

# RX-7

## Factory Service Material

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### This includes

- 1993 Factory Service Manual
- 1988 Factory Service Manual
- 1995 Printed Microfiche of all parts
- 1989 Printed Microfiche of all parts\*
- 1990 Printed Microfiche of all parts\*
- 1986 Printed Microfiche of all parts\*
- 1987 Printed Microfiche of all parts\*
- 1988 Printed Microfiche of all parts\*

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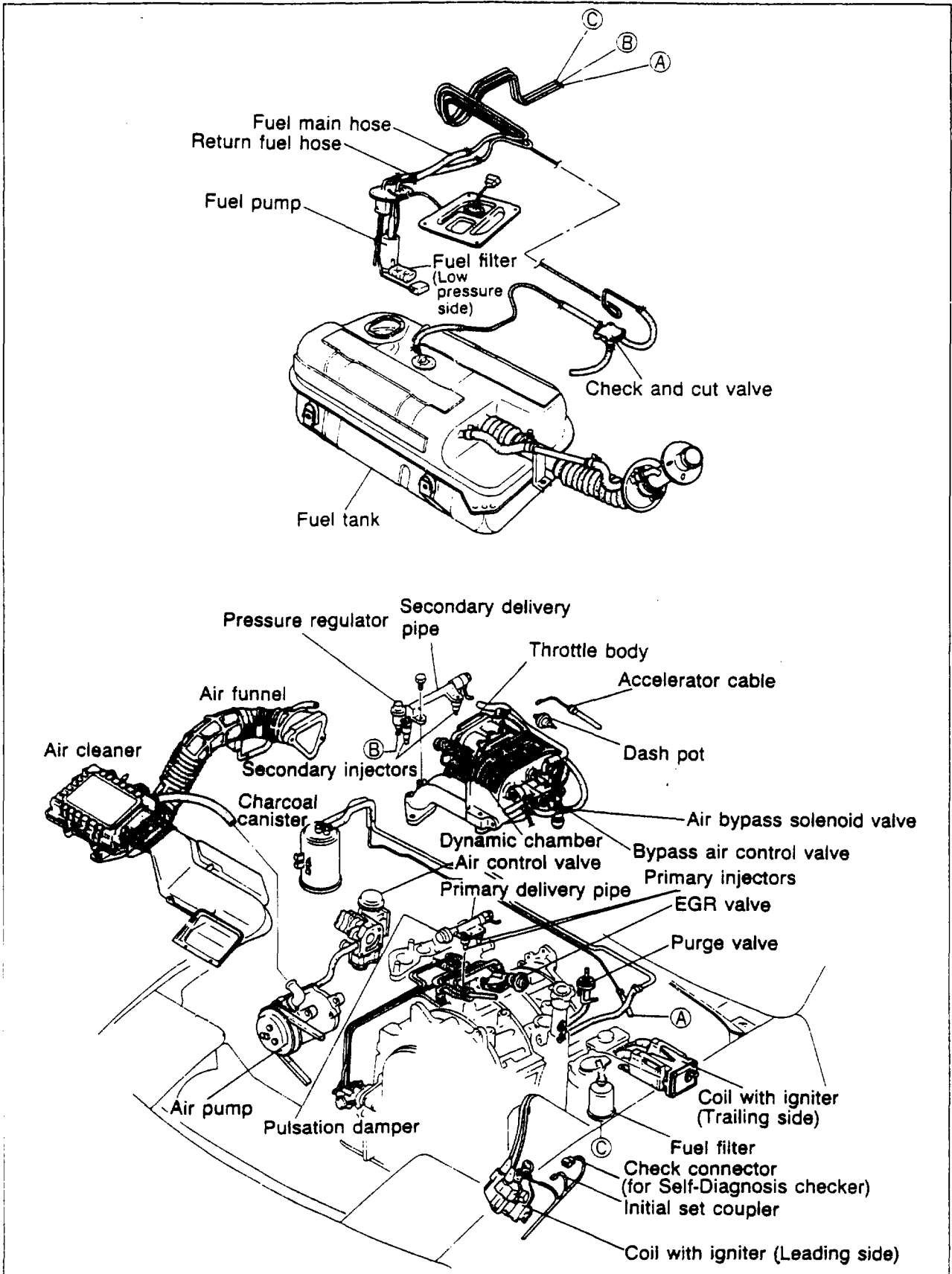
\* These works are currently in process and may or not be readily available upon request. They will be hosted on the same link above and for download

# FUEL AND EMISSION CONTROL SYSTEMS (EGI)

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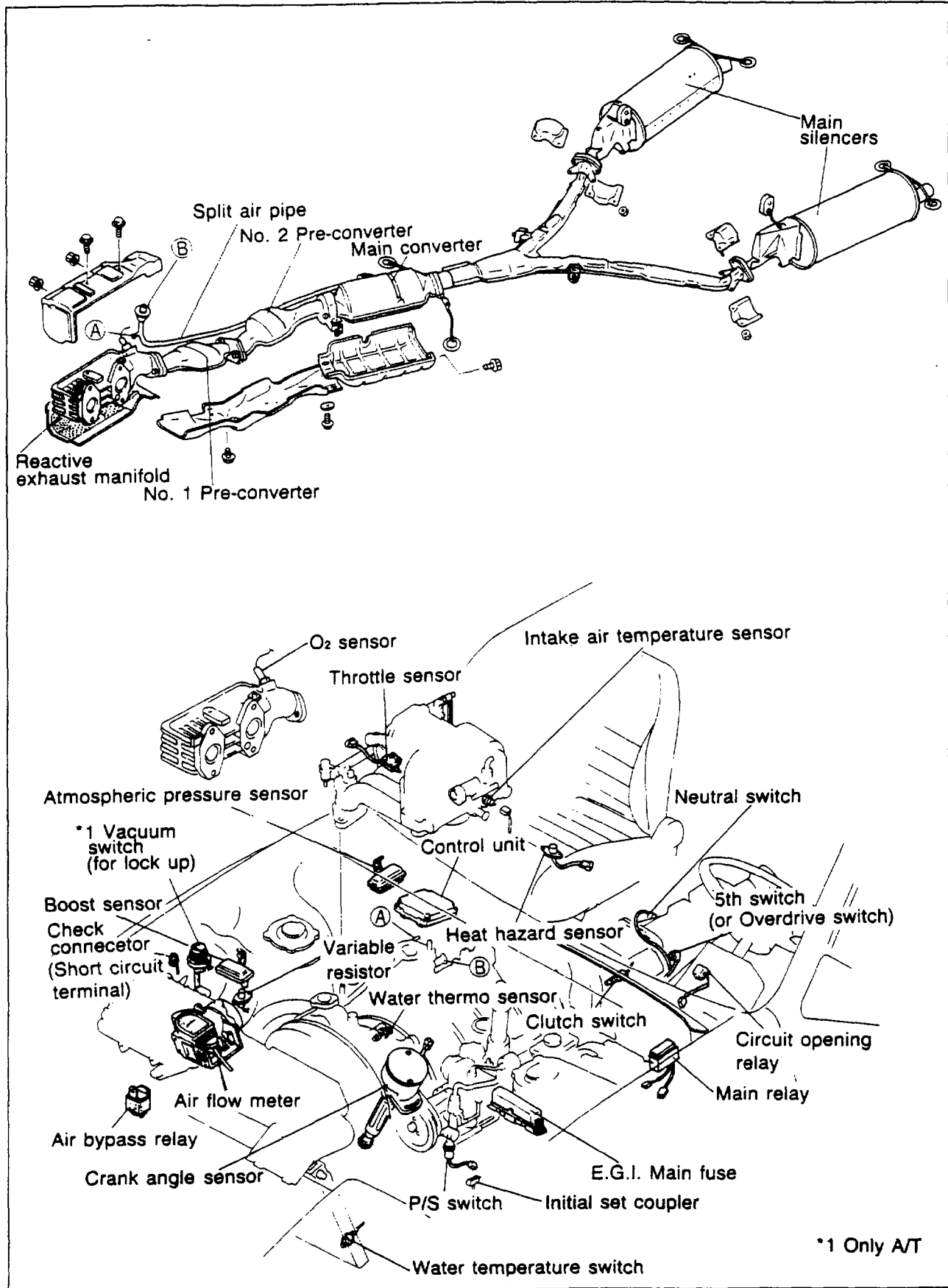


**COMPONENTS LOCATION**  
**Fuel and Output Devices**

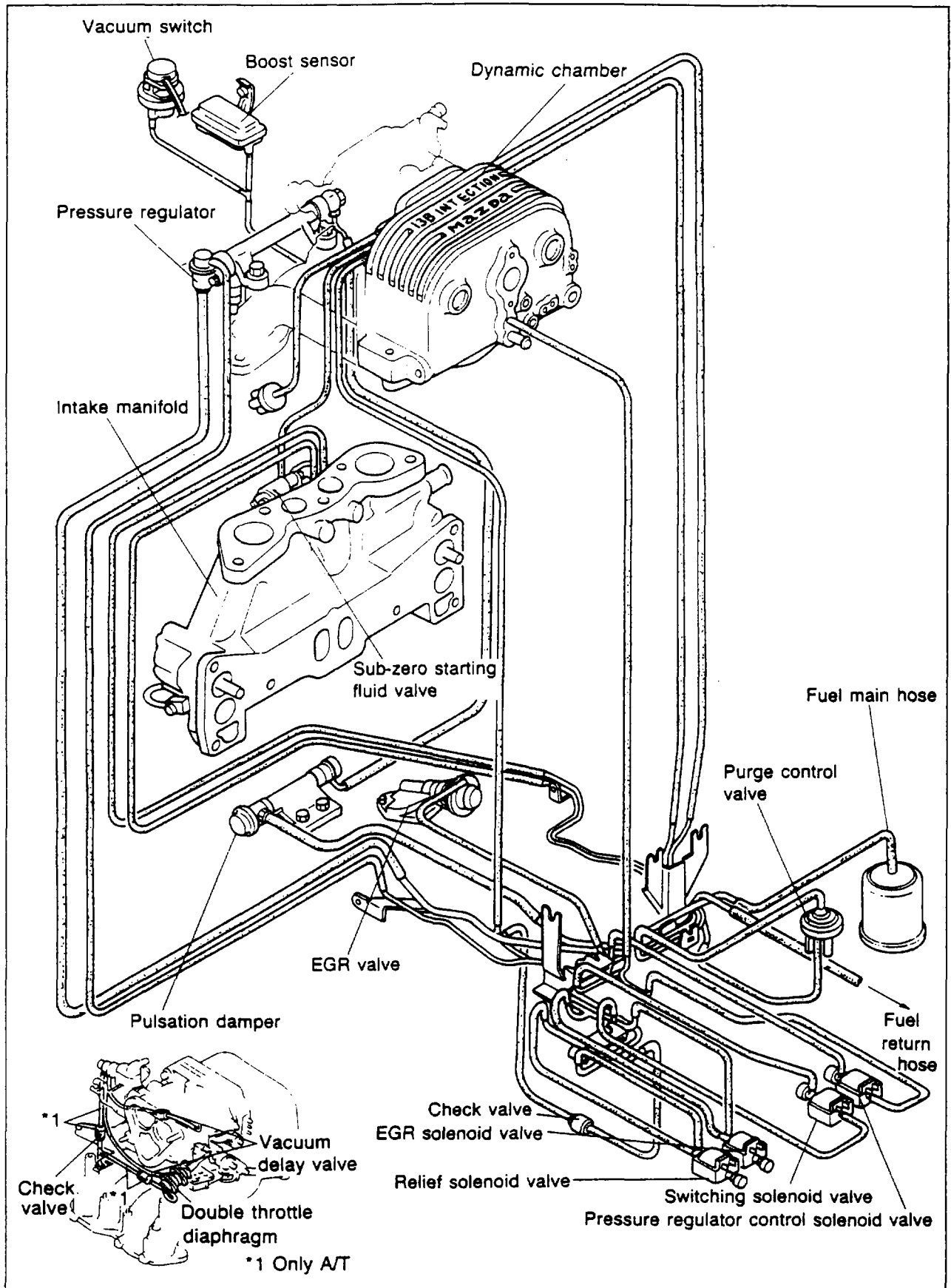


# 4A OUTLINE

## Exhaust and Input Devices



VACUUM HOSE ROUTING DIAGRAM



# 4A OUTLINE

## COMPONENT DESCRIPTION

Component	Function	Remarks
<b>Anti Afterburn Valve</b>	Supplies fresh air into rear port during deceleration	Included in air control valve
<b>Air Bleed Socket</b>	Supplies fresh air into primary injector hole	
<b>Air Bypass Solenoid Valve</b>	Supplies bypass air into primary intake manifold	Assist of BAC valve during cold condition
<b>Air cleaner</b>	Filters air into throttle chamber	
<b>Air Control Valve</b>	Directs air to one of three locations; exhaust port, main converter or relief air silencer	Consists of 3 valves; Relief valve Switching valve Anti afterburn valve
<b>Air Flow Meter</b>	Detects amount of intake air; sends signal to control unit	
<b>Atmospheric Pressure Sensor</b>	Detects atmospheric pressure; sends signal to control unit	
<b>Air Pump</b>	Supplies secondary air to air control valve	
<b>Bypass Air Control (BAC) Valve</b>	Supplies bypass air into dynamic chamber	Controlled by duty signal from control unit
<b>Boost Sensor</b>	Detects intake manifold vacuum; sends signal to control unit	
<b>Catalytic Converter</b>	Reduces HC, CO and NOx	
<b>Charcoal Canister</b>	Stores gas tank fumes when engine stopped	Vented to atmosphere through charcoal and filter
<b>Check and cut valve</b>	Controls pressure in fuel tank	
<b>Control Unit</b>	<p>Detects the following:</p> <ol style="list-style-type: none"> <li>1.Engine speed</li> <li>2.Intake air amount</li> <li>3.Engine coolant temperature</li> <li>4.Throttle opening</li> <li>5.Intake manifold vacuum</li> <li>6.O<sub>2</sub> concentration</li> <li>7.Radiator coolant temperature</li> <li>8.Idle mixture</li> <li>9.In-gear condition</li> <li>10 Intake air temperature</li> <li>11.Floor temperature</li> <li>12.A/C operation</li> <li>13.Cranking signal</li> <li>14 Atmospheric pressure</li> <li>15.Initial set signal</li> <li>16 Position of transmission gear</li> <li>17.P/S operation</li> </ol> <p>Controls operation of the following:</p> <ol style="list-style-type: none"> <li>1.Fuel injection system</li> <li>2.Ignition control system</li> <li>3.BAC system</li> <li>4.Pressure regulator control system</li> <li>5.Secondary air injection control system</li> <li>6.Shift indicator light system</li> <li>7.EGR system</li> </ol>	<p>Crank angle sensor Air flow meter Water thermo sensor Throttle sensor Boost sensor Oxygen (O<sub>2</sub>) sensor Water temperature switch Variable resistor Neutral switch and clutch switch (Inhibitor switch) Intake air temperature sensor Heat hazard sensor A/C switch Starter switch Atmospheric pressure sensor Initial set coupler 5th switch, overdrive switch P/S switch</p>

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Component	Function	Remarks
<b>Coil with Igniter</b>	Generates high voltage	Leading: ignite simultaneously Trailing: ignite individually
<b>Crank Angle Sensor</b>	Detects eccentric shaft angle at 30° intervals and front rotor position; sends signal to control unit	
<b>Dashpot</b>	Gradually closes throttle valve during deceleration	
<b>Double Throttle System</b>	Gradually opens the No. 2 secondary throttle valve when No. 1 secondary throttle valve suddenly opens	
<b>Dynamic Chamber</b>	Connects front and rear ports	Primary and secondary separated
<b>EGR Solenoid Valve</b>	Supplies intake manifold vacuum to EGR valve	Yellow
<b>EGR Valve</b>	Supplies exhaust gas into intake manifold	
<b>Fast Idle System</b>	Opens primary throttle valve slightly at idle	Only during cold condition
<b>Fuel Filter</b>	Filters particles from fuel	
<b>Fuel Pump</b>	Provides fuel to injectors	Operates while engine is running Installed in fuel tank
<b>Heat Hazard Sensor</b>	Detects floor temperature; sends signal to control unit	Heat hazard sensor turned ON; relieves secondary air
<b>Initial Set Coupler</b>	Sends initial set signal to control unit	While adjustment of idle speed, idle mixture; coupler is shorted
<b>Injector</b>	Injects fuel into intermediate housing and secondary intake manifold	Controlled by signals from control unit
<b>Intake Air Temperature Sensor</b>	Detects intake air temperature and temperature into the engine; sends signal to control unit	Located on the air flow meter and air intake pipe Thermistor
<b>Mileage Switch</b>	Detects vehicle mileage sends signal to control unit	Above 20,000 miles; mileage switch ON
<b>Oxygen (O<sub>2</sub>) Sensor</b>	Detects O <sub>2</sub> concentration; sends signal to control unit	Zirconia ceramic and platinum coating
<b>Pressure Regulator</b>	Adjusts fuel pressure supplied to injectors	
<b>Pressure Regulator Control Solenoid Valve</b>	Shuts vacuum passage between dynamic chamber and pressure regulator	Only during hot condition Orange
<b>Pulsation Damper</b>	Absorbs fuel pulsation	
<b>Purge Valve</b>	Regulates evaporative fumes from gas tank and canister to intake manifold	

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# 4A OUTLINE

Component	Function	Remarks
<b>Relief Solenoid Valve</b>	Controls relief valve	Blue
<b>Shift Indicator Light</b>	Reveals shift condition to driver	
<b>Switching Solenoid Valve</b>	Controls switching valve of the air control valve	Gray
<b>Throttle Body</b>	Controls intake air quantity	
<b>Throttle Sensor</b>	Detects primary throttle valve opening angle; sends signal to control unit	
<b>Variable Resistor</b>	Adjusts air/fuel ratio; sends signal to control unit	Tamper-proof
<b>Water Thermo Sensor</b>	Detects engine coolant temperature; sends signal to control unit	Thermistor
<b>Water Temperature Switch</b>	Detects radiator coolant temperature; sends signal to control unit	

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## SPECIFICATIONS

		<b>13B EGI engine</b>	
Idle speed	[rpm]	725—775 (with/BAC valve) (for A/T...N Range)	
Air cleaner	Element type	Long life dry	
Throttle body	Type	Horizontal — draft (2 stage — 3 barrel)	
	Throat diameter	Primary [mm (in)]	45 (1.772)
		Secondary [mm (in)]	45 (1.772) x 2
	Water thermo valve	Operation temperature [°C (°F)]	M/T: 58—62 (136.4—143.6) or more A/T: 66—70 (150.8—158.0) or more
Dashpot	Adjustment speed [rpm]	2,700—3,100	
Fuel tank	Capacity [liters (US gal)]	63 (16.6)	
Fuel filter	Low pressure	Nylon 6 (164 and 45 mesh)	
	High pressure	Filter paper	
Pressure regulator	Type	Diaphragm	
	Regulated pressure [kPa (kg/cm <sup>2</sup> , psi)]	245.2—255.0 (2.5—2.6, 35.6—37.0)	
Fuel pump	Type	Impeller (intank)	
	Outlet pressure [kPa (kg/cm <sup>2</sup> , psi)]	441—588 (4.5—6.0, 64.0—85.3)	
	Feeding capacity [liters (US gal)/minute]	at least 1.3 (0.35)	
Injector (Primary and Secondary)	Drive	Voltage drive	
	Injection volume [cc (cu in)/15 sec.]	111—118 (6.8—7.2)	
Heat hazard sensor	Operation temperature [°C (°F)]	105—115 (221—239)	
Main silencer	Capacity [cc (cu in)]	10,000 (610.3) x 2	
Ignition timing		Leading: 5° ATDC Trailing: 20° ATDC (at idle)	
Distribution	Type	Control unit	
Spark advance	Type	Control unit	
Idle-up system	A/C [rpm]	800	
	"D" range [rpm]	750 (at warm engine)	
Bypass air control system		Linear solenoid	
Anti-afterburn valve	Operation time [sec]	M/T: 1.60—2.20 A/T: 0.52—0.92	
Exhaust gas recirculation valve	Opening pressure [mm Hg (in Hg)]	Min 50 (1.97)	

87U04A-003

# 4A TROUBLESHOOTING GUIDE

## TROUBLESHOOTING GUIDE

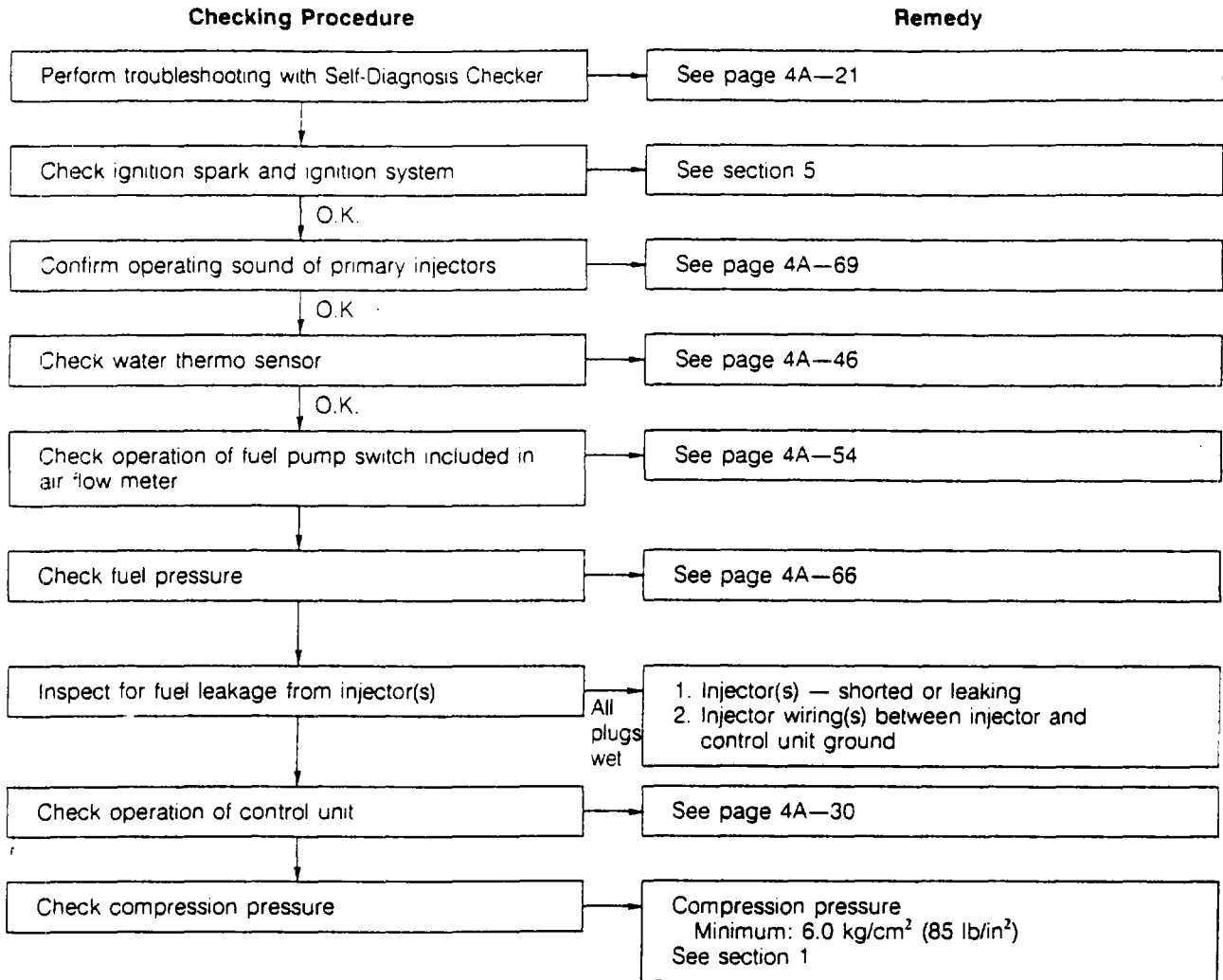
### PRELIMINARY CHECKS

When troubleshooting, always first check the below.

- |                          |                                       |
|--------------------------|---------------------------------------|
| 1. Main relay            | 4. Fuses                              |
| 2. Main fuse             | 5. Connectors                         |
| 3. Circuit opening relay | 6. Vacuum hoses and air hoses routing |

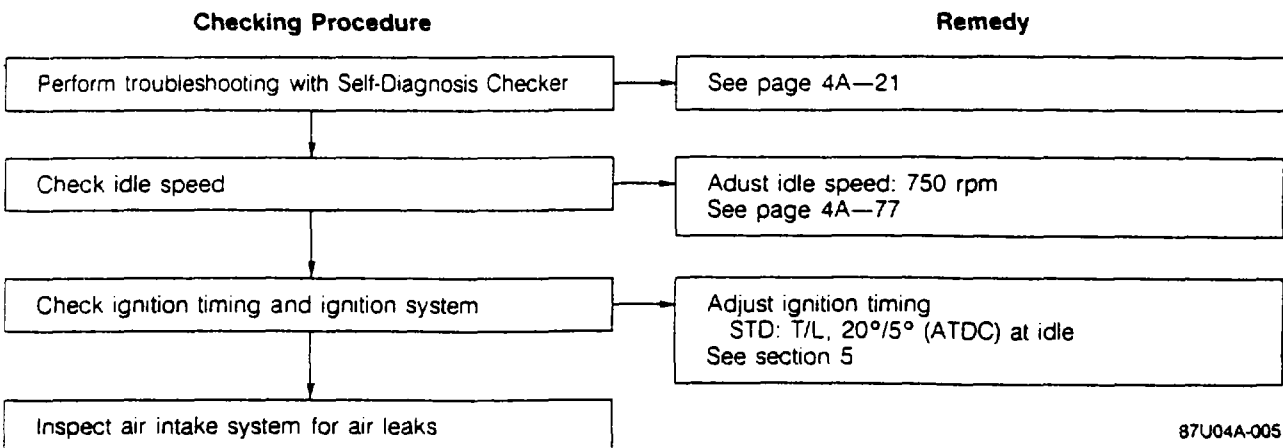
77U04B-050

### 1. HARD START OR NO START (CRANKS OK)

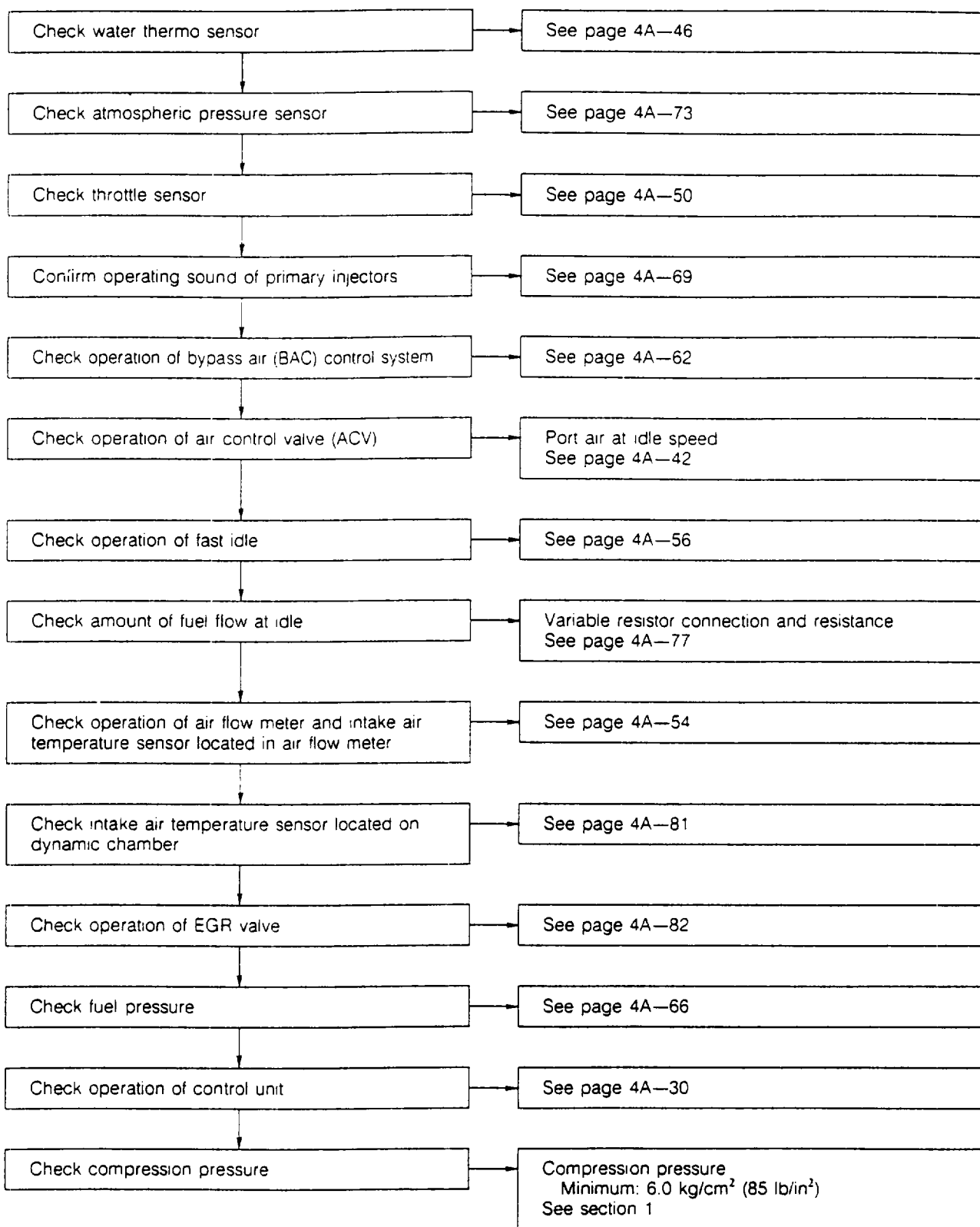


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### 2. ROUGH IDLING



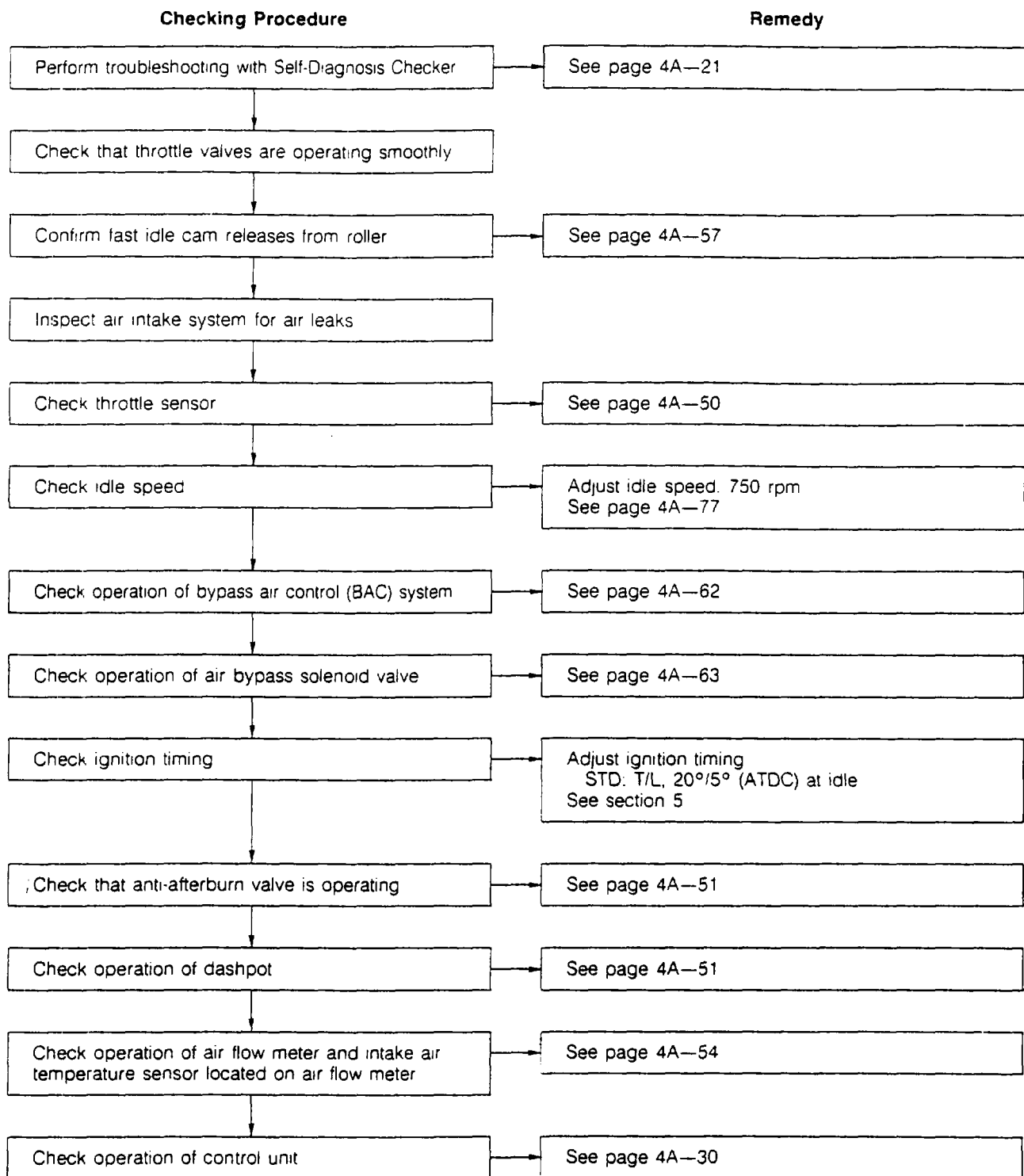
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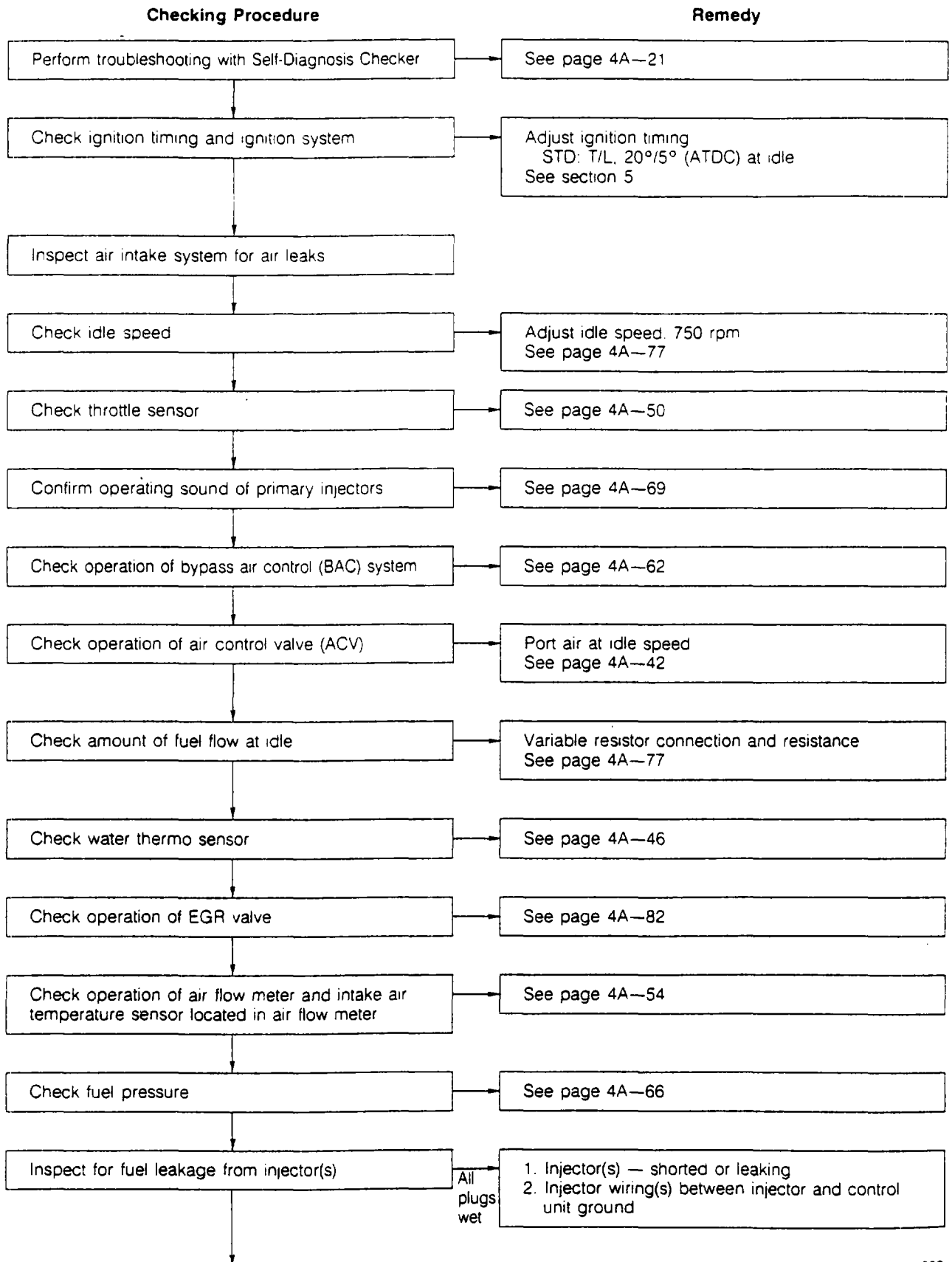
# 4A TROUBLESHOOTING GUIDE

## 3. HIGH IDLE SPEED AT NORMAL OPERATING TEMPERATURE

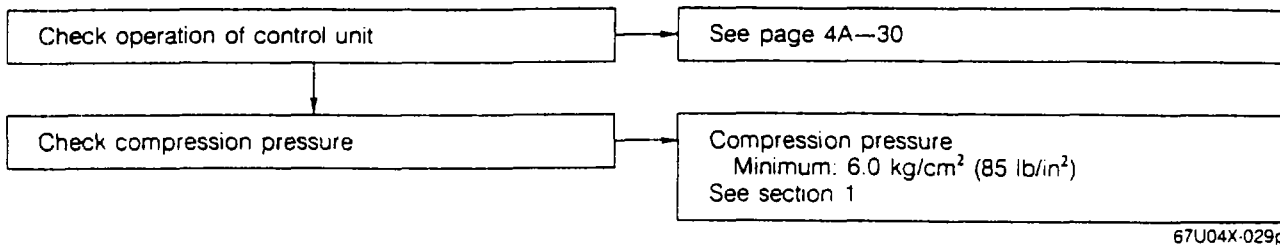


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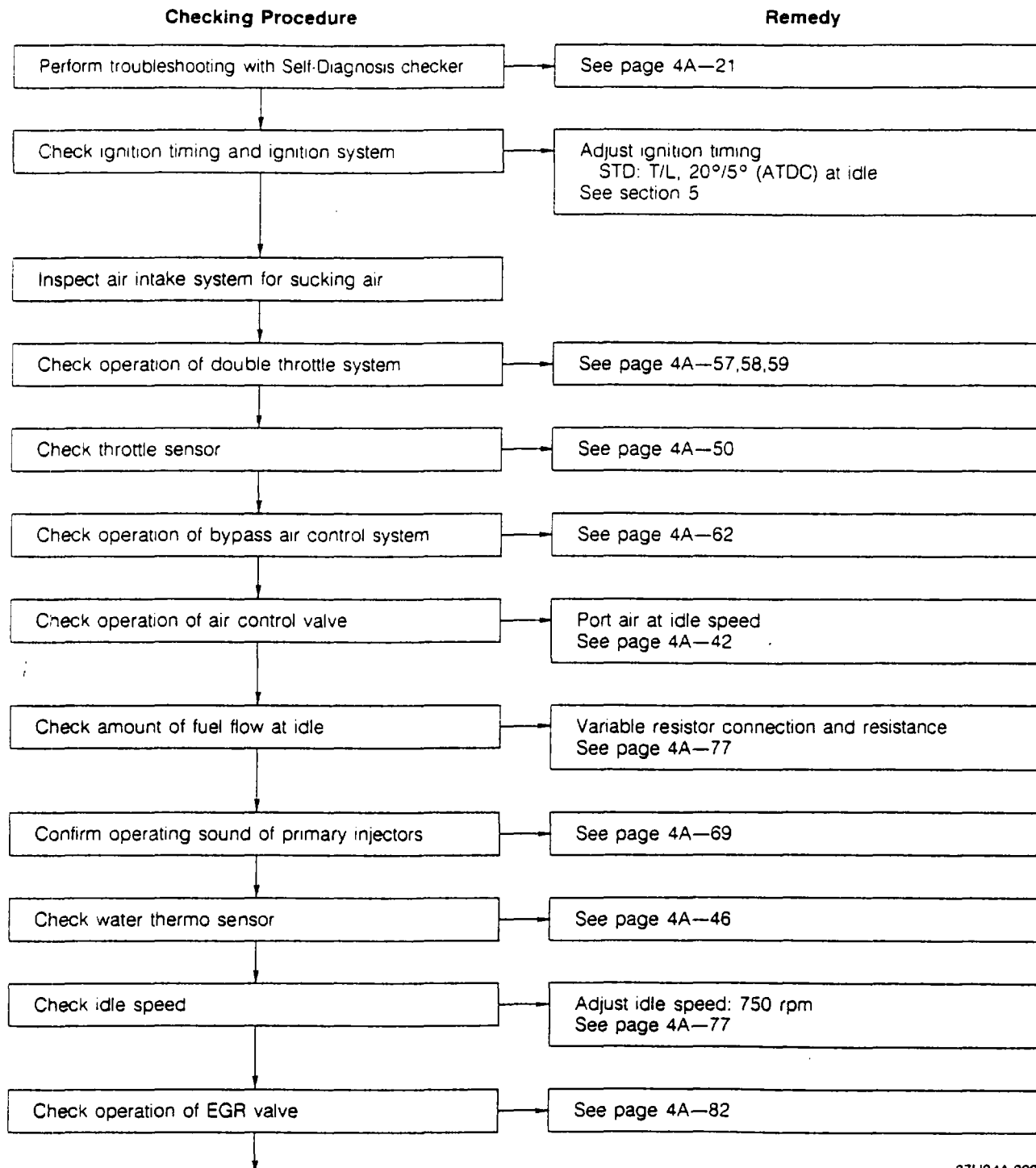
## 4. ENGINE DOES NOT RUN SMOOTHLY AT NORMAL OPERATING TEMPERATURE

