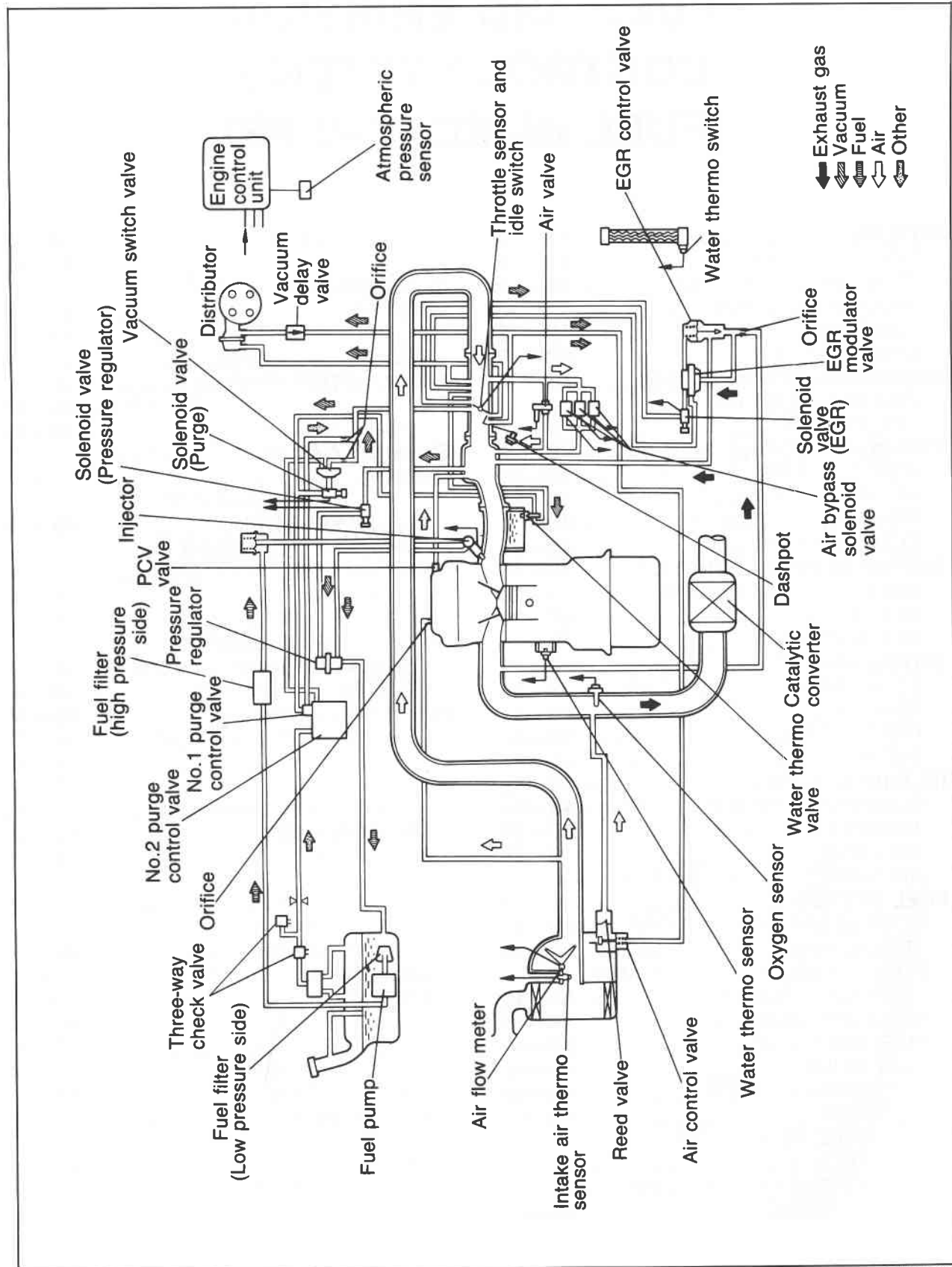


FUEL AND EMISSION CONTROL SYSTEMS (FUEL INJECTION FE)

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REMOVAL.....	4B—31	EXHAUST SYSTEM	4B—81
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INSTALLATION	4B—34	INSPECTION.....	4B—82
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FUEL PRESSURE RELEASE AND		BRAKE LIGHT SWITCH	4B—91
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TROUBLESHOOTING	4B—55	SENSOR.....	4B—99

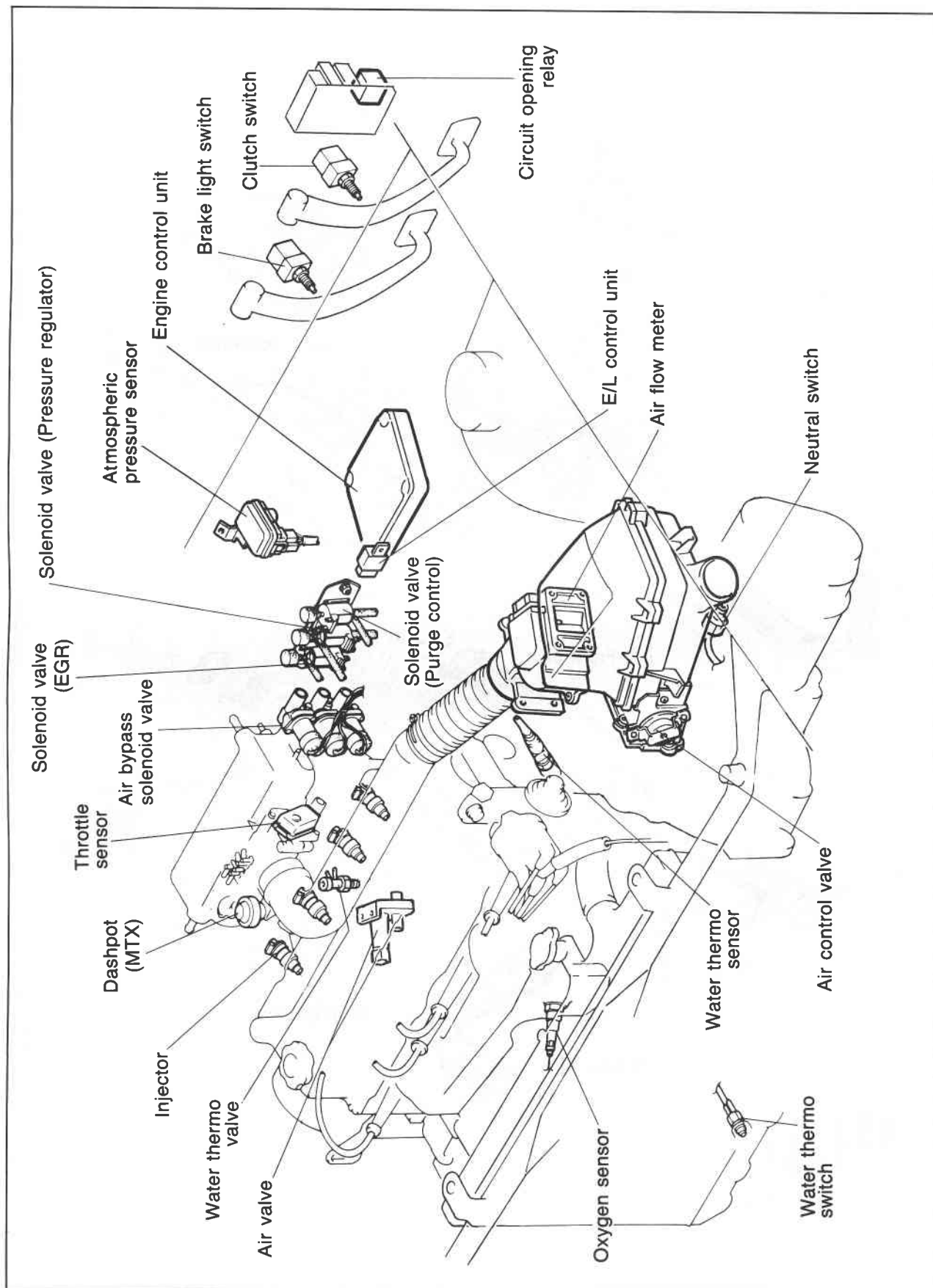
OUTLINE

SYSTEM DIAGRAM



86U04A-002

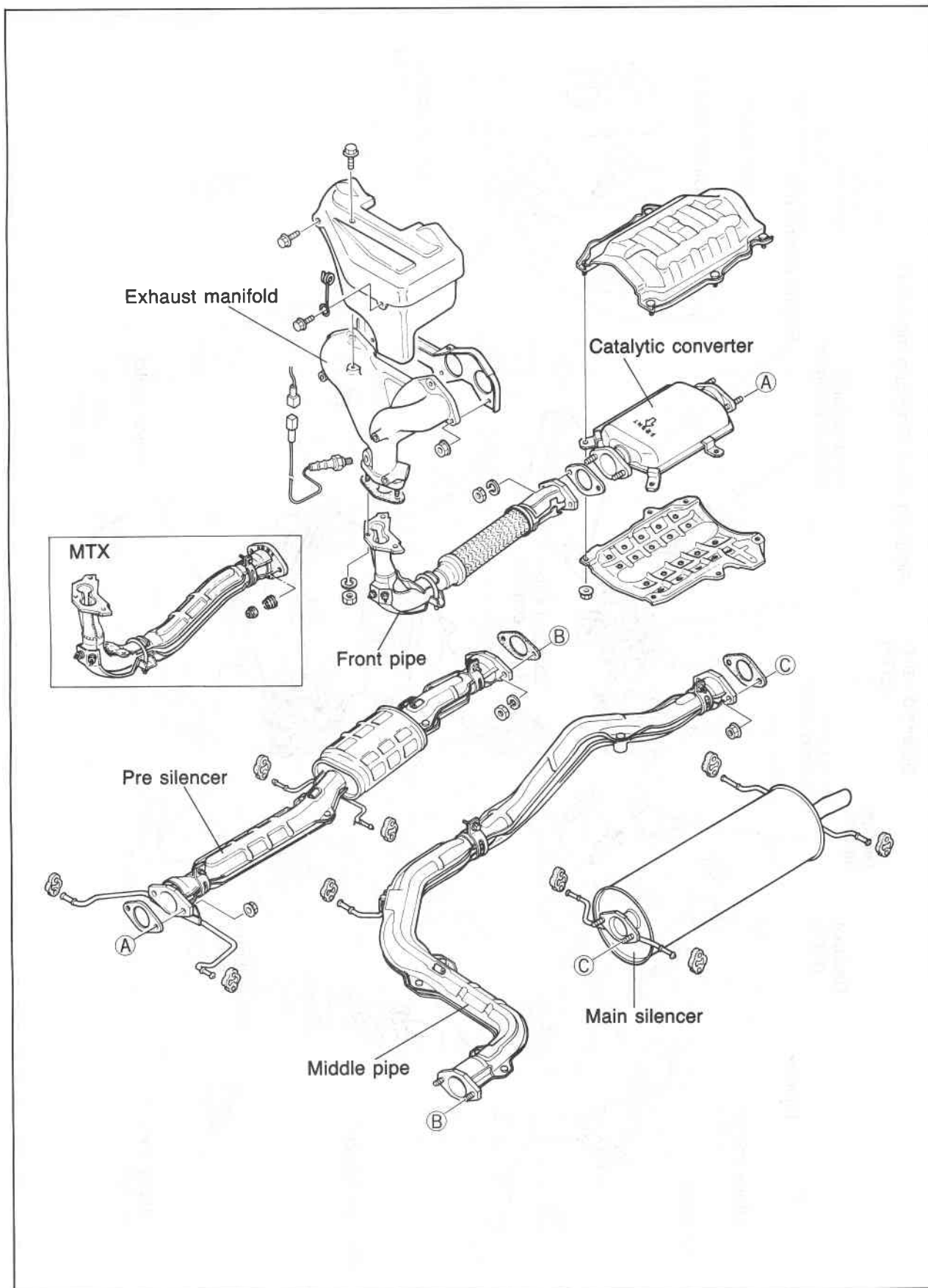
COMPONENT LOCATION



76G04B-002

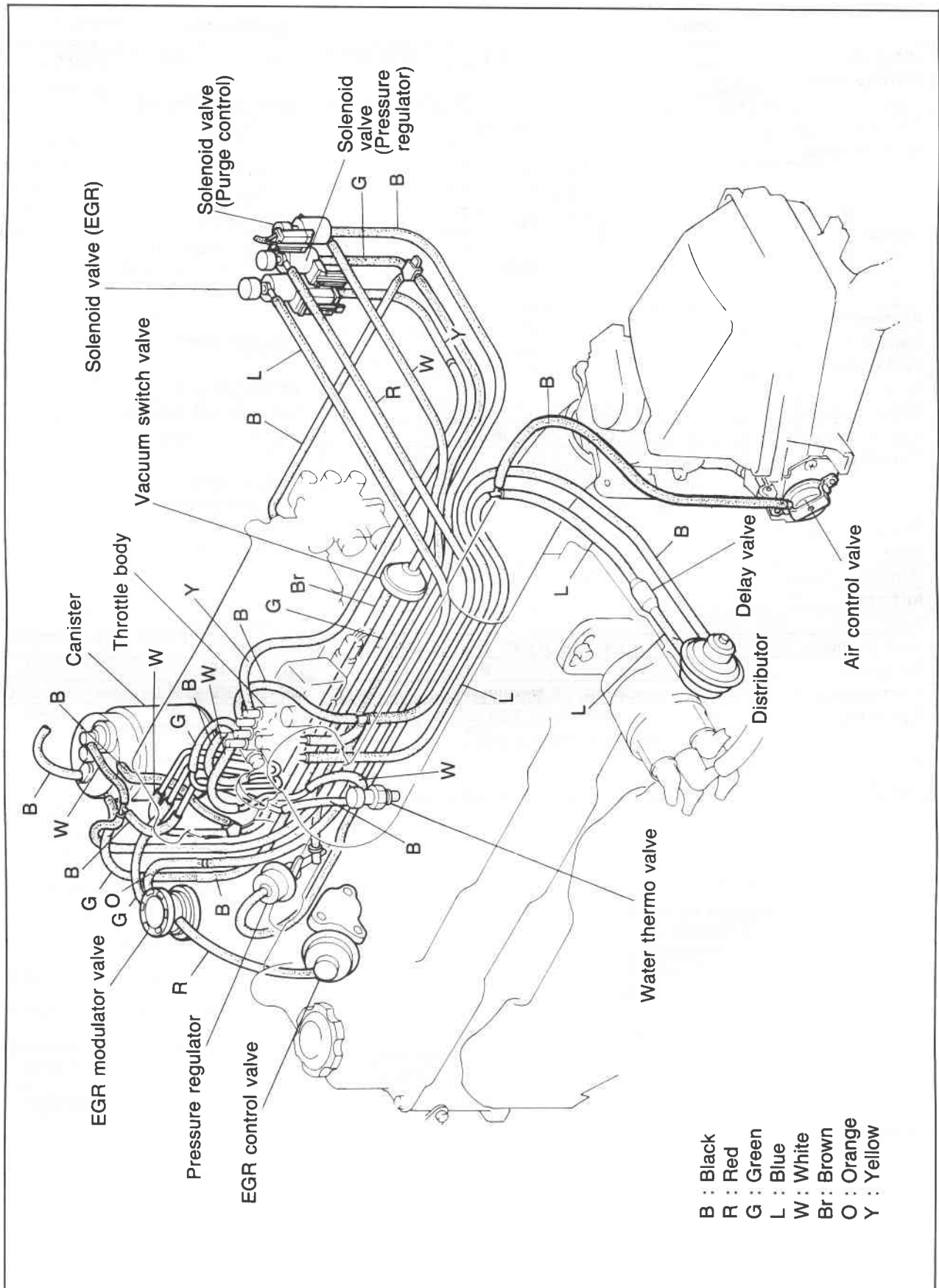
4B OUTLINE

Exhaust System



86U04A-005

VACUUM HOSE ROUTING DIAGRAM



86U04A-006

4B OUTLINE

SPECIFICATIONS

Item		Specification
Idle speed	rpm	MTX: 800 $\pm 50\%$ (Neutral), ATX: 900 $\pm 50\%$ (P range)
Throttle body		
Type		Horizontal draft (1-barrel)
Throat diameter	mm (in)	50 (2.0)
Air flow meter		
Resistor	E2—Vs	More than 20
	E2—Vc	100—300
	E2—Vb	200—400
	E2—THA	-20°C (-4°F) 13,600—18,400 20°C (68°F) 2,210— 2,690 60°C (140°F) 493— 667
Air cleaner		
Element type		Oil permeated
Fuel pump		
Type		Impeller (in tank)
Output pressure	kPa (kg/cm ² , psi)	441—588 (4.5—6.0, 64—85)
Feeding capacity	cc (cu in)/10 sec.	220 (13.4) minmum
Fuel flter		
Type	Low pressure side	Nylon element
	High pressure side	Paper element
Pressure regulator		
Type		Diaphragm
Regulating pressure	kPa (kg/cm ² , psi)	235—275 (2.4—2.8, 34—40)
Injector		
Type		High-ohmic
Type of drive		Voltage
Resistance	Ω	12—16
Injection amount	cc (cu in) 15 seconds	38—53 (2.3—3.2)
Fuel tank		
Capacity	liters (US gal, Imp gal)	60 (15.9, 13.2)
Fuel		
Specification		Unleaded regular

76G04B-506

TROUBLESHOOTING GUIDE

This troubleshooting guide shows the malfunction numbers and the symptoms of various failures. Perform troubleshooting as described below.

Possible cause		Input sensors and switches								Output solenoid valves				
		Ignition pulse	Air flow meter	Water thermo sensor	Intake air thermo sensor	Throttle sensor	Atmospheric pressure sensor	Oxygen sensor	Feedback system	Solenoid valve (Pressure regulator)	Solenoid valve (Purge)	Solenoid valve (EGR)	Air bypass solenoid valve (Idle-up C)	Air bypass solenoid valve (Idle-up B)
Symptom		4B-14	4B-15	4B-16	4B-17	4B-18	4B-19	4B-20	4B-21	4B-22	4B-23	4B-23	4B-23	4B-24
1	Fault Indicated by SST Code No.	01	08	09	10	12	14	15	17	25	26	28	34	35
2 Hard start or won't start (Crank OK)		<div>TRUBLESHOOTING PROCEDURE</div> <div>Note</div> <div>Step 1 under symptom is to quickly determine what system or unit may be at fault by use of the SST. (Self-Diagnosis Checker 49 H018 9A1)</div> <div>1st: Check input sensors and output solenoid valves with the SST. (Refer to page 4B-10.)</div> <div>2nd: Check other switches with the SST. (Refer to page 4B-26.)</div> <div>3rd: Check the following items:</div> <div><div>Electrical system</div><div>1) Battery condition</div><div>2) Fuses</div><div>Fuel system</div><div>1) Fuel level</div><div>2) Fuel leakage</div><div>3) Fuel filter</div><div>4) Idle speed</div><div>Engine</div><div>1) Compression</div><div>2) Overheating</div><div>Ignition system</div><div>1) Ignition spark</div><div>2) Ignition timing</div><div>Intake air system</div><div>1) Air cleaner element</div><div>2) Vacuum or air leakage</div><div>3) Vacuum hose routing</div><div>4) Accelerator cable</div><div>Others</div><div>1) Clutch slippage</div><div>2) Brake dragging</div><div>4th: Check Fuel and Emission Control Systems. (Refer to page 4B-8.)</div></div>												
3	Engine stalls													
	While warming up													
	After warming up													
4	Rough idle													
	While warming up													
	After warming up													
5	High idle speed after warming up													
6	Poor acceleration, hesitation or lack of power													
7	Runs rough on deceleration													
8	Afterburn in exhaust system													
9	Poor fuel consumption													
10	Engine stalls or rough after hot starting													
11	Fails emission test													

76G04B-003

4B TROUBLESHOOTING GUIDE

The Troubleshooting Guide lists the systems most likely to cause a given symptom. After finding systems to check, refer to the pages shown for detailed guides for each system.

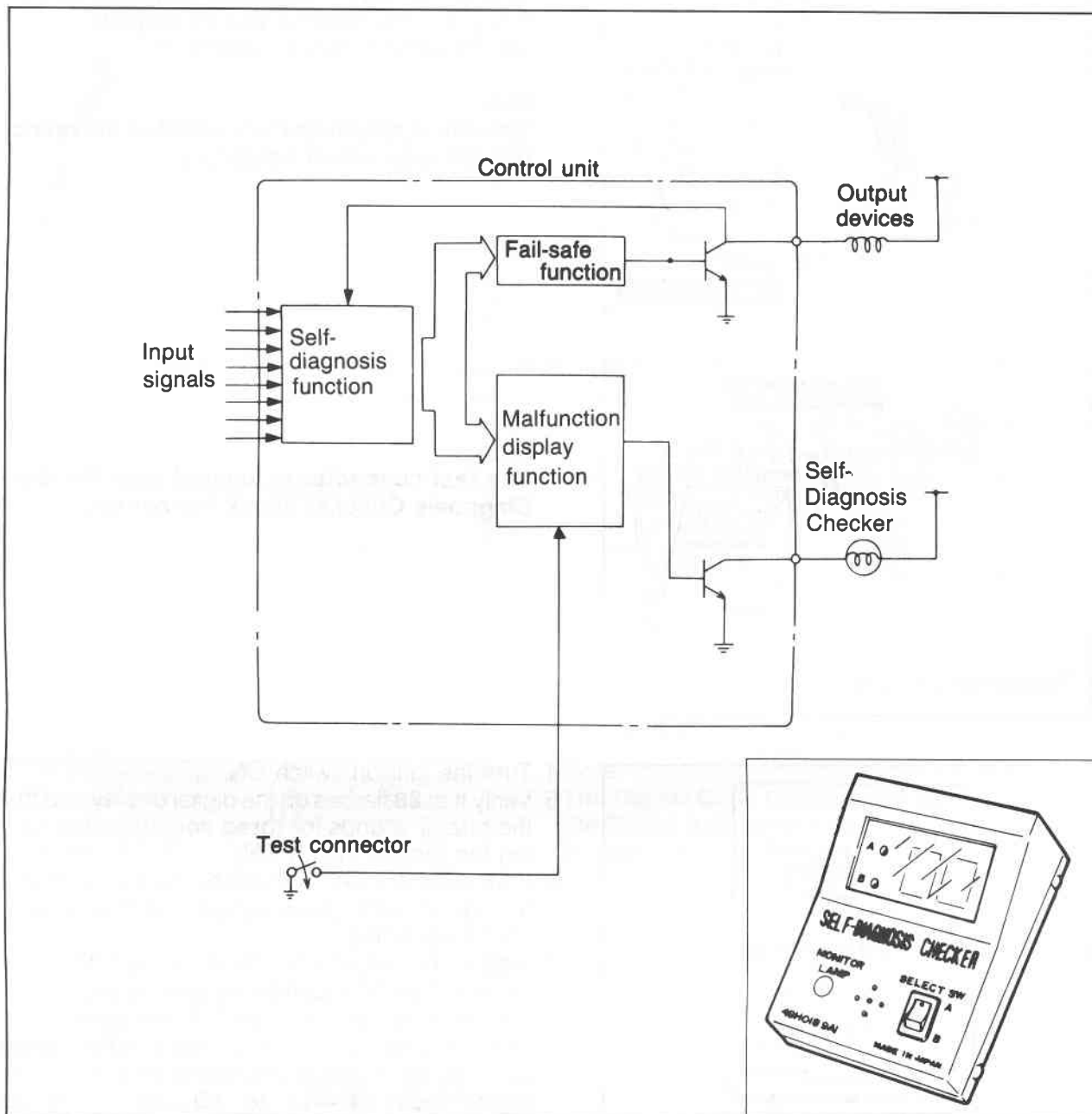
Possible cause		Fuel and Emission Control Systems									
		Intake Air System (Poor connection of components, throttle body)	Fuel System (Fuel injection, Fuel pressure)	Pressure Regulator Control System	Idle-up System (Air valve, solenoid valve malfunction)	EGR System (EGR control valve stuck and open)	EEC system (Vacuum switch valve, No.1 purge control valve malfunction)	PCV System (System clogged)	Deceleration System (Dashpot, fuel cut operation malfunction)	Air injection system (Reed valve malfunction)	Exhaust system (System clogged)
Page		4B—30	4B—42	4B—53	4B—35	4B—71	4B—74	4B—80	4B—64	4B—68	4B—81
Symptom	2	2	1								
	3	4	3		1	2					
		5	4		2	3		1			
	4	6	5		1	4		2		3	
		7	6		2	4	5	1		3	
	5	3			1				2		
	6	3	4			1	2				5
	7		3		2				1		
	8	3	4		1				2		
	9		2			3			1		4
	10		2	1							
	11	7	8		5	2	6		3	4	1

76G04B-004

The numbers of the list show the priorities of inspections from the most possible to that with the lowest possibility.

These were determined on the following basis:

- Ease of inspection
- Most possible system
- Most possible point in system

TROUBLESHOOTING WITH SST

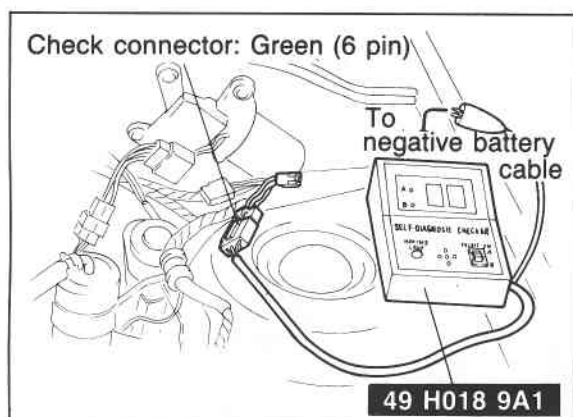
86U04A-010

When troubles occur in the main input devices or output devices, check for the cause using the **SST**. Failures of each input and output device are indicated and retrieved from the control unit as malfunction code numbers.

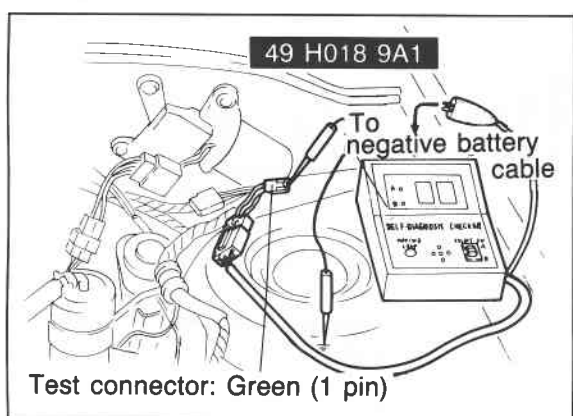
Note

The control unit constantly checks for malfunction of the input devices. But, the control unit checks for malfunction of output devices only in a 3 second period after the ignition switch is turned ON and the test connector is grounded.

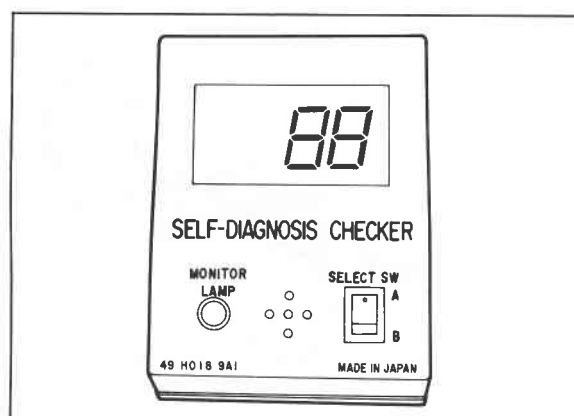
4B TROUBLESHOOTING WITH SST



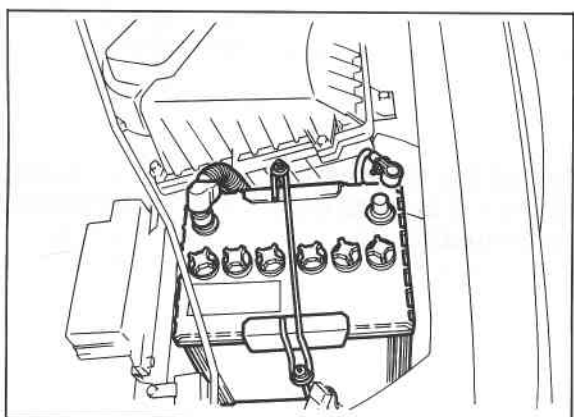
86U04A-011



86U04A-012



76G04B-005



76G04B-134

INSPECTION PROCEDURE

1. Connect the **SST** to the check connector, (Green, 6-pin) and the negative battery terminal.
2. Set the select switch to position A.

Note

The check connector is located at the rear of the left side wheel housing.

3. Ground the test connector (Green, 1-pin) with a jumper wire.

Note

The test connector is located near the Self-Diagnosis Checker check connector.

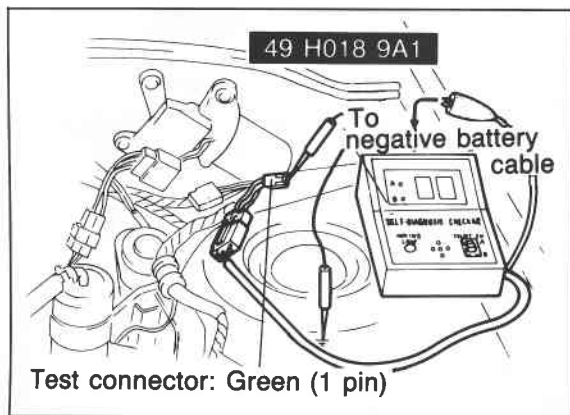
4. Turn the ignition switch ON.
5. Verify that **88** flashes on the digital display and that the buzzer sounds for **three seconds** after turning the ignition switch ON.
6. If **88** does not flash, check the main relay (Refer to page 4B—86), power supply circuit, and check connector wiring.
7. If **88** flashes and the buzzer sounds continuously for more than **20 seconds**, replace the engine control unit and perform steps 3 and 4 again.
8. Note the code numbers and check for the causes by referring to the check sequences shown on pages **from 4B—14 to 4B—24**. Repair as necessary.

Note

Cancel the code numbers by performing the after-repair procedure after repairing.

AFTER-REPAIR PROCEDURE

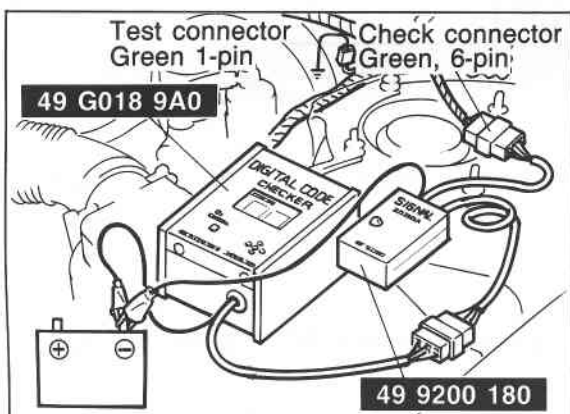
1. Cancel the memory of malfunctions by disconnecting the negative battery cable and depressing the brake pedal for **at least 2 seconds**; then reconnect the negative battery cable.



86U04A-015

**Ignition switch: ON
for six seconds**

76G04B-006



76G04B-007

2. Connect the **SST** to the check connector.
3. Ground the test connector (Green, 1-pin) with a jumper wire.

4. Turn the ignition switch ON, but do not start the engine for **six seconds**.
5. Start and warm up the engine, then run it at **2,500—3,000 rpm** for **three** minutes in neutral.
6. Verify that no code numbers are displayed.

Note

The Digital Code Checker (49 G018 9A0) with the Signal Adapter (49 9200 180) may be used in place of the Self-Diagnosis Checker (49 H018 9A1).

4B TROUBLESHOOTING WITH SST

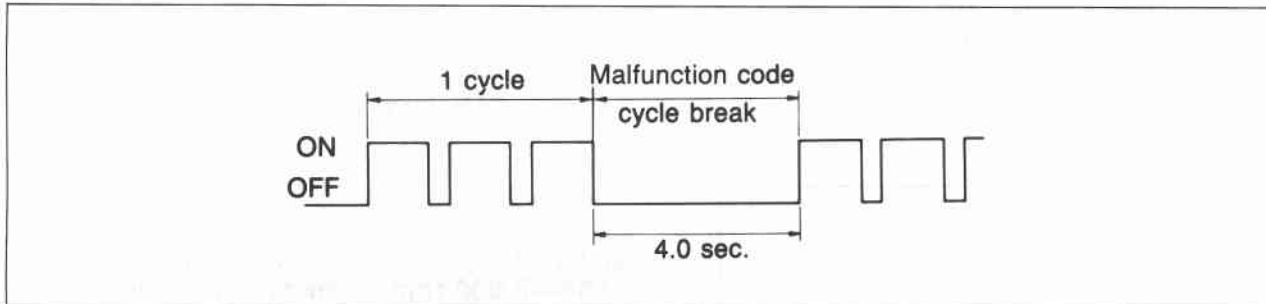
PRINCIPLE OF CODE CYCLE

Malfunction codes are determined as shown below

86U04A-017

1. Code cycle break

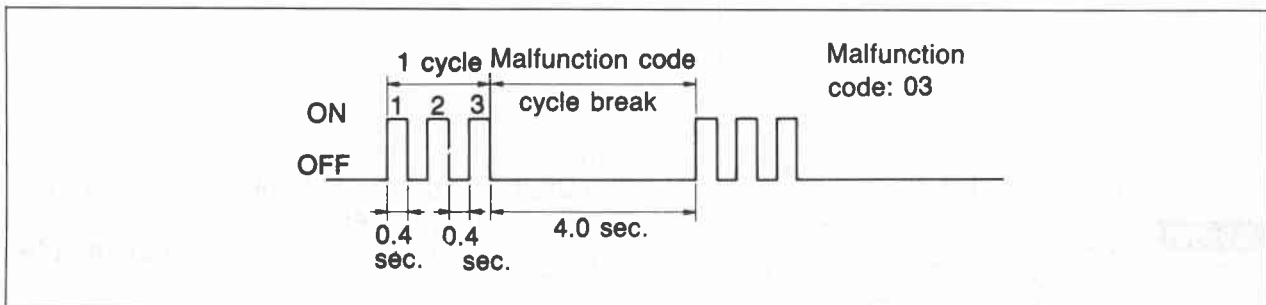
The time between malfunction code cycles is 4.0 sec (the time the light is off).



76G04B-122

2. Second digit of malfunction code (ones position)

The digit in the ones position of the malfunction code represents the number of times the buzzer is on 0.4 sec during one cycle.

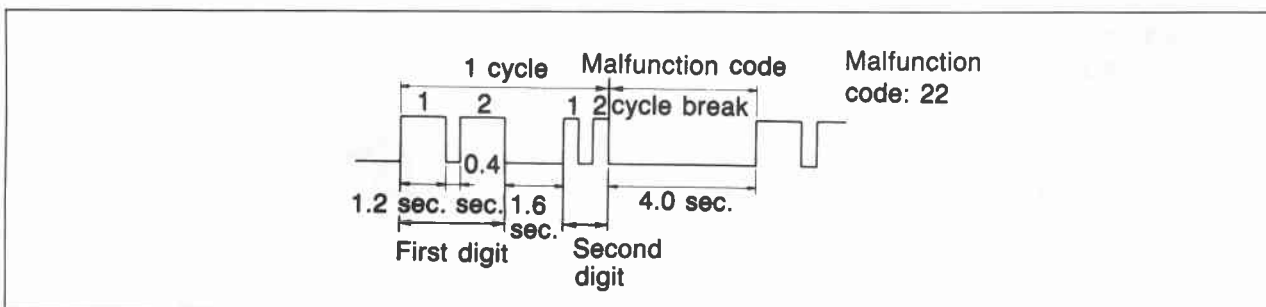


76G04B-123

3. First digit of malfunction code (tens position)








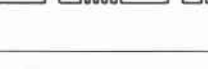





The digit in the tens position of the malfunction code represents the number of times the buzzer is on 1.2 sec during one cycle.

It should also be noted that the light goes off for 1.6 sec. between the long and short pulses of the buzzer.



76G04B-124

CODE NUMBER

Malfunction display		Sensor or subsystem	Self-diagnosis	Fail-safe
Code No.	Output signal pattern			
01	ON OFF 	Ignition pulse	No ignition signal	—
08	ON OFF 	Air flow meter	Open or short circuit	Maintains basic signal at preset value
09	ON OFF 	Water thermo sensor	Open or short circuit	Maintains constant command 35°C (95°F)
10	ON OFF 	Intake air thermo sensor (air flow meter)	Open or short circuit	Maintains constant 20°C (68°F) command
12	ON OFF 	Throttle sensor	Open or short circuit	Maintains constant command of throttle valve fully open
14	ON OFF 	Atmospheric pressure sensor	Open or short circuit	Maintains constant command of sea level pressure
15	ON OFF 	Oxygen sensor	Sensor output continues less than 0.55V 120 sec. after engine starts (1,500 rpm)	Cancels EGI feed-back operation
17	ON OFF 	Feedback system	Sensor output not changed 20 sec. after engine exceeds 1,500 rpm	Cancels EGI feed-back operation
25	ON OFF 	Solenoid valve (pressure regulator)	Open or short circuit	—
26	ON OFF 	Solenoid valve (purge control)		—
28	ON OFF 	Solenoid valve (EGR)		—
34	ON OFF 	Air bypass solenoid valve (Idle-up C)		—
35	ON OFF 	Air bypass solenoid valve (Idle-up B)		—

76G04B-008

Caution

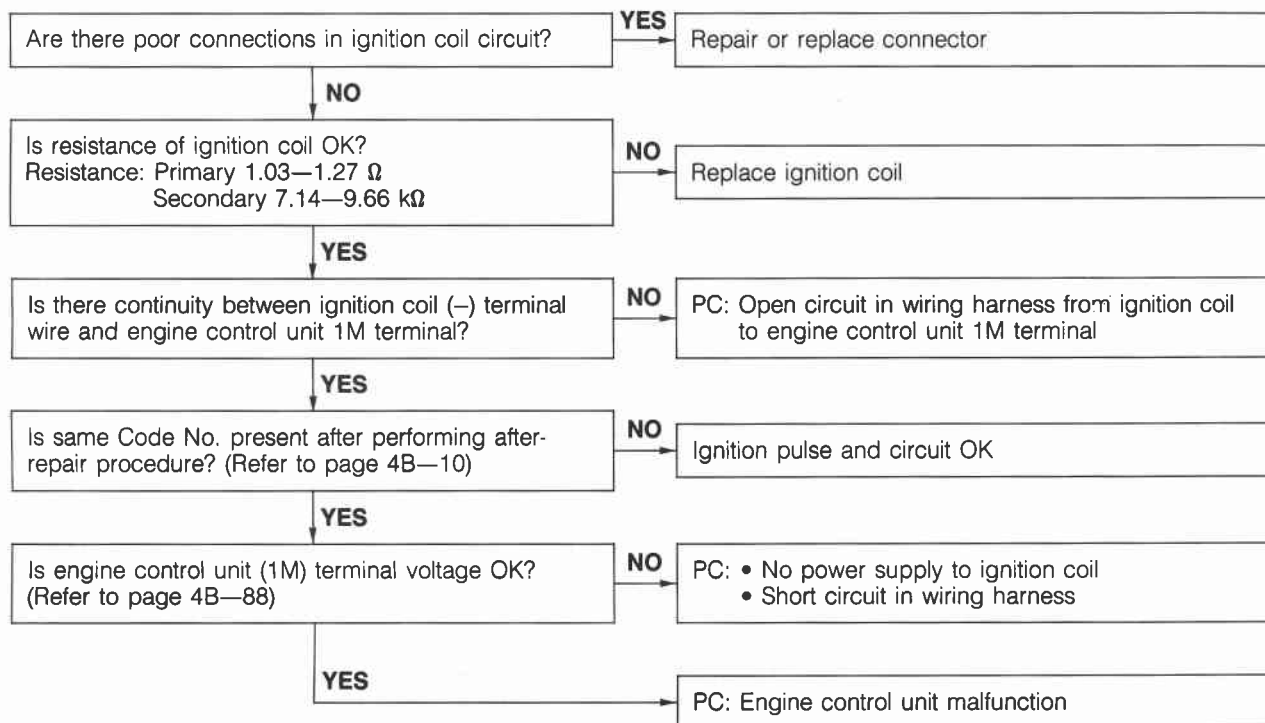
- If there is more than one failure present, the lowest number malfunction code is displayed first, the remaining codes are displayed sequentially.
- After repairing a failure, turn off the ignition switch and disconnect the negative battery cable and depress the brake pedal for at least 2 seconds to erase the memory of a malfunction code.

4B TROUBLESHOOTING WITH SST

If a malfunction code number is shown on the **SST**, check the following chart along with the wiring diagram.

