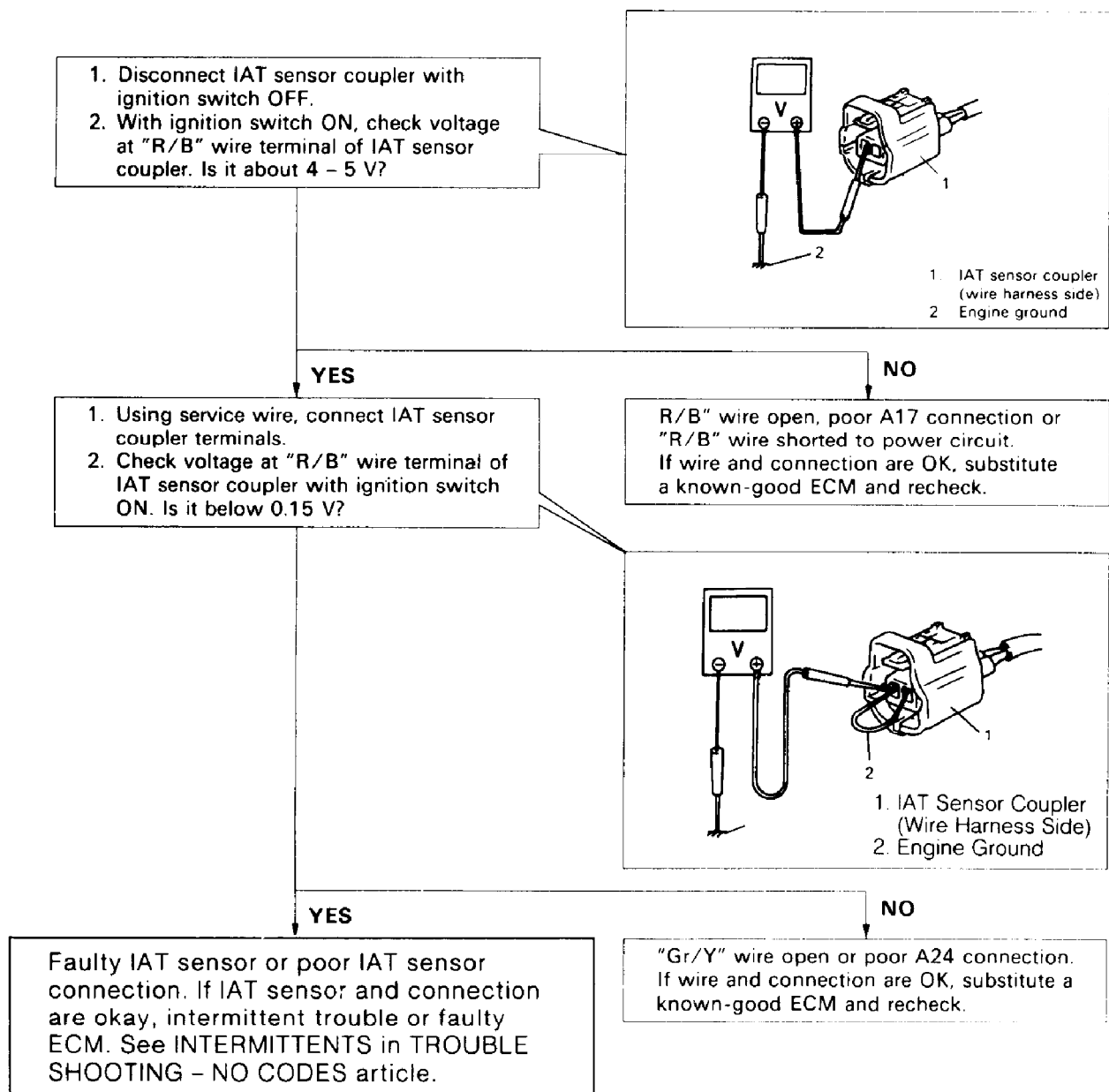
Fig. 17: Code 22, Flow Chart - TPS Circuit Indication Low

CODE 23 - IAT SENSOR CIRCUIT, LOW TEMPERATURE INDICATED



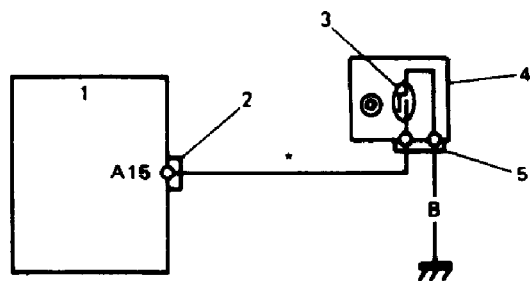
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Fig. 18: Code 23, Schematic - IAT Sensor Circuit Low



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Fig. 19: Code 23, Flow Chart - IAT Sensor Circuit Low

