FUEL AND EMISSION CONTROL SYSTEMS (NON-TURBO)

06U0F1-001

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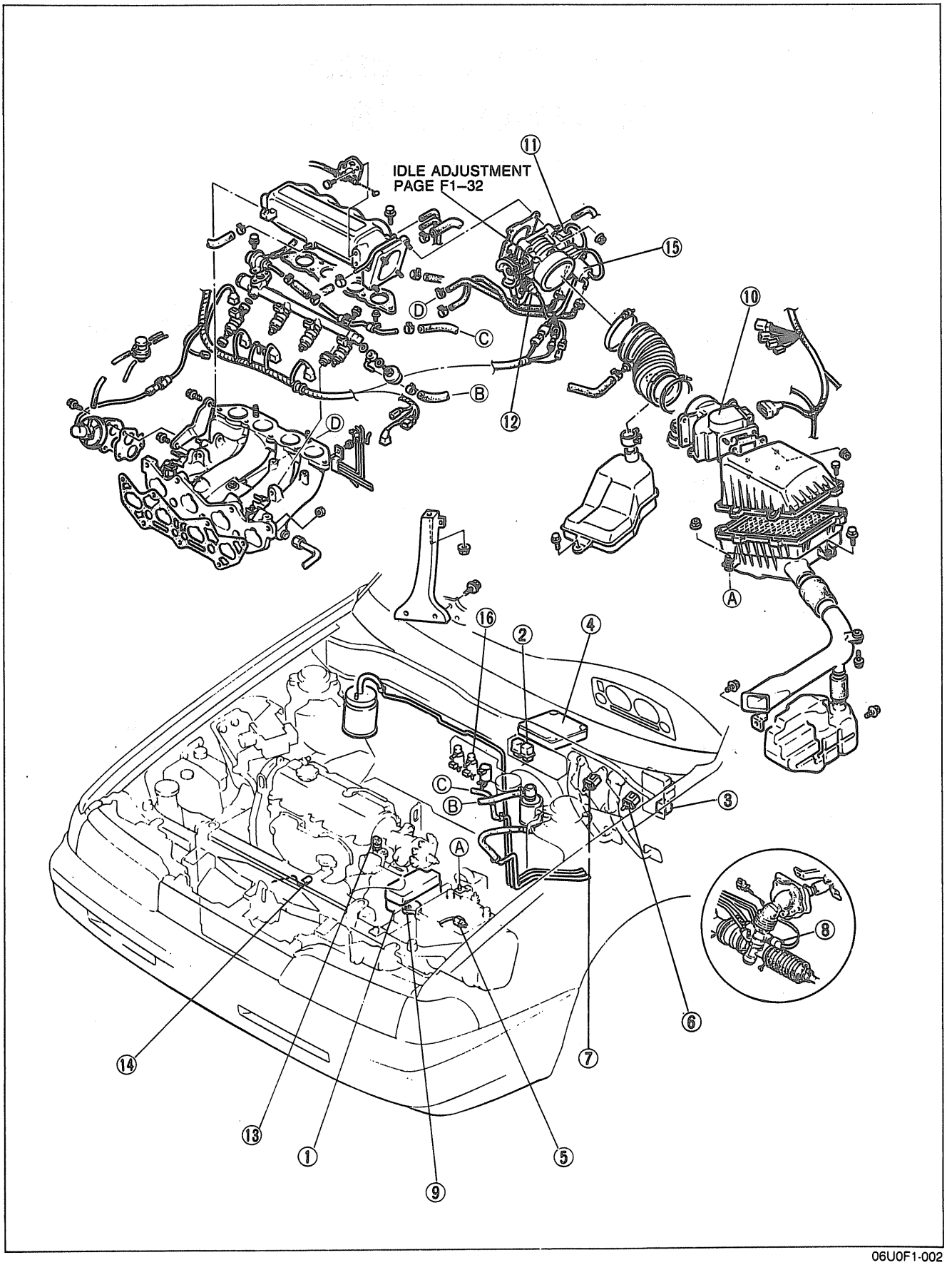
CONTROL DEVICES



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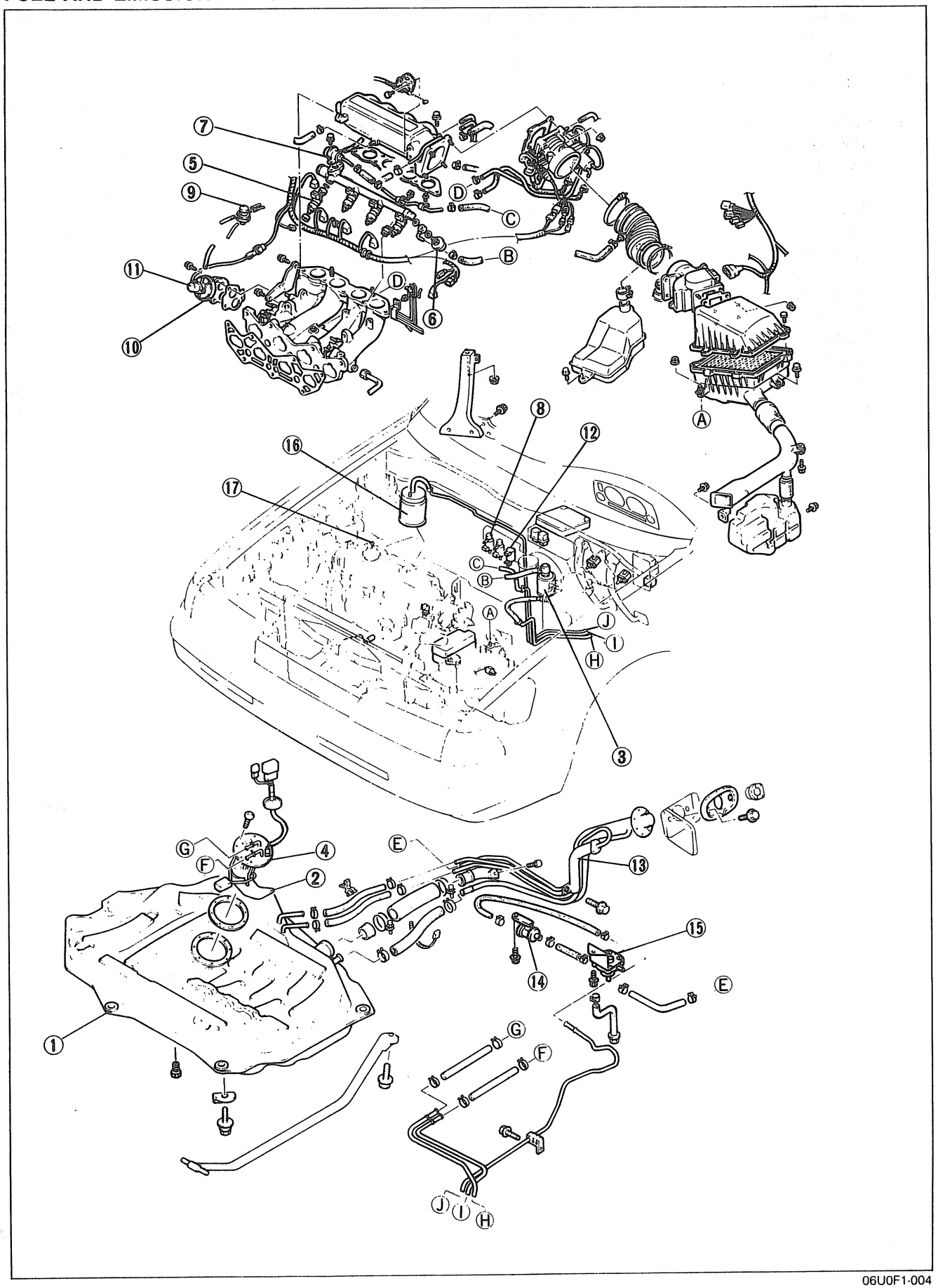
FUEL AND EMISSION DEVICES



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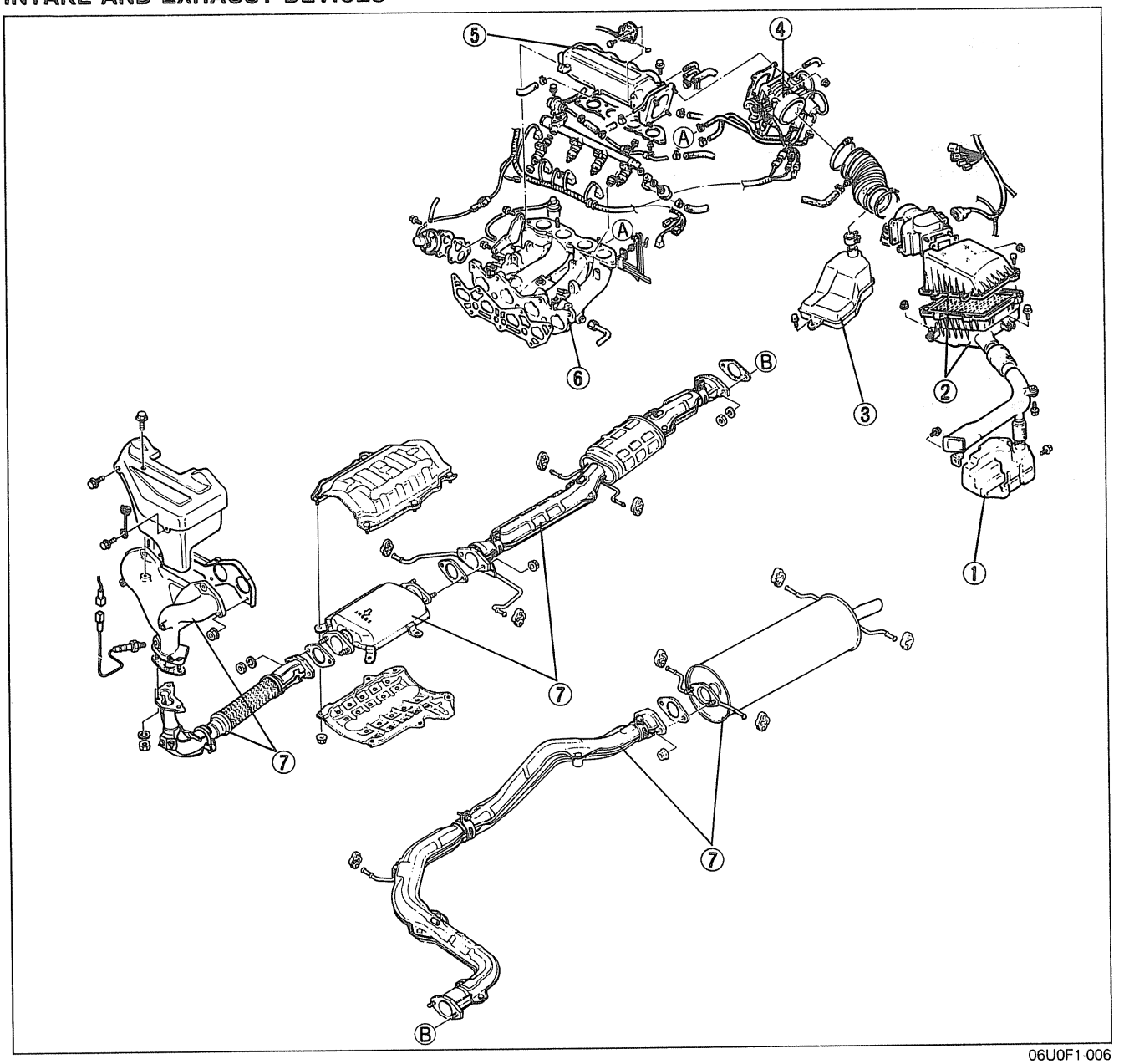
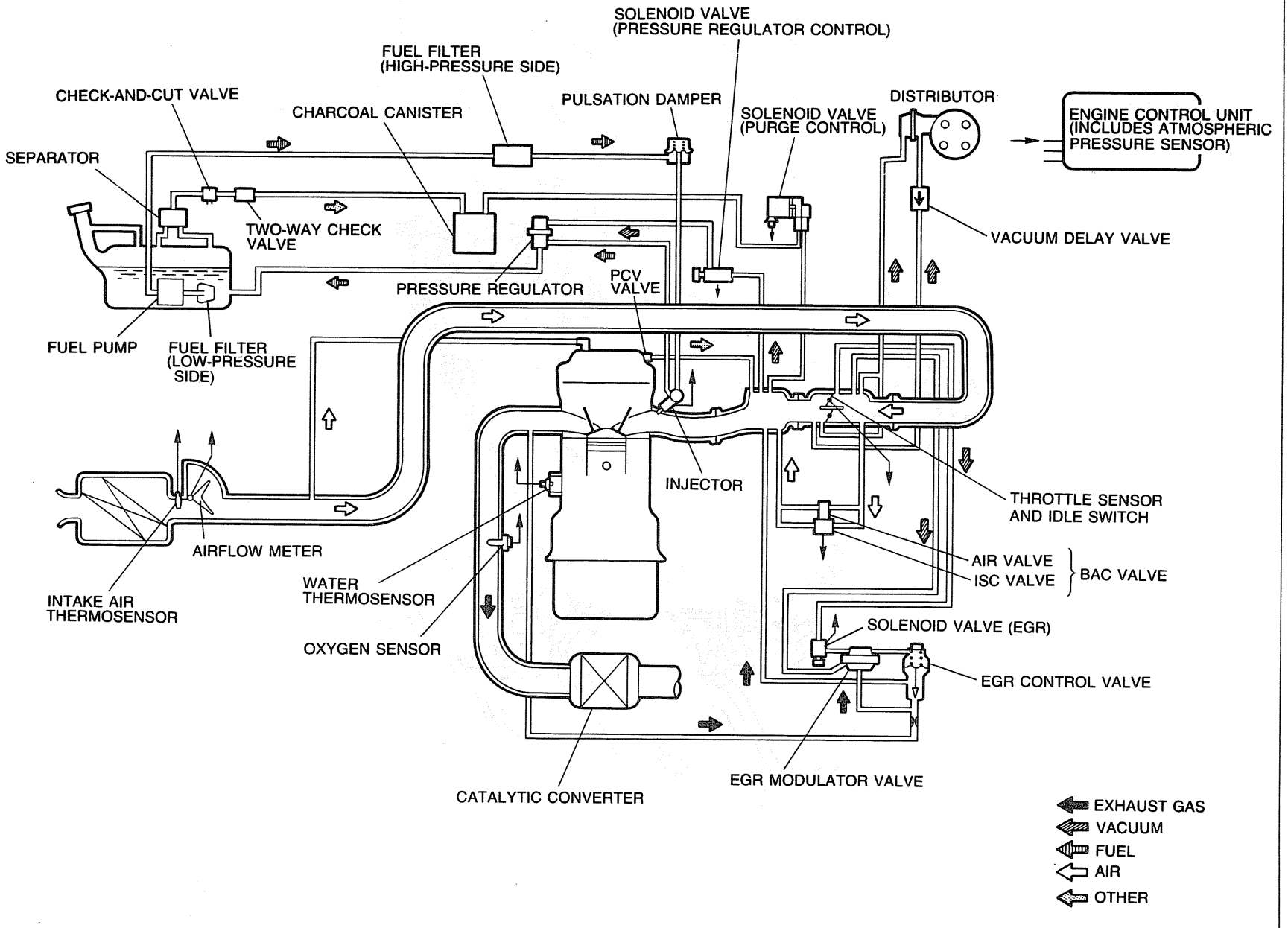
INTAKE AND EXHAUST DEVICES