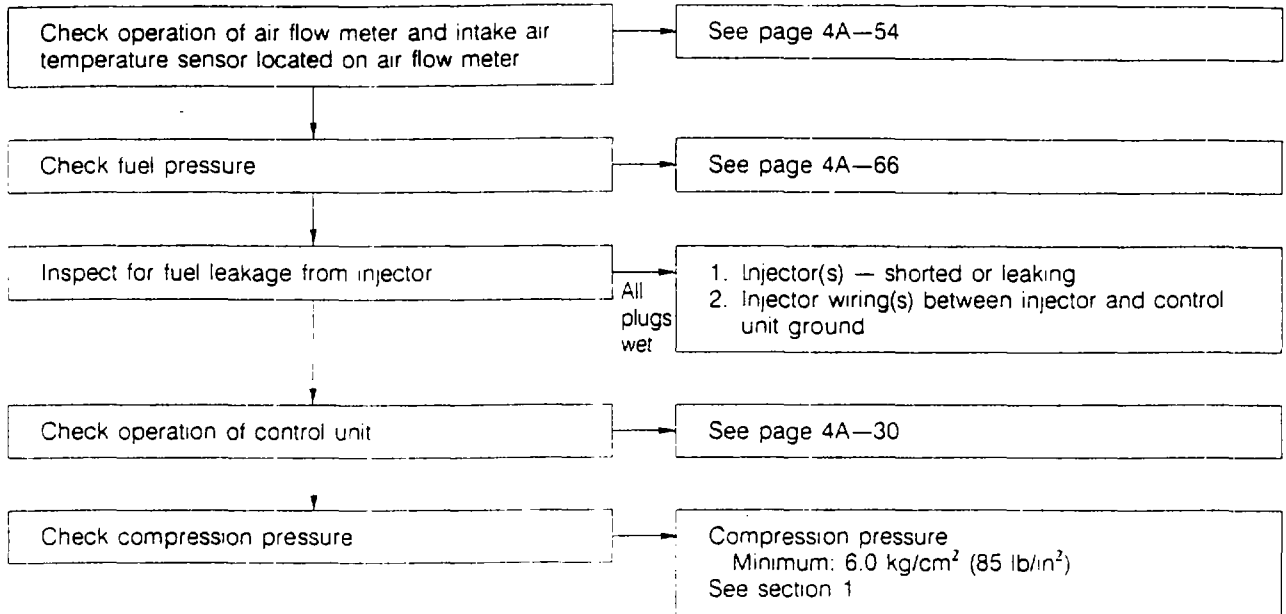


# 4A TROUBLESHOOTING GUIDE



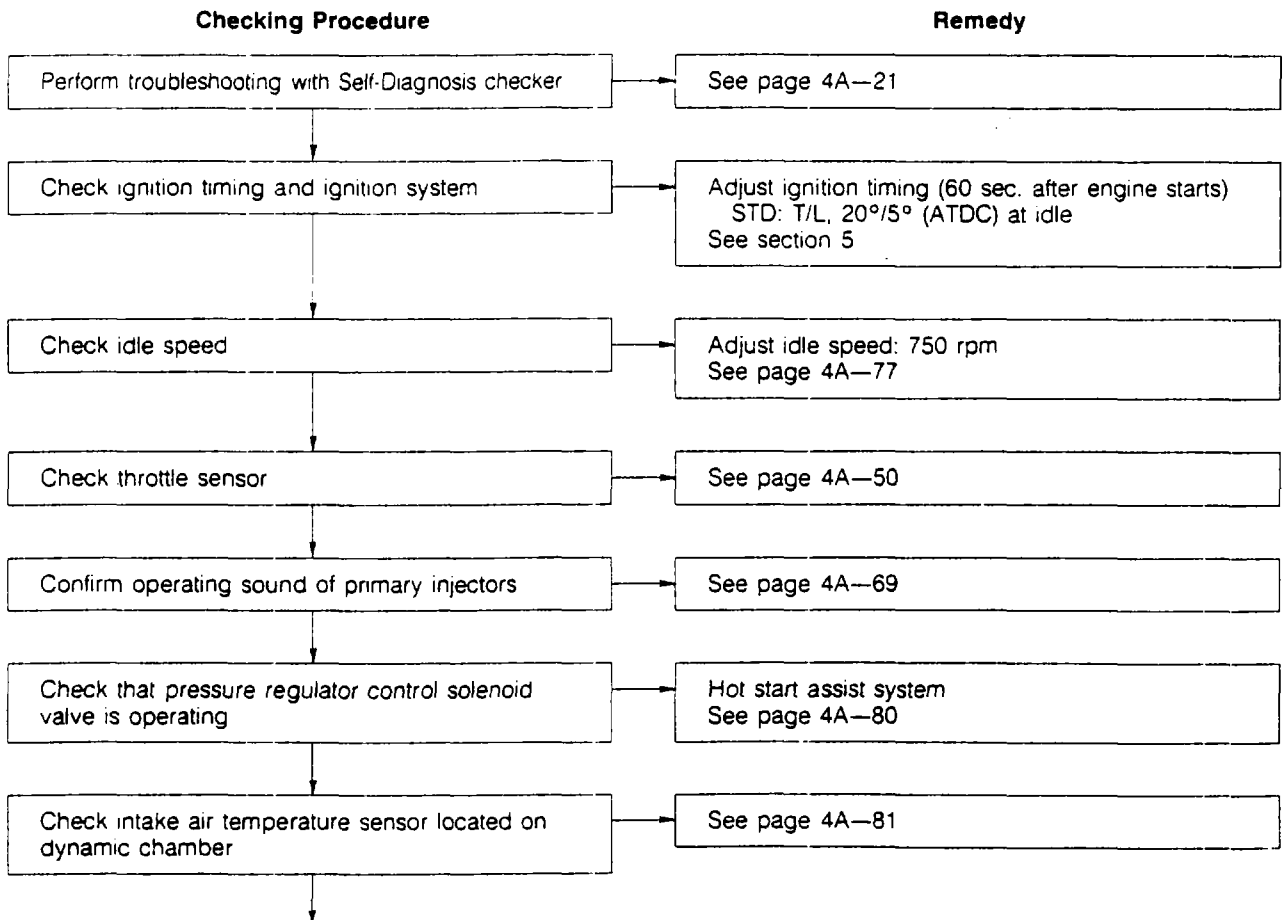
## 5. ENGINE DOES NOT RUN SMOOTHLY AT COLD CONDITION





87U04A-010

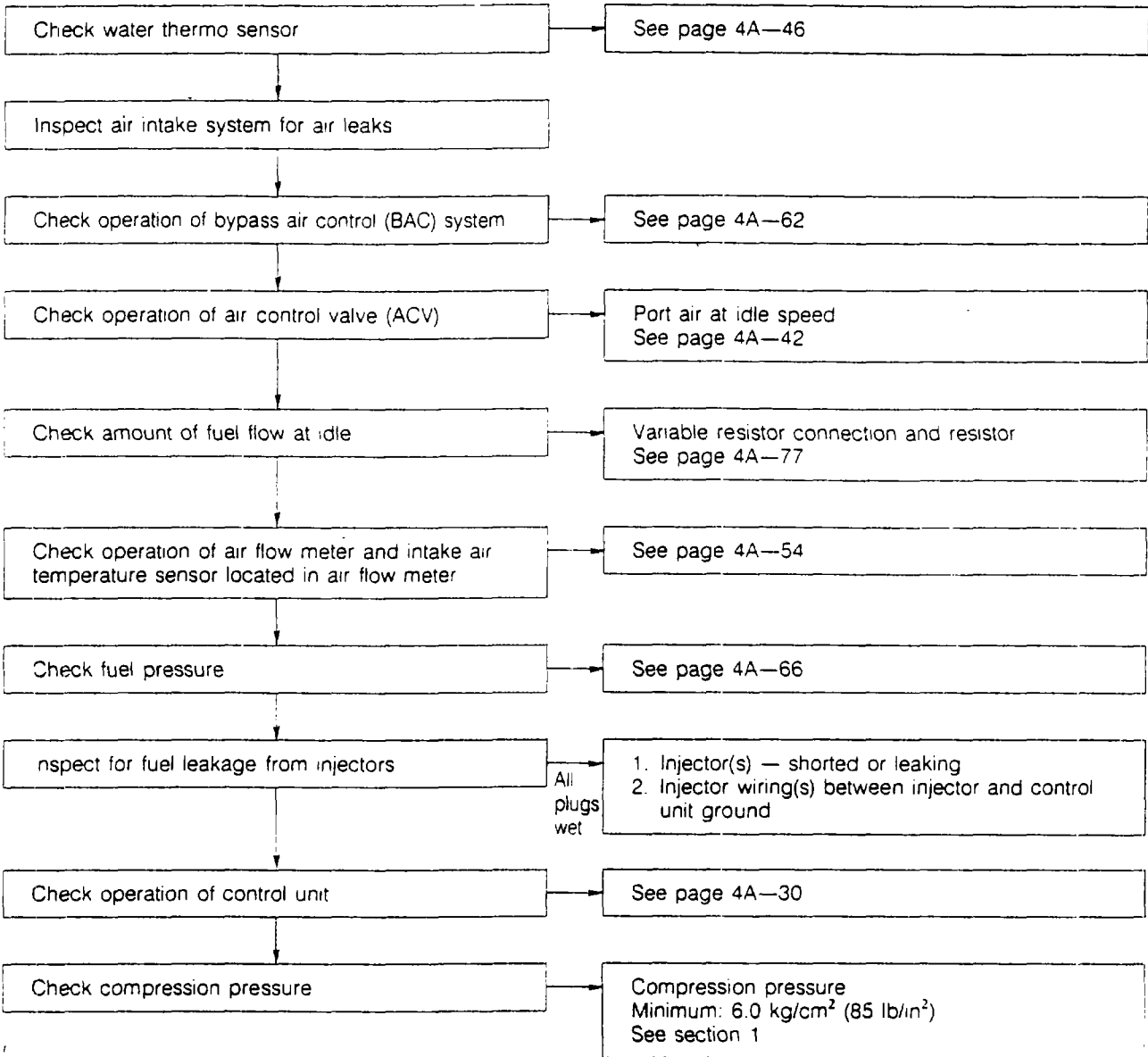
## 6. ENGINE DOES NOT RUN SMOOTHLY AT HOT CONDITION



87U04A-011

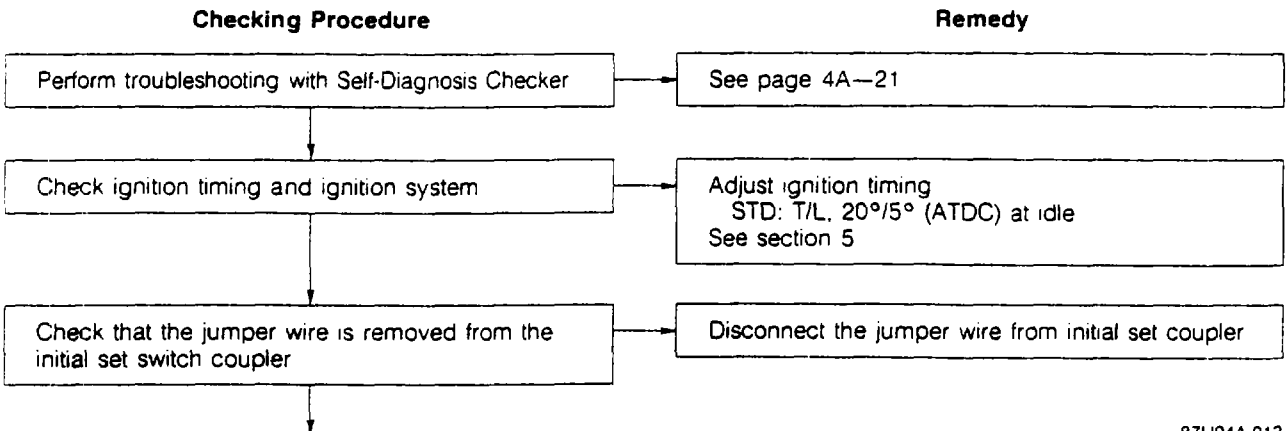


# 4A TROUBLESHOOTING GUIDE

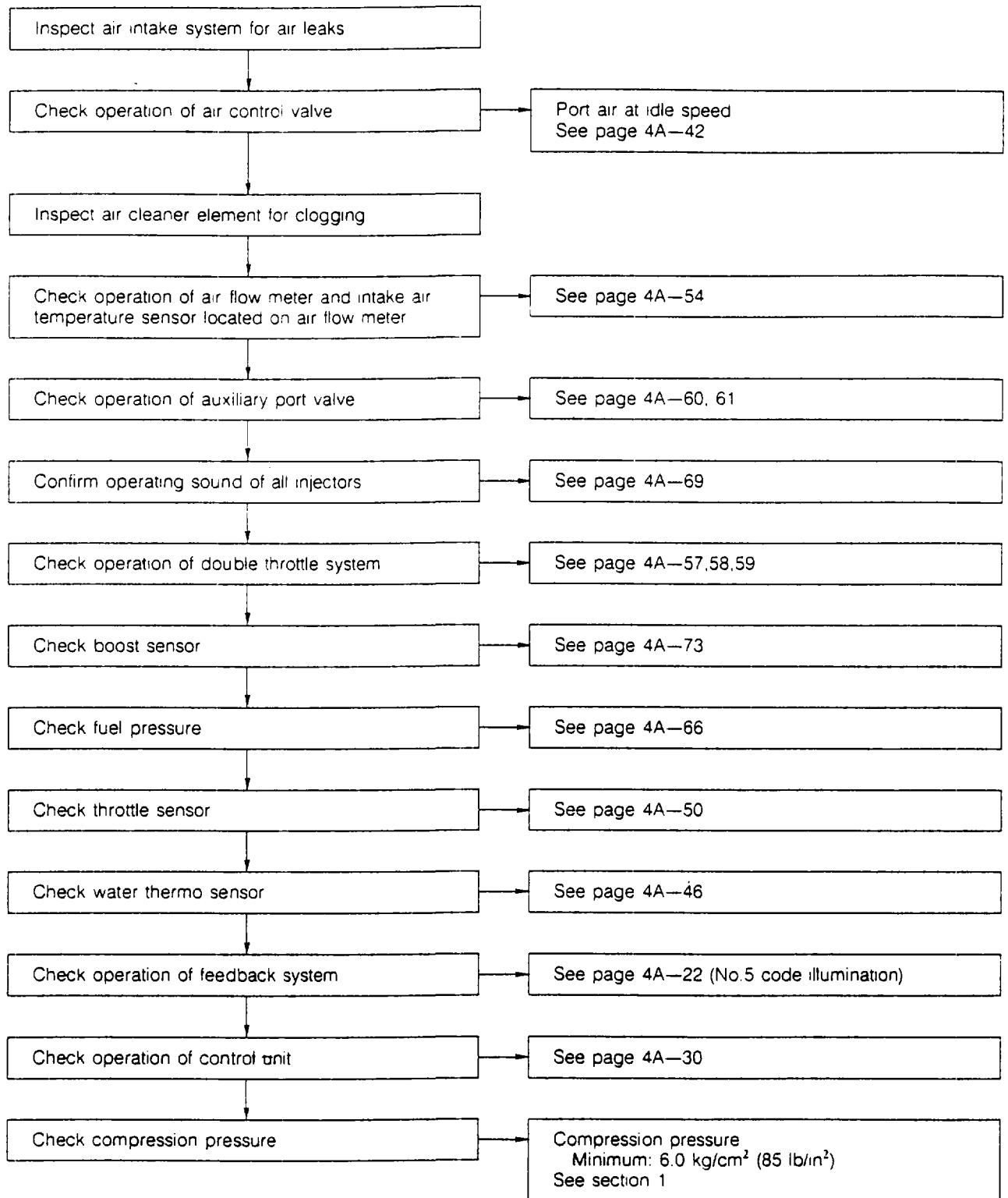


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## 7. LACK OF POWER



87U04A-013



87U04A-014

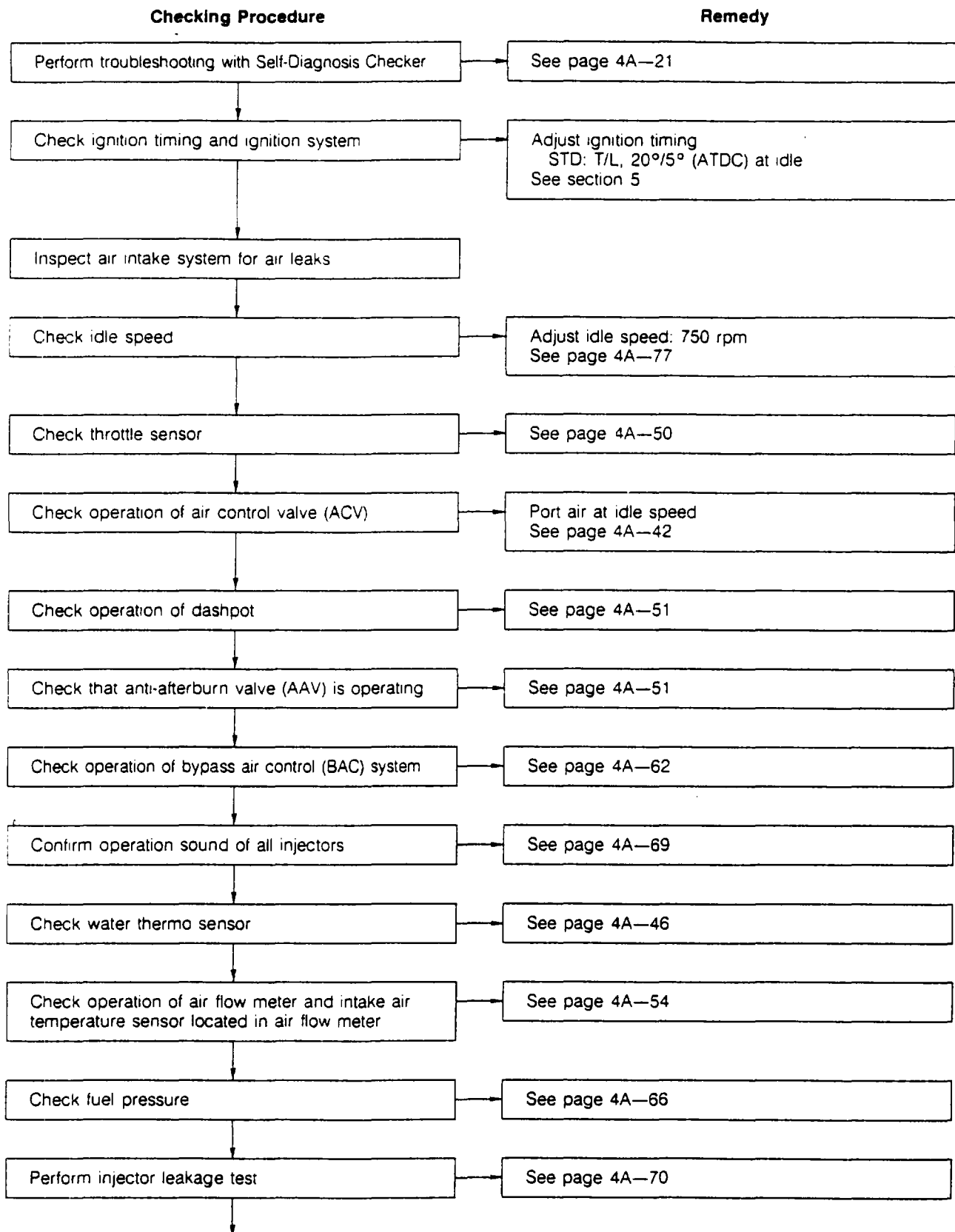
## 8. POOR ACCELERATION OR HESITATION

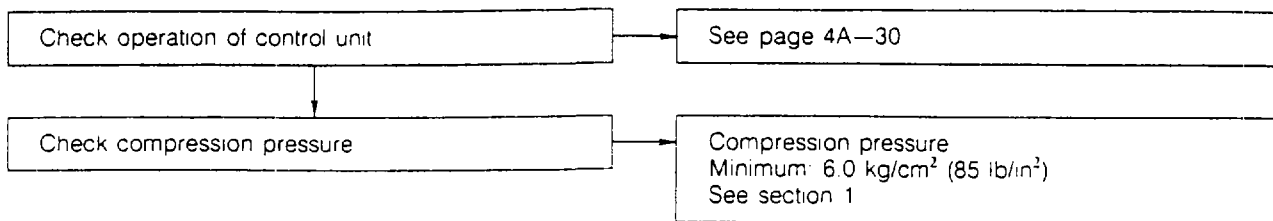
Refer to "LACK OF POWER"

87U04X-036

# 4A TROUBLESHOOTING GUIDE

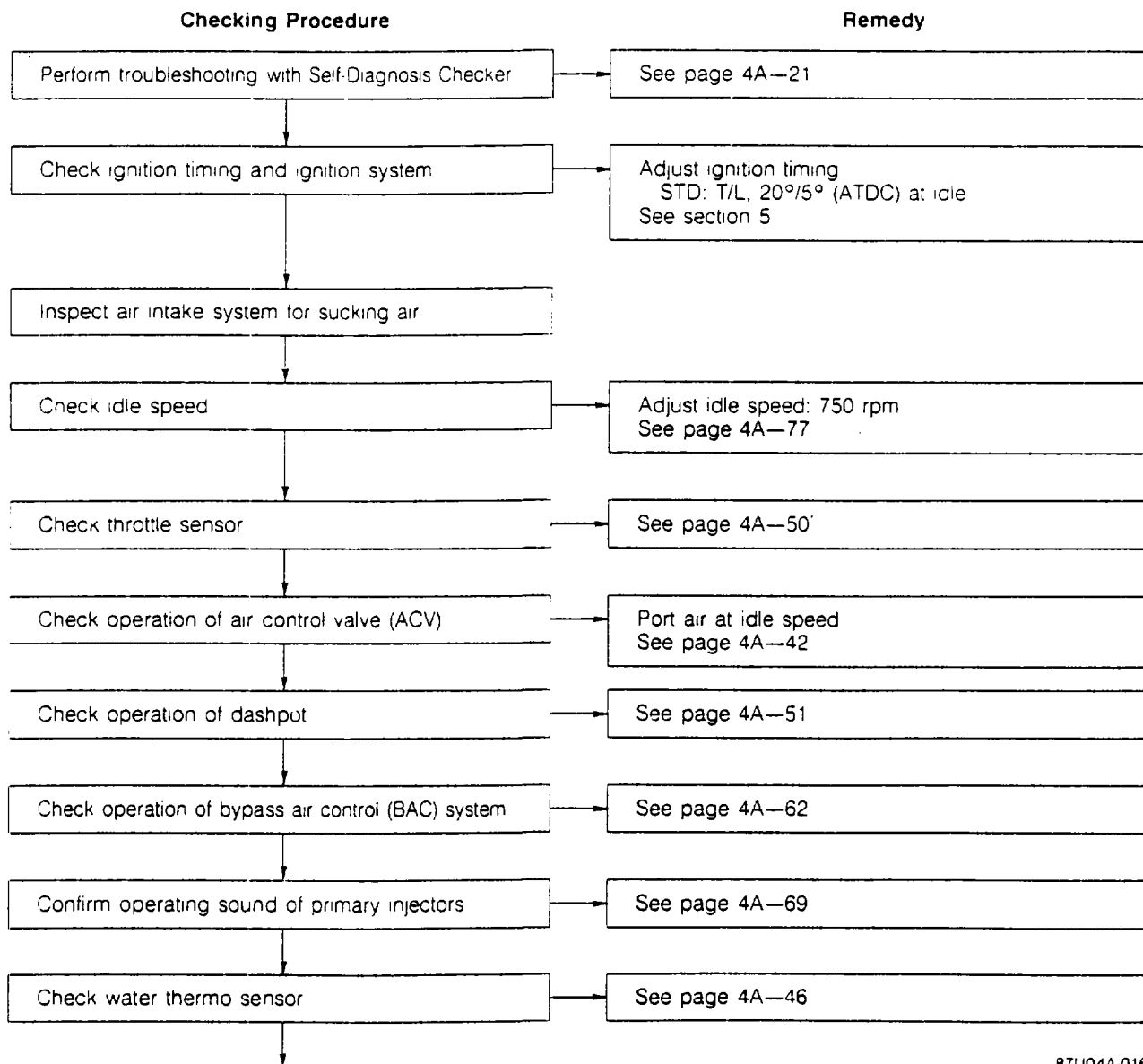
## 9. AFTERBURN





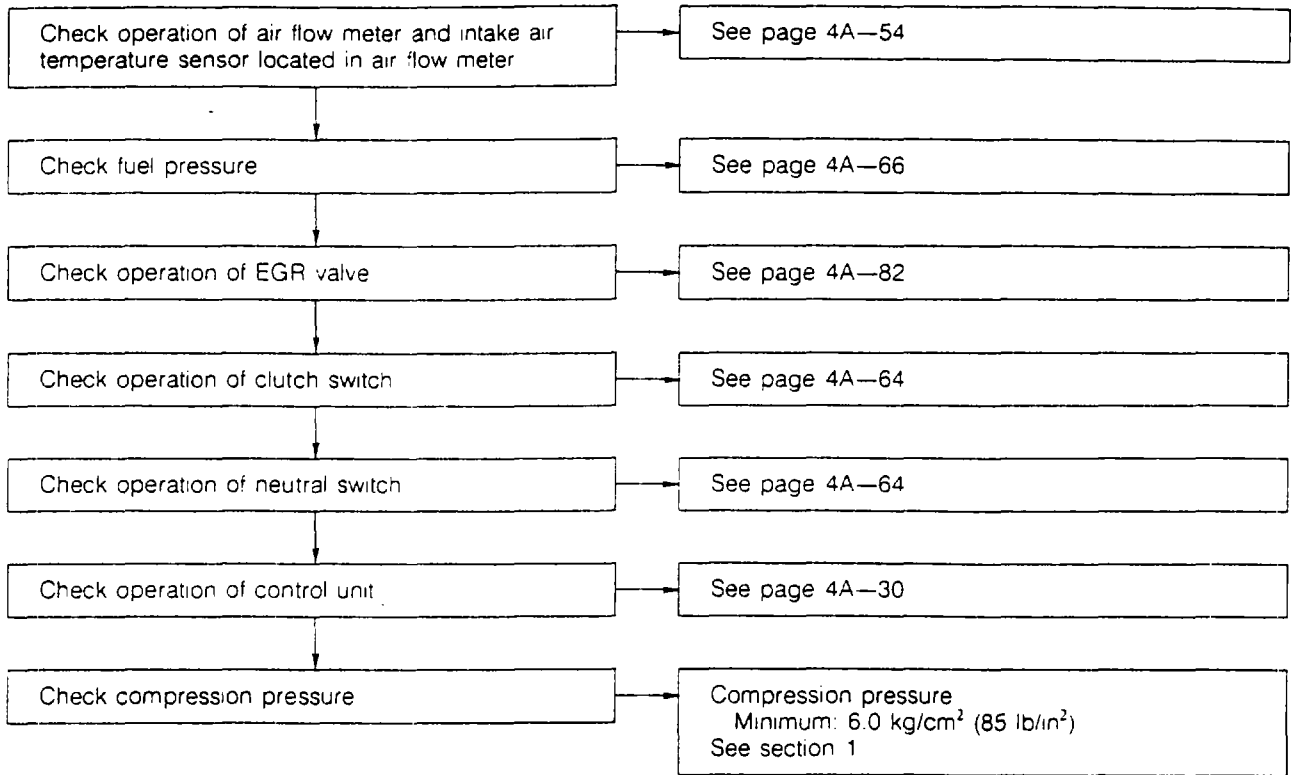
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## 10. RUNS ROUGH ON DECELERATION

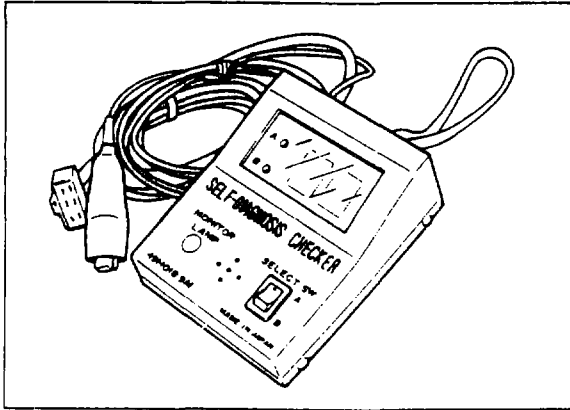


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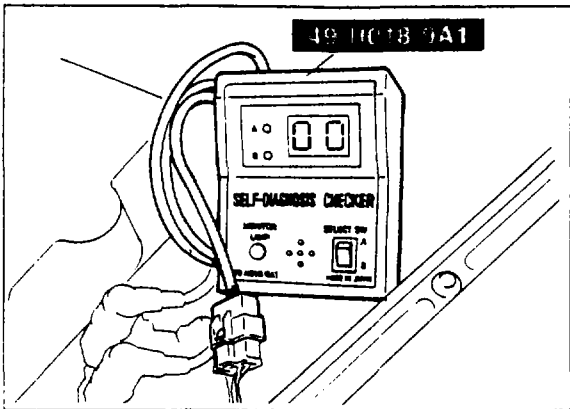
# 4A TROUBLESHOOTING GUIDE



87U04A-017



67G04B-740



87U04A-018

## SELF-DIAGNOSIS CHECKER

### Self-Diagnosis Checker (49 H018 9A1)

**Self-Diagnosis Checker** (49 H018 9A1) can be used to detect (via the control unit check terminal) problems with each sensor and damaged wiring, poor contact or short circuits between the sensors and the control unit.

The code numbers are shown in the table below.

### INSPECTION

1. Warm up the engine to normal operating temperature.
2. Connect **Self-Diagnosis Checker** (49 H018 9A1) to the check connector as shown.
3. Turn the select switch to "B" on **Self-Diagnosis Checker**.
4. Check for code number indication.
5. If a code number is indicated, check for the cause of the problem (Refer to page 4A—23).

### Note

**The Self-Diagnosis Checker buzzer will sound for approx. 3 seconds after the ignition switch is turned ON.**

Code No.	Location problem	Fail safe function
01	Crank angle sensor	—
02	Air flow meter	Maintains basic signal at preset value
03	Water thermo sensor	Maintains constant 80°C (176°F) command
04	Intake air temperature sensor (Air flow meter)	Maintains constant 20°C (68°F) command
05	Oxygen (O <sub>2</sub> ) sensor	Stops feedback correction
06	Throttle sensor	Maintains constant 100% (approx. 18°) command
07	Boost sensor	Maintains constant -96 mmHg (3.78 inHg) command
09	Atmospheric pressure sensor	Maintains constant command of sea-level pressure
12	Coil with igniter (Trailing side)	Stops operation of ignition system (only trailing side)
15	Intake air temperature sensor (Dynamic chamber)	Maintains constant 20°C (68°F) command

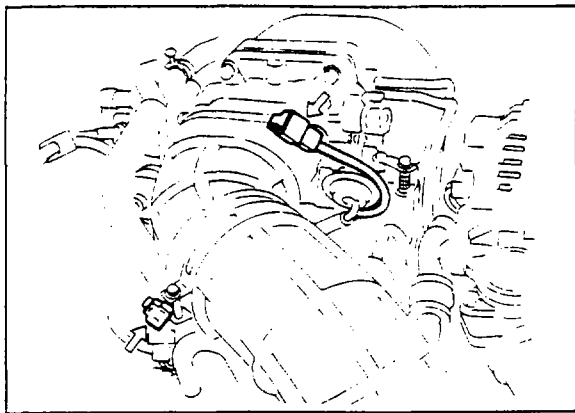
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# 4A SELF-DIAGNOSIS CHECKER

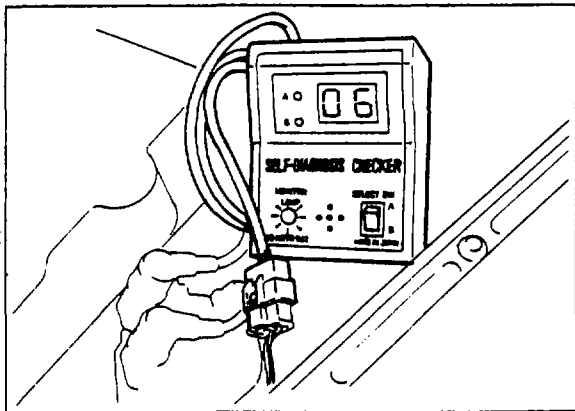
## MONITOR LAMP (FEEDBACK SYSTEM) Lamp flashes to indicate O<sub>2</sub> sensor signal.

Monitor Lamp	Air-Fuel Ratio
ON	Too rich
Flashes ON and OFF	Best
OFF	Too lean

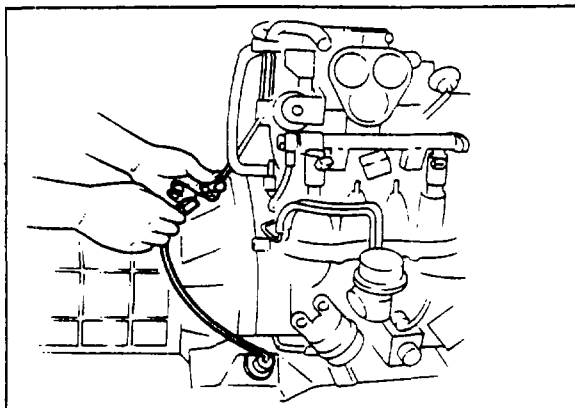
87U04A-019



87U04A-020



87U04A-021



87U04A-022

### OPERATION OF FEEDBACK SYSTEM Inspection

#### Step 1

Before checking O<sub>2</sub> sensor, disconnect the neutral switch connector.

1. Warm up the engine to normal operating temperature and run it at idle.
2. Disconnect the throttle sensor connector.

**Code number: 06**  
**Monitor lamp: ON**

#### Step 2

3. Check that the monitor lamp starts to flash within 10 seconds after increasing the engine speed to between 1,500 and 2,000 rpm.

**Code number: 06**  
**Monitor lamp: Flashes ON and OFF**

#### Step 3

4. Check that the number of flashes is within specifications.

**Specification: more than 8 times/10 seconds**  
**(at 1,500—2,000 rpm)**

#### Step 4

5. Hold the engine speed at 1,750 rpm and disconnect the O<sub>2</sub> sensor connector. Check that the code number and lamp change as follows.

**Code number: 05**  
**Monitor lamp: OFF**

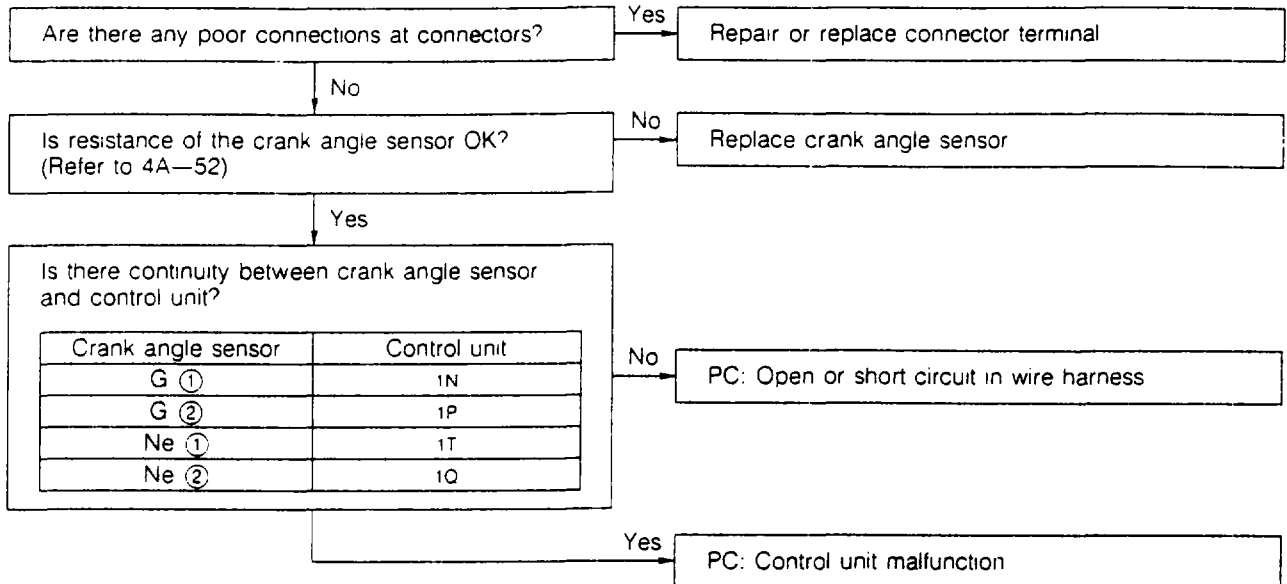
6. If the Self-Diagnosis checker shows other than the above, the control unit is faulty.
7. Replace the control unit.

## TROUBLESHOOTING WITH SELF-DIAGNOSIS CHECKER

If a code number is illuminated on the Self-Diagnosis Checker, check the following chart along with the wiring diagram (Section 50).