Code No. 01 (Ignition pulse)

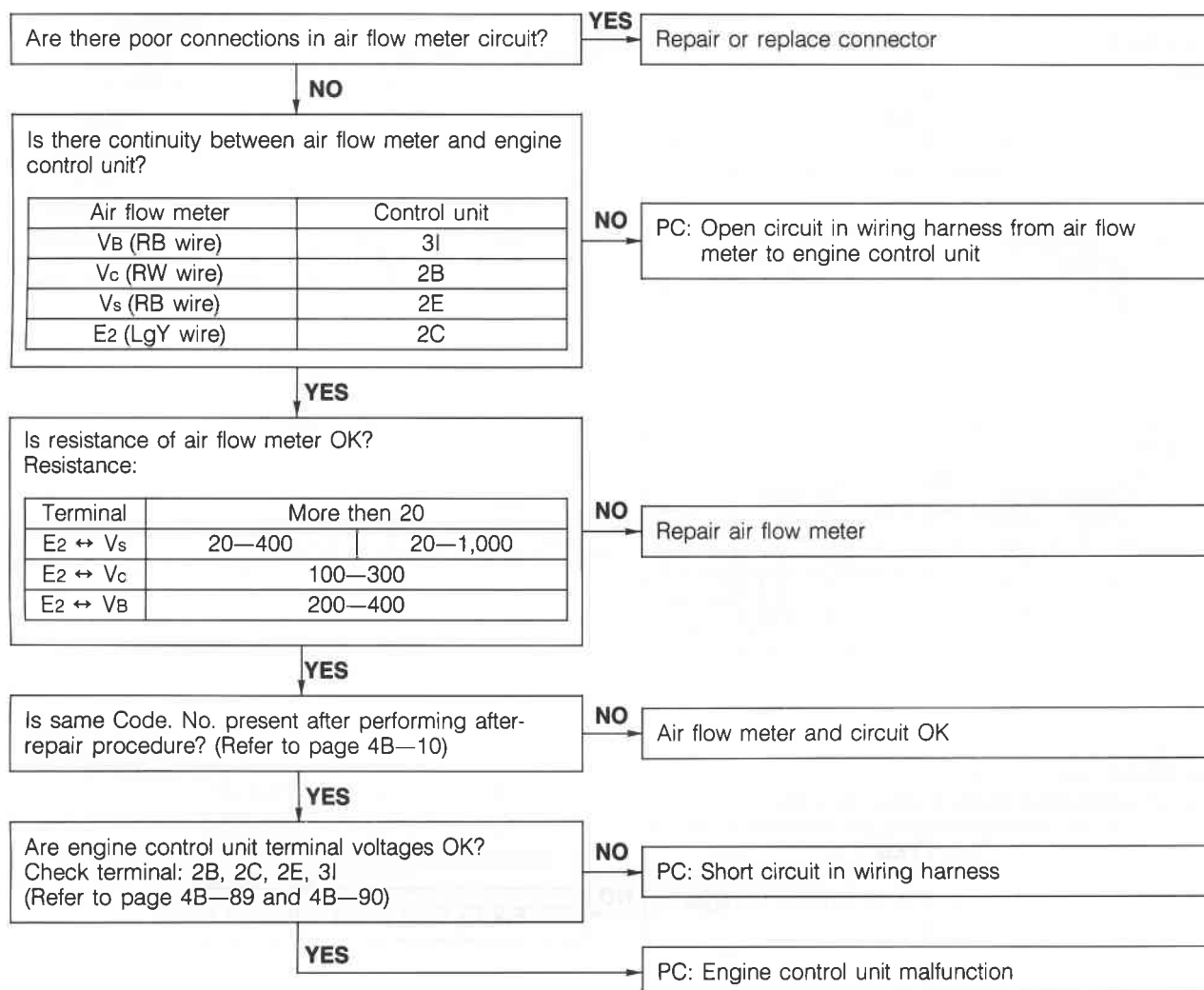
PC: Possible Cause



76G04B-009

Code No. 08 (Air flow meter)

PC: Possible Cause

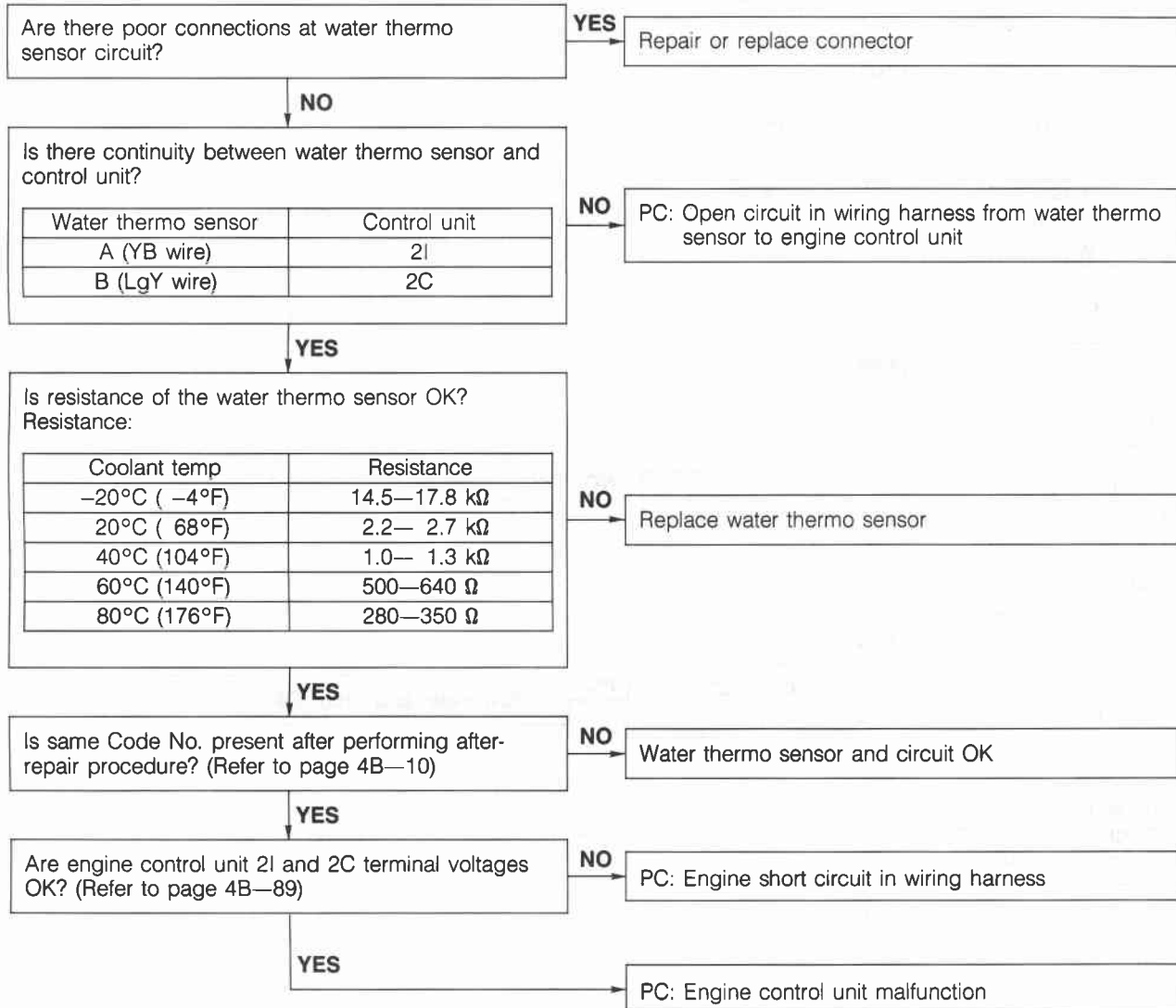


76G04B-010

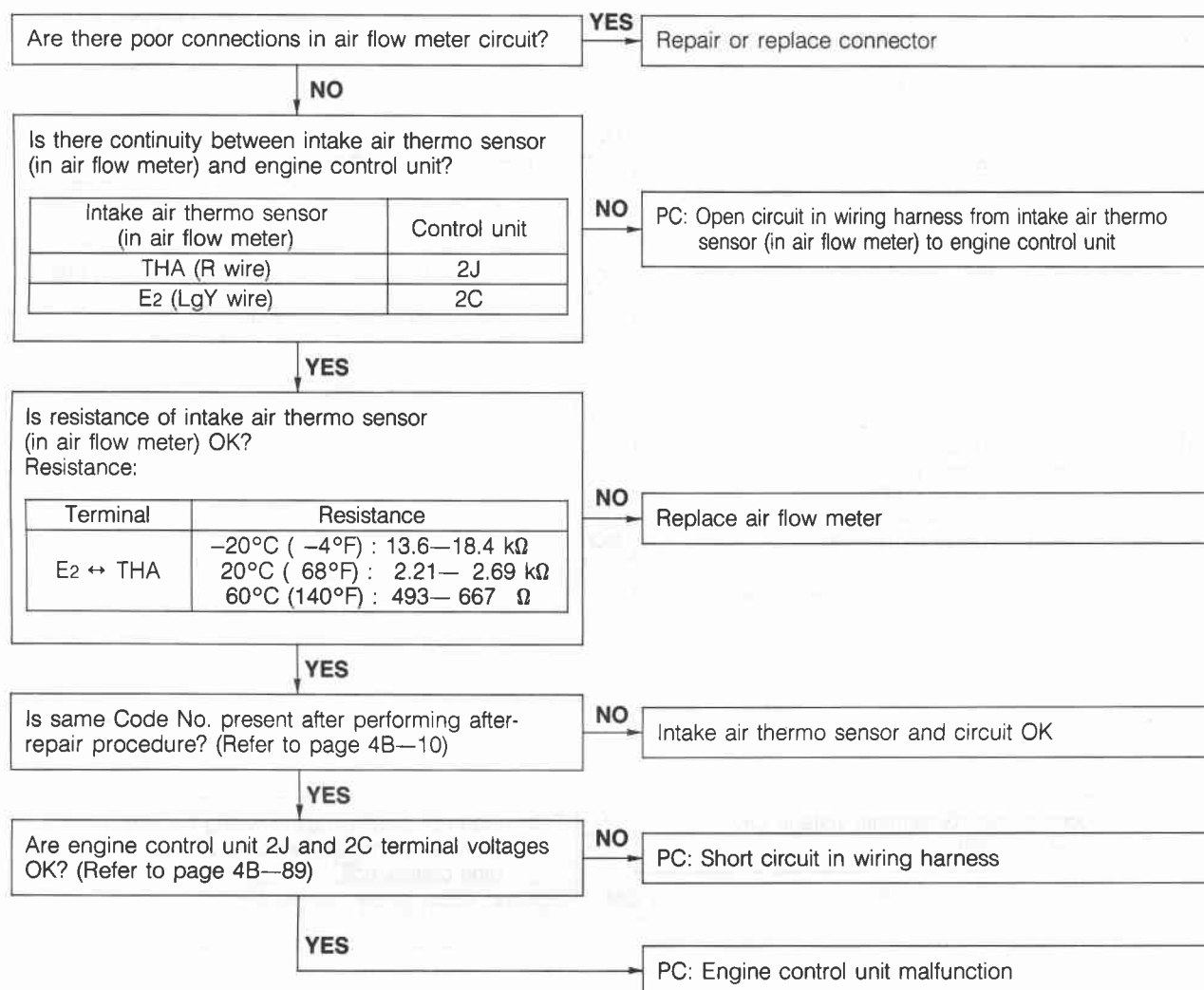
4B TROUBLESHOOTING WITH SST

Code No. 09 (Water thermo sensor)

PC: Possible Cause



76G04B-011

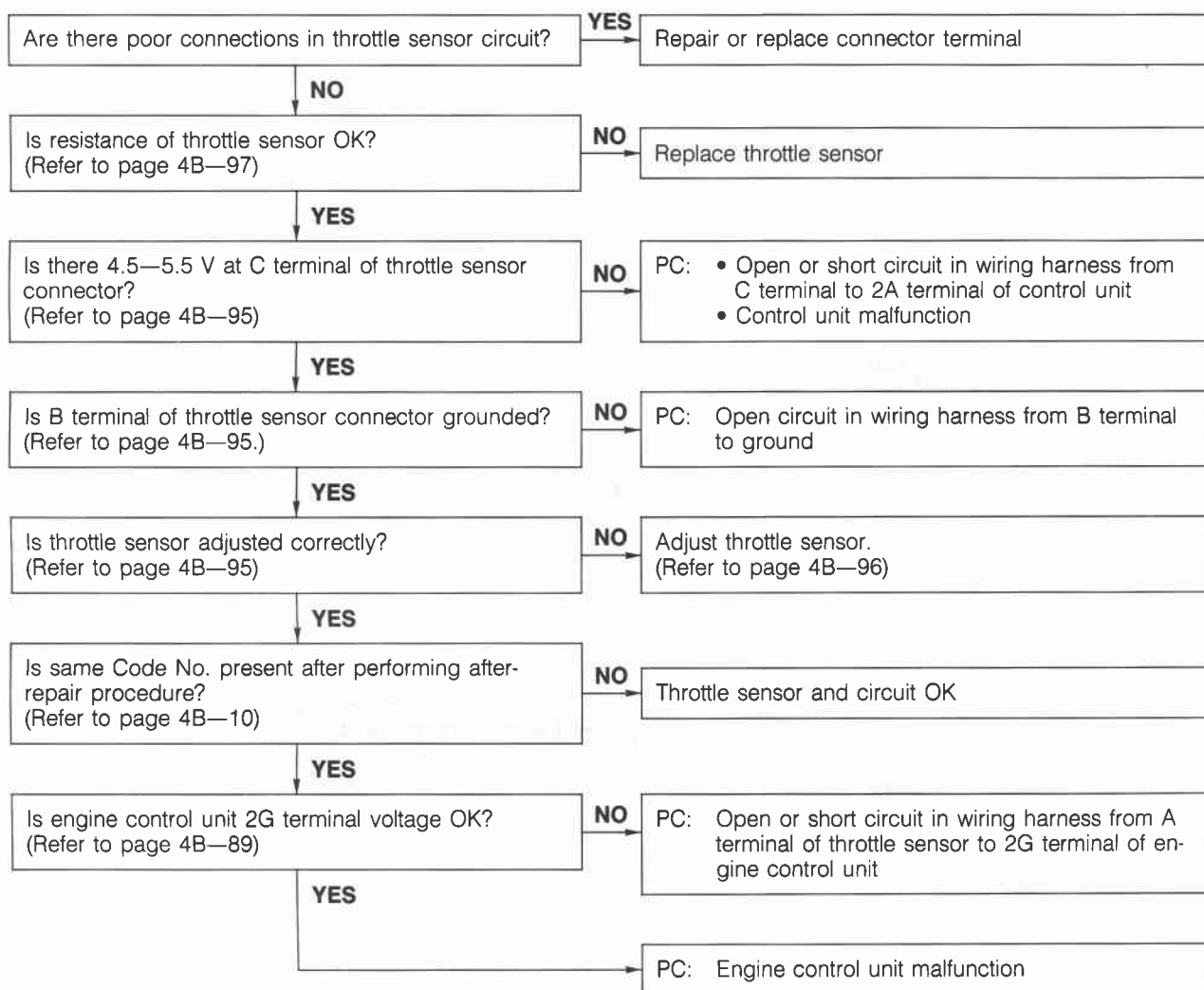
Code No. 10 (Intake air thermo sensor)**PC: Possible Cause**

76G04B-012

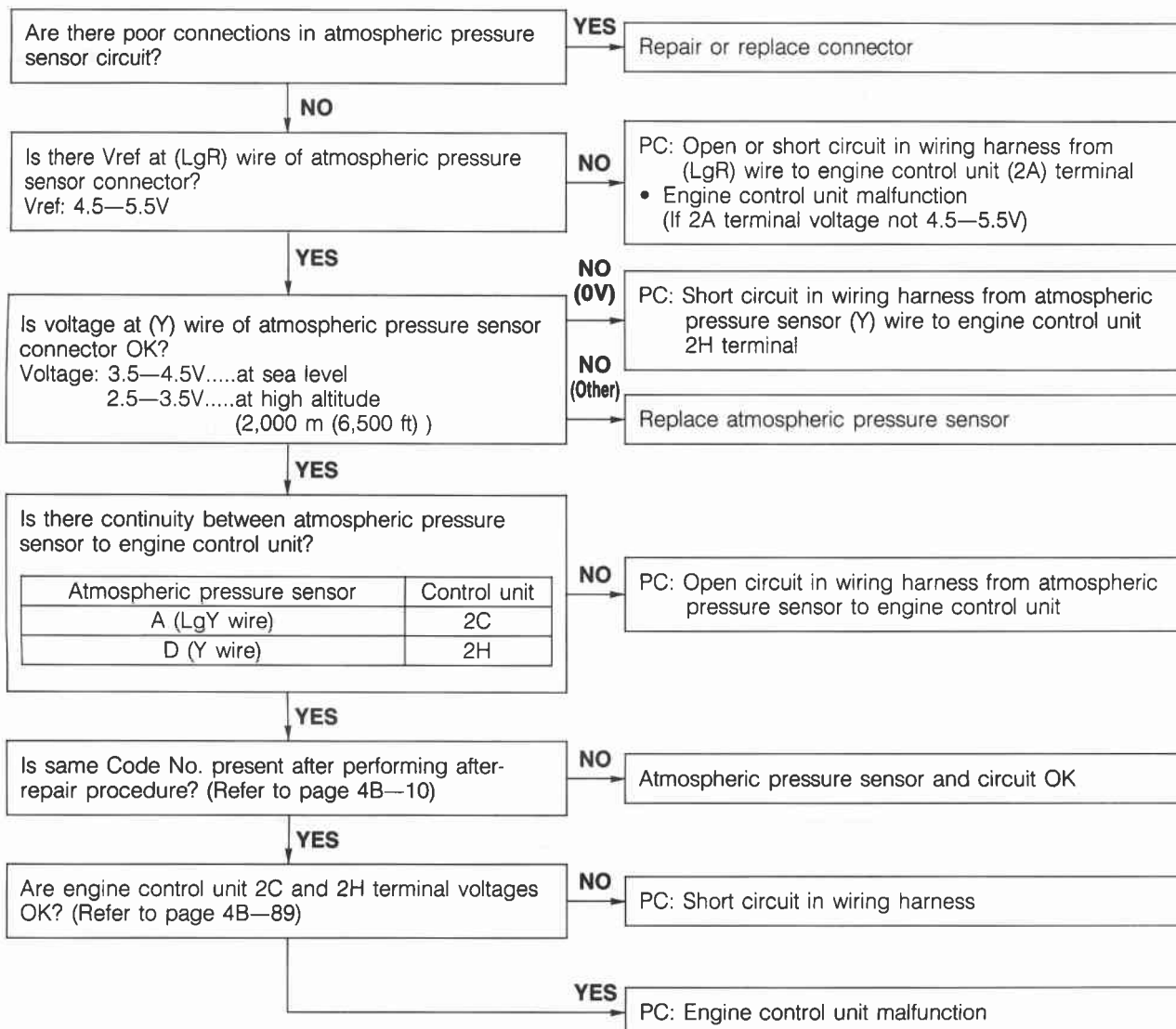
4B TROUBLESHOOTING WITH SST

Code No. 12 (Throttle sensor)

PC: Possible cause



76G04B-013

Code No. 14 (Atmospheric pressure sensor)**PC: Possible cause**

76G04B-014

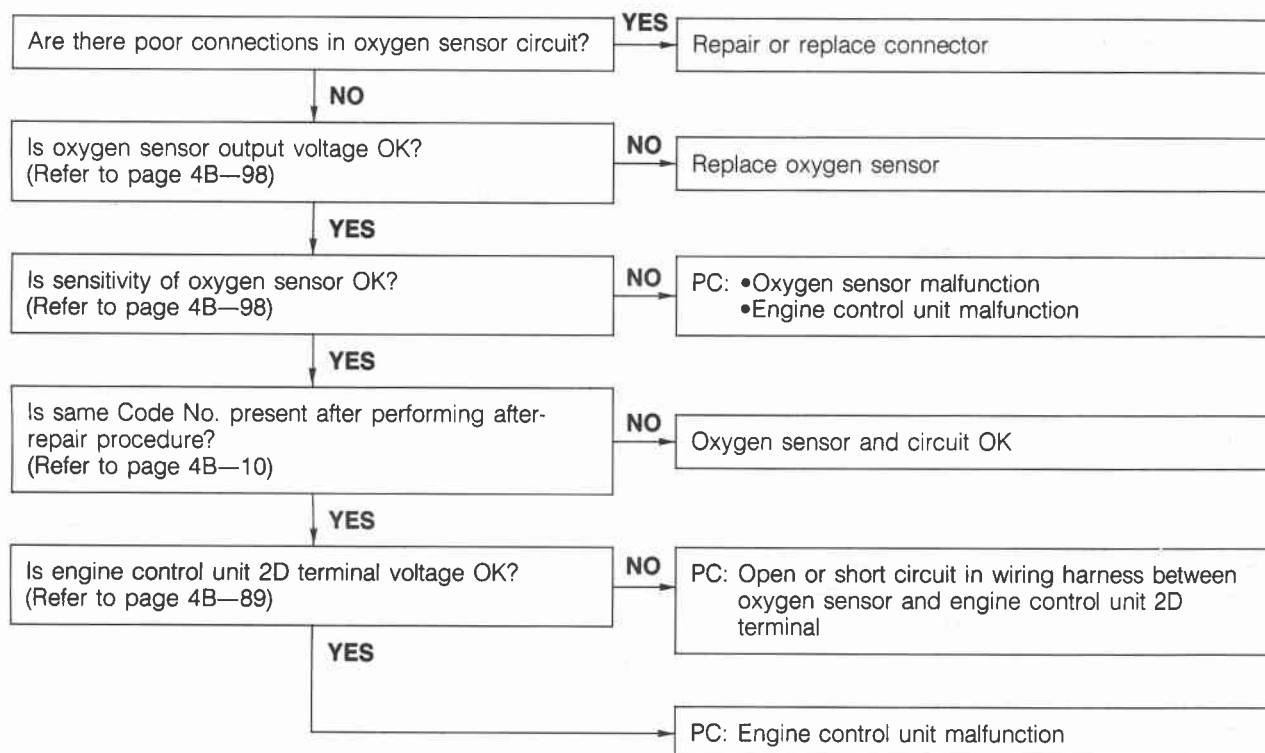
4B TROUBLESHOOTING WITH SST

Code No. 15 (Oxygen sensor)

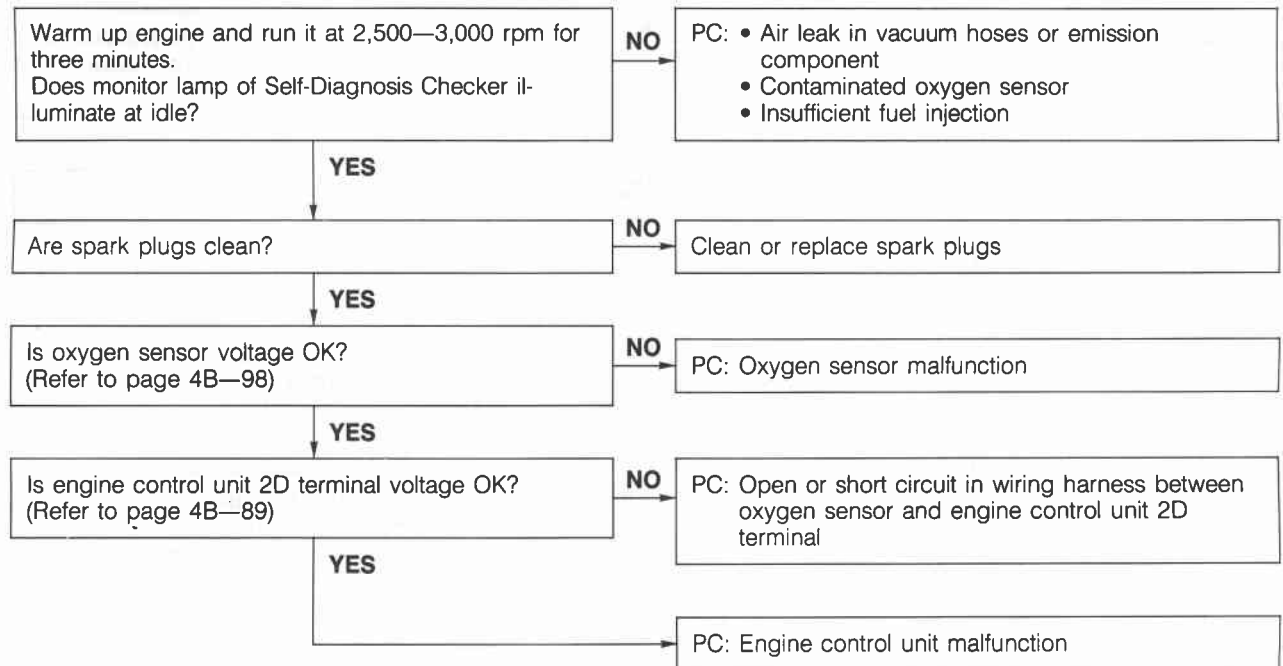
PC: Possible Cause

Note

When Codes No.15 and 17 are present at the same time, first perform the checking procedure for Code No.17. (Refer to page 4B—21.)



76G04B-015

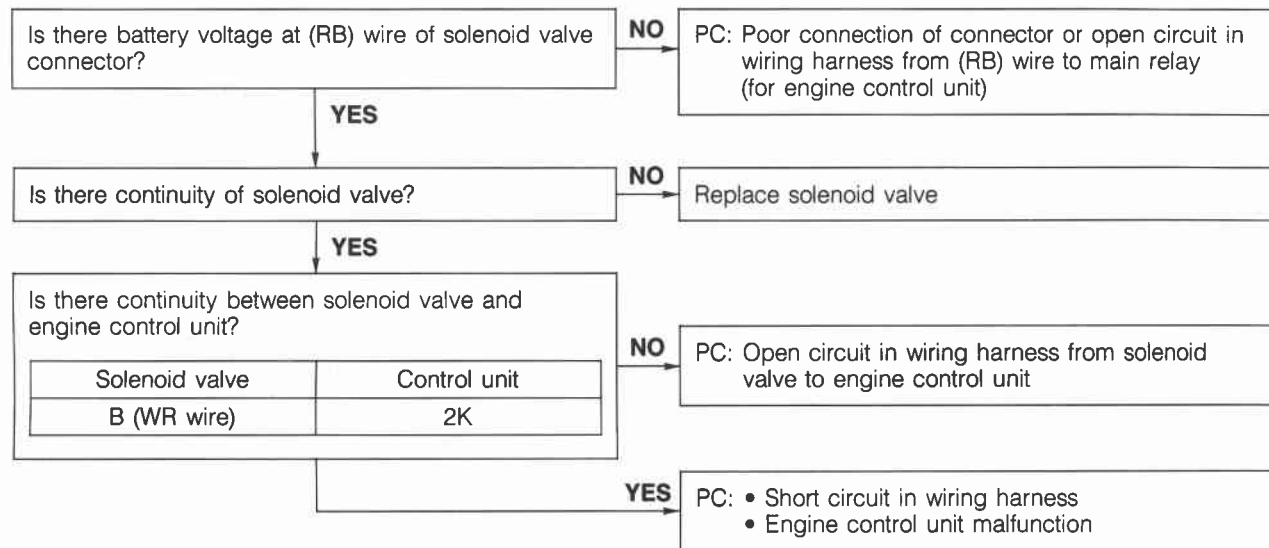
Code No. 17 (Feedback system)**PC: Possible Cause**

76G04B-016

4B TROUBLESHOOTING WITH SST

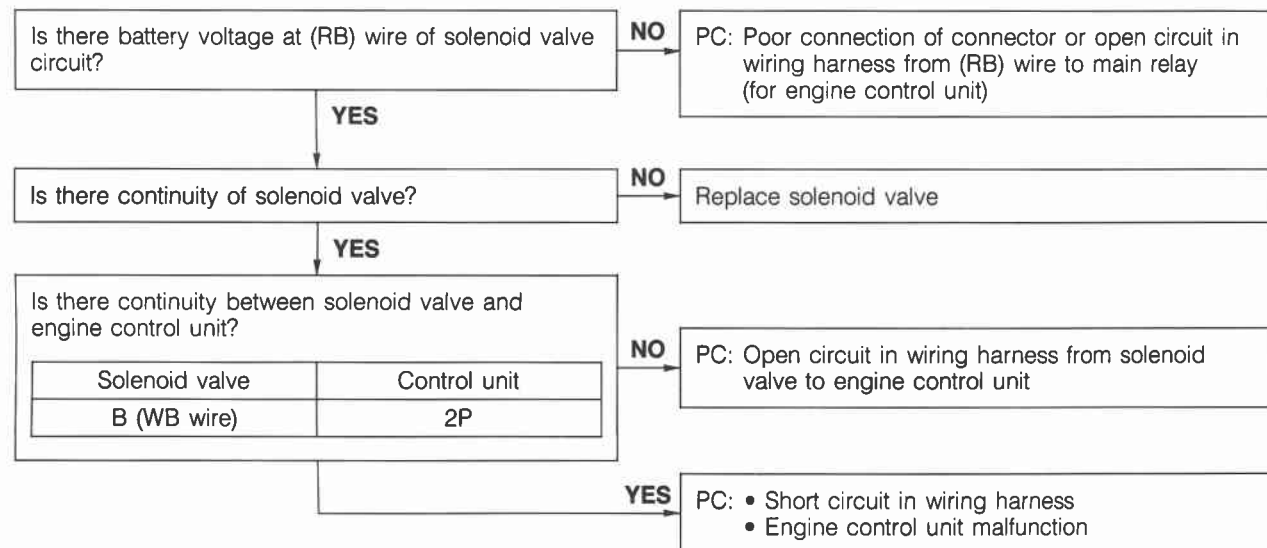
Code No. 25 (Solenoid valve-Pressure regulator)

PC: Possible Cause

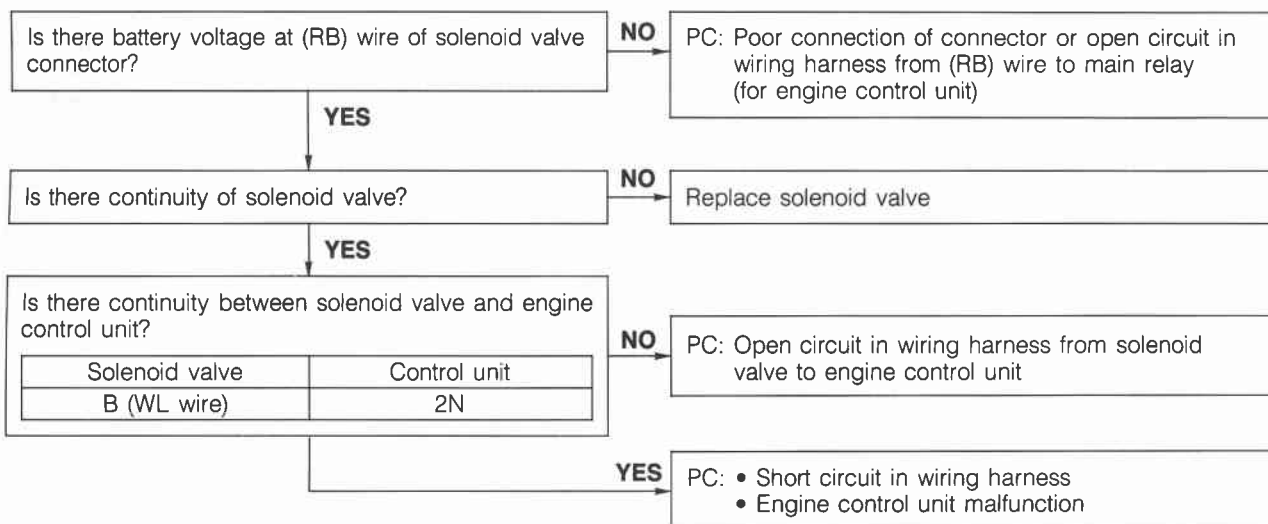


76G04B-017

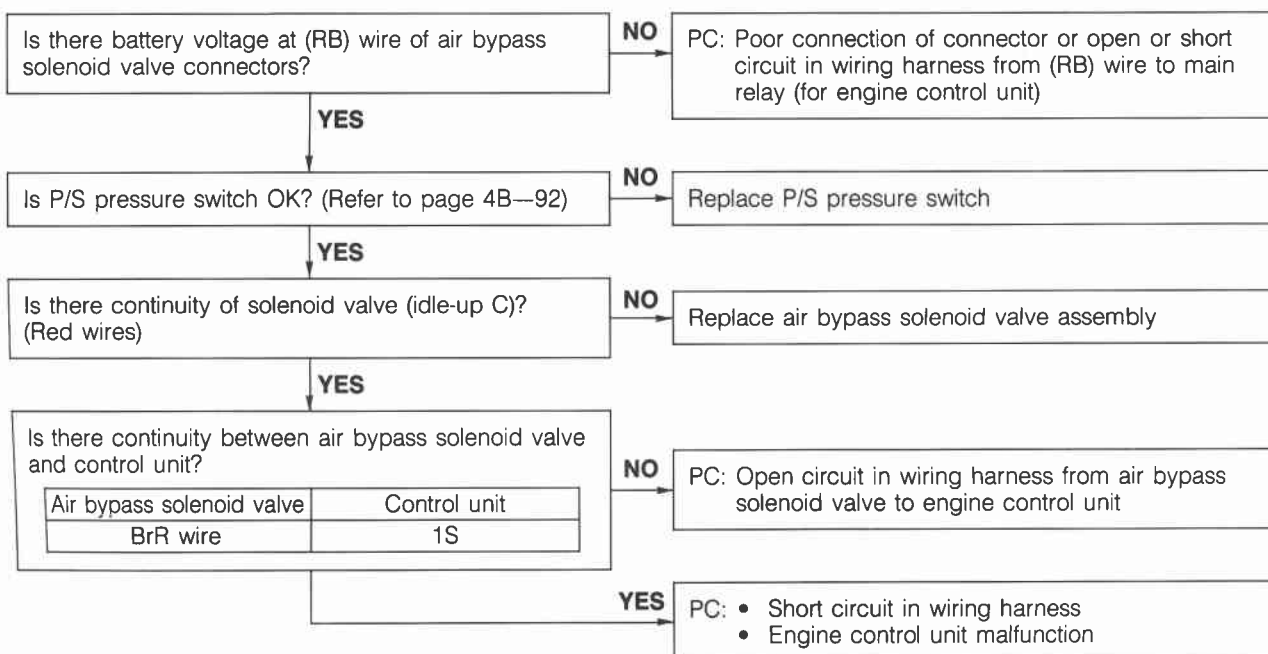
Code No. 26 (Solenoid valve-Purge)



76G04B-018

Code No. 28 (Solenoid valve—EGR)**PC: Possible Cause**

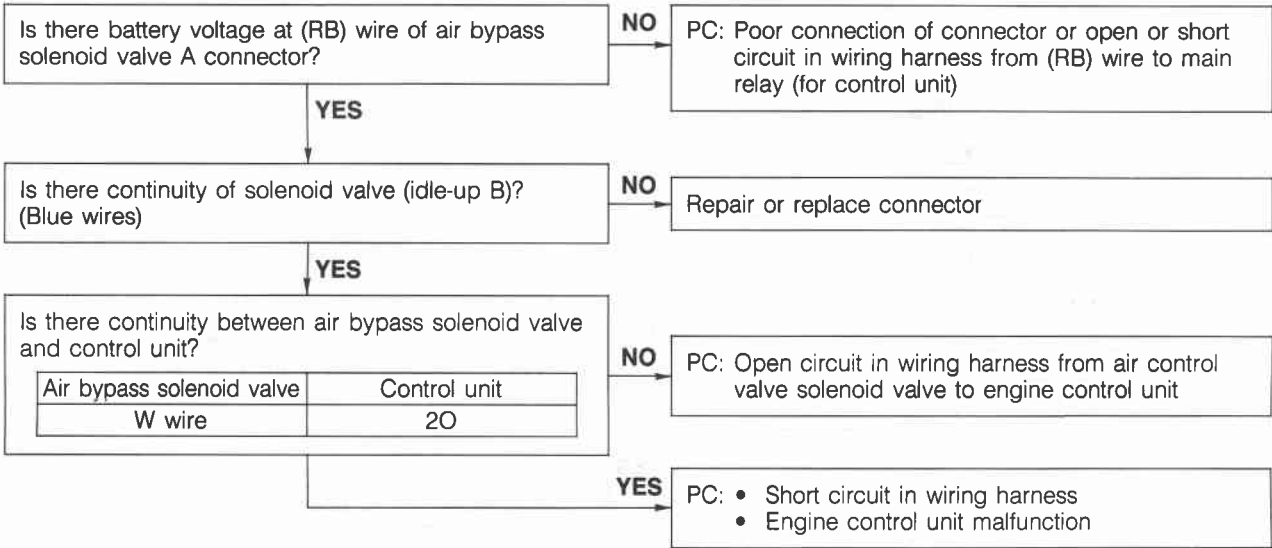
76G04B-019

Code No. 34 (Air bypass solenoid valve—Idle-up C)

76G04B-020

4B TROUBLESHOOTING WITH SST

No. 35 Code (Air bypass solenoid valve—Idle-up B) PC: Possible Cause



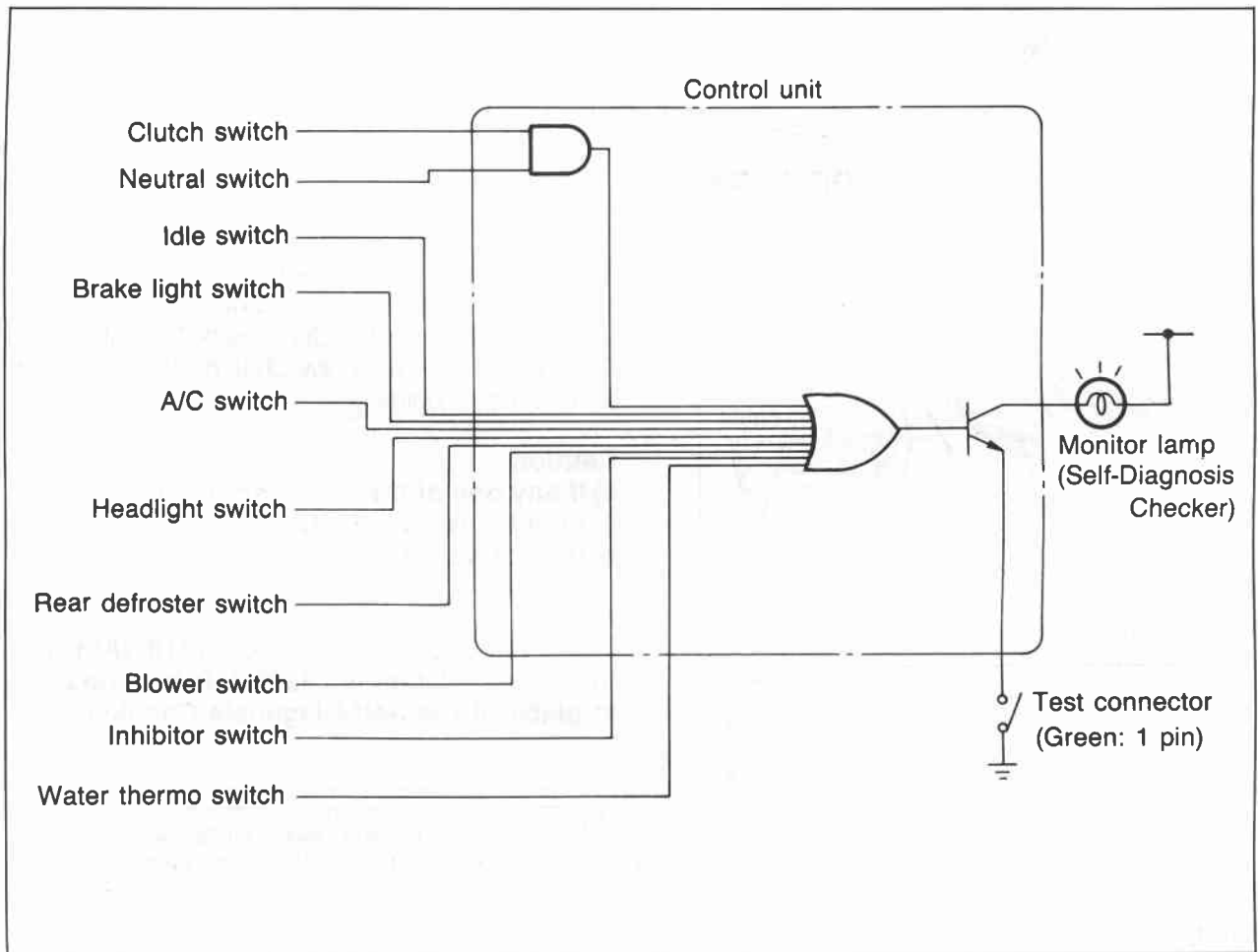
76G04B-021

SWITCH MONITOR FUNCTION

Individual switches can be monitored by the SST.

Note

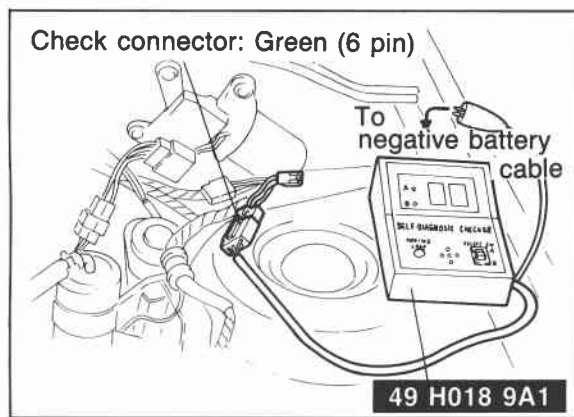
The test connector must be grounded and the ignition switch ON (engine stopped).