06U0F1-006


SOLENOID VALVE
(PRESSURE REGULATOR CONTROL)
FUEL FILTER
(HIGH-PRESSURE SIDE)
CHECK-AND-CUT VALVE
CHARCOAL CANISTER
PULSATION DAMPER
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(INCLUDES ATMOSPHERIC
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SEPARATOR
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VALVE
VACUUM DELAY VALVE
PRESSURE REGULATOR
PCV
VALVE
FUEL PUMP
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(LOW-PRESSURE
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INJECTOR
THROTTLE SENSOR
AND IDLE SWITCH
AIRFLOW METER
AIR VALVE
ISC VALVE
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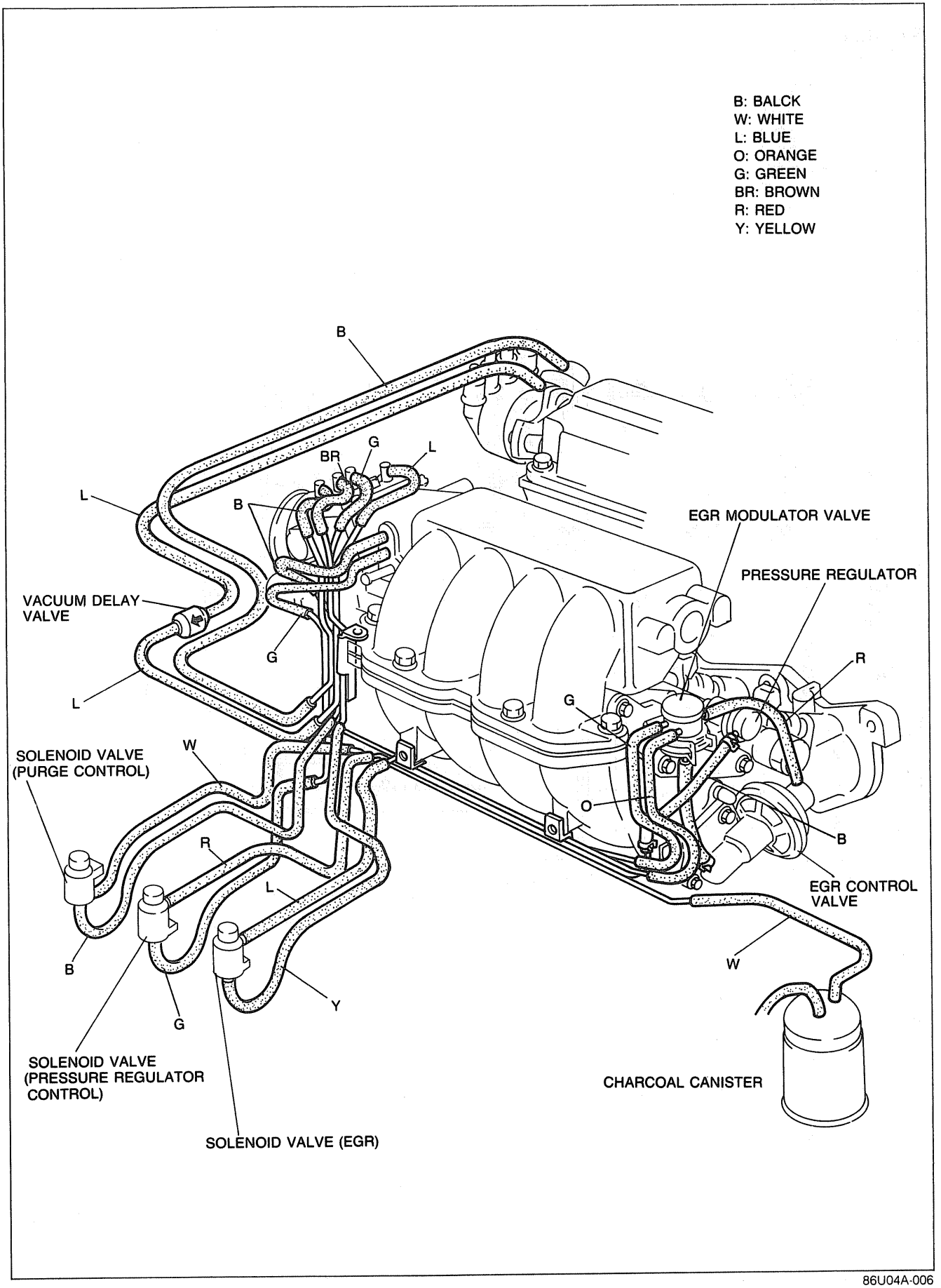
EGR CONTROL VALVE
CATALYTIC CONVERTER
EGR MODULATOR VALVE
EXHAUST GAS
VACUUM
FUEL
AIR
OTHER

VACUUM HOSE ROUTING DIAGRAM



86U04A-006

SPECIFICATIONS

Item \ Engine			Non-Turbo Engine
Idle speed		rpm	750 ± 25 (ATX: P range)*
Throttle body			
Type			Horizontal draft (2-barrel)
Throat diameter	mm (in)	No.1	MTX: 40 (1.6), ATX: 46 (1.8)
		No.2	MTX: 46 (1.8), ATX: 40 (1.6)
Airflow meter			
Resistor	Ω	E_2—V_S	Fully closed: 20—400 Fully open: 20—1,000
		E_2—V_C	100—400
		E_2—V_B	200—400
		E_2—THA	−20°C (−4°F) 13,600—18,400 20°C (68°F) 2,210— 2,690 60°C (140°F) 493— 667
Fuel pump			
Type			Impeller (in tank)
Output pressure		kPa (kg/cm², psi)	441—588 (4.5—6.0, 64—85)
Feeding capacity		cc (cu in)/10 sec.	220 (13.4) min
Fuel filter			
Type		Low-pressure side	Nylon element
		High-pressure side	Paper element
Pressure regulator			
Type			Diaphragm
Regulating pressure		kPa (kg/cm², psi)	235—275 (2.4—2.8, 34—40)
Injector			
Type			High-ohmic
Type of drive			Voltage
Resistance		Ω	12—16
Injection amount		cc (cu in)/15 sec.	44—61 (2.68—3.72)
Idle speed control valve			
Solenoid resistance		Ω	6.3—9.9
Fuel tank			
Capacity		liters (US gal, Imp gal)	60 (15.9, 13.2)
Air cleaner			
Element type			Oil permeated
Fuel			
Specification			Unleaded regular (RON 87 or higher)

* With test connector grounded.

16U0F1-023

TROUBLESHOOTING GUIDE

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

Possible cause / Symptom			Input sensors and switches								Output solenoid valves			
			Ignition pulse	Airflow meter	Water thermosensor	Intake air thermosensor	Throttle sensor	Atmospheric pressure sensor	Oxygen sensor	EGR position sensor (California only)	Feedback system	Solenoid valve (Pressure regulator)	Solenoid valve (Purge)	Solenoid valve (EGR)	Solenoid valve (Idle speed control)
Page			F1–17	F1–18	F1–19	F1–20	F1–21	F1–21	F1–22	F1–23	F1–24	F1–25	F1–25	F1–26	F1–26
1	Fault Indicated by SST Code No.		01	08	09	10	12	14	15	16	17	25	26	28	34
2	Hard start or won't start (Cranks OK)														
3	Engine stalls	While warming up													
		After warming up													
4	Rough idle	While warming up													
		After warming up													
5	High idle speed after warming up														
6	Poor acceleration, hesitation or lack of power														
7	Runs rough on deceleration														
8	Afterburn in exhaust system														
9	Poor fuel consumption														
10	Engine stalls or rough after hot starting														

TROUBLESHOOTING PROCEDURE

Note

- **Step 1 under symptom is to quickly determine what system or unit may be at fault by use of the SST. (Self-Diagnosis Checker 49 H018 9A1)**

1st: Check input sensors and output solenoid valves with the **SST**. (Refer to page F1–12.)

2nd: Check other switches with the **SST**. (Refer to page F1–28.)

3rd: Check the following items:

Electrical system
1) Battery condition
2) Fuses

Ignition system
1) Ignition spark
2) Ignition timing

Fuel system
1) Fuel level
2) Fuel leakage
3) Fuel filter
4) Idle speed (with test connector grounded)

Intake air system
1) Air cleaner element
2) Vacuum or air leakage
3) Vacuum hose routing
4) Accelerator cable

Engine
1) Compression
2) Overheating

Others
1) Clutch slippage
2) Brake dragging

4th: Check Fuel and Emission Control Systems. (Refer to page F1–11.)

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

Possible cause		Fuel and Emission Control Systems								
		Intake Air System (Poor connection of components, throttle body)	Fuel System (Fuel injection, Fuel pressure)	Pressure Regulator Control System	Idle Speed Control (ISC) System (Air valve, Idle speed control solenoid malfunction)	EGR System (EGR control valve stuck and open)	Evaporative Emission Control system (Solenoid valve [Purge control] malfunction)	PCV System (System clogged)	Deceleration System (Fuel cut operation malfunction)	Exhaust system (System clogged)
Page		F1–33	F1–44	F1–60	F1–39	F1–66	F1–69	F1–73	F1–63	F1–74
Symptom	2	2	1							
	3	4	3		1	2				
		5	4		2	3		1		
	4	5	4		1	3		2		
		6	5		2	3	4	1		
	5	2			1					
	6	3	4			1	2			5
	7		3		2				1	
	8	3	4		1				2	
	9		2			3			1	4
	10		2	1						

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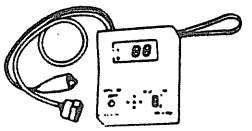
The numbers of the list show the priorities of inspections from the most probable to that with the lowest probability.
These were determined on the following basis:

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

TROUBLESHOOTING WITH SST

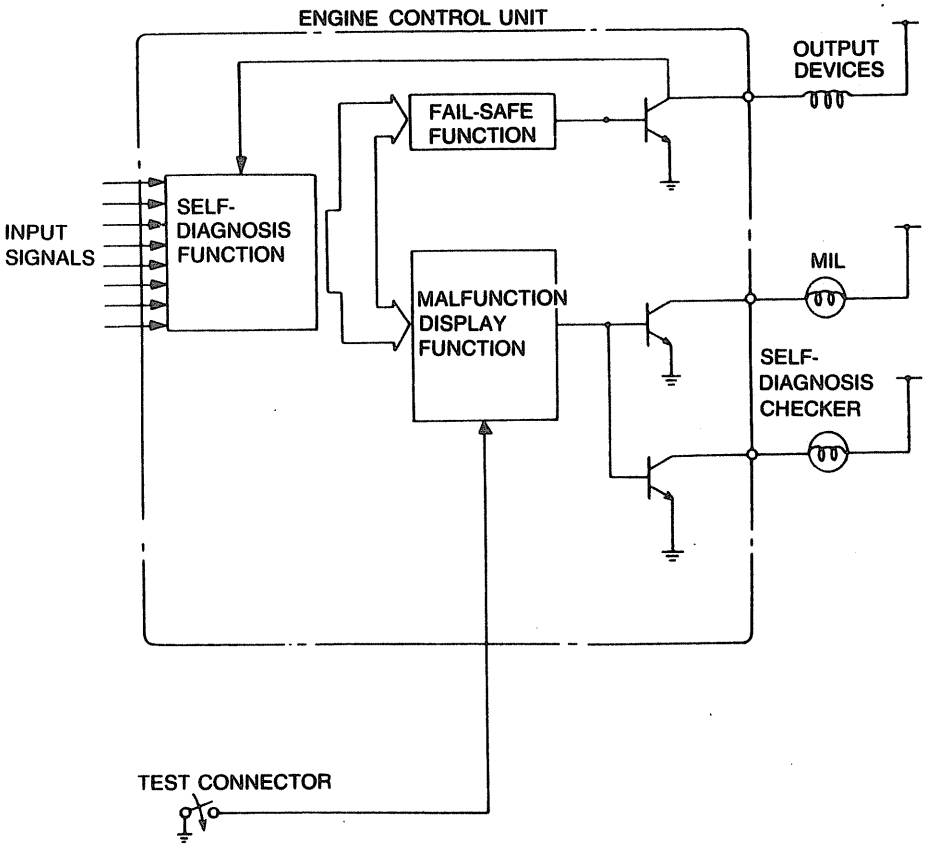
PREPARATION
SST

49 H018 9A1 Self-Diagnosis Checker		For diagnosis

06U0F1-010

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

Note
- **The engine control unit constantly checks for malfunction of the input devices. But, the engine control unit checks for malfunction of output devices only in a 3 second period after the ignition switch is turned ON and the test connector (Green: 1-pin) is grounded.**