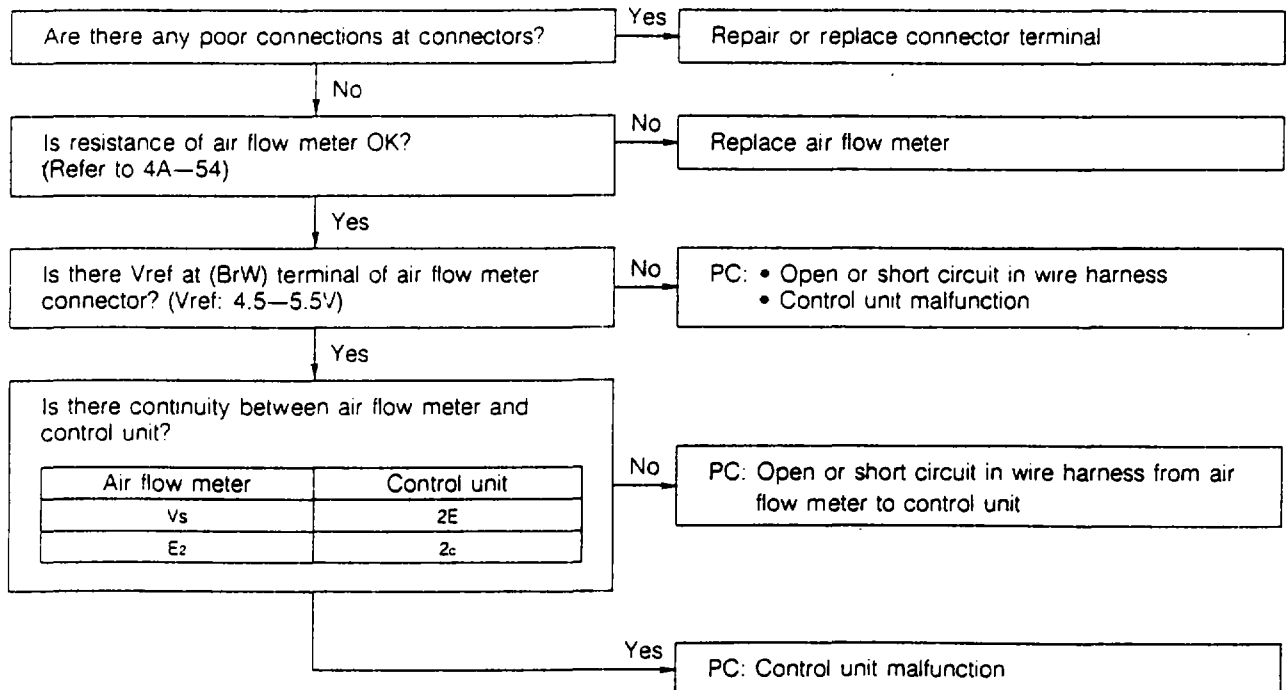
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### No. 01 code illumination



67U04X-207p

### No. 02 code illumination

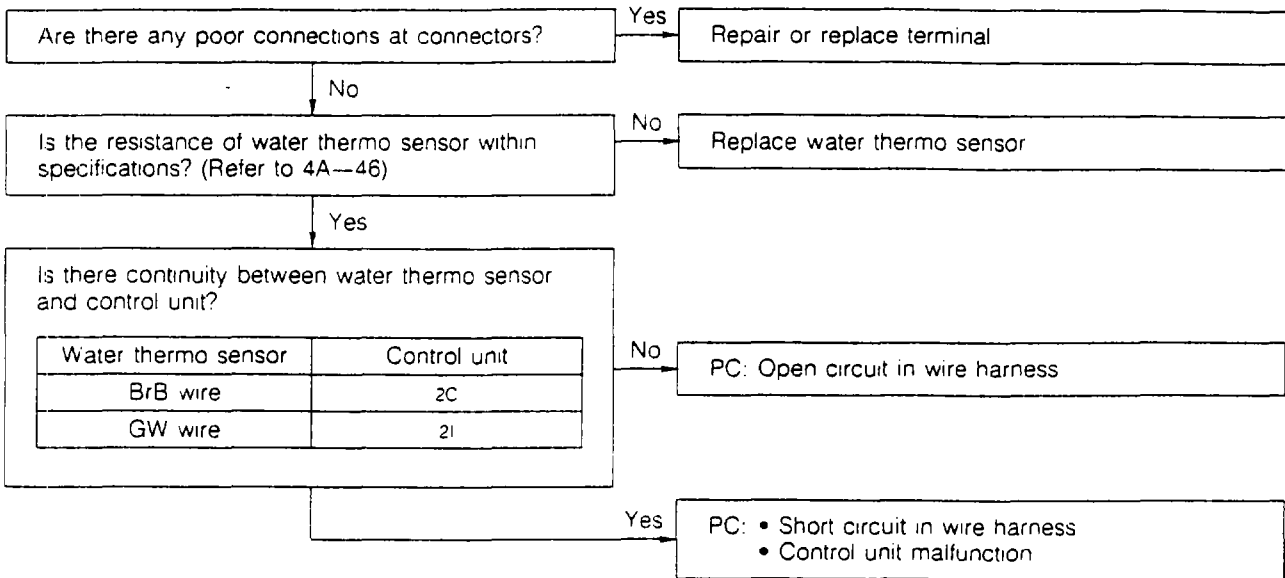


67U04X-208p



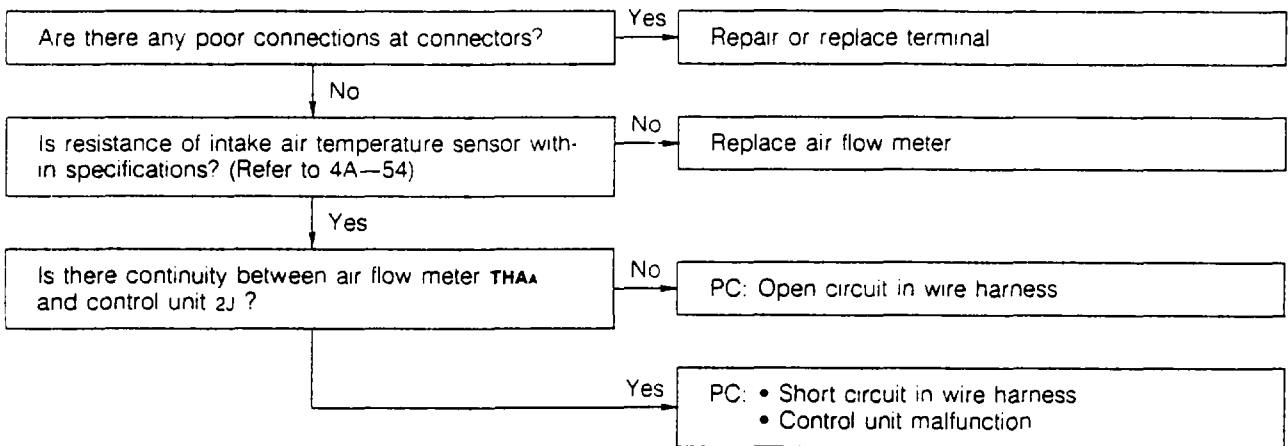
# 4A TROUBLESHOOTING WITH SELF-DIAGNOSIS CHECKER

## No. 03 code illumination



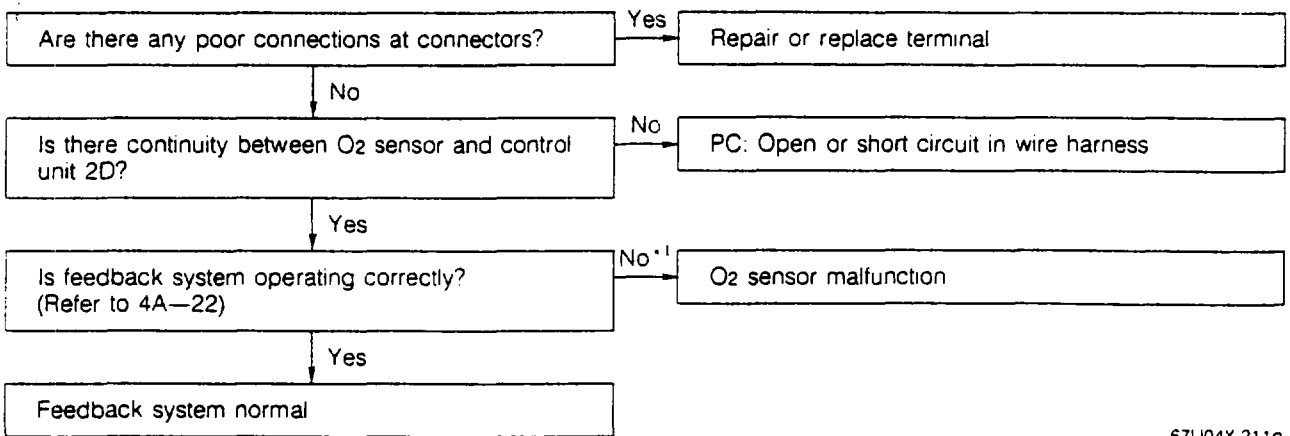
67U04X-209D

## No. 04 code illumination



67U04X-210D

## No. 05 code illumination

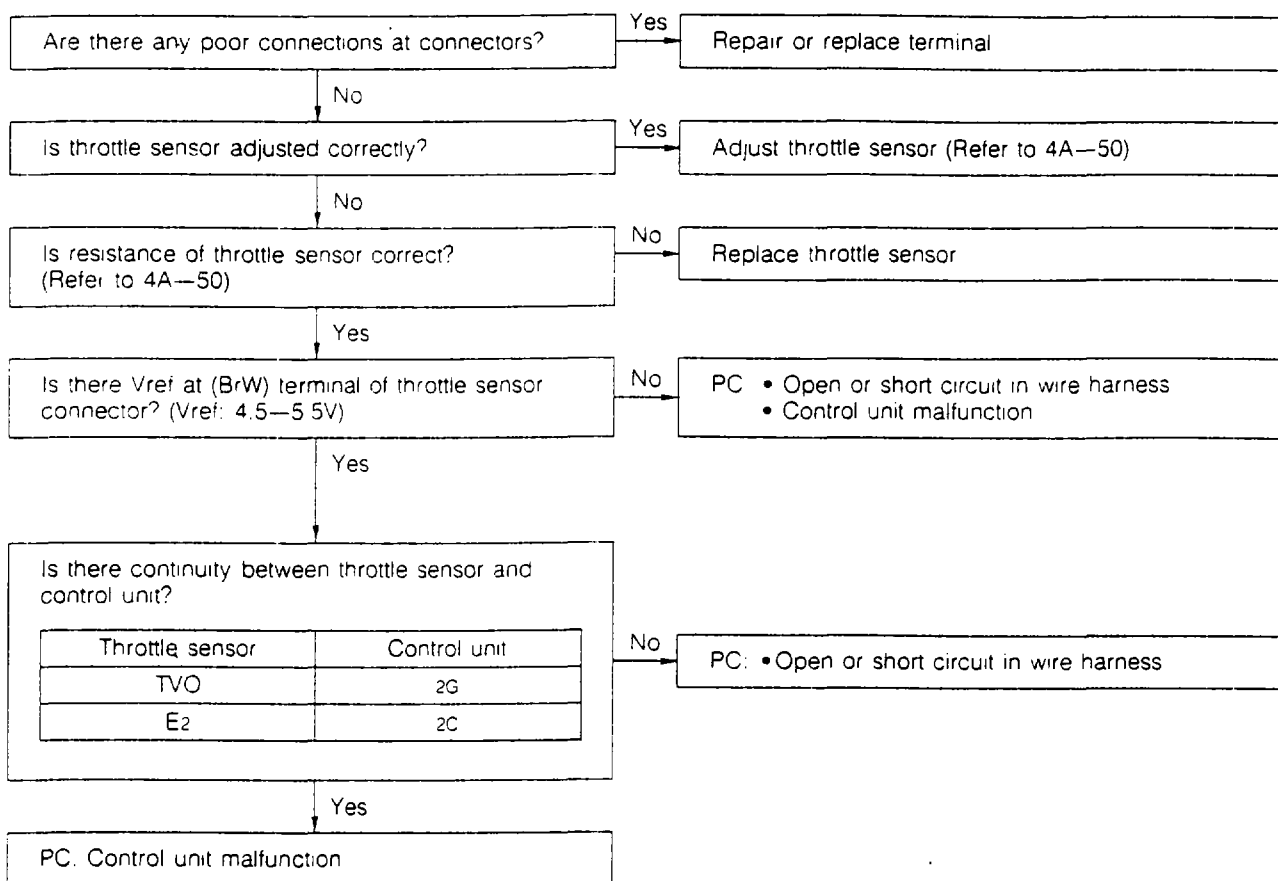


67U04X-211P

\*1; Do not perform step 2 or step 3 on page 4A-22.

67U04X-212

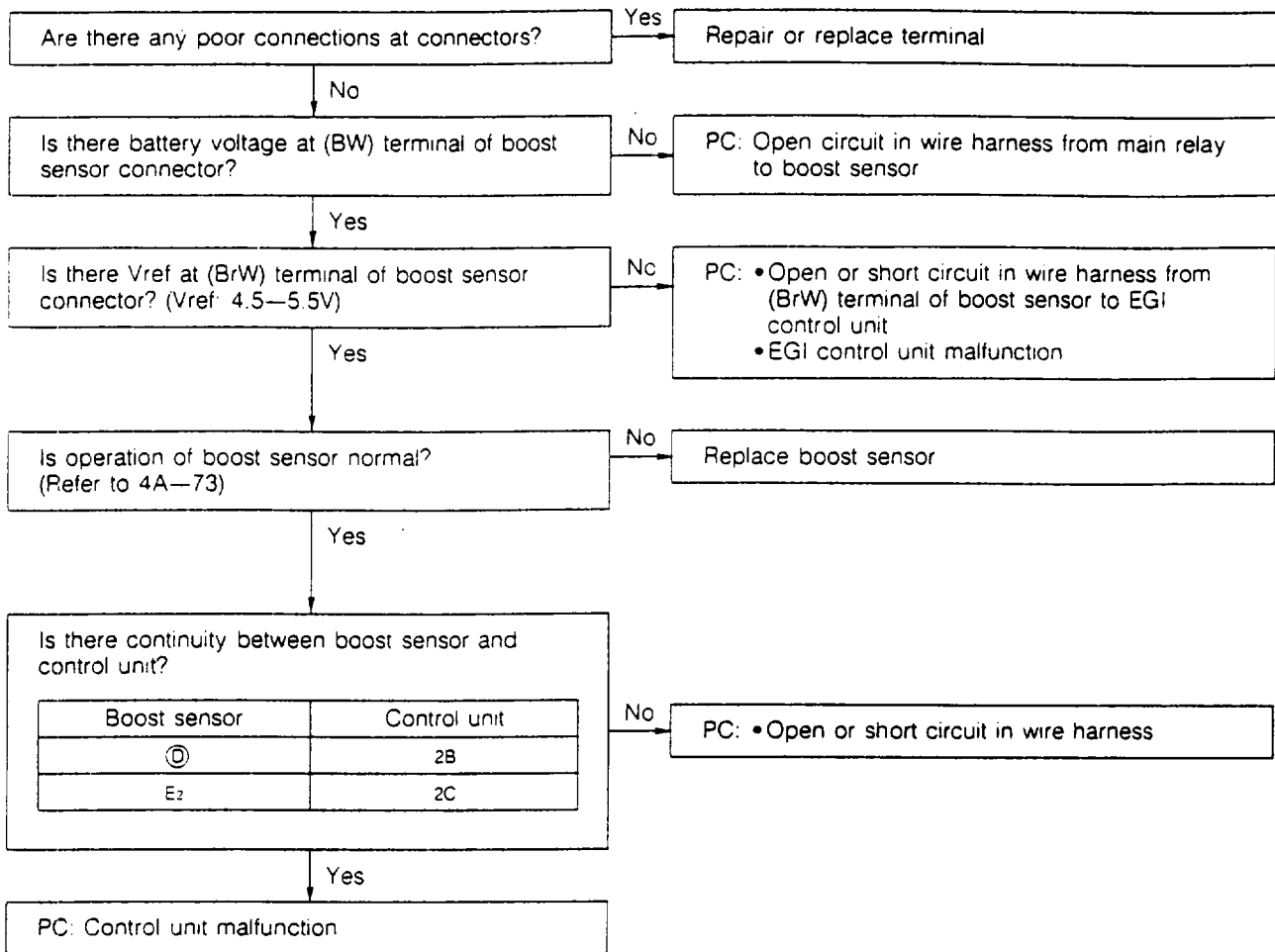
## No. 06 code illumination



67U04X-213D

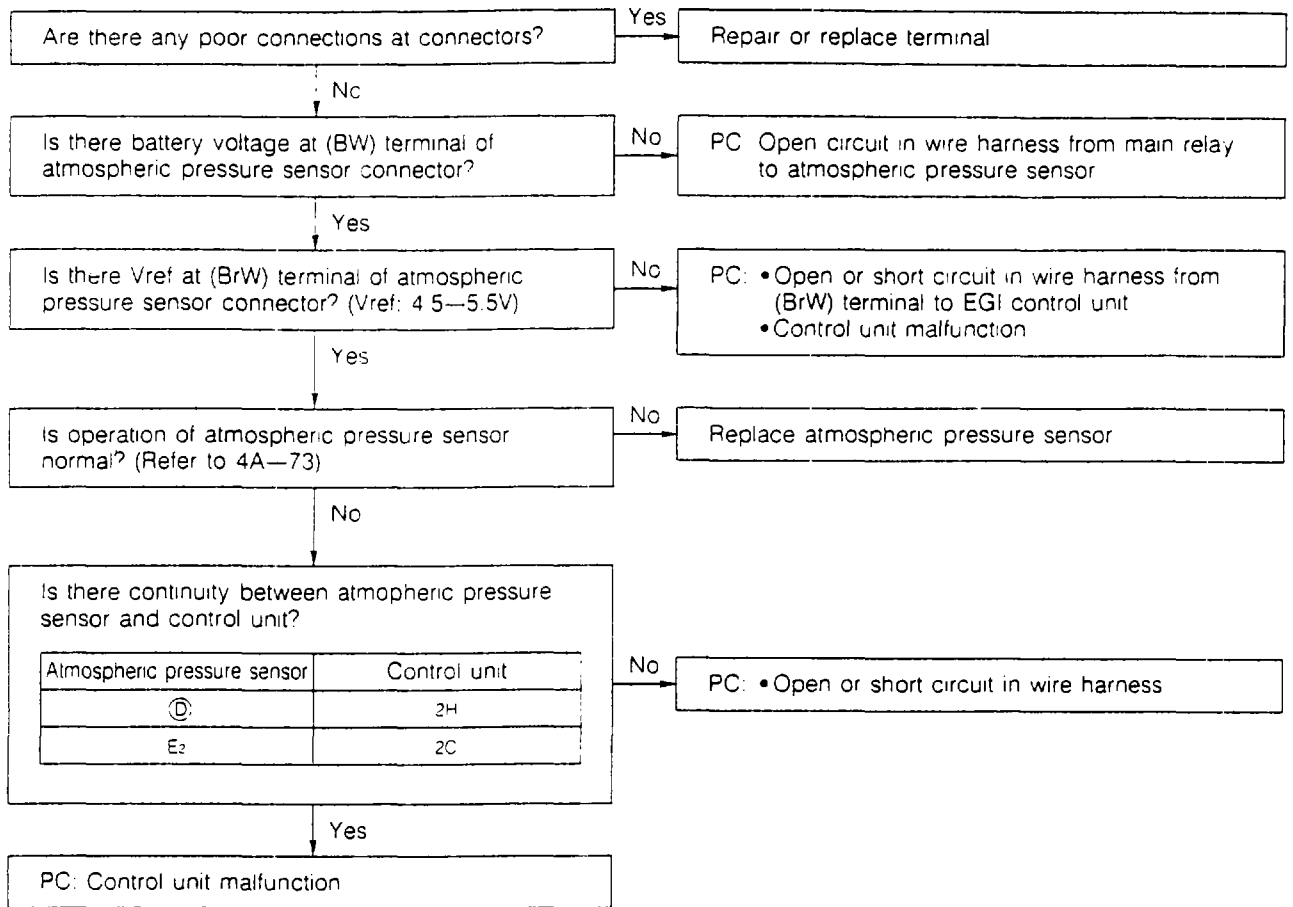
# 4A TROUBLESHOOTING WITH SELF-DIAGNOSIS CHECKER

## No. 07 code illumination



67U04X-214p

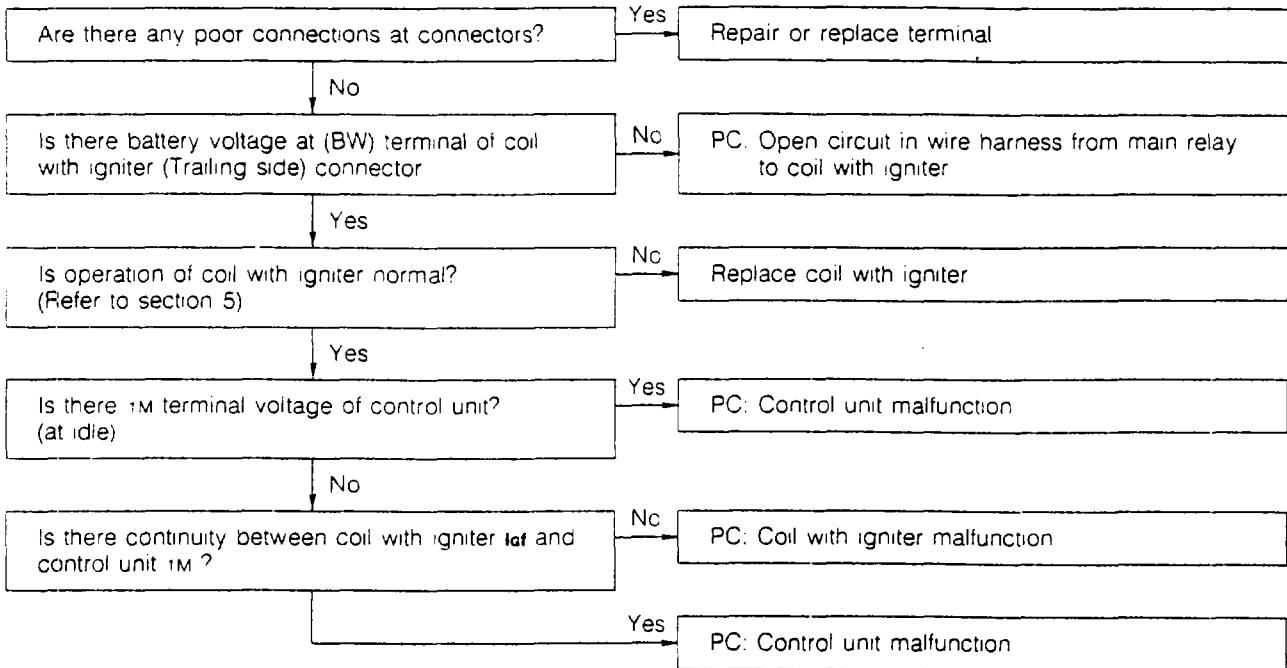
## No. 09 code illumination



67U04X-215p

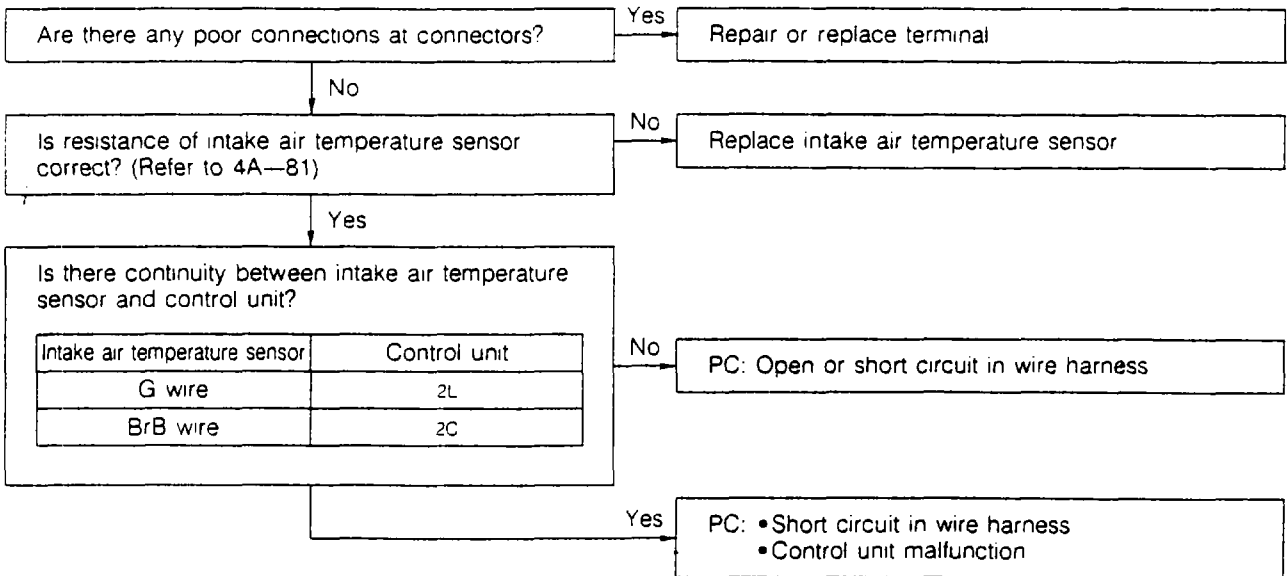
# 4A TROUBLESHOOTING WITH SELF-DIAGNOSIS CHECKER

## No. 12 code illumination



67U04X 216

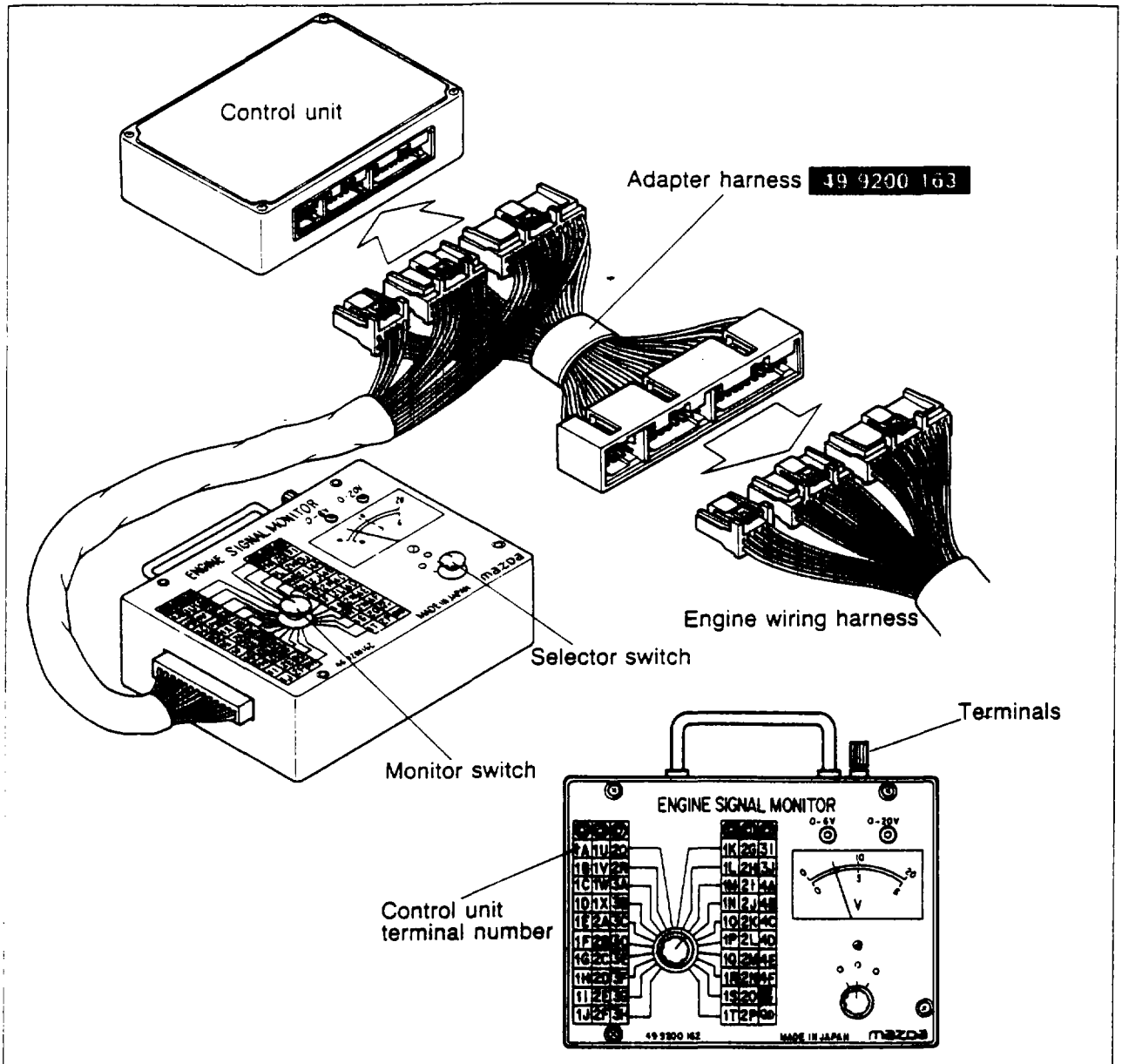
## No. 15 code illumination



67U04X-217p

## CONTROL UNIT

## ENGINE SIGNAL MONITOR (49 9200 162) AND ADAPTER (49 9200 163)



77U04B-230

The **Engine Signal Monitor** (49 9200 162) has been developed to check the E.G.I. control unit terminal voltages. This monitor easily inspects the terminal voltage by setting the monitor switch.

**How to Use The Engine Signal Monitor**

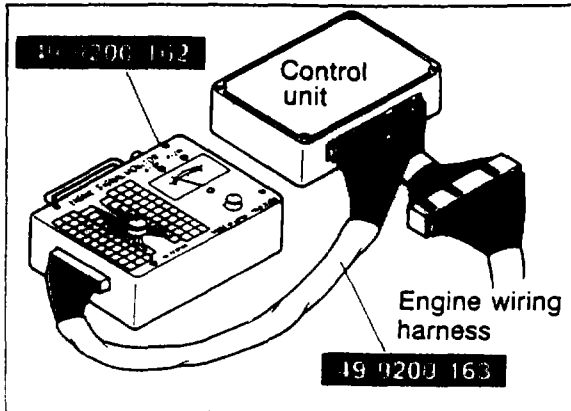
1. Connect the **Engine Signal Monitor** (49 9200 162) between the control unit and the engine harness using the **adapter** (49 9200 163).
2. Turn the selector switch and monitor switch to select the terminal number.
3. Check the terminal voltage.

**Caution**

**Do not apply voltage to the terminals of the monitor.**

77U04B 231

# 4A CONTROL UNIT



67U04X-197

## INSPECTION

1. Connect the **Engine Signal Monitor** (49 9200 162) and **adapter** (49 9200 163) to the control unit as shown in the figure.
2. Turn the ignition switch ON, and check the voltage of the terminals.

### Caution

- a. **Before checking the control unit, warm up the engine to normal operating temperature.**
- b. **If the proper voltage is not indicated on the voltmeter, check all wiring, connections and finally, check that component.**

Terminal	Input	Output	Connected to	Voltage (after warming up)		Remark
				Ignition switch: ON	Idle	
1A		○	Self-Diagnosis Checker	Ignition switch OFF → ON for 3 sec. below 5V, after 3 sec. approx. 12V		with Self-Diagnosis Checker
1B		○	Self-Diagnosis Checker	Ignition switch OFF → ON for 3 sec. below 5V, after 3 sec. approx. 12V		with Self-Diagnosis Checker
1C		○	Air bypass relay	approx. 12V		
1D		○	Self-Diagnosis Checker (Monitor lamp)	Ignition switch OFF → ON for 3 sec. below 5V, after 3 sec. approx. 12V		with Self-Diagnosis Checker
1E	○		A/C switch	below 2.5V (A/C: ON), approx. 12V (A/C: OFF)		Blower motor ON
1F		○	A/C main relay	approx. 12V (A/C: OFF)		Blower motor ON
1G	○		Neutral switch	below 1.5V (in neutral) approx. 12V (others)		A/T: always below 1.5V
1H	○		Water temperature switch	below 1.5V (Radiator coolant temperature above 17°C (62.6°F))		
1I	○		5th switch	approx. 12V (M/T; 5th gear, A/T; others) below 1.5V (M/T; others, A/T; over drive)		
1J	○		Initial set coupler	approx. 4—7V (Initial set coupler: OFF), below 1.5V (Initial set coupler: ON)		
1K		○	Shift indicator light	below 1.5V	approx. 12V	
1L	○		Clutch switch	below 1.5V (clutch pedal; released) approx. 12V (clutch pedal; depressed, A/T)		
1M		○	Coil with igniter (Trailing) IGf-T	below 2V		
1N	○		Crank angle sensor (G)	below 1.0V		G
1C	○		Mileage switch	approx. 12V (below 20,000 miles) below 1.5V (above 20,000 miles)		
1P	○		Crank angle sensor (G)	below 1.0V		B
1Q	○		Crank angle sensor (Ne)	below 1.0V		W
1R	○		P/S switch	10—12V	below 1.5V (Steering wheel turned) approx. 10—12V (Straight ahead)	

87U04A-024

# CONTROL UNIT 4A

Terminal	Input	Output	Connected to	Voltage (after warming up)		Remark
				Ignition switch: ON	Idle	
1S		○	Port air solenoid valve	below 2.5V		Mileage switch ON; below 1.5V
1T	○		Crank angle sensor (Ne)	below 1.0V		R
1U		○	Coil with igniter (Trailing) IGS-T (Select signal)	approx. 4.4V	approx. 2.2V	
1V		○	Coil with igniter (Leading) IGT-L (Ignition timing signal)	0V	approx. 0.8V	
1W	○		Heat hazard sensor	below 1.5V	approx. 12V	Floor Temp.: below 110°C (230°F)
1X		○	Coil with igniter (Trailing) IGT-T (Ignition timing signal)	0V	approx. 0.8V	
2A		○	V ref	4.5—5.5V		
2B	○		Boost sensor	3.5—4.0V		Disconnect the vacuum hose
2C	—	—	Ground	0V		
2D	○		O <sub>2</sub> sensor	below 1.0V		Acceleration: 0.5—1.0V Deceleration: 0—0.4V
2E	○		Air flow meter (Vs)	approx. 4V	2.5—3.5V	
2F	○		Variable resistor	1—4V (varies according to the variable resistor adjustment)		
2G	○		Throttle sensor (TVO)	approx. 1V (throttle sensor adjusted properly)		
2H	○		Atmospheric pressure sensor	3.5—4.5V (at sea level) 2.5—3.5V (at 2,000 m (6,500ft))		
2I	○		Water thermo sensor	approx. 0.4—1.8V		
2J	○		Air flow meter (Intake air temperature sensor)	2—3V at 20°C (68°F)		
2K		○	Split air solenoid valve	below 2.5V (M/T; in 5th gear, A/T; in overdrive)		Others: approx. 12V
2L	○		Intake air temperature sensor (dynamic chamber)	1—2V at 80°C (176°F)		
2M		○	Pressure regulator control solenoid valve	below 2.0V	approx. 12V	
2N		○	EGR solenoid valve	approx. 12V		
2O		○	Switching solenoid valve	approx. 12V (throttle sensor adjusted properly)	approx. 12V	
2P		○	Relief solenoid valve	below 2.0V (throttle sensor adjusted properly)	below 2.0V	
2Q		○	Bypass air control valve	8—12V Engine signal monitor green and red light flash		
2R	—	—	Ground	0V		
3A	—	—	Ground	0V		
3B	○		Starter switch	below 1.5V		approx 10V (at cranking)

87U04A-025

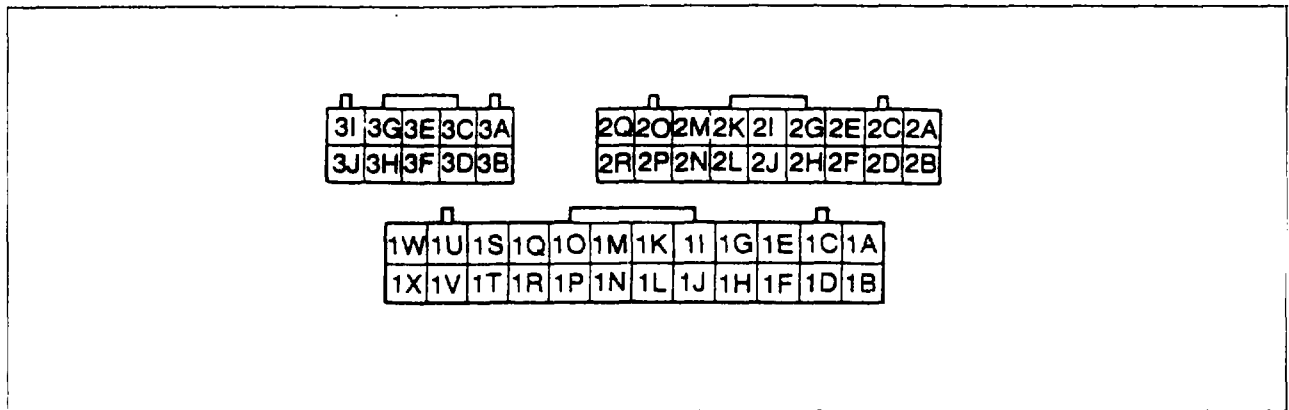


# 4A CONTROL UNIT

Terminal	Input	Output	Connected to	Voltage (after warming up)		Remark
				Ignition switch: ON	Idle	
3C		○	Injector (Rear primary)	approx. 12V	approx. 12V* <sup>1</sup>	
3D		○	Inhibitor switch	below 1.5V (A/T; N,P range) approx. 12V (A/T, others)		M/T; always below 1.5V
3E		○	Injector (Front primary)	approx. 12V	approx. 12V* <sup>1</sup>	
3F		○	Injector (Rear secondary)	approx. 12V		
3G	--	—	Ground	0V		
3H		○	Injector (Front secondary)	approx. 12V		
3I	—	—	Main relay	approx. 12V		
3J	○		Battery	approx. 12V		

\*<sup>1</sup> Engine signal monitor green and red light flash  
87U04A-026

## Control unit connector (Control unit side)

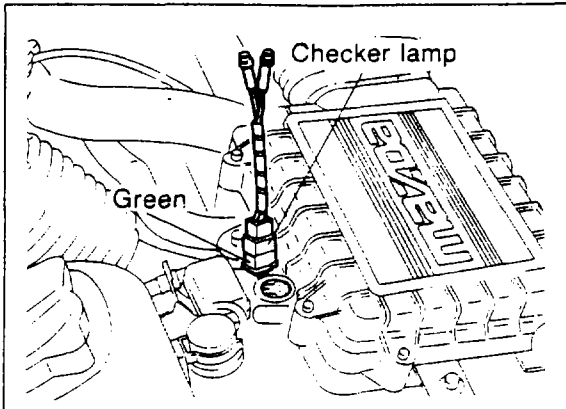


77U04B-076

## EMISSION CHECKING PROCEDURE

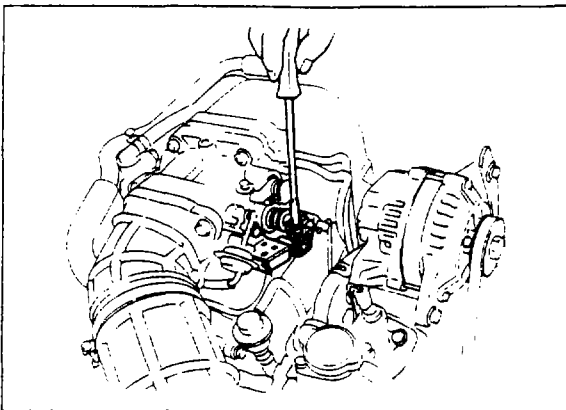
### INSPECTION OF THROTTLE SENSOR

1. Warm up the engine, then turn it off.
2. Connect the **checker lamp (49 F018 001)** to the check connector (Green).
3. Turn the ignition switch on and check whether one of the lamps illuminates.



67U04X-007

4. If both lamps illuminate or neither does, turn the throttle sensor adjusting screw until only one of the lamps illuminates.
  - a) If both lamps illuminate, turn the adjusting screw counterclockwise.
  - b) If both lamps do not illuminate, turn the adjusting screw clockwise.
5. Reinstall the cap on the adjusting screw after adjusting.



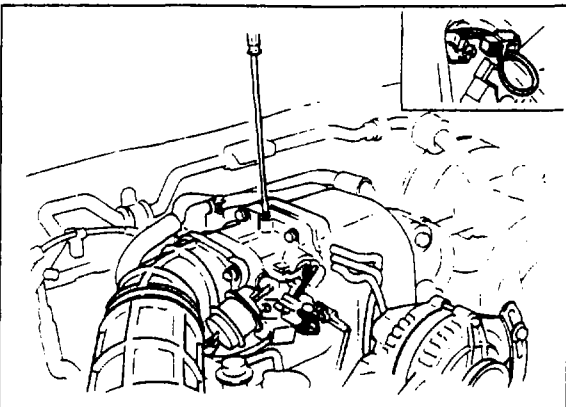
67U04X-008

### INSPECTION OF IDLE SPEED

6. Connect a tachometer to the engine.
7. Connect a jumper wire at the terminal of the initial set coupler.
8. Start the engine and adjust the idle speed. (Refer to 4A-77)
9. After adjusting, disconnect the jumper wire from the initial set coupler.

#### Note:

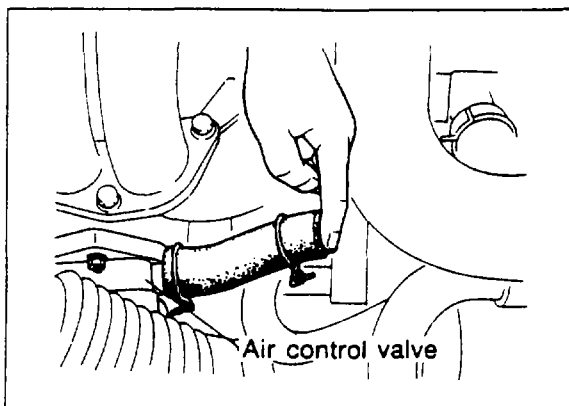
**Failure to use a jumper wire at the initial set coupler will result in a misadjustment.**



67U04X-009p

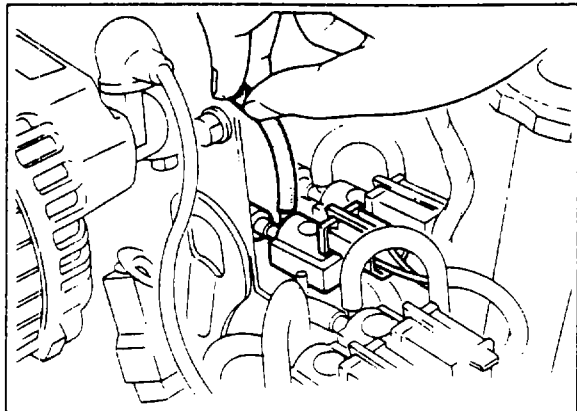
### INSPECTION OF ANTI-AFTERBURN VALVE

10. Disconnect the air hose (air pump—air control valve) at the air pump and place a finger over the air hose opening.
11. Increase the engine speed to **3,000 rpm**, and then decrease the engine speed rapidly.
12. Check that air is sucked into the air hose for a few seconds while decelerating.
13. Reconnect the air hose to the air pump.



67U04X-010

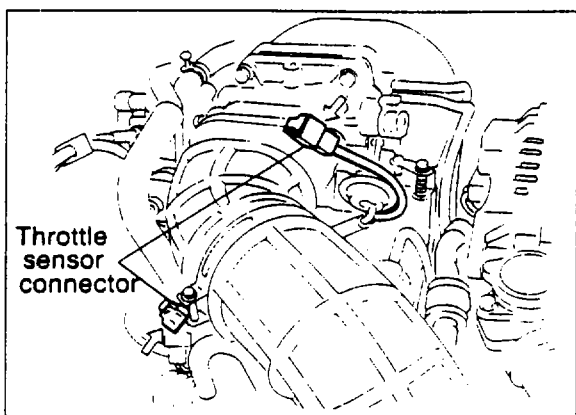
# 4A EMISSION CHECKING PROCEDURE



67U04X-011

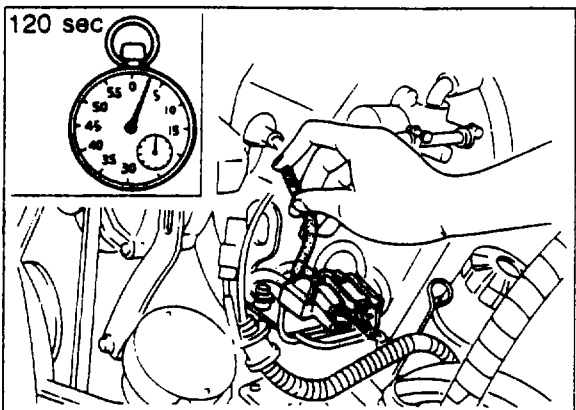
## INSPECTION OF SWITCHING SOLENOID VALVE

14. Disconnect the vacuum hose (switching solenoid valve—air control valve) at the switching solenoid valve.
15. Place a finger over the port opening of the solenoid valve.
16. Gradually increase the engine speed and check that air is sucked into the port.



67U04X-012

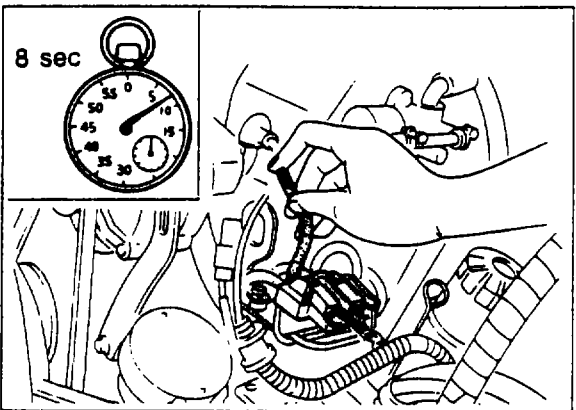
17. Disconnect the throttle sensor connector.
18. Gradually increase the engine speed and check that air is not sucked into the port opening when the engine speed is over **1,000—1,200 rpm**.
19. Reconnect the vacuum hose to the switching solenoid valve.
20. Reconnect the throttle sensor connector.



67U04X-013

## INSPECTION OF RELIEF SOLENOID VALVE

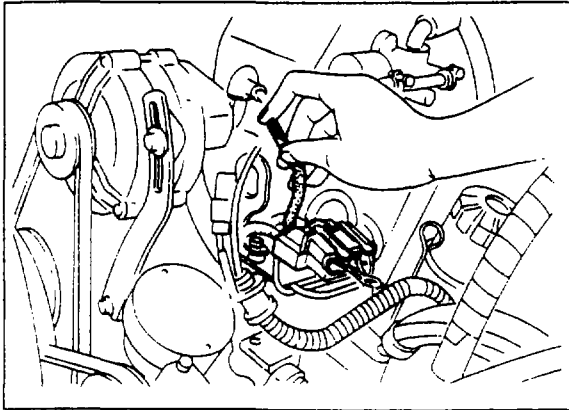
21. Disconnect the vacuum hose (relief solenoid valve—air control valve) at the relief solenoid valve.
22. Place a finger over the port opening and increase the engine speed to over **1,500 rpm**.
23. Disconnect the throttle sensor connector and check that air is sucked into the port opening for about **120 sec**, and then stops.