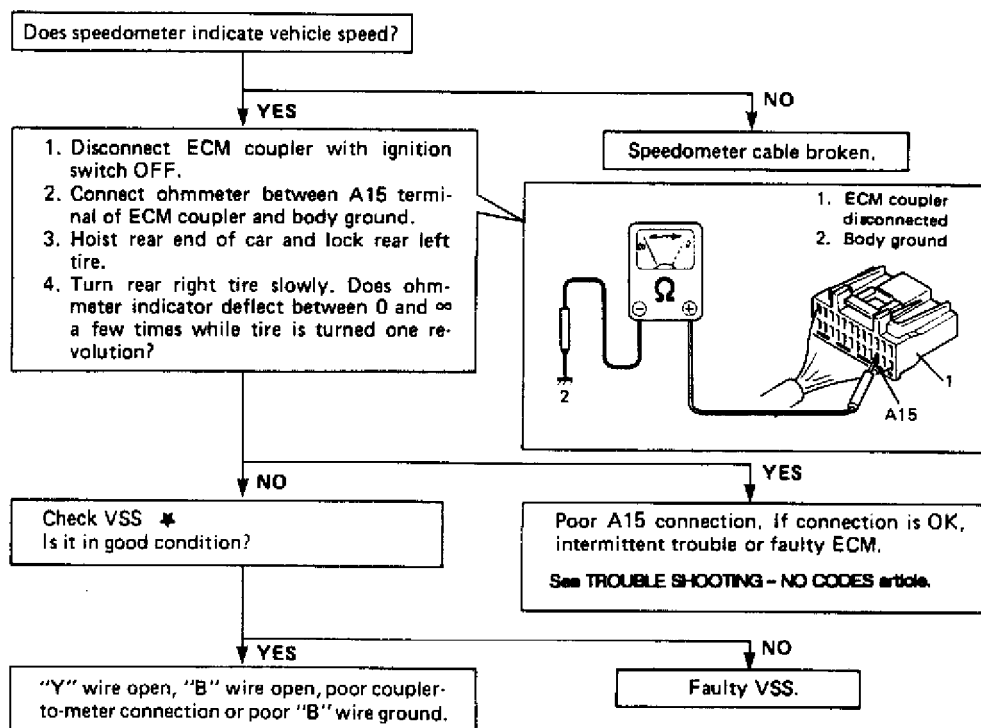


- 1. ECM
- 2. ECM Coupler
- 3. VSS
- 4. Speedometer
- 5. VSS Coupler

* - BRN/YEL on Samurai, YEL on Sidekick

NOTE: Ensure ignition switch is in OFF position.

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 Fig. 20: Code 24, Schematic - Vehicle Speed Sensor



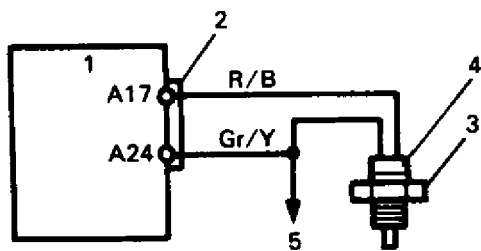
* - See SYSTEM & COMPONENT TESTING article.

G - TESTS W

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Fig. 21: Code 24, Flow Chart - Vehicle Speed Sensor

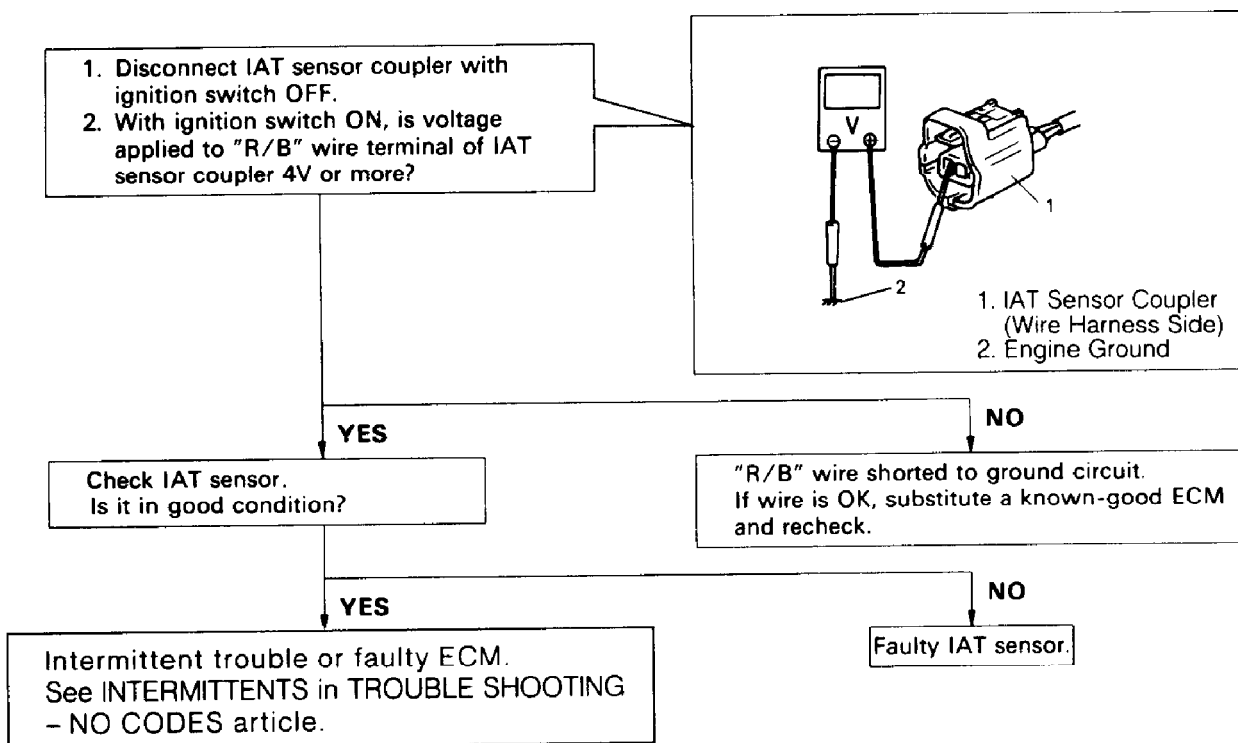
CODE 25 - IAT SENSOR CIRCUIT, HIGH TEMPERATURE INDICATED



1. ECM
2. ECM Coupler
3. IAT Sensor
4. IAT Sensor Coupler
5. To Other Sensors

93C81093

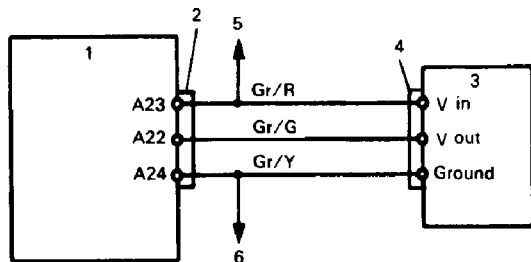
Fig. 22: Code 25, Schematic - Air Temperature Sensor Circuit High