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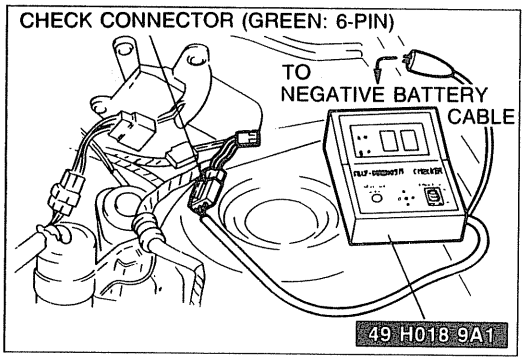

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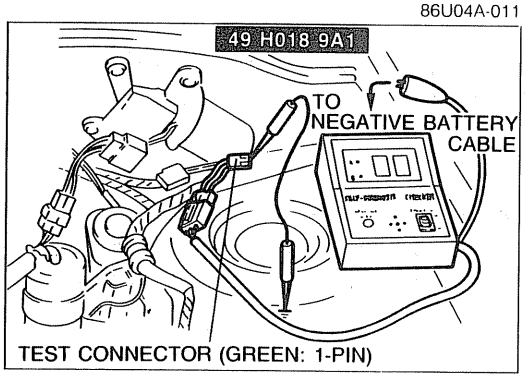

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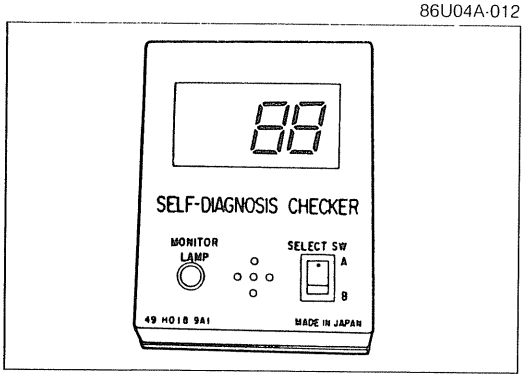

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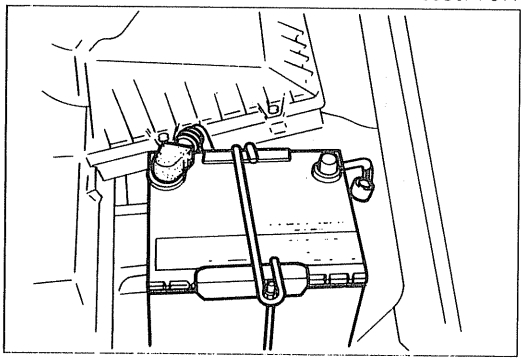
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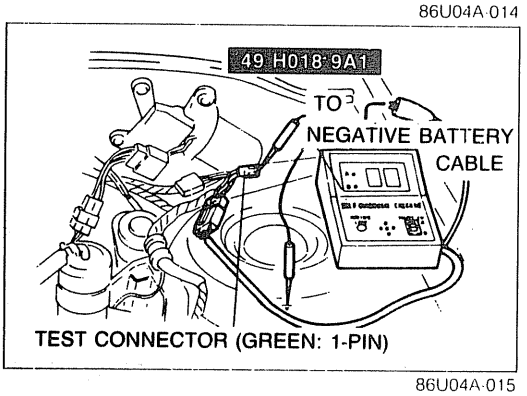

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INSPECTION PROCEDURE

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

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

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

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

4. Turn the ignition switch ON.
5. Verify that **88** flashes on the digital display and that the buzzer sounds for **three seconds** after turning the ignition switch ON.
6. If **88** does not flash, check the main relay (Refer to page F1–80), power supply circuit, and check connector wiring.
7. If **88** flashes and the buzzer sounds continuously for more than **20 seconds**, replace the engine control unit and perform steps 3 and 4 again.
8. Note the code numbers and check for the causes by referring to the check sequences shown on pages **from F1–17 to F1–26**. Repair as necessary.

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

AFTER-REPAIR PROCEDURE

1. Cancel the memory of malfunctions by disconnecting the negative battery cable and depressing the brake pedal for **at least five seconds**; then reconnect the negative battery cable.
2. Connect the **SST** to the check connector.
3. Ground the test connector (Green, 1-pin) with a jumper wire.

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

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PRINCIPLE OF CODE CYCLE

Malfunction codes are determined as shown below

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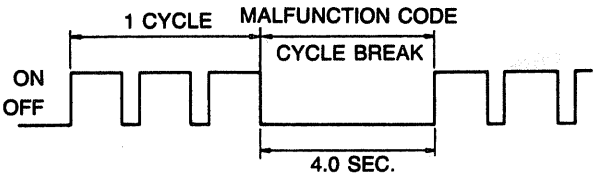
1. Code cycle break

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



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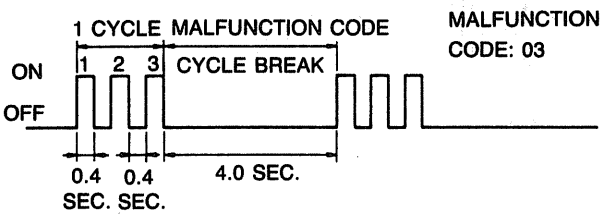
2. Second digit of malfunction code (ones position)

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



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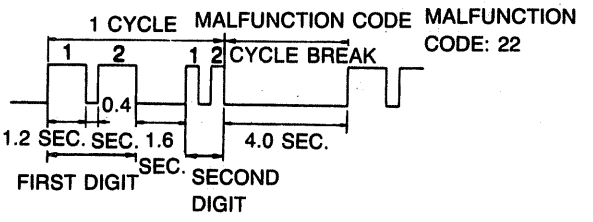
3. First digit of warning code (tens position)

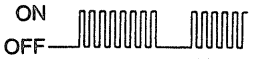
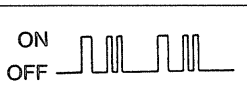
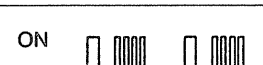
The digit in the tens position of the malfunction code represents the number of times the buzzer is on 1.2 sec during one cycle.

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



69G04C-554

CODE NUMBER

Malfunction display		Sensor or subsystem	Self-diagnosis	Fail-safe
Code No.	MIL output signal pattern			
01		Ignition pulse	No ignition signal	—
08		Airflow meter	Open or short circuit	Maintains basic signal at preset value
09		Water thermosensor	Open or short circuit	Maintains constant command • 40°C (104°F) for EGI • 50°C (122°F) for ISC control use
10		Intake air thermosensor (airflow meter)	Open or short circuit	Maintains constant 20°C (68°F) command
12		Throttle sensor	Open or short circuit	Maintains constant command of throttle valve fully open
14		Atmospheric pressure sensor	Open or short circuit	Maintains constant command of sea level pressure
15		Oxygen sensor	Sensor output continues less than 0.55V 120 sec. after engine starts (1,500 rpm)	Cancels EGI feedback operation
16		EGR position sensor (California only)	Open short circuit	Cuts off EGR
17		Feedback system	Sensor output not changed 20 sec. after engine exceeds 1,500 rpm	Cancels EGI feedback operation
25		Solenoid valve (pressure regulator)	Open or short circuit	—
26		Solenoid valve (purge control)		—
28		Solenoid valve (EGR)		—
34		ISC valve		—

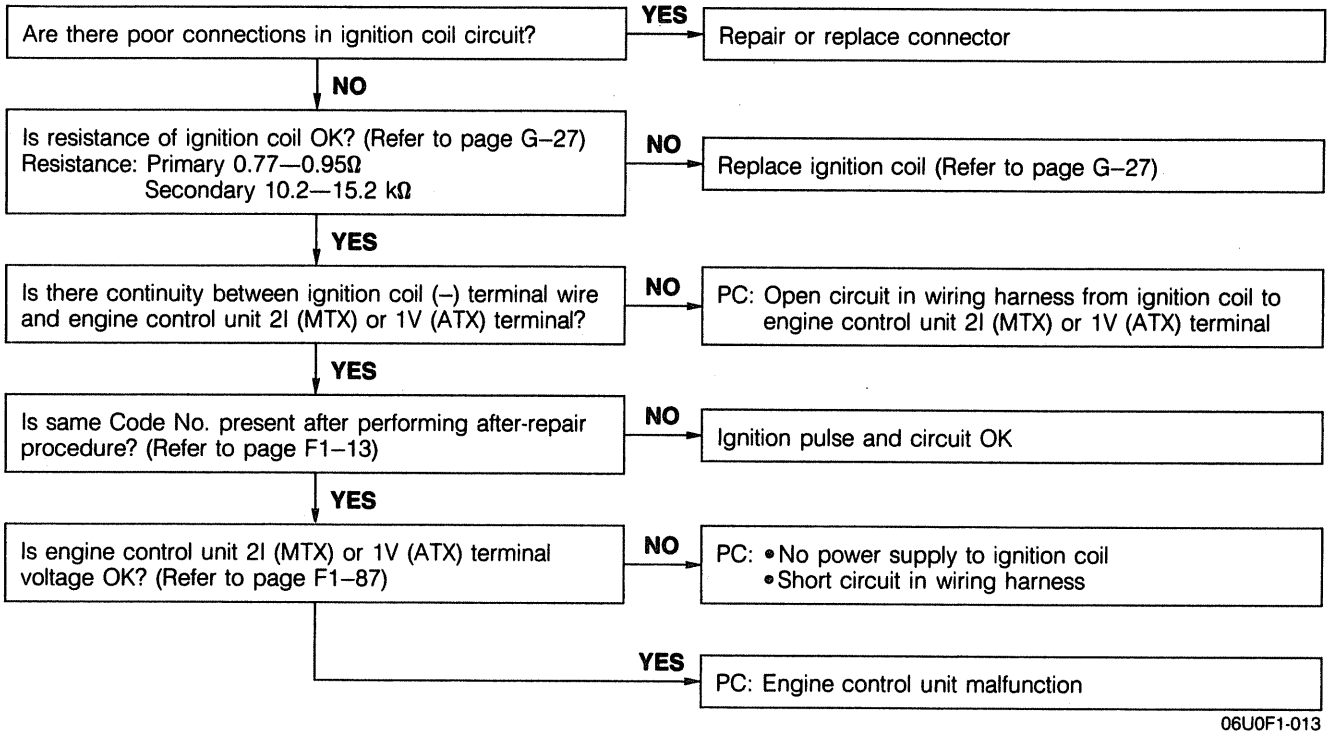
06U0F1-012

Caution

- **If there is more than one failure present, the lowest number malfunction code is displayed first, the remaining codes are displayed sequentially.**
- **After repairing a failure, turn off the ignition switch and disconnect the negative battery cable and depress the brake pedal for at least 5 seconds to erase the memory of a malfunction code.**

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

Code No.01 (Ignition pulse) **PC: Possible Cause**



06U0F1-013

Code No.08 (Airflow meter)

PC: Possible Cause

Are there poor connections in airflow meter circuit?
- YES → Repair or replace connector
- NO ↓

Is there continuity between airflow meter and engine control unit?

Airflow meter	Control unit
V_B (R/B wire)	1B
V_C (R/W wire)	2J (MTX) 2A (ATX)
V_S (R/B wire)	2O (MTX) 2B (ATX)
E_2 (LG/Y wire)	2D (MTX) 3D (ATX)

- NO → PC: Open circuit in wiring harness from airflow meter to engine control unit
- YES ↓

Is resistance of airflow meter OK?
Resistance:

Terminal	Fully closed (Ω)	Fully open (Ω)
$E_2 \leftrightarrow V_S$	20—400	20—1,000
$E_2 \leftrightarrow V_C$	100—400	
$E_2 \leftrightarrow V_B$	200—400	

- NO → Replace airflow meter (Refer to page F1–96)
- YES ↓

Is same Code No. present after performing after-repair procedure? (Refer to page F1–13)
- NO → Airflow meter and circuit OK
- YES ↓

Are engine control unit terminal voltages OK?
Check terminal: 1B,2D,2J,2O (MTX) 1B,2A,2B,3D (ATX)
(Refer to page F1–87)
- NO → PC: Short circuit in wiring harness
- YES → PC: Engine control unit malfunction

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Code No.09 (Water thermosensor)

PC: Possible Cause

Are there poor connections at water thermosensor circuit?
- YES → Repair or replace connector
- NO ↓

Is there continuity between water thermosensor and control unit?

Water thermosensor	Control unit
A (Y/B wire)	2Q (MTX), 2E (ATX)
B (LG/Y wire)	2D (MTX), 3D (ATX)

- NO → PC: Open circuit in wiring harness from water thermosensor to engine control unit
- YES ↓

Is resistance of the water thermosensor OK?
Resistance:

Coolant temp	Resistance
–20°C (–4°F)	14.6—17.8 kΩ
20°C (68°F)	2.2— 2.7 kΩ
40°C (104°F)	1.0— 1.3 kΩ
60°C (140°F)	500—650Ω
80°C (176°F)	290—350Ω

- NO → Replace water thermosensor (Refer to page F1–99)
- YES ↓

Is same Code No. present after performing after-repair procedure? (Refer to page F1–13)
- NO → Water thermosensor and circuit OK
- YES ↓

Are engine control unit terminal voltages OK?
Check terminal: 2D, 2Q (MTX) 2E, 3D (ATX)
(Refer to page F1–87)
- NO → PC: Engine short circuit in wiring harness
- YES → PC: Engine control unit malfunction

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Code No.10 (Intake air thermosensor)

PC: Possible Cause

Are there poor connections in airflow meter circuit?
- YES → Repair or replace connector
- NO ↓

Is there continuity between intake air thermosensor (in airflow meter) and engine control unit?