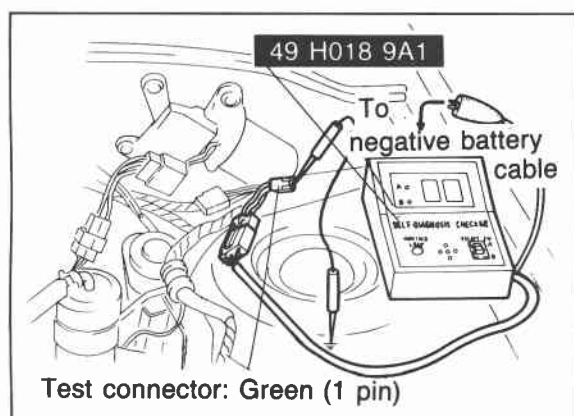
76G04B-022

Switch	Self-Diagnosis Checker (Monitor lamp)		Remarks
	Light ON	Light OFF	
Clutch switch	Pedal released	Pedal depressed	Gear: 1N
Neutral switch	In gear	Neutral	Clutch pedal released
Idle switch	Pedal depressed	Pedal released	—
Brake light switch	Pedal depressed	Pedal released	—
A/C switch	ON	OFF	Blower motor position: "1" position
Headlight switch	ON	OFF	—
Rear defroster switch	ON	OFF	—
Blower switch	ON	OFF	Blower motor position: "3" or "4" position
Inhibitor switch	D, 1, 2 and R range	P and N range	—
Water thermo switch (Electrical fan)	Terminal disconnected	Terminal connected	While fan not operating

4B SWITCH MONITOR FUNCTION



86U04A-034



76G04B-023

INSPECTION PROCEDURE

1. Warm up the engine to normal operating temperature and stop it.
2. Connect the **SST** to the check connector (Green, 6-pin) and the negative battery terminal.
3. Connect a jumper wire between the test connector (Green, 1-pin) and a ground.
4. Turn the ignition switch ON. Check if monitor lamp illuminates when each switch is made to function as described below.

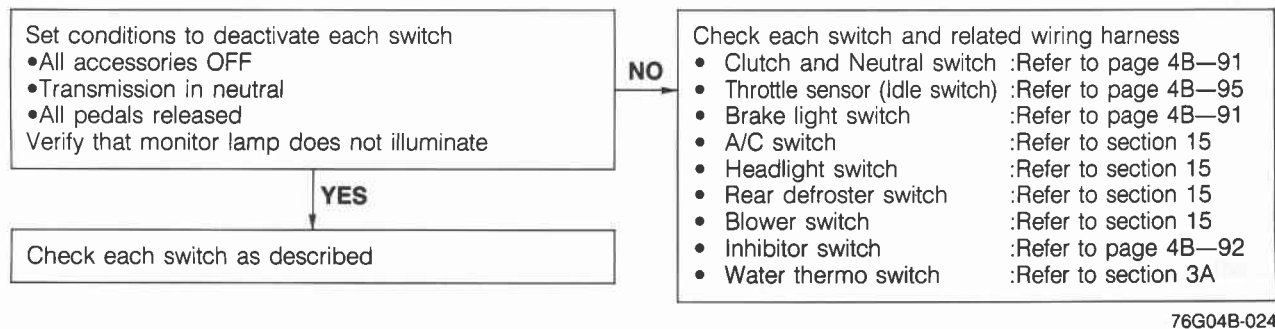
Caution

- a) If any one of the switches is activated, the monitor lamp will stay on.
- b) Do not start the engine.

Note

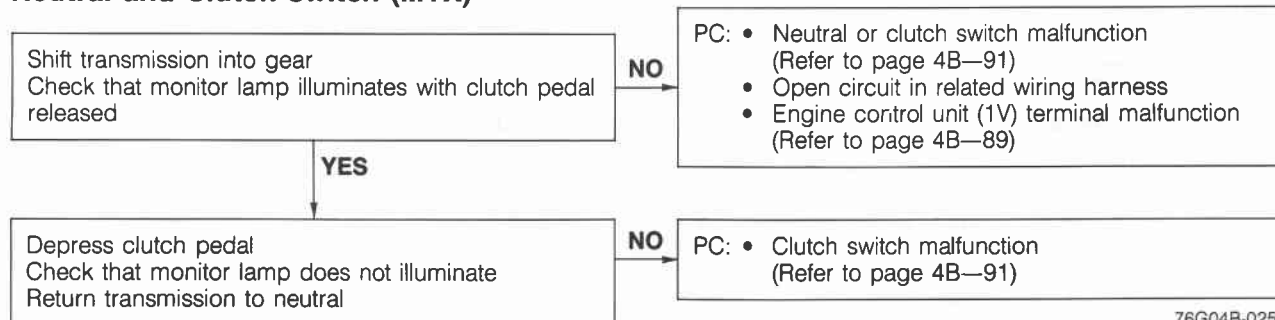
The Digital Code Checker (49 G018 9A0) with the Signal Adapter (49 9200 180) may be used in place of the Self-Diagnosis Checker.

Procedure



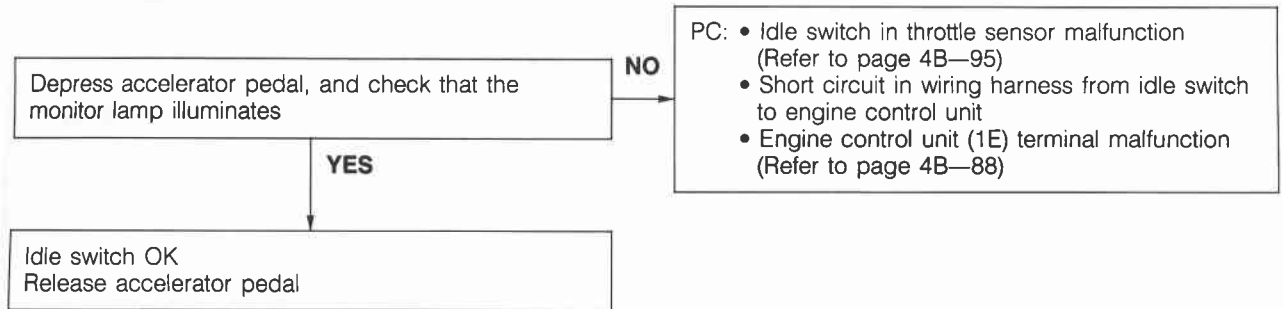
76G04B-024

Neutral and Clutch switch (MTX)



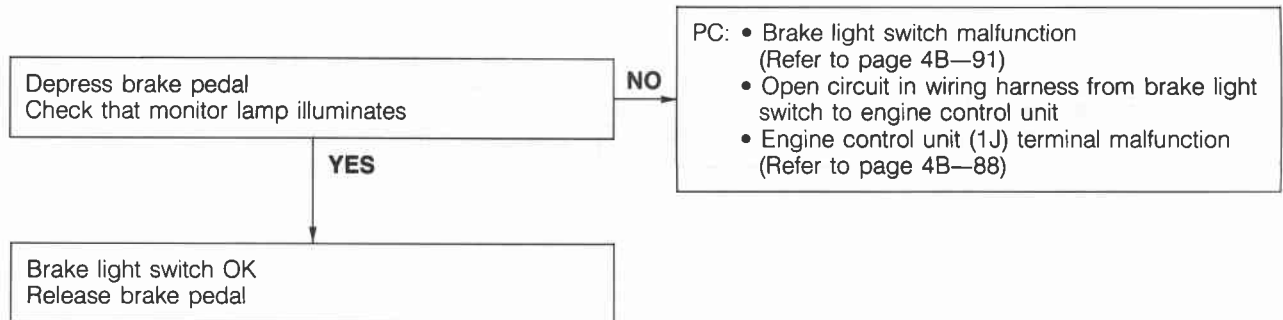
76G04B-025

Idle switch



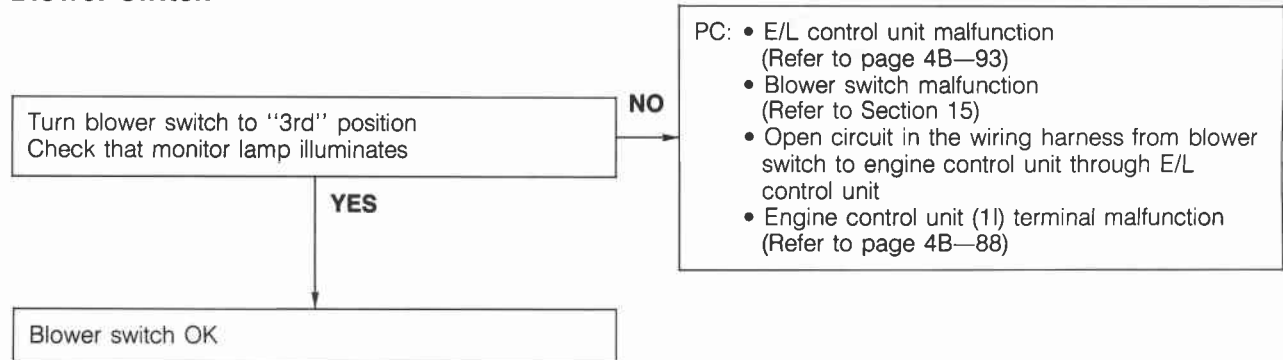
76G04B-026

Brake light switch



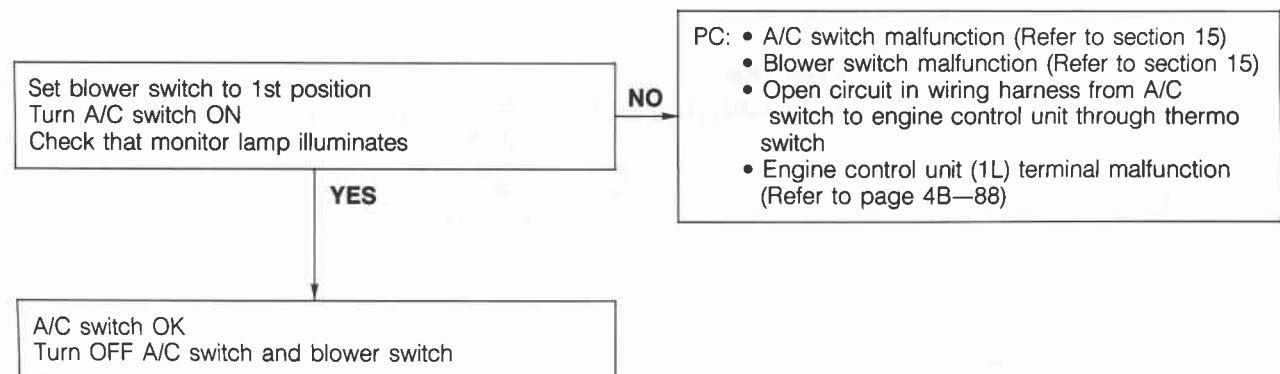
76G04B-027

Blower switch



76G04B-028

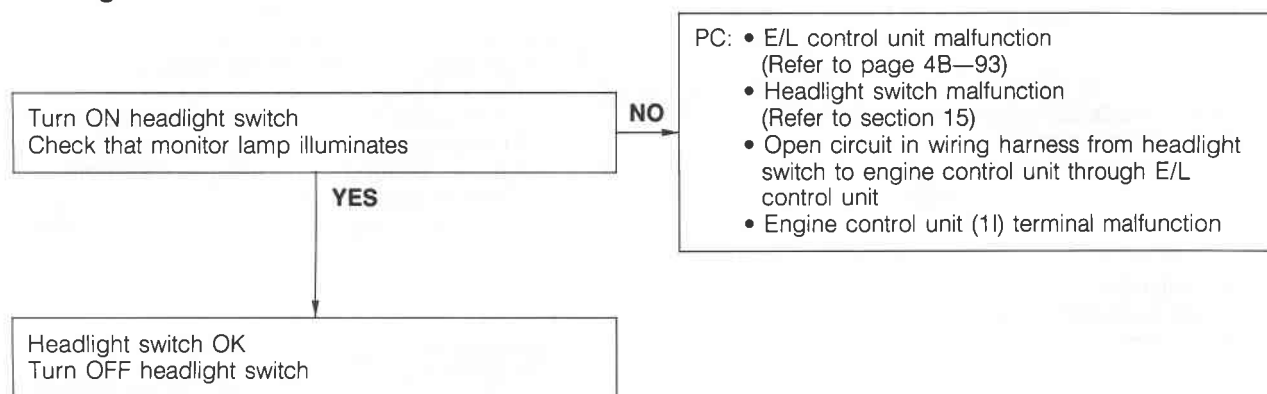
A/C switch



76G04B-029

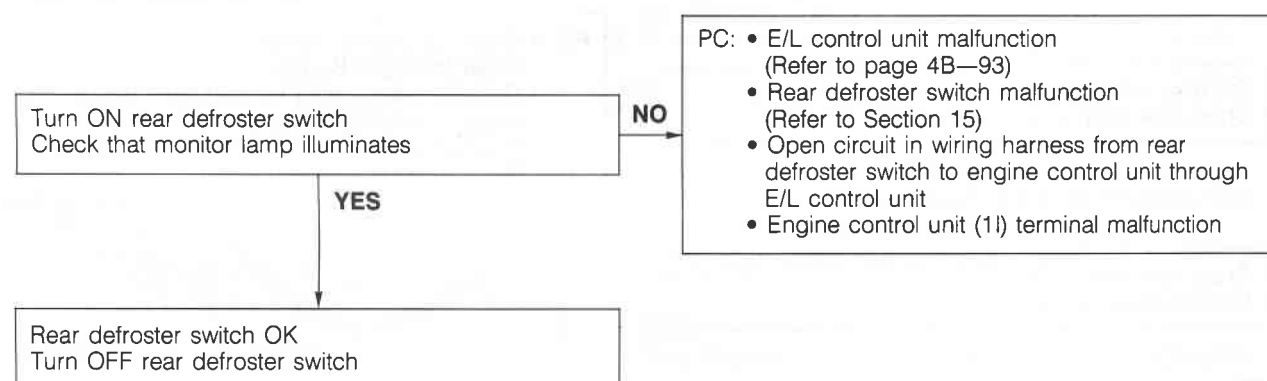
4B SWITCH MONITOR FUNCTION

Headlight switch



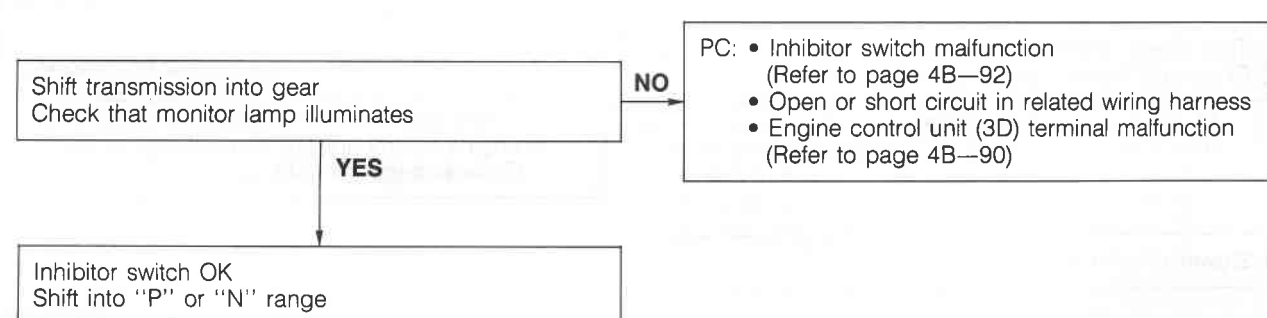
76G04B-030

Rear defroster switch



76G04B-031

Inhibitor switch

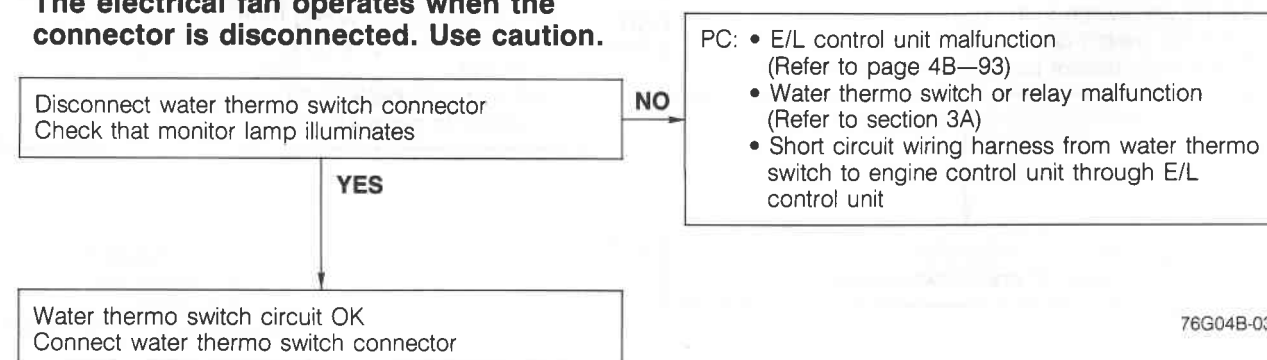


76G04B-032

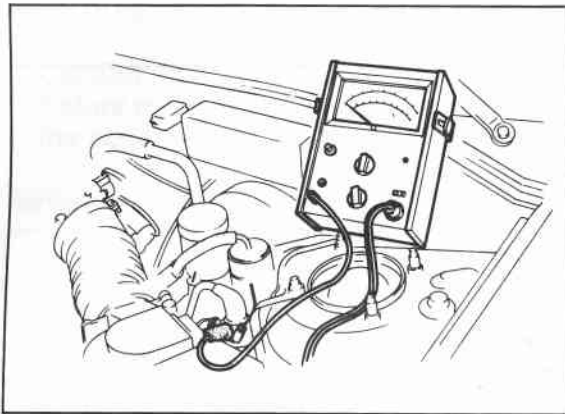
Water thermo switch circuit (not included in switch inspection)

Warning

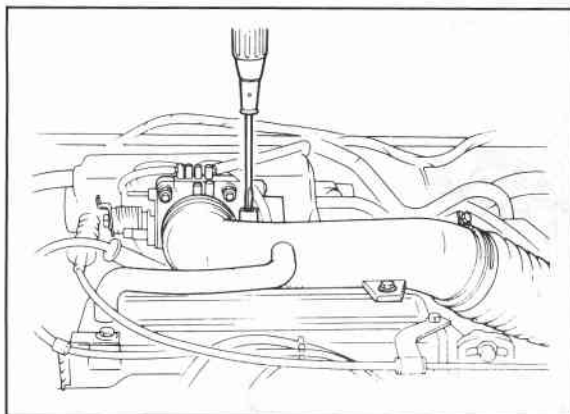
The electrical fan operates when the connector is disconnected. Use caution.



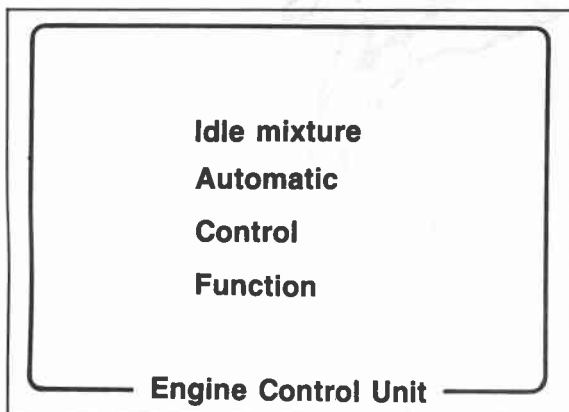
76G04B-033



76G04B-034



76G04B-035



86U04A-049

IDLE ADJUSTMENT

IDLE SPEED

Preparation

- 1) Check the condition of the engine (plugs, leaks in hoses, etc.).
- 2) Make sure all accessories are OFF.
- 3) Warm up the engine and run it for **three minutes at 2,500—3,000 rpm** in neutral.
- 4) Check the initial ignition timing and adjust if necessary.

Inspection and Adjustment

Caution

Disconnect the air bypass solenoid connector when checking and adjusting the idle speed.

1. Check that the idle speed is within specification.

Specification:

MTX—800 ± 50 rpm

ATX—900 ± 50 rpm (P range)

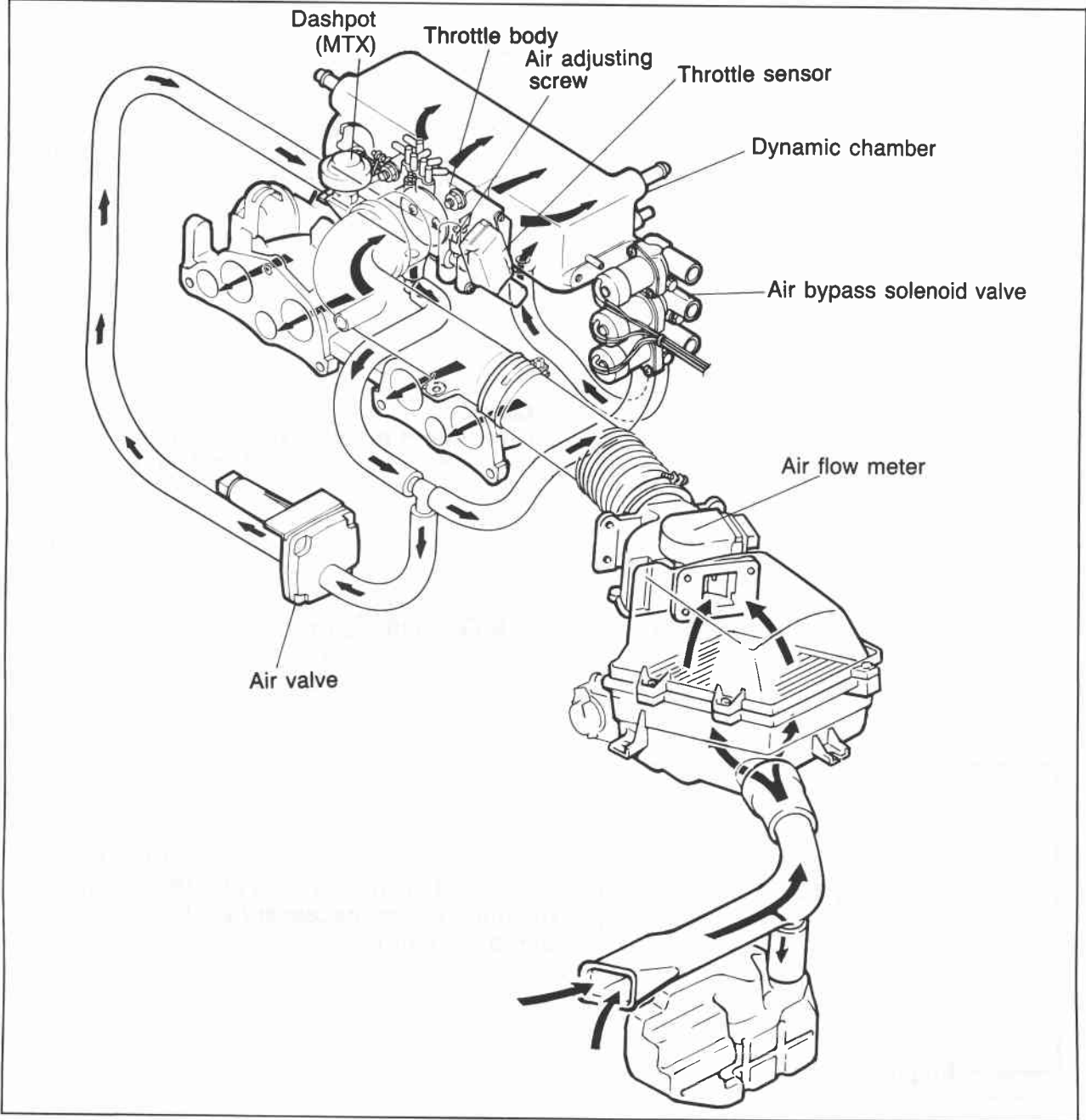
2. If the idle speed is not within specification, remove the blind cap from the throttle body and adjust it by turning the air adjust screw.

IDLE MIXTURE

Because an automatic compensation function for air/fuel mixture is built into the engine control unit, it is not necessary to check and adjust the idle mixture.

4B INTAKE AIR SYSTEM

INTAKE AIR SYSTEM



76G04B-036

This system controls the air required by the engine for operation. The system consists of the air duct, air cleaner, air flow meter, throttle body, dynamic chamber, and intake manifold.

COMPONENT DESCRIPTIONS

Component	Function	Remarks
Air cleaner	Filters air into throttle body	
Air flow meter	Detects amount of intake air; sends signal to engine control unit	Intake air thermo sensor and fuel pump switch are integrated
Throttle body	Controls intake air quantity	Integrated throttle sensor and idle switch

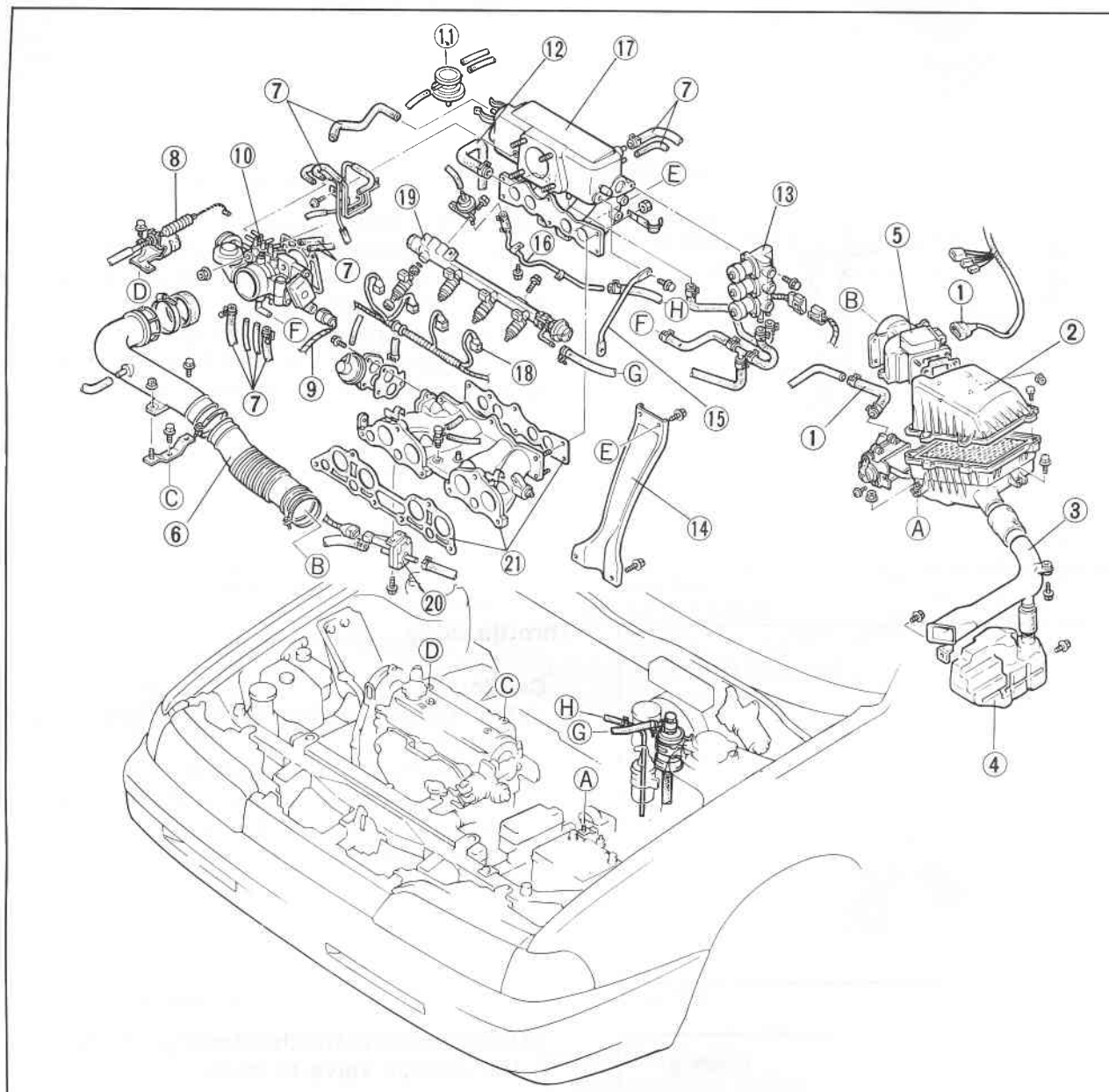
76G04B-037

REMOVAL

Caution

Before removing the following parts, release the fuel pressure from fuel system to reduce the possibility of injury or fire. (Refer to page 4B—45.)

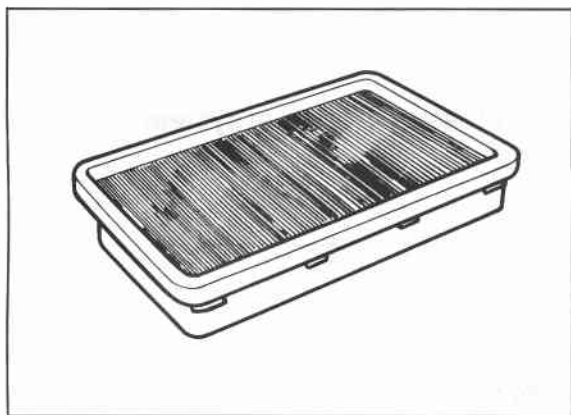
Remove in the sequence shown in the figure.



76G04B-038

- | | | |
|--|---|---------------------------------|
| 1. Air flow meter connector and secondary air hose | 7. Vacuum hoses, air hoses, and water hoses | 14. Intake manifold bracket |
| 2. Air cleaner | 8. Accelerator cable | 15. Dynamic chamber bracket |
| 3. Air duct | 9. Throttle sensor connector | 16. Fuel return pipe |
| 4. Resonance chamber | 10. Throttle body | 17. Dynamic chamber |
| 5. Air flow meter | 11. EGR modulator valve | 18. Injector connector |
| 6. Air hose | 12. Air hose | 19. Delivery pipe assembly |
| | 13. Air bypass solenoid valve | 20. Air valve |
| | | 21. Intake manifold and gaskets |

4B INTAKE AIR SYSTEM



69G04A-059

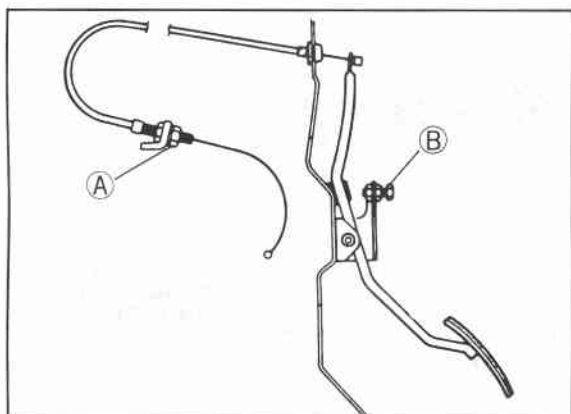
PARTS INSPECTION

Air Cleaner Element

1. Check the condition of the air cleaner element.
2. Replace, if necessary.

Caution

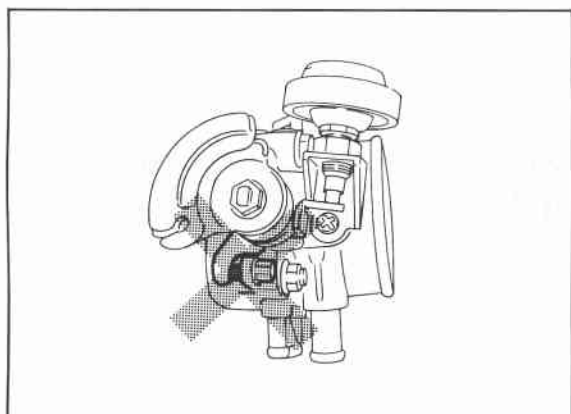
Do not use the compressed air to clean the air cleaner element.



86U04A-053

Accelerator Cable

1. Inspect the deflection of the cable. If the deflection is not within **1—3 mm (0.04—0.12 in.)**, adjust by turning nuts A.
2. Depress the accelerator pedal to the floor and confirm that the throttle valve is fully opened. Adjust by turning bolt B if necessary.



79G04D-084

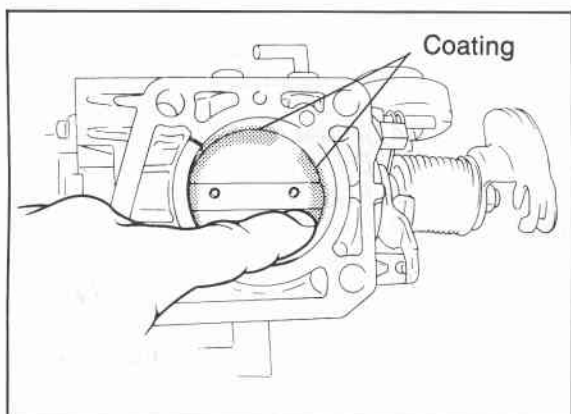
Throttle Body

Caution

- a) The throttle adjust screw is preset and sealed.

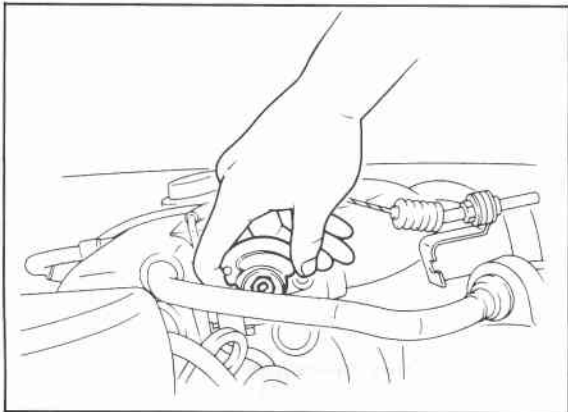
Do not attempt to adjust it.

If there is a malfunction of the throttle adjust screw, lever, or throttle valve, replace the throttle body as an assembly.



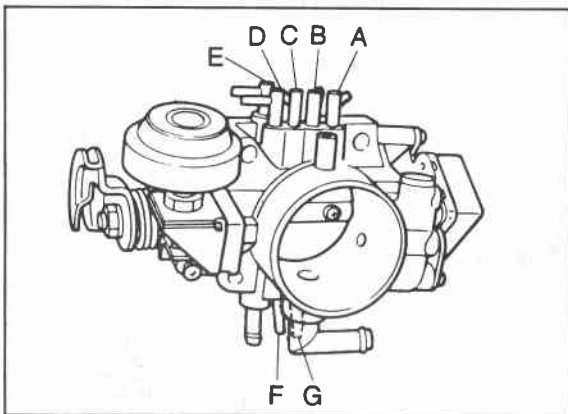
79G04D-085

- b) Do not remove the thin sealing coating from the throttle valve or bore.



76G04B-039

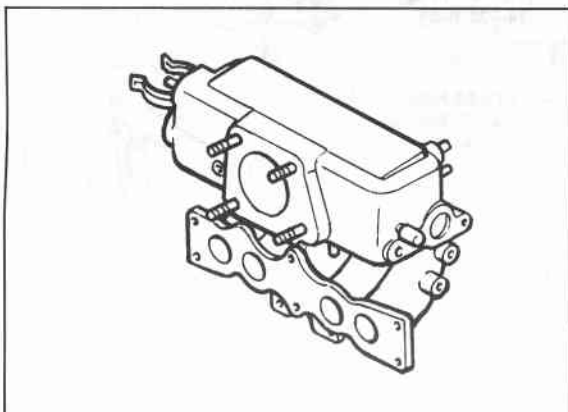
1. Check that the throttle valve moves smoothly when the throttle lever is moved from fully closed to fully open.



76G04B-040

2. Warm up the engine and run at idle.
3. Check the vacuum generated at each port as shown in the following table.

Condition	Idle	Other
Port (Connected to)		
A (solenoid valve, EGR)	No	Yes
B (distributor, advance)	No	Yes
C (EGR modulator valve)	No	Yes
D (water thermo valve)	No	Yes
E (vacuum switch valve & charcoal canister)	Yes	
F (distributor, retard & air control valve)	Yes	
G (distributor, advance)	Yes	

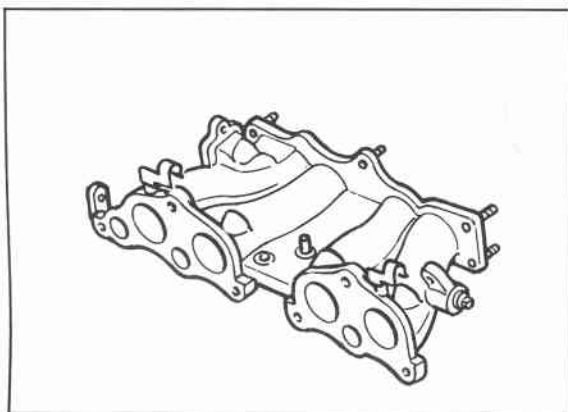


76G04B-041

4. If vacuum is not obtained as in the table, clean the necessary port.

Dynamic Chamber

1. Visually check the dynamic chamber for damage.
2. Replace, if necessary.



76G04B-042

Intake Manifold

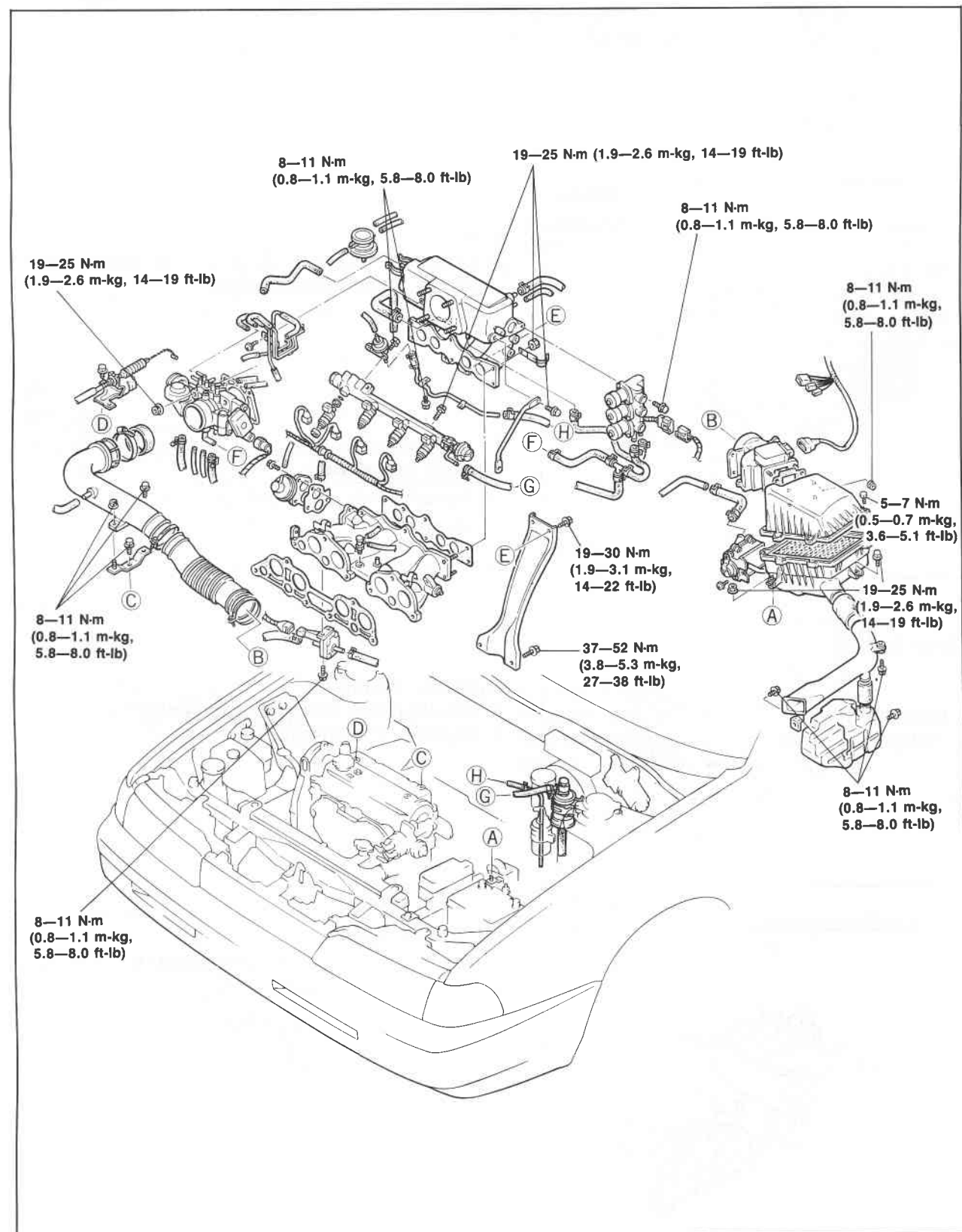
1. Visually check the intake manifold for damage.
2. Replace, if necessary.