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Fig. 23: Code 25, Flow Chart - Air Temperature Sensor Circuit High

CODE 31 - MAP SENSOR CIRCUIT, SIGNAL VOLTAGE HIGH

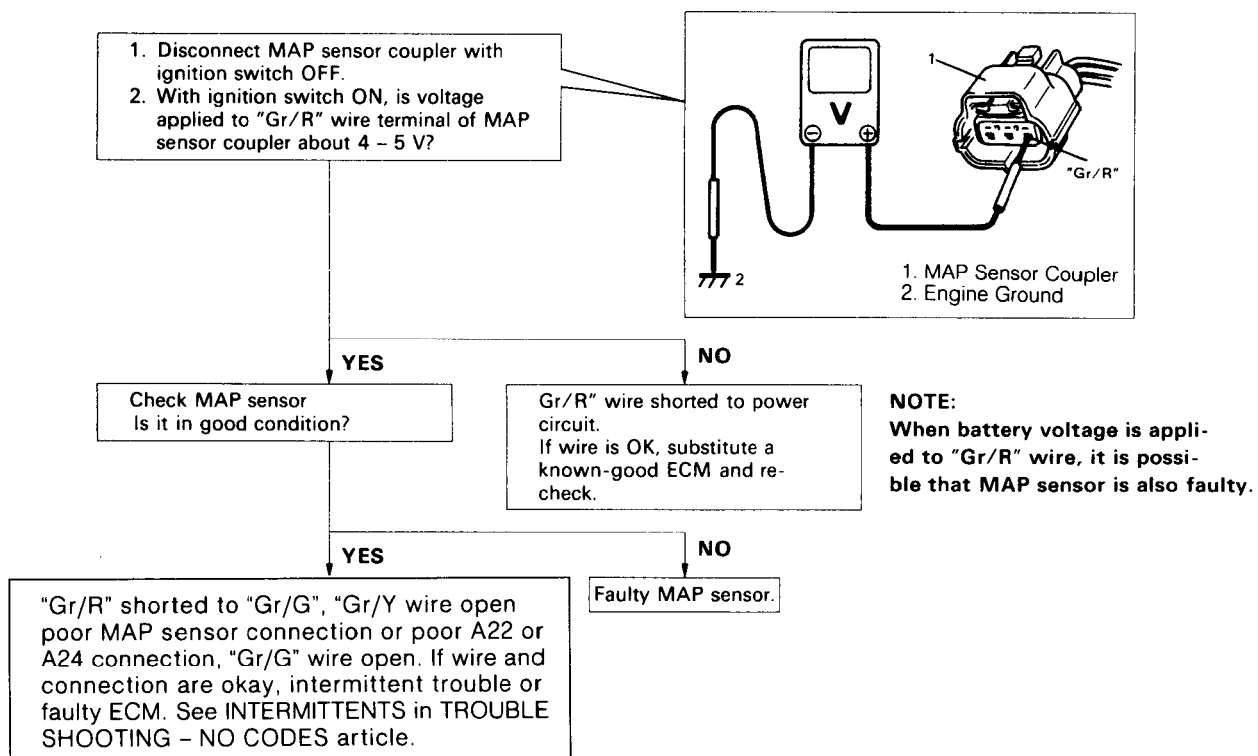


1. ECM
2. ECM Coupler
3. MAP Sensor
4. MAP Sensor Coupler
5. To TP Sensor
6. To Other Sensors

G - TESTS W

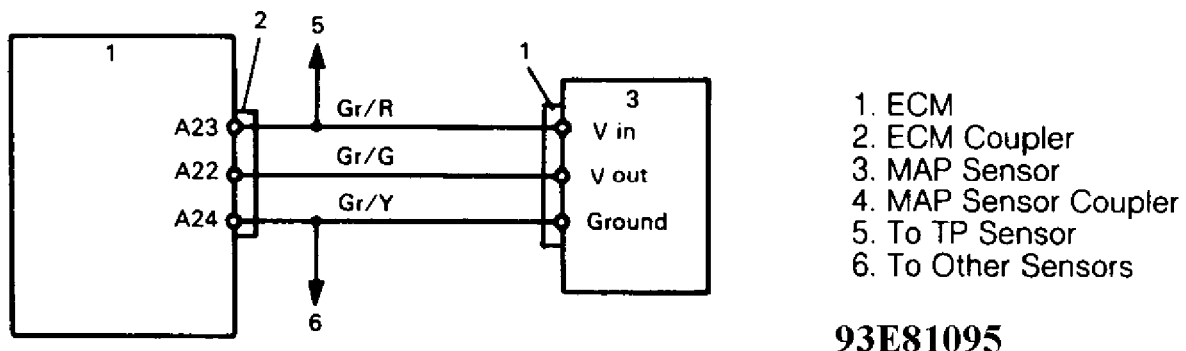
93D81094

Fig. 24: Code 31, Schematic - MAP Sensor Circuit Voltage High



93J80571
Fig. 25: Code 31, Flow Chart - MAP Sensor Circuit Voltage High

CODE 32 - MAP SENSOR CIRCUIT, SIGNAL VOLTAGE LOW



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Fig. 26: Code 32, Schematic - MAP Sensor Circuit Voltage Low