Intake air thermosensor (in airflow meter)	Control unit
THA (R wire)	2P (MTX), 2K (ATX)
E2 (LG/Y wire)	2D (MTX), 3D (ATX)

- NO → PC: Open circuit in wiring harness from intake air thermosensor (in airflow meter) to engine control unit
- YES ↓

Is resistance of intake air thermosensor (in airflow meter) OK?
Resistance:

Terminal	Resistance
E2 ↔ THA	−20°C (−4°F): 13.6—18.4 kΩ 20°C (68°F): 2.21—2.69 kΩ 60°C (140°F): 493—667Ω

- NO → Replace airflow meter (Refer to page F1–96)
- YES ↓

Is same Code No. present after performing after-repair procedure? (Refer to page F1–13)
- NO → Intake air thermosensor and circuit OK
- YES ↓

Are engine control unit terminal voltages OK?
Check terminal: 2D, 2P (MTX) 2K, 3D (ATX)
(Refer to page F1–87)
- NO → PC: Short circuit in wiring harness
- YES → PC: Engine control unit malfunction

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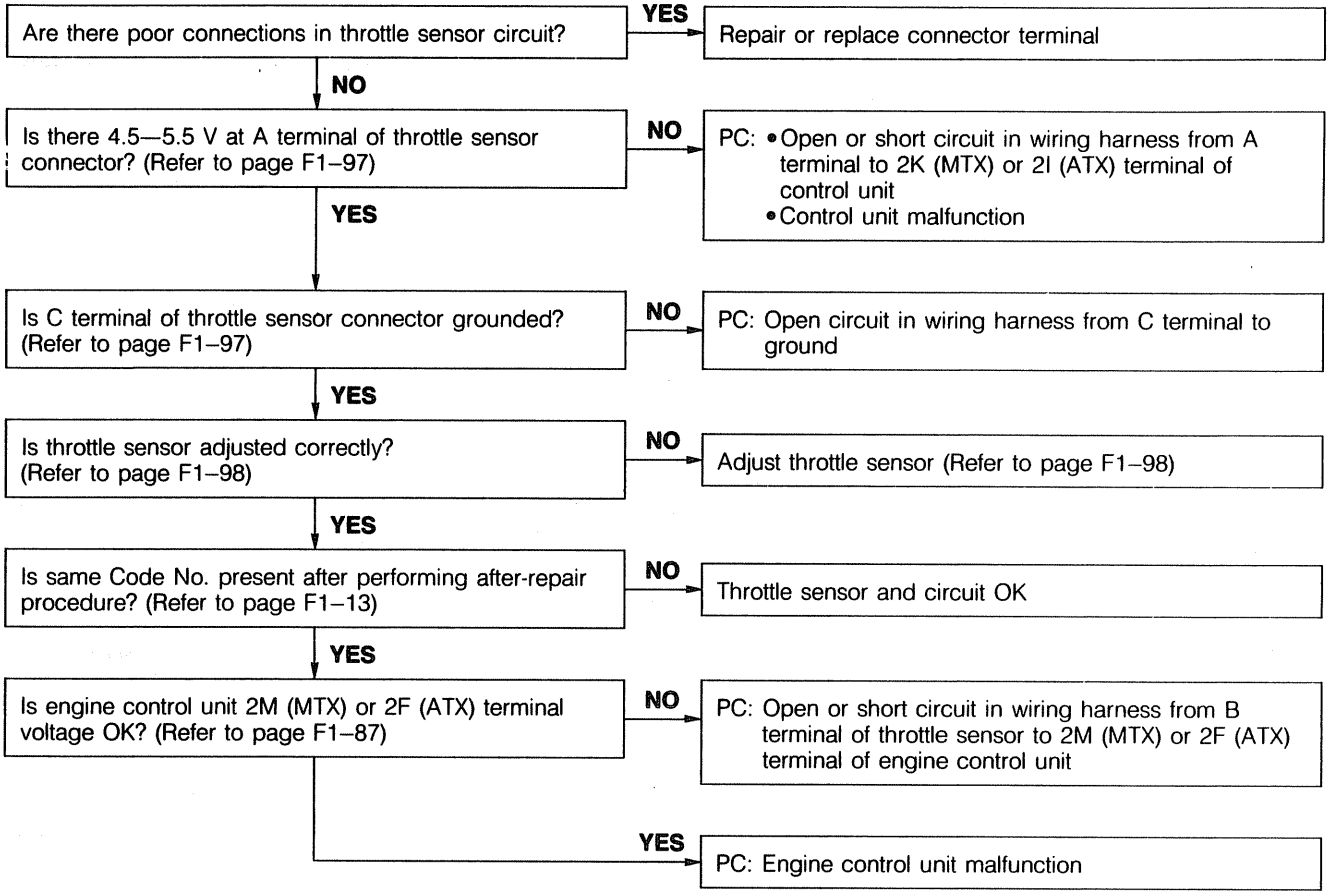
Code No.12 (Throttle sensor)

PC: Possible cause



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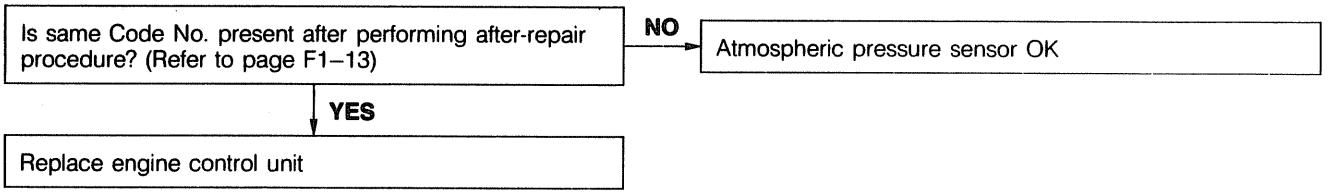
Code No.14 (Atmospheric pressure sensor)



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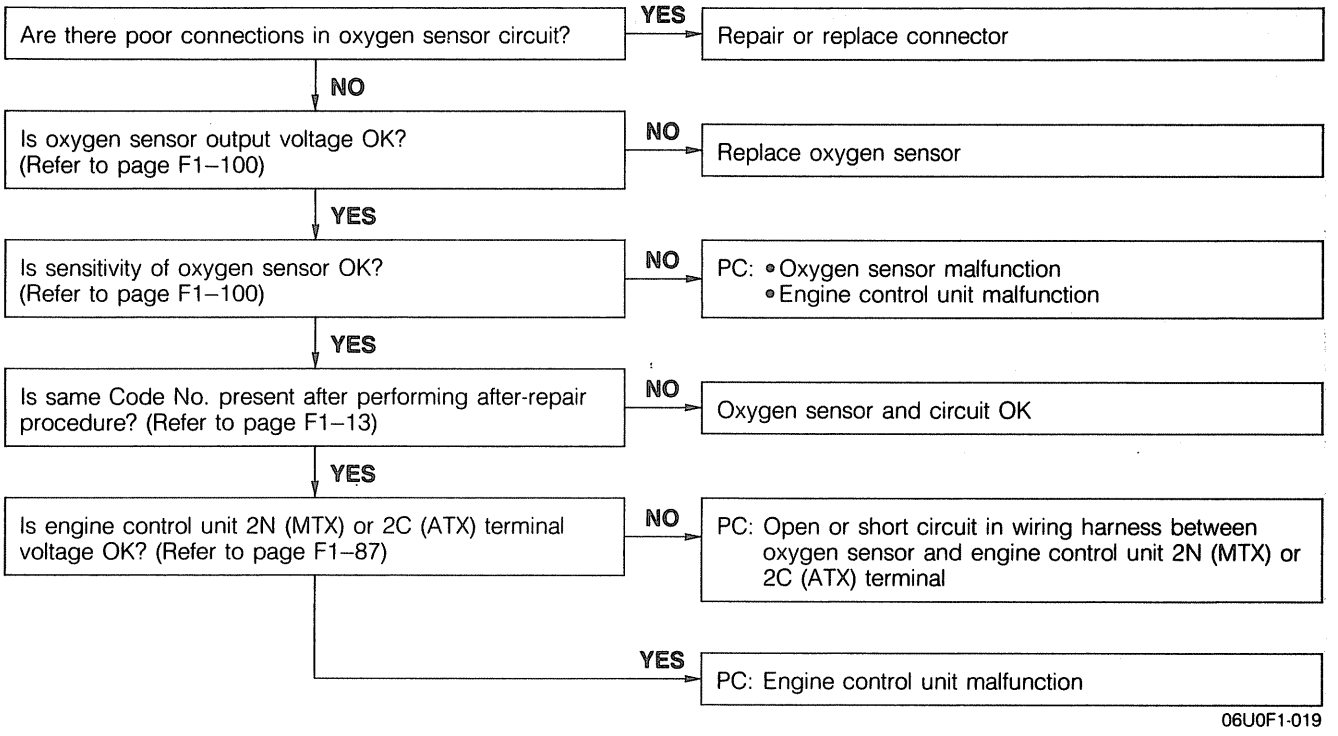
Code No.15 (Oxygen sensor)

PC: Possible Cause

Note

- **When Codes No.15 and 17 are present at the same time, first perform the checking procedure for Code No.17. (Refer to page F1–24.)**



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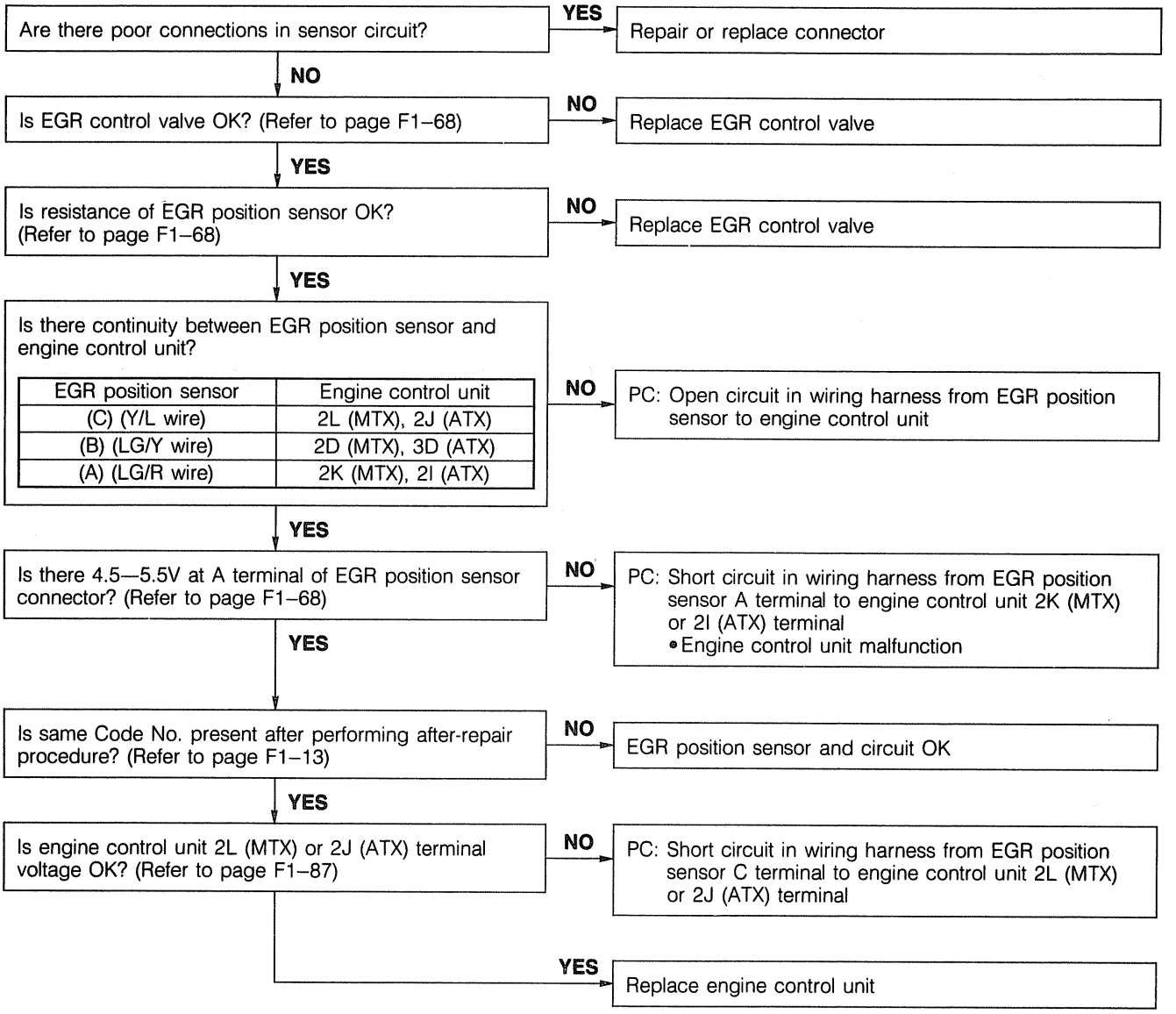
Code No.16 (EGR position sensor) (California only)

PC: Possible Cause

Note

- **Inspect the vacuum hose to the EGR control valve for air leakage, blockage and damage if the MIL illuminates only during cruising.**