67U04X-014

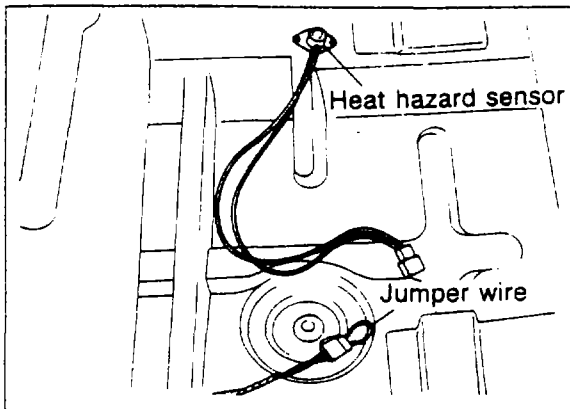
24. Decrease the engine speed to idle and check that air is sucked into the port opening. Note the amount of time that air is sucked into the port opening.

**Specified time: 8 sec.**



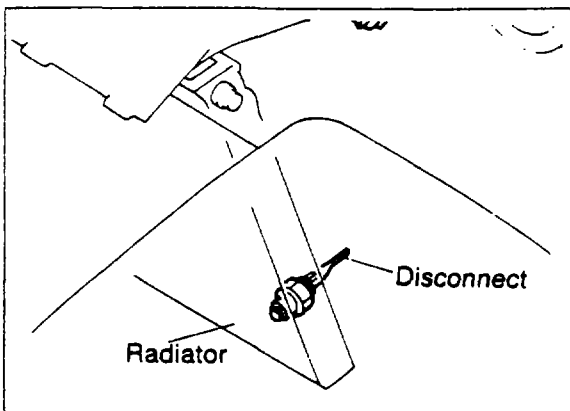
67U04X-015

25. Reconnect the throttle sensor connector.
26. Increase the engine speed and check that air is not sucked into the port opening when the engine speed is over **3,400—3,600 rpm**.



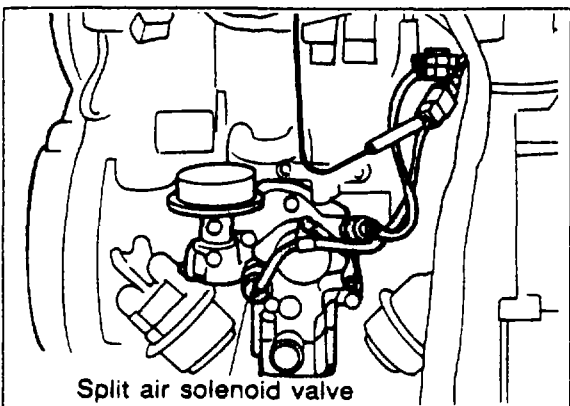
67U04X-016

27. Disconnect the heat hazard sensor connector and connect a jumper wire to both terminals in the connector.
28. Check that air is not sucked into the port opening at any engine speed.
29. Disconnect the jumper wire from both terminals in the connector and connect the heat hazard sensor connector.



67U04X-017

30. Stop the engine and disconnect the water temperature switch connector at the radiator.
31. Start the engine and gradually increase the engine speed. Check that air is not sucked into the port opening when the engine speed is over **1,000—1,200 rpm**.
32. Reconnect the vacuum hose to the relief solenoid valve.
33. Stop the engine and reconnect the water temperature switch connector.



87U04A-027

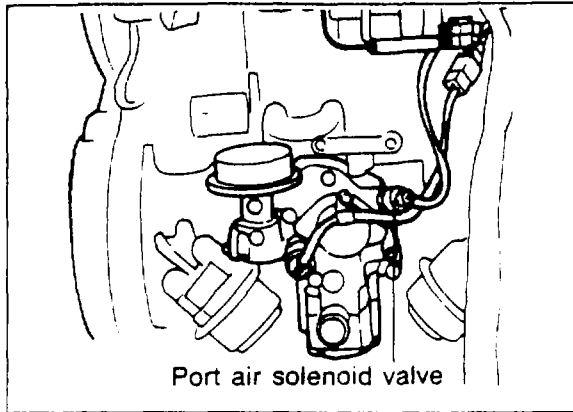
### INSPECTION OF SPLIT AIR SOLENOID VALVE

34. Connect the voltmeter to the split air solenoid valve (LB) terminal and ground.
35. Turn the ignition switch, and shift into 5th gear and check the voltmeter reading. (Refer to 4A—48 for A/T model)

**Overdrive or 5th gear: below 2.5V**  
**Others: approx. 12V**

36. Disconnect the voltmeter.

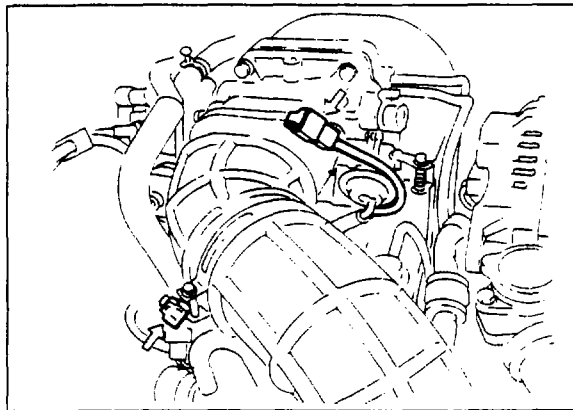
# 4A EMISSION CHECKING PROCEDURE



87U04A-028

- ### INSPECTION OF PORT AIR SOLENOID VALVE
37. Connect the voltmeter to the port air solenoid valve (BR) terminal and ground.
  38. Start the engine and run it at idle.

**Voltmeter reading: below 2.5V**

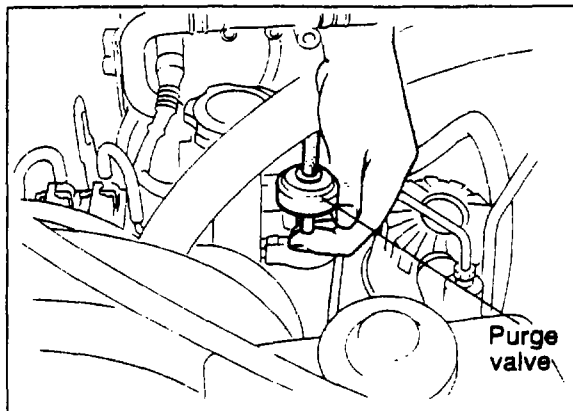


67U04X-020

39. Disconnect the throttle sensor connector and check the voltmeter reading again.

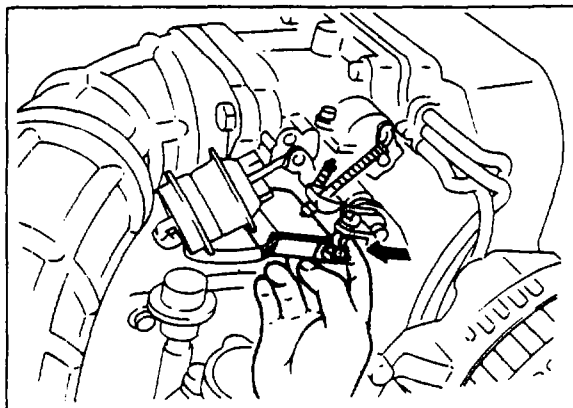
**Voltmeter reading: approx. 12V**

40. Reconnect the throttle sensor connector.



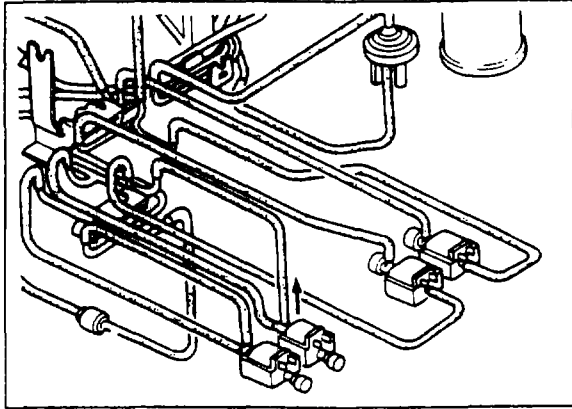
67U04X-021

- ### INSPECTION OF PURGE VALVE
41. Disconnect the hose (purge valve ~ oil filler pipe) from the purge valve.
  42. Place a finger over the port of the purge valve opening.
  43. Increase the engine speed to **2,000 rpm** and check that the air is sucked into the port.
  44. Reconnect the hose to the purge valve.



67U04X-022

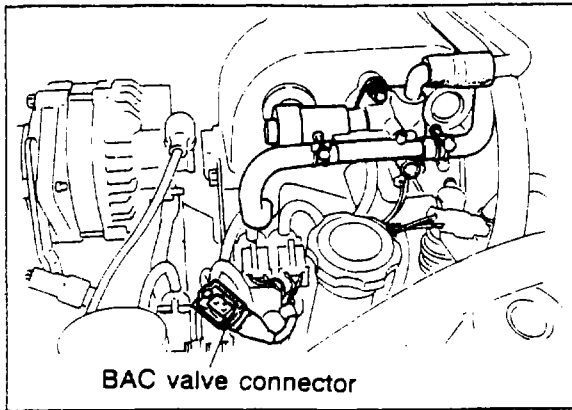
- ### INSPECTION OF FUEL CUT OPERATION
45. Hold the engine speed at **2,000 rpm** and check that the engine speed varies when the throttle sensor rod is pushed in with a finger.



87U04A-029

## INSPECTION OF EGR VALVE

46. Disconnect the vacuum hose from the EGR solenoid valve.
47. Apply vacuum to the EGR valve with a vacuum pump.
48. Check that the engine speed is decreased.
49. Reconnect the vacuum hoses to the solenoid valve.



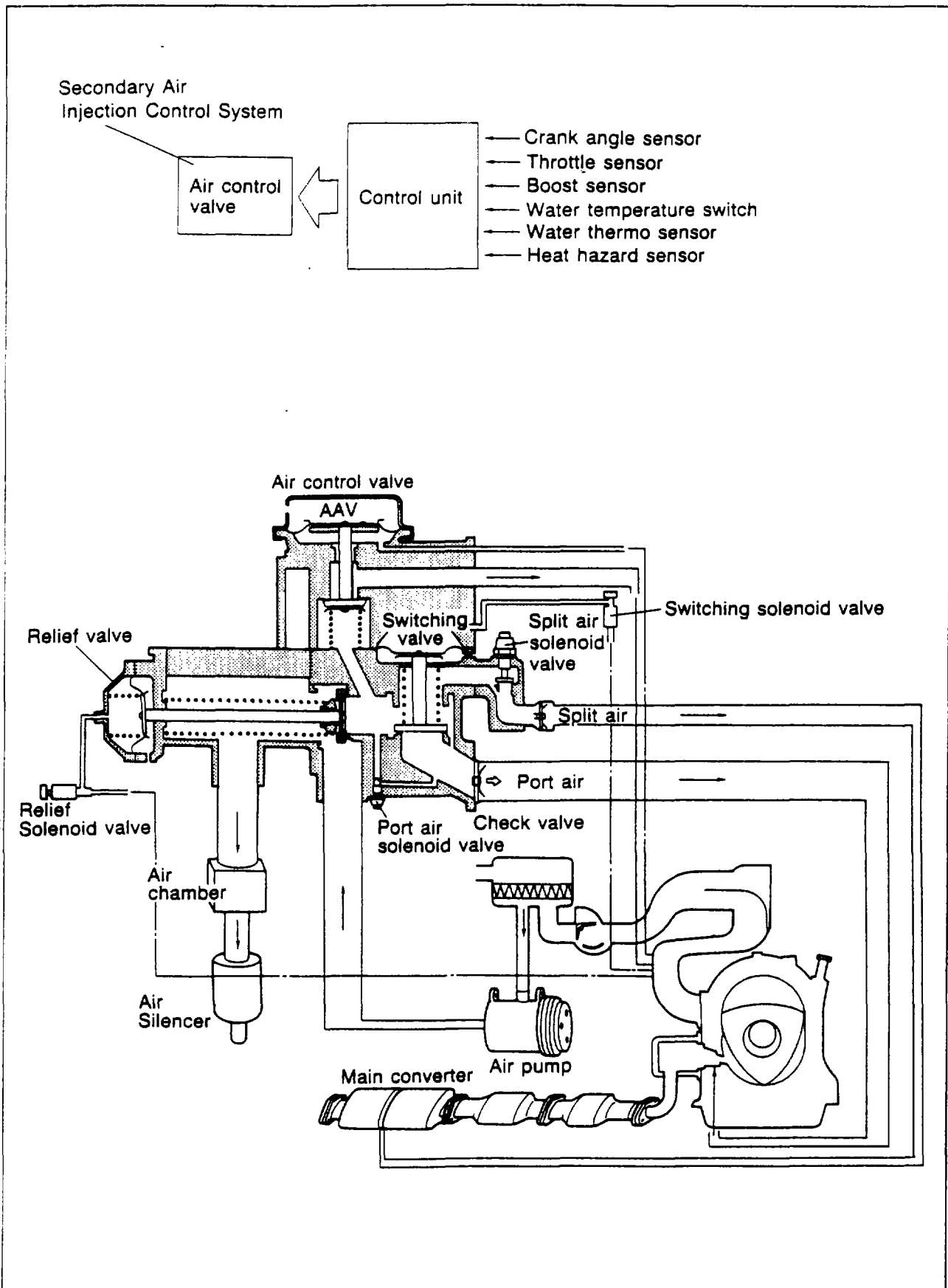
87U04A-030

## INSPECTION OF BAC VALVE

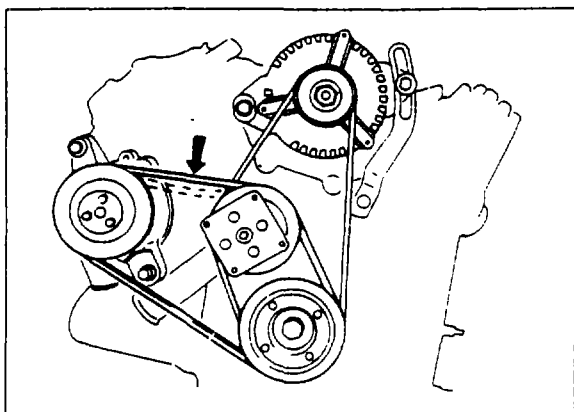
50. Connect a jumper wire to the terminals of initial set coupler.
51. Disconnect the BAC valve connector.
52. Check that the engine speed is decreased.
53. Reconnect the BAC valve connector.
54. Disconnect the tachometer from the engine and the jumper wire from the initial set coupler.
55. Stop the engine.

# 4A SECONDARY AIR INJECTION CONTROL SYSTEM

## SECONDARY AIR INJECTION CONTROL SYSTEM



67U04X-041

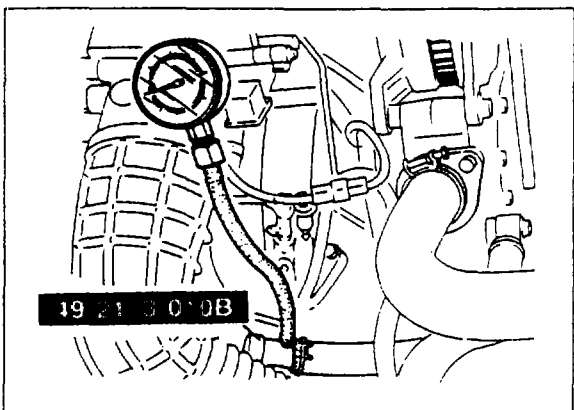


67U04X-042

## AIR PUMP

### Inspection

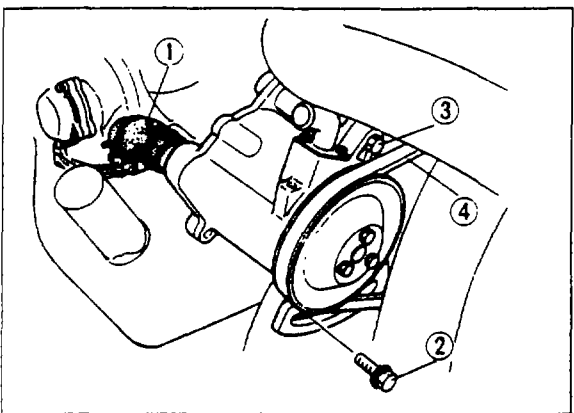
1. Warm up the engine to normal operating temperature.
2. Check the hoses and connections for leaks.
3. Check the air pump for noise.
4. Check the air pump drive belt tension.
5. Adjust, repair or replace, if necessary.



87U04A-031

6. Disconnect the air hose (air pump—air control valve) at the air control valve.
7. Connect the **air pump gauge set** (49 2113 010B) to the air hose.
8. Connect a tachometer to the engine.
9. Start the engine and run it at idle speed.
10. Observe the pressure reading.
11. Replace the pump if necessary.

**Pressure: 11.8 kPa  
(0.12 kg/cm<sup>2</sup>, 1.7 psi) at idle**



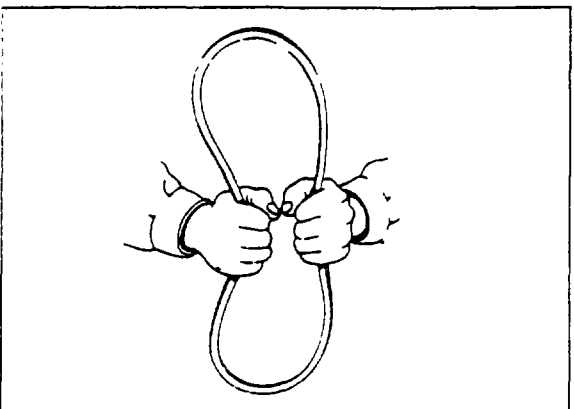
67U04X-044

### Removal

1. Disconnect the air hose.
2. Remove the air pump strap bolt.
3. Remove the air pump mounting bolt.
4. Remove the air pump drive belt and remove the air pump.

### Installation

Install the air pump in the reverse order of removal and adjust the drive belt tension.



67U04X-045

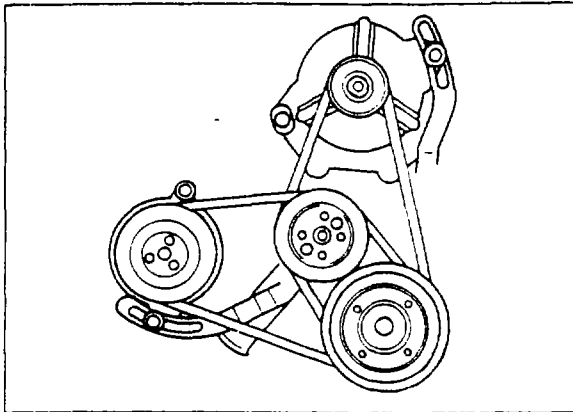
## AIR PUMP DRIVE BELT

### Inspection

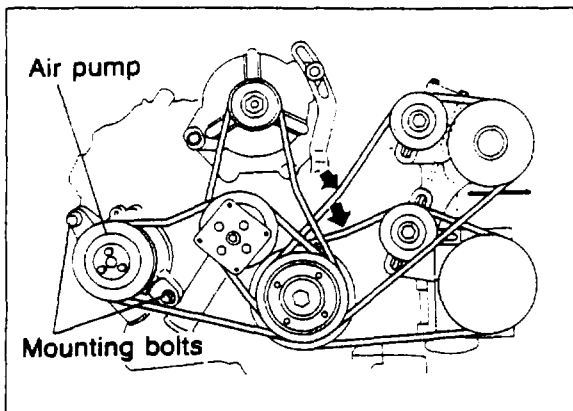
1. Check the drive belt for cracks, deterioration or oil contamination.  
Replace if necessary.
2. If the belt is noisy, check for loose or misaligned pulleys.



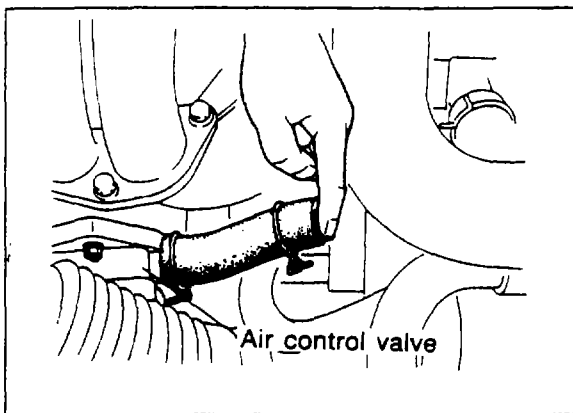
# 4A SECONDARY AIR INJECTION CONTROL SYSTEM



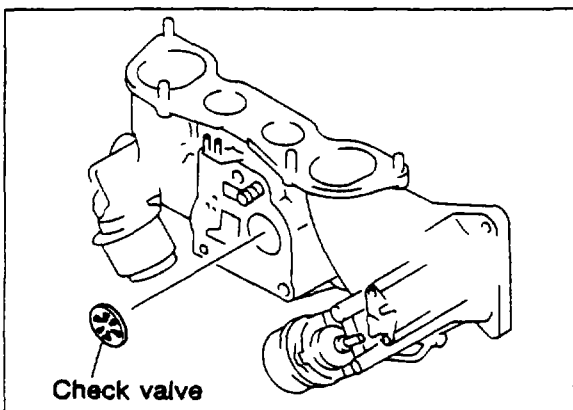
67U04X-046



77U04A-254



67U04X-048



67U04X-049p

## Adjustment

1. Loosen the air pump strap bolt and mounting bolt.
2. Move the air pump closer to, or away from the engine until the correct belt tension is obtained.

## Belt tension:

11—13 mm (0.43—0.51 in)  
when pressed at 98.1N (10 kg, 22 lb)

3. Tighten the bolts.

## Removal

1. Loosen the A/C and P/S pulley drive belts (if equipped) until the air pump drive belt can be removed.
2. Loosen the air pump strap and mounting bolts, and move the air pump until the drive belt can be removed.

## Installation

1. Install a new belt and adjust the belt tension (Refer to "Adjustment").
2. Install the other drive belts and adjust the belt tension.

## Belt tension:

6—8 mm (0.24—0.32 in) — A/C  
11—13 mm (0.43—0.51 in) — P/S  
when pressed at 98.1N (10 kg, 22 lb)

## CHECK VALVE (IN INTAKE MANIFOLD)

### Inspection

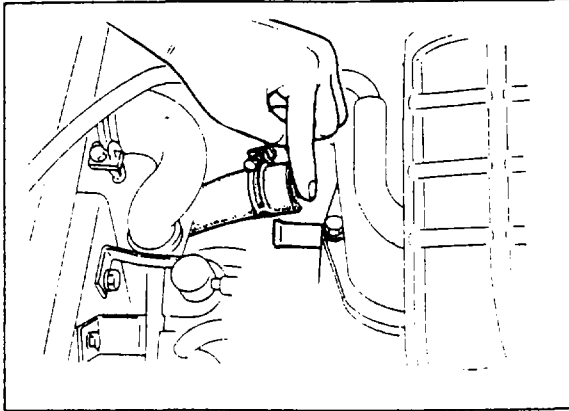
1. Disconnect the air hose (air pump to air control valve) at the air pump.
2. Connect a tachometer to the engine.
3. Start the engine and disconnect the connector from the switching solenoid valve.
4. Increase the engine speed to **1,500 rpm** and check for exhaust gas leakage at the air inlet fitting on the air control valve.
5. Replace the check valve, if there is exhaust gas leakage.

### Removal

1. Remove the air control valve. (Refer to 4A—43)
2. Remove the gasket and check valve.

### Installation

Install the check valve in the reverse order of removal.

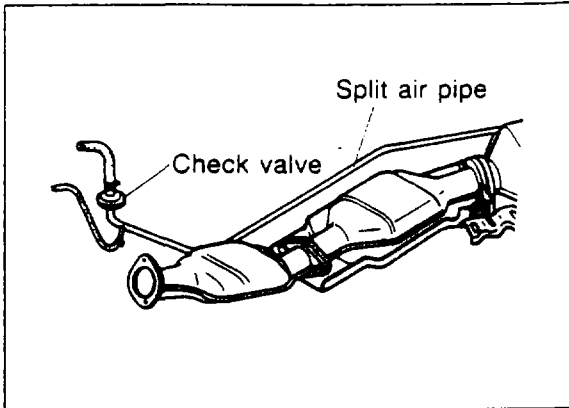


67U04X-050

## CHECK VALVE (INTAKE MANIFOLD TO CATALYTIC CONVERTER)

### Inspection

1. Disconnect the air hose (intake manifold to catalytic converter) at the rear of the intake manifold.
2. Connect a tachometer to the engine.
3. Start the engine.
4. Place a finger over the air hose opening.
5. Increase the engine speed to **1,500 rpm** and check for exhaust gas leakage from the air hose opening.
6. Replace the check valve, if there is exhaust gas leakage.



67U04X-051

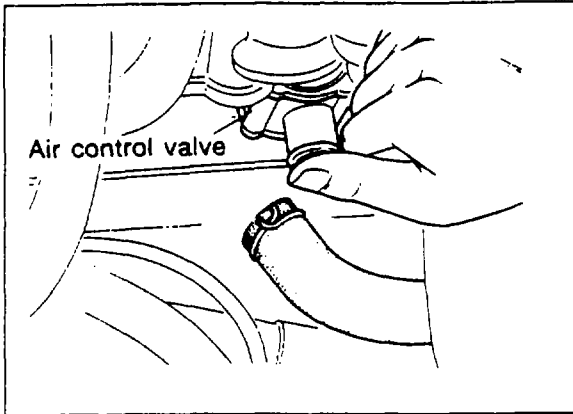
### Removal

1. Unfasten the clip and disconnect the air hose from the check valve.
2. Remove the split air pipe attaching bolts and remove the air pipe assembly.

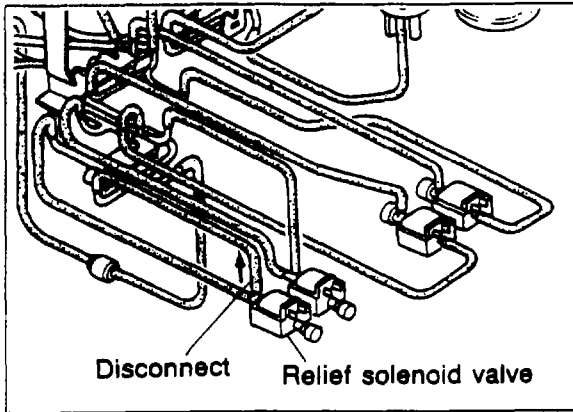
### Installation

Install the check valve and air pipe assembly in the reverse order of removal.

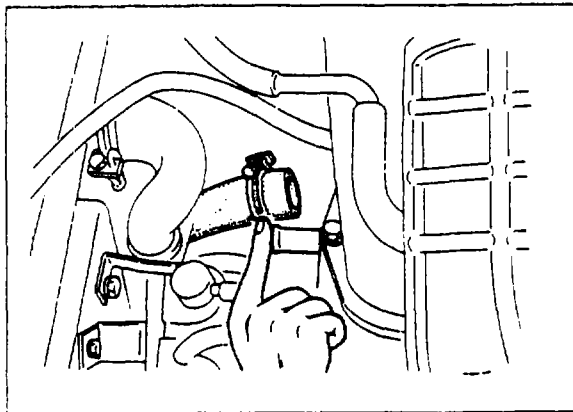
# 4A SECONDARY AIR INJECTION CONTROL SYSTEM



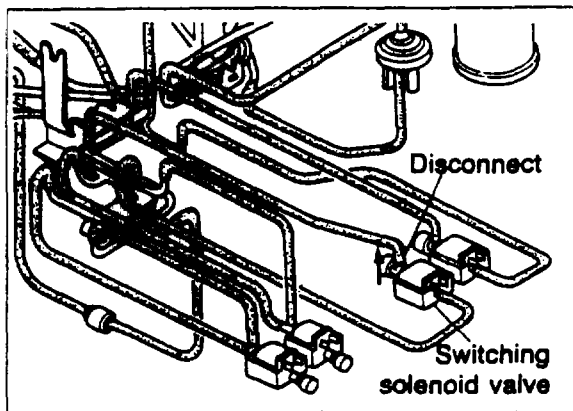
67U04X-052



67U04X-053



67U04X-054

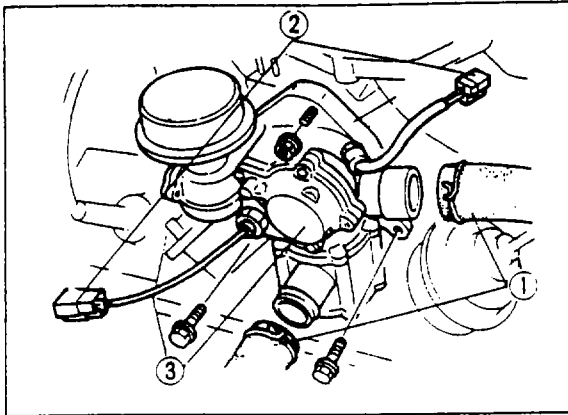


67U04X-055

## AIR CONTROL VALVE

### Inspection

1. Warm up the engine to normal operating temperature.
2. Connect a tachometer to the engine.
3. Disconnect the air hose (air silencer to air control valve) at the air control valve.
4. Place a finger over the air control valve outlet.
5. Increase the engine speed and check that air begins to flow out between **1,500 to 2,500 rpm**.
6. Run the engine at idle speed.
7. Disconnect the vacuum hose (relief solenoid valve to air control valve) at the relief solenoid valve.
8. Check that air flows out.
9. Reconnect the vacuum hose and the air hose.
10. Disconnect the split air hose (check valve to intake manifold) at the intake manifold.
11. Place a finger over the port opening.
12. Disconnect the vacuum hose (switching solenoid valve to air control valve) at the switching solenoid valve.
13. Check that air flows out.
14. Reconnect the vacuum hose and split air hose.
15. Replace the air control valve, if necessary.



67U04X-056

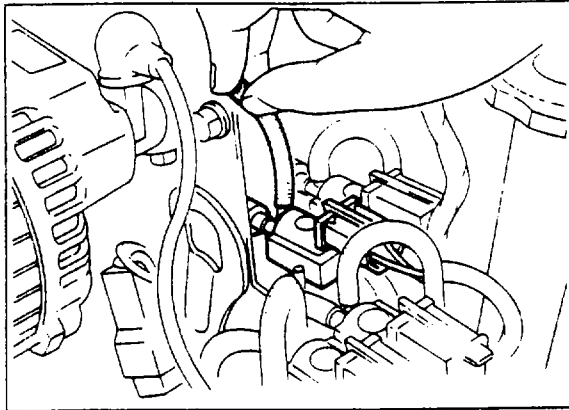
## Removal

Remove the parts in the numbered sequence as shown in the figure.

1. Air hose
2. Split air solenoid valve and port air solenoid valve connector
3. Air control valve

## Installation

Install the air control valve in the reverse order of removal.



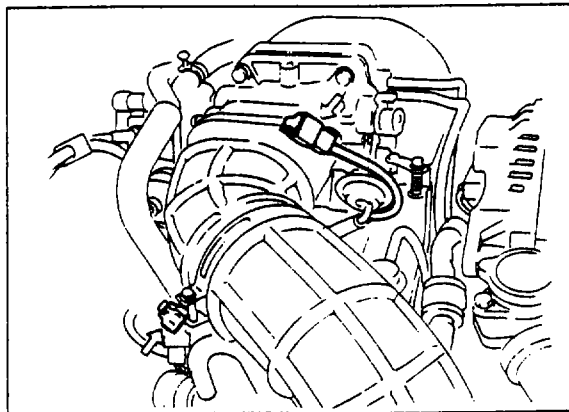
67U04X-057

## SWITCHING SOLENOID VALVE

### Inspection

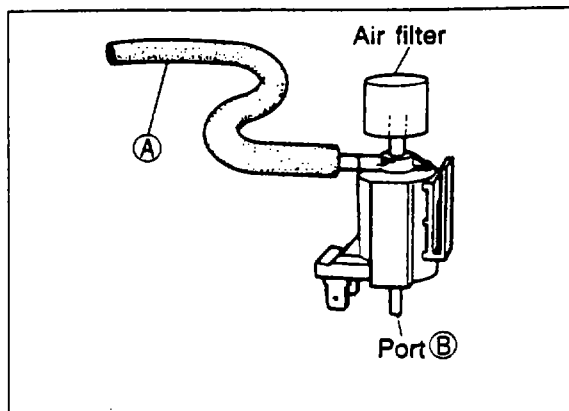
#### Signal

1. Warm up the engine and run it at idle speed.
2. Connect a tachometer to the engine.
3. Disconnect the vacuum hose (switching solenoid valve to air control valve) at the switching solenoid valve.
4. Place a finger over the port opening.
5. Gradually increase the engine speed and check that air is sucked into the port.



67U04X-058

6. Disconnect the throttle sensor connector.
7. Gradually increase the engine speed and check that air is not sucked into the port opening when the engine speed is **over 1,000—1,200 rpm**.

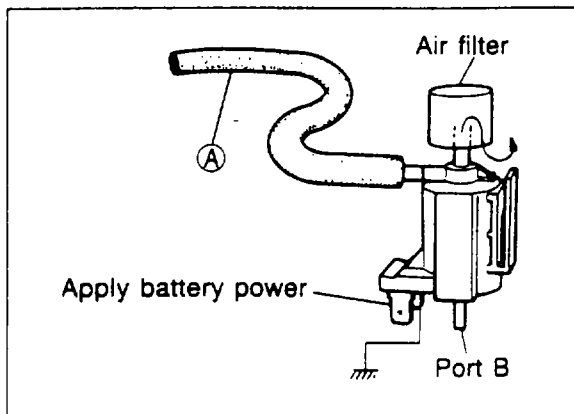


67U04X-059

## Switching solenoid valve

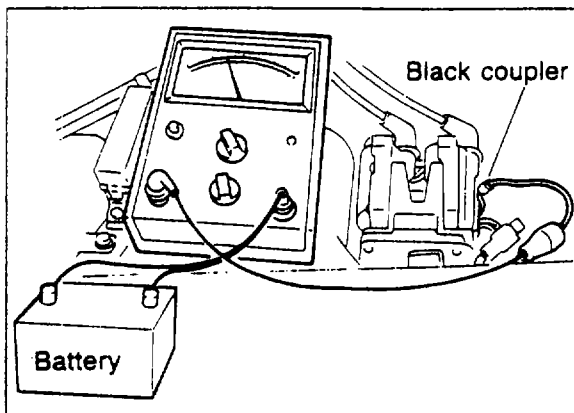
1. Disconnect the vacuum hoses from the switching solenoid valve.
2. Blow through the solenoid valve from port (A). Check that air passes through the valve and flows from port (B).

# 4A SECONDARY AIR INJECTION CONTROL SYSTEM



67U04X-06C

3. Disconnect the solenoid valve connector and connect 12V and ground to the terminals on the solenoid valve.
4. Blow through the solenoid valve from port (A). Check that air passes through the valve and flows from the air filter.



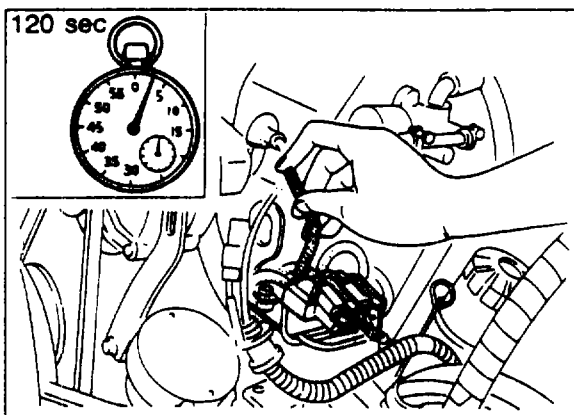
67U04X-061

## RELIEF SOLENOID VALVE

### Inspection

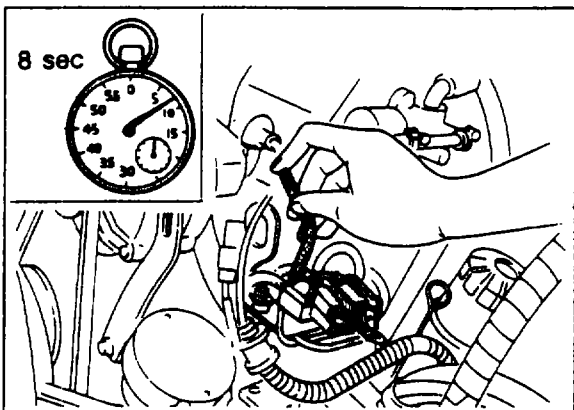
#### Signal

1. Warm up the engine and run it at idle.
2. Connect a tachometer to the engine.



67U04X-062

3. Disconnect the vacuum hose (relief solenoid valve to air control valve) at the relief solenoid valve.
4. Place a finger over the port opening and increase the engine speed to over **1,500 rpm**.
5. Disconnect the throttle sensor connector and check that air is sucked into the port opening for about **120 sec**, and then stops.

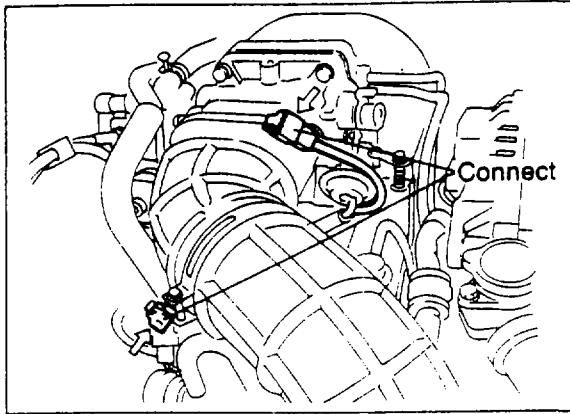


67U04X-063

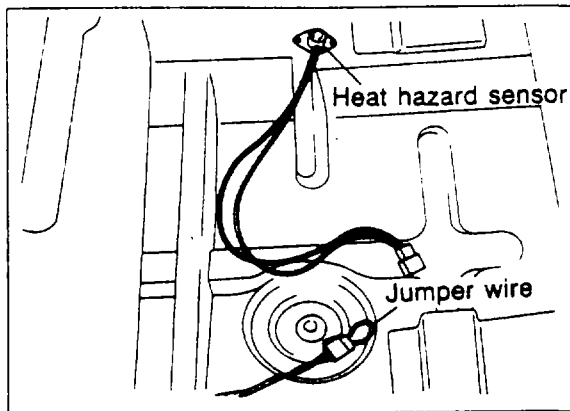
6. Decrease the engine speed to idle and check that air is sucked into the port opening, check the amount of time that air is sucked into the port opening.

**Specified time: 8 sec.**

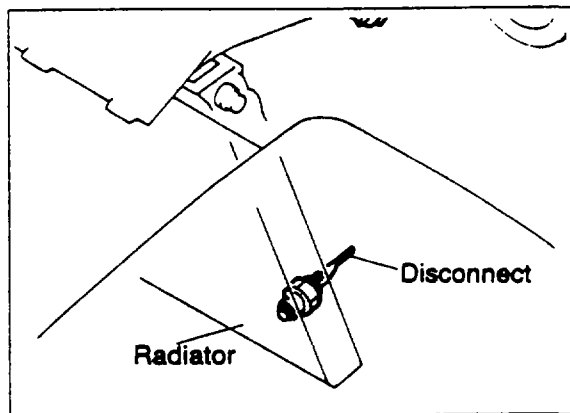
# SECONDARY AIR INJECTION CONTROL SYSTEM 4A



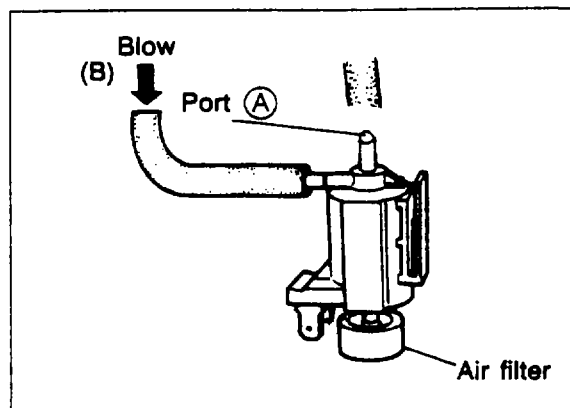
67J04X-064



67U04X-065



67U04X-066



67U04X-067

7. Reconnect the throttle sensor connector.
8. Increase the engine speed and check that air is not sucked into the port opening when the engine speed is **over 3,400—3,600 rpm**.

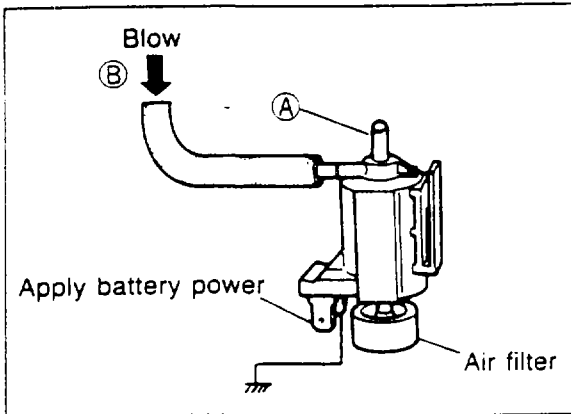
9. Disconnect the heat hazard sensor connector, and connect a jumper wire to the terminals in the connector.
10. Check that air is not sucked into the port opening at any engine speed.
11. Disconnect the jumper wire and reconnect the heat hazard sensor.

12. Stop the engine and disconnect the water temperature switch connector at the radiator.
13. Start the engine and gradually increase the engine speed and check that air is not sucked into the port opening when the engine speed is **over 1,000—1,200 rpm**.

## Relief solenoid valve

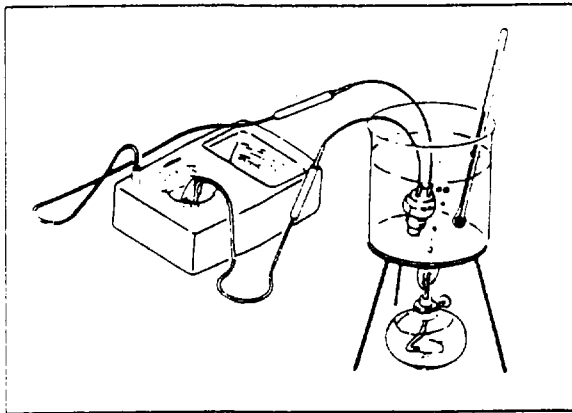
1. Disconnect the vacuum hose from the relief solenoid valve.
2. Blow through the solenoid valve from the port (B). Check that air passes through the valve and flows from the air filter.