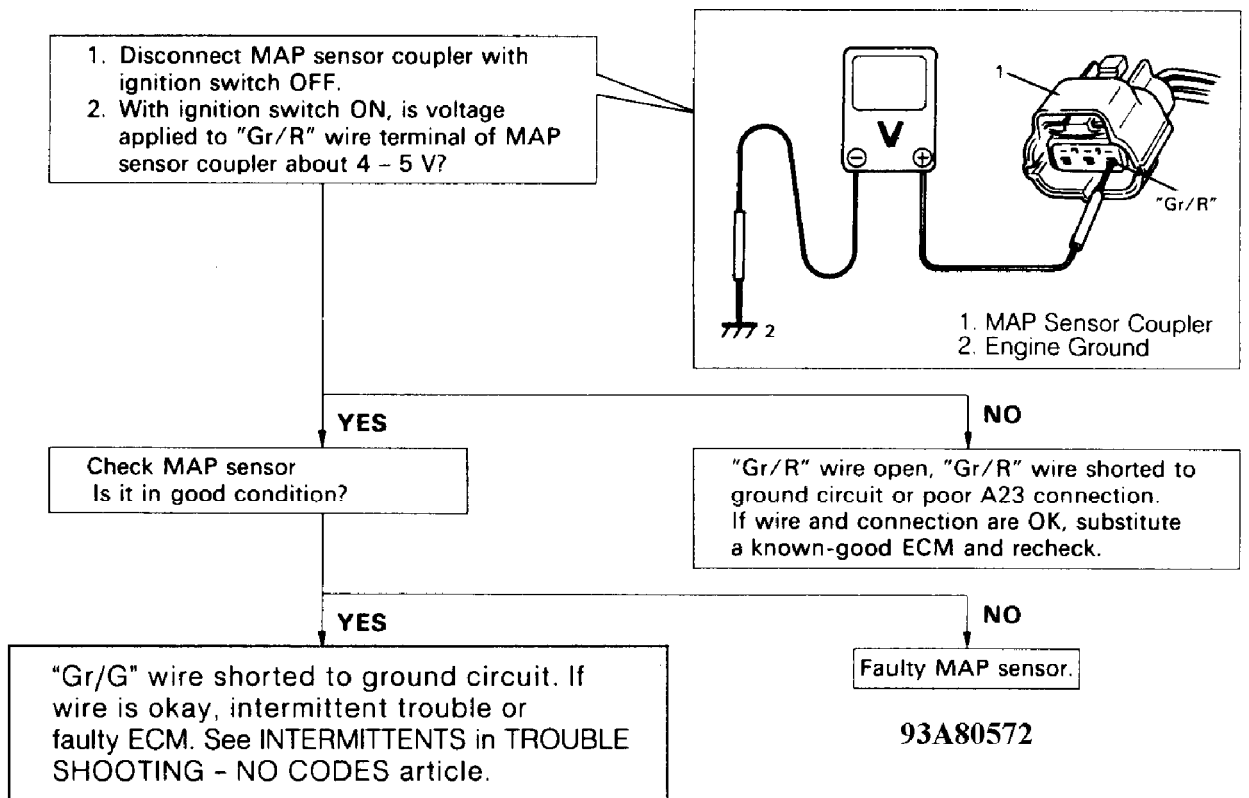
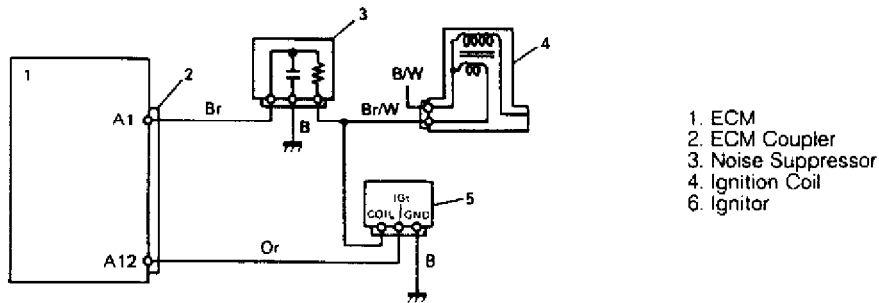


Fig. 27: Code 32, Flow Chart - MAP Sensor Circuit Voltage Low

CODE 41 - NO IGNITION SIGNAL



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Fig. 28: Code 41, Schematic - No Ignition Signal

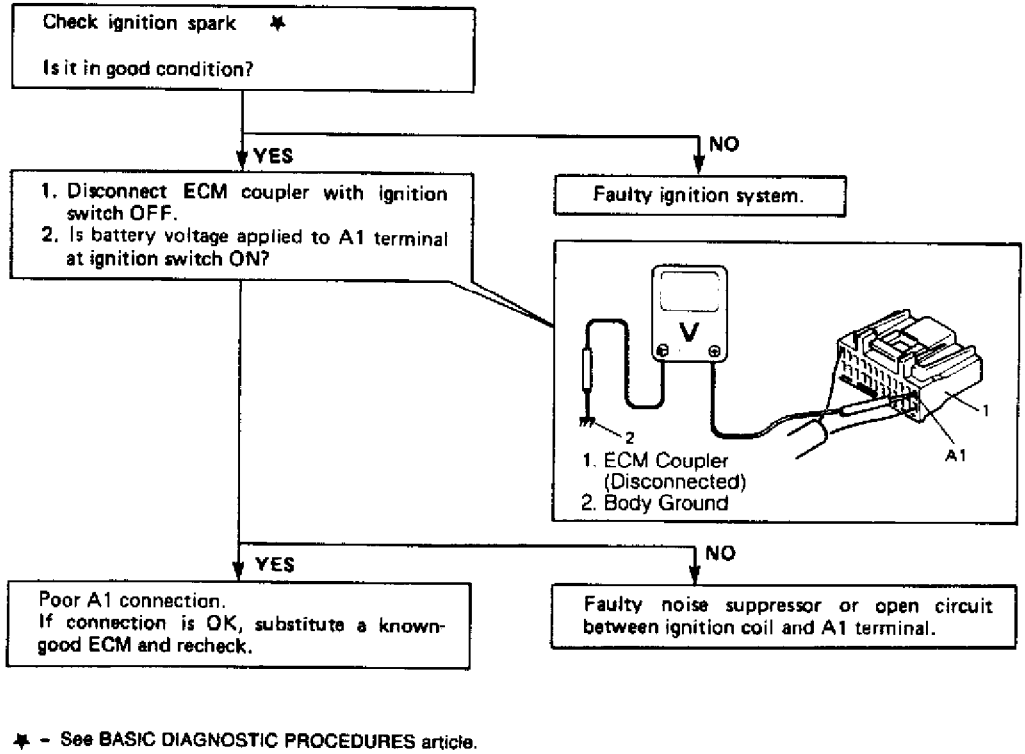
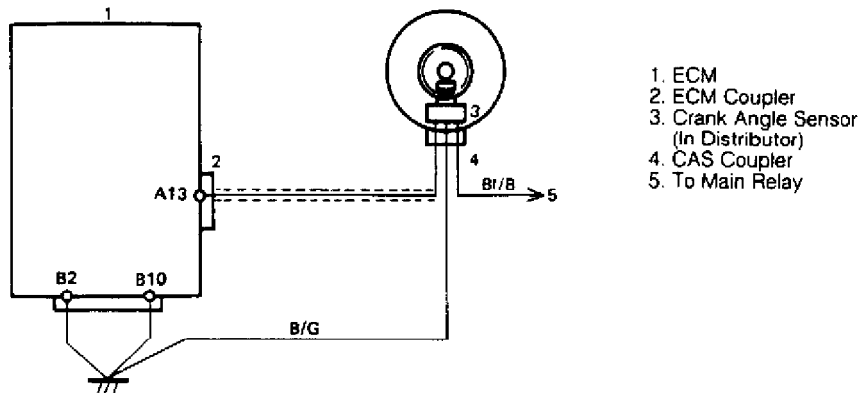