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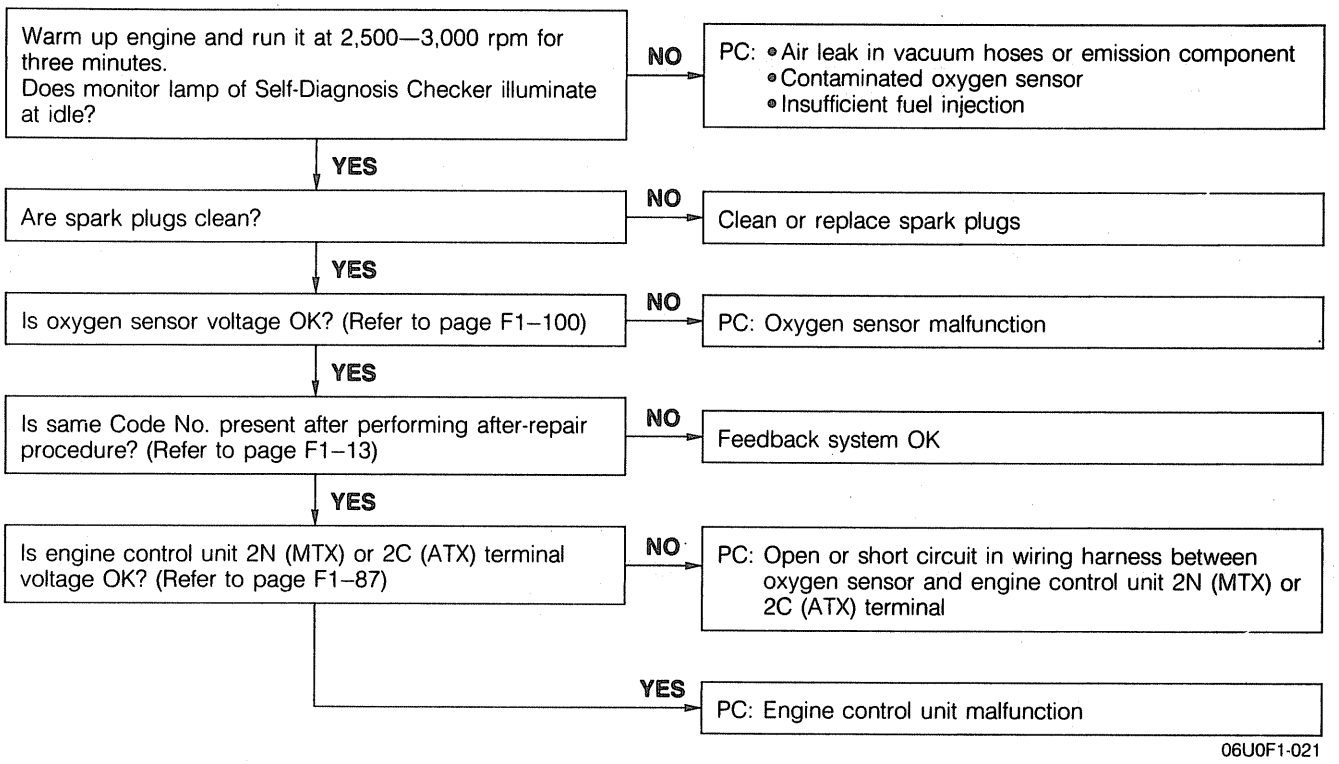
Code No.17 (Feedback system)

PC: Possible Cause



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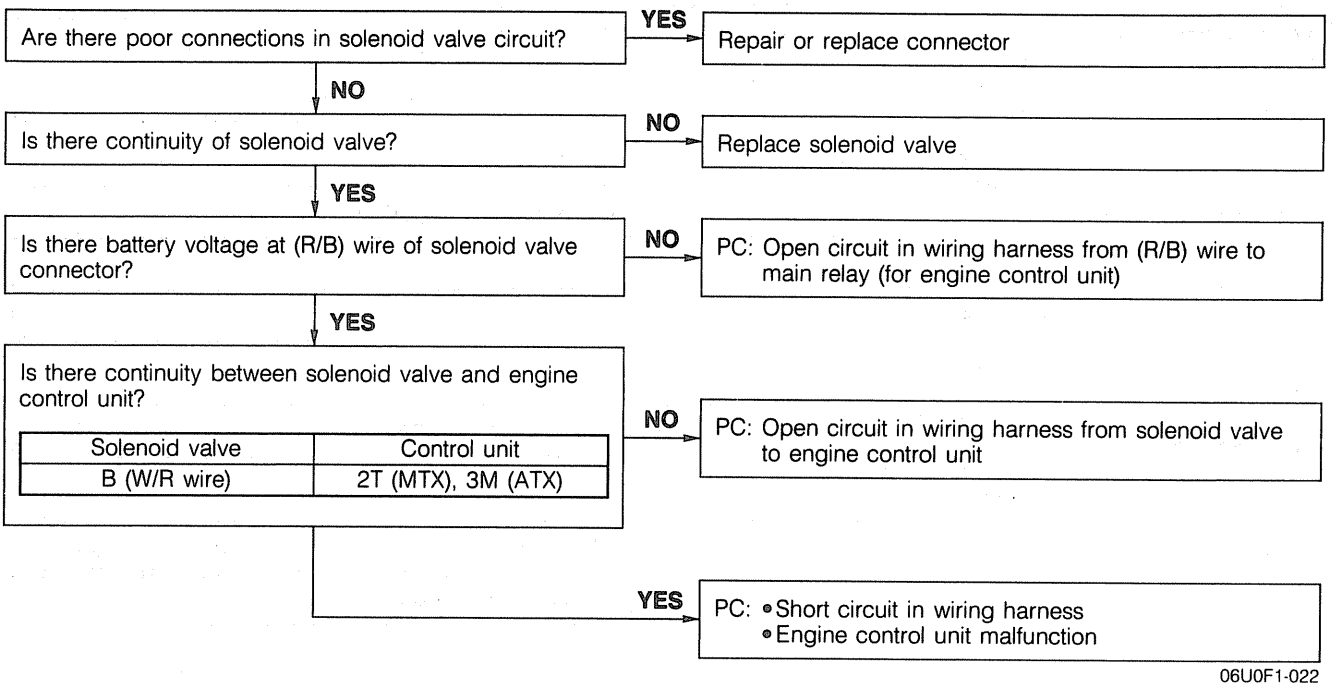
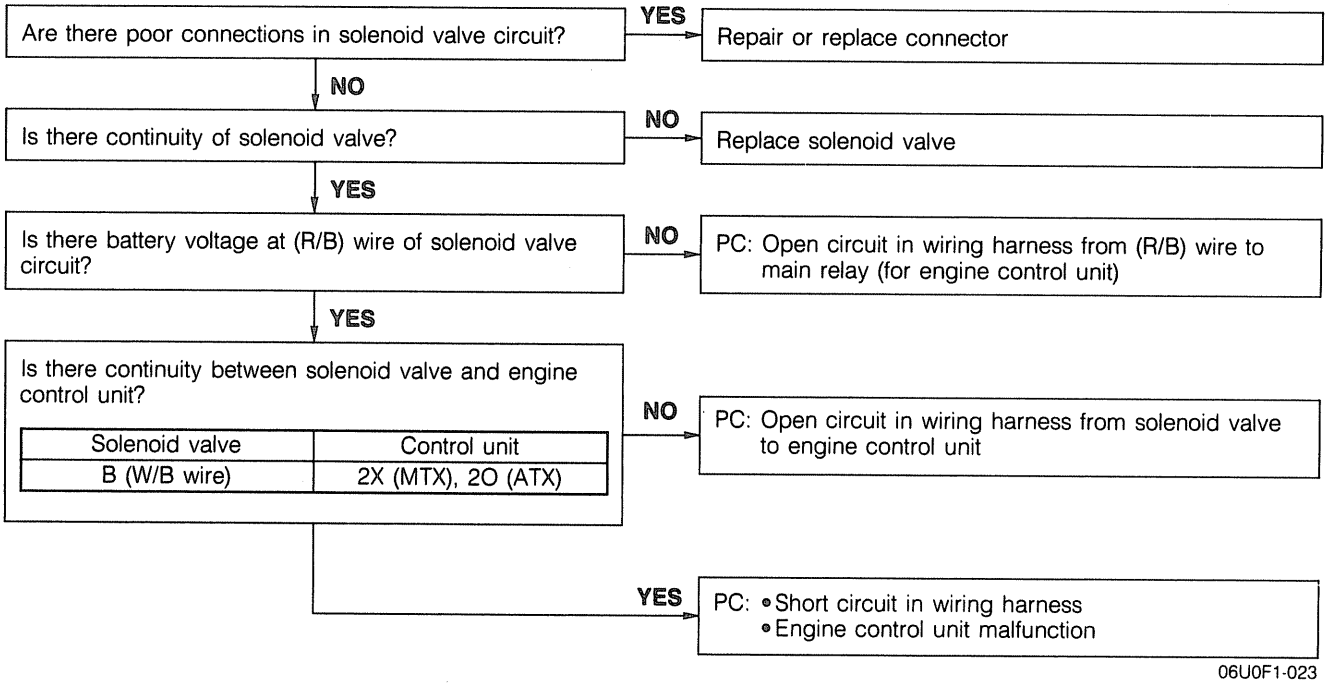
Code No.25 (Solenoid valve — Pressure regulator)

PC: Possible Cause



06U0F1-022

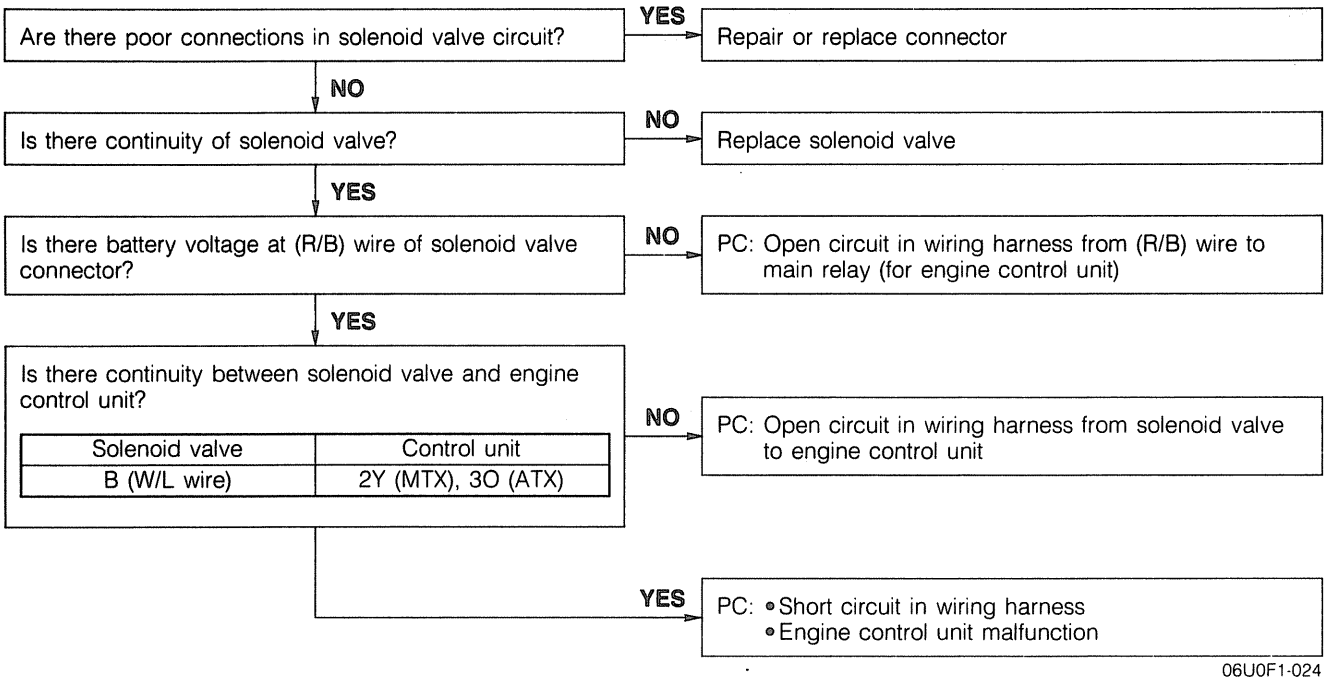
Code No.26 (Solenoid valve — Purge)



06U0F1-023

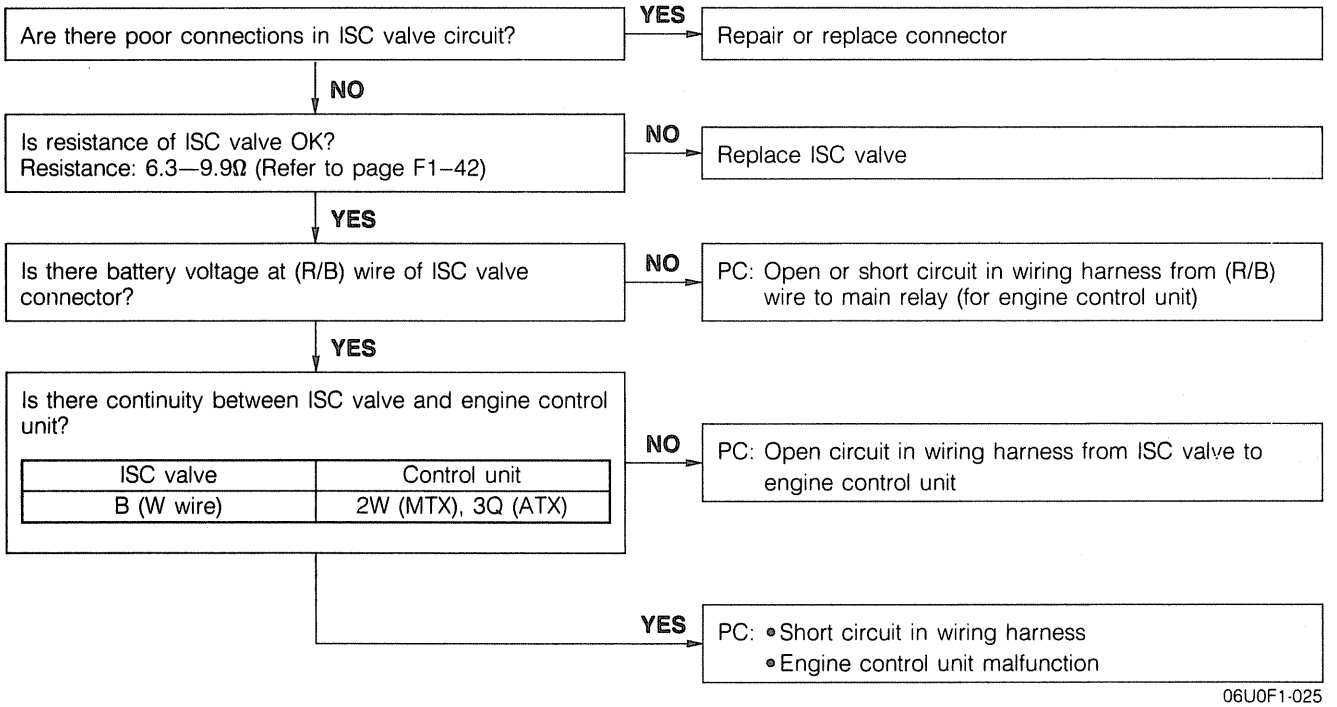
Code No.28 (Solenoid valve — EGR)