# 4A SECONDARY AIR INJECTION CONTROL SYSTEM



67U04X-068

3. Disconnect the solenoid valve connector and connect 12V and ground to the terminals of the solenoid valve.
4. Blow through the solenoid valve from port (B). Check that air passes through the solenoid valve and flows from port (A).



67U04X-069

## WATER TEMPERATURE SWITCH

### Removal

Remove the water temperature switch from the radiator.

### Installation

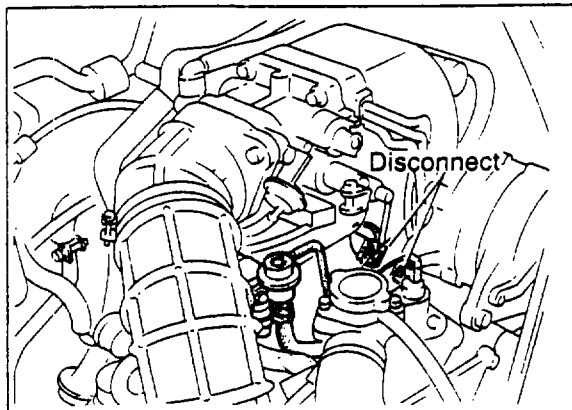
Install in the reverse order of removal.

### Inspection

1. Place the water temperature switch in water with a thermometer and heat the water gradually.
2. Check the temperature at which continuity exists between the terminals.

**Specified temperature: 15—19°C (59—66.2°F)**

3. Replace the switch, if necessary.



67U04X-070

## WATER THERMO SENSOR

### Removal

1. Disconnect the water thermo sensor connector.
2. Remove the sensor from the water pump.

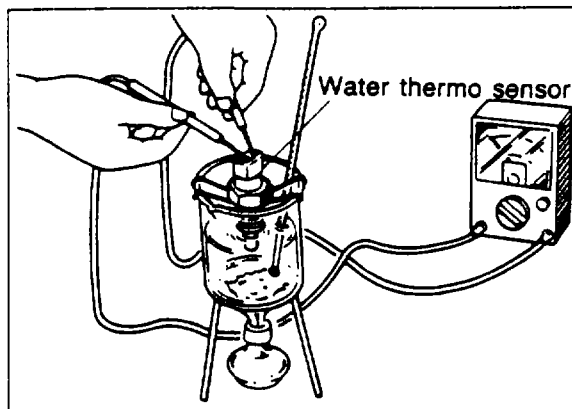
### Installation

Install in the reverse order of removal.

### Inspection

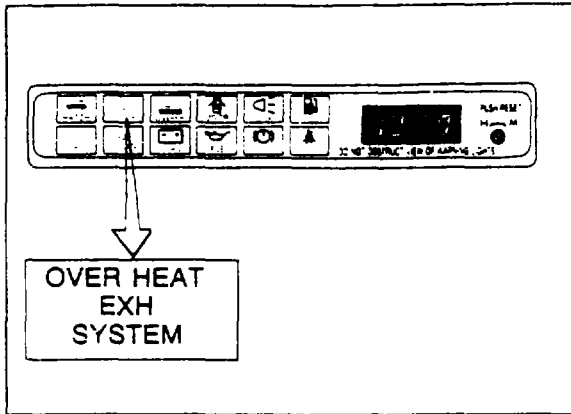
1. Place the water thermo sensor in water with a thermometer and heat the water gradually.
2. Check the resistance of the sensor using an ohmmeter.

Water temperature	Resistance
-20°C (-4°F)	16.2 ± 1.62 kΩ
20°C (68°F)	2.45 ± 0.24 kΩ
80°C (176°F)	0.32 ± 0.032 kΩ

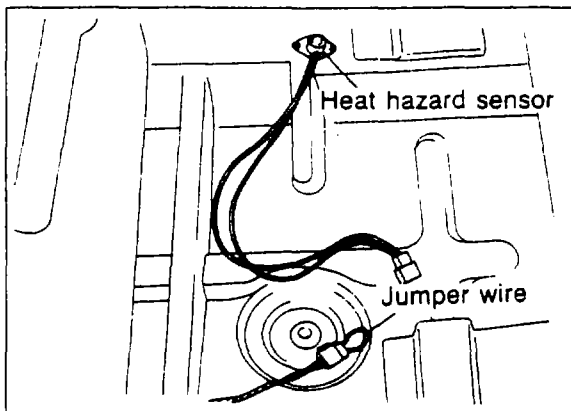


67U04X-071

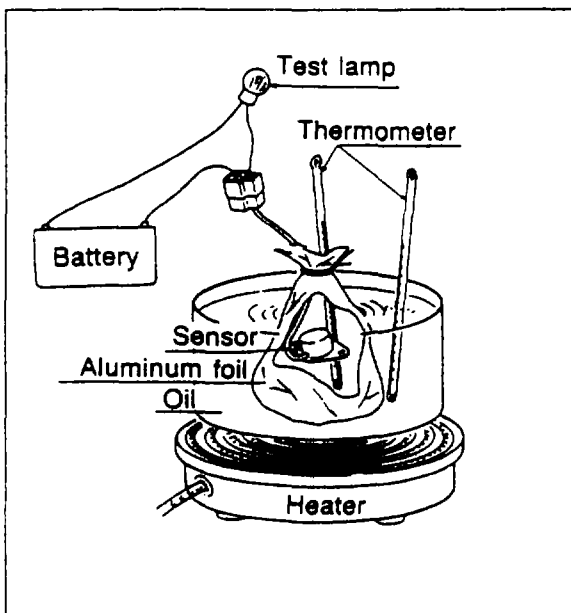
3. Replace the sensor, if necessary.



67U04X-072



67U04X-073



67U04X-074

## HEAT HAZARD SENSOR

### Inspection

#### Warning system

1. Turn the ignition switch on. The heat hazard warning light will come on.
2. Start the engine and the warning light should go off.

3. Disconnect the heat hazard sensor connector.
4. Check that the heat hazard warning light comes on when a jumper wire is connected to the terminals of the sensor connector.

## Heat hazard sensor

### Removal

1. Remove right seat.
2. Lift up the floor mat.
3. Disconnect the heat hazard sensor connector and remove the sensor connector.

### Installation

Install in the reverse order of removal.

### Inspection

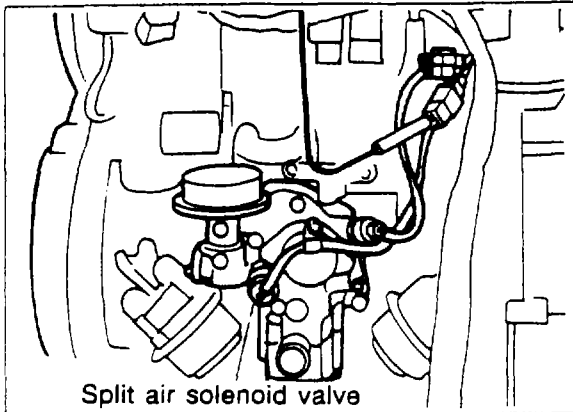
1. Wrap the sensor and thermometer with aluminum foil to prevent oil penetration and place it in a container of oil.
2. Connect a test lamp and battery power to the terminals of the sensor connector.
3. Gradually heat the oil.  
The test lamp should come on when the temperature in the aluminum foil reaches to **105—115°C (221—239°F)**.
4. Replace the sensor if it does not operate within these specifications.

### Note

Do not heat the oil to more than **150°C (302°F)**.



# 4A SECONDARY AIR INJECTION CONTROL SYSTEM



87U04A-032

## SPLIT AIR SOLENOID VALVE

### Inspection

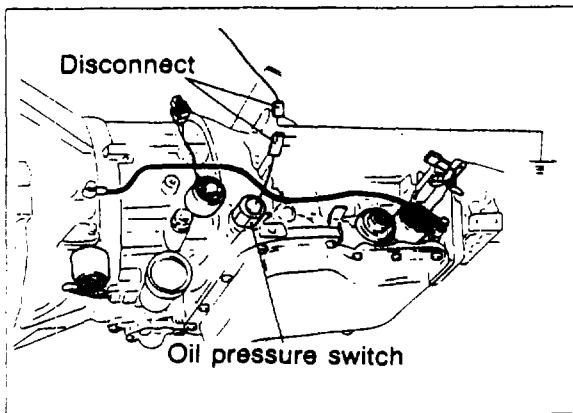
#### Signal (for M/T)

1. Connect a voltmeter to the split air solenoid valve (LB) terminal and ground.
2. Turn the ignition switch on.
3. Shift into 5th gear and observe the voltmeter reading.

#### Voltmeter reading

5th gear: below 2.5V

Others: approx. 12V



87U04A-033

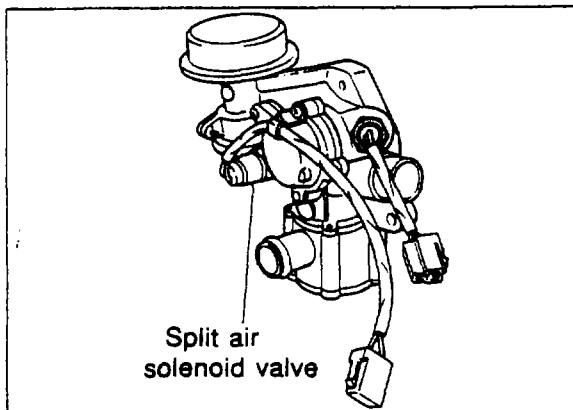
#### Signal (for A/T)

1. Shift into "D" range.
2. Disconnect the oil pressure switch connector and connect a jumper wire between the connector and ground.
3. Observe the voltmeter reading.

#### Voltmeter reading

Oil pressure switch ON: below 2.5V  
(Overdrive)

Oil pressure switch OFF: approx. 12V  
(Others)



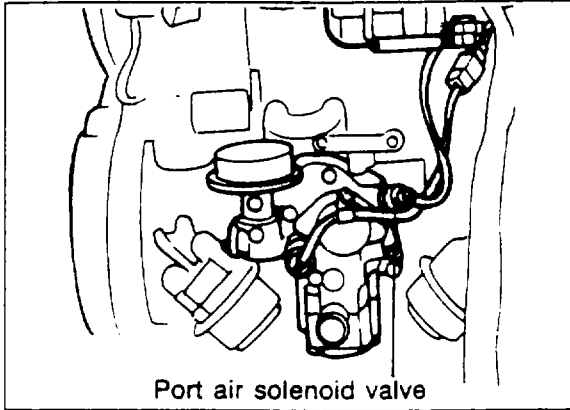
67U04X-077

## Removal

1. Disconnect the split air solenoid valve connector.
2. Remove the solenoid valve.

## Installation

Install in the reverse order of removal.



87U04A-034

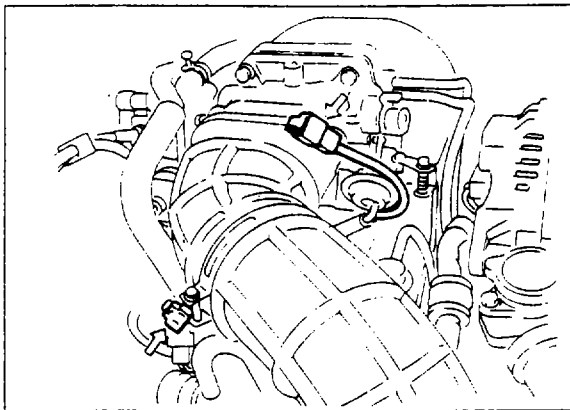
## PORT AIR SOLENOID VALVE

### Inspection

#### Signal

1. Connect a voltmeter to the port air solenoid valve (BR) terminal and ground.
2. Start the engine and run it at idle speed.
3. Observe the voltmeter reading.

**Voltmeter reading: below 2.5V**



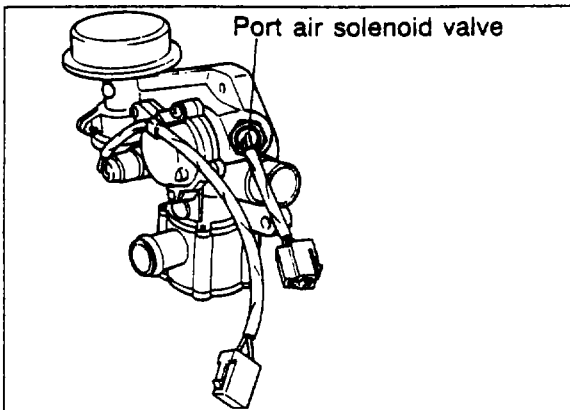
87U04A-035

4. Disconnect the throttle sensor connector.
5. Observe the voltmeter reading.

**Voltmeter reading: approx. 12V**

#### Note

The solenoid valve voltage reading will be a constant below 2.5V (approx.) after the vehicle has accumulated over 20,000 miles.



67U04X-080

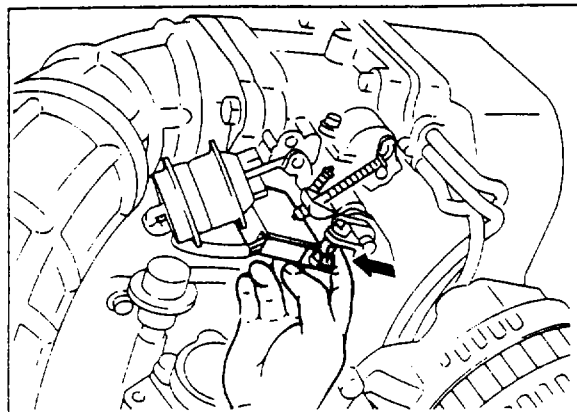
### Removal

1. Disconnect the port air solenoid valve connector.
2. Remove the solenoid valve.

### Installation

Install in the reverse order of removal.

# 4A DECELERATION CONTROL SYSTEM



77U04A-221

## DECELERATION CONTROL SYSTEM

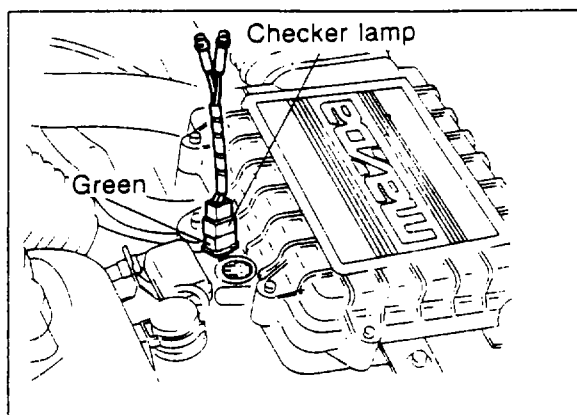
### FUEL CUT

#### Inspection

1. Hold the engine speed at **2,000 rpm**.
2. Check that the engine speed varies when the throttle sensor is pushed in with a finger.

#### Note

**Do not push in the throttle sensor completely.**

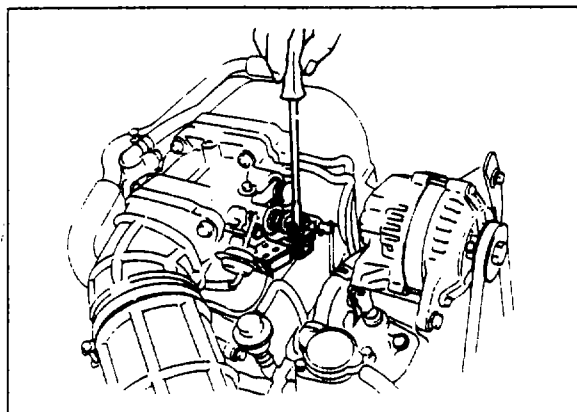


67U04X-082

### THROTTLE SENSOR

#### Adjustment

1. Warm up the engine, then stop it.
2. Connect the **checker lamp (49 F018 001)** to the check connector (Green).
3. Turn the ignition switch on and check whether one of the lamps illuminates.

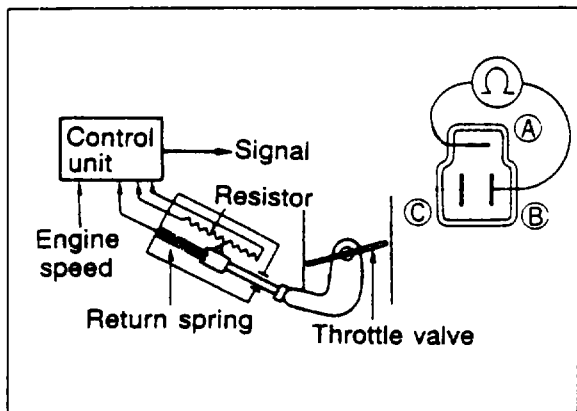


67U04X-083

4. If both lamps illuminate or if neither does, turn the throttle sensor adjusting screw until one of the lamps illuminates.
  - a) If both lamps illuminate turn the adjusting screw counter-clockwise.
  - b) If both lamps do not illuminate turn the adjusting screw clockwise.
5. Reinstall the cap on the adjusting screw after adjusting.

#### Note:

**Do not use excessive pressure on the screw; this may cause incorrect adjustment.**



77U04A-222

### Inspection

1. Disconnect the throttle sensor connector.
2. Connect a circuit tester to the sensor as shown.
3. Open the throttle valve and observe the sensor resistance.

### Throttle opening

**A — B**

**Idle position: approx. 1 k $\Omega$**

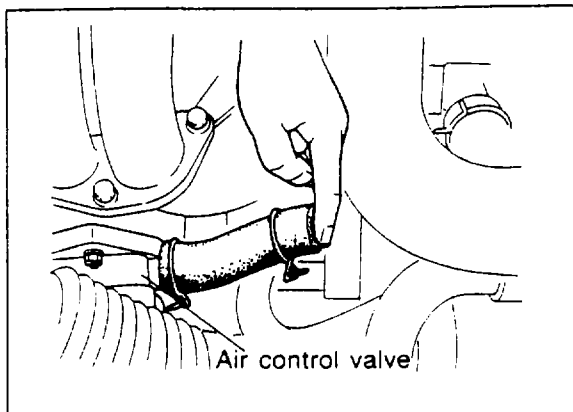
**Full open: approx. 5  $\pm$  1 k $\Omega$**

**A — C**

**Idle position: approx. 5  $\pm$  1 k $\Omega$**

**Full open: approx. 5  $\pm$  1 k $\Omega$**

4. Reconnect the connector.

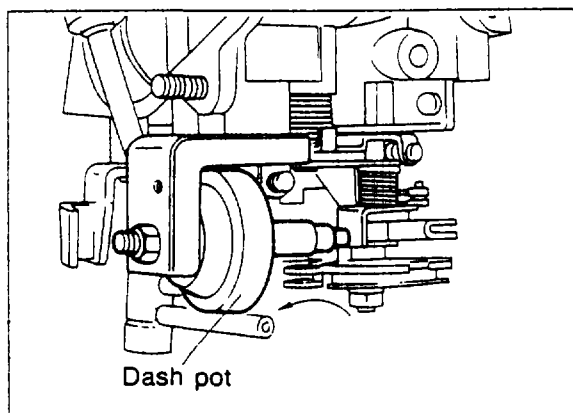


67U04X-085

## ANTI-AFTERBURN VALVE

### Inspection

1. Warm up the engine and run it at idle speed.
2. Disconnect the air hose (air control valve to air pump) at the air pump.
3. Place a finger over the air hose opening.
4. Check that air is not sucked into the air hose at idle speed.
5. Increase the engine speed to over **3,000 rpm**, then decrease the engine speed **rapidly**.
6. Check that air is sucked into the air hose for a few seconds while decelerating.
7. Replace the air control valve, if necessary.

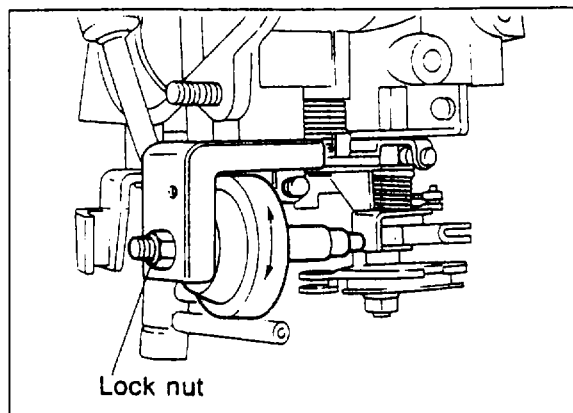


67U04X-086

## DASHPOT

### Inspection

1. Open the throttle valve fully, then push the dashpot rod with a finger and check that the rod goes into the dashpot slowly.
2. Release the rod and check that it comes out quickly.
3. Replace it, if necessary.

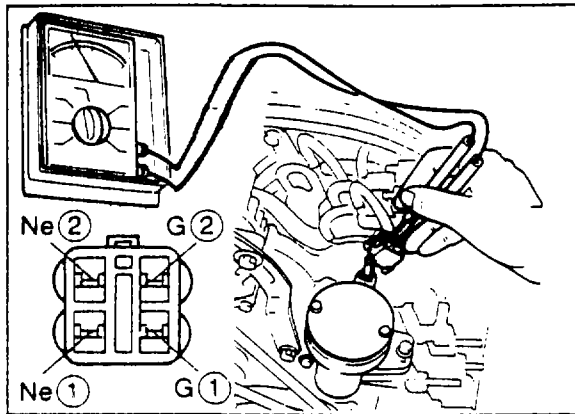


67U04X-087

## Adjustment

1. Warm up the engine to the normal operating temperature and run it at idle speed.
2. Connect a tachometer to the engine.
3. Increase the engine speed to **3,500 rpm**.
4. Slowly decrease the engine speed and check that the dashpot rod contacts the lever at **2,700—3,100 rpm**.
5. Loosen the lock nut and adjust by turning the dashpot, if necessary.

# 4A ELECTRONIC SPARK ADVANCE (ESA) CONTROL SYSTEM



77U04A-223

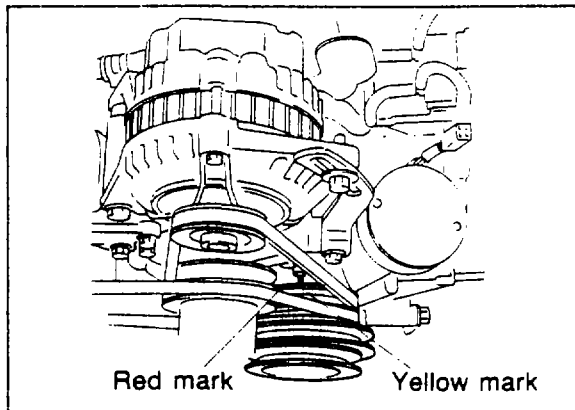
## ELECTRONIC SPARK ADVANCE (ESA) CONTROL SYSTEM

### CRANK ANGLE SENSOR

#### Inspection

1. Disconnect the crank angle sensor connector.
2. Connect a circuit tester to the terminals of the crank angle sensor connector.
3. Check the resistance of the following.

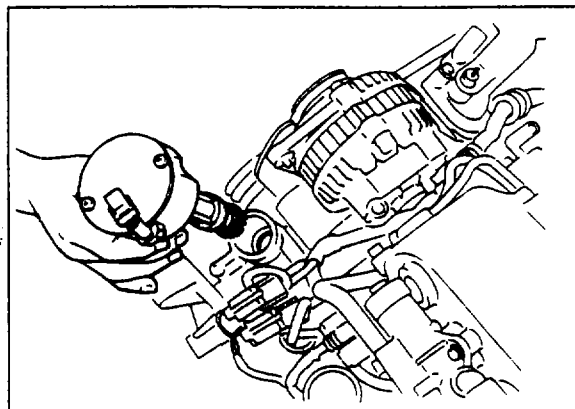
Terminal	Resistance
G ① (G) — G ② (B)	110—210 $\Omega$
Ne ① (R) — Ne ② (W)	110—210 $\Omega$



67U04X-089

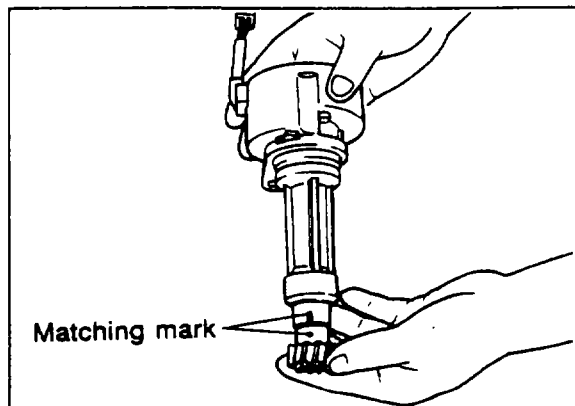
#### Removal

1. Set the eccentric shaft pulley to the leading mark (Yellow mark) by turning the pulley.



87U04A-056

2. Disconnect the crank angle sensor connector.
3. Remove the blind cap and the lock bolt.
4. Remove the sensor.



87U04A-036

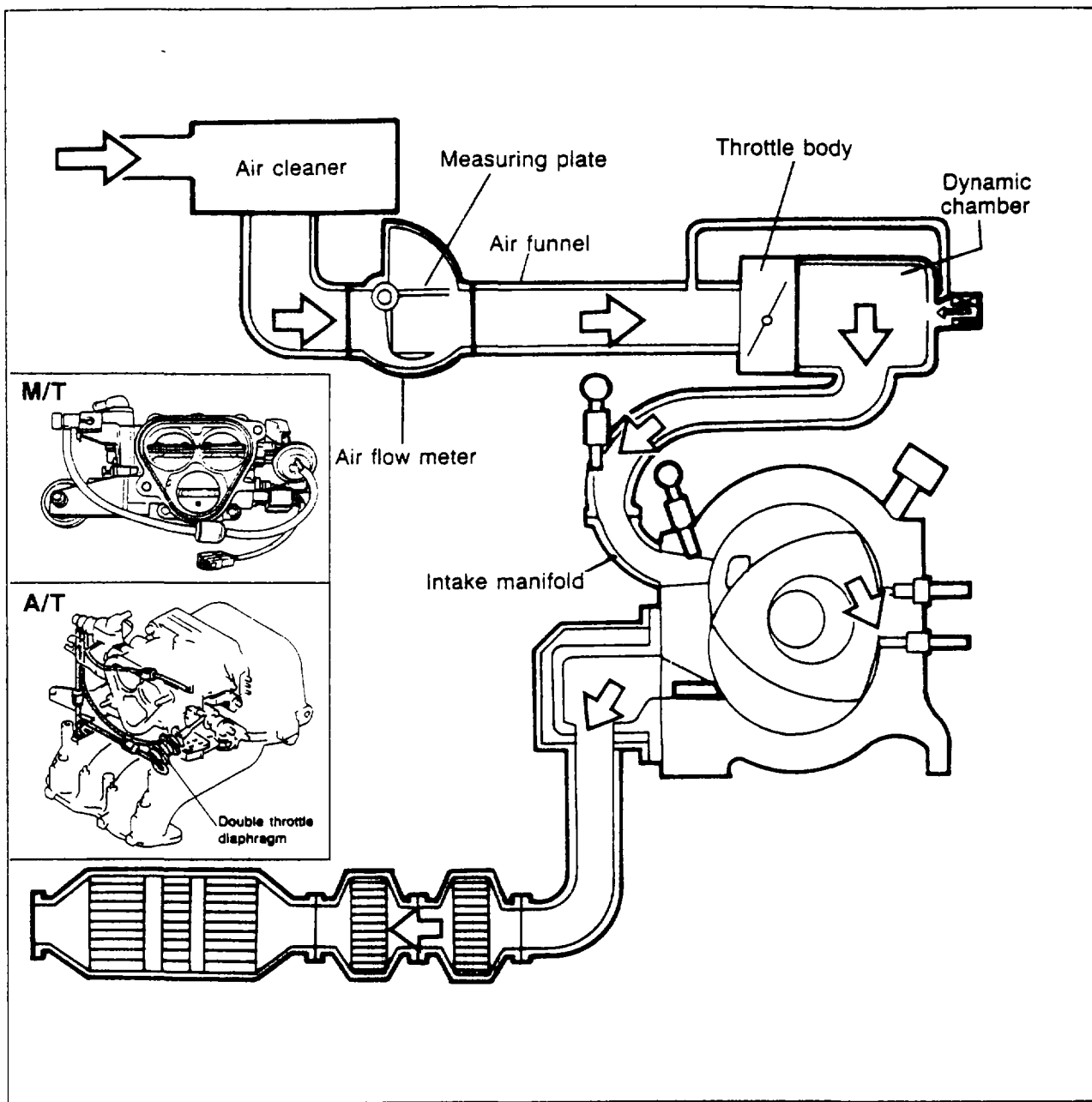
#### Installation

1. Align the matching mark on the crank angle sensor housing and driven gear.
2. Check that the eccentric shaft pulley is set to the leading mark (Yellow mark).
3. Install the sensor and lock bolt.
4. Check the ignition timing. (Refer to section 5)
5. Tighten the lock bolt.

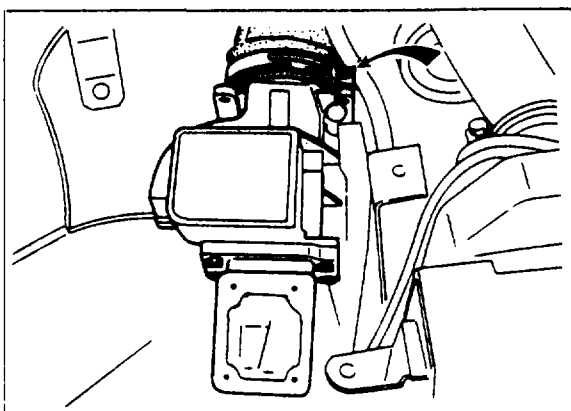
**Tightening torque: 7.8—10.8 N·m  
(0.8—1.1 m·kg, 5.8—8.0 ft·lb)**

6. Install a new blind cap.

INTAKE AIR SYSTEM



77U04A-255



67U04X-093

**AIR FLOW METER**

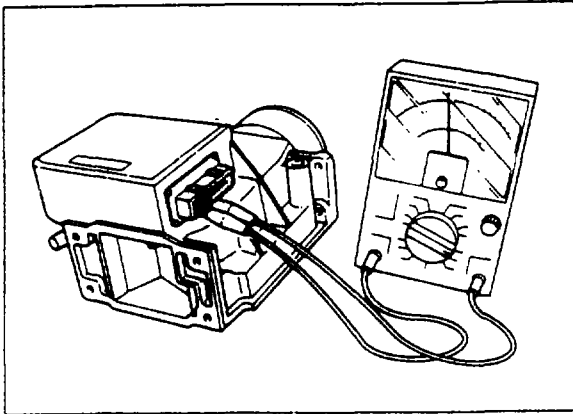
**Removal**

1. Remove the air cleaner element.
2. Remove the air flow meter attaching bolts and remove the air cleaner.
3. Loosen the air funnel band and remove the air flow meter.

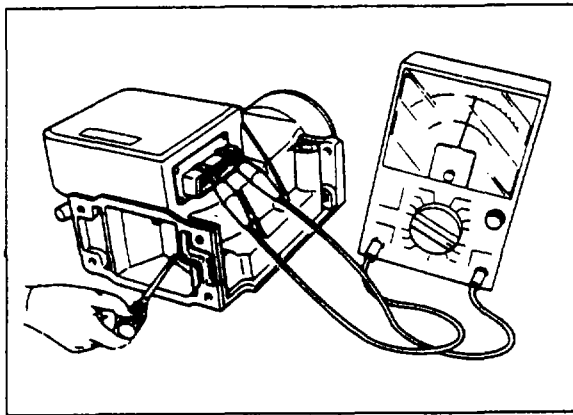
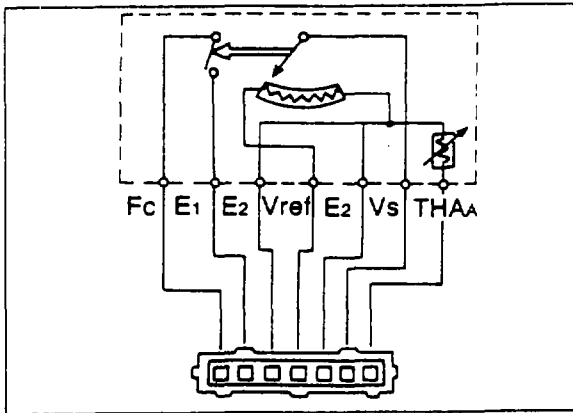
**Installation**

Install in the reverse order of removal.

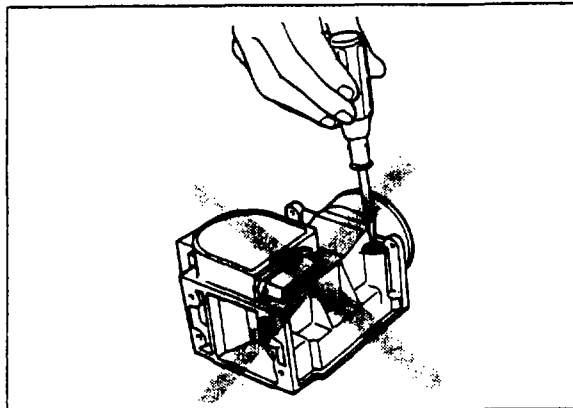
# 4A INTAKE AIR SYSTEM



67U04X-094



67U04X-095



77U04B-142

## Inspection

1. Check the air flow meter body for cracks or damage.
2. Check that the measuring plate opens smoothly.
3. Check the resistance of the terminals using a circuit tester.

Terminal	Resistance ( $\Omega$ )	
E2 ↔ Vs	50—500	
E2 ↔ Vref	200—500	
E2 ↔ THA (Intake air temperature sensor)	-20°C (-4°F)	10,000—20,000
	0°C (32°F)	4,000—7,000
	20°C (68°F)	2,000—3,000
	40°C (104°F)	900—1,300
	60°C (140°F)	400—700
E1 ↔ Fc	$\infty$	

4. Press open the measuring plate. Measure the resistance between E<sub>1</sub> and Fc (fuel pump switch) and between E<sub>2</sub> and Vs.

Terminal	Measuring plate	
	Fully closed	Fully open
E <sub>1</sub> ↔ Fc	$\infty$	0
E <sub>2</sub> ↔ Vs	50—500	50—500

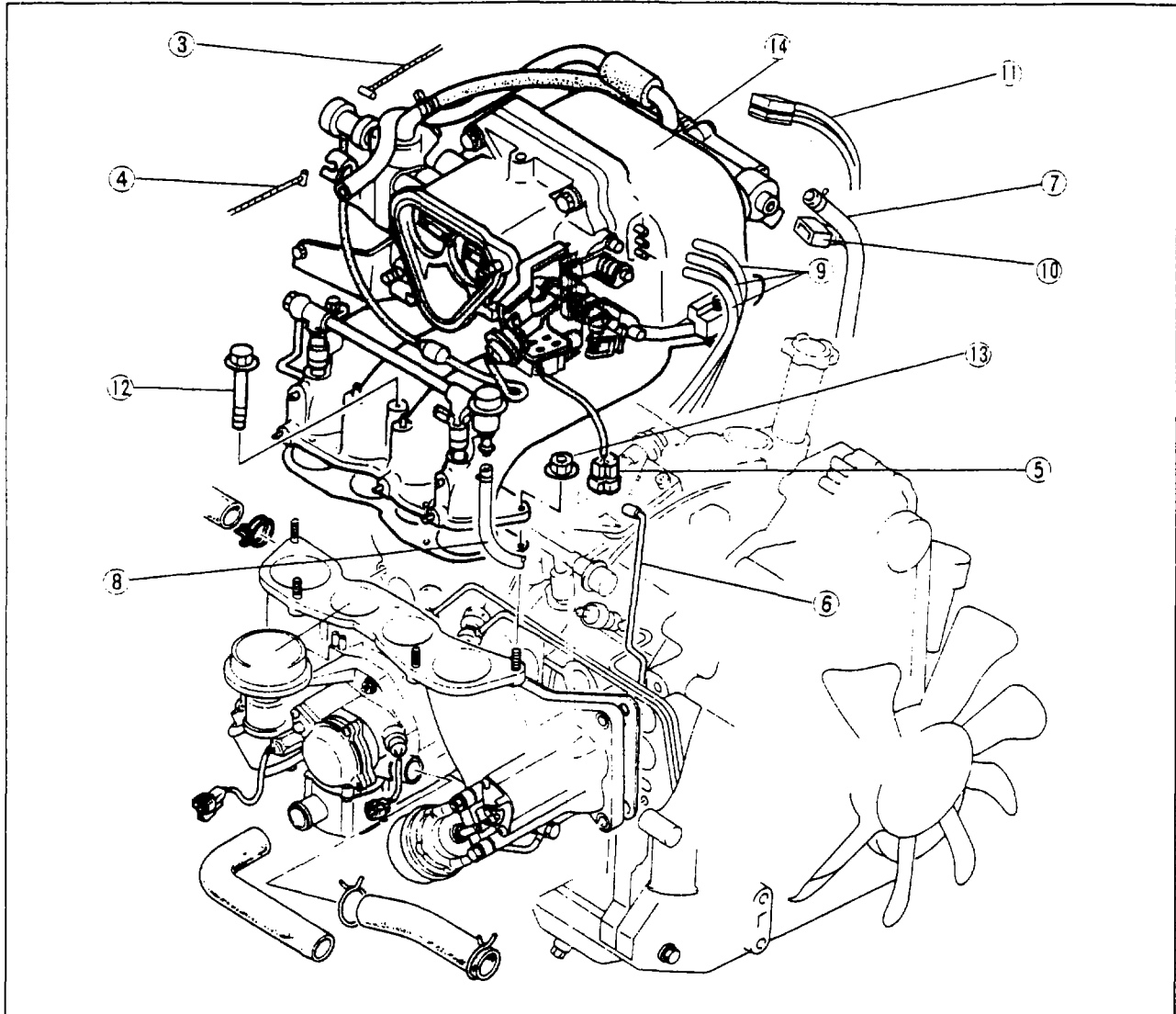
## Precaution

The air bypass adjust screw is pre-set and sealed at the factory and must not be tampered with.

## DYNAMIC CHAMBER

### Removal

67U04X-096



87U04A-037

Remove in the sequence as shown in the figure.

- |                                       |   |
|---------------------------------------|---|
| 1. Battery negative cable             | 8. Fuel hoses                               |
| 2. Air funnel                         | 9. Vacuum hoses                             |
| 3. Accelerator cable                  | 10. Bypass air control valve connector      |
| 4. Cruise control cable (if equipped) | 11. Intake air temperature sensor connector |
| 5. Throttle sensor connector          | 12. Bolts                                   |
| 6. Metering oil pump connecting rod   | 13. Nuts                                    |
| 7. Water hoses                        | 14. Dynamic chamber and throttle body       |

#### Caution

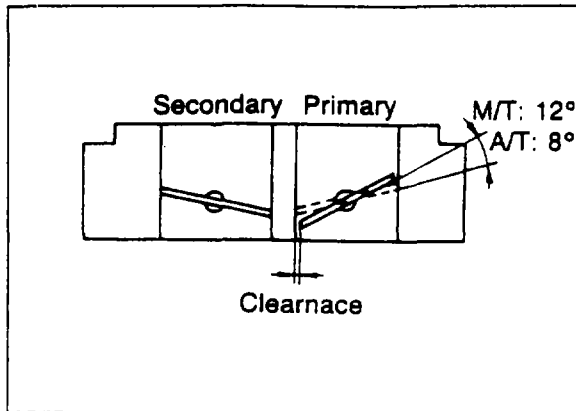
Cover the intake manifold ports with a clean cloth to prevent dust or dirt from entering after the dynamic chamber is removed.

#### Installation

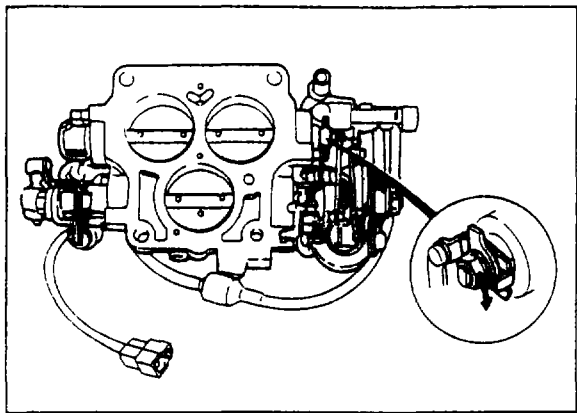
Install in the reverse order of removal.



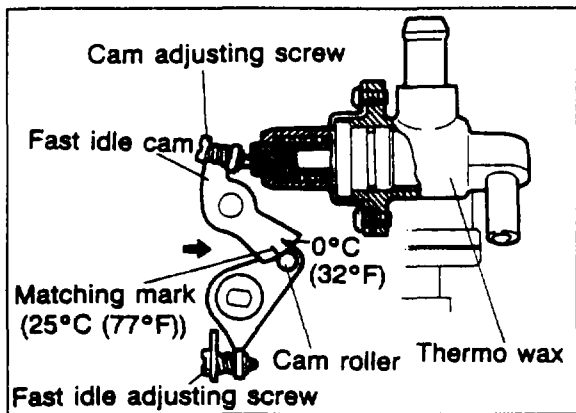
# 4A INTAKE AIR SYSTEM



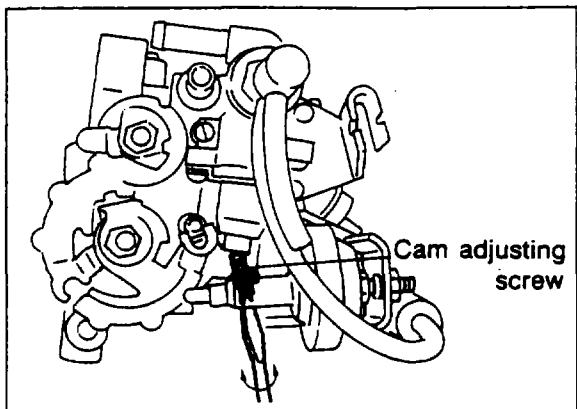
87U04A-038



67U04X-099



87U04A-039



67U04X-101

## THROTTLE BODY

### Inspection

#### No. 1 secondary throttle valve

1. Remove the air funnel from the throttle body.
2. Check the clearance between the primary throttle valve and the wall of the throttle bore when the No. 1 secondary throttle valve starts to open.