Fig. 29: Code 41, Flow Chart - No Ignition Signal

CODE 42 - CRANK ANGLE SENSOR



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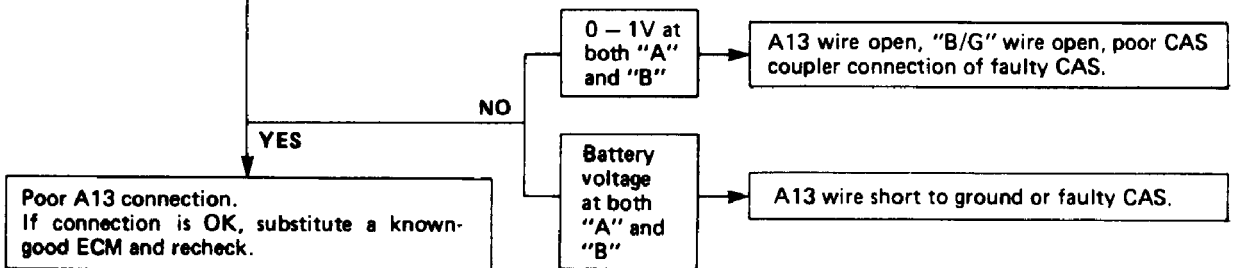
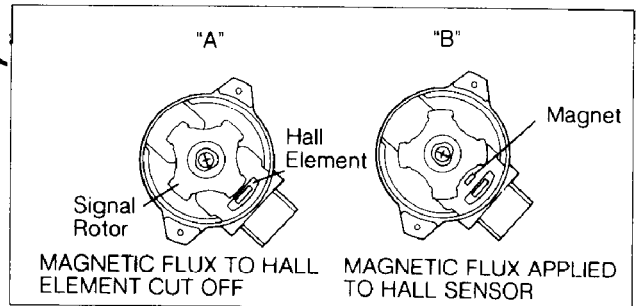
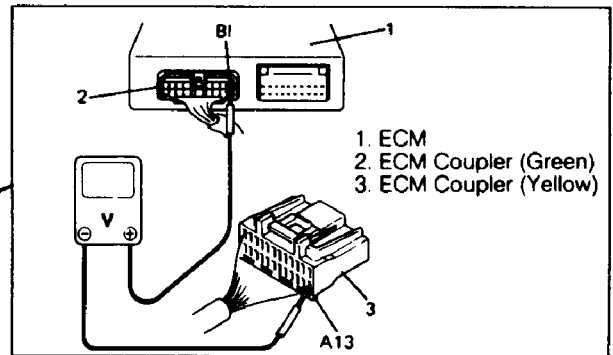
Fig. 30: Code 42, Schematic - Crank Angle Sensor

NOTE:

- Be sure to use a voltmeter with high impedance (10 kΩ/V minimum).
- Don't remove signal rotor from shaft.

1. With ignition switch OFF, disconnect ECM coupler (Yellow).
2. Connect voltmeter between B1 terminal of ECM coupler (Green) and A13 terminal of yellow coupler (disconnected).
3. Remove distributor cap, rotor and shield cover.
4. With ignition switch ON, check voltage with signal rotor inserted between hall element and magnet ("A") and without it ("B") respectively, by turning crankshaft.

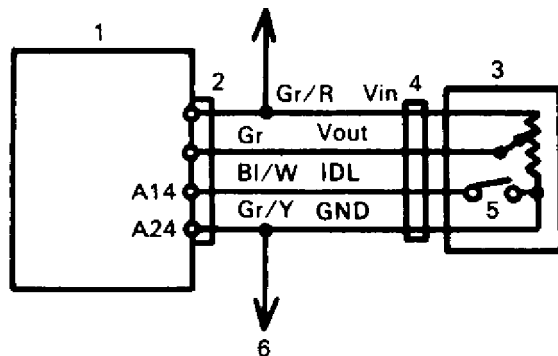
| | |
|--------------------------|-----------------|
| "A" | 0 – 1.0 V |
| "B" | Battery voltage |
| Is it in good condition? | |



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Fig. 31: Code 42, Flow Chart - Crank Angle Sensor