PC: Possible Cause



06U0F1-024

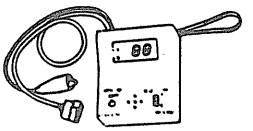
Code No.34 (ISC valve)



06U0F1-025

SWITCH MONITOR FUNCTION

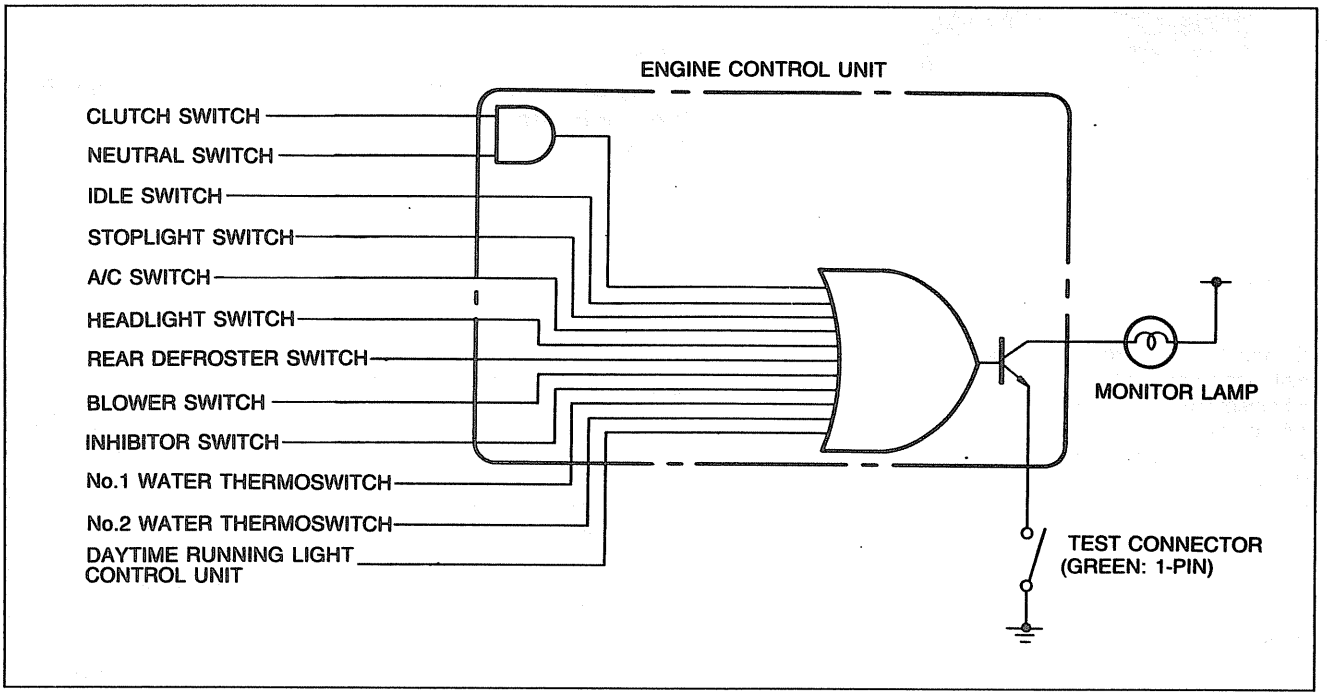
PREPARATION
SST

49 H018 9A1 Self-Diagnosis Checker		For diagnosis

06U0F1-026

Individual switches can be monitored by the **SST**.

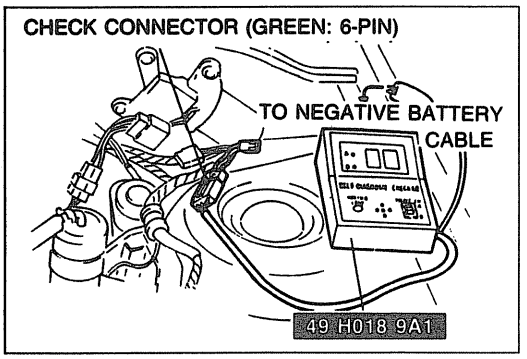
Note
- **The test connector must be grounded and the ignition switch ON (engine stopped).**



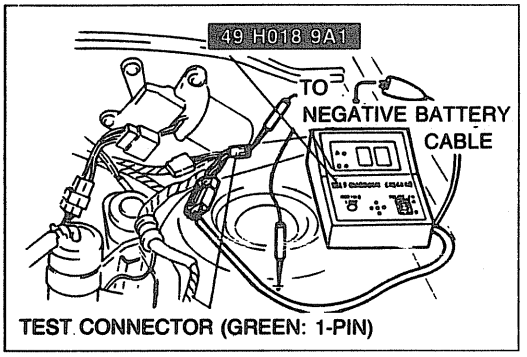
06U0F1-027

Switch	Self-Diagnosis Checker (Monitor lamp)		Remarks
	Light ON	Light OFF	
Clutch switch	Pedal released	Pedal depressed	Gear: IN
Neutral switch	In gear	Neutral	Clutch pedal released
Idle switch	Pedal depressed	Pedal released	—
Stoplight switch	Pedal depressed	Pedal released	—
A/C switch	ON	OFF	Blower motor position: "1" position
Headlight switch	ON	OFF	—
Rear defroster switch	ON	OFF	—
Blower switch	ON	OFF	Blower motor position: "3" or "4" position
Inhibitor switch	D, 1, 2, and R ranges	P and N ranges	—
No.1 water thermoswitch (Electrical fan)	Check connector (for electrical fan) (B/G) terminal grounded	Check connector (for electrical fan) (B/G) terminal not grounded	While fan not operating
No.2 water thermoswitch (Electrical fan) (ATX)	Check connector (for electrical fan) (L/B) terminal grounded	Check connector (for electrical fan) (L/B) terminal not grounded	While fan not operating
Daytime running light control unit (Canada only)	Parking brake lever released	Parking brake lever pulled up	—

16U0F1-002



86U04A-034



86U04A-035

INSPECTION PROCEDURE

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

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

Procedure

Set conditions to deactivate each switch
- All accessories OFF
- Transmission in neutral
- All pedals released
- Parking brake lever pulled

Verify that monitor lamp does not illuminate

NO →

Check each switch and related wiring harness

• Clutch and Neutral switch	:Refer to page F1–94
• Idle switch	:Refer to page F1–99
• Stoplight switch	:Refer to page F1–94
• A/C switch	:Refer to Section U
• Headlight switch	:Refer to Section T
• Rear defroster switch	:Refer to Section T
• Blower switch	:Refer to Section U
• Inhibitor switch	:Refer to Section K
• No.1 water thermoswitch	:Refer to Section E
• No.2 water thermoswitch	:Refer to Section E
• Parking brake switch	:Refer to Section P

YES ↓

Check each switch as described

06U0F1-028

Neutral and Clutch switch (MTX)

Shift transmission into gear
Check that monitor lamp illuminates with clutch pedal released

NO →

PC:
- Neutral or clutch switch malfunction (Refer to page F1–94)
- Open circuit in related wiring harness
- Engine control 1V terminal malfunction (Refer to page F1–88)

YES ↓

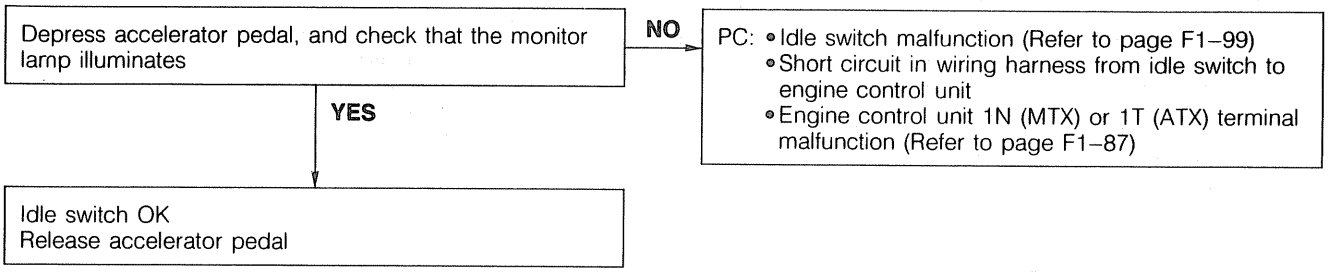
Depress clutch pedal
Check that monitor lamp does not illuminate
Return transmission to neutral

NO →

PC: • Clutch switch malfunction (Refer to page F1–94)