4B INTAKE AIR SYSTEM

INSTALLATION

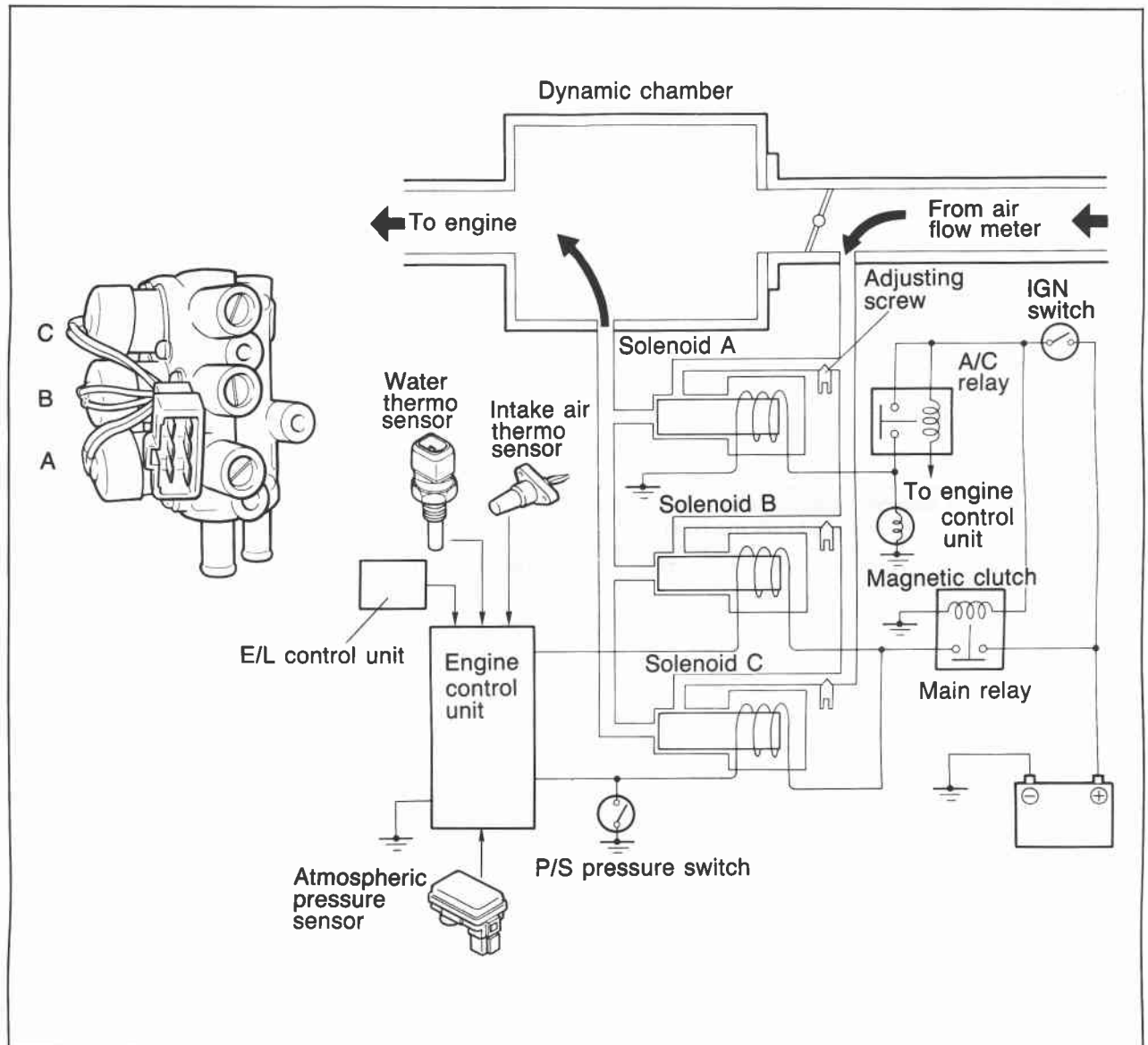
Install in the reverse order of removal.

Torque Specification



76G04B-125

IDLE-UP SYSTEM



76G04B-043

Air Valve

This valve is constructed so that the gate valve is opened and closed by means of a bimetal strip and heat coil. It acts as a fast idle mechanism by opening the gate valve to increase intake air by bypassing the throttle valve while engine is cold, therefore engine speed is increased to shorten the warm up period.

Air Bypass Solenoid Valve

This valve incorporates three solenoid valves. They operate according to the signal from the engine control unit or A/C switch in order to achieve idling stability and the optimum idle speed. The operating conditions of each solenoid valve are as shown below.

Solenoid valve	Operating condition
A	A/C operated
B	Intake air temp. above 55°C (131°F) or vehicle at above 1,000 m (3,280 ft)
C	P/S operated, E/L applied, intake air temp. above 55°C (131°F), pressure regulator solenoid ON or vehicle at above 1,900 m (6,232 ft)

4B IDLE-UP SYSTEM

COMPONENT DESCRIPTIONS

Component	Function	Remarks
Air bypass solenoid valve	Controls bypass air amount	Operates A: A/C : ON B: Intake air temp. high or at high altitude C: P/S : ON, E/L applied or hot start
Air valve	When cold, supplies bypass air into dynamic chamber	<ul style="list-style-type: none">• Engine speed increased to shorten warm-up period• Bimetal type
Atmospheric pressure sensor	Detects atmospheric pressure; sends signal to engine control unit	
E/L control unit	Detects electrical load applied; sends signal to engine control unit	
Engine control unit	Detects signals from input sensors and switches; controls air bypass solenoid valve	
Intake air thermo sensor	Detects intake air temperature; sends signal to engine control unit	Installed in air flow meter
P/S pressure switch	Detects P/S operation; sends signal to engine control unit	P/S: ON when steering wheel turned right or left

76G04B-044

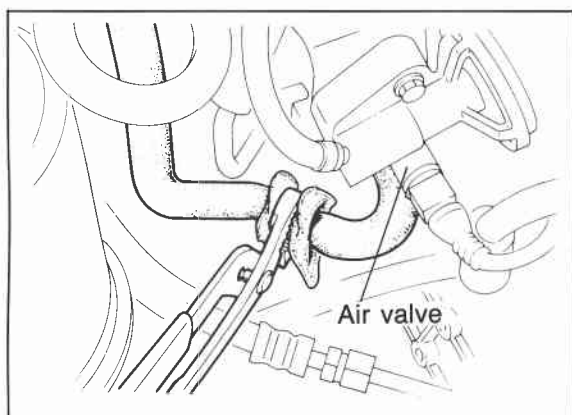
TROUBLESHOOTING

Check the condition of the wiring harness and connectors before checking the sensors or switch.

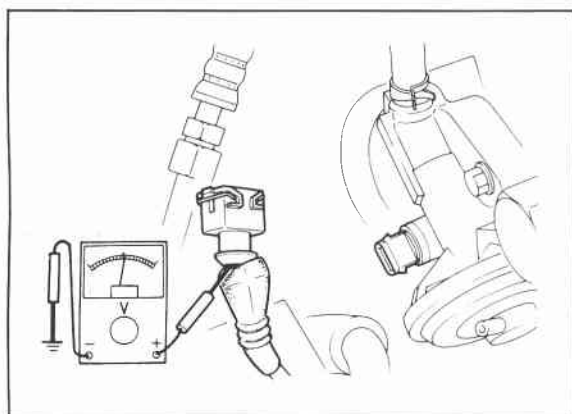
<div> <div>Possible cause</div> <div>Page</div> </div>		Air valve	Air bypass solenoid valve		Engine control unit terminal	
			Idle-up signal	Adjustment	1S	20
		4B—38	4B—39	4B—40	4B—89	4B—90
Symptom						
Engine stalls	While warming up	1	2	3	4	5
	After warming up		1	2	3	4
Rough idle	While warming up	1	2	3	4	5
	After warming up		1	2	3	4
High idle speed after warming up		1	2	3	4	5
Runs rough on deceleration			1	2	3	4
Afterburn in exhaust system		1	2	3	4	5
Falls emission test		1	2	3	4	5

76G04B-045

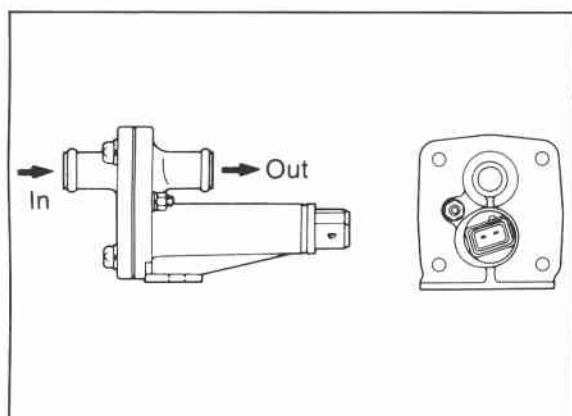
4B IDLE-UP SYSTEM



76U04A-120



76G04B-046



76G04B-047

AIR VALVE

Pre-inspection

1. Start the engine and run it at idle.
2. Pinch the bypass air hose and check that the engine rpm drops.

When engine still cool RPM reduced
After warming-up RPM drop within 200 rpm

3. If the speed is not reduced when cold, check the air valve, or check for vacuum leaks at the bypass air hose.
4. If the speed drop is **more than 200 rpm** when warm, check the air valve and current to the valve.

Inspection of Terminal Voltage

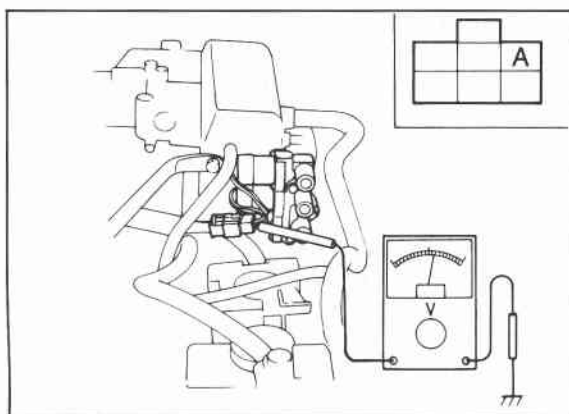
1. Disconnect the connector from the valve.
2. Remove the rubber boot from the connector.
3. Start the engine and run it at idle.
4. Check that there is battery voltage at terminal (WY), using a voltmeter.
5. If not correct, check the circuit opening relay and wiring harness.

Inspection of Air Valve

1. Check the valve for operation.

Temperature 20°C (68°F) Valve open
(When engine cool)
After warming-up Valve closed

2. Replace valve if faulty.



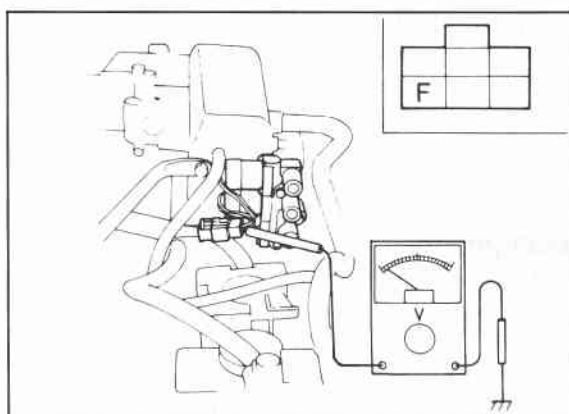
76G04B-048

AIR BYPASS SOLENOID VALVE

Inspection of Idle-up Signal

A/C

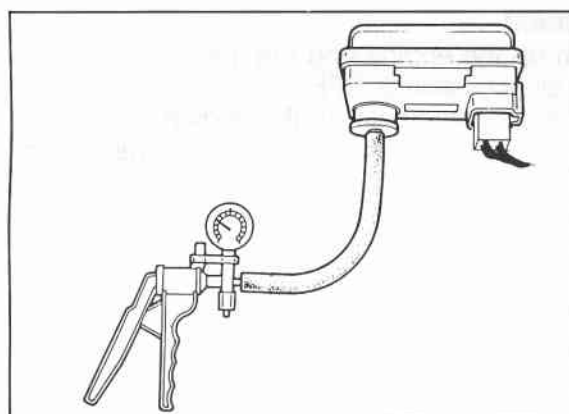
1. Warm up the engine and run it at idle.
2. Connect a voltmeter between terminal **A** and ground.
3. Turn the A/C and blower motor switches ON.
4. Check that the meter shows **battery voltage**.
5. If not correct, check the A/C relay, A/C switch, blower motor switch, fuse, and wiring harness.



76G04B-049

P/S

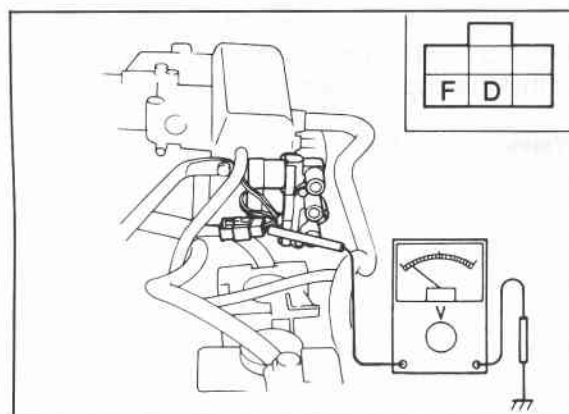
1. Warm up the engine and run it at idle.
2. Attach a voltmeter between the terminal **F** and ground.
3. Turn the steering wheel all the way to either the right or left.
4. Check that the meter shows **0V**.
5. Release the steering wheel.
6. Check that the meter shows battery voltage.
7. If not correct, check the P/S pressure switch (Refer to page 4B—92) and wiring harness.



76G04B-050

High altitude compensation

1. Warm up the engine and run it at idle.
2. Connect a vacuum pump to the atmospheric pressure sensor.
3. Connect a voltmeter between the terminals shown in the following table and ground.
4. Apply vacuum to the atmospheric pressure sensor as shown in the table using a vacuum pump.
5. Check that the voltmeter shows **0V**.

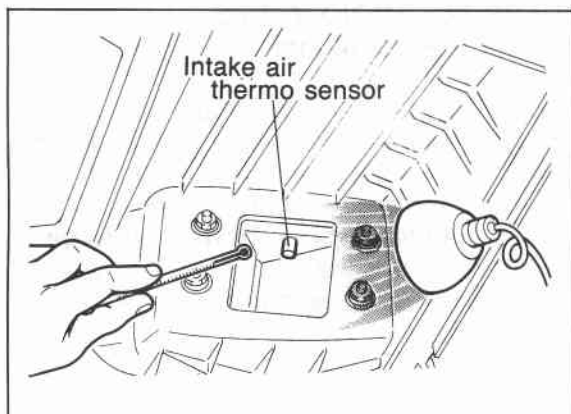


76G04B-051

6. Release the vacuum.
7. Check that the voltmeter shows battery voltage.
8. If not correct, check the atmospheric pressure sensor (Refer to page 4B—99) and wiring harness.

Terminal	Vacuum Amount
F	Approx. 155 mmHg (6.10 inHg)
D	Approx. 85 mmHg (3.35 inHg)

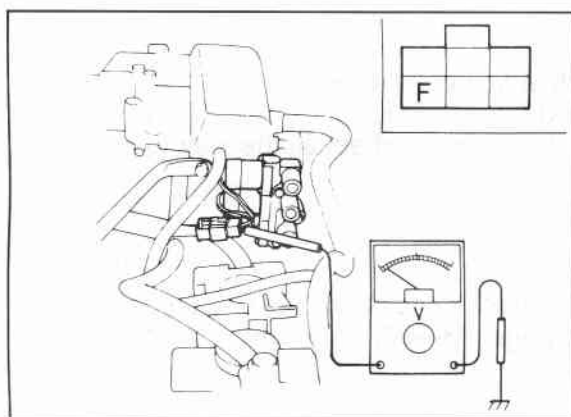
4B IDLE-UP SYSTEM



76G04B-052

Hot idle compensation

1. Warm up the engine and run it at idle.
2. Connect a voltmeter between the terminal **F**, **D** and ground.
3. Remove the air cleaner upper case assembly.
4. Heat the intake air thermo sensor to more than **55°C (131°F)**.
5. Check that the meter shows **0V**.
6. If not correct, check the intake air thermo sensor (Refer to page 4B—94).



76G04B-053

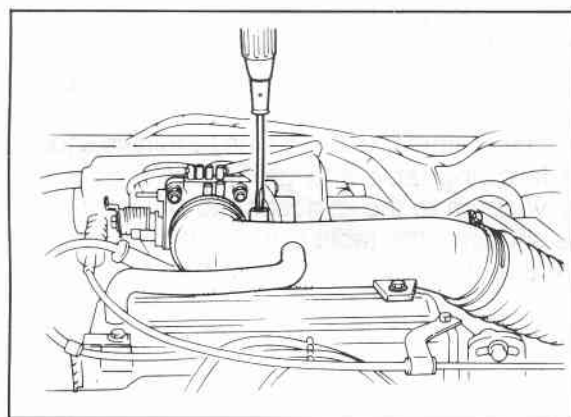
E/L (Electrical load)

1. Warm up the engine and run it at idle.
2. Connect a voltmeter between the **F** terminal and ground.
3. Apply the E/L.

E/L:

- Headlight
- Electrical fan motor
- Blower motor (3rd or 4th position)
- Rear defroster

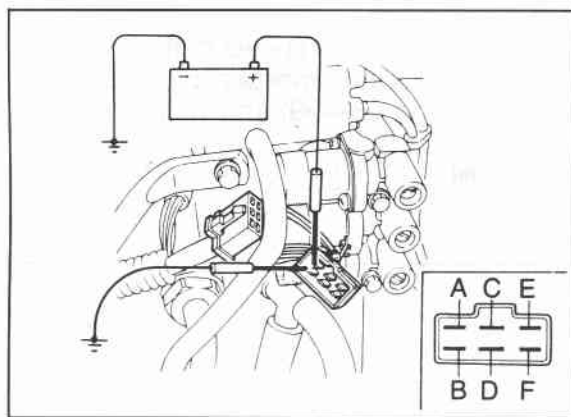
4. Check that the meter shows **0V**.
5. If not correct, check the electrical load control unit (Refer to page 4B—93).



76G04B-054

Adjustment

1. Warm up the engine and run it at idle.
2. Turn all accessories OFF.
3. Connect a tachometer to the engine.
4. Disconnect the air bypass solenoid valve connector.
5. Check the idle speed and adjust it if necessary.

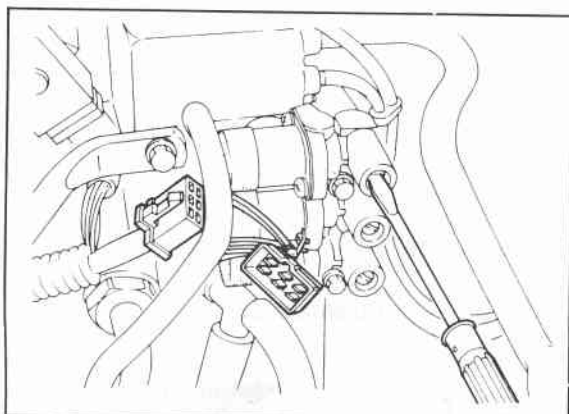


76G04B-055

6. Apply battery power to each BAT terminal and ground each GRD terminal as shown in the table.
7. Check that the engine speed is within specification.

Valve	BAT	GRD	Engine speed
A (for A/C)	A	B	1,250—1,350 rpm
B (for high altitude and high intake air temp.)	C	D	900—1,000 rpm (MTX)
C (for P/S, E/L, high intake air temp., high altitude and hot idle compensations)	E	F	1,000—1,100 rpm (ATX)

IDLE-UP SYSTEM 4B

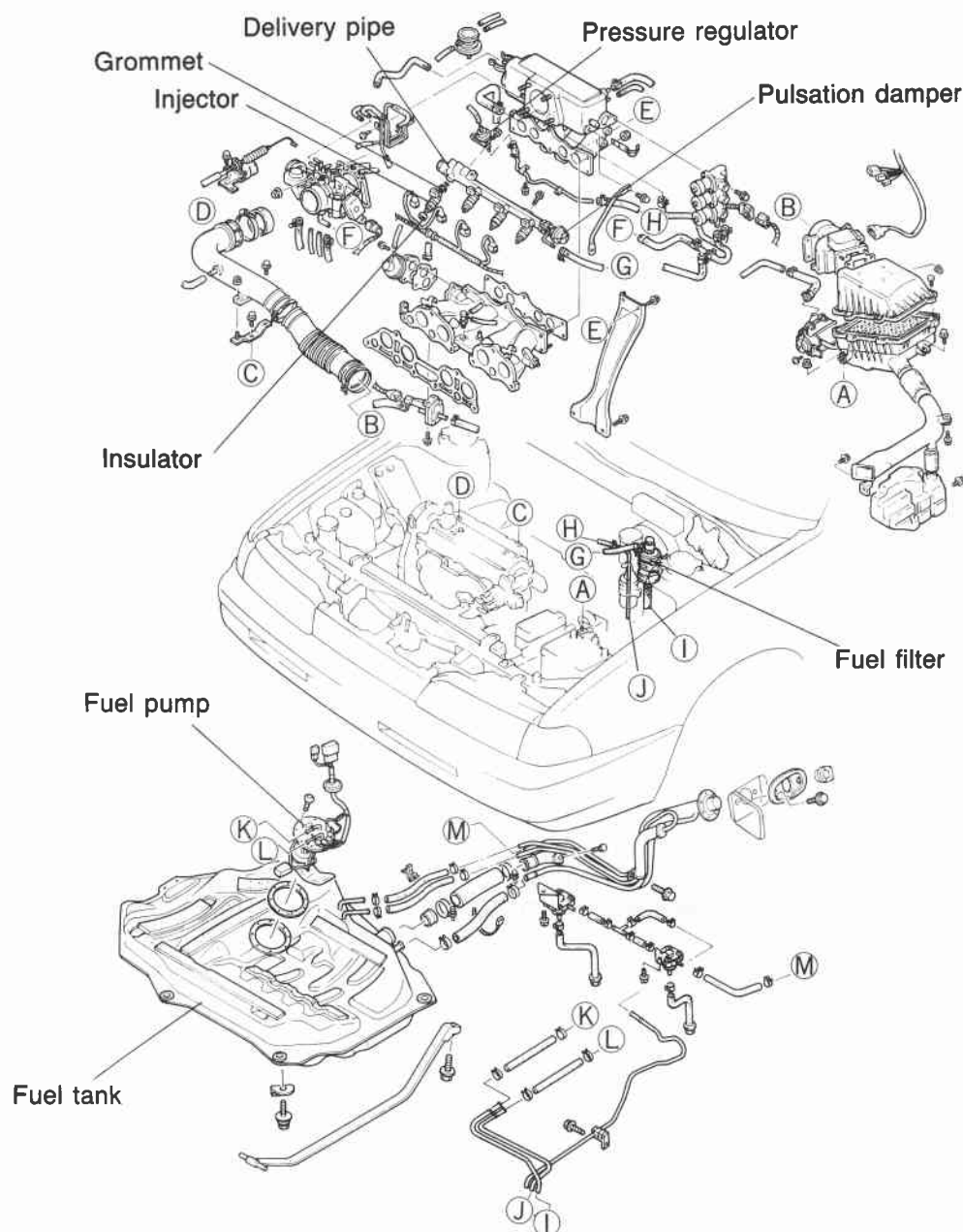


76G04B-056

8. If not correct, adjust by adjusting the respective adjusting screw.
9. If there is no idle-up, replace the air bypass solenoid valve.
10. Reconnect the connector to the valves.

4B FUEL SYSTEM

FUEL SYSTEM



76G04B-057

This system supplies the fuel necessary for combustion at a constant pressure to the injectors. Fuel is metered and injected into the intake manifold according to the injection control signals from the engine control unit. It consists of the fuel pump, fuel filters, delivery pipe, pulsation damper, pressure regulator, injectors, fuel pump switch (incorporated in the air flow meter), and the circuit opening relay. The fuel pump is mounted in the fuel tank to minimize the operating noise of the fuel pump. The injectors are directly supplied with battery voltage through the main relay.

COMPONENT DESCRIPTIONS

Component	Function	Remarks
Air flow meter	Detects amount of intake air; sends signal to engine control unit	Intake air thermo sensor and fuel pump switch are integrated
Atmospheric pressure sensor	Detects atmospheric pressure; sends signal to engine control unit	
Circuit opening relay	Voltage for fuel pump while engine running	
Clutch switch	Detects in-gear condition; sends signal to engine control unit	Switch ON when clutch pedal released
Engine control unit	Detects signals from input sensors and switches; controls injector operation	
Fuel filter	Filters particles from fuel	
Fuel pump	Provides fuel to injectors	<ul style="list-style-type: none"> • Operates while engine running • Installed in fuel tank
Idle switch	Detects when throttle valve fully closed; sends signal to engine control unit	Installed in throttle sensor
Ignition coil (-) terminal	Detects engine speed; sends signal to engine control unit	
Ignition switch (ST position)	Sends engine cranking signal to engine control unit	
Inhibitor switch	Detects in-gear condition; sends signal to engine control unit	Switch ON in "N" or "P" range
Injector	Injects fuel into intake port	<ul style="list-style-type: none"> • Controlled by signals from engine control unit • High-ohmic injector
Intake air thermo sensor	Detects intake air temperature; sends signal to engine control unit	Installed in air flow meter
Main relay	Supplies electric current to injectors and engine control unit	
Neutral switch	Detects in-gear condition; sends signal to engine control unit	Switch ON in-gear
Oxygen sensor	Detects Oxygen concentration; sends signal to engine control unit	Zirconia ceramic and platinum coating
Pressure regulator	Adjusts fuel pressure supplied to injectors	
Pulsation damper	Absorbs fuel pulsation	
Throttle sensor	Detects throttle valve opening angle; sends signal to engine control unit	Integrated idle switch
Water thermo sensor	Detects coolant temperature; sends signal to engine control unit	
Water thermo switch	Detects radiator coolant temperature; sends signal to engine control unit	ON: above 17°C (63°F)

76G04B-058

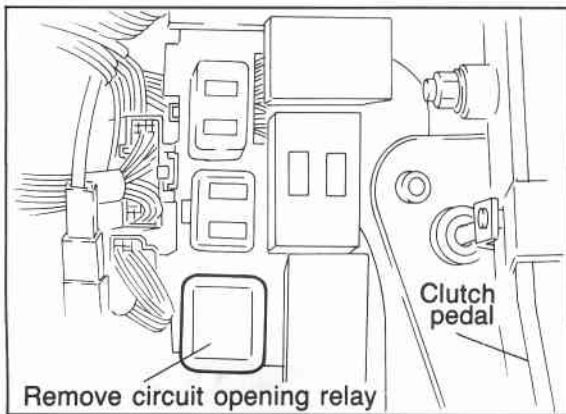
4B FUEL SYSTEM

TROUBLESHOOTING

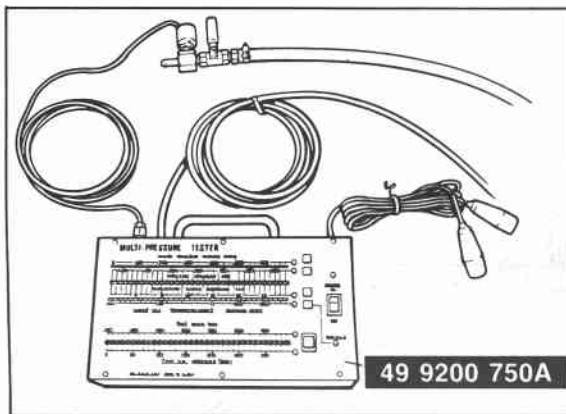
Check the condition of the wiring harness and connectors before checking the sensors or switches.

Possible cause Page		Air flow meter	Atmospheric pressure sensor	Oxygen sensor	Throttle sensor	Water thermo sensor	Water thermo switch	Fuel pump	Injector	Fuel pressure	Engine control unit terminal	
											3C 3E	3B
Symptom		4B-94	4B-99	4B-98	4B-95	4B-97	4B-97	4B-49	4B-51	4B-48	4B-90	4B-90
Hard start or won't start (Crank OK)			5			4		1	3			2
Engine stalls	While warming up	4				3			2	1	5	
	After warming up	1							3	2	4	
Rough idle	While warming up	4				3			2	1		
	After warming up	1	2						4	3		
Poor acceleration, hesitation, or lack of power		1			3				4	2		
Runs rough on deceleration		1							2			
Afterburn in exhaust system		1							2			
Poor fuel consumption		5	6	4		3			2	1		
Fails emission test				1			2					
Engine stalls or rough after hot starting		1							3	2		

76G04B-059



86U04A-068



86U04A-069

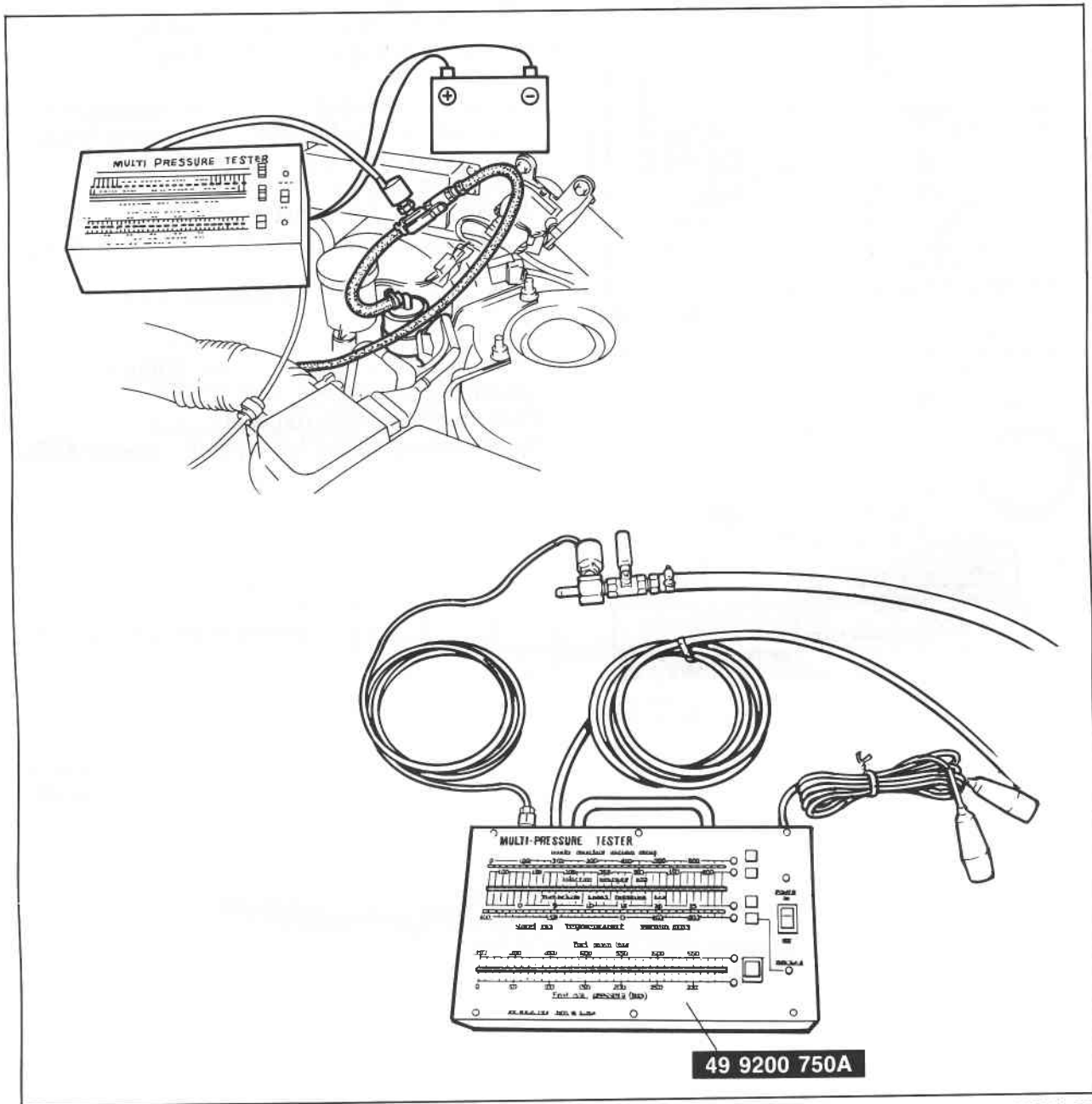
FUEL PRESSURE RELEASE AND SERVICING FUEL SYSTEM

Fuel in the fuel system remains under high pressure even when the engine is not running.

- a) Before disconnecting any fuel line, release the fuel pressure from the fuel system to reduce the possibility of injury or fire.
 1. Start the engine.
 2. Disconnect the circuit opening relay.
 3. After the engine stalls, turn OFF the ignition switch.
 4. Reconnect the circuit opening relay.
- b) Use a rag as protection from fuel spray when disconnecting the hoses.
Plug the hoses after removal.
- c) When inspecting the fuel system, use the **SST**.

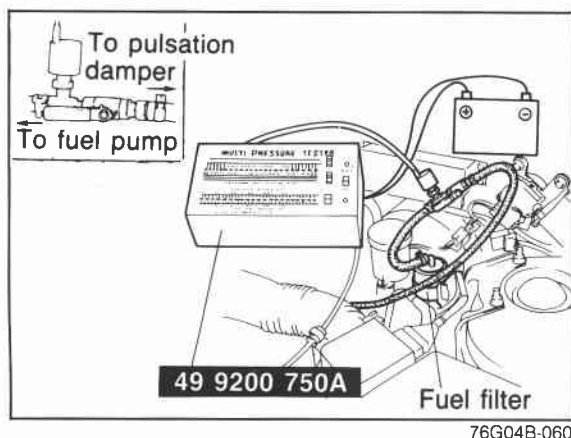
4B FUEL SYSTEM

MULTI-PRESSURE TESTER (49 9200 750A)

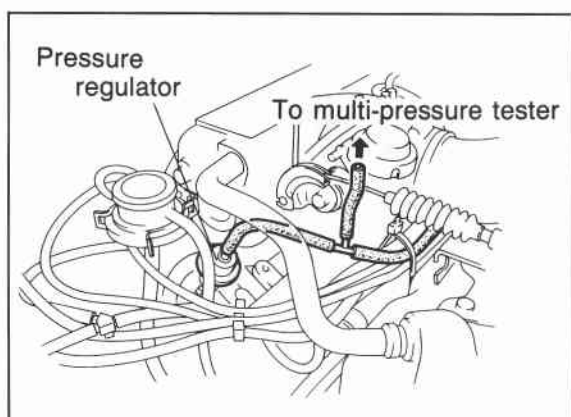


69G04A-099

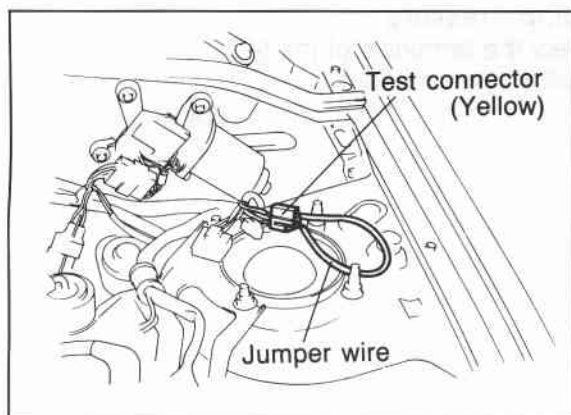
The **MULTI-PRESSURE TESTER** (49 9200 750A) has been developed to check the fuel pressure and intake manifold vacuum. These can easily be inspected by setting the buttons on the tester.



76G04B-060



86U04A-071



86U04A-072

How to Connect Multi-Pressure Tester

Warning

Before connecting the SST, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page 4B—45.)

1. Disconnect the negative battery terminal.
2. Disconnect the fuel main hose from the fuel filter.
3. Connect the **SST** between the fuel main hose and fuel pump with the adapter.

Caution

Do not reverse the adapter connection.

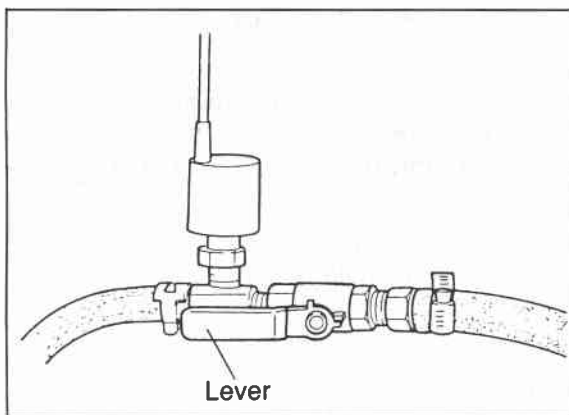
4. Disconnect the vacuum hose from the pressure regulator control solenoid valve. Connect the **SST** vacuum hose with a three-way joint.
5. Connect the negative battery terminal.
6. Connect the **SST** to the battery.

7. Connect the terminals of the test connector (Yellow) with a jumper wire. Turn the ignition switch ON to operate the fuel pump.
8. Check for fuel leaks.

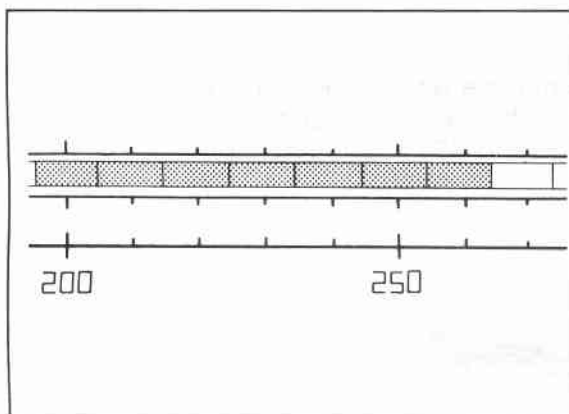
Caution

After checking for fuel leakage, turn the ignition switch OFF and disconnect the jumper wire from the test connector.

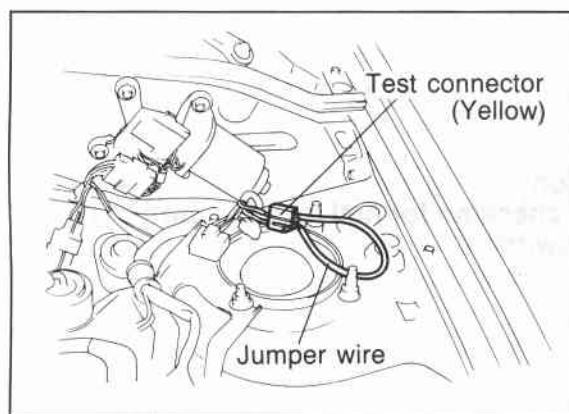
4B FUEL SYSTEM



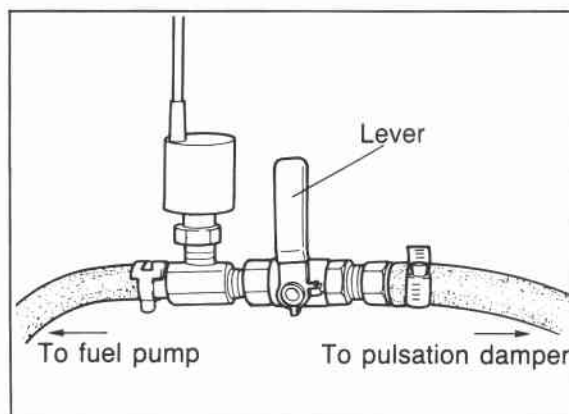
76G04B-061



86U04A-074



86U04A-075



76G04B-062

FUEL PRESSURE

Note

- When inspecting fuel pressure, use the SST. (Refer to page 4B—47).
- Warm up the engine to normal operating temperature.

Injection Pressure

- Set the lever on the adapter as shown in the figure.

- Run the engine and measure the injection pressure at various speeds.

**Injection pressure: Approx. 235—275 kPa
(2.4—2.8 kg/cm², 34—40 psi)**

- If not within specification, check the fuel pump pressure and fuel line pressure.

Fuel Pump Pressure

- Connect the terminals of the test connector (Yellow) with a jumper wire.
- Turn the ignition switch ON to operate the fuel pump.
- Set the lever on the adapter as shown in the figure.
- Check the fuel pump pressure.

**Fuel pump pressure: 441—588 kPa
(4.5—6.0 kg/cm², 64—85 psi)**

- If the fuel pump pressure is not within specification, check the following;

No pressure

- Fuel pump operation (Refer to page 4B—49.)

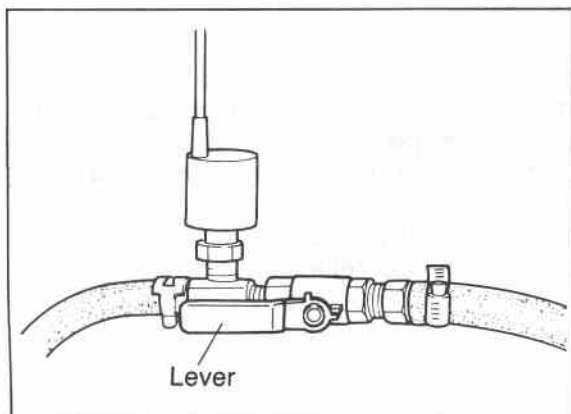
Low pressure

- Fuel pump feeding capacity (Refer to page 4B—50.)

High pressure

- Replace the fuel pump

- After checking the fuel pump pressure, disconnect the jumper wire from the test connector.



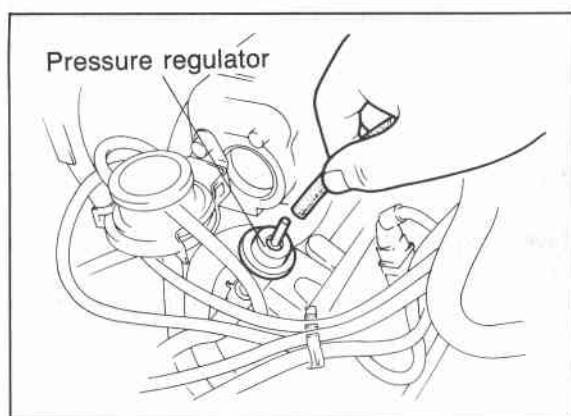
76G04B-126

Fuel Line Pressure

1. Start the engine and run it at idle.
2. Set the lever on the adapter as shown in the figure.
3. Check the fuel line pressure.