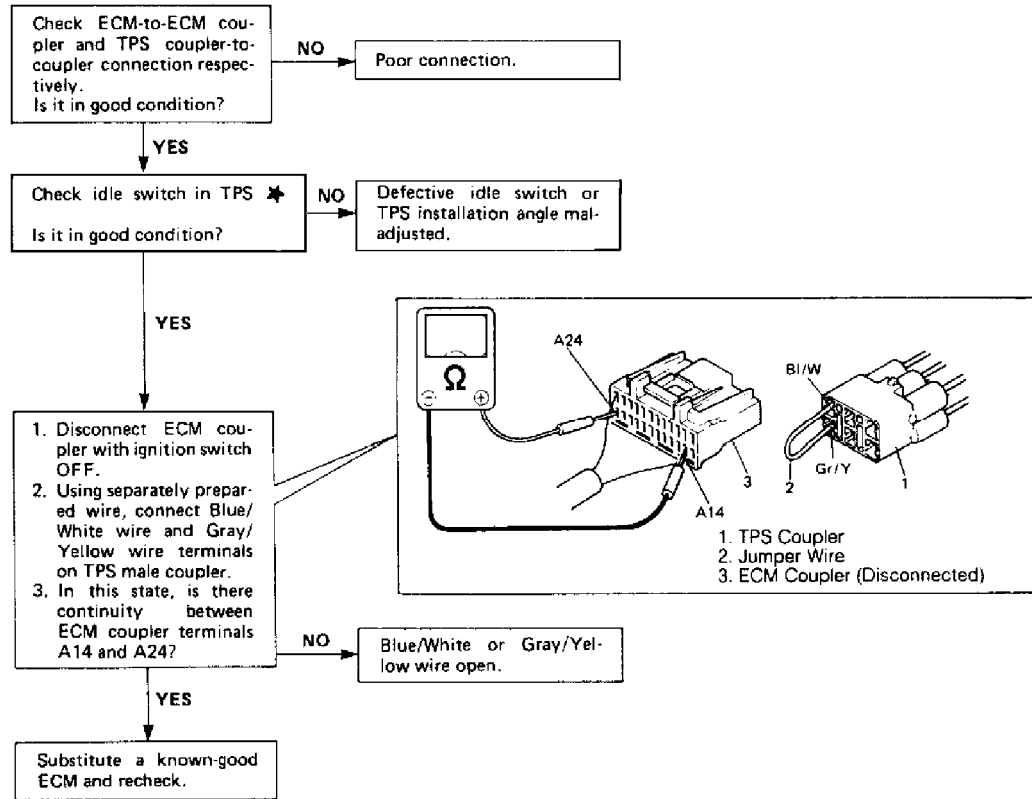
CODE 44 - IDLE SWITCH CIRCUIT OPEN OR MISADJUSTED



1. ECM
2. ECM Coupler
3. TP Sensor
4. TP Sensor Coupler
5. Idle Switch
6. To Other Sensors

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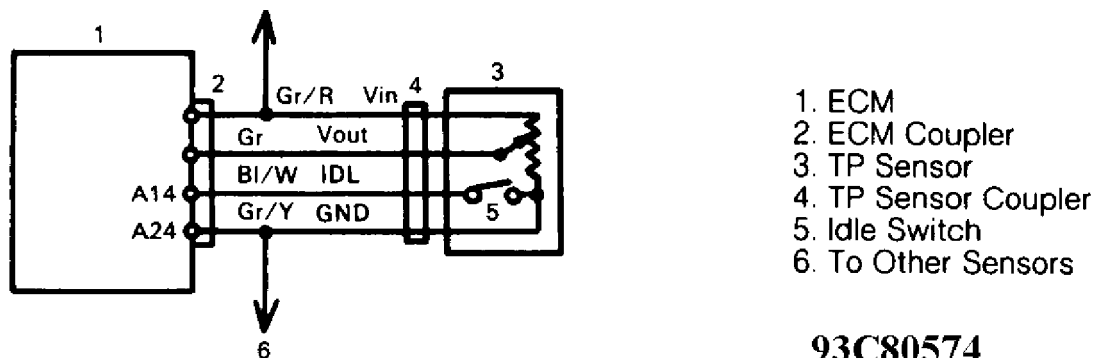
Fig. 32: Code 44, Schematic - Idle Switch Circuit Open Or Misadjusted



★- See SYSTEM & COMPONENT TESTING article.

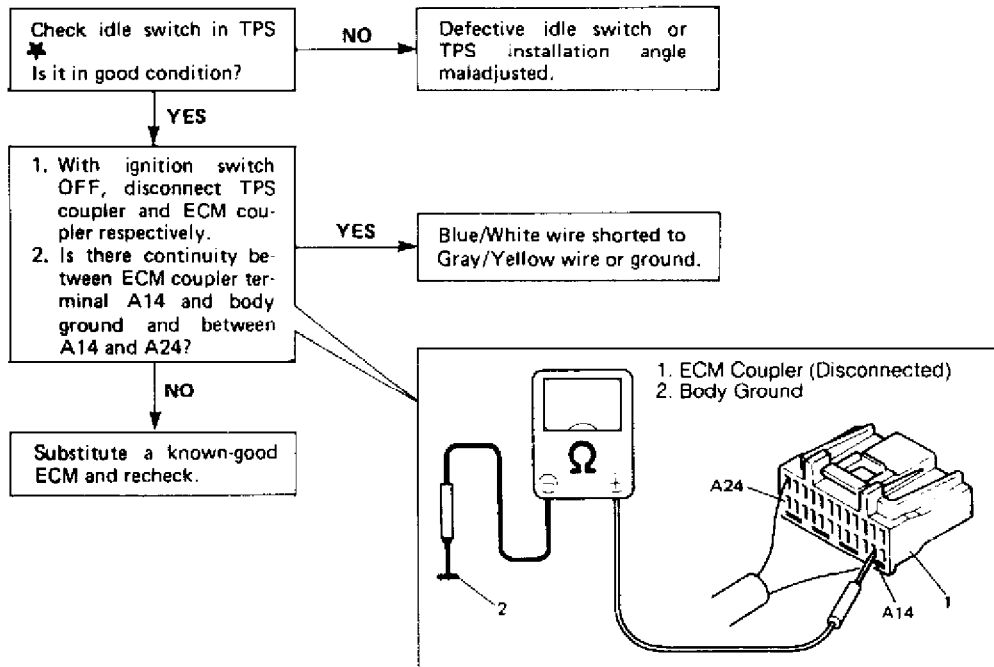
Fig. 33: Code 44, Flow Chart - Idle Switch Circuit Open Or Misadjusted

CODE 45 - IDLE SWITCH CIRCUIT SHORTED OR MISADJUSTED



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Fig. 34: Code 45, Schematic - Idle Switch Circuit Shorted Or Misadjusted



★ - See SYSTEM & COMPONENT TESTING article.