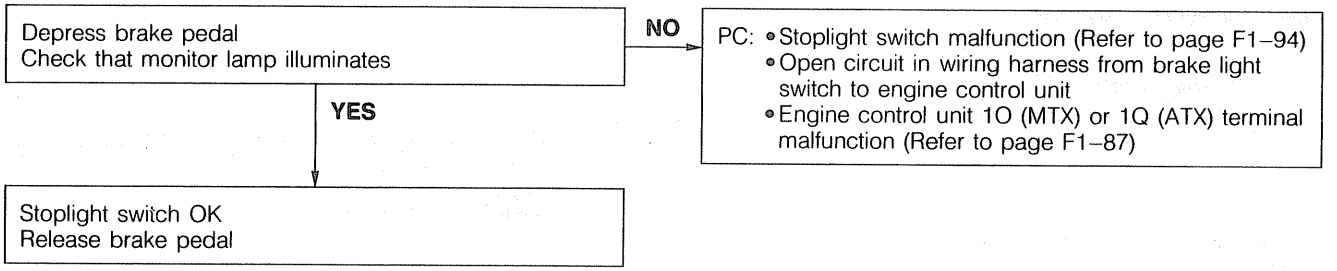
06U0F1-029

Idle switch



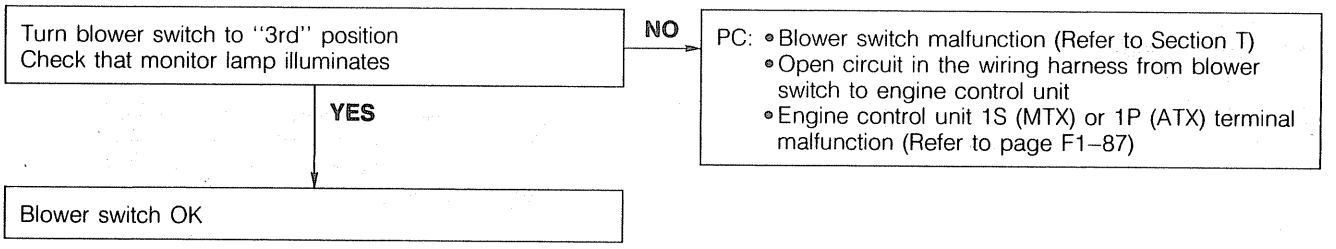
06U0F1-030

Stoplight switch



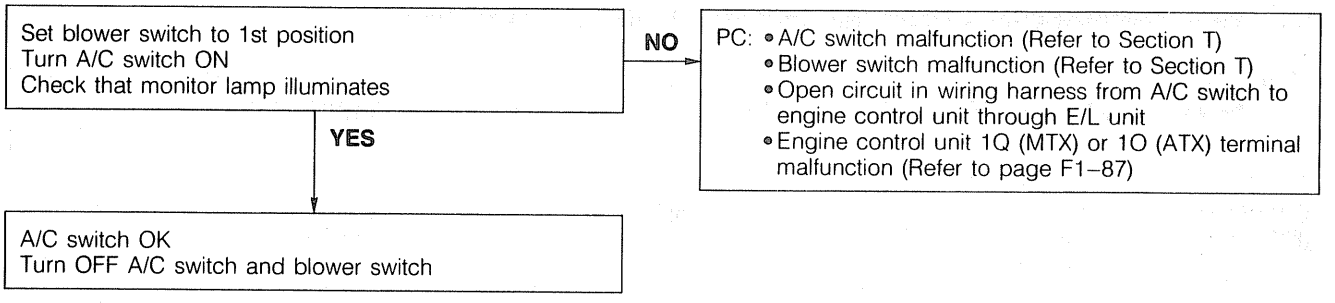
06U0F1-031

Blower switch



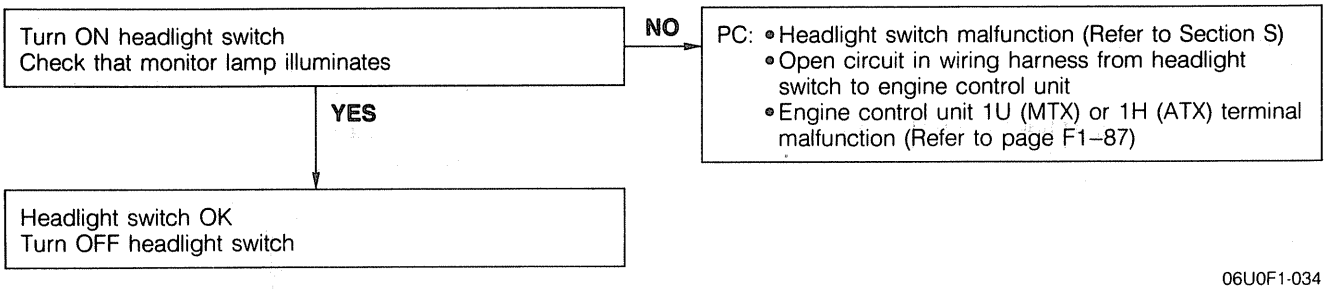
06U0F1-032

A/C switch



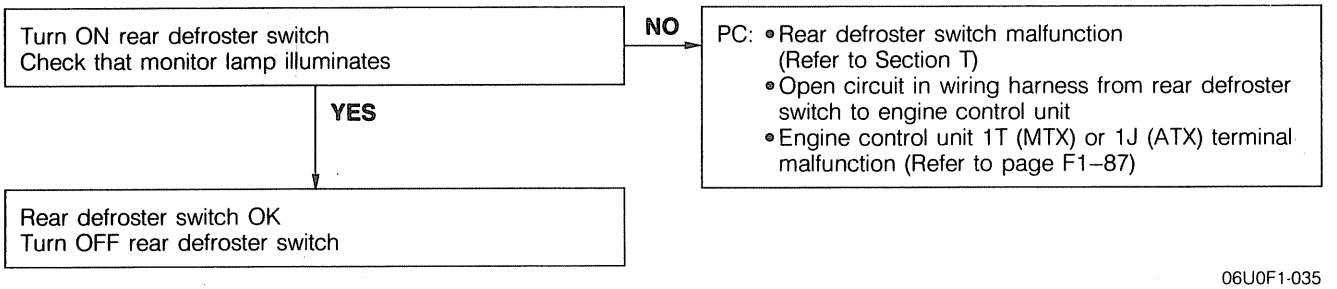
06U0F1-033

Headlight switch



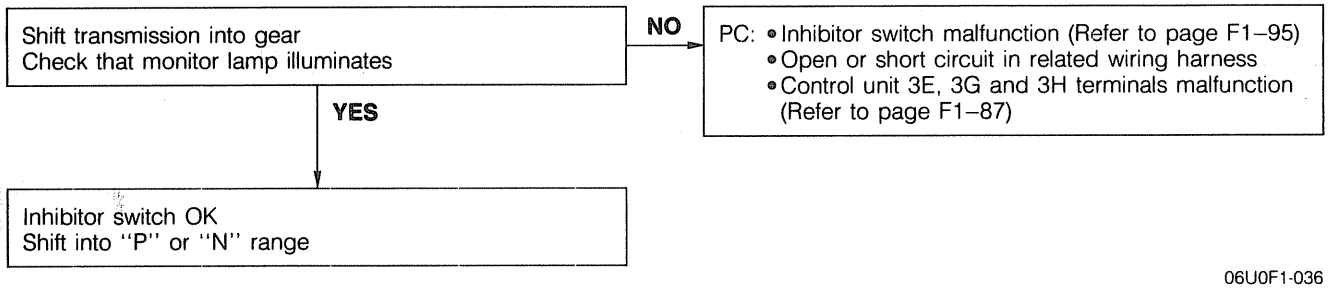
06U0F1-034

Rear defroster switch



06U0F1-035

Inhibitor switch (ATX)

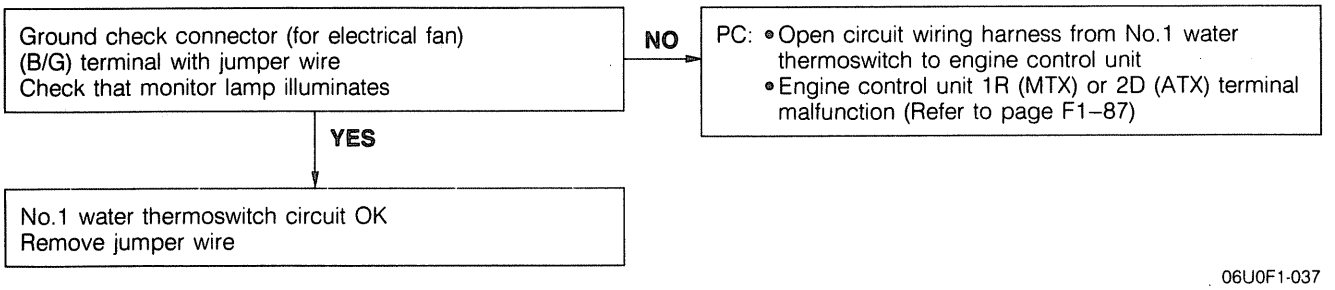


06U0F1-036

No.1 water thermoswitch circuit (not included in switch inspection)

Warning

- **The electrical fan operates when the check connector (for electrical fan) (B/G) terminal is grounded. Use caution.**

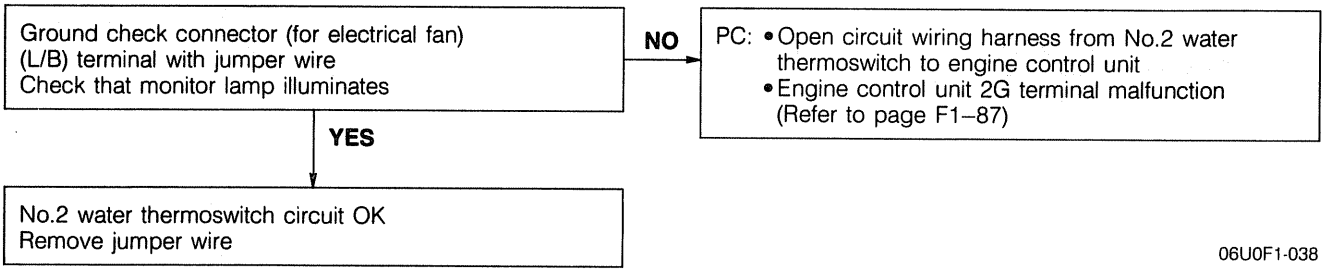


06U0F1-037

No.2 water thermoswitch circuit (not included in switch inspection) (ATX)

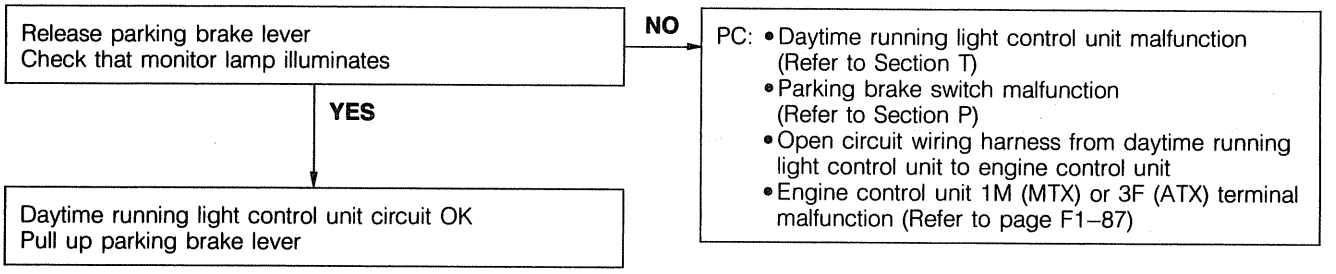
Warning

- **The electrical fan operates when the check connector (for electrical fan) (L/B) terminal is grounded. Use caution.**

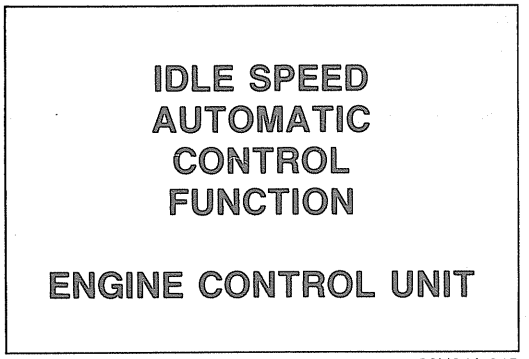


06U0F1-038

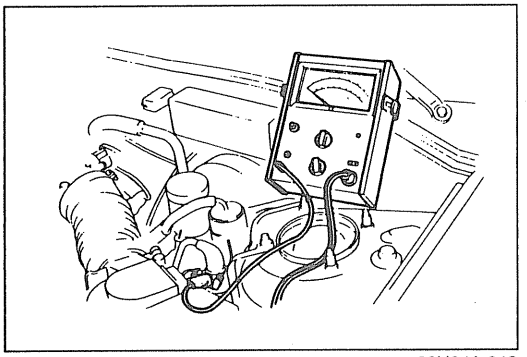
Daytime running light control unit (Canada only)



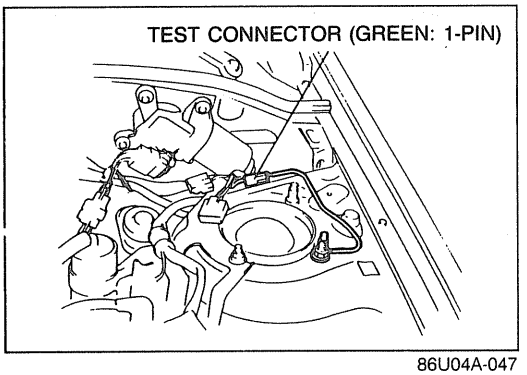
06U0F1-039



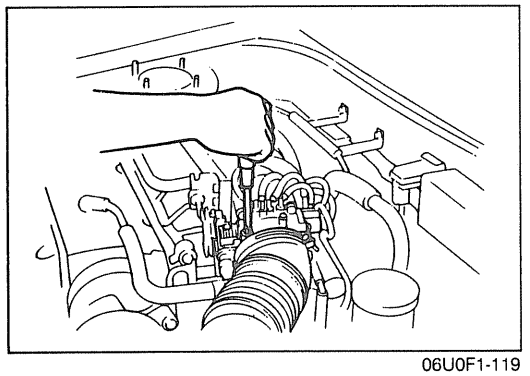
86U04A-045



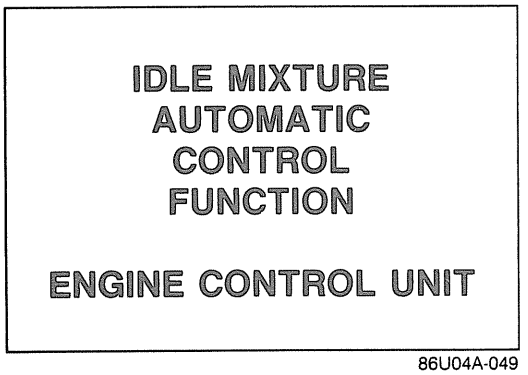
86U04A-046



86U04A-047



06U0F1-119



86U04A-049

IDLE ADJUSTMENT

IDLE SPEED

Because the idle speed is controlled automatically by the engine control unit through the idle speed control (ISC) solenoid valve, usually it is not necessary to check and adjust the idle speed.
However, the idle speed should be adjusted when rough idling occurs when the test connector (Green: 1-pin) is grounded.

Preparation

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

Inspection and Adjustment

1. Ground the test connector with a jumper wire.
2. Check that the idle speed is within specification.

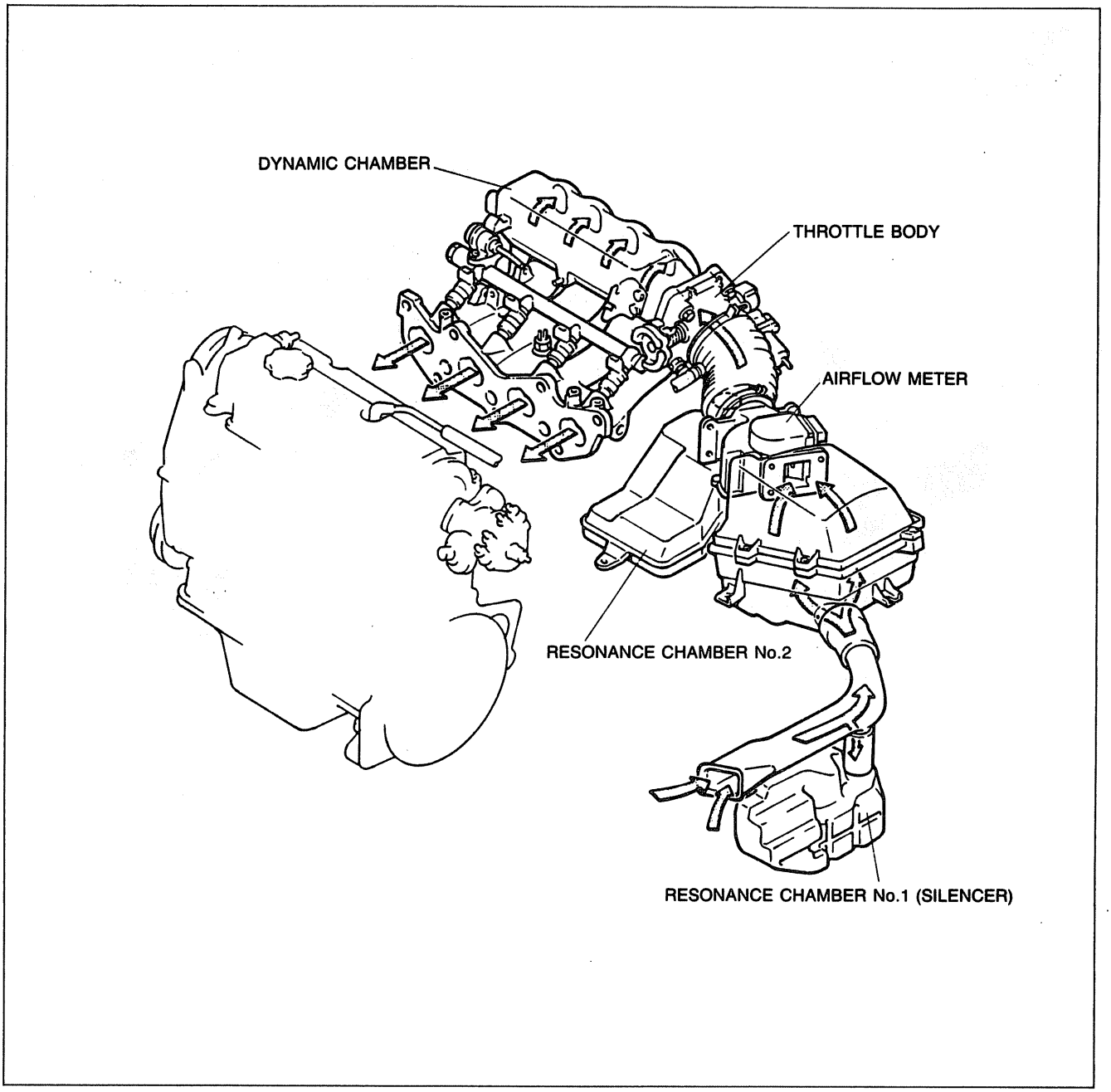
   Idle speed: 750 ± 25 rpm MTX: Neutral
   ATX: P range

3. If the idle speed is not within specification, adjust it by turning the air adjust screw.
4. After adjusting the idle speed, disconnect the jumper wire from the test connector.