**Fuel line pressure: Approx. 186—226 kPa
(1.9—2.3 kg/cm², 27—33 psi)**

4. If not within specification, check the vacuum hose.

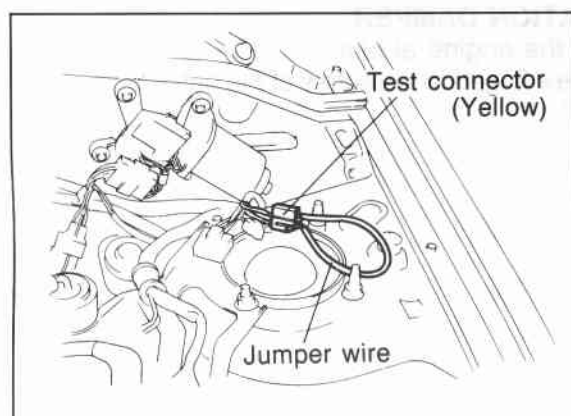


86U04A-078

5. Disconnect the vacuum hose from pressure regulator, and place a finger over the end of the hose.
6. Check the fuel line pressure.

**Fuel line pressure: 235—275 kPa
(2.4—2.8 kg/cm², 34—40 psi)**

7. If not within specification, replace the pressure regulator.
8. Connect the vacuum hose to pressure regulator.



76G04B-063

FUEL PUMP

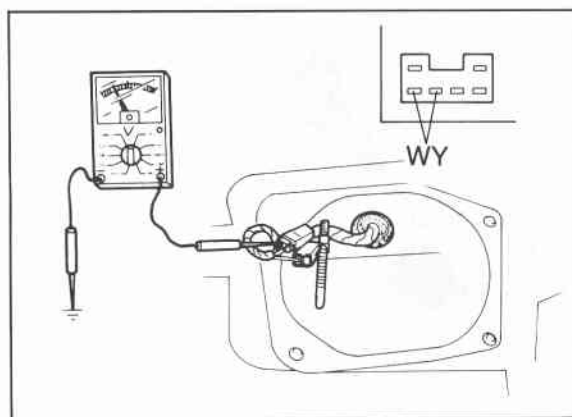
Operation Test

1. Connect a jumper wire to the test connector (Yellow).
2. Remove the fuel filler cap.
3. Turn the ignition switch ON.
4. Listen for operational sound of the fuel pump at the filler inlet.
5. Install the fuel filler cap.

6. If no sound is heard, check the voltage at the fuel pump connector (WY wire and a ground).

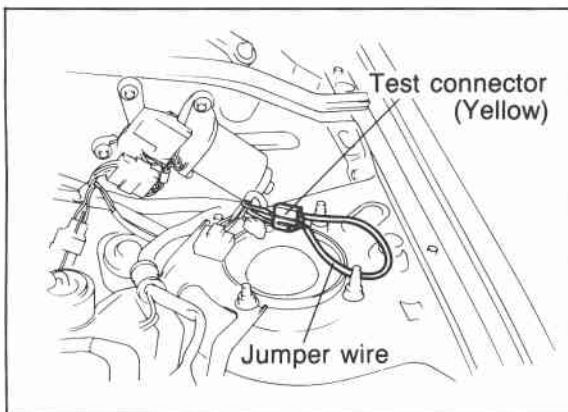
Voltage: 12V

7. If the voltage is normal, replace the fuel pump.
8. If not correct, check the circuit opening relay (Refer to page 4B—86) and its circuits.
9. Disconnect the jumper wire.

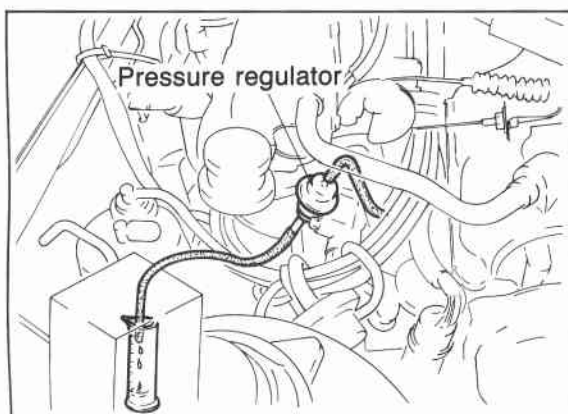


76G04B-064

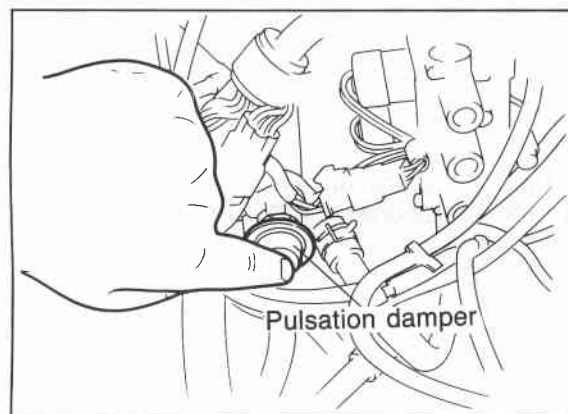
4B FUEL SYSTEM



76G04B-065



86U04A-082



86U04A-083

Volume Test

Warning

Before performing following procedures, release the fuel pressure to reduce the possibility of injury or fire. (Refer to page 4B—45)

1. Connect a jumper wire to test connector (Yellow).
2. Disconnect the fuel return hose from fuel return pipe.

3. Turn the ignition switch ON for 10 seconds, and check the feeding capacity with graduated cylinder.

Feeding capacity:

220 cc (13.4 cu in)/10 sec. min.

4. If not within specification, check the fuel filter, and fuel line.
5. Turn the ignition switch OFF and disconnect the jumper wire.

PULSATION DAMPER

1. Run the engine at idle.
2. Place a finger on the screw of the pulsation damper head.
3. Check that pulsation is felt.

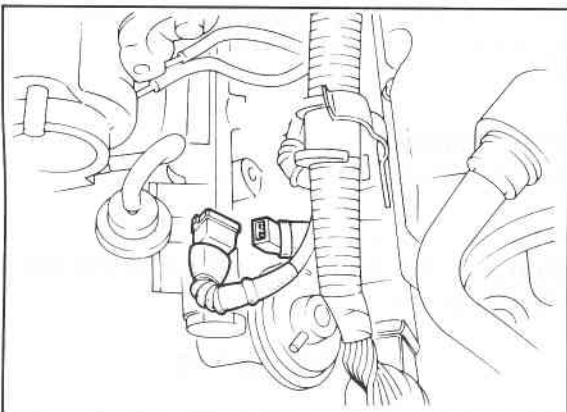


76G04B-066

INJECTOR

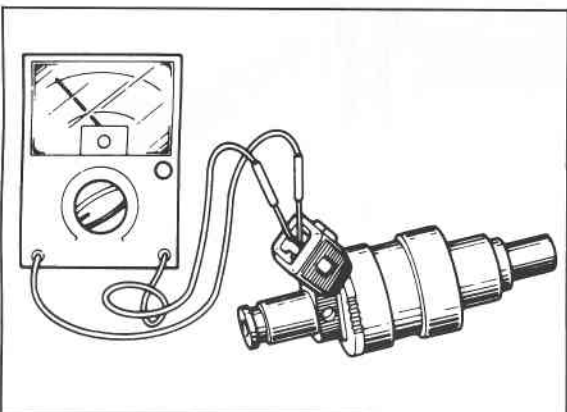
On-vehicle Inspection If engine runs

1. Warm up the engine and run it at idle.
2. Listen for operational sound of the injector with a screwdriver or a sound scope.
3. If no operational sound is heard, check the main relay and injector resistance.



76G04B-067

4. Disconnect the connector from each injector respectively.
5. Check that the engine speed decreases about **100—200 rpm** each time.
6. If not correct, check the injector resistance and injection volume of the injector.



76G04B-068

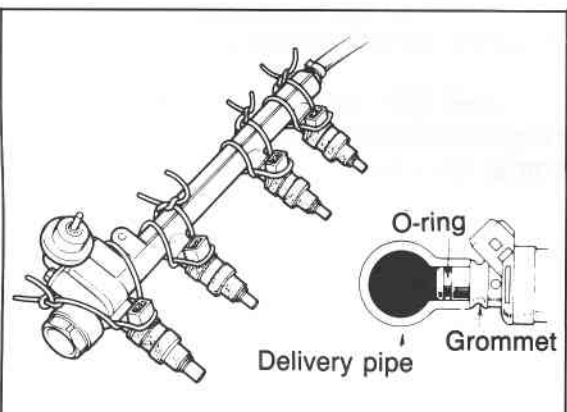
Inspection

There are 3 inspections which must be performed for the injectors.

Resistance

1. Remove the injectors from the engine. (Refer to page 4B—58.)
2. Check the resistance of each injector with an ohmmeter.
3. If not correct, replace the injector.

Resistance: 12—16 Ω



76G04B-069

Fuel leakage test and volume test

1. Lift the dynamic chamber upward.
2. Remove the injectors and delivery pipe. (Refer to pages 4B—58 and 59.)
3. Affix the injectors, pressure regulator, and pulsation damper to the delivery pipe with wire.

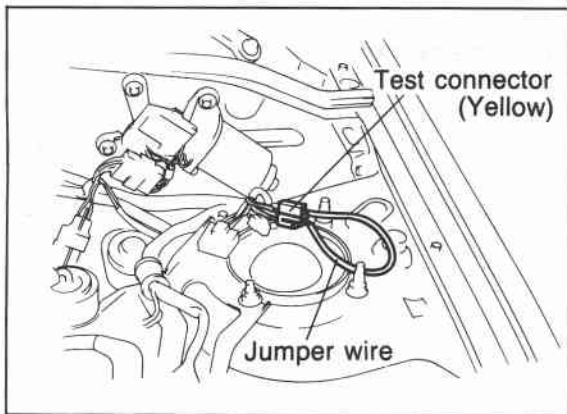
Caution

Affix the injectors firmly to the delivery pipe so that no movement of the injectors is possible.

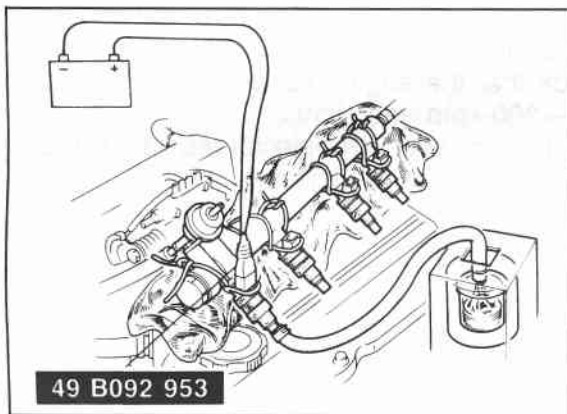
Warning

Be extremely careful when working with fuel. Always work away from sparks or open flames.

4B FUEL SYSTEM



76G04B-070



76G04B-071

4. Connect the fuel return hose and vacuum hose to the pressure regulator.
5. Connect the terminals of the fuel pump test connector with a jumper wire. Turn the ignition switch ON.
6. Check that no fuel leaks from the injector nozzles.

Note

After 1 minute a drop of fuel from the injector is acceptable.

7. Connect the **SST** to the battery and injector.
8. Check the injection volume with a graduated container.

Injection volume:

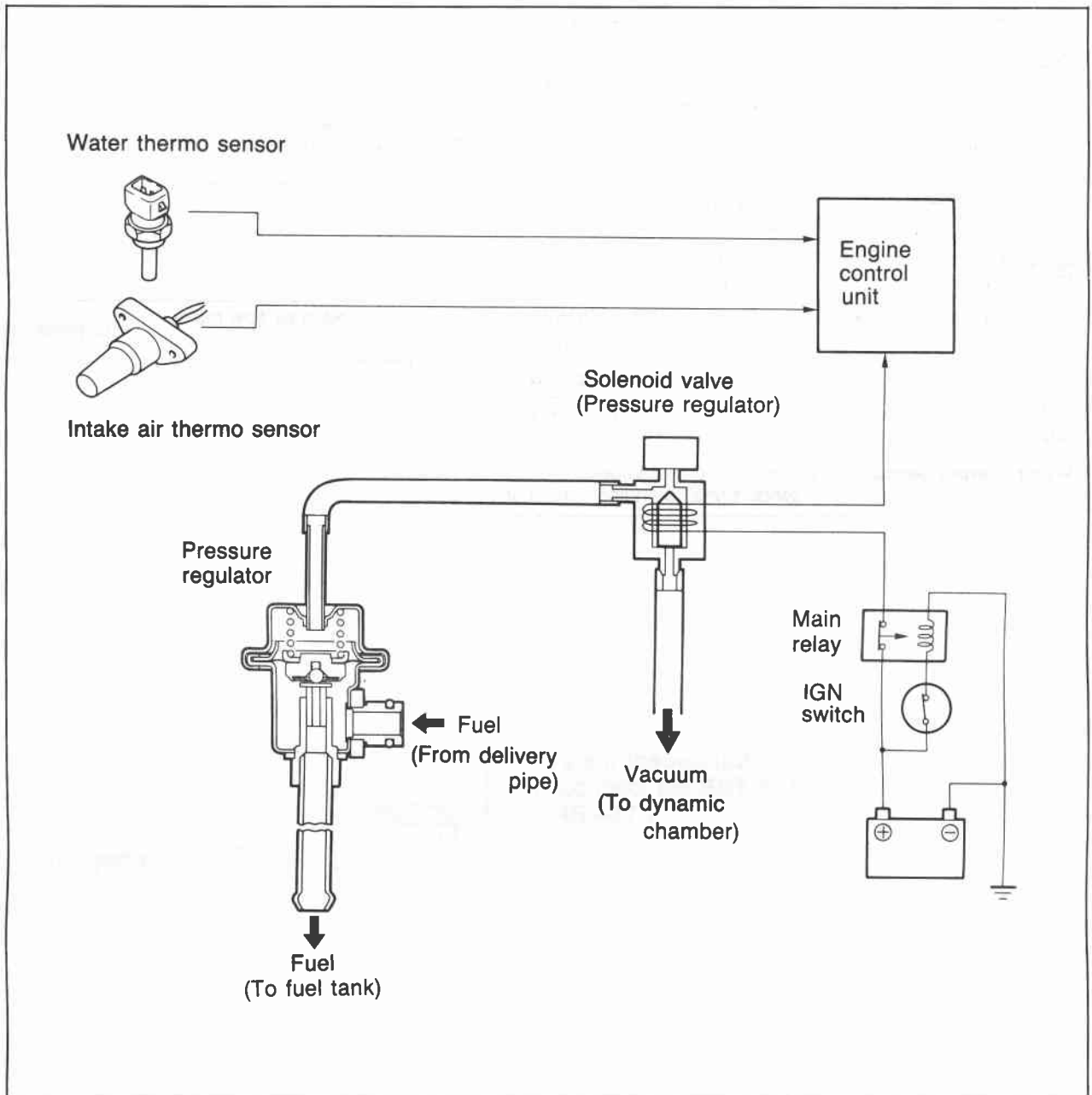
Approx. 38—53 cc (2.3—3.2 cu in) /15 sec.

Caution

When using the SST, make sure of the SST number and use correct one.

9. If not correct, replace the injectors.

PRESSURE REGULATOR CONTROL SYSTEM



76G04B-072

To prevent percolation of the fuel during idle after the engine is restarted, vacuum is cut to the pressure regulator, increasing the fuel pressure.

Specified time: Approx. 120 sec.

Operating condition: Coolant temperature — above 70°C (158°F)
Intake air temperature — above 10°C (50°F)

4B FUEL SYSTEM

COMPONENT DESCRIPTIONS

Component	Function	Remarks
Engine control unit	Detects signals from input sensors and switches; controls solenoid valve (Pressure regulator control)	
Idle switch	Detects when throttle valve fully closed; sends signal to engine control unit	Installed in throttle sensor
Ignition coil (-) terminal	Detects engine speed; sends signal to engine control unit	
Ignition switch (ST position)	Sends engine cranking signal to engine control unit	
Intake air thermo sensor	Detects intake air temperature; sends signal to engine control unit	Installed in air flow meter
Pressure regulator	Adjusts fuel pressure supplied to injectors	
Solenoid valve (Pressure regulator control)	Controls vacuum line to pressure regulator	Closes vacuum line when hot
Water thermo sensor	Detects coolant temperature; sends signal to engine control unit	

76G04B-073

TROUBLESHOOTING

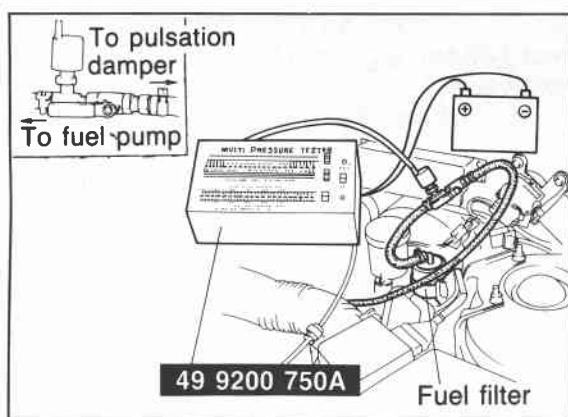
Check the condition of the wiring harness and connections before checking the sensors or switches below.

Note

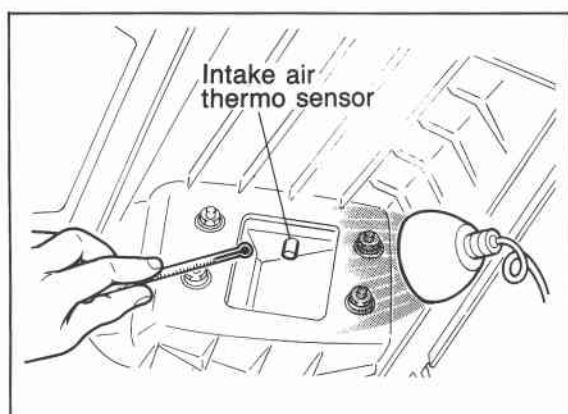
Make the system inspection first. If no problem is found, continue with the next system inspection of the Troubleshooting Guide. (Refer to pages 4B—7 and 8.)

Possible cause Page	Solenoid valve (Pressure regulator control)	Water thermo sensor	Intake air thermo sensor	Engine control unit terminal 2K	System inspection
Symptom	4B—56	4B—97	4B—94	4B—89	4B—55
Engine stalls or rough after hot starting	2	3	4	5	1

76G04B-074



76G04B-075



76G04B-076

System Inspection

1. Connect the **SST** to the engine. (Refer to page 4B—47.)
2. Start the engine.

3. Warm up the engine to normal operating temperature and stop the engine.

Warning

Be careful when disconnecting the water thermo sensor connector because the surrounding area is very hot.

4. Lift the air cleaner upper cover assembly.
5. Heat the intake air thermo sensor to **above 10°C (50°F)**.

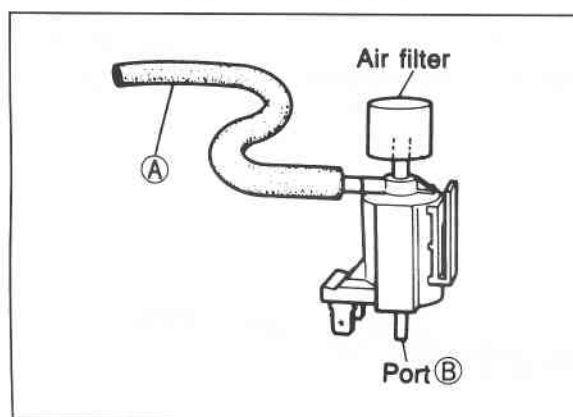
4B FUEL SYSTEM

Operating time	Fuel line pressure kPa (kg/cm ² , psi)
After starting; for 120 sec.	235—275 (2.4—2.8, 34—40)
After 120 sec.	186—226 (1.9—2.3, 27—33)

76G04B-127

6. Restart the engine.

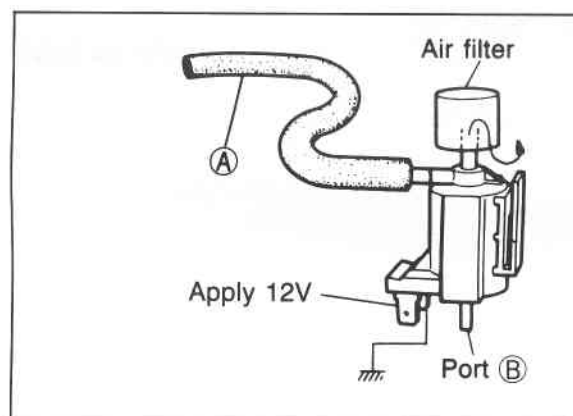
7. Check the fuel line pressure and operating times as shown in the chart.



86U04A-098

Solenoid Valve (Pressure Regulator Control) Inspection

1. Disconnect the vacuum hose from the solenoid valve and vacuum pipe.
2. Blow through the solenoid valve from vacuum hose A.
3. Check that air flows from port B.



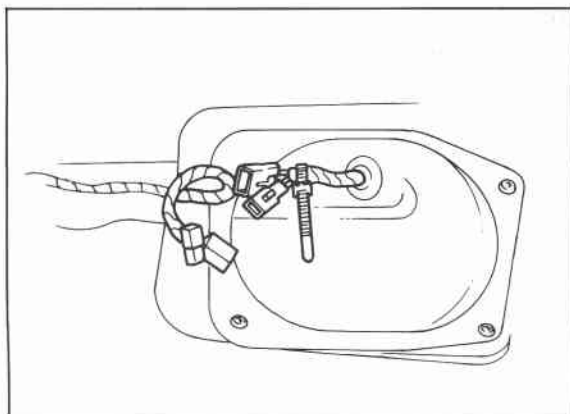
86U04A-099

4. Disconnect the solenoid valve connector.
5. Connect 12V and a ground to the terminals of the solenoid valve.
6. Blow through the solenoid valve from the vacuum hose A.
7. Check that air flows from the valve air filter.

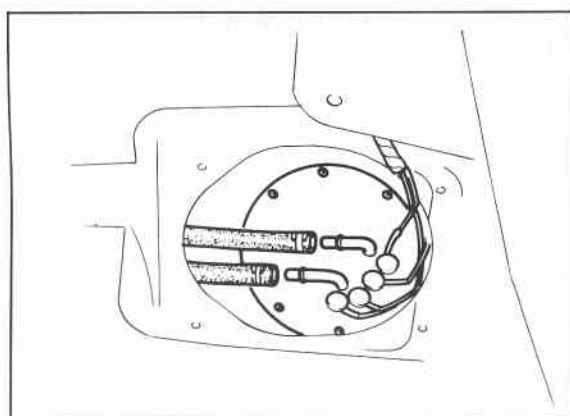
REPLACEMENT

Caution

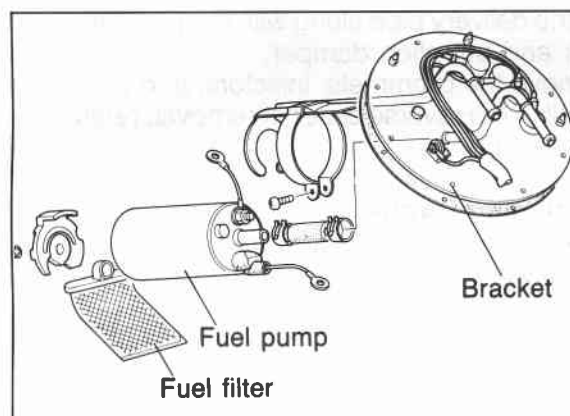
- a) Before performing the following procedure, release the fuel pressure from the fuel system to reduce the possibility of injury or fire (Refer to page 4B—45).
- b) When servicing the fuel system, keep sparks, cigarettes, and open flames away from the fuel.



76G04B-077



86U04A-101



86U04A-102

Fuel Pump

1. Remove the rear seat and disconnect the fuel pump connector.
2. Remove the service hole cover.
3. Disconnect the fuel hoses.
4. Remove the fuel pump and fuel tank gauge assembly.

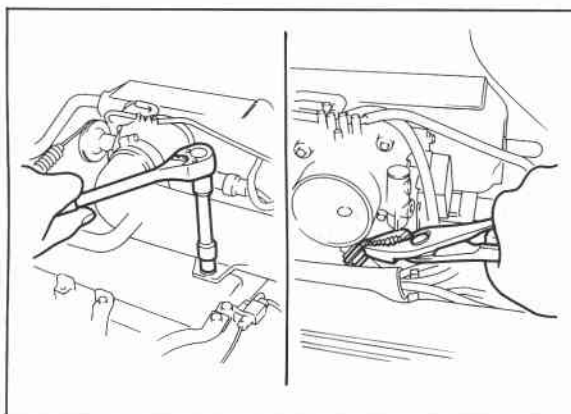
5. Replace the fuel pump.

Caution

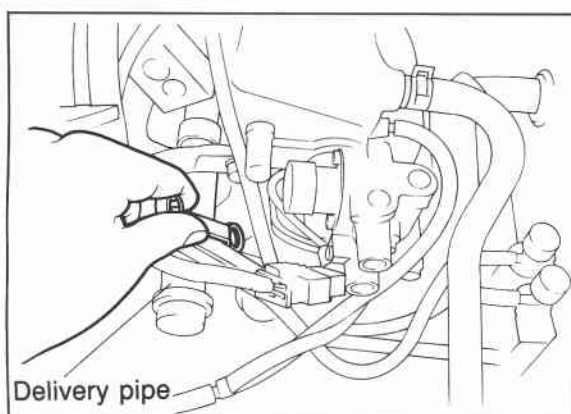
Secure the fuel pump terminals and fuel hoses securely.

6. Install in the reverse order of removal.

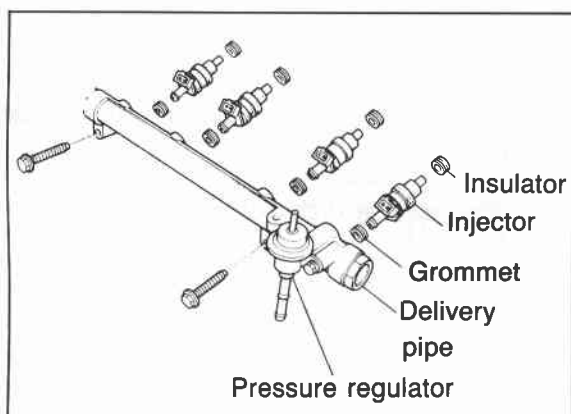
4B FUEL SYSTEM



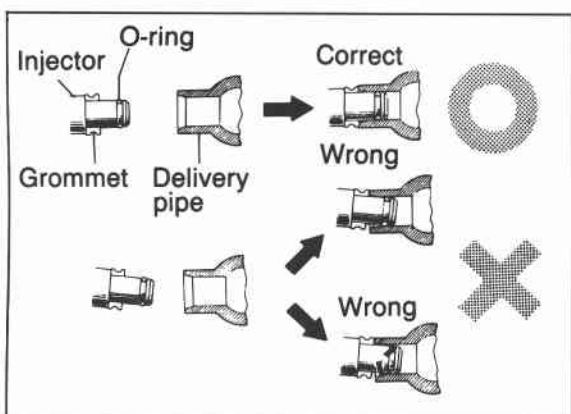
76G04B-078



76G04B-079



76G04B-080



86U04A-108

Injector

1. Disconnect the air pipe from the throttle body.
2. Disconnect the air hose from the throttle body.

3. Disconnect the delivery pipe from the intake manifold.

4. Lift the delivery pipe along with the pressure regulator and pulsation damper.
5. Remove the grommets, injectors, and insulators.
6. Install in the reverse order of removal, referring to installation note.

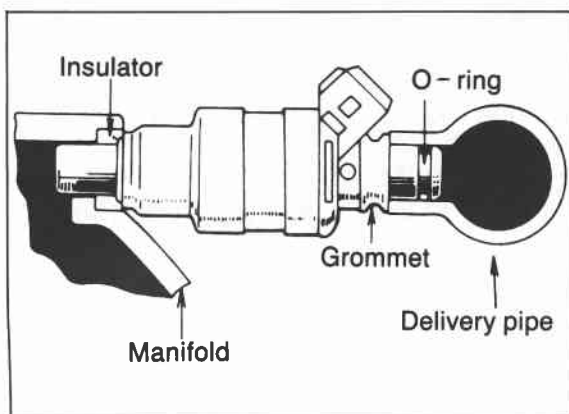
Tightening torque:

Delivery pipe 19—25 N·m
(1.9—2.6 m·kg, 14—19 ft·lb)

Installation note

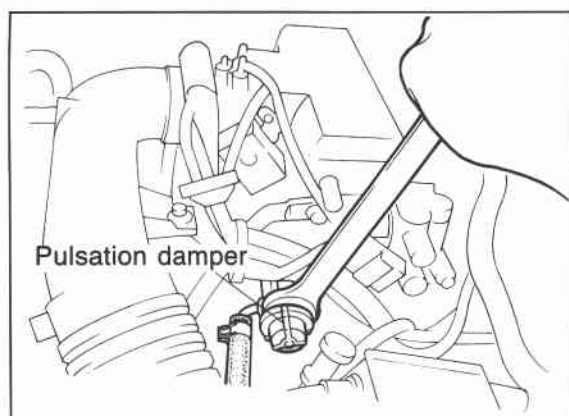
Injector

1. Use new O-rings.
2. Apply a small amount of engine oil to the O-rings when installing.



86U04A-109

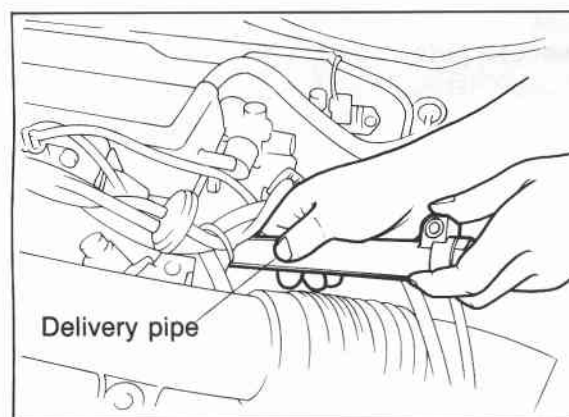
3. Install the injectors and the injector insulators.



76G04B-081

Delivery Pipe

1. Remove the pulsation damper and pressure regulator from the delivery pipe.
2. Remove the injectors (Refer to page 4B—58).



76G04B-082

3. Replace the delivery pipe.
4. Install in the reverse order of removal, referring to installation note.

Tightening torque:

Pressure regulator

8—11 N·m (0.8—1.1 m·kg, 69—95 in·lb)

Delivery pipe

19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)

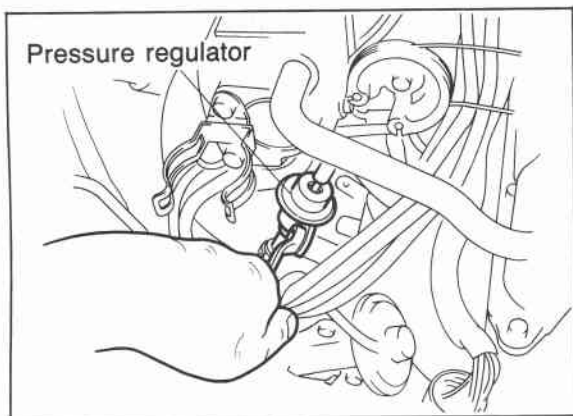
Installation note

Injector

Refer to page 4B—58.

76G04B-083

4B FUEL SYSTEM



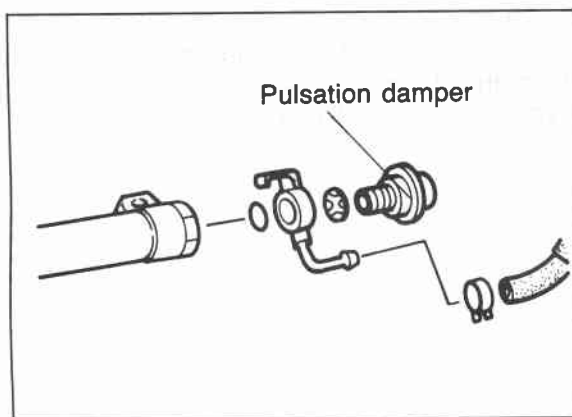
76G04B-084

Pressure Regulator

1. Disconnect the vacuum hose and fuel return hose.
2. Remove the pressure regulator.
3. Install in the reverse order of removal.

Tightening torque:

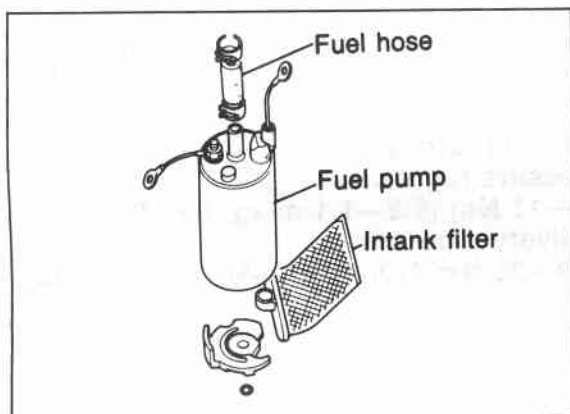
8—11 N·m (0.8—1.1 m·kg, 69—95 in·lb)



76G04B-085

Pulsation Damper

1. Loosen the pulsation damper and remove it.
2. Install in the reverse order of removal.



76G04B-086

Fuel Filter

Low pressure side

Refer to page 4B—57.

High pressure side

The fuel filter must be replaced at the intervals outlined in the maintenance schedule.

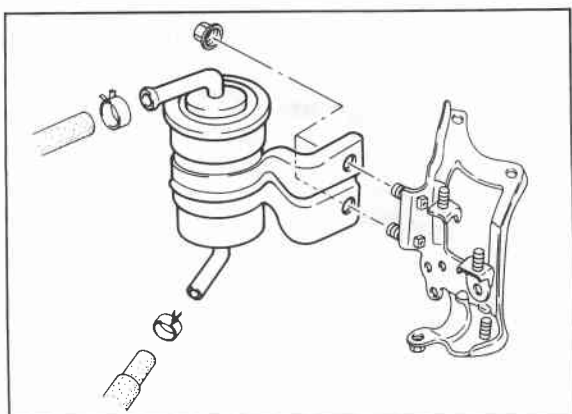
Warning

Always work away from sparks or open flames.

1. Disconnect the fuel hoses from the fuel filter.
2. Remove the fuel filter and the bracket.
3. Install a new filter and the bracket.
4. Connect the fuel hoses.

Note

When installing the filter, push the fuel hoses fully onto the fuel filter and secure the hoses with spring clamps.



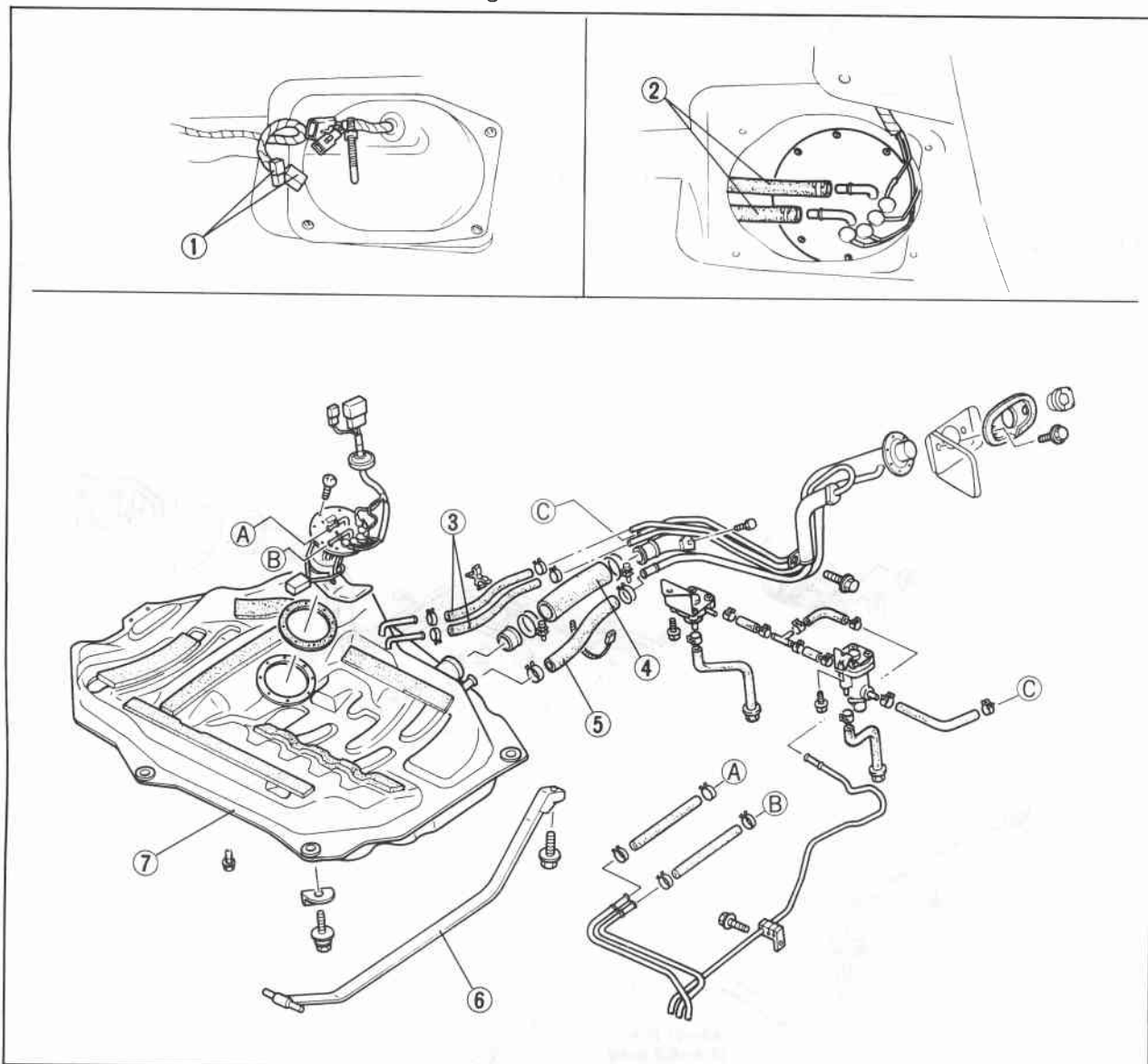
86U04A-116

FUEL TANK Removal

Caution

- a) Before performing the following procedure, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page 4B—45)
- b) When removing the fuel tank, keep sparks, cigarettes, and open flames away from the fuel tank.

Remove in the sequence shown in the figure.



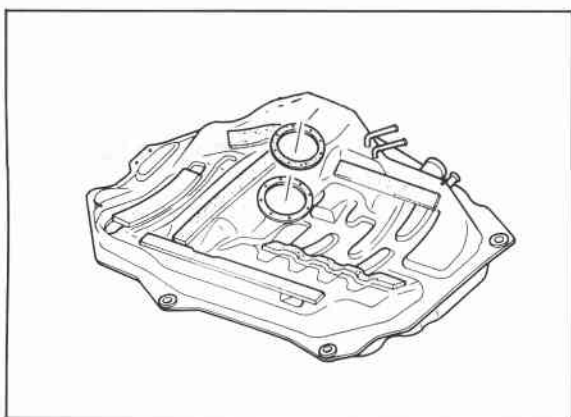
76G04B-087

Note

Drain the fuel from the fuel tank before removing the tank.