Fig. 35: Code 45, Flow Chart - Idle Switch Circuit Shorted Or Misadjusted

CODE 51 - EGR SYSTEM CIRCUIT CHECK, CALIF. MODELS ONLY

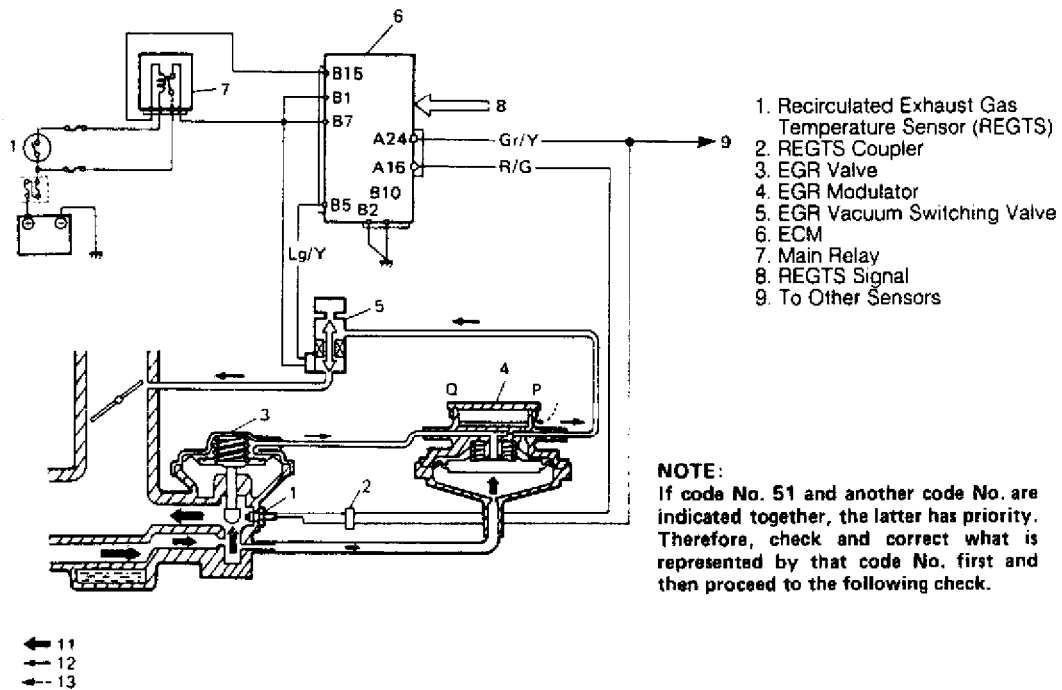
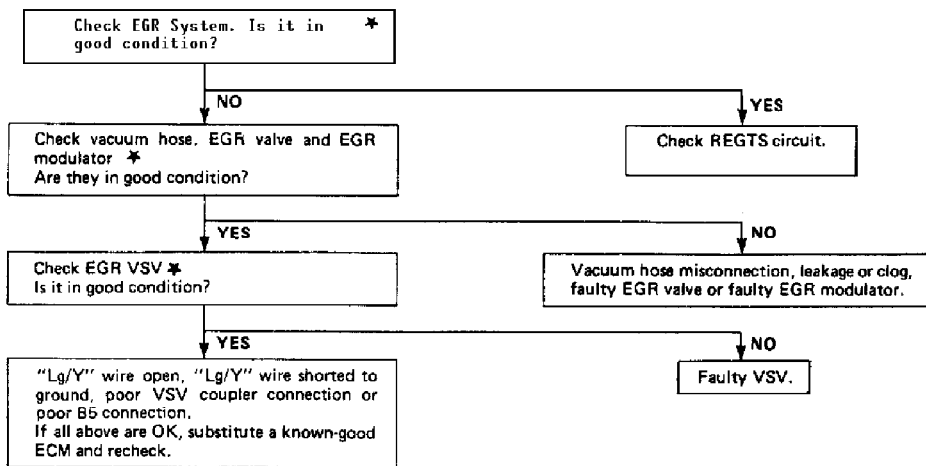


Fig. 36: Code 51, Schematic - EGR System Circuit Check, Calif

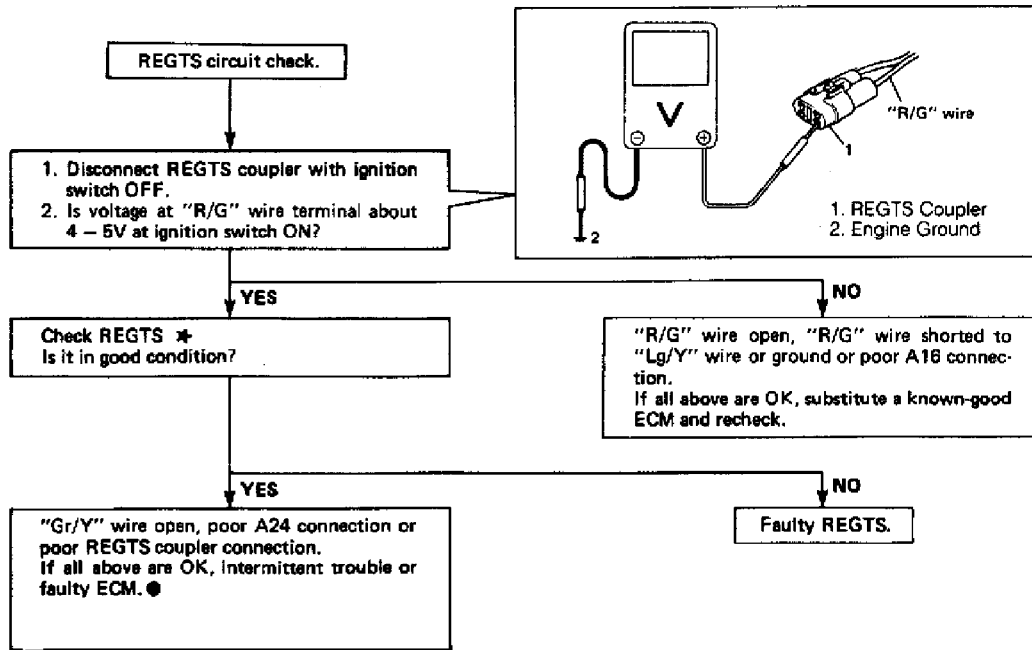
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* - See SYSTEM & COMPONENT TESTING article.