#### Standard clearance:

M/T: 0.5—0.7 mm (0.02—0.03 in)

A/T: 0.8—1.4 mm (0.03—0.06 in)

3. If the clearance is not within the specification, bend the tab until the proper clearance is obtained.

### Fast idle operation

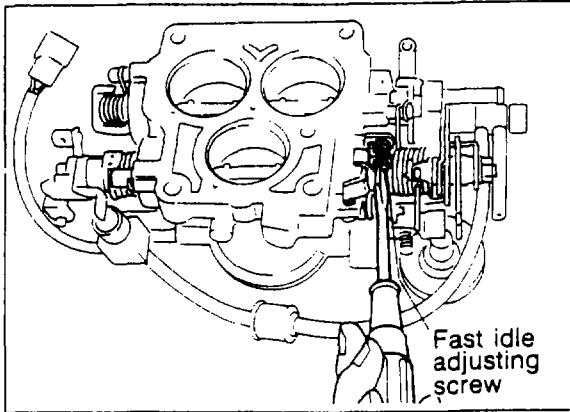
For this operation to be checked, the vehicle and throttle body must be at **25°C (77°F)**.

1. Check that the matching mark on the fast idle cam is aligned with the center of the cam roller.

2. If the matching mark and the center of the cam roller do not align, turn the cam adjusting screw until proper alignment is obtained.

### Note

**Fast idle adjustment is unnecessary unless it has been tampered with.**

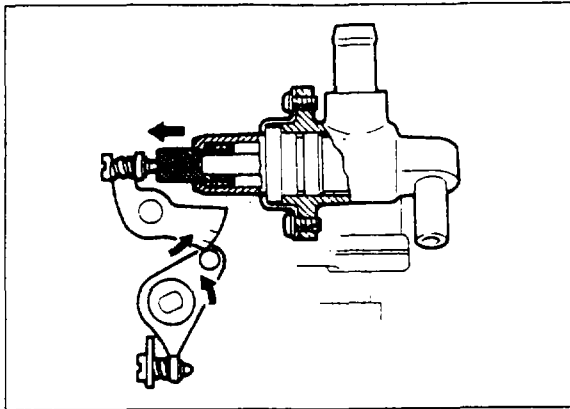


67U04X-102

3. With the matching mark aligned, check the clearance between the primary throttle valve and the wall of the throttle bore.

**Standard clearance:**  
0.4—0.5 mm (0.016—0.02 in)

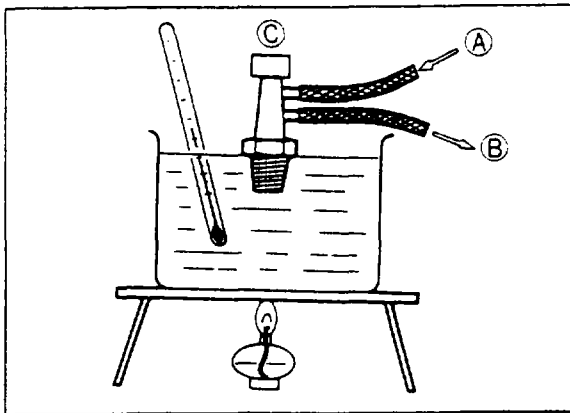
4. To adjust, turn the fast idle adjusting screw, if necessary.



67U04X-103

### On Vehicle

1. Warm up the engine to operating temperature.
2. Check that the wax rod extends outward fully and the idle cam separates from the roller.



67U04X-104

### Water thermo valve

#### Removal

Remove the water thermo valve from the throttle chamber.

#### Installation

Install in the reverse order of removal.

#### Inspection

##### M/T

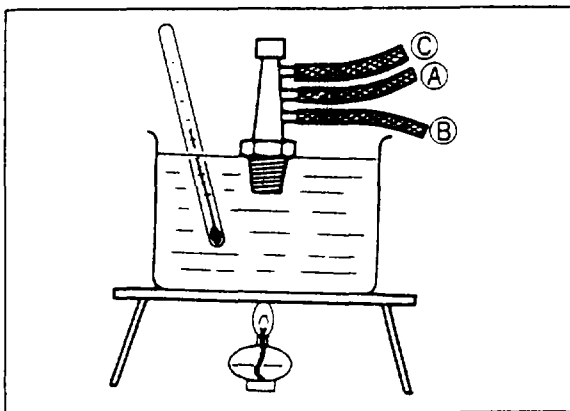
1. Immerse the water thermo valve in a container.
2. Heat the water gradually and observe the temperature.
3. Blow through port (A) and check the thermo valve operation.

Water temperature	Air passes
Below 60°C (140°F)	From (A) to (B)
Above 60°C (140°F)	From (A) to (C)

##### A/T

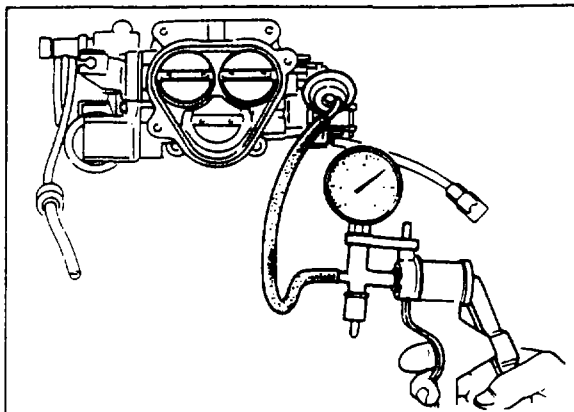
Check the water thermo valve operation the same as for M/T.

Water temperature	Air passes
Below 68°C (154.4°F)	From (A) to (C)
Above 68°C (154.4°F)	From (A) to (B)



77U04A-256

## 4A INTAKE AIR SYSTEM

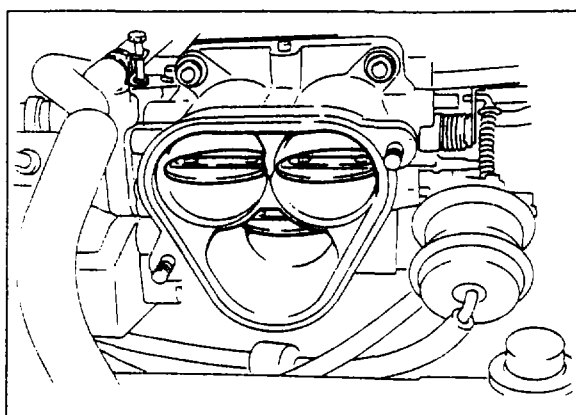


67U04X-106

### Double throttle diaphragm

#### M/T

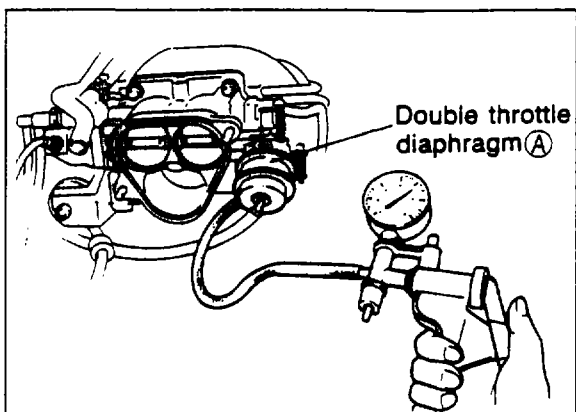
1. Disconnect the vacuum hose from the double throttle diaphragm.
2. Apply at least **200 mm Hg (7.87 in Hg)** vacuum to the diaphragm.
3. Check that the No. 2 secondary throttle valve is fully closed.



67U04X-107

#### A/T

1. Check that the No.2 secondary throttle valve is fully closed.
2. When the primary throttle valve is fully opened, check that the No.2 secondary throttle valve is fully opened.

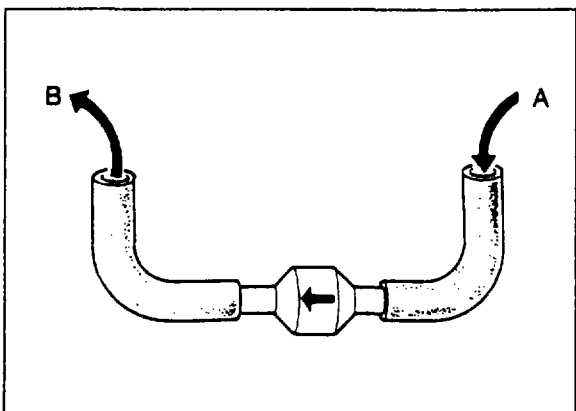


87U04A-040

3. Disconnect the vacuum hose from the double throttle diaphragm (A).
4. Apply **460 mmHg (18.1 inHg)** vacuum to the No.2 secondary throttle valve diaphragm using a vacuum pump tester.
5. Check the clearance between the No.2 secondary throttle valve and the wall of the throttle bore when the primary throttle valve is fully opened.

#### Standard clearance:

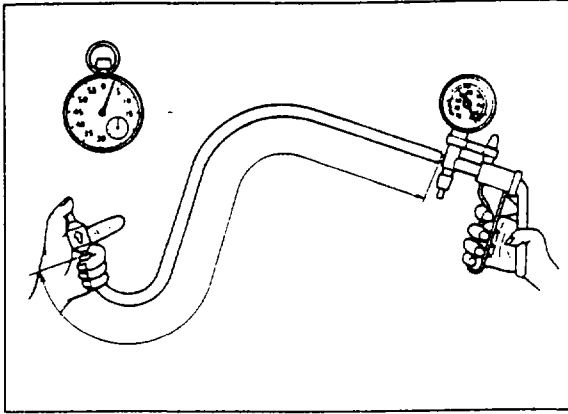
**2.2—3.2 mm (0.09—0.13 in)**



67U04X-109

#### Check valve (only A/T)

1. Remove the check valve.
2. Blow through (A) and check that air flows from (B).
3. Blow through (B) and check that air does not flow from (A).



67U04X-110

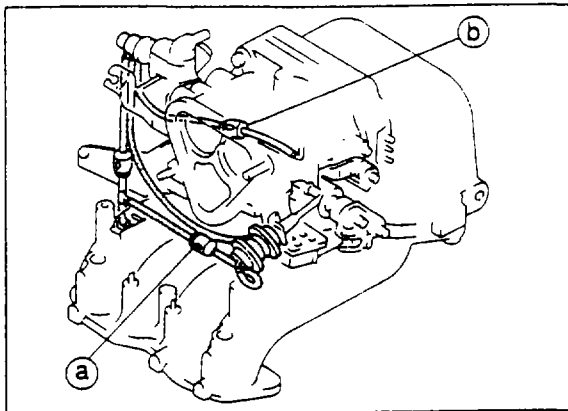
## Delay Valve

1. Disconnect the vacuum delay valve.
2. Connect a **1.0 m (3.28 ft)** vacuum hose to a vacuum pump tester.
3. Connect the vacuum delay valve to the hose.

### Note

**Check that the direction of the vacuum delay valve is as shown.**

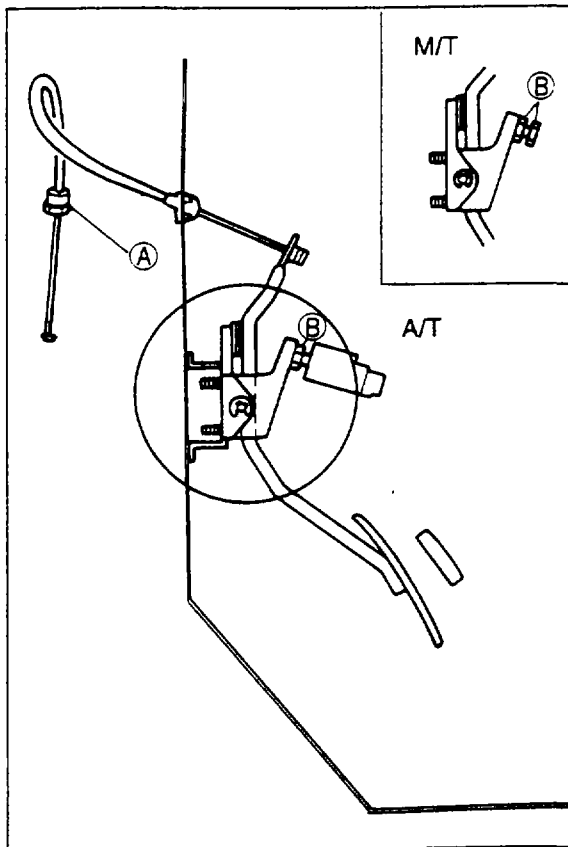
4. Block the other side of the vacuum delay valve.
5. Apply at least **500 mmHg (19.7 inHg)** vacuum.



67U04X-111

6. Release the vacuum and check the time required for the vacuum reading to decrease to **100 mmHg (3.9 inHg)** from **400 mmHg (15.7 inHg)**.

	Specified time
M/T	9—15 sec
A/T (a)	1.1 sec
A/T (b)	0.4 sec



67U04X-113

## ACCELERATOR LINKAGE

### Inspection

1. Remove the air funnel
2. Depress the accelerator pedal fully and check that the throttle valves are horizontal (fully open position).
3. Check that the accelerator linkage returns fully and moves freely.

### Adjustment

1. Check the free play of the cable at the throttle chamber.

**Free play: 1—3 mm (0.04—0.12 in)**

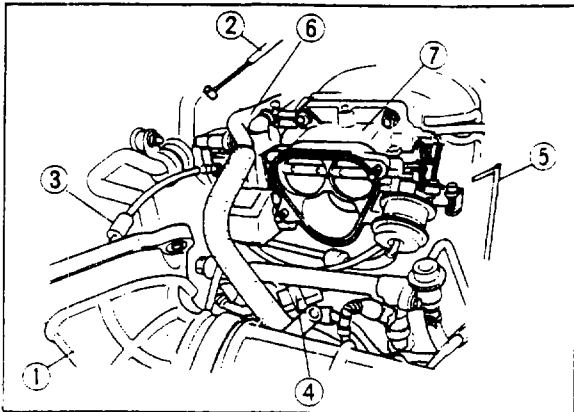
2. Adjust with nut (A), if not within specifications.

### Caution

**Check that the fast idle operation is fully cancelled.**

3. Check that the throttle valves are fully opened with the accelerator pedal fully depressed.
4. Adjust stopper bolt (B), if necessary.

# 4A INTAKE AIR SYSTEM



87U04A-041

## REMOVAL AND INSTALLATION OF THROTTLE BODY

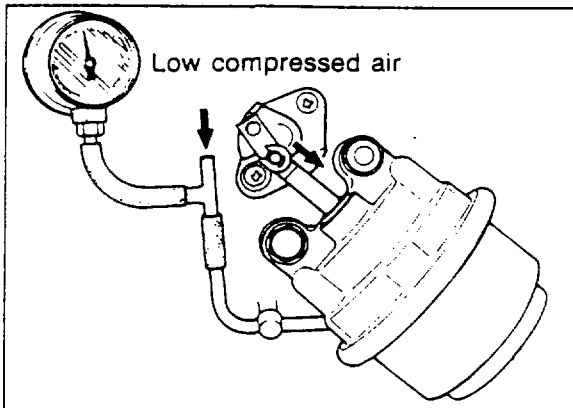
### Removal

Remove parts in the numbered sequence as shown in the figure.

1. Air funnel
2. Accelerator cable
3. Cruise control cable (if equipped)
4. Throttle sensor connector
5. Metering oil pump connecting rod
6. Air hoses
7. Throttle body

### Installation

Install in the reverse order of removal.



87U04A-042

## ACTUATOR

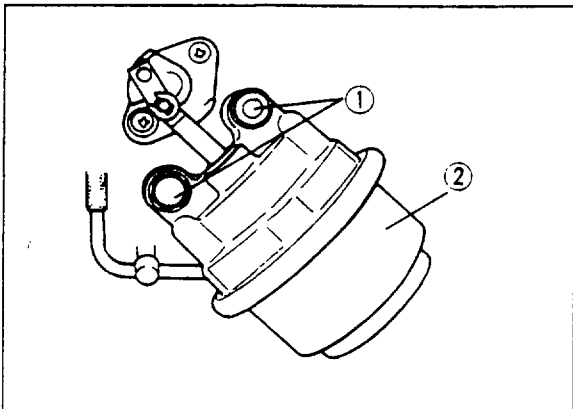
### Inspection

1. Remove the air hose from the actuator and connect a pressure gauge as shown.
2. Apply low pressure compressed air to the actuator and check operation.

**Starting to open: 8.3 kPa (0.085 kg/cm<sup>2</sup>, 1.2 psi)**

**Fully opened: 14.7 kPa (0.15 kg/cm<sup>2</sup>, 2.1 psi)**

3. Replace the actuator if necessary.



67U04X-116

### Removal

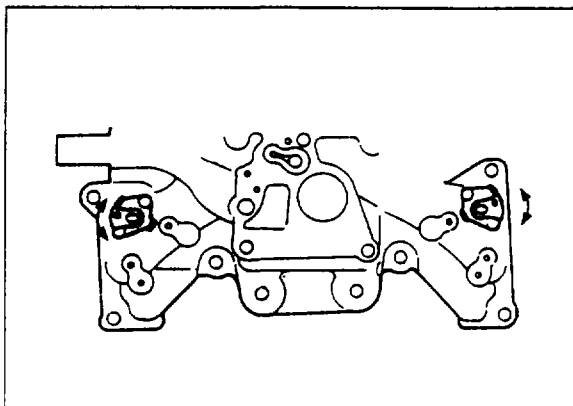
1. Remove the actuator attaching nuts.
2. Remove the actuator.

### Installation

Install in the reverse order of removal.

### Caution

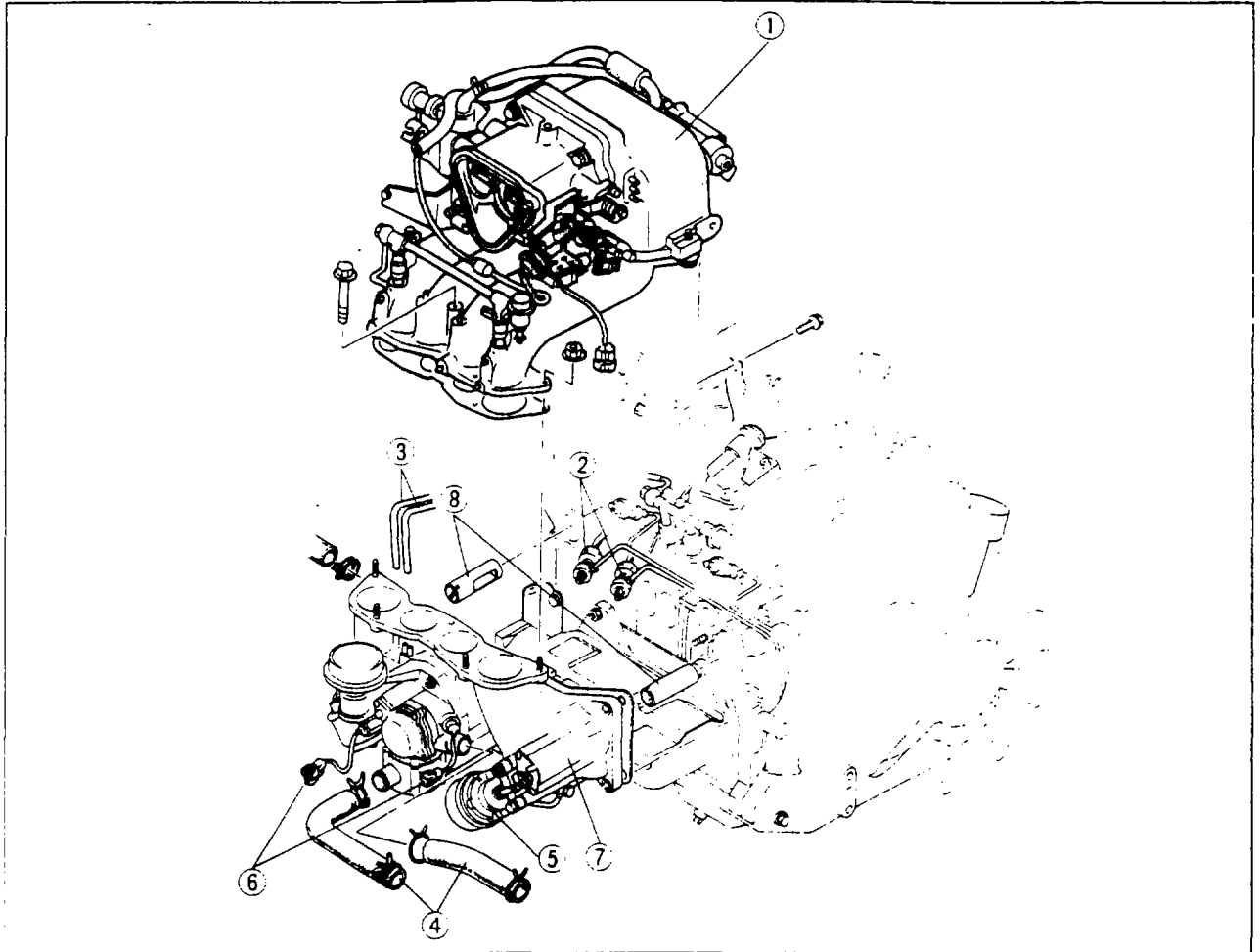
**Rotate the lever and check that it moves smoothly before installing the actuator.**



67U04X-117

## AUXILIARY PORT VALVE Removal

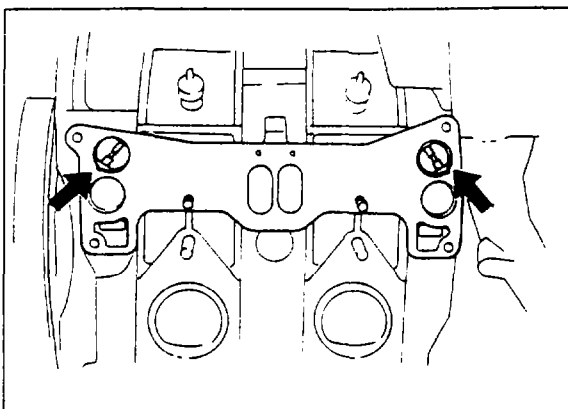
67U04X-118



67U04X-119p

Remove in the sequence shown in the figure.

- |  |                              |
|--|------------------------------|
| 1. Dynamic chamber and intake pipe<br>(Refer to 4A—55) | 5. Actuator (Refer to 4A—60) |
| 2. Manifold oil nozzles                                | 6. Connectors                |
| 3. Vacuum hoses  | 7. Intake manifold           |
| 4. Air hoses   | 8. Auxiliary port valves     |



67U04X-120

### Inspection

Check the auxiliary port valves for cracks or damage.

### Installation

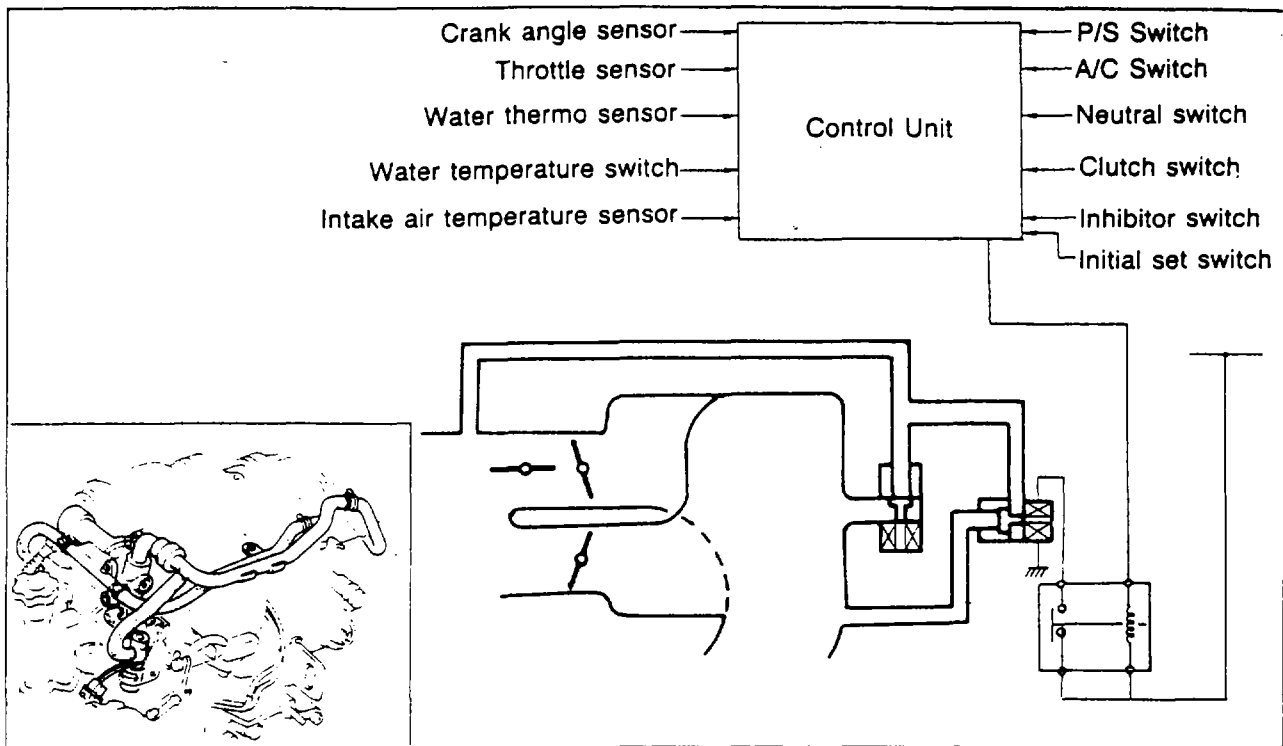
Install in the reverse order of removal.

### Caution

Install so that the large position of the auxiliary port valve shafts align with the matching mark on the gasket as shown in the figure.

# 4A BYPASS AIR CONTROL (BAC) SYSTEM

## BYPASS AIR CONTROL (BAC) SYSTEM



87U04X-121

### BAC SYSTEM Inspection

#### Note

Connect a jumper wire to both terminals of the initial set coupler.

1. Warm up the engine and run it at idle.
2. Connect a tachometer to the engine.
3. Disconnect the BAC valve connector.
4. Check that the engine speed decreases.
5. Connect the BAC valve connector.

#### Removal

1. Drain the engine coolant.
2. Disconnect the air hose and water hoses from the valve.
3. Remove the BAC valve attaching nuts.
4. Remove the BAC valve.

#### Installation

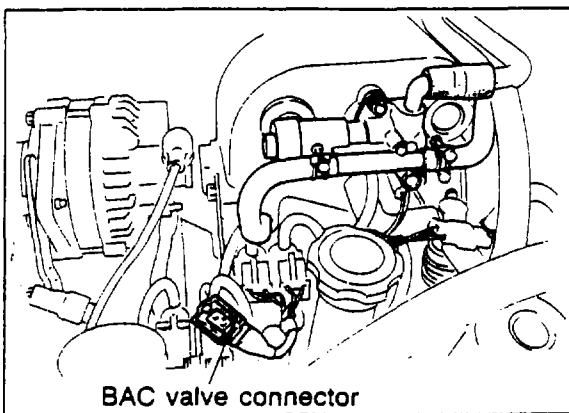
Install in the reverse order of removal.

### BAC VALVE Inspection

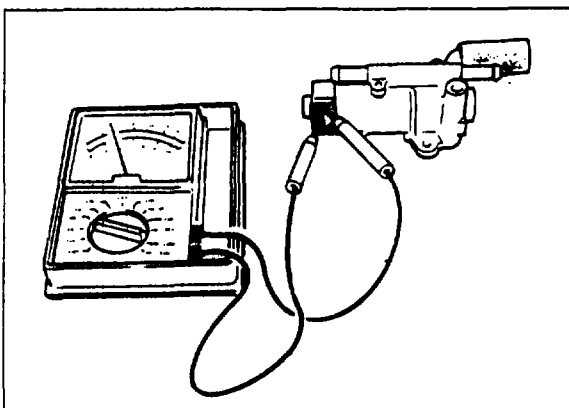
1. Disconnect the BAC valve connector.
2. Check the valve resistance using a circuit tester.

**Resistance: 10.7—12.3  $\Omega$**

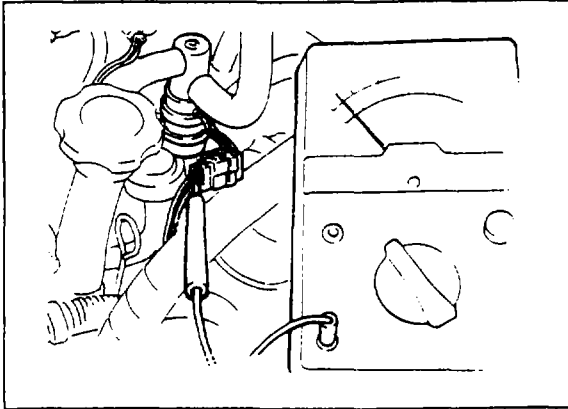
3. Apply 12V and a ground to the terminals of the BAC valve.
4. The valve should click when voltage is applied.
5. Replace the valve, if necessary.



87U04A-057



87U04X-123



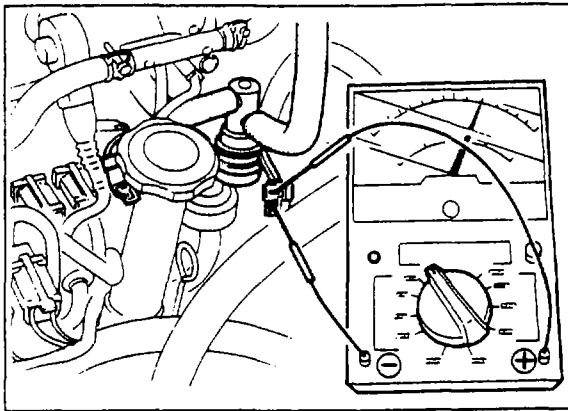
77U04A-226

## AIR BYPASS SOLENOID VALVE

### Inspection

#### Signal

1. Disconnect the water thermo sensor connector.
2. Connect a resistor (**2 kΩ**) to the terminals of the sensor connector.
3. Connect a voltmeter to the terminal (BrY) of the air bypass solenoid valve connector and ground.
4. Start the engine and check the following:
  - For 17 seconds after engine starts.  
**Voltmeter reading is 0V.**
  - After 17 seconds.  
**Voltmeter reading is 12V.**



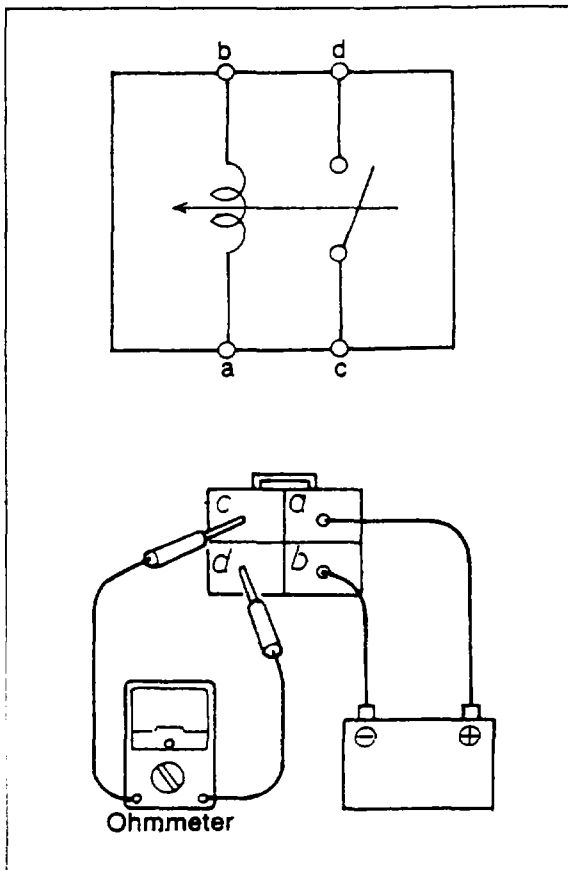
67U04X-125

### Air bypass solenoid valve

1. Disconnect the air bypass solenoid valve connector.
2. Check the solenoid valve resistance using a circuit tester.

**Resistance: 9.2—11.3 Ω**

3. Replace the solenoid valve, if necessary.



67U04X-126

### Air bypass relay

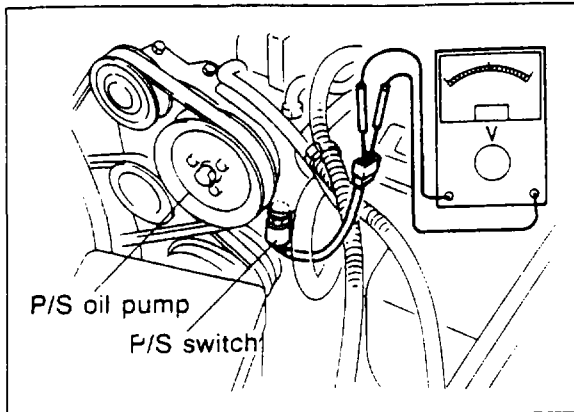
1. Apply 12V and ground (12V to **(A)** terminal and ground to **(B)** terminal), and check that there is continuity at terminals **(C)** and **(D)** using a circuit tester.

Operation Terminals	12V Not applied	12V Applied
<b>(C)</b> — <b>(D)</b>	No continuity	Continuity

2. Replace the relay, if necessary.



# 4A BYPASS AIR CONTROL (BAC) SYSTEM



67U04X-127

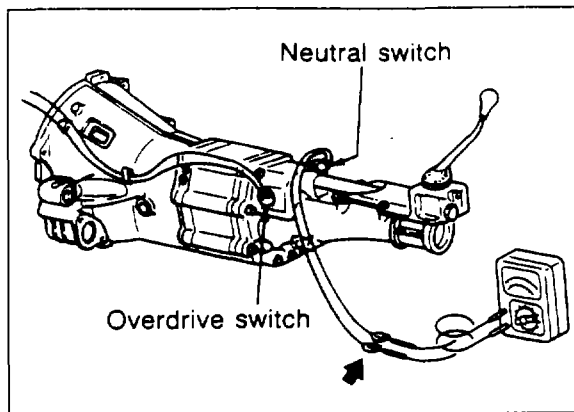
## POWER STEERING SWITCH

### Inspection

1. Start the engine and run it at idle.
2. Disconnect the P/S switch connector.
3. Connect a circuit tester to the switch.
4. Turn the steering wheel either to the right or left, and check the continuity.

Steering wheel	Continuity
Turn	Yes
Straight ahead	No

5. Replace the switch, if necessary.



67U04X-128

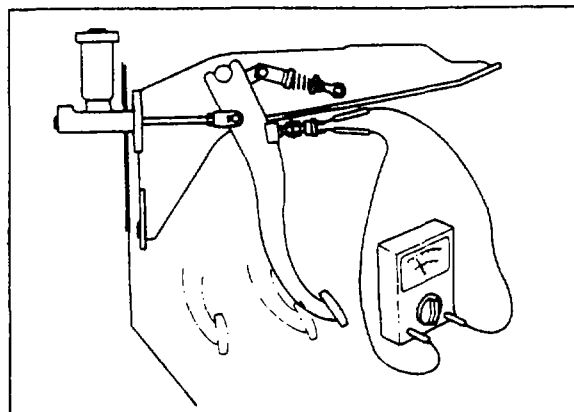
## NEUTRAL SWITCH (M/T)

### Inspection

1. Disconnect the neutral switch connector.
2. Connect a circuit tester to the switch.
3. Check the continuity.

Transmission	Continuity
In neutral	Yes
In other ranges	No

4. Replace the switch, if necessary.



67U04X-129

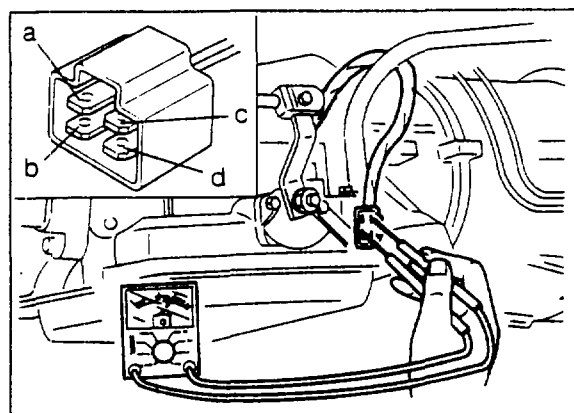
## CLUTCH SWITCH (M/T)

### Inspection

1. Disconnect the clutch switch connector.
2. Connect a circuit tester to the switch.
3. Check the continuity.

Pedal	Continuity
Depressed	Yes
Released	No

4. Replace the switch, if necessary.



67U04X-130

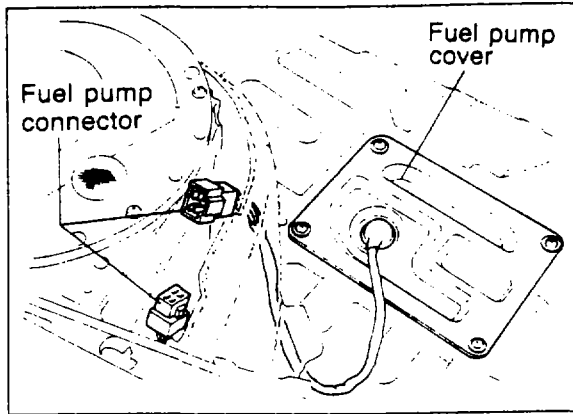
## INHIBITOR SWITCH (A/T)

### Inspection

1. Disconnect the inhibitor switch connector.
2. Connect a circuit tester to the switch terminals ③ and ④.
3. Check the continuity.

Select	Continuity
In "P" and "N"	Yes
In other	No

4. If a problem is found, refer to section 7B for further checks.



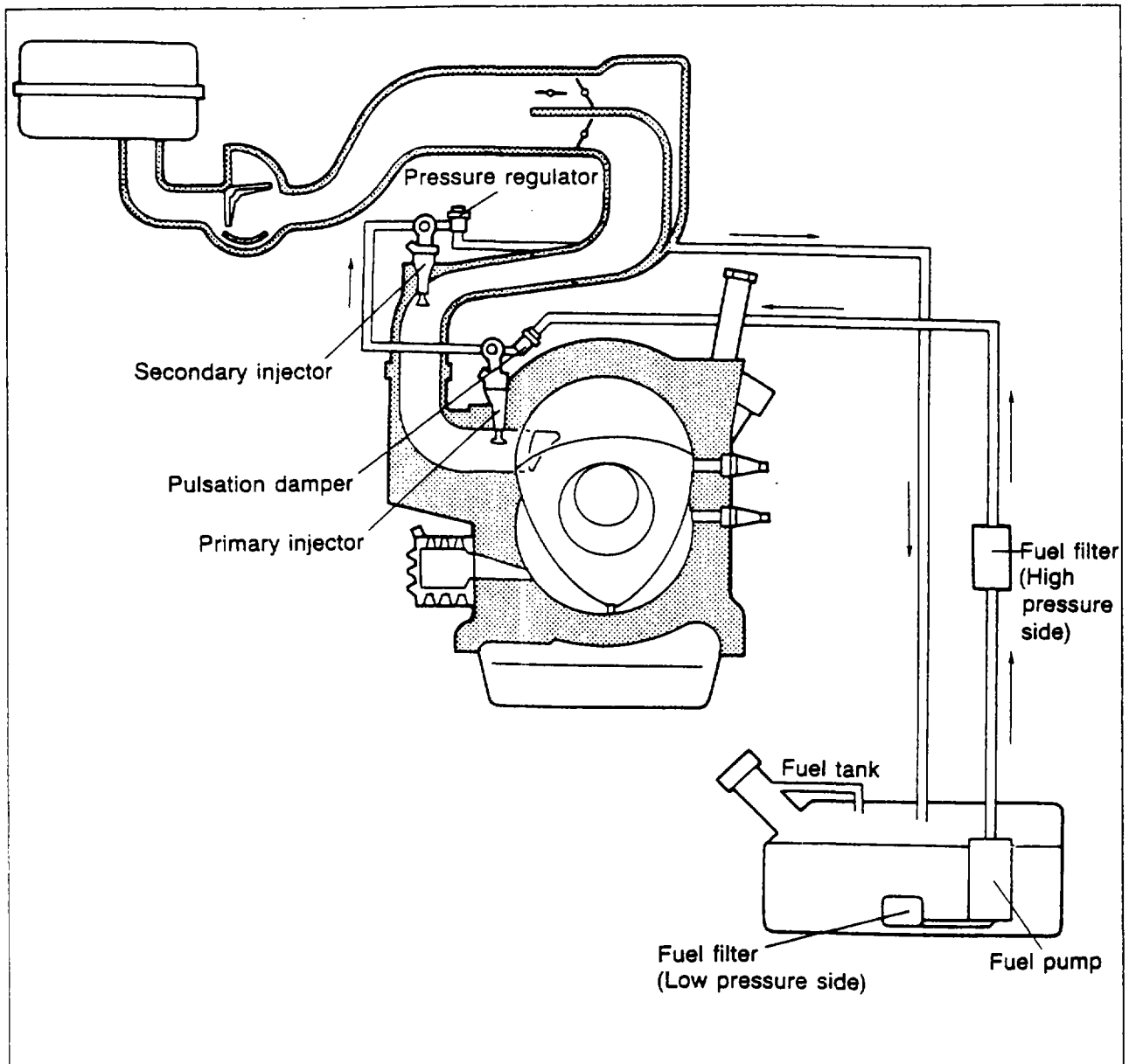
77U04A-255

## FUEL SYSTEM

### FUEL PRESSURE RELEASE AND SERVICING FUEL SYSTEM

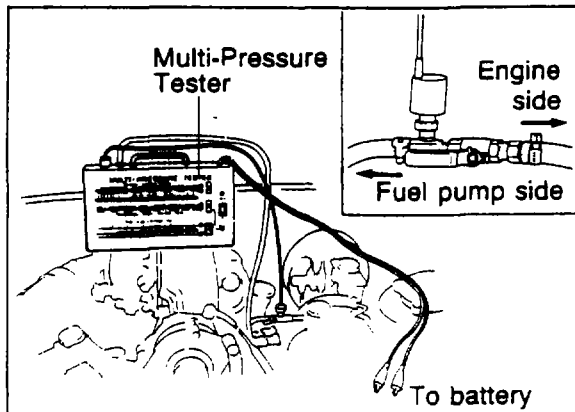
Fuel in the fuel lines remains under high pressure even when the engine is not running.