- | | |
|-------------------------|--------------------|
| 1. Fuel pump connectors | 5. Breather hose |
| 2. Fuel hoses | 6. Fuel tank strap |
| 3. Evaporative hoses | 7. Fuel tank |
| 4. Fuel filler hose | |

4B FUEL SYSTEM



86U04A-118

Inspection

1. Check the fuel tank for cracks and corrosion.
2. If any defect is found, repair or replace the tank.

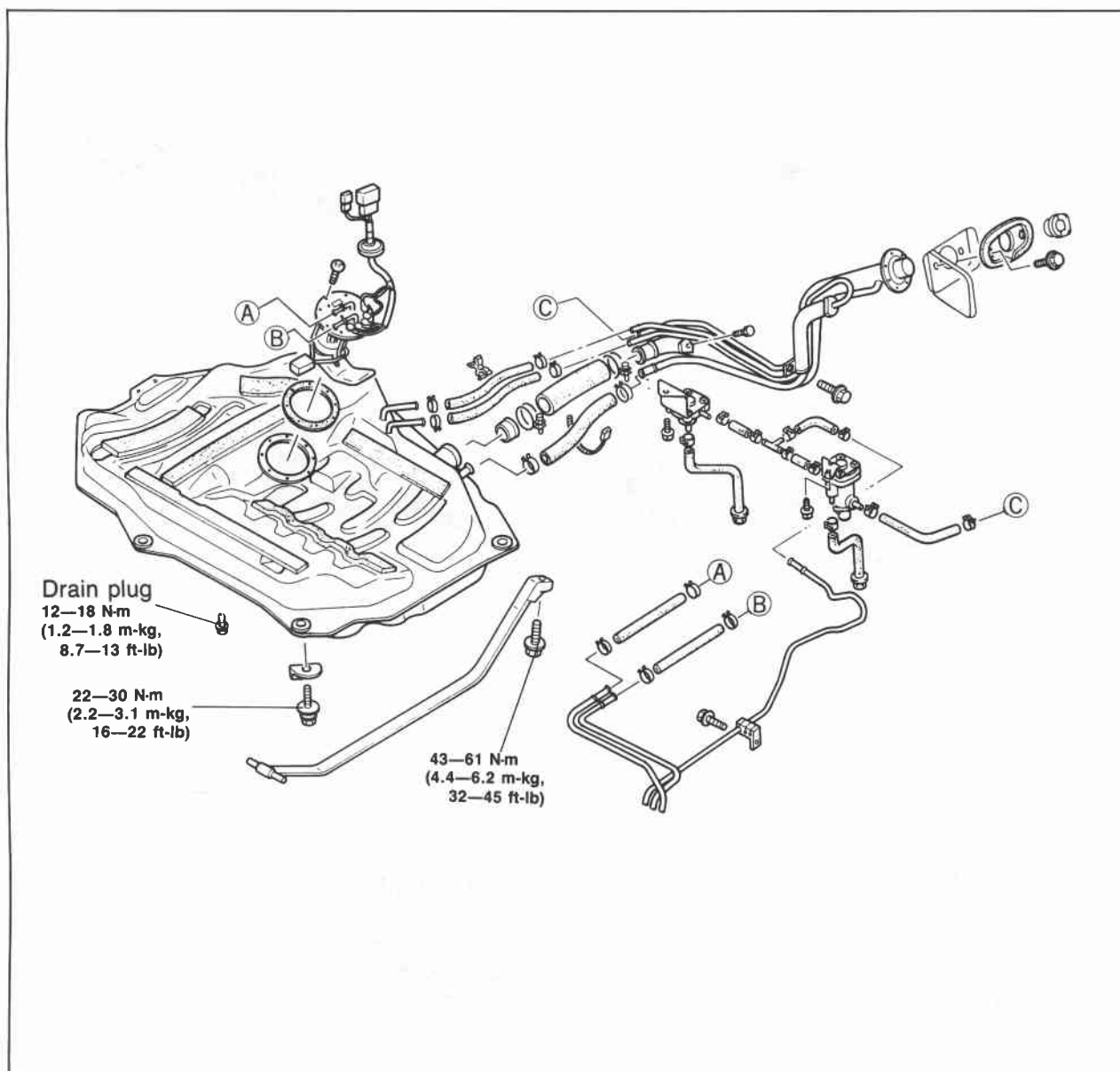
Warning

Before repairing, clean the fuel tank thoroughly with steam to sufficiently remove all explosive gas.

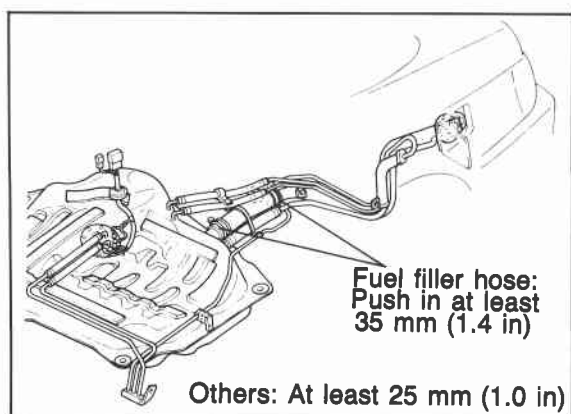
Installation

Install in the reverse order of removal, referring to the installation note.

Torque Specifications



86U04A-119



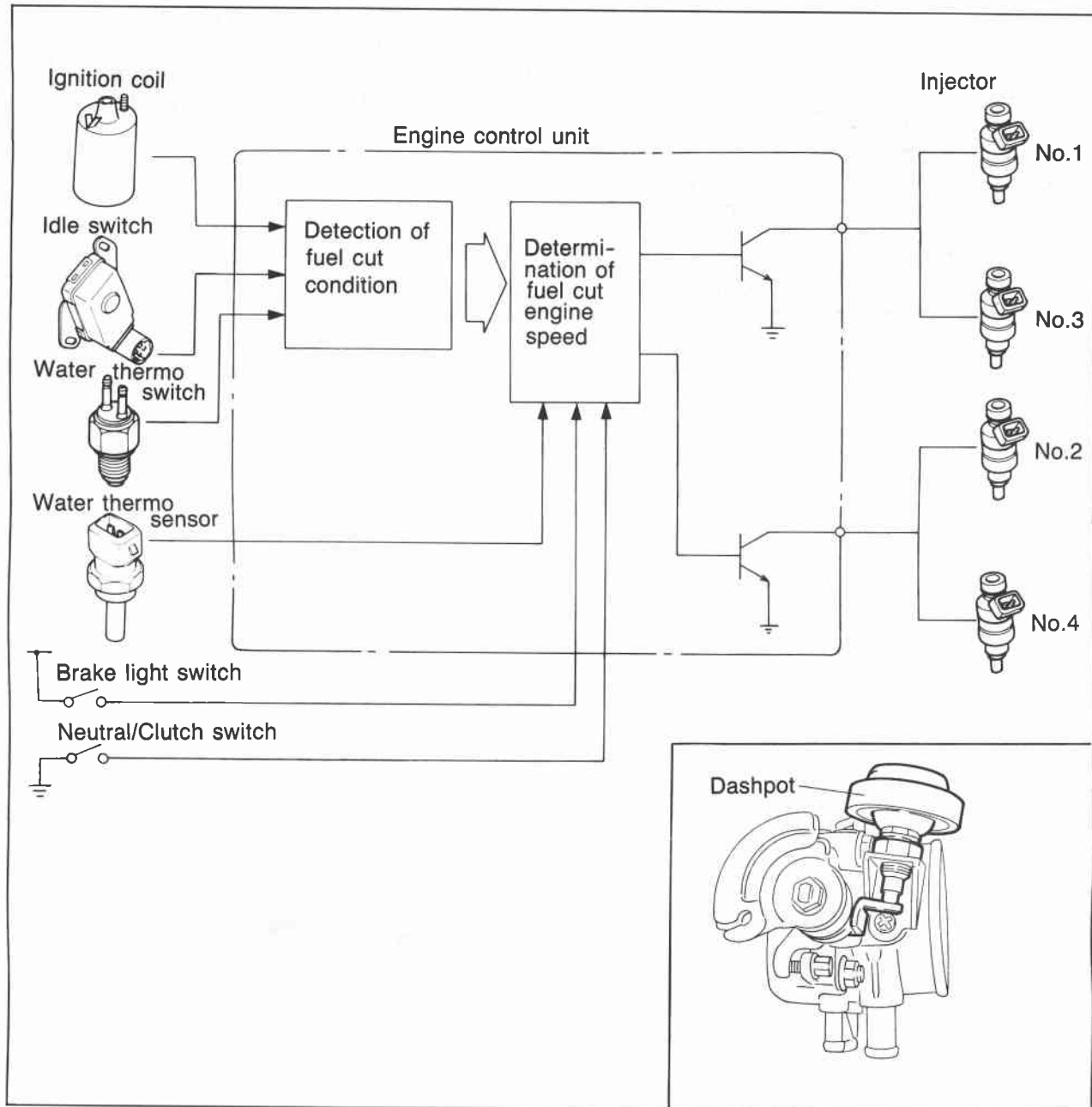
86U04A-120

Installation note

1. Push the hose ends of the main fuel hose, fuel return hose and evaporation hoses onto the fuel tank fittings **at least 25 mm (1.0 in)**.
2. Push the fuel filler hose ends onto the fuel tank pipe and filler pipe **at least 35 mm (1.4 in)**.

4B DECELERATION CONTROL SYSTEM

DECELERATION CONTROL SYSTEM



76G04B-088

This system consists of the dashpot and fuel cut system. The dashpot is to prevent after-burn so that the throttle valve gradually closes during deceleration.

The control unit detects engine deceleration judging from the engine speed and the idle switch, and signals a fuel cut operation to match the engines need, based on the coolant temperature and the driving condition.

DECELERATION CONTROL SYSTEM 4B

COMPONENT DESCRIPTIONS

Component	Function	Remarks
Brake light switch	Detects braking operation (deceleration); sends signal to engine control unit	
Clutch switch	Detects in-gear condition; sends signal to engine control unit	Switch ON when clutch pedal released
Dashpot (MTX)	Prevents sudden closing of throttle valve during deceleration or shifting	Adjustment speed: 1,900—2,100 rpm
Engine control unit	Detects signals from input sensors and switches; cuts fuel injection	
Idle switch	Detects when throttle valve fully closed; sends signal to engine control unit	Installed in throttle sensor
Ignition coil (–) terminal	Detects engine speed; sends signal to engine control unit	
Neutral switch	Detects in-gear condition; sends signal to engine control unit	Switch ON when in-gear
Water thermo sensor	Detects coolant temperature; sends signal to engine control unit	
Water thermo switch	Detects radiator coolant temperature; sends signal to engine control unit	ON: above 17°C (63°F)

76G04B-089

4B DECELERATION CONTROL SYSTEM

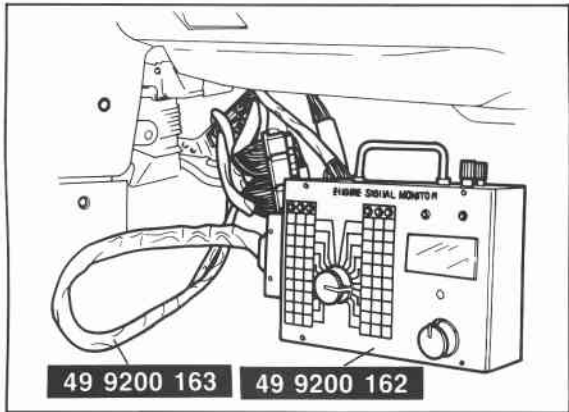
TROUBLESHOOTING

Check the condition of the wiring harness and connectors before checking the sensor or switches below.

Note
Make the system inspection first. If no problem is found, continue with the next system inspection of the Troubleshooting Guide. (Refer to page 4B—7 and 8.)

Symptom	Possible cause	Dashpot	Water thermo sensor	Electrical signal inspection (Injector)
	Page	4B—67	4B—97	4B—66
High Idle speed after warming up		1		
Runs rough on deceleration		1	3	2
Afterburn in exhaust system		1	3	2
Poor fuel consumption		1	3	2
Falls emission test		1	3	2

76G04B-090

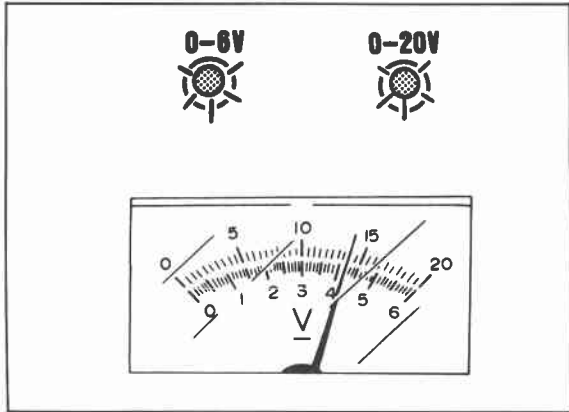


76G04B-091

Electrical Signal Inspection (Injector)

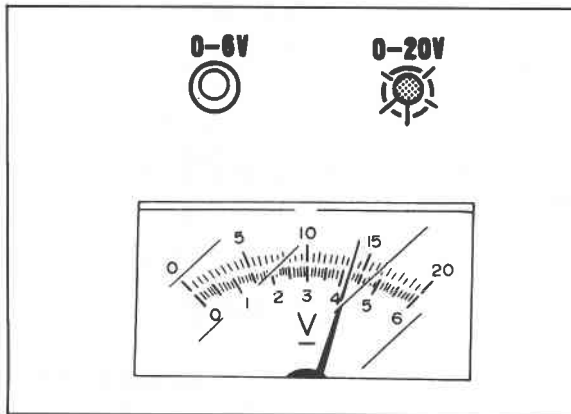
1. Connect the **SST** between the wiring harness and engine control unit.
2. Set 3C or 3E position on the **SST**.

Note
3C — For No. 2 and No. 4 injectors
3E — For No. 1 and No. 3 injectors



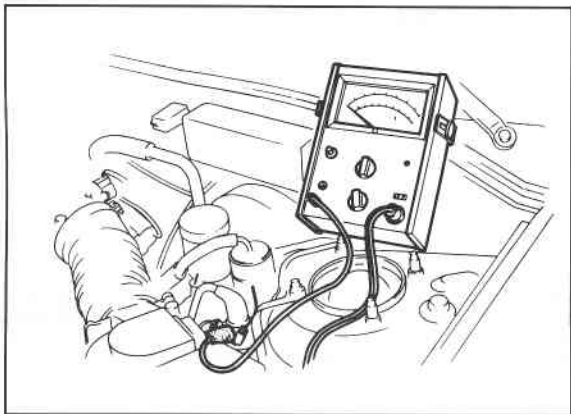
86U04A-125

3. Check that the indicator lamps alternately flash at idle.



86U04A-126

4. Increase the engine speed to **4,000 rpm**, then suddenly decrease the engine speed.
5. Check that the red indicator lamp stays illuminated during deceleration.

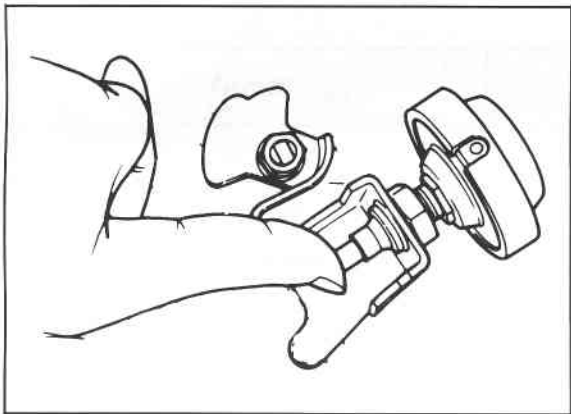


76G04B-092

Dashpot Preparation

Before checking this system, follow these directions.

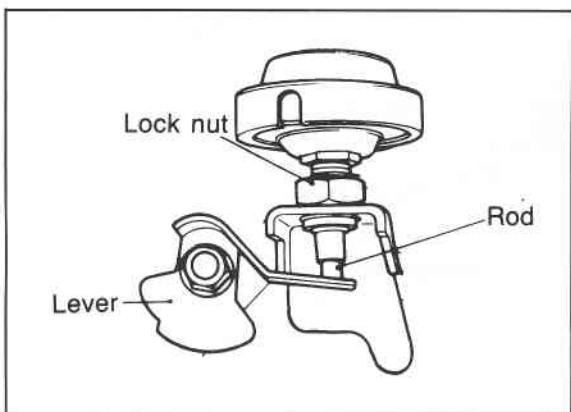
- Switch OFF all accessories.
- Connect a tachometer to the check connector.
- Warm up the engine to normal operating temperature.



76G04B-093

Inspection

1. Open the throttle valve fully and push the dashpot rod with a finger. Check that the rod goes into the dashpot slowly.
2. Release the rod and check that it comes out quickly.



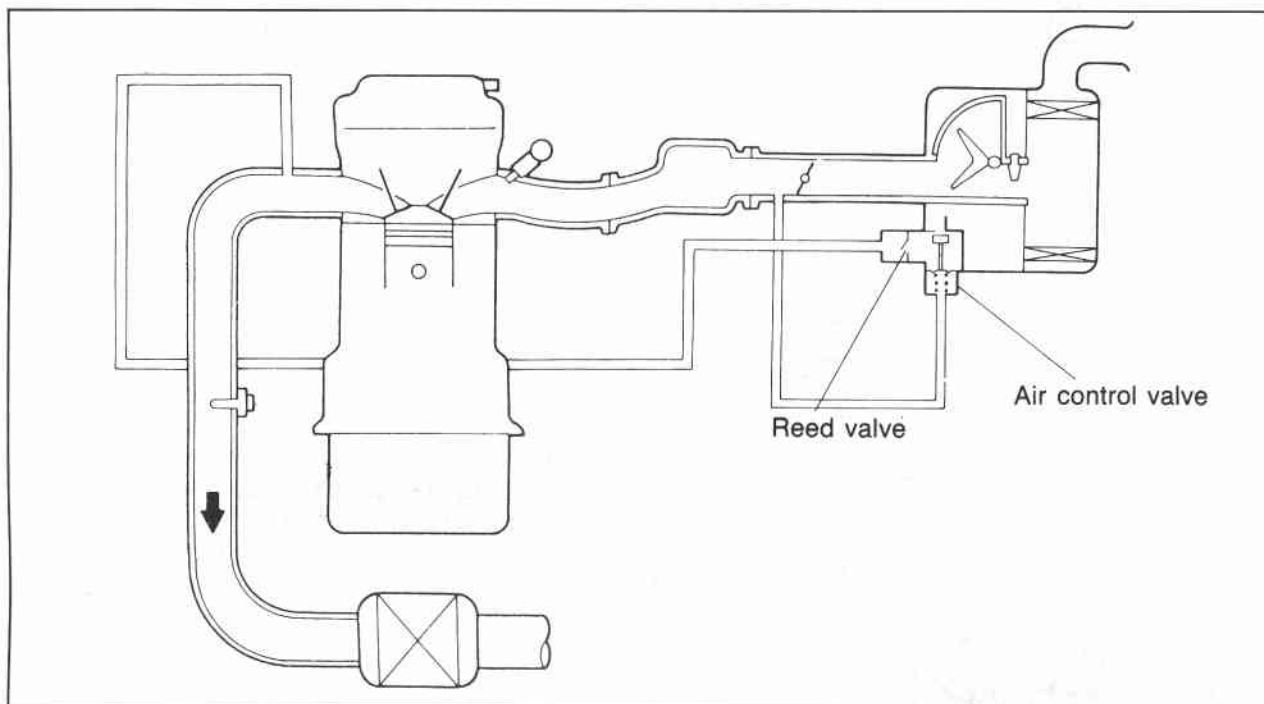
76G04B-094

Adjustment

1. Warm up the engine and run it at idle.
2. Connect a tachometer to the engine.
3. Increase the engine speed to **2,500 rpm**.
4. Slowly decrease the engine speed and check that the dashpot rod touches the lever at **1,900—2,100 rpm**.
5. If not within specification, loosen the lock nut and adjust by turning the dashpot.

4B AIR INJECTION SYSTEM

AIR INJECTION SYSTEM



76G04B-095

This system supplies secondary air into the exhaust system to improve idle stability.

COMPONENT DESCRIPTIONS

Component	Function	Remark
Air cleaner	Filters air entering throttle body	
Air control valve	Directs air to reed valve	Installed on air cleaner
Reed valve	Directs air to exhaust manifold	Improves idle stability

76G04B-096

TROUBLESHOOTING

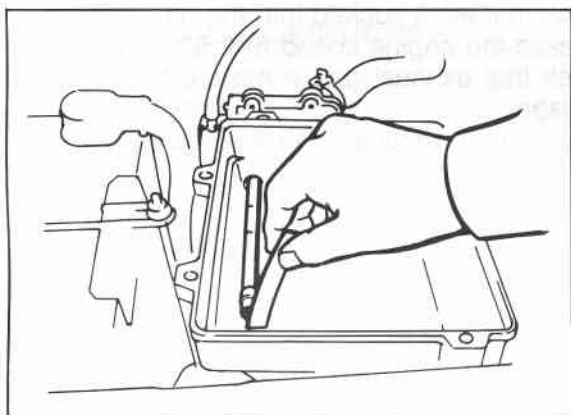
Check the condition of the wiring harness and connectors before checking the sensors or switch.

Note

Make the system inspection first. If no problem is found, continue with the next system inspection of the Troubleshooting Guide. (Refer to pages 4B—7 and 8.)

Possible cause	Air control valve	Reed valve	System inspection
Page	4B—69	4B—70	4B—69
Checking order	2	3	1

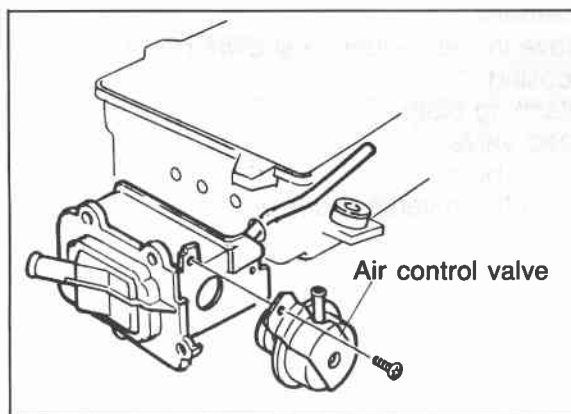
76G04B-097



76G04B-098

System Inspection

1. Warm up the engine and run it at idle.
2. Lift up the air cleaner upper case.
3. Check that air is sucked into the air passage.
4. Increase the engine speed to **2,500 rpm** and check that no air is sucked into the passage.

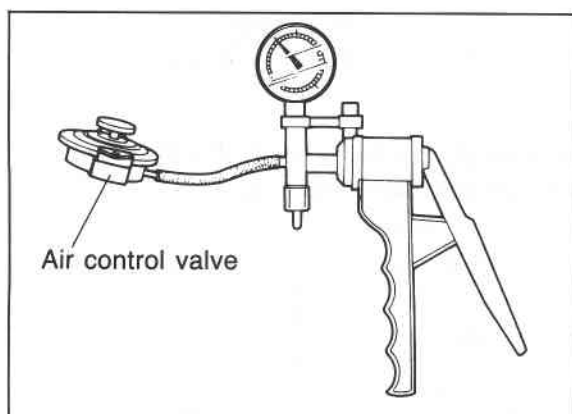


76G04B-099

Air Control Valve Inspection

1. Remove the air control valve.

4B AIR INJECTION SYSTEM

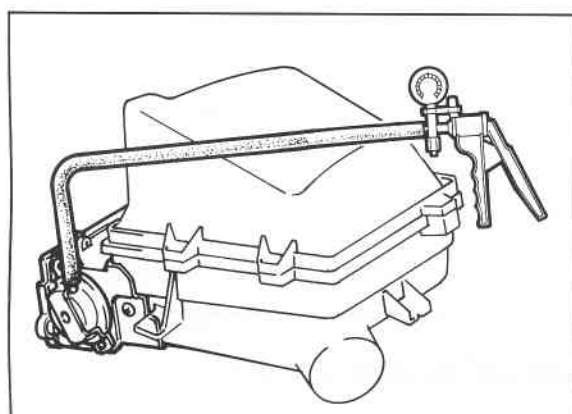


56G04B-114p

2. Connect a vacuum pump to the valve.
3. Apply vacuum gradually and check that the stem starts to move as specified.

Specification:

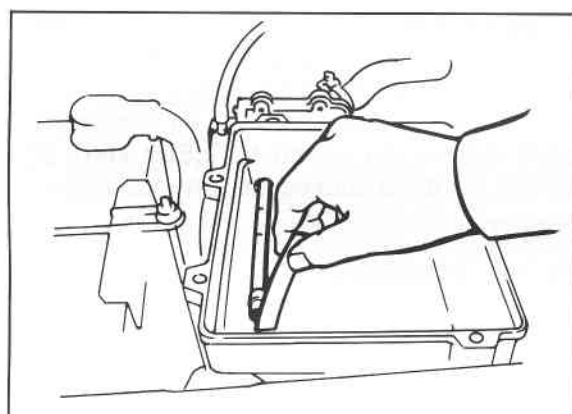
180—280 mmHg (7.1—11.0 inHg)



76G04B-100

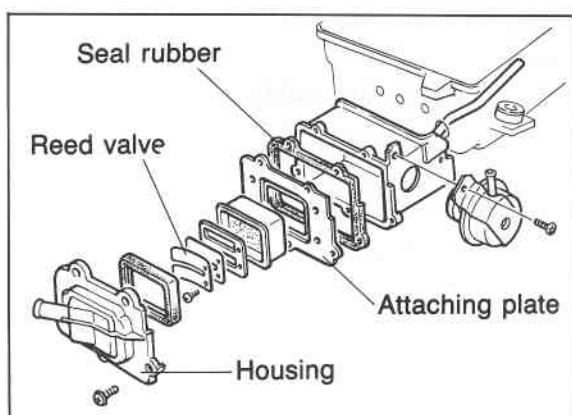
Reed Valve Inspection

1. Warm up the engine and run it at idle.
2. Disconnect the vacuum hose from the air control valve and plug it.
3. Attach a vacuum pump to the air control valve and apply **500 mmHg (19.7 inHg)** vacuum.



76U04A-066

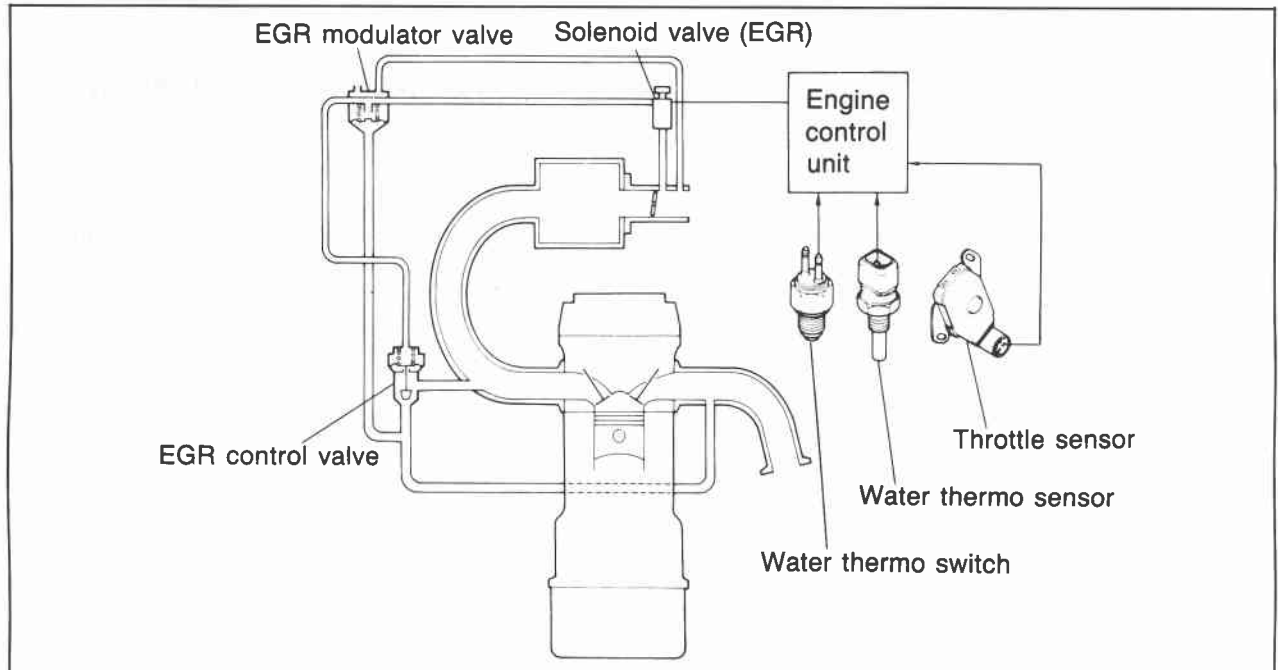
4. Check that air is sucked into the air passage.
5. Increase the engine speed to **2,500 rpm**.
6. Check that exhaust gas is not emitted from the passage.
7. If not correct, replace the reed valve.



76G04B-101

Replacement

1. Remove in the sequence shown in the figure.
 - 1) Housing
 - 2) Attaching plate
 - 3) Reed valve
 - 4) Seal rubber
2. Install in the reverse order of removal.

EXHAUST GAS RECIRCULATION (EGR) SYSTEM

86U04A-127

This system introduces exhaust gas into the intake manifold to reduce NOx in the exhaust gas. It operates depending on the engine load, engine speed (**above 1,500 rpm**), engine coolant temperature (**above 70°C, 158°F**), and radiator coolant temperature (**above 17°C, 63°F**).

COMPONENT DESCRIPTIONS

Component	Function	Remarks
EGR control valve	Recirculates portion of exhaust gas	
EGR modulator valve	Controls vacuum acting on EGR control valve	
Engine control unit	Detects signals from input sensors and switches; controls solenoid valve (EGR)	
Ignition coil (-) terminal	Detects engine speed; sends signal to engine control unit	
Solenoid valve (EGR)	Controls vacuum line to EGR control valve	
Throttle sensor	Detects throttle valve opening angle; sends signal to engine control unit	Integrated idle switch
Water thermo sensor	Detects coolant temperature; sends signal to engine control unit	
Water thermo switch	Detects radiator coolant temperature; sends signal to engine control unit	ON: above 17°C (63°F)

76G04B-102

4B EGR SYSTEM

TROUBLESHOOTING

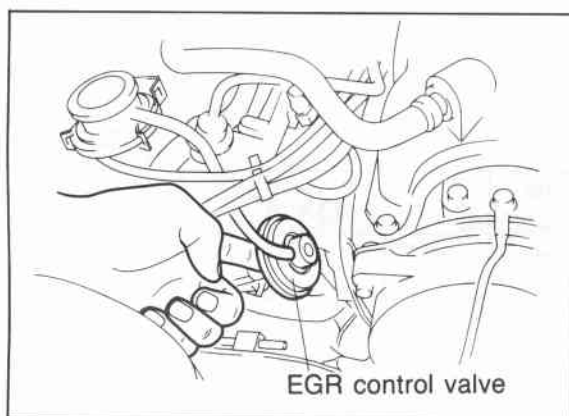
Check the condition of the wiring harness and connectors before checking the sensors or switches below.

Note

Make the system inspection first. If no problem is found, continue with the next system inspection of the Troubleshooting Guide. (Refer to pages 4B—7 and 8.)

Possible cause	Solenoid valve (EGR)	EGR modulator valve	EGR control valve	Water thermo sensor	Water thermo switch	Engine control unit terminal	System inspection
						2N	
Page	4B—72	4B—73	4B—73	4B—97	4B—97	4B—90	4B—72
Checking order	3	2	4	6	5	7	1

76G04B-103



86U04A-130

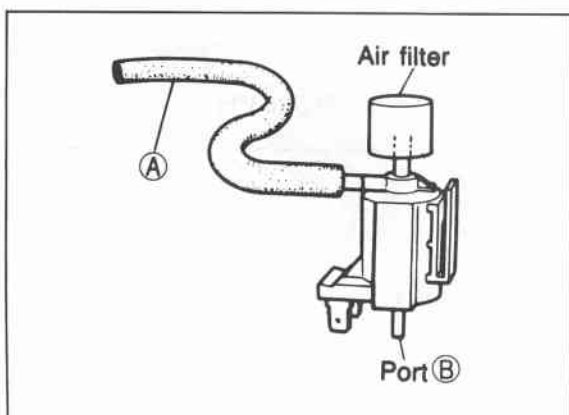
System Inspection

1. Start the engine.
2. Accelerate the engine and verify that the diaphragm of the EGR control valve does not move while the engine is still cold.
3. Warm up the engine to normal operating temperature and run it at idle.

Warning

Be careful when checking the EGR control valve because the surrounding area is very hot.

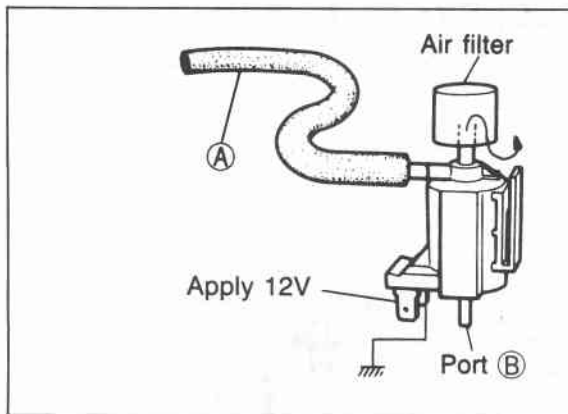
4. Accelerate the engine and check that the diaphragm of the EGR control valve moves upward.



86U04A-131

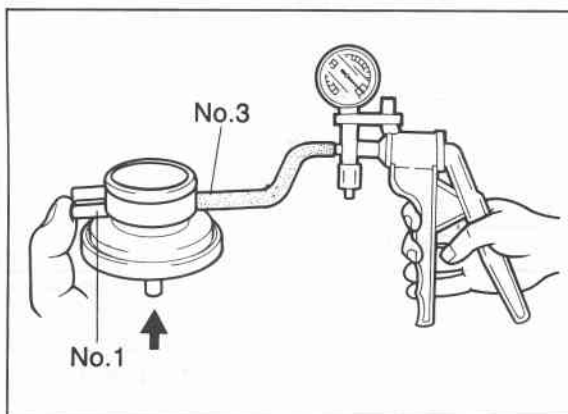
Solenoid Valve (EGR)

1. Disconnect the vacuum hose from the solenoid valve and vacuum pipe.
2. Blow through the solenoid valve from vacuum hose A.
3. Check that air flows from port B.



86U04A-132

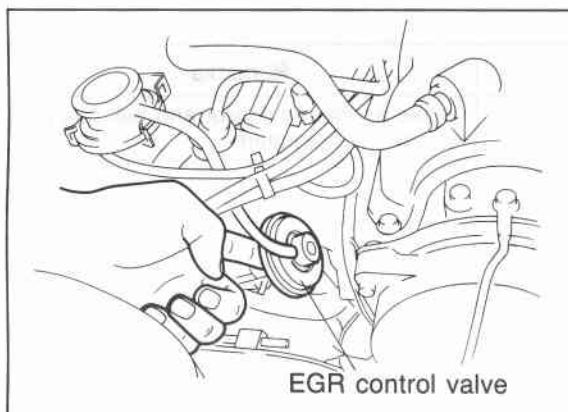
4. Disconnect the solenoid valve connector.
5. Connect 12V and a ground to the terminals of the solenoid valve.
6. Blow through the solenoid valve from vacuum hose A.
7. Check that air flows from the valve air filter.



86U04A-133

EGR Modulator Valve

1. Remove the EGR modulator valve.
2. Plug the No. 1 port and connect a vacuum pump to the No. 3 port.
3. Blow into the exhaust gas port. Operate the vacuum pump and verify that vacuum is held.
4. Release the exhaust gas port and confirm that vacuum is released.



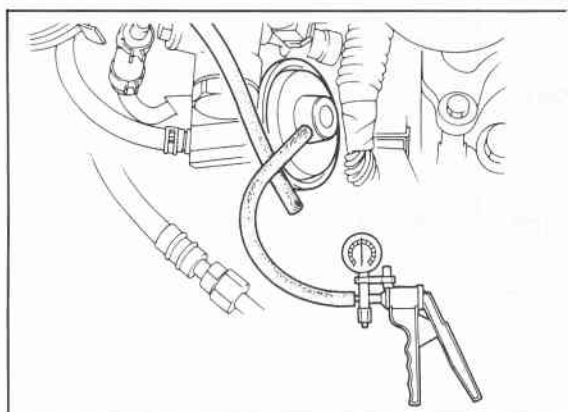
86U04A-134

EGR Control Valve

1. Manually actuate the valve by pushing on the diaphragm with finger.
2. Check that the spring resistance is present and the diaphragm moves freely with no sticking or binding.

Note

Before replacing the EGR control valve, check the intake air and control systems.



86U04A-135

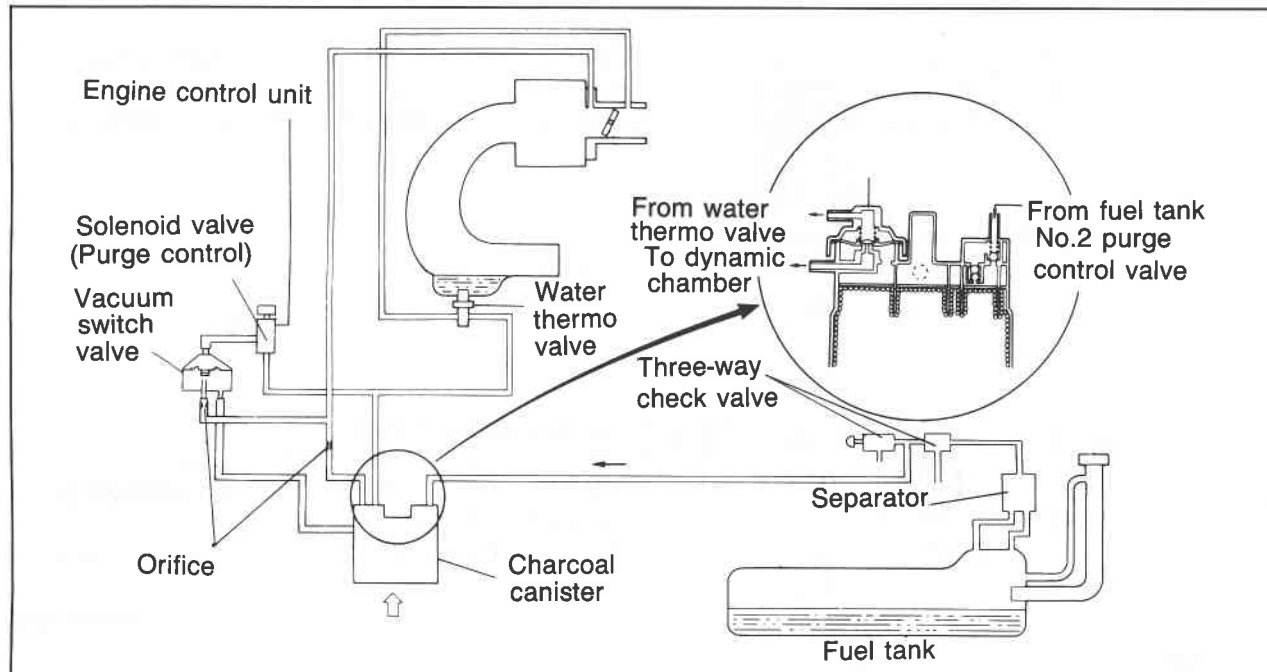
3. Warm up the engine and run it at idle.
4. Connect a vacuum pump to the valve and apply vacuum.
5. Check that the engine runs roughly or stalls at more than the specified vacuum.

Specification:

40—60 mmHg (1.6—2.4 inHg)

6. If not correct, replace the EGR control valve.

EVAPORATIVE EMISSION CONTROL (EEC) SYSTEM



86U04A-136

This system stores fuel vapor generated in the fuel tank in the canister when the engine is not running. The fuel vapor is stored in the canister until it is drawn into the dynamic chamber and burned when the engine is started.

COMPONENT DESCRIPTIONS

Component	Function	Remarks
Air flow meter	Detects amount of intake air; sends signal to engine control unit	Intake air thermo sensor and fuel pump switch are integrated
Charcoal canister	Stores fuel tank fumes when engine stopped	
Engine control unit	Detects signals from input sensors and switches; controls solenoid valve (Purge control)	
Ignition coil (-) terminal	Detects engine speed; sends signal to engine control unit	
Separator	Prevents fuel from flowing into charcoal canister	
Solenoid valve (Purge control)	Controls vacuum line to vacuum switch valve	
Three-way check valve	Controls pressure in fuel tank	
Vacuum switch valve	Regulates evaporative fumes from canister to intake manifold	
Water thermo sensor	Detects coolant temperature; sends signal to engine control unit	
Water thermo valve	Controls vacuum applied to No.1 purge control valve and solenoid valve (Purge control)	Opens vacuum line above 54°C (129°F)

76G04B-104

TROUBLESHOOTING

Check the condition of the wiring harness or connectors, before checking the sensors or switches.

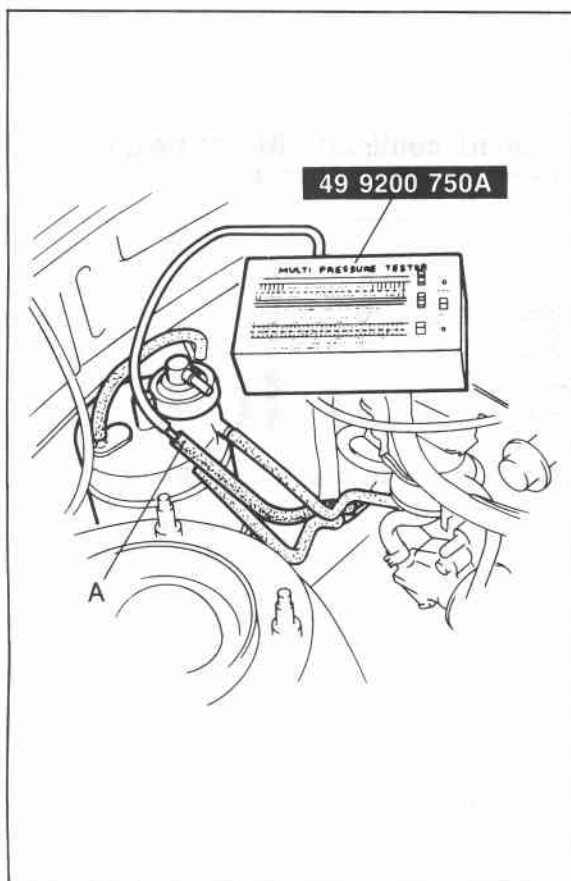
Note

Make the system inspection first. If no problem is found, continue with the next system inspection of the Troubleshooting Guide. (Refer to pages 4B—7 and 8.)