IDLE MIXTURE

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

INTAKE AIR SYSTEM



86U04A-050

This system controls the air required by the engine for operation. The system consists of the air duct, air cleaner, airflow meter, throttle body, dynamic chamber, and intake manifold.
This system also has a resonance chamber to improve mid-range torque characteristics.

COMPONENT DESCRIPTIONS

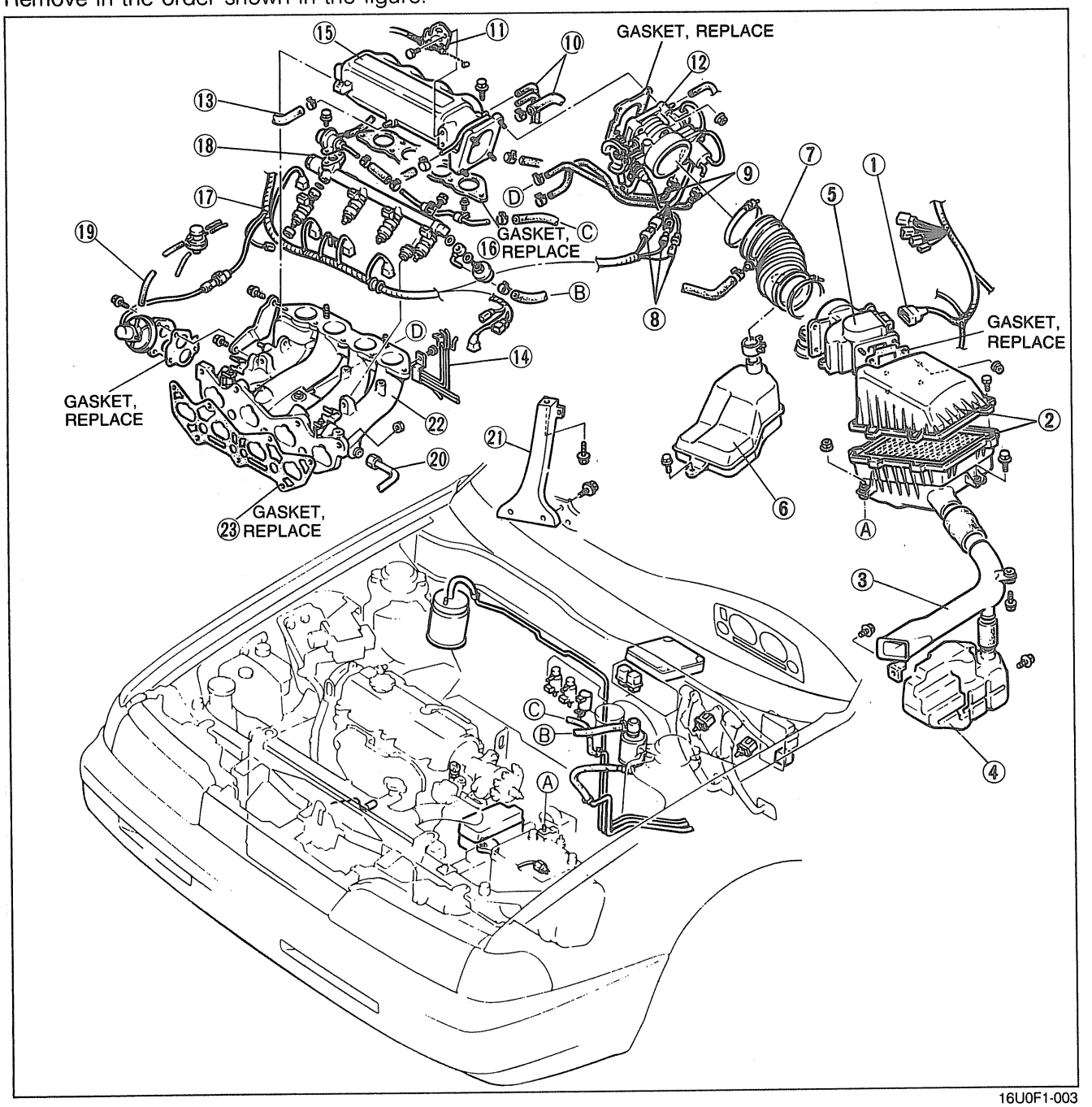
Component	Function	Remarks
Air cleaner	Filters air into throttle body	
Airflow meter	Detects amount of intake air; sends signal to control unit	Intake air thermosensor and fuel pump switch are integrated
Throttle sensor	Detects throttle valve opening angle; sends signal to control unit	Installed on throttle body
Throttle body	Controls intake air quantity	Integrated throttle sensor and idle switch

06U0F1-040

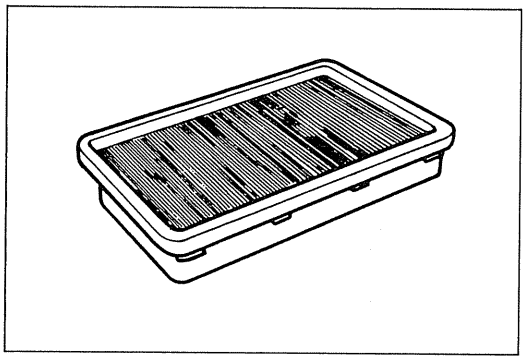
REMOVAL

Caution
- **Before removing the following parts, release the fuel pressure from fuel system to reduce the possibility of injury or fire. (Refer to page F1–47.)**

Remove in the order shown in the figure.



1. Airflow meter connector
2. Air cleaner
3. Air duct
4. Resonance chamber No.1
5. Airflow meter
6. Resonance chamber No.2
7. Air hose
8. Connectors
9. Water hoses
10. Vacuum hoses
11. Accelerator cable
12. Throttle body
13. PCV hose
14. Vacuum pipe assembly
15. Dynamic chamber
16. Gasket
17. Wiring harness
18. Delivery pipe assembly
19. Vacuum hoses
20. EGR pipe
21. Intake manifold bracket
22. Intake manifold
23. Gasket



69G04A-059

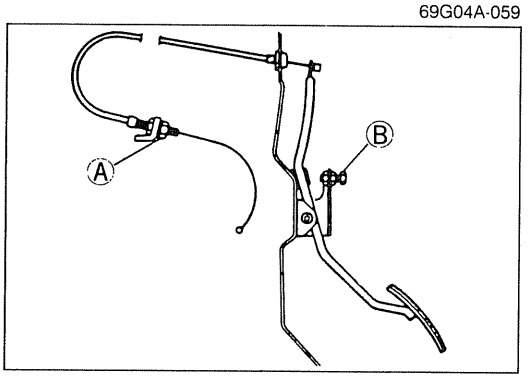
PARTS INSPECTION

Air Cleaner Element

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

Caution

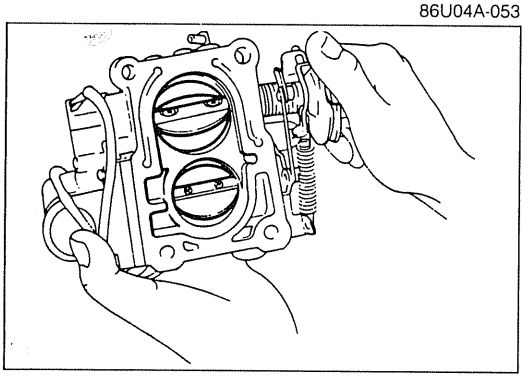
- **Do not use the compressed air to clean the air cleaner element.**



86U04A-053

Accelerator Cable

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



86U04A-054

Throttle Body

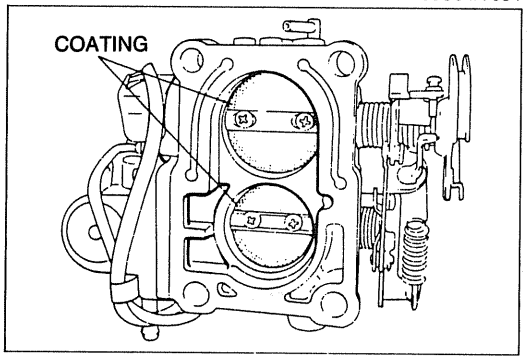
Note

- **The No.2 throttle valve is preset at the factory to begin opening after the No.1 throttle valve has opened approx. 25 degrees (MTX) or 10 degrees (ATX).**

1. Check that the No.1 and No.2 throttle valves move smoothly when the throttle lever is moved from fully closed to fully open.
2. Replace, if necessary.

Caution

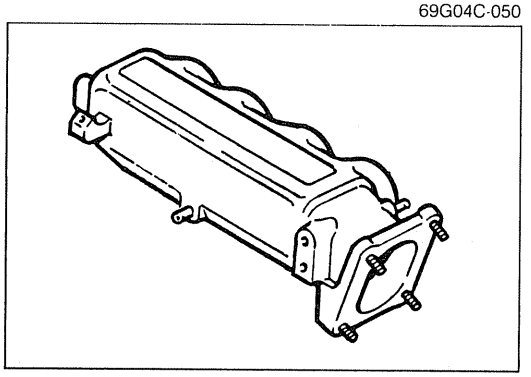
- **Do not remove the thin sealing coating from the throttle valve or bore.**



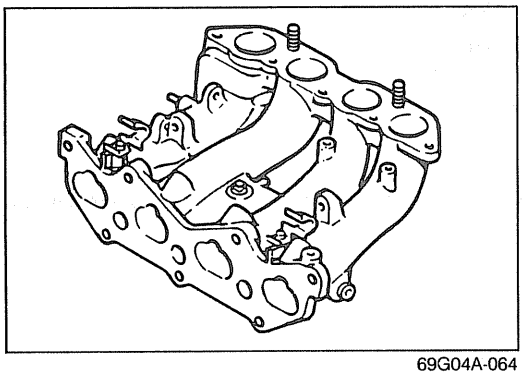
69G04C-050

Dynamic Chamber

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



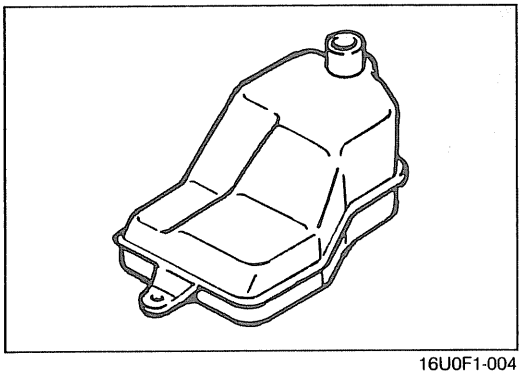
69G04A-062



69G04A-064

Intake Manifold

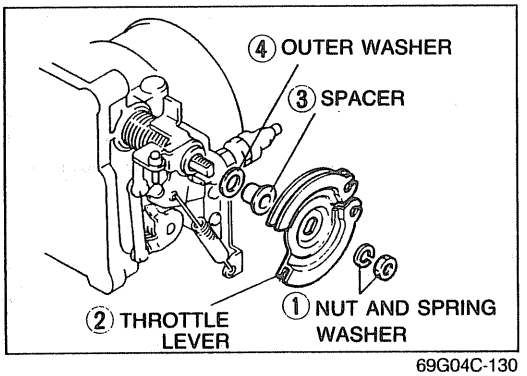
1. Visually check the intake manifold for damage.
2. Replace, if necessary.



16U0F1-004

Resonance Chamber No.2

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



69G04C-130

REPLACEMENT

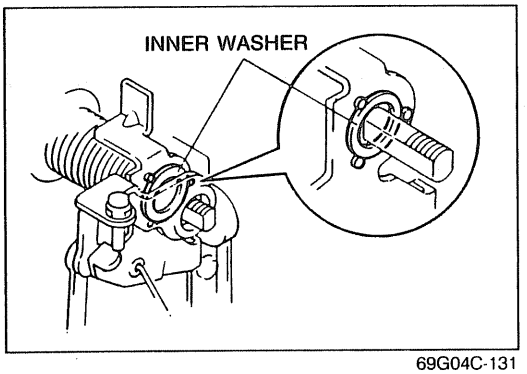
Throttle Lever

Removal

Caution

- **When loosening the throttle lever nut, hold the throttle valves fully open to prevent damaging the idle switch.**

Remove the throttle lever in the sequence shown in the figure.



69G04C-131

Installation