- a) Before disconnecting a fuel line, release fuel pressure from the fuel lines to eliminate the possibility of injury or fire.
  1. Start the engine.
  2. Disconnect the fuel pump connector with the engine running.
  3. Allow the engine to stall, then turn the ignition switch OFF.
- b) Use a rag to protect from fuel spraying out when disconnecting the hoses, and plug the hoses after removal to prevent leakage.

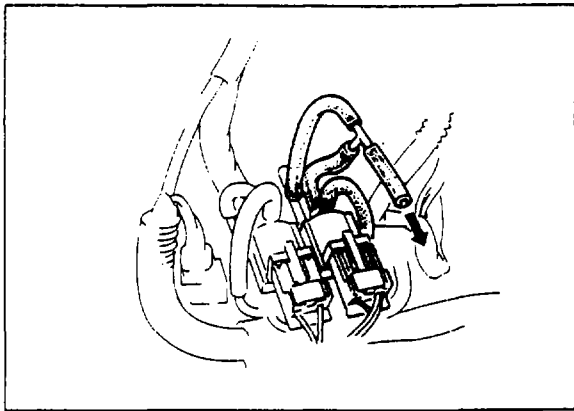


77U04A-227

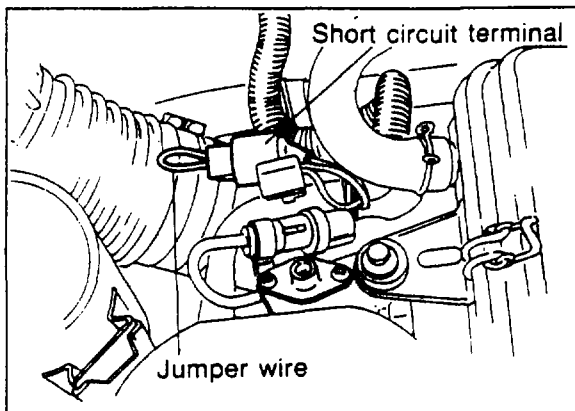
# 4A FUEL SYSTEM



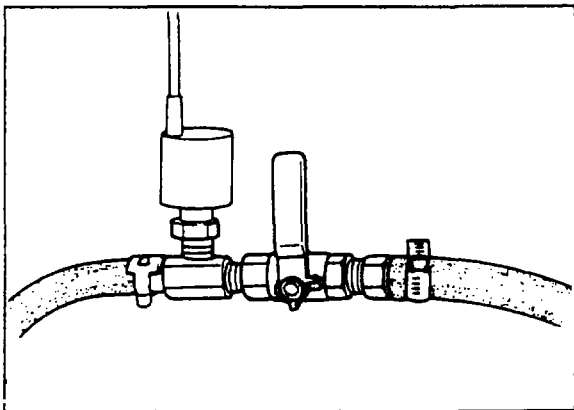
87U04A-043



67G04B-774



67G04B-775



67G04B-776

## HOW TO USE THE MULTI-PRESSURE TESTER

When inspecting the fuel pressure, use the Multi-Pressure Tester (49 9200 750A).

### Warning

**Before connecting the multi-pressure tester (49 9200 750A), release the fuel pressure from the fuel line to eliminate possibly causing injury or a fire. (Refer to 4A—65)**

1. Disconnect the negative battery terminal.
2. Disconnect the fuel main hose from the fuel main pipe.
3. Connect a **Multi-Pressure Tester (49 9200 750A) Adapter** between fuel main hose and fuel main pipe.

### Caution

**Do not reverse the adapter connection.**

4. Disconnect the vacuum hose from the EGR solenoid valve, and connect the **Multi-Pressure Tester (49 9200 750A) Vacuum Hose** using three-way joint.
5. Connect the negative battery terminal.
6. Connect the **Multi-Pressure Tester (49 9200 750A) Wires** to the battery.

7. Connect the terminals of the check connector (yellow connector) with a jumper wire. Turn on the ignition switch to operate the fuel pump.
8. Check for fuel leaks.
9. Check the fuel pressure after checking fuel leakage.

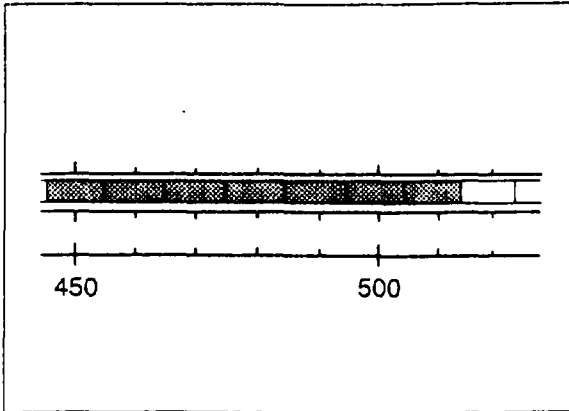
### Caution

**Afer checking fuel leakage, turn off the ignition switch and disconnect the jumper wire from the check connector.**

## FUEL PRESSURE

### Fuel Pump

1. Connect the terminals of the check connector (yellow connector) with a jumper wire. Turn on the ignition switch to operate the fuel pump.
2. Move the lever on the adapter as shown in the figure.



87U04A-044

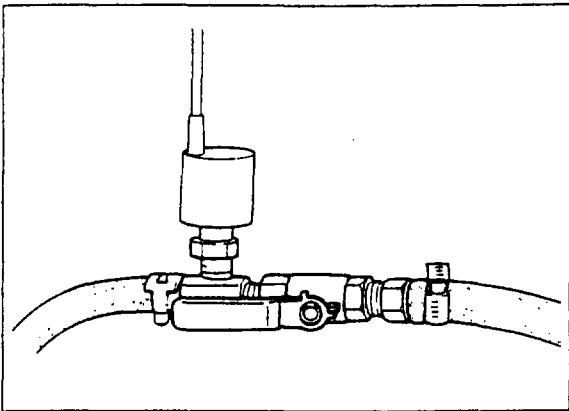
3. Check the fuel pump pressure.

**Fuel pump pressure: 441—588 kPa  
(4.5—6.0 kg/cm<sup>2</sup>, 64—85.3 psi)**

4. If it is not within specified value, check the wiring harness and main relay.

When these are normal, replace the fuel pump.

5. After checking fuel pump pressure, turn OFF the ignition switch and disconnect the jumper wire from the check connector.

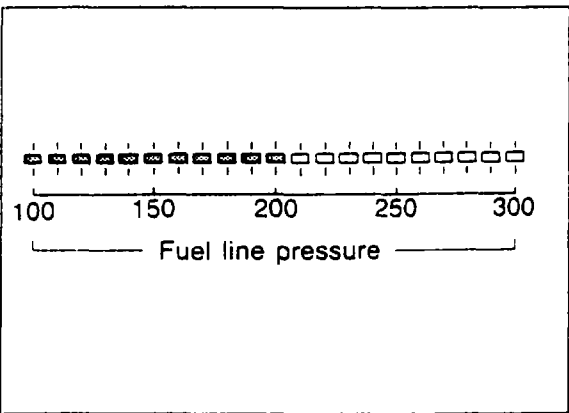


67G04B-778

### Fuel Line

1. Warm up the engine to the normal operating temperature and run it at idle.

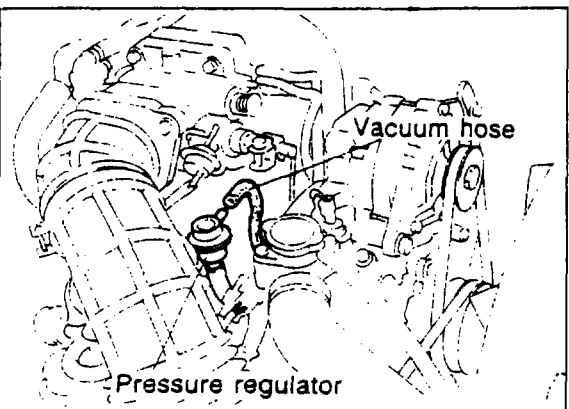
2. Move the lever on the adapter as shown in the figure.



87U04A-045

3. Check the fuel line pressure.

**Fuel line pressure: Approx 196 kPa  
(2.0 kg/cm<sup>2</sup>, 28.4 psi)**



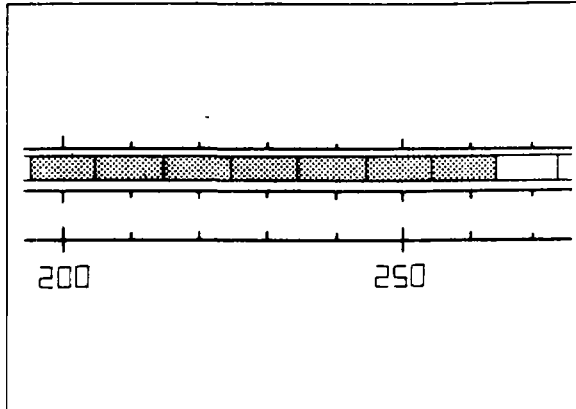
87U04A-046

4. Disconnect the vacuum hose from the pressure regulator, and check the fuel line pressure again.

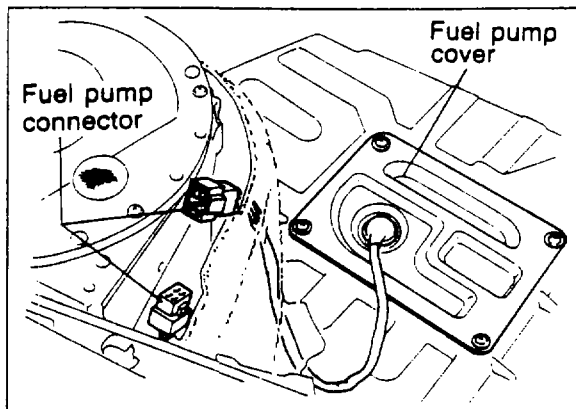
**Fuel line pressure: 235—275 kPa  
(2.4—2.8 kg/cm<sup>2</sup>, 34.1—39.8 psi)**

5. If it is not within specified value, replace the pressure regulator.

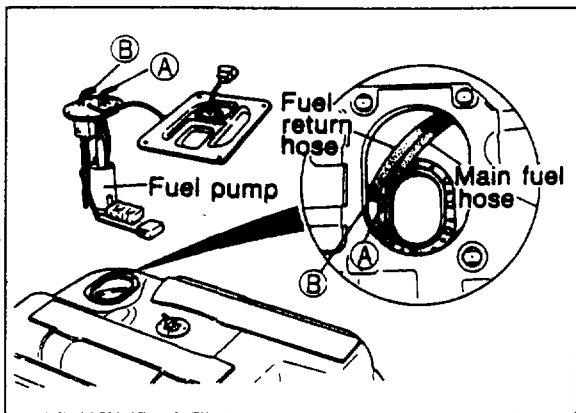
# 4A FUEL SYSTEM



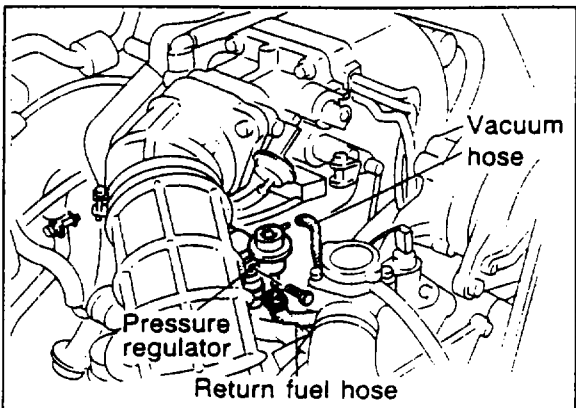
67G04B-781



87U04A-047



67G04B-783



87U04A-048

## Injection pressure

When the trouble is poor acceleration or hesitation, check the injection pressure.

1. Run the vehicle and measure the injection pressure on the **Multi-Pressure Tester**.

## Fuel pressure (Injection pressure)

Approx. 235—275 kPa

(2.4—2.8 kg/cm<sup>2</sup>, 34.1—39.8 psi)

2. If the injection pressure is lower than specifications, check the following points.
  - a) Fuel pump outlet pressure.
  - b) Fuel filter clog.
3. If the injection pressure is higher than specifications, check the following points.
  - a) Fuel return pipe clog.
  - b) Fuel line pressure.

## REMOVAL

### Warning

**Before removing the fuel pump and pressure regulator, release the fuel pressure from the fuel line to eliminate possibly causing injury or a fire. (Refer to 4A—65)**

## Fuel Pump

1. Lift up the rear mat.
2. Remove fuel pump cover.
3. Disconnect the fuel pump connector.
4. Disconnect the fuel main hose and the fuel return hose.
5. Remove the fuel pump screws.
6. Remove the fuel pump from the fuel tank.

## Installation

Install in the reverse order of removal.

## Pressure Regulator

1. Disconnect the vacuum hose.
2. Disconnect the return fuel hose and fuel main hose.
3. Remove the pressure regulator.

### Warning

**a) Cover the hose with a cloth as a small amount of fuel will come out when it is disconnected.**

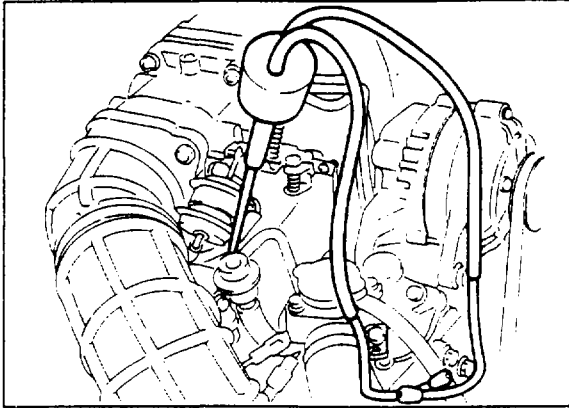
**b) Plug the fuel hoses to prevent leakage.**

## Installation

Install in the reverse order of removal.

### Caution

**Check for fuel leaks after installing the pressure regulator.**



67U04X-139

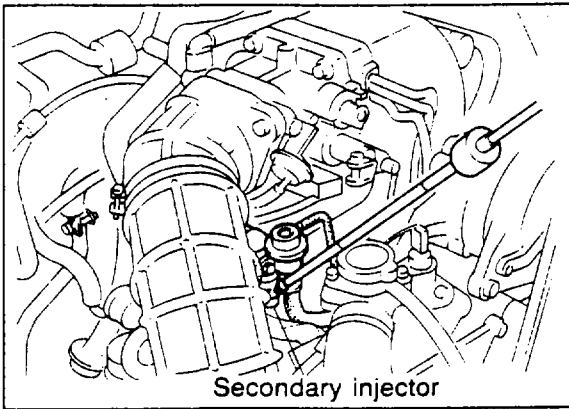
## INJECTOR

### On Vehicle Inspection

#### Operation sound

#### Primary injectors

Check the operating sound of the injectors, using a sound scope as shown in the figure. Check the operating sound of the primary injectors at idle speed and during acceleration.

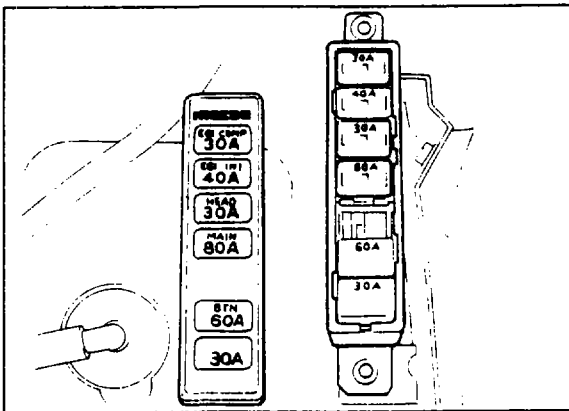


Secondary injector

87U04A-058

#### Secondary injectors

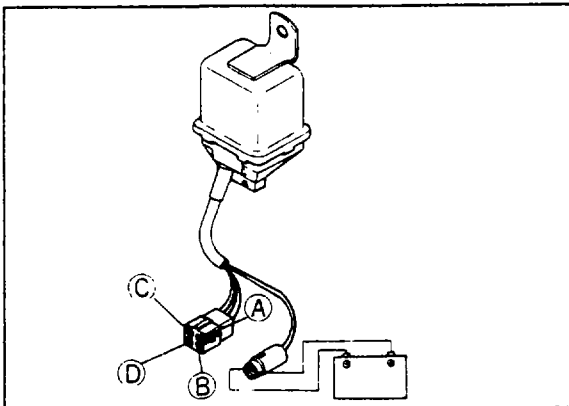
1. Disconnect the vacuum hose from the boost sensor.
2. Disconnect the throttle sensor connector.
3. Start the engine and increase the engine speed.
4. Check the operating sound of the secondary injectors **over 3,500 rpm**.



87U04A-049

If operating sounds are not heard, check the following:

1. Check resistance of the crank angle sensor. (Refer to 4A—52)
2. Check the wire from the crank angle sensor to the control unit for continuity.
3. Replace the resistor, if necessary.
4. Check the EGI main fuse.

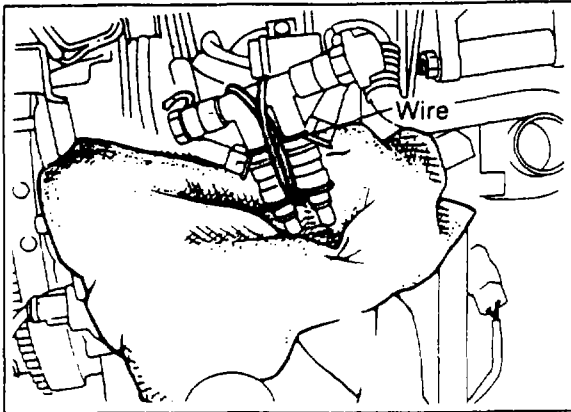


87U04A-050

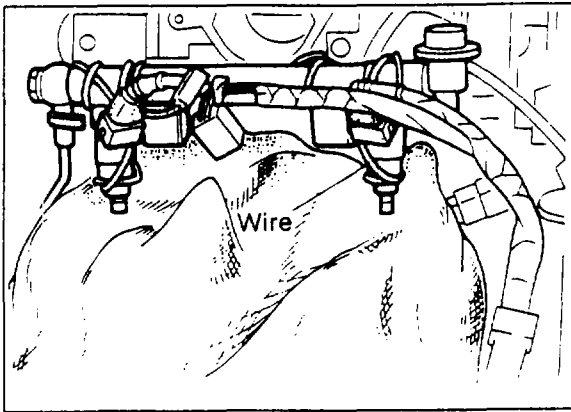
5. Check the operating sound of the main relay by turning the ignition switch on and off.
6. Apply 12V and ground to the 2-prong connector of the main relay, and using a circuit tester check that there is continuity at terminals.

Operation Terminals	12V Not applied	12V Applied
A — B	No continuity	Continuity
C — D		

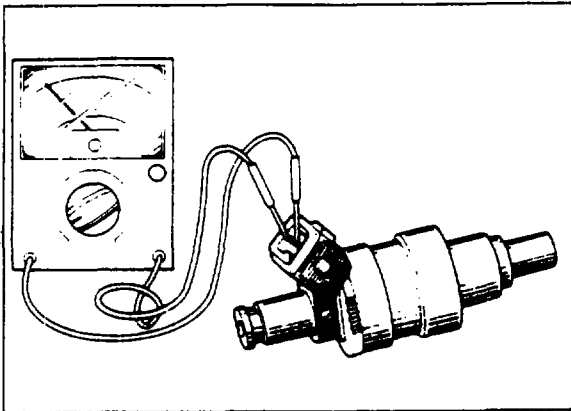
# 4A FUEL SYSTEM



77U04A-232



67U04X-145p



87U04A-051

## Inspection

### Warning

Before performing the following procedures, release the fuel pressure from the fuel line to eliminate possibility of injury or fire. (Refer to 4A—65)

### Fuel injection leakage test

- 1 Remove the dynamic chamber and intake pipe, if the primary injectors are to be tested. (Refer to 4A—55)
- 2 Remove the delivery pipe attaching bolts.
- 3 Affix the injectors to the delivery pipe with wire.

### Caution

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

### Warning

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

- 4 Connect the terminals of the fuel pump check connector with a jumper wire (Refer to 4A—66). Turn on the ignition switch.
- 5 Check that fuel does not leak from the injector nozzles.

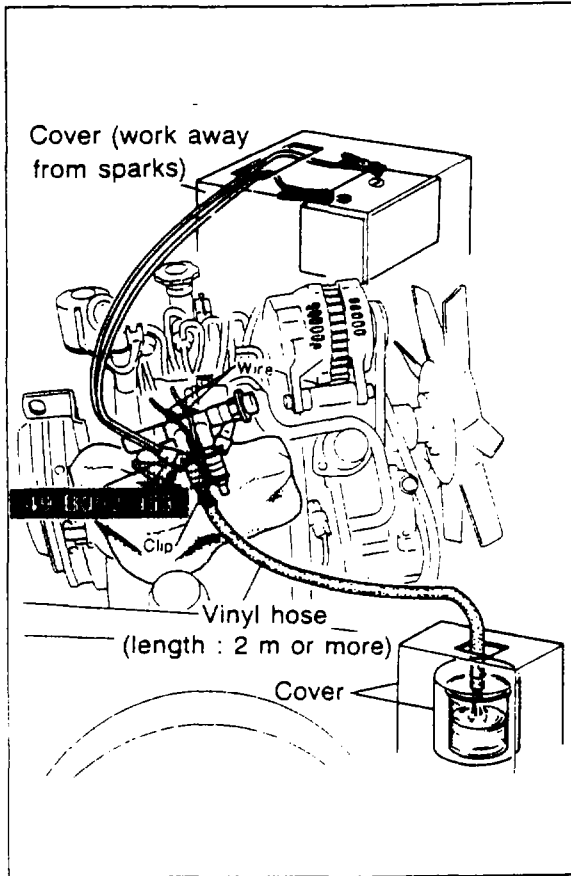
### Note

After 5 minutes a very slight amount of fuel leakage from the injector is acceptable.

### Resistance

Check the resistance of the injector using a circuit tester.

**Resistance: 12—16  $\Omega$**



87U04A-052

### Injection volume test (Primary)

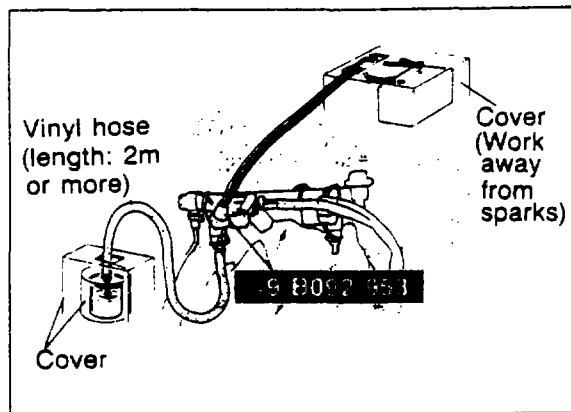
Affix the injectors to the primary delivery pipe with wire as explained above.

1. Connect a suitable vinyl hose to the injector.
2. Connect **injector checker** (49 B092 953) to the injector.
3. Connect the terminals of the fuel pump check connector with a jumper wire (Refer to 4A-66). Turn on the ignition switch.
4. Connect the **injector checker** to the battery.
5. Check the injection volume with a graduated container.

**Volume: 111—118 cc (6.8—7.2 cu in)/15 sec.**

### Warning

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



67U04X-148

### Injection volume test (Secondary)

Check the injection volume in the same manner as you did the primary injectors.



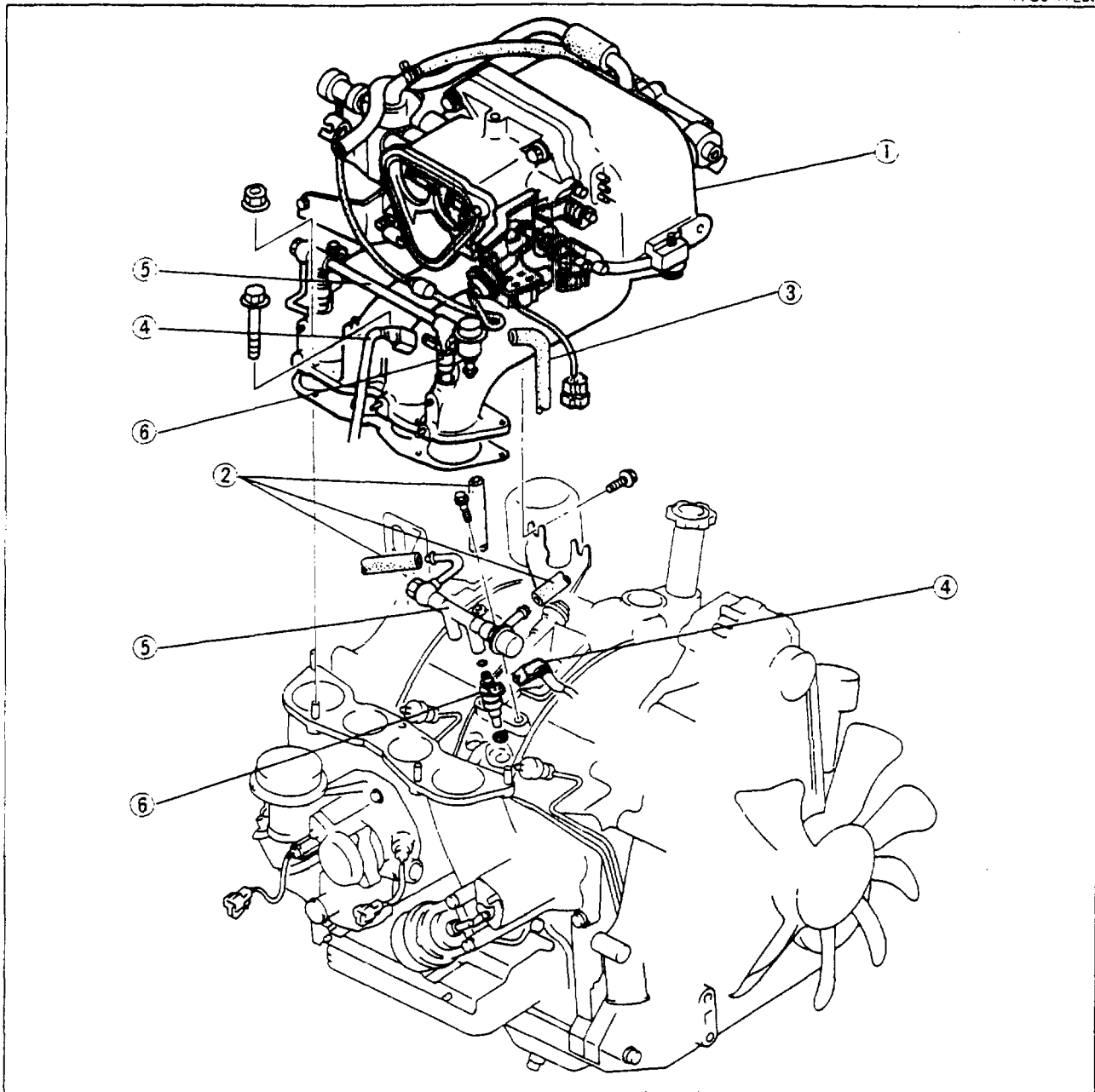
# 4A FUEL SYSTEM

## Removal

### Warning

Before performing the following procedures, release the fuel pressure from fuel line to eliminate possibility of injury or fire (Refer to 4A—65).

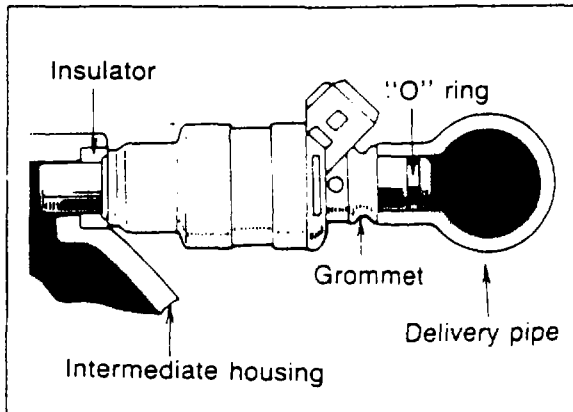
77U04A-233



67U04X 150

Remove in the sequence as shown in the figure.

1. Dynamic chamber and intake pipe  
(Refer to 4A—55)
2. Fuel hoses
3. Vacuum hoses
4. Injector connectors
5. Delivery pipes
6. Injectors



67U04X-151o

## Installation

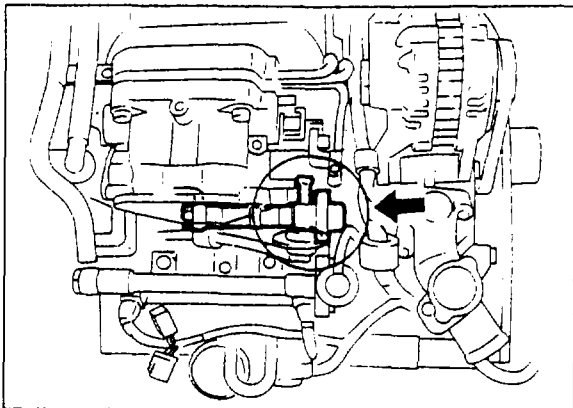
Install the injectors in the reverse order of removal.

### Caution

a) Replace "O" rings with new ones when installing.

Use a lubricant and be careful not to damage the "O" rings during installation.

b) Check for leaks with fuel pressure applied (Refer to 4A-67) before installing the dynamic chamber and intake pipe.

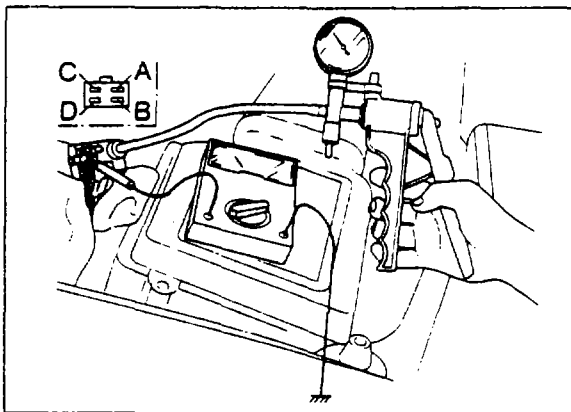


67U04X-152

## PULSATION DAMPER

### Inspection

1. Start the engine and run it at idle.
2. Place a finger on the pulsation damper.
3. Check that the pulsation damper pulsates.
4. Replace the pulsation damper, if necessary.



77U04A-234

## BOOST SENSOR

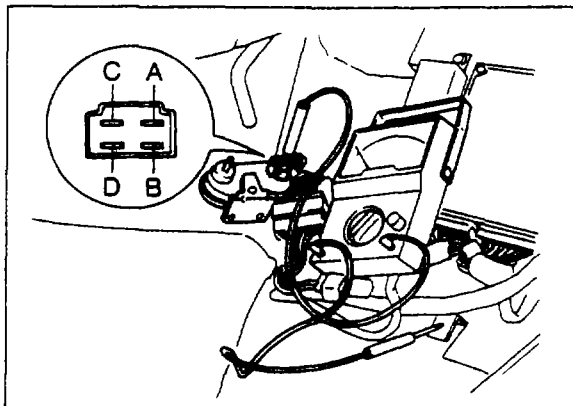
### Inspection

1. Disconnect the vacuum hose from boost sensor.
2. Connect a voltmeter to the boost sensor (D) terminal.
3. Apply **100 mmHg (3.9 inHg)** vacuum to the boost sensor using a vacuum pump tester.
4. Turn the ignition switch ON and check the voltmeter reading.

### Voltmeter reading:

**approx. 2.5—3.5V at 100 mmHg (3.9 inHg) of vacuum**

5. Replace the sensor, if necessary.



67U04X-154

## ATMOSPHERIC PRESSURE SENSOR

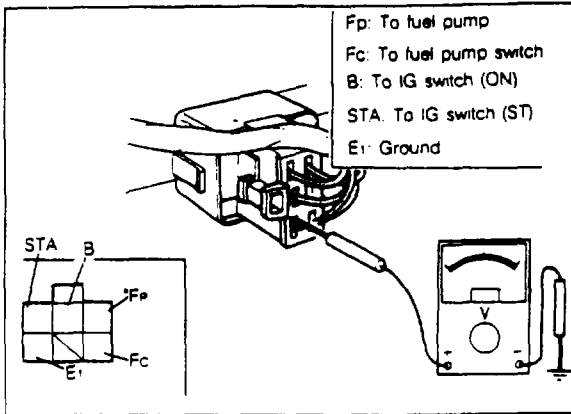
### Inspection

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.

# 4A FUEL SYSTEM

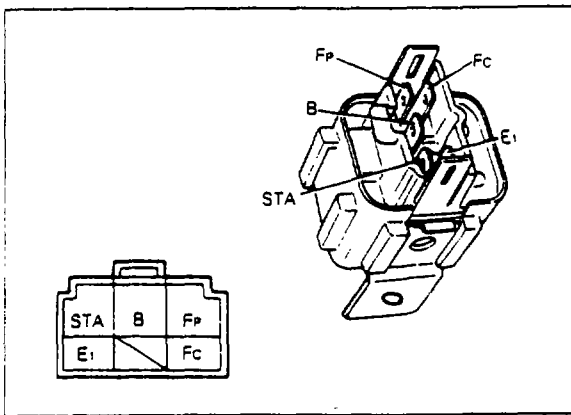


## CIRCUIT OPENING REPLAY

### Inspection of Terminal Voltage

1. Check voltage between each terminal and ground by using a voltmeter.

Condition \ Terminal	Fp	Fc	B	STA	E1
IG SW: ON	0V	12V	12V	0V	0V
Measuring plate: open	12V	0V	12V	0V	0V
IG SW: ST	12V	0V	12V	12V	0V

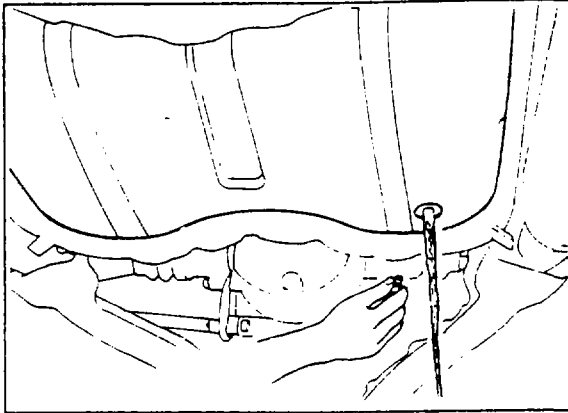


### Inspection of Resistance

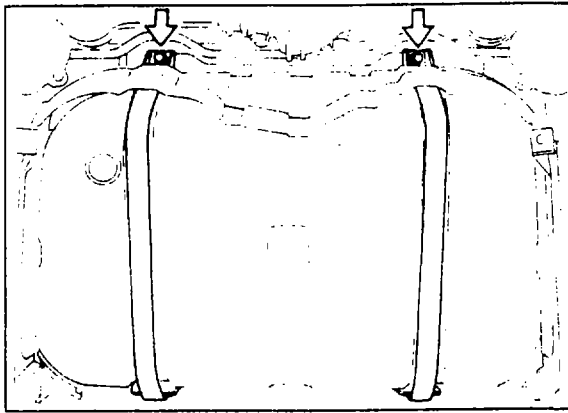
1. Check the resistance between the terminals by using an ohmmeter.

Between terminals	Resistance ( $\Omega$ )
STA $\leftrightarrow$ E1	15—30
B $\leftrightarrow$ Fc	80—150
B $\leftrightarrow$ Fp	$\infty$

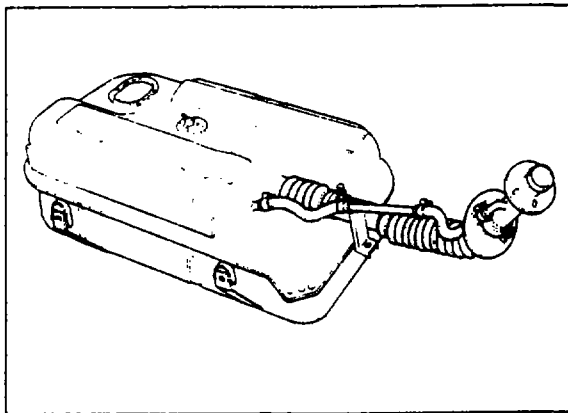
2. If the resistance is not within specification, replace the circuit opening relay.



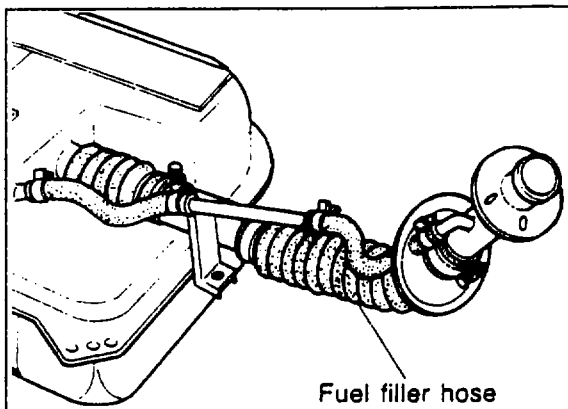
77U04A-235



67U04X-156



67U04X-157



67U04X-158

## FUEL TANK Removal

### Warning

**Before performing the following procedures, release the fuel pressure from the fuel line to eliminate possibility of injury or fire. (Refer to 4A—65)**

1. Drain the fuel tank.
2. Remove the fuel pump (Refer to 4A—66).
3. Disconnect the fuel filler hose from the fuel tank.
4. Raise the rear of the vehicle and support it with stands.
5. Remove the fuel tank protectors.
6. Disconnect the evaporation hoses from the fuel tank.
7. Remove the fixing band attaching bolts.
8. Remove the fuel tank.

### Note

**When removing the fuel tank, keep sparks, cigarettes and open flames away from the fuel tank.**

## Inspection

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

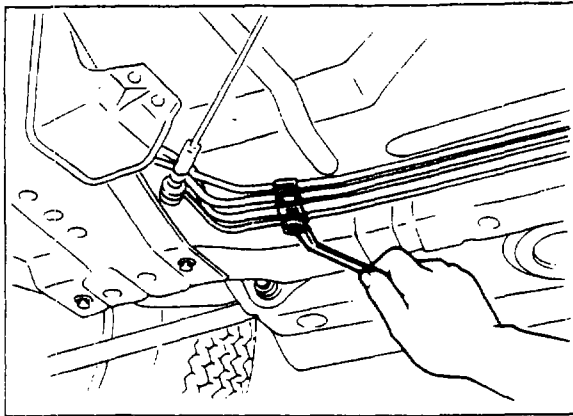
### Warning

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

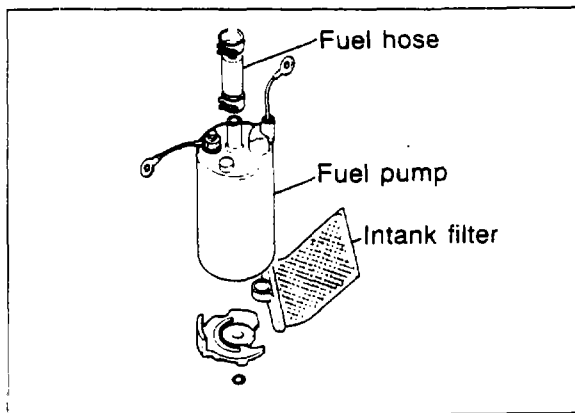
## Installation

Install the fuel tank in the reverse order of removal.

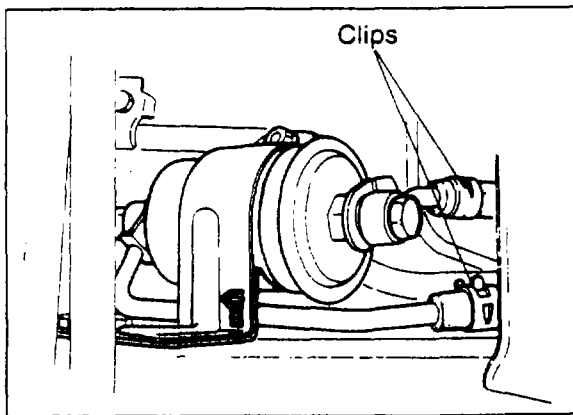
1. Push the fuel main hose, fuel return hose and evaporation hoses into the fuel tank fittings until they are inserted **at least 25 mm (1.0 in)**.
2. Push the fuel filler hoses into the fuel tank pipe and filler pipe **at least 40 mm (1.6 in)**.



67U04X-159



77U04A-236



77U04A-237

## FUEL LINE

### Inspection

1. Check the fuel lines for leaks and tighten the fuel line connections, if necessary.
2. Drain the fuel tank and blow out the fuel lines with compressed air, if an excessive amount of dirt or water is found.
3. Push the fuel hose onto the fuel pipe until the fuel pipe is inserted **at least 30—35 mm (1.2—1.4 in.)**.

## FUEL FILTER (LOW PRESSURE SIDE)

### Replacement

#### Warning

**Before performing the following procedures, release the fuel pressure from the fuel line to eliminate possibility of injury or fire. (Refer to 4A—65)**

1. Remove the fuel pump. (Refer to 4A—66)
2. Remove the rubber boot and clip.
3. Remove the filter and install a new filter.

#### Note

**Always use a new clip and filter.**

## (HIGH PRESSURE SIDE)

### Replacement

#### Warning

**Before performing the following procedures, release the fuel pressure from the fuel line to eliminate possibility of injury or fire. (Refer to 4A—65)**

The fuel filter is to be replaced at intervals, following the maintenance schedule.

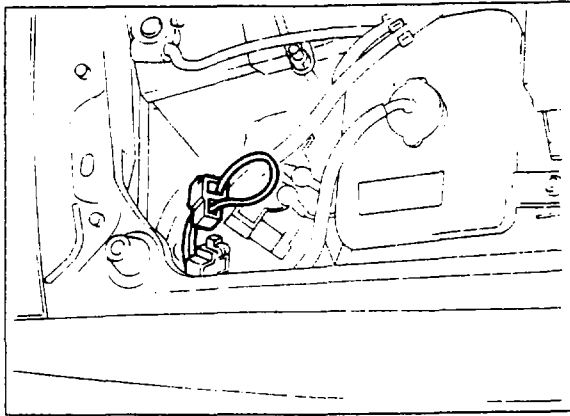
1. Raise the front of the vehicle and support it with stands.
2. Loosen the clips at both ends of the filter and disconnect the fuel hoses.
3. Remove the fuel filter with the bracket.
4. Install a new filter and connect the fuel hoses.