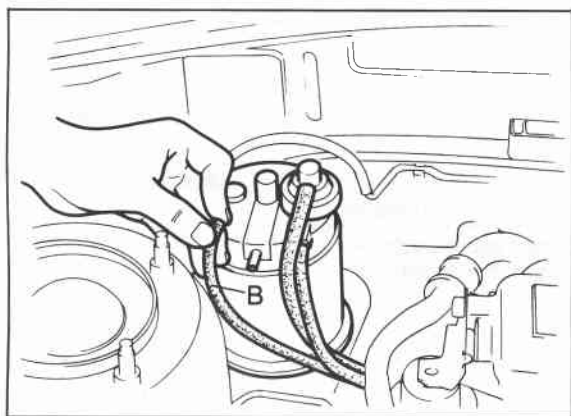
Possible cause	Vacuum switch valve	Solenoid valve (Purge control)	Three-way check valve	Separator	No.1 purge control valve	No.2 purge control valve	Water thermo valve	Water thermo valve	Engine control unit terminal	System inspection
									2P	
Page	4B—77	4B—78	4B—78	4B—79	4B—77	4B—77	4B—78	4B—97	4B—90	4B—76
Checking order	3	2	9	10	4	5	6	7	8	1

76G04B-105

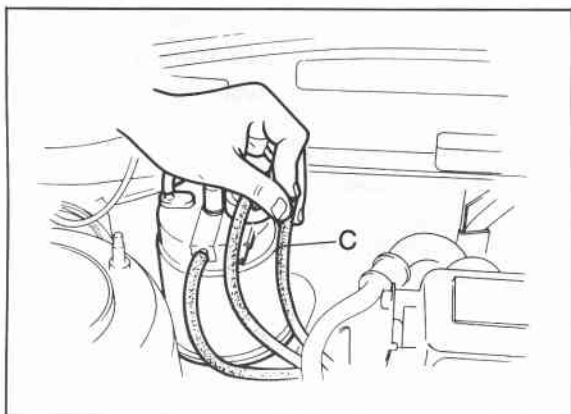
4B EEC SYSTEM



86U04A-139



86U04A-141



86U04A-142

System Inspection

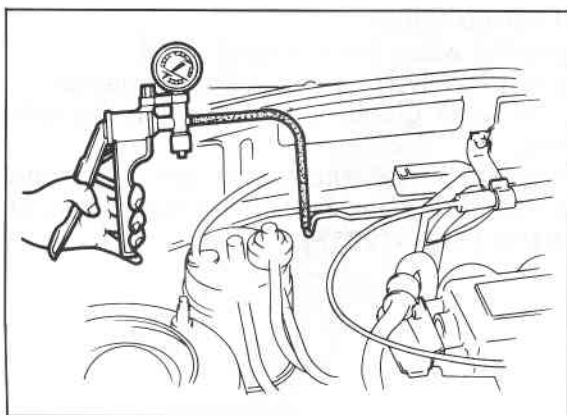
1. Check the vacuum hose routing.
2. If there is a poor connection, clog, or leak, repair or replace as necessary.
3. Warm up the engine and run it at idle.
4. Disconnect vacuum hose A from No. 1 purge control valve and connect the **SST** to the hose.

86U04A-140

5. Increase the engine speed to above **2,500 rpm** and verify that the gauge shows more than **150 mmHg (5.9 inHg)**.
6. If not correct, check the water thermo valve.
7. Reconnect hose A to No. 1 purge control valve.

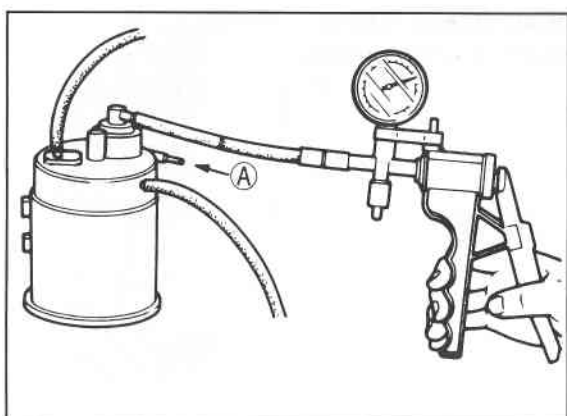
8. Disconnect vacuum hose B from the canister and place a finger over the end of the hose.
9. Accelerate the engine rapidly and check that vacuum is felt at **above 1,500 rpm**.
10. Reconnect hose B to the canister.

11. Disconnect vacuum hose C from the canister and place a finger over the end of the hose.
12. Check that vacuum is felt.
13. If not correct, check the vacuum line between the canister and the dynamic chamber for clogging.



86U04A-143

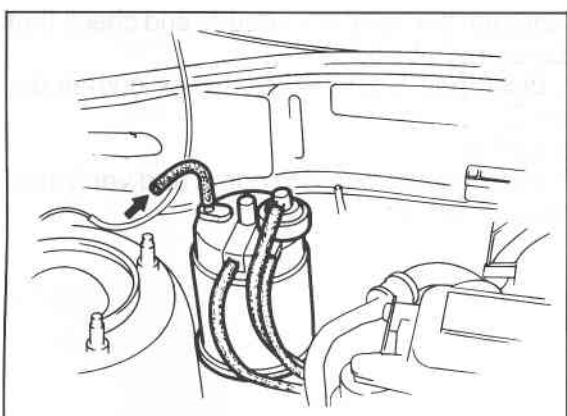
14. Disconnect the evaporation hose from the evaporation pipe.
15. Connect the vacuum pump to the evaporation pipe.
16. Operate the vacuum pump and verify that no vacuum is held.
17. If vacuum is held, check the evaporation pipe for clogging.



86U04A-144

No. 1 Purge Control Valve

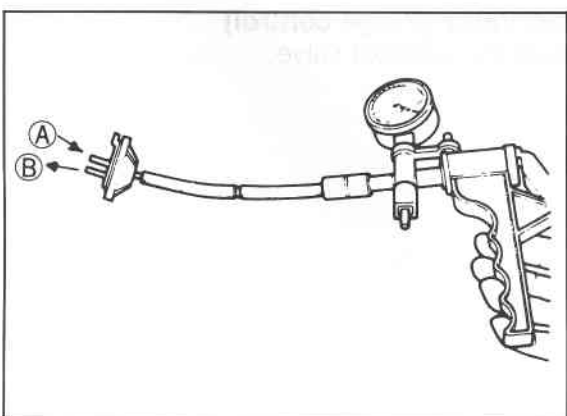
1. Blow through the purge control valve from port A and check that air does not flow.
2. Connect a vacuum pump to the purge control valve.
3. Apply **110 mmHg (4.33 inHg)** vacuum, and blow through port A again; air should flow.



86U04A-145

No. 2 Purge Control Valve

1. Disconnect vacuum hose B from the evaporation pipe.
2. Blow through the hose and verify that air flows freely.



86U04A-146

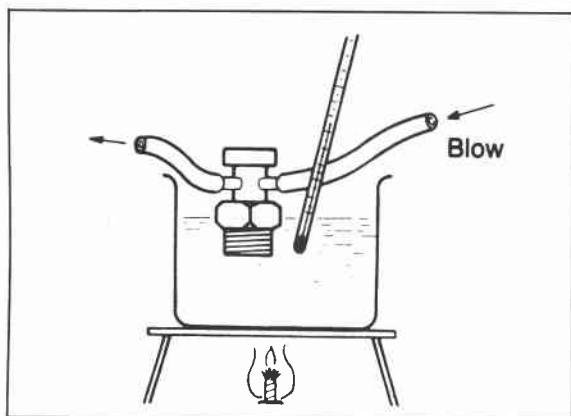
Vacuum Switch Valve

1. Remove vacuum switch valve.
2. Connect a vacuum pump to the valve.
3. Blow through the valve from port A and verify that air comes out of port B when vacuum is applied.

Specified vacuum:

66—106 mmHg (2.6—4.2 inHg)

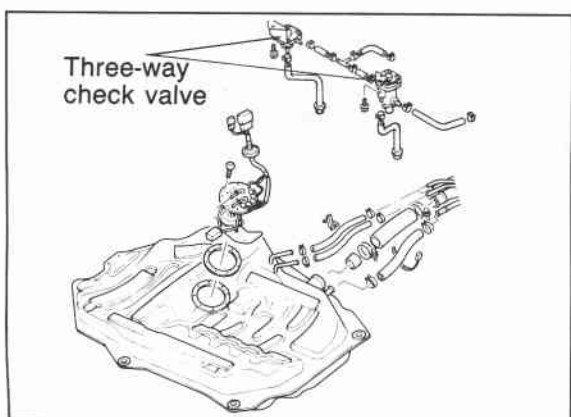
4B EEC SYSTEM



86U04A-147

Water Thermo Valve

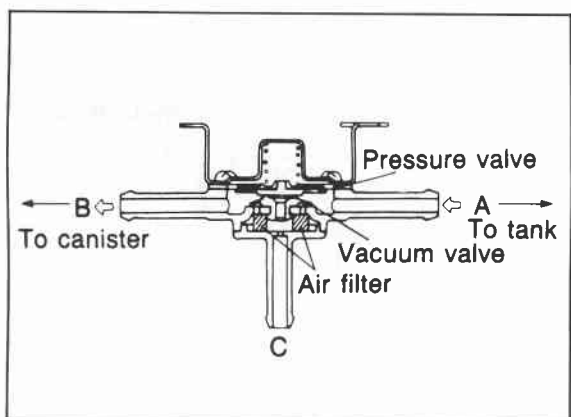
1. Remove the water thermo valve.
2. Immerse the valve in a water-filled container.
3. Heat the water gradually and observe the temperature.
4. Blow through the valve from one vacuum port and verify that air comes out of the other port at **46—54°C (115—129°F)**.



86U04A-148

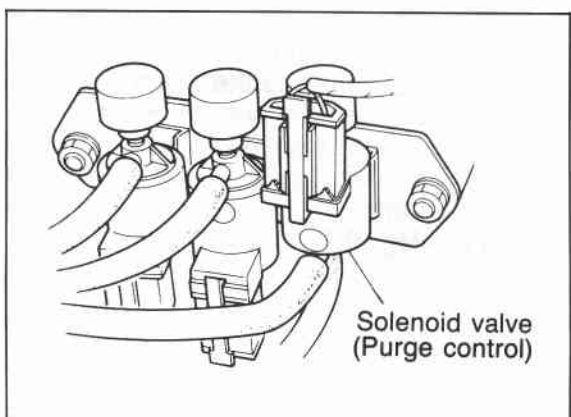
Three-Way Check Valve

1. Remove the check valve.



86U04A-149

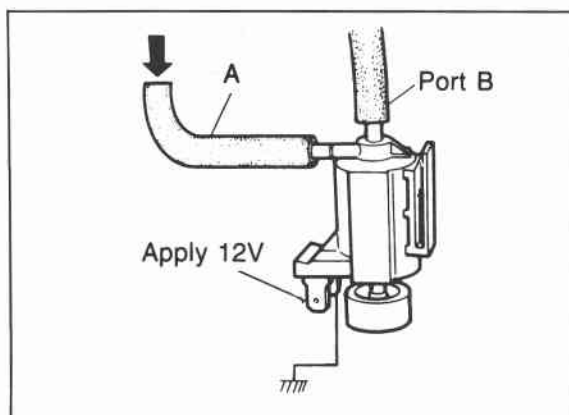
2. Blow through the valve from port A, and check that air comes out of port B. Next, block port B and check that air comes out of port C.
3. Block port B.
4. Connect a vacuum pump to port A and verify that no vacuum is held.



76G04B-128

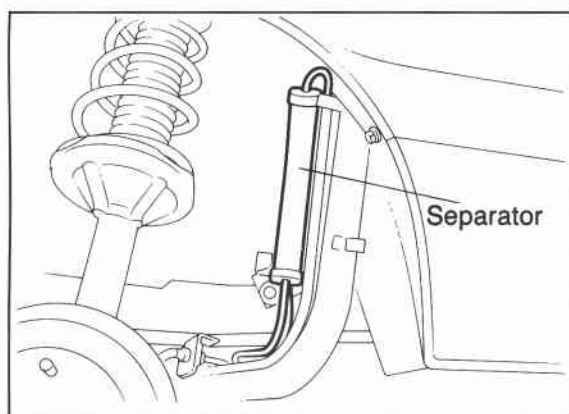
Solenoid Valve (Purge control)

1. Remove the solenoid valve.



86U04A-151

2. Connect vacuum hoses to the valve as shown in the figure.
3. Blow air through the valve from hose A and check that air comes out of the valve air filter.
4. Apply 12V and ground the solenoid valve with jumper wires.
5. Blow air through the valve from hose A and check that the air comes out of port B.
6. Replace, if necessary.



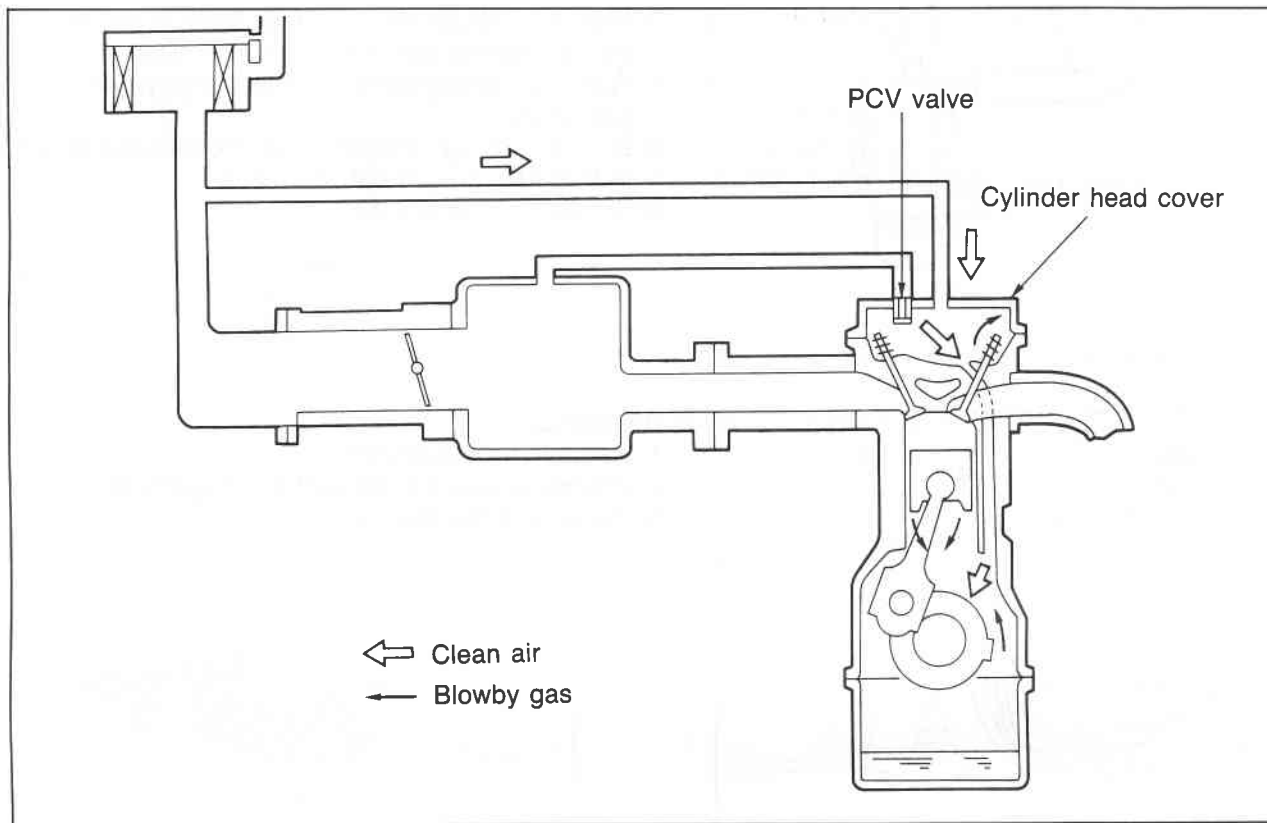
86U04A-154

Separator

1. Remove the separator.
2. Visually check the separator for damage.
3. Replace, if necessary.

4B PCV SYSTEM

POSITIVE CRANKCASE VENTILATION (PCV) SYSTEM



76G04B-106

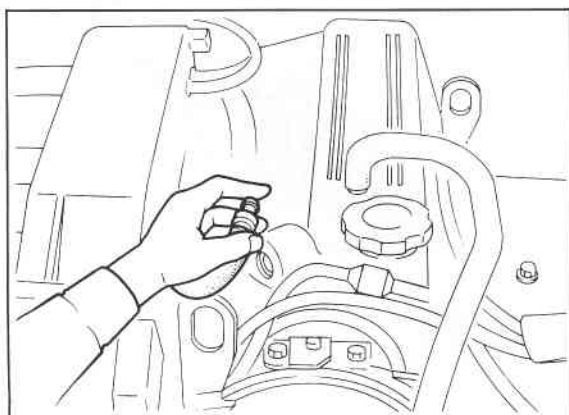
The PCV valve is operated by the intake manifold vacuum.

When the engine is running at idle, the PCV valve is opened slightly and a small amount of blowby gas is drawn into the dynamic chamber.

At high engine speeds, the PCV valve is further opened and a larger amount of blowby gas is drawn into the dynamic chamber.

COMPONENT DESCRIPTION

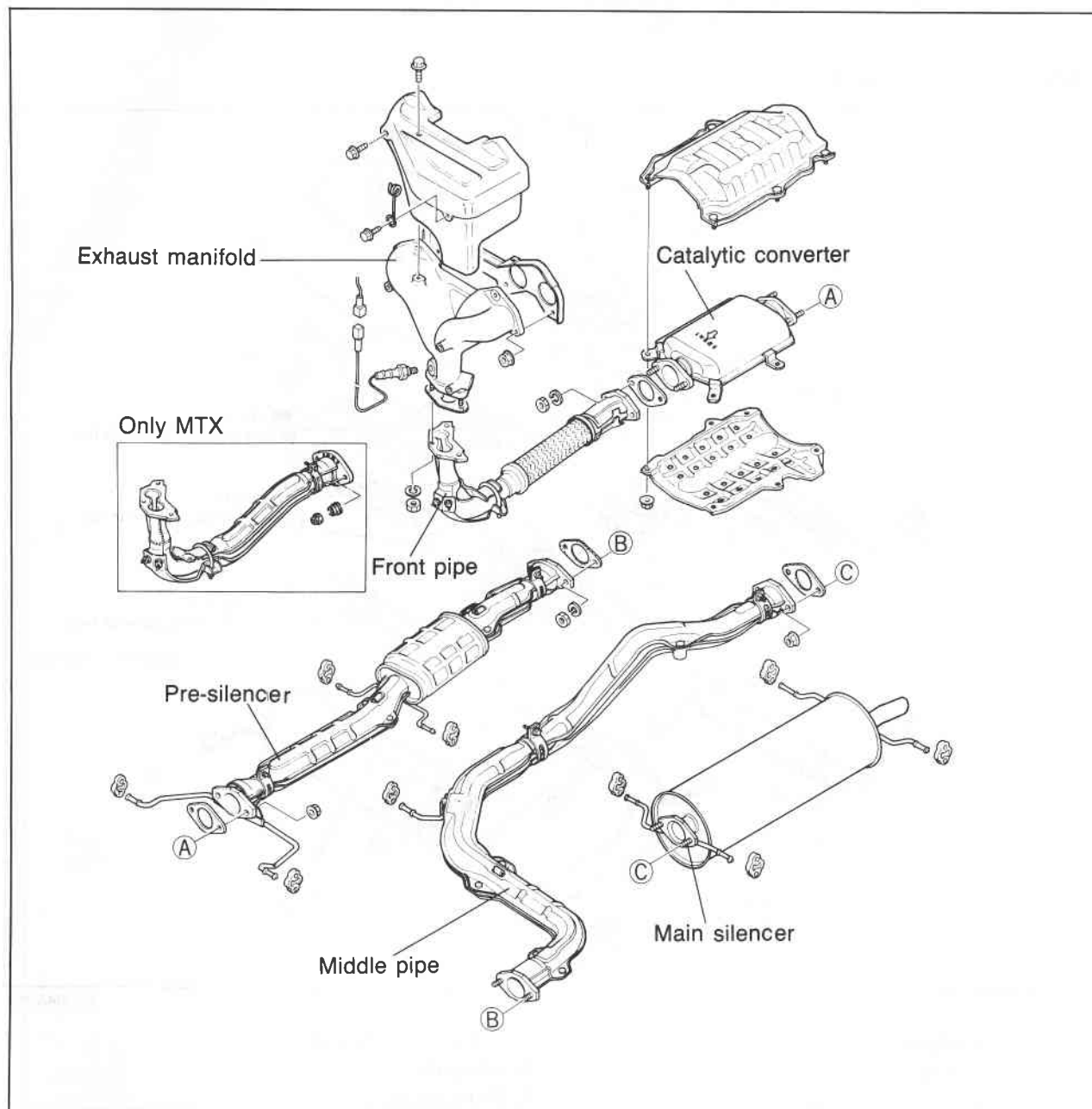
Component	Function
PCV valve	Controls blowby gas amount pulled into engine



86U04A-157

PCV VALVE

1. Warm up the engine to the normal operating temperature and run it at idle.
2. Disconnect the PCV valve and the ventilation hose from the cylinder head cover.
3. Close the PCV valve opening.
4. Check that vacuum is felt.

EXHAUST SYSTEM

76G04B-107

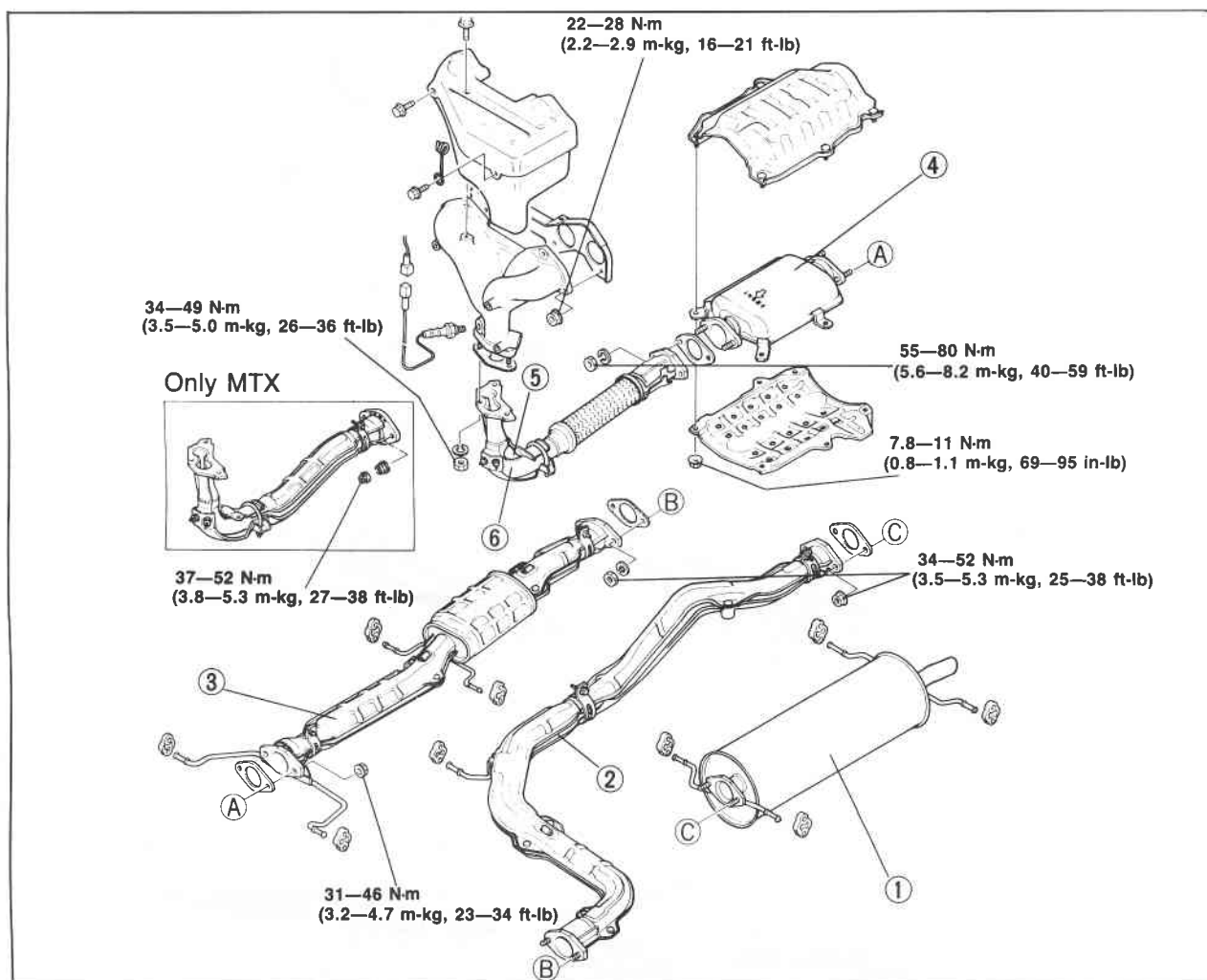
The catalytic converter is used to reduce CO, HC and NO_x. The converter contains a compound of platinum and rhodium. It is a three-way catalyst type with a volume of **1,600 cc (98 cu in)**.

4B EXHAUST SYSTEM

REMOVAL AND INSTALLATION

1. Remove in the sequence shown in the figure.
2. Install in the reverse order of removal.

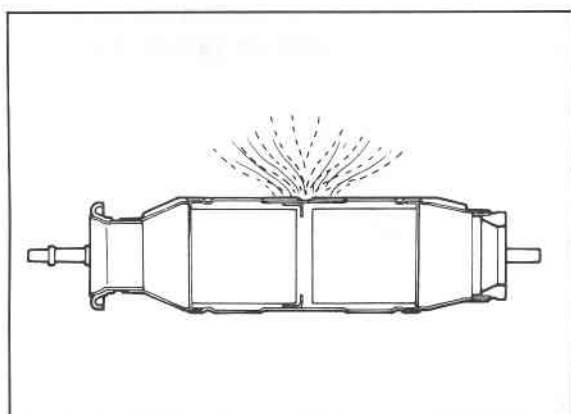
Torque Specifications



86U04A-159

1. Main silencer
2. Middle pipe
3. Pre-silencer

4. Catalytic converter
5. Bracket
6. Front pipe



86U04A-160

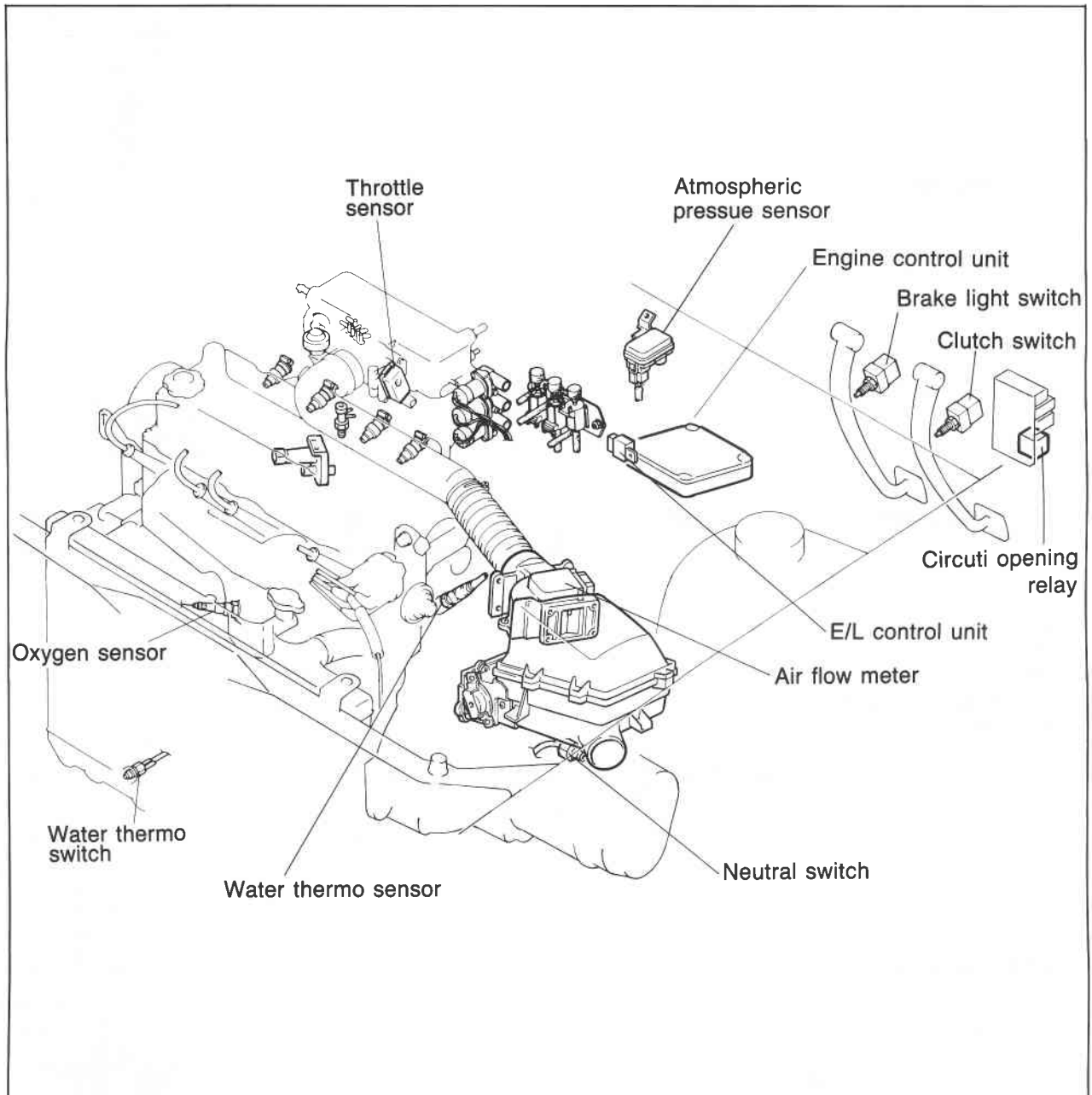
INSPECTION

1. Check the catalytic converter and exhaust pipe for deterioration or restriction.
2. Check the insulation covers welded onto the catalytic converter for damage.

Note

If the insulation cover is touching the catalytic converter housing, excessive heat at the floor will occur.

CONTROL SYSTEM



76G04B-129

The control system consists of the input devices and the engine control unit. The engine control unit controls the fuel injection amount (EGI), fuel injection pressure, bypass air amount, switch monitor function, and fail-safe function.

4B CONTROL SYSTEM

RELATIONSHIP CHART Input Devices and Output Devices

BRAKE LIGHT SWITCH	○	×	×	×	×	×	×	×	×	×	
ELECTRICAL LOAD CONTROL UNIT	×	×	×	×	×	×	×	×	○	×	
P/S PRESSURE SWITCH*	×	×	×	×	×	×	×	×	○	×	
A/C SWITCH	○	×	×	×	×	○	○	×	×	○	
IGNITION SWITCH (STA POSITION)	○	○	×	○	×	×	×	×	○	○	
INHIBITOR SWITCH	○	×	×	×	○	×	×	×	×	○	
NEUTRAL AND CLUTCH SWITCH	○	×	×	×	×	×	×	×	×	○	
OXYGEN SENSOR	○	×	×	×	×	×	×	×	×	×	
WATER THERMO SWITCH (RADIATOR)	○	×	×	×	○	×	×	×	×	×	
ATMOSPHERIC PRESSURE SENSOR	○	×	×	×	×	○	×	○	○	×	
INTAKE AIR THERMO SENSOR	○	×	×	○	×	×	×	○	○	×	
WATER THERMO SENSOR	○	×	×	○	○	○	×	×	○	×	
IDLE SWITCH	○	○	×	○	×	×	×	×	○	×	
THROTTLE SENSOR	○	○	×	×	○	×	×	×	×	○	
AIR FLOW METER	○	×	×	×	×	○	×	×	×	×	
IGNITION COIL	○	○	×	○	○	○	×	×	○	○	
INPUT DEVICES	OUTPUT DEVICES	FUEL INJECTION AMOUNT	FUEL INJECTION TIMING	AIR VALVE	PRESSURE REGULATOR	EGR	PURGE	IDLE-UP (A)*	IDLE-UP (B)	IDLE-UP (C)	AIR CONDITIONER
		INJECTOR									

X : Not related ○ : Related

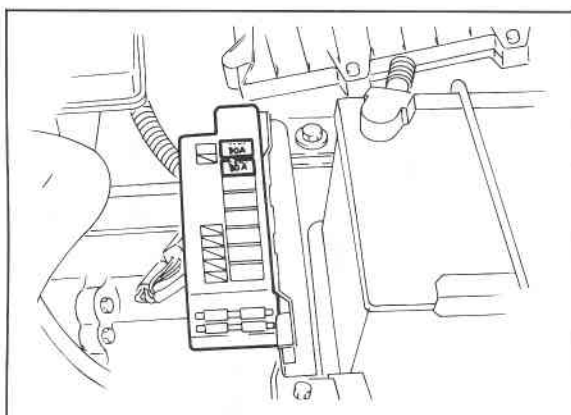
* It does not have a relationship with the engine control unit

76G04B-108

Output Devices and Engine Conditions

ENGINE CONDITIONS		CRANKING (COLD ENGINE)	WARMING UP (DURING IDLE)	MEDIUM LOAD		ACCEL- ERATION	HEAVY LOAD	DECEL- ERATION	IDLE (THROT- TLE VALVE FULLY CLOSED)	IGN: ON (ENGINE NOT RUNNING)	REMARK
OUTPUT DEVICES											
INJEC- TOR	FUEL INJECTION AMOUNT	Rich		Rich and lean	Rich	Fuel cut		Rich and lean	No injection		
	FUEL INJECTION TIMING	1 group (once per revolution)				1 group (once per revolution)					
AIR VALVE		Open		Closed *						* After warming up	
SOLE- NOID VALVE	PRESSURE REGULATOR	OFF (Vacuum to pressure regulator)		After start ON * (Vacu- um cut)		OFF				* Hot start only	
	EGR	ON (EGR cut)		OFF (EGR)	ON (EGR cut)	OFF (EGR)		ON (EGR cut)		ON	
	PURGE	OFF (2nd stage not operated)		ON (2nd stage operates)		OFF (2nd stage not operated)				1st stage: controlled by water thermo valve	
AIR BYPASS SOLE- NOID VALVE	IDLE-UP (A)	Open *								* With A/C ON	
	IDLE-UP (B)	Open (When intake air temp. above 55°C (131°F) or vehicle at above 1,000 m (3,280 ft)								No bypass	
	IDLE-UP (C)	Open (When E/L applied, P/S operated, intake air temp. above 55°C (131°F), solenoid valve (pressure regulator) ON or vehicle at above 1,900 m (6,232 ft)		After start open *						* Hot start only	
AIR CONDITIONER		Operates		Not operate *		Operates		Does not operate		* Full throttle	

4B CONTROL SYSTEM

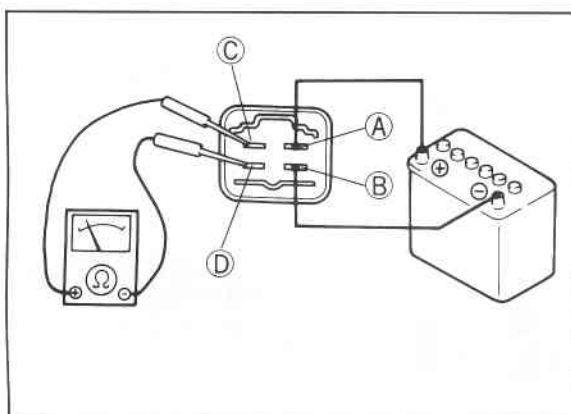


69G04A-161

EGI MAIN FUSE

Inspection

Check the continuity of EGI main fuse.

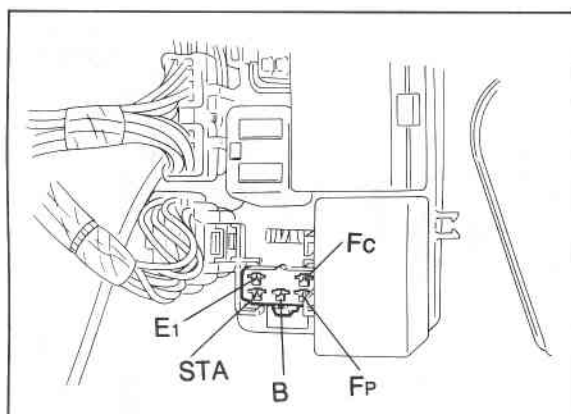


86U04A-169

MAIN RELAY

1. Check that a "clicking" sound is heard at the main relay when turning the ignition switch ON and OFF.
2. Apply 12V and a ground to (A) and (B) terminals of the main relay.
3. Check continuity at terminals using an ohmmeter.

Terminals	Operation	
	12V Not applied	12V Applied
© — ①	No continuity	Continuity



76G04B-130

CIRCUIT OPENING RELAY

Relay Circuit

1. Remove the circuit opening relay.
2. Check the circuit as described.

Terminal	Checking item	Correct result
Fp	Resistance	0.2—30Ω
Fc	Continuity (cranking)	∞
B	Voltage (Ign: ON)	Battery voltage
STA	Voltage (Cranking)	Approx. 9V
E1	Continuity	∞

Circuit Opening Relay

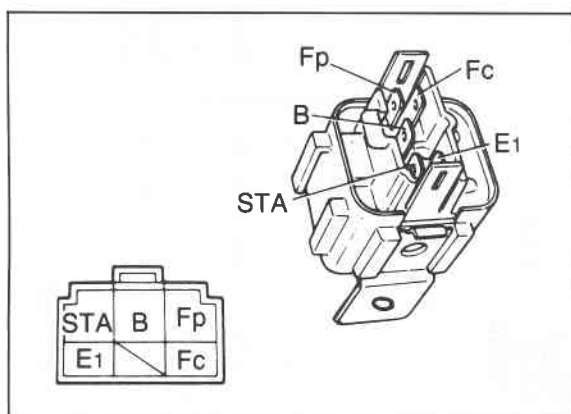
Apply 12V and a ground to the terminals below and check the circuit opening relay as described.

12V	Grounded	Correct result
STA	E1	B ↔ FP: Continuity
B	Fc	Fp: Battery voltage

Resistance

Check the resistance between the terminals using an ohmmeter.

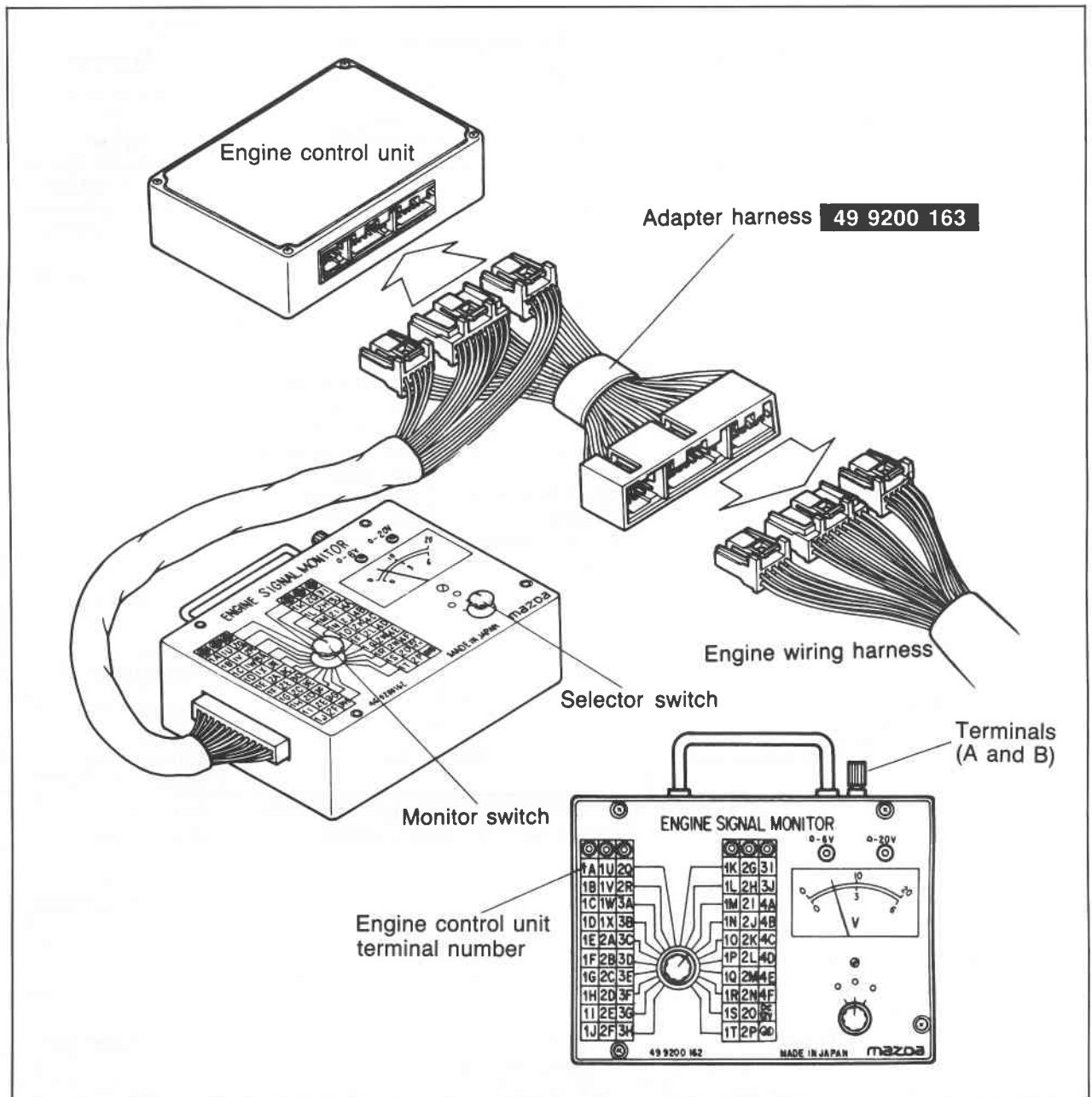
Between terminals	Resistance (Ω)
STA ↔ E1	15 ~ 30
B ↔ Fc	80 ~ 150
B ↔ Fp	∞



69G04A-164

ENGINE CONTROL UNIT

Engine Signal Monitor (49 9200 162) and Adapter (49 9200 163).



86U04A-171

The **Engine Signal Monitor** (49 9200 162) was developed to check the control unit terminal voltages. This monitor easily inspects the individual terminal voltages through selection of the monitor switch.

How to Use the Engine Signal Monitor

1. Connect the **Engine Signal Monitor** (49 9200 162) between the engine control unit and the engine harness using the **adapter** (49 9200 163).
2. Turn the selector switch and monitor switch to select the terminal number.
3. Check the terminal voltage.

Caution

Never apply voltage to terminals A and B.

4B CONTROL SYSTEM

Terminal Voltage

If the input and output devices and related wiring are normal, but the engine control unit terminal voltage is incorrect, replace the engine control unit.

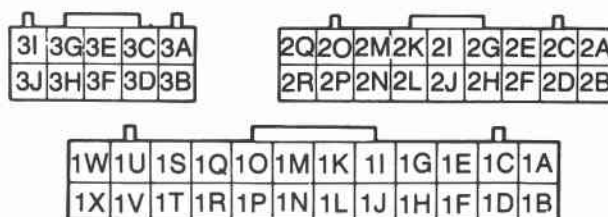
Terminal	Input	Output	Connection to	Voltage (After warming-up)		Remarks
				IGN: ON	Idle	
1A	—	—	—	—	—	—
1B		○	Self-Diagnosis Checker (Code number)	For 3sec. after ignition switch OFF → ON: below 6.2V (Buzzer sounds) After 3sec.: Battery voltage (Buzzer does not sound)		<ul style="list-style-type: none"> Using Self-Diagnosis Checker and test connector grounded Buzzer sounds: below 6.2V Buzzer does not sound: Battery voltage
1C	—	—	—	—	—	—
1D		○	Self-Diagnosis Checker (Monitor lamp)	Test connector grounded For 3sec. after ignition switch OFF → ON: below 6.2V (light illuminates) After 3sec.: Battery voltage (light does not illuminate)	(Test connector grounded) approx. 10V (Test connector not grounded) Monitor lamp ON: below 6.2V Monitor lamp OFF: Battery voltage	With Self-Diagnosis Checker
1E	○		Idle switch	Accelerator pedal released: below 1.5V Accelerator pedal depressed: Battery voltage		
1F		○	A/C relay	A/C switch ON: below 2.5V A/C switch OFF: Battery voltage		Blower motor ON
1G	—	—	—	—	—	—
1H	○		Water thermo switch	Below 1.5V		Radiator temp.: above 17°C (63°F)
1I	○		Electrical load control unit	Electrical load ON: below 1.5V Electrical load OFF: Battery voltage		Electrical load: Rear defroster Headlight Blower motor (3rd & 4th position) Electrical fan
1J	○		Brake light switch	Brake pedal released: below 1.5V Brake pedal depressed: battery voltage		
1K	—	—	—	—	—	—
1L	○		A/C switch	A/C switch ON: below 1.5V A/C switch OFF: battery voltage		Blower motor: ON
1M	○		Ignition coil ⊖ terminal	Battery voltage	*1 Battery voltage	*1 Engine Signal Monitor: green and red lights flash
1N	—	—	—	—	—	—
1O	—	—	—	—	—	—

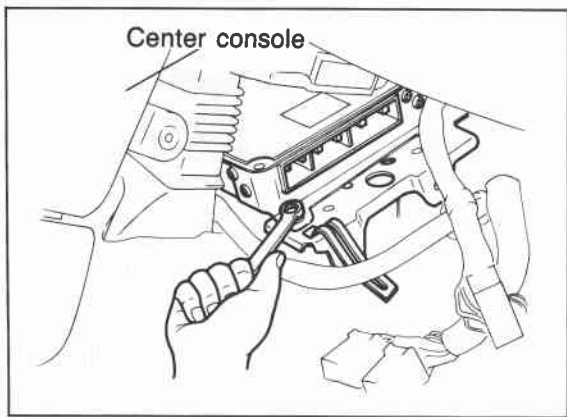
Terminal	Input	Output	Connection to	Voltage (After warming-up)		Remarks
				IGN: ON	Idle	
1P	—	—	—	—	—	—
1Q	—	—	—	—	—	—
1R	—	—	—	—	—	—
1S		○	Air bypass solenoid valve (Idle-up C) and P/S pressure switch	Battery voltage		While solenoid ON (Refer to page 4B—35): below 1.5V
1T	—	—	—	—	—	—
1U	—	—	—	—	—	—
1V	○		MTX Neutral and clutch switch	In-gear condition Clutch pedal depressed: battery voltage Clutch pedal released: below 1.5V		Neutral: constant battery voltage
1W	○		Test connector	Test connector grounded: below 1.5V Test connector not grounded: battery voltage		Green connector, 1-pin
1X	—	—	—	—	—	—
2A		○	V ref	4.5—5.5V		
2B	○		Air flow meter (Vc)	6—10V		
2C	—	—	Ground (E2)	Approx. 0V		
2D	○		Oxygen sensor	0V	0—1.0V	<ul style="list-style-type: none"> • Cold engine: 0V at idle • After warming-up: Increase engine speed: 0.5—1.0V Deceleration: 0—0.4V
2E	○		Air flow meter (Vs)	Approx. 1.7V	Approx. 3—5V	Increase engine speed: voltage increases
2F	—	—	—	—	—	—
2G	○		Throttle sensor	Accelerator pedal released: 0.4—0.6 V		
2H	○		Atmospheric pressure sensor	At sea level: approx. 4.0V		
2I	○		Water thermo sensor	0.3—0.6 V		Engine coolant temp. 20°C (68°F): approx. 2.5V
2J	○		Air flow meter (Intake air thermo sensor)	Approx. 2.3V at 20°C (68°F)		
2K		○	Solenoid valve (Pressure regulator control)	For 120 sec. after ignition switch OFF → ON: below 1.5V	For 120 sec. after starting: below 1.5V	Hot condition: Coolant temp. above 70°C (158°F) Intake air temp. above 10°C (50°F)
				Battery voltage		Other conditions
2L	—	—	—	—	—	—
2M	—	—	—	—	—	—

4B CONTROL SYSTEM

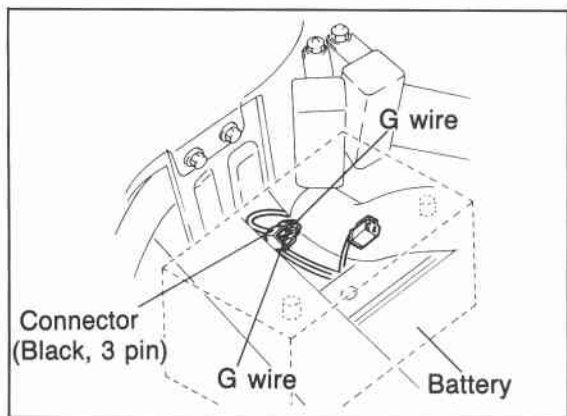
Terminal	Input	Output	Connection to	Voltage (After warming-up)		Remarks
				IGN: ON	Idle	
2N		○	Solenoid valve (EGR)	Below 1.5V		<ul style="list-style-type: none"> Cold engine: below 1.5V Radiator coolant temp.—below 17°C (63°F) or Engine coolant temp.—below 70°C (158°F) Engine above approx. 1,500 rpm: Battery voltage
2O		○	Air bypass solenoid valve (Idle-up B)	Battery voltage		While solenoid ON (Refer to page 4B—35): below 1.5 V
2P		○	Solenoid valve (Purge control valve)	Battery voltage		<ul style="list-style-type: none"> Medium and high load: below 1.5V
2Q	—	—	—	—		
2R	—	—	Ground (E02)	Below 1.5V		
3A	—	—	Ground (E01)	Below 1.5V		
3B	○		Ignition switch (Start position)	Below 1.5V		While cranking: battery voltage
3C		○	Injector (No. 4 and No. 2)	Battery voltage	*1 Battery voltage	*1 Engine Signal Monitor green and red lights flash
3D	○		Inhibitor switch	"N" or "P" range: below 2.0V Other ranges: battery voltage		ATX
3E		○	Injector (No. 1 and No. 3)	Battery voltage	*1 Battery voltage	*1 Engine Signal Monitor: green and red lights flash
3F	—	—	—	—		—
3G	—	—	Ground (E1)	Below 1.5V		
3H	—	—	—	—		—
3I	○	—	Main relay	Battery voltage		
3J	—	—	Battery	Battery voltage		For back-up

76G04B-110

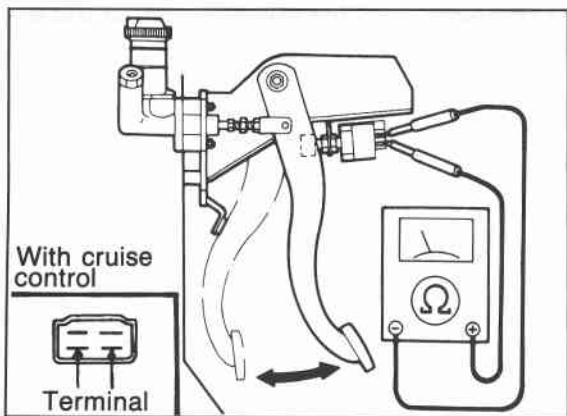




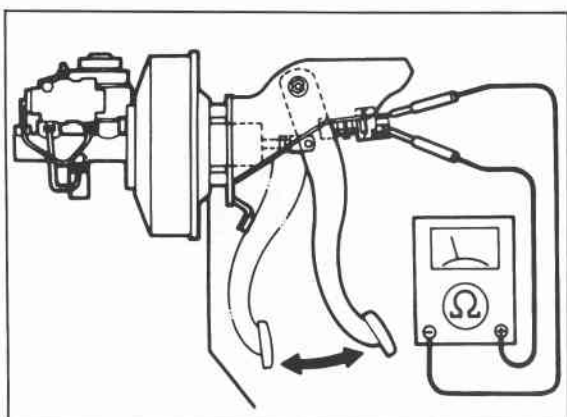
86U04A-174



69G04A-171



69G04A-172



86U04A-175

Replacement

1. Disconnect the negative battery cable.
2. Remove the front console covers (right and left).
3. Disconnect the connectors from the control unit.
4. Replace the control unit.

NEUTRAL SWITCH

Inspection

1. Disconnect the neutral switch connector.
2. Connect an ohmmeter to the switch.
3. Check continuity of the switch.

Transmission	Continuity
In neutral	No
In other ranges	Yes

4. After checking, connect the switch connector.

Note

Refer to section 7A for replacement of the neutral switch.

CLUTCH SWITCH

Inspection

1. Disconnect the clutch switch connector.
2. Connect an ohmmeter to the switch.
3. Check continuity of the switch.

Pedal	Continuity
Depressed	No
Released	Yes

4. After checking, connect the switch connector.

Note

Refer to section 6 for replacement of the clutch switch.

BRAKE LIGHT SWITCH

Inspection

1. Disconnect the brake light switch connector.
2. Connect an ohmmeter to the switch.
3. Check the continuity of the switch.

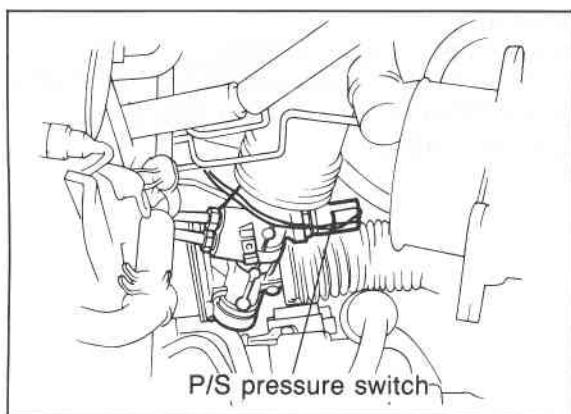
Pedal	Continuity
Depressed	Yes
Released	No

4. After checking, connect the switch connector.

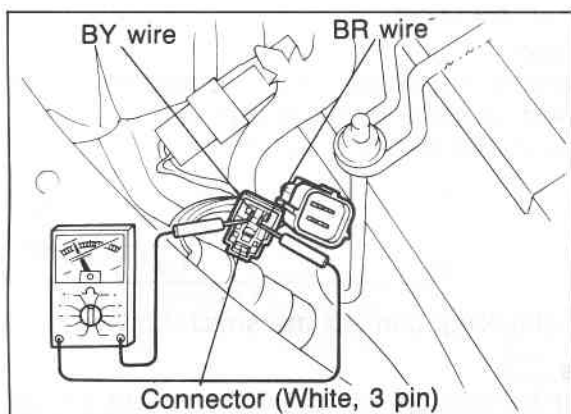
Note

Refer to section 11 for replacement of the brake switch.

4B CONTROL SYSTEM



86U04A-176



86U04A-177

P/S PRESSURE SWITCH

Inspection

1. Disconnect the P/S pressure switch connector.
2. Connect an ohmmeter to the switch.
3. Start the engine. Check continuity of the switch while turning the steering wheel at idle.

P/S	Continuity
Turning	Yes
Not turning	No

4. Connect the switch connector after checking.

Note

Refer to section 10 for replacement of the P/S pressure switch.

INHIBITOR SWITCH

Inspection

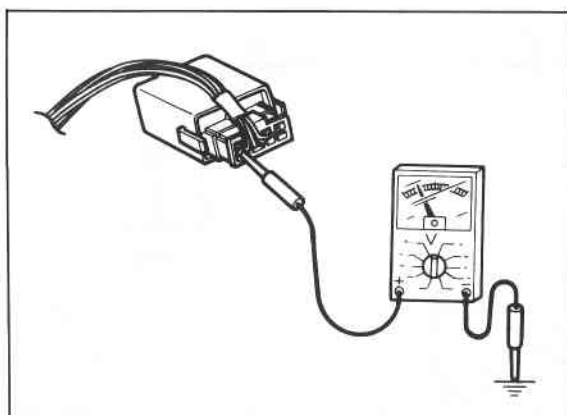
1. Disconnect the inhibitor switch connector.
2. Connect an ohmmeter to the switch.
3. Check continuity of the switch.

Position	Continuity
P and N ranges	Yes
Other ranges	No

4. Connect the switch connector after checking.

Note

Refer to Section 7B for replacement of the inhibitor switch.



69G04A-174

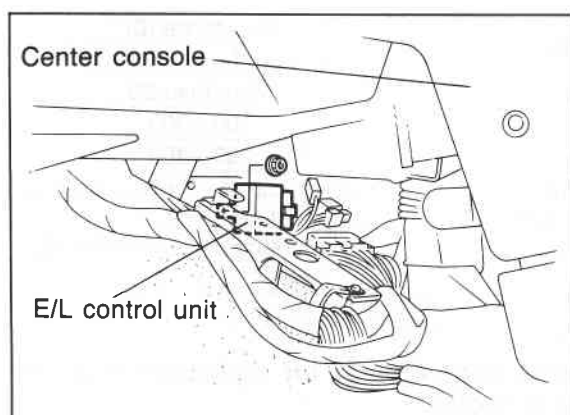
E/L CONTROL UNIT

Inspection

1. Connect a voltmeter between the E/L control unit and ground.
2. Start the engine and check the terminal voltages as described below.

Terminal	Input	Output	Connection to	Voltage (after warm-up)		Remarks
				Ignition switch: ON	Idle	
A (BW)	—	—	Ignition switch	Battery voltage		
B	—	—	—	—	—	—
C (B)	—	—	Ground	0V		
D (LY)	○		Electrical fan relay	Battery voltage		Coolant temp.: below 97°C (207°F)
				Below 1.5V		Coolant temp.: above 97°C (207°F)
E (GY)		○	Engine control unit (1I)	0V		E/L: ON
				Battery voltage		E/L: OFF
F (RB)	○		Headlight switch	Battery voltage		Headlight switch: ON
				Below 1.5V		Headlight switch: OFF
G (LB)	○		Blower motor switch	Below 1.5V		Blower motor switch: ON (3rd or 4th position)
				Approx. 5V		Others
H (BL)	○		Rear defroster switch	Below 1.5V		Rear defroster switch: ON
				Battery voltage		Rear defroster switch: OFF

76G04B-131



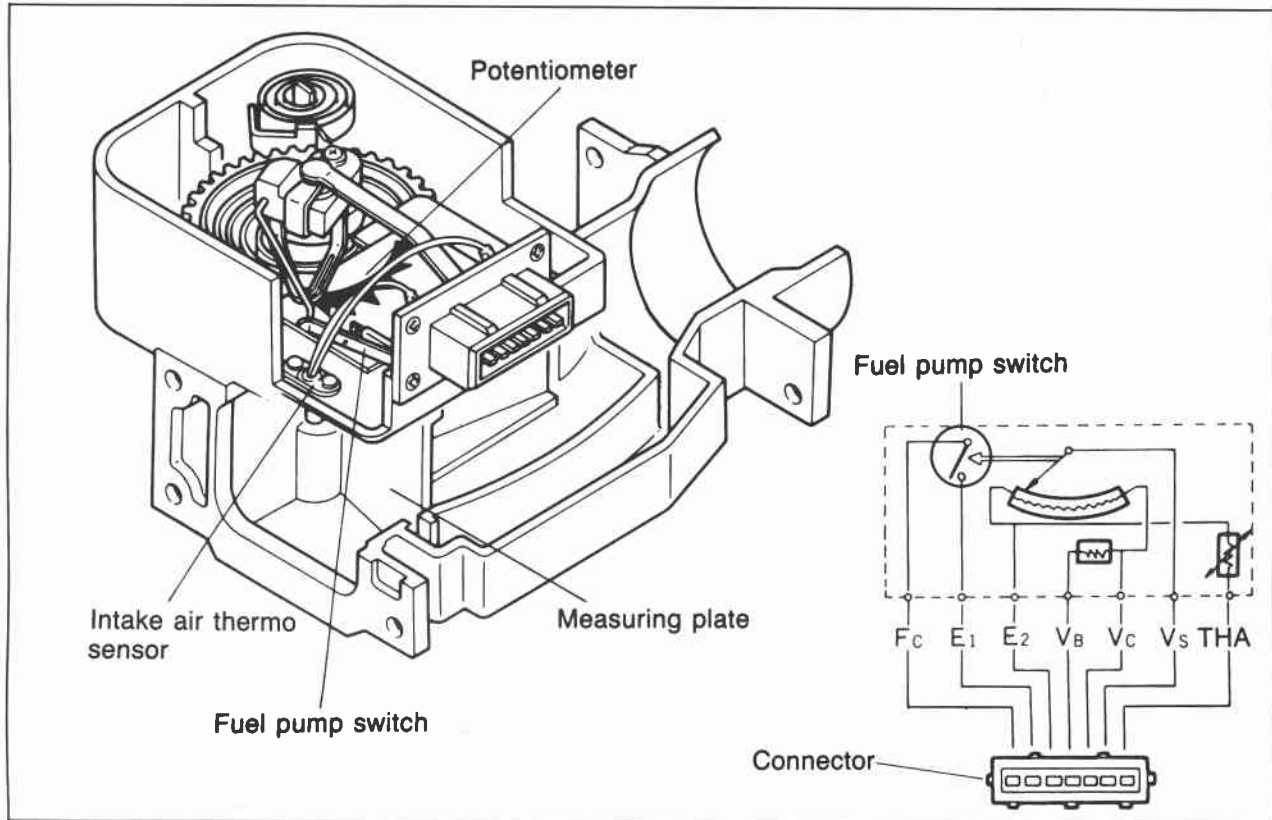
76G04B-111

Replacement

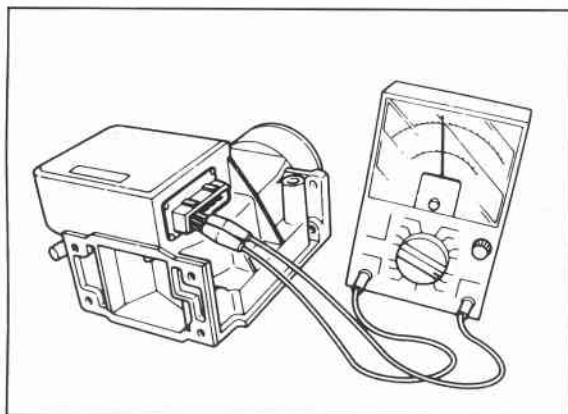
1. Remove the engine control unit. (Refer to page 4B—91)
2. Replace the E/L control unit.
3. Install in the reverse order of removal.

4B CONTROL SYSTEM

AIR FLOW METER



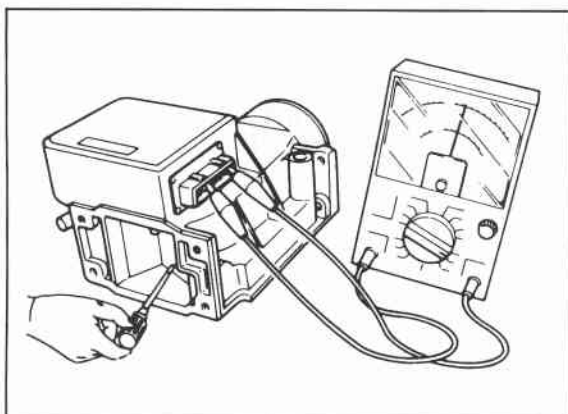
69G04C-100



76G04B-112

Inspection

1. Remove the air flow meter. (Refer to page 4B—31)
2. Check the air flow meter body for cracks.
3. Verify that the measuring plate moves smoothly.
4. Disconnect the connector from the air flow meter.
5. Using an ohmmeter, check resistance between the terminals with the measuring plate fully closed and fully open.
6. Connect the connector to the air flow meter after inspecting.

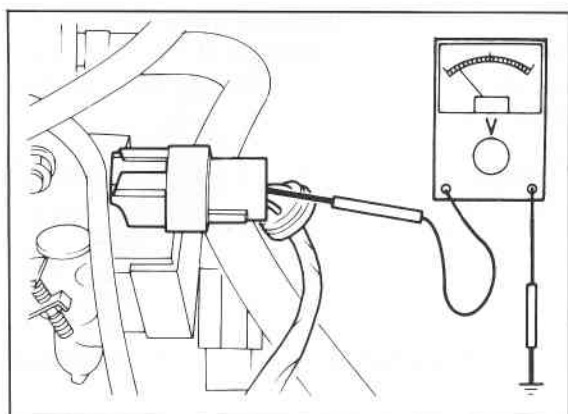


76G04B-113

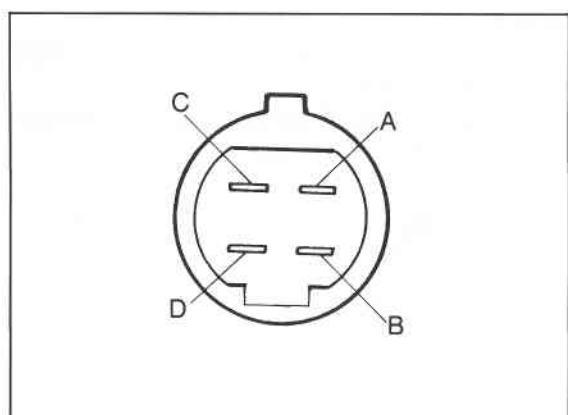
Terminal	Resistance (Ω)	
	Fully closed	Fully open
E2 \leftrightarrow Vs	More than 20	
E2 \leftrightarrow Vc	100—300	
E2 \leftrightarrow Vb	200—400	
E2 \leftrightarrow THA (Intake air thermo sensor)	-20°C (-4°F) 20°C (68°F) 60°C (140°F)	13.6—18.4 k Ω 2.21—2.69 k Ω 493—667 Ω
E1 \leftrightarrow Fc	∞	0

Note

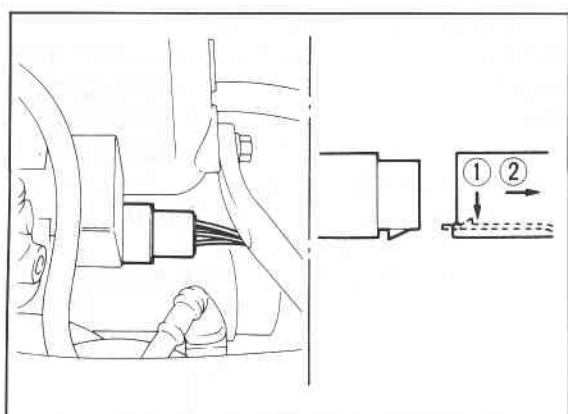
Refer to page 4B—31 for replacement of the air flow meter.



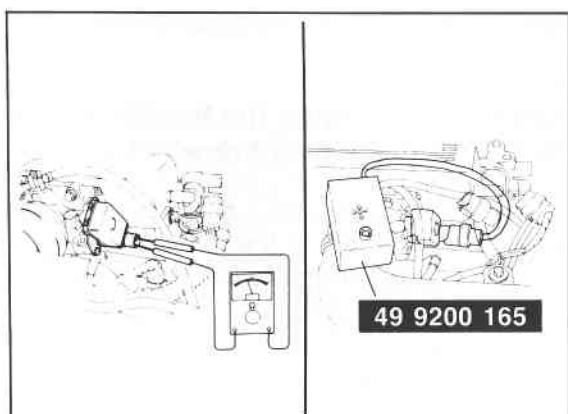
76G04B-114



76G04B-115



76U04A-018



76G04B-116

THROTTLE SENSOR

Inspection of Terminal Voltage

1. Remove the rubber boot from the connector.
2. Turn the ignition switch ON.
3. Check voltage between each terminal and a ground.
4. Open the throttle valve and again check voltage between each terminal and a ground.

Condition	Closed	Fully open
Terminal		
A (V _T)	0.4—0.6V	Approx. 4.0V
B (GND)	Below 1.5 V	
C (V ref)	4.5—5.5 V	
D (IDL)	Below 1.5 V	Approx. 12 V

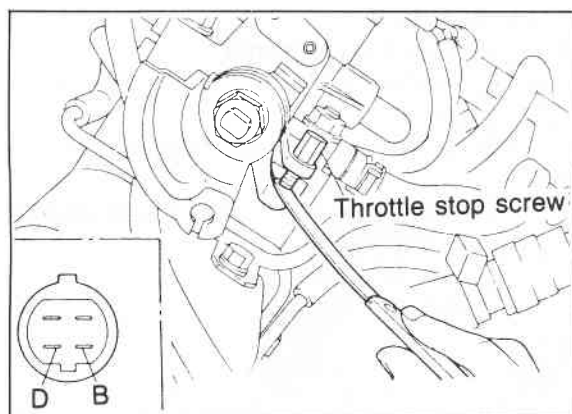
5. If not correct at the D terminal only, check the throttle sensor setting.
6. If not correct on other terminals, check resistance at the throttle sensor (Refer to page 4B—97) and terminals (2A, 2C, 1E and 2G) (Refer to page 4B—88 and 89) of the engine control unit and wiring harness.
7. Install the rubber boot on the connector.

Throttle Sensor Setting

Inspection

1. Disconnect the connector from the throttle sensor.
2. Connect the **SST** to the throttle sensor or connect an ohmmeter between terminals B and D.

4B CONTROL SYSTEM



76G04B-117

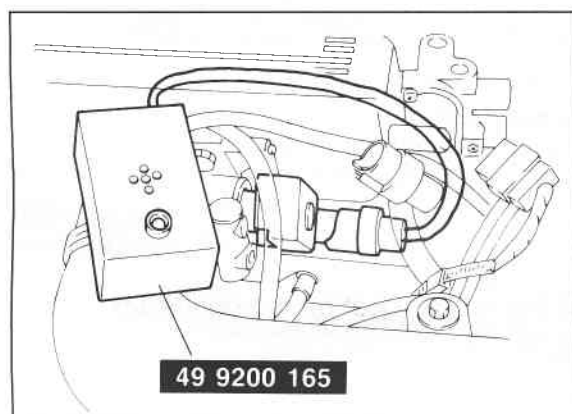
- Place a feeler gauge between the lever and the throttle stop screw and check that the **SST** buzzer sounds or that there is continuity between terminals B and D.

Feeler gauge	0 mm (0 in)	0.7 mm (0.028 in)
Buzzer	Sounds	Does not sound
Lamp	ON	OFF
Continuity	YES	NO

- If not correct, adjust the throttle sensor as outlined below.

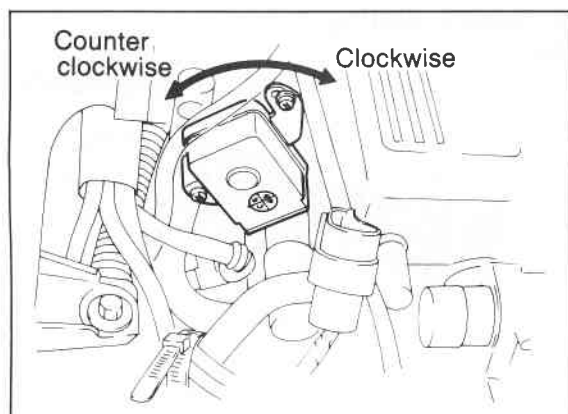
Adjustment

- Disconnect the connector and connect the **SST** to the throttle sensor.
- Place a **0.40 mm (0.016 in)** feeler gauge between the lever and the throttle stop screw.



76G04B-118

- Loosen the two attaching screws.
- Rotate the throttle sensor clockwise about 30°, then rotate it counterclockwise until the buzzer sounds.
- If it does not buzz, replace the throttle sensor.
- If it does buzz, substitute the feeler gauge with a **0.55 mm (0.022 in)** gauge.
- Check that the buzzer does not sound.
- If it buzzes, repeat steps 3 to 7.
- If it still buzzes, replace the throttle sensor.



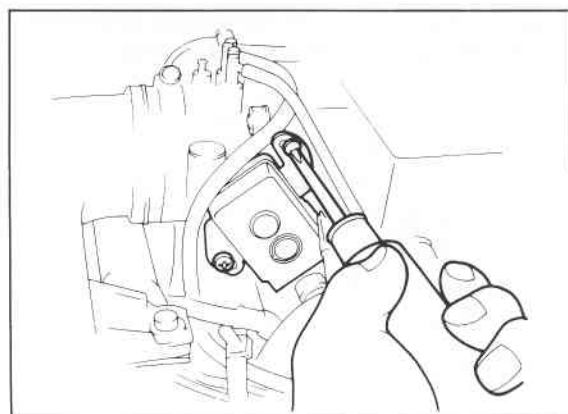
76G04B-119

- Tighten the two attaching screws.

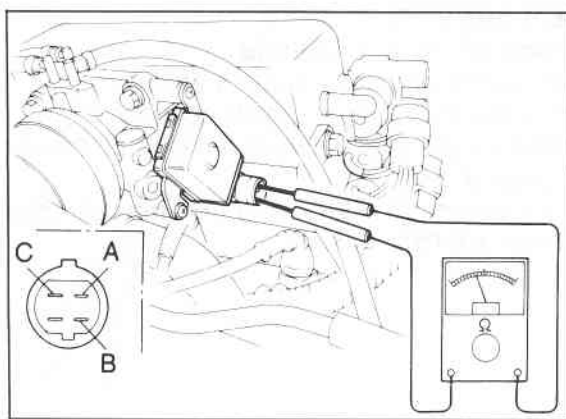
Note

Be careful not to disturb the throttle sensor position when tightening the screws.

- Open the throttle valve fully a few times; then recheck the adjustment of the throttle sensor.
- Disconnect the **SST** from the throttle sensor and reconnect the connector.



76G04B-120



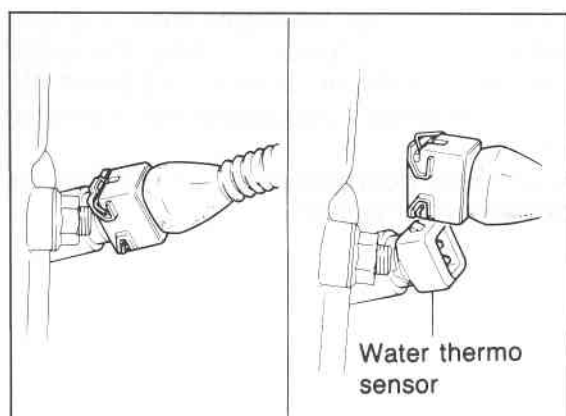
56G04B-038

Inspection of Resistance

1. Disconnect the connector from the sensor.
2. Check resistance between the terminals as shown in the table.
3. Open the throttle valve fully and check resistances between terminals.

Condition	Closed	Fully open
Terminal		
A ↔ B	Approx. 500 Ω	Approx. 4.5 kΩ
B ↔ C	4—6 kΩ	

4. If not correct, replace the throttle sensor.

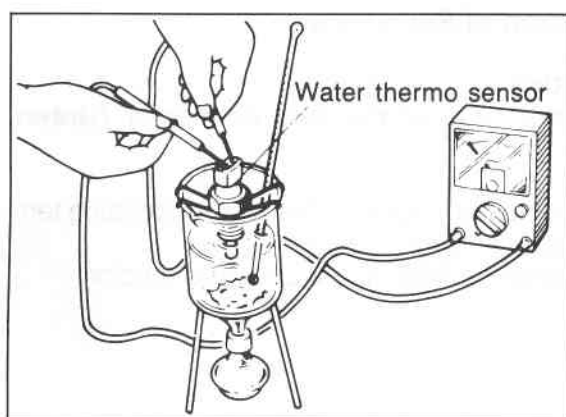


86U04A-202

WATER THERMO SENSOR

Inspection

1. Remove the water thermo sensor from the cylinder head.

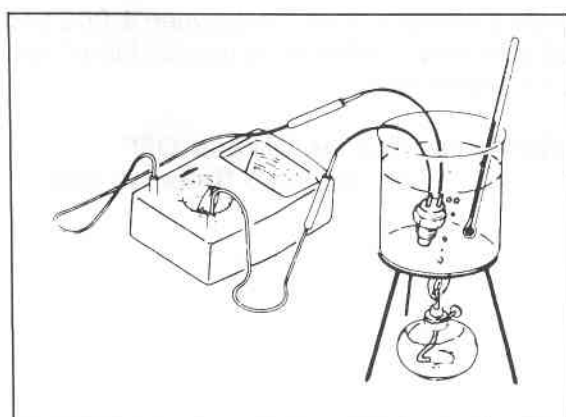


86U04A-203

2. Place the sensor in water with a thermometer and heat the water gradually.
3. Check resistance of the sensor with an ohmmeter.

Coolant	Resistance
-20°C (-4°F)	14.5—17.8 kΩ
20°C (68°F)	2.2—2.7 kΩ
40°C (104°F)	1.0—1.3 kΩ
60°C (140°F)	500—640 Ω
80°C (176°F)	280—350 Ω

4. If not correct, replace the water thermo sensor.



76G04B-132

WATER THERMO SWITCH

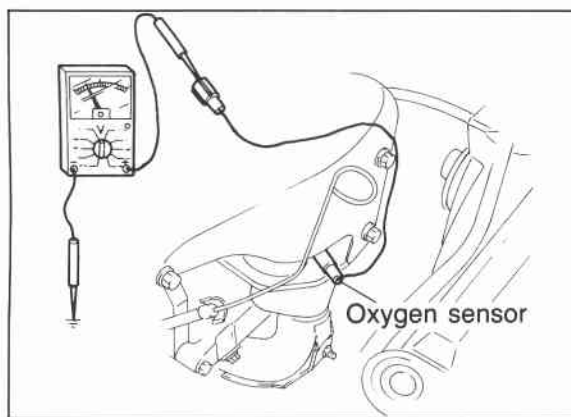
Inspection

1. Remove the switch from the radiator.
2. Place the switch in water with a thermometer, and heat the water gradually.
3. Check for continuity of the switch with an ohmmeter.

Coolant temp.	Continuity
More than approx. 17°C (63°F)	Yes
Less than approx. 17°C (63°F)	No

4. If not correct, replace the water thermo switch.

4B CONTROL SYSTEM

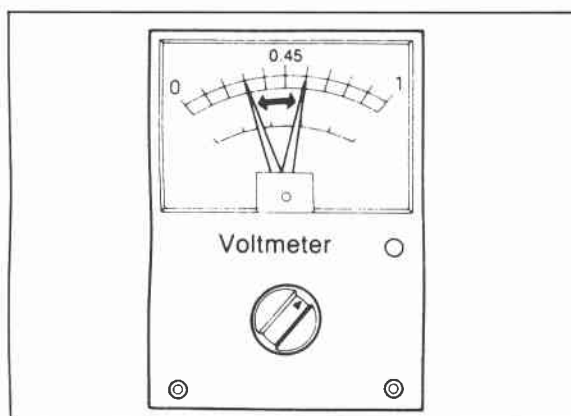


76G04B-121

OXYGEN SENSOR

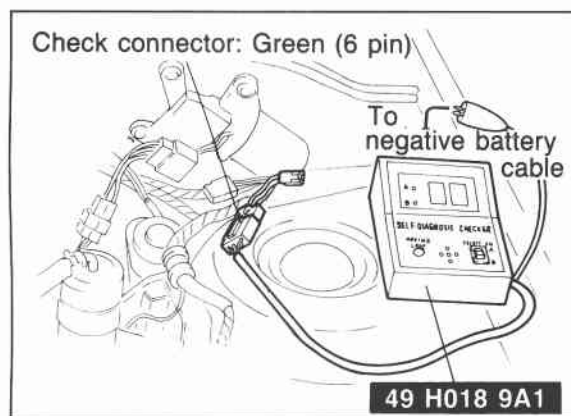
Inspection of Output Voltage

1. Warm up the engine and run it at idle.
2. Disconnect the oxygen sensor connector.
3. Connect a voltmeter between the oxygen sensor and ground.
4. Run the engine at **4,000 rpm** until the voltmeter indicates **approx. 0.55V**.



86U04A-206

5. Increase and decrease the engine speed suddenly several times. Check to see that when the speed is increased the meter reads between **0.5V—1.0V**, and when the speed is decreased it reads between **0V—0.4V**.
6. If the voltmeter doesn't indicate as specified, replace the oxygen sensor.



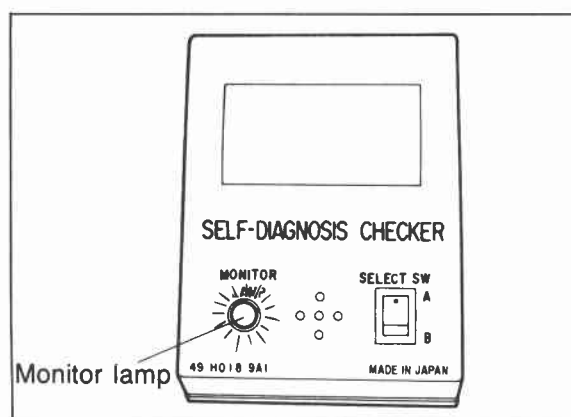
76G04B-133

Inspection of Sensitivity

Caution

Do not ground the test connector (Green, 1-pin).

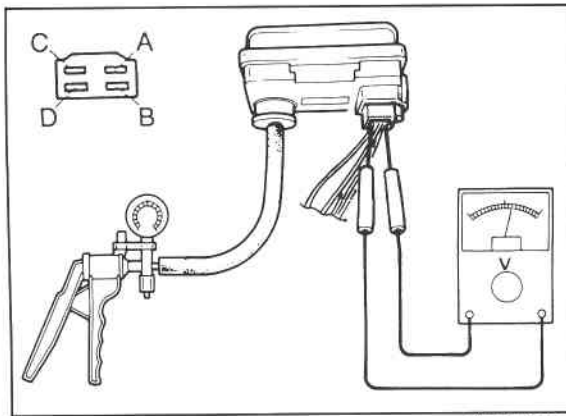
1. Warm up the engine to the normal operating temperature and run it at idle.
2. Connect the **SST** to the check connector.



86U04A-208

3. Increase the engine speed to between **2,000 and 3,000 rpm**, and check that the monitor lamp flashes for 10 seconds.

Monitor lamp: Flashes ON and OFF more than 8 times/10 sec



67U04X-154

ATMOSPHERIC PRESSURE SENSOR Inspection

1. Connect a voltmeter to the atmospheric pressure sensor (D) terminal.
2. Turn the ignition switch on and take a voltage reading.

Voltage: 3.5—4.5V at sea level
2.5—3.5V at high altitude
[2,000m (6,500 ft)]

3. Replace the sensor if necessary.