Continued on next graphic

Fig. 37: Code 51, Flow Chart (1 of 2) - EGR System Circuit Check Calif



✱ - See SYSTEM & COMPONENT TESTING article.

● - See TROUBLE SHOOTING - NO CODES article.

Fig. 38: Code 51, Flow Chart (2 of 2) - EGR System Circuit Check Calif

CODE 53 - ECM GROUND CIRCUIT CHECK, CALIF. MODELS ONLY

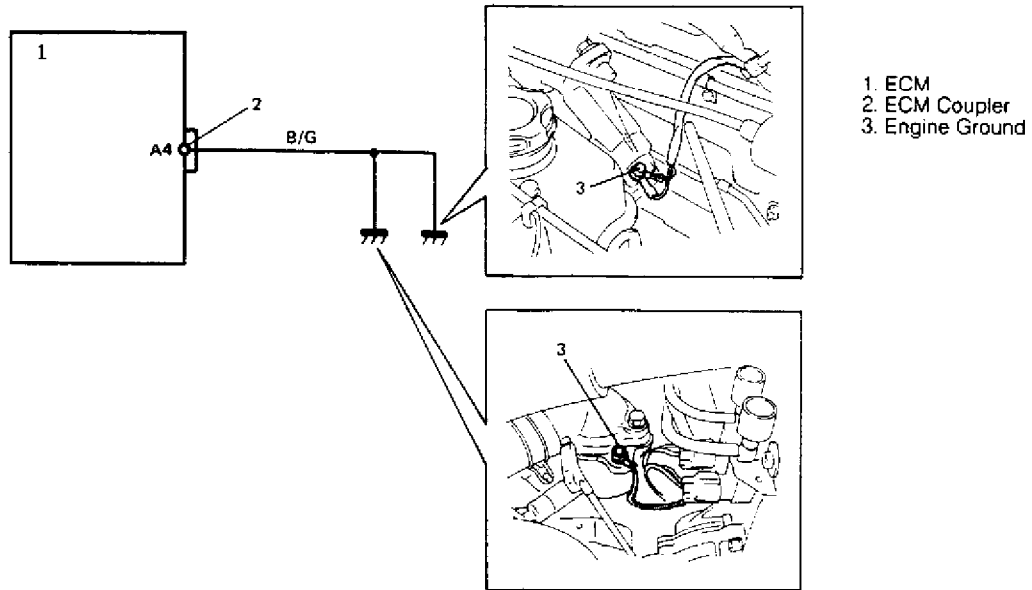
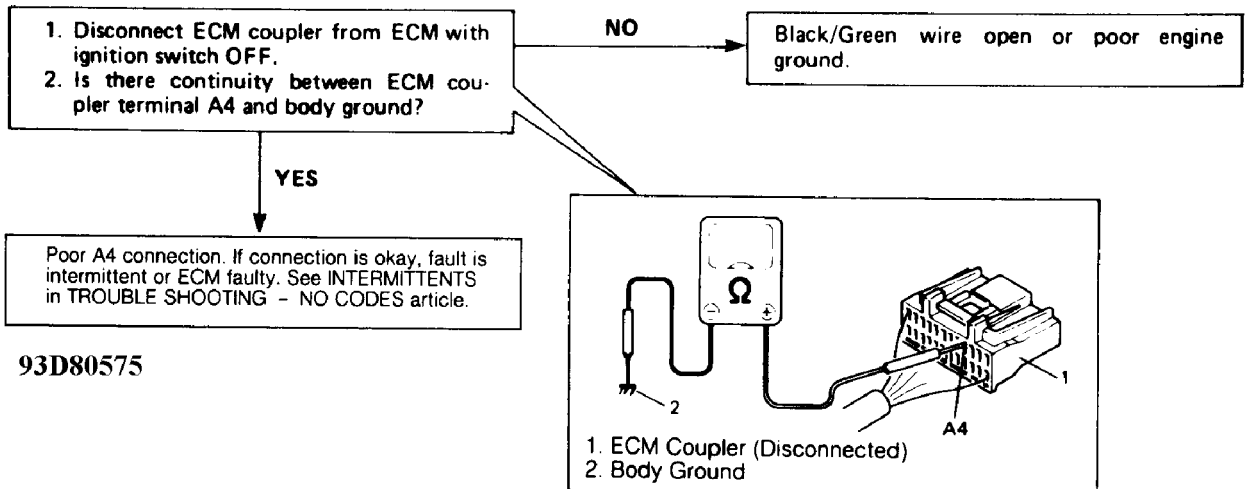


Fig. 39: Code 53, Schematic - ECM Ground Circuit Check, Calif. Only



G - TESTS W

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Fig. 40: Code 53, Flow Chart - ECM Ground Circuit Check, Calif. Only

SUMMARY

If no hard fault codes (or only pass codes) are present, driveability symptoms exist, proceed to H - TESTS W/O CODES article in the ENGINE PERFORMANCE section for diagnosis by symptom (i.e., ROUGH IDLE, NO START, etc.) or intermittent diagnostic procedures.

END OF ARTICLE