#### Warning

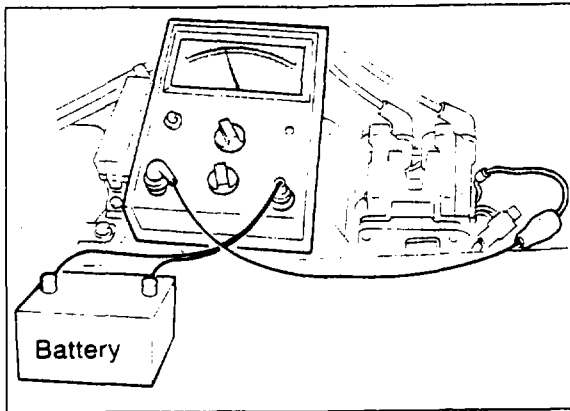
**Always work away from sparks or open flames.**

#### Note

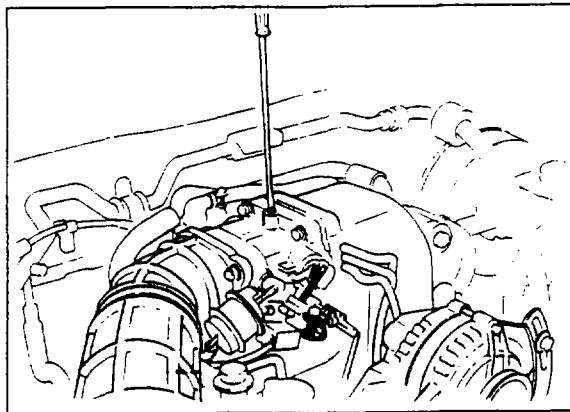
**When installing the filter, push the fuel hoses fully onto the fuel filter and secure the hoses with clips.**



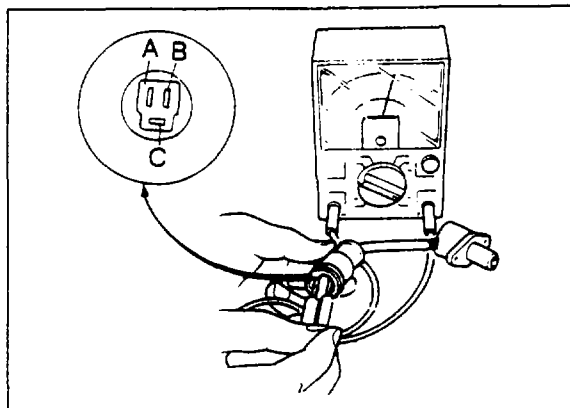
77U04A-238



67U04X-162p



67U04X-163



## IDLE SPEED AND IDLE MIXTURE

### Note

- To check or adjust idle speed, connect a tachometer to the service coupler at the trailing side coil with igniter.
- If the tachometer does not function correctly on the trailing side coil with igniter, reconnect at the leading side coil with igniter (black coupler).
- If using an inductive (secondary pick up) type tachometer, connect it only at the trailing side high tension leads. If connected on the leading side coil, it will function incorrectly.

### IDLE SPEED

Before checking or adjusting the idle speed, follow these directions.

- Switch off all accessories.
- Connect a tachometer to the engine.
- Warm up the engine to normal operating temperature.
- Connect a jumper wire to the terminals of initial set coupler.

1. Check and adjust the throttle sensor. (Refer to 4A—50)
2. Remove the blind cap and adjust the idle speed by turning the air adjust screw.

**Idle speed: 725—775 rpm (A/T: N Range)**

3. Install the blind cap and disconnect the jumper wire from the initial set coupler.

### Caution

If the jumper wire is not removed, the engine performance is reduced. Make certain the jumper wire is removed.

### IDLE MIXTURE

#### NOTE

Usually idle mixture adjustment is unnecessary. Idle mixture adjustment should be performed only when the variable resistor or the engine is replaced.

#### Variable Resistor Inspection

1. Disconnect the variable resistor connector.
2. Check the resistance of the variable resistor using a circuit tester.

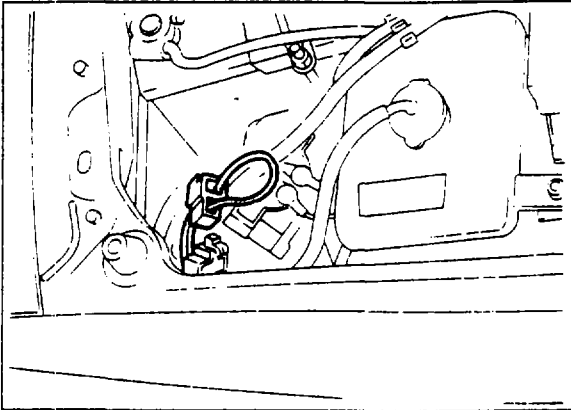
#### Resistance

A—C: 0.5—4.5 k $\Omega$

B—C: 0.5—4.5 k $\Omega$

3. Replace the resistor, if necessary.
4. Adjust the idle mixture.

## 4A IDLE SPEED AND IDLE MIXTURE

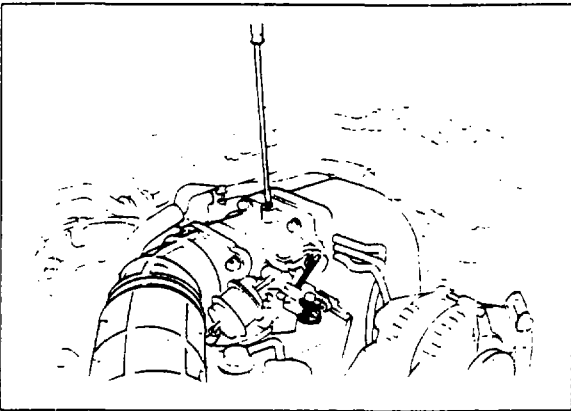


77U04A-239

### Adjustment of Idle Mixture

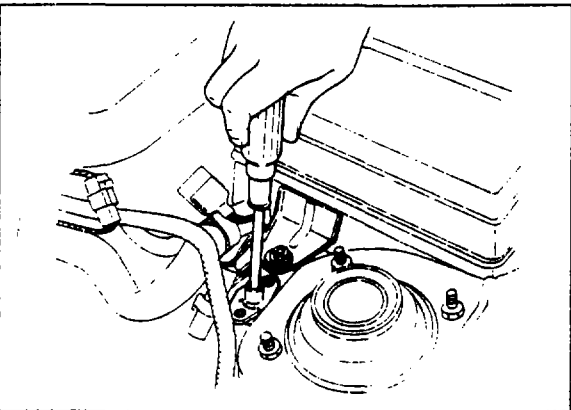
Before adjusting the idle mixture, follow these directions.

- Switch off all accessories.
- Connect a tachometer to the engine.
- Warm up the engine to normal operating temperature.
- Connect a jumper wire to the terminals of initial set coupler.



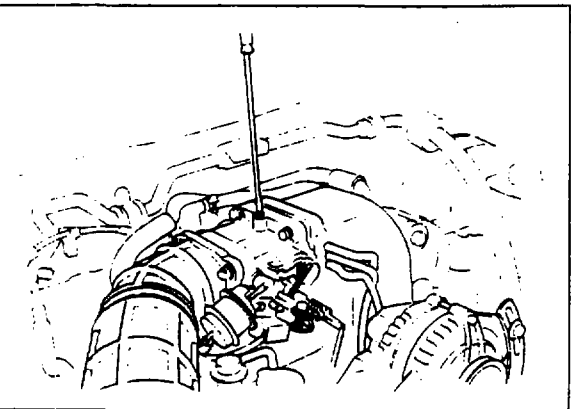
67U04X-165p

1. Check and adjust the throttle sensor. (Refer to 4A-50)
2. Remove the blind cap and adjust the idle speed to **750 rpm** by turning the air adjust screw.



67U04X-166

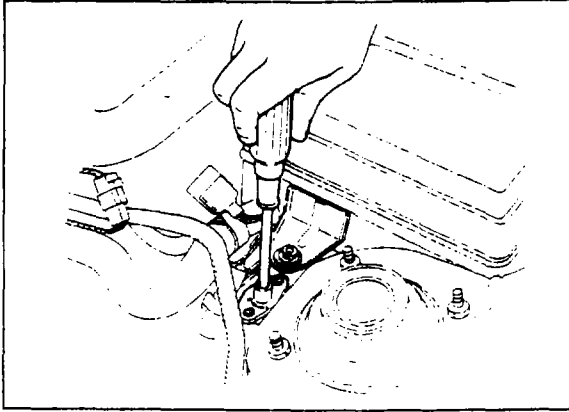
3. Set the idle speed to the highest rpm by turning the variable resistor.



67U04X-167

4. Reset the idle speed to **750 rpm** by turning the air adjust screw.

## IDLE SPEED AND IDLE MIXTURE 4A

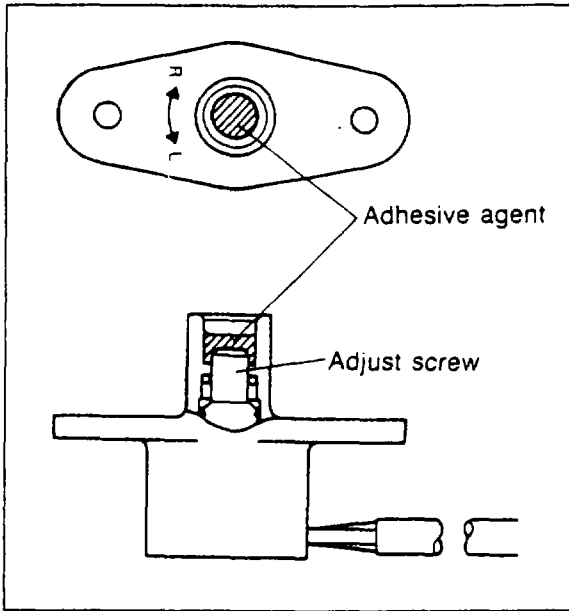


67U04X-168

5. Turn the variable resistor **counterclockwise** until the idle speed becomes **730 rpm**, and then turn it **clockwise** to reset the speed to **750 rpm**.
6. Install the blind cap and disconnect the jumper wire.

### Caution

If the jumper wire is not removed, the engine performance will be reduced. Make certain the jumper wire is removed.

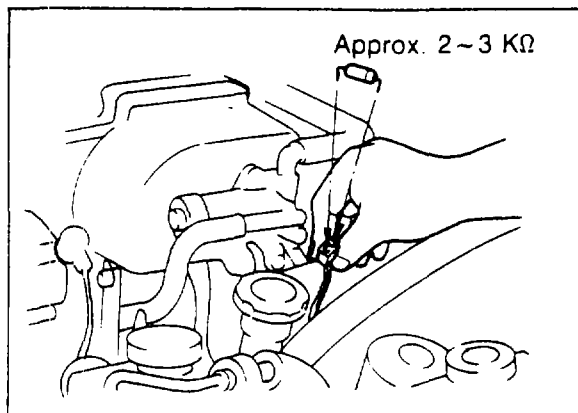


67U04X-169

7. Plug the head of the adjust screw with **adhesive agent** (P/N N304 23 795).



# 4A HOT START ASSIST SYSTEM



67U04X-170

## HOT START ASSIST SYSTEM

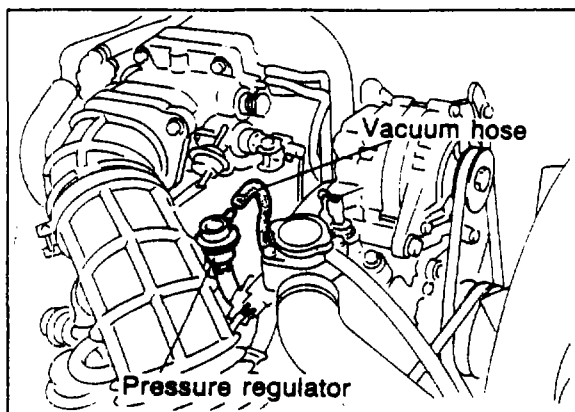
### ON VEHICLE INSPECTION

1. Disconnect the intake air temperature sensor connector.
2. Connect a resistor (2—3 kΩ) to the terminals of the sensor connector.

After starting	Engine speed
for 90 sec	800 rpm
	850 rpm (A/T; D range)
after 90 sec	750 rpm

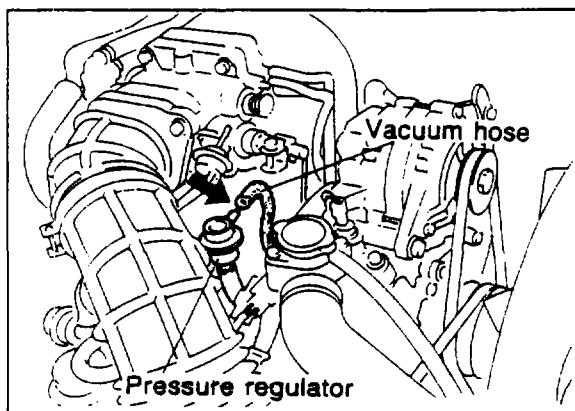
67U04X-171

3. Connect a tachometer to the engine.
4. Start the engine and check the engine speed as shown in the chart.



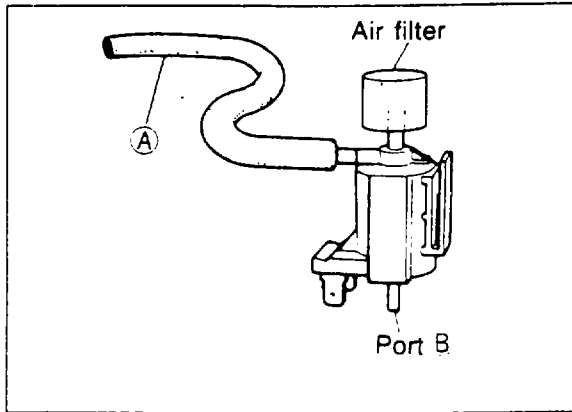
67U04X-172

5. Stop the engine and disconnect the vacuum hose from the pressure regulator.

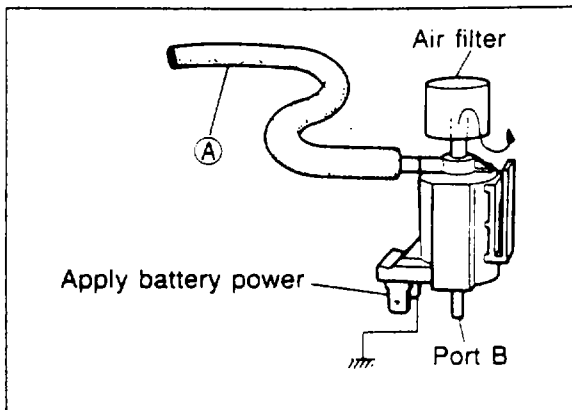


67U04X-173

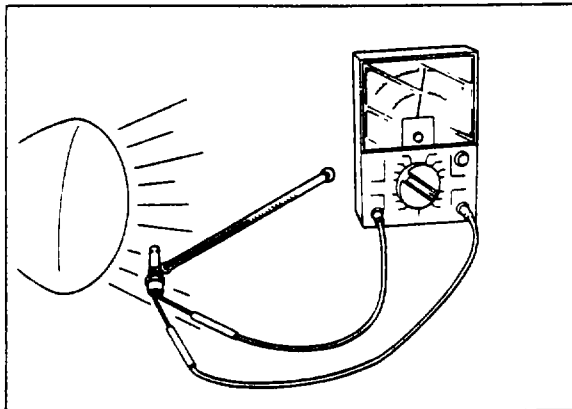
6. Place a finger on the vacuum hose opening port. Start the engine and check the following:
  - **For 90 seconds** after engine is started, air is not pulled into port.
  - **After 90 seconds**, air is pulled into port.



67U04X-174



67U04X-175



67U04X-176

## PRESSURE REGULATOR CONTROL SOLENOID VALVE

### 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 passes through the valve and flows from port (B).

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 passes through the valve and flows from the air filter.

## INTAKE AIR TEMPERATURE SENSOR (ON DYNAMIC CHAMBER)

### Removal

Remove the intake air temperature sensor from the dynamic chamber.

### Installation

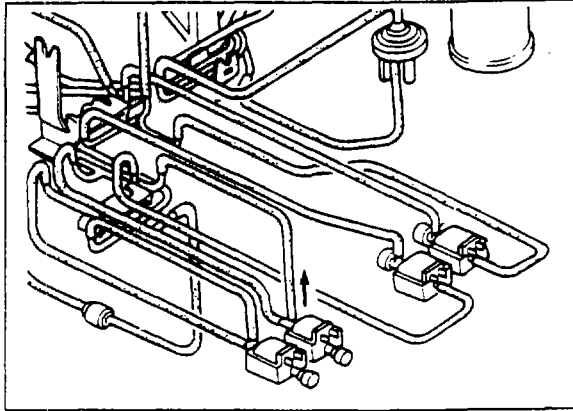
Install in the reverse order of removal.

### Inspection

1. Connect a circuit tester to the sensor terminals.
2. Check the resistance of the sensor.

Temperature	Resistance
20°C ( 68°F)	41.5 ± 4.15 kΩ
50°C (122°F)	11.85 ± 1.19 kΩ
85°C (185°F)	3.5 ± 0.35 kΩ

# 4A EXHAUST GAS RECIRCULATION (EGR) CONTROL SYSTEM



87U04A-053

## EXHAUST GAS RECIRCULATION (EGR) CONTROL SYSTEM

### EGR VALVE

#### Inspection

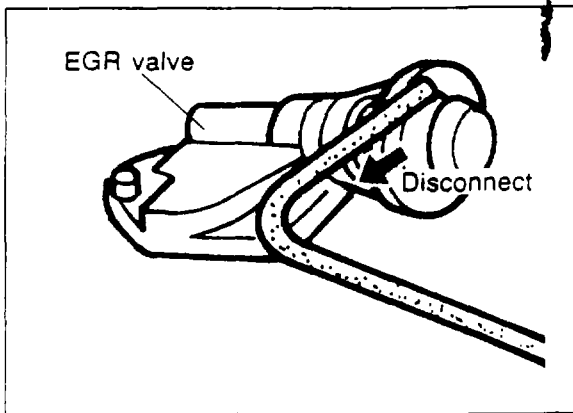
- 1 Warm up the engine and run it at idle.
- 2 Disconnect the vacuum hose from the EGR solenoid valve.
- 3 Apply vacuum to the EGR valve with a vacuum pump.
- 4 Assure that the engine either runs rough or stalls.

#### Removal

- 1 Remove the dynamic chamber. (Refer to 4A—55)
- 2 Disconnect the vacuum hose from the EGR valve.
- 3 Remove the valve.

#### Installation

Install in the reverse order of removal.

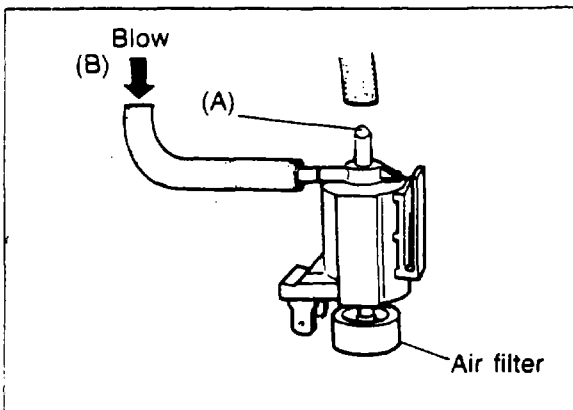


67U04X-178o

### EGR SOLENOID VALVE

#### Inspection

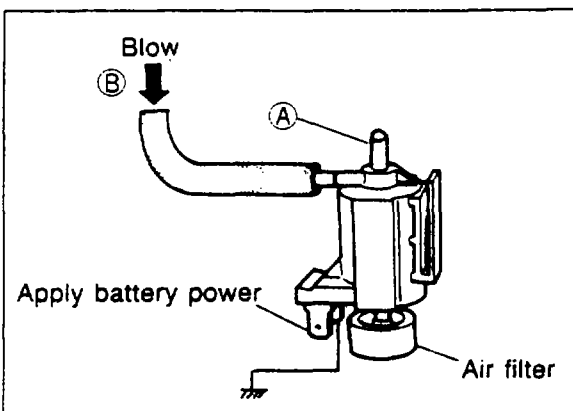
- 1 Disconnect the vacuum hose from the EGR solenoid valve.
- 2 Blow through the solenoid valve from port (B). Check that air passes through the valve and flows from the air filter.



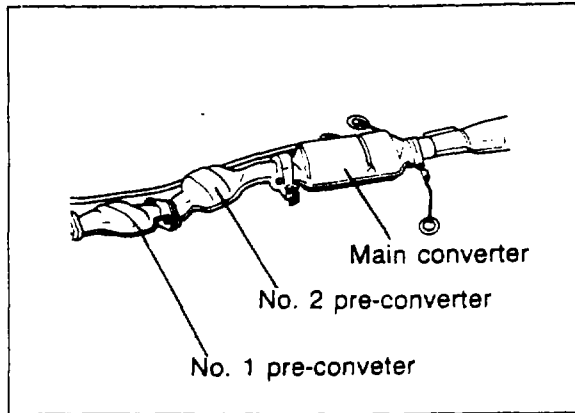
67U04X-179

- 3 Disconnect the EGR solenoid valve connector and connect 12V and a ground to the terminals of the solenoid valve.

- 4 Blow through the solenoid valve from port (B). Check that air passes through the valve and flows from port (A).



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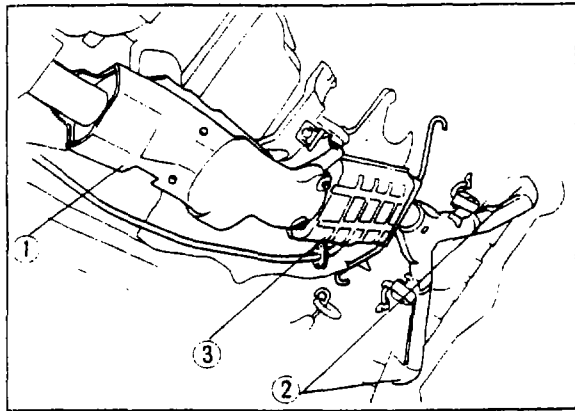


67U04X-184

## CLOSED LOOP CONTROL SYSTEM

### PRE-CONVERTERS AND MAIN CONVERTER Inspection

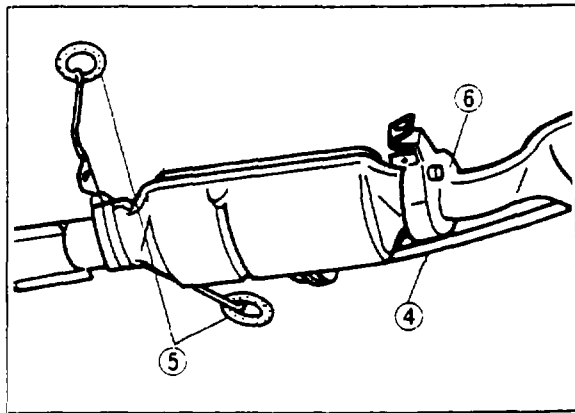
1. Visually inspect the pre-converters and main converter for cracks or damage.
2. Check the pre-converters and main converter connections for tightness.
3. Start the engine and run it at idle.
4. Check for exhaust gas leakage from the pre-converters and main converter connections.



67U04X-185

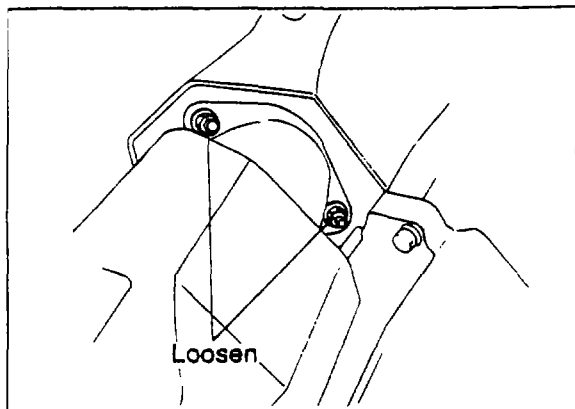
### Removal

1. Remove the lower cover from the pre-converters.
2. Remove the lower covers from the rear of the exhaust pipes.
3. Remove the lower cover from the main converter.



67U04X-186

4. Disconnect the split air pipe from the main converter.
5. Remove the converter bracket rubbers.
6. Remove the nuts attaching the main converter front flange to the No. 2 pre-converter.



67U04X-187

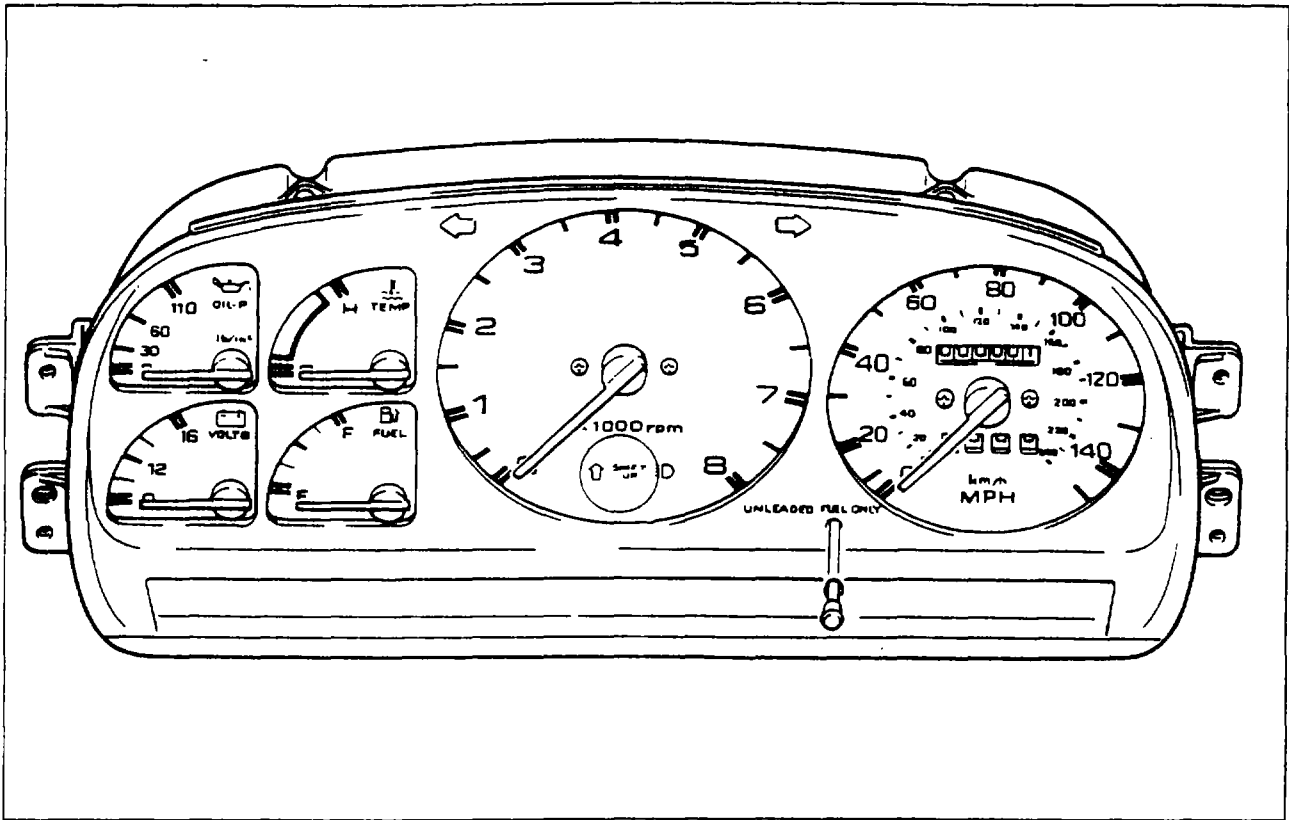
7. Support the main converter to prevent it from dropping.
8. Remove the nuts attaching the rear exhaust pipe to the silencer.
9. Carefully lower the exhaust pipe and main converter assembly from the vehicle.
10. Remove the attaching nuts and remove the converters.

### Installation

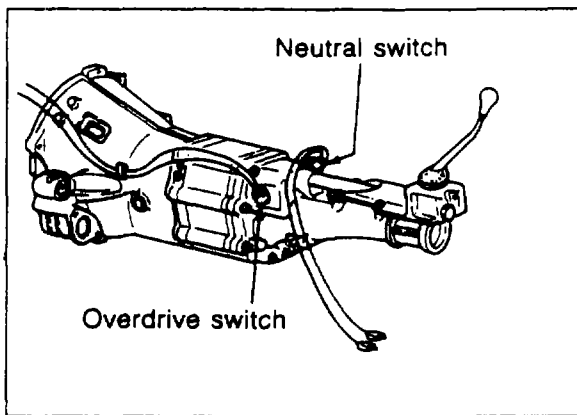
Install in the reverse order of removal.

# 4A SHIFT INDICATOR LIGHT CONTROL SYSTEM

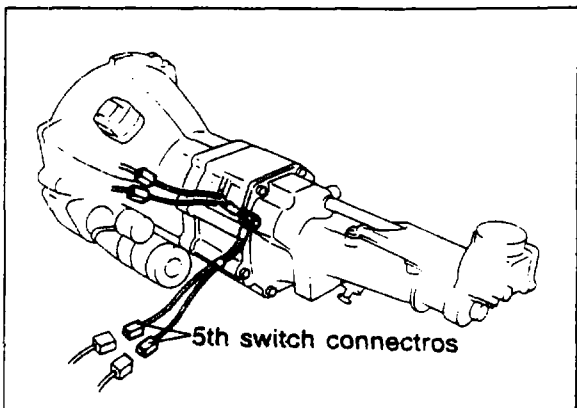
## SHIFT INDICATOR LIGHT CONTROL SYSTEM (ONLY M/T)



67U04X-188



67U04X-189

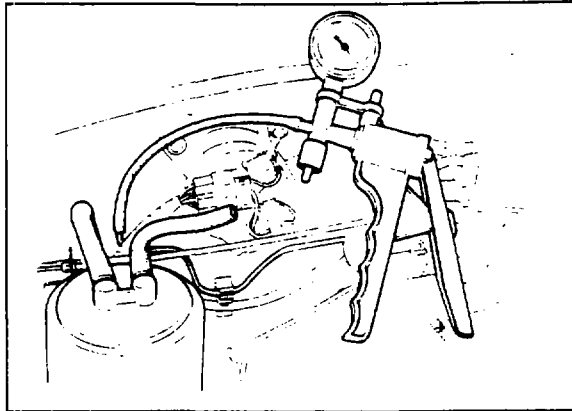


67U04X-190

### SHIFT INDICATOR LIGHT Inspection

1. Warm up the engine and then turn it off.
2. Disconnect the neutral switch connector.
3. Start the engine and increase the engine speed to **above 2,600 rpm**.
4. Check that the shift indicator light comes on.
5. Stop the engine.

6. Disconnect the 5th gear switch connector.
7. Start the engine and increase the engine speed to **above 2,600 rpm**.
8. Check that the shift indicator light does not come on.



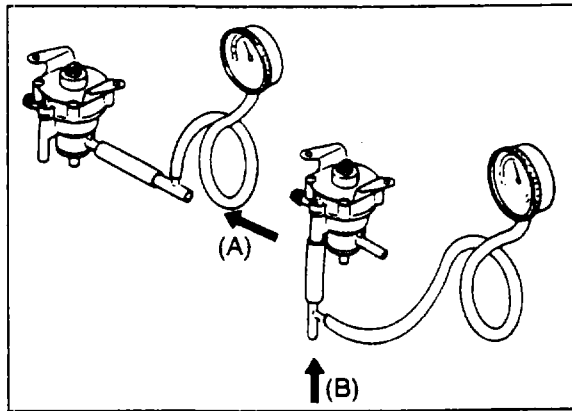
77U04A-241

## CRANKCASE AND EVAPORATIVE EMISSION CONTROL SYSTEM

### EVAPORATIVE LINE

#### Inspection

1. Disconnect the ventilation hose from the canister and connect a vacuum pump tester to the ventilation hose.
2. Operate the vacuum pump tester and make sure no vacuum is held.
3. If vacuum is held, check the check and cut valve and evaporation pipe for blockage.



87U04A-054

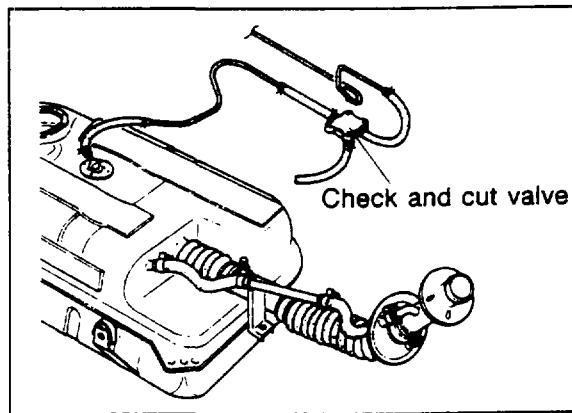
### CHECK AND CUT VALVE

#### Inspection

1. Remove the check and cut valve.
2. Connect a pressure gauge to the passage from the fuel tank.
3. Blow through the valve from (A) and check that the valve opens at a pressure of 0.98—4.9 kPa (0.01—0.05 kg/cm<sup>2</sup>, 0.14—0.71 psi).
4. Remove the pressure gauge and connect it to the passage to atmosphere.
5. Blow through the valve from (B) and check that the valve opens at a pressure of 5.39—6.87 kPa (0.055—0.07 kg/cm<sup>2</sup>, 0.78—1.00 psi).

#### Note

The test should be performed with the valve held horizontally. Otherwise the check balls in the valve will close the passages.



87U04A-055

### Removal

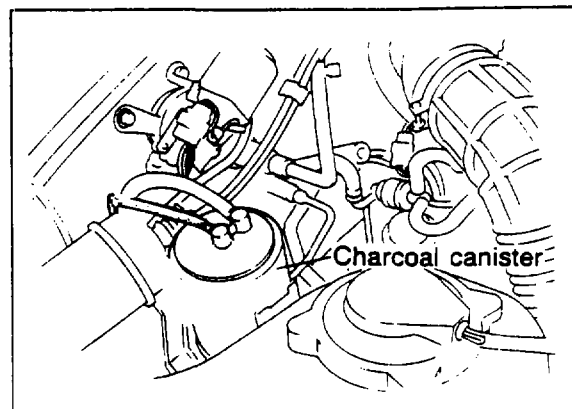
1. Raise the rear of the vehicle and support it with stands.
2. Unfasten the hose bands and disconnect the evaporative hoses from the check and cut valve.
3. Remove the valve.

### Installation

Install in the reverse order of removal noting the hose positions.

#### Caution

- a) When installing the check and cut valve, fully push the evaporative hoses on to the valve and secure the hoses with bands.
- b) When connecting the hoses to the valve, note the direction of the valve fittings.

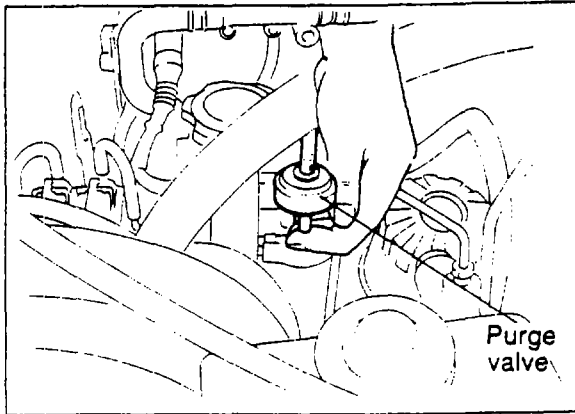


67U04X-195

### CHARCOAL CANISTER

Visually check the canister for leakage or damage.

# 4A CRANKCASE AND EVAPORATIVE EMISSION CONTROL SYSTEM



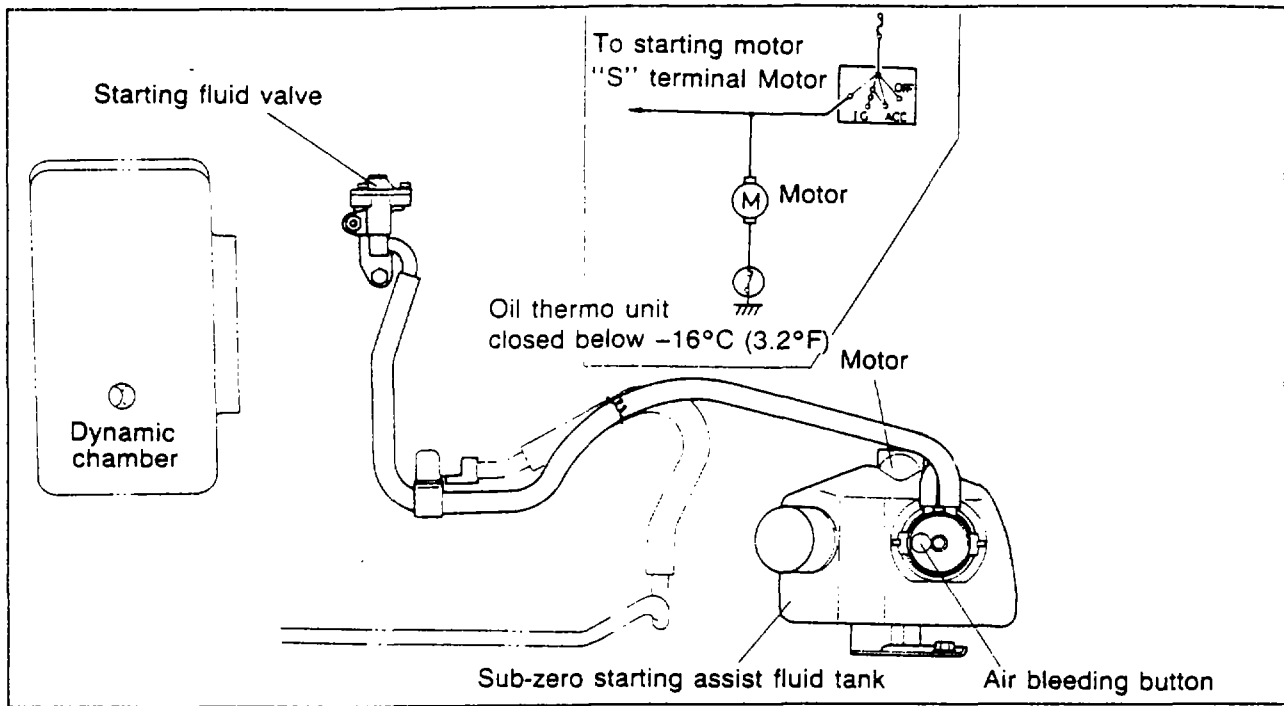
67U04X-196

## PURGE VALVE

### Inspection

1. Disconnect the hose (purge valve to oil filler pipe) from the purge valve.
2. Start the engine and run it at idle.
3. Place a finger on the port opening and check that air is not drawn into the port.
4. Increase the engine speed to **2,000 rpm** and air should be drawn into the port.
5. Replace the valve, if necessary.

SUB-ZERO STARTING ASSIST DEVICE (EXCEPT FOR CALIFORNIA)

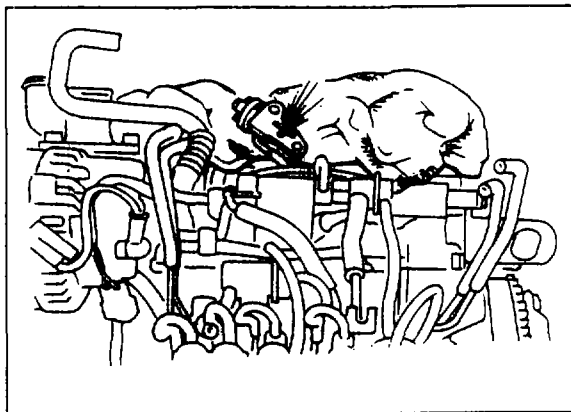


67U04X-181

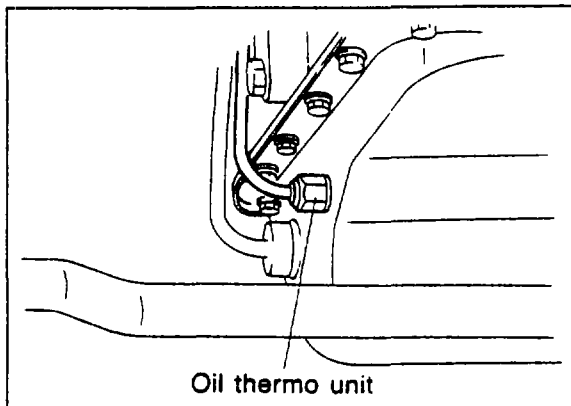
**SUB-ZERO STARTING ASSIST DEVICE**

**Inspection**

1. Check that there is sufficient starting assist fluid in the tank, and add if necessary.
2. Disconnect the (S) terminal connector from the starter.
3. Remove the starting fluid valve from the intake manifold.
4. Turn the ignition key to the "START" position and check that no starting assist fluid is ejected from the valve.  
[Ambient temperature: **above  $-20$ — $-12^{\circ}\text{C}$  ( $-4^{\circ}\text{F}$ — $-10.4^{\circ}\text{F}$ )**]
5. Disconnect the oil thermo unit connector on the oil pan and ground the connector.
6. Turn the ignition key to the "START" position. Push the air bleed button on the tank and check that starting assist fluid is ejected from the valve.



67U04X-182



67U04X-183

**SUB-ZERO STARTING ASSIST FLUID**

The mixture of the starting assist fluid should be **90%** high quality ethylene glycol antifreeze solution and **10%** water.

**OIL THERMO UNIT**

Check the oil thermo unit continuity using a circuit tester.

Ambient temperature	Continuity
Below $-16^{\circ}\text{C}$ ( $3.2^{\circ}\text{F}$ )	Yes
Above $-16^{\circ}\text{C}$ ( $3.2^{\circ}\text{F}$ )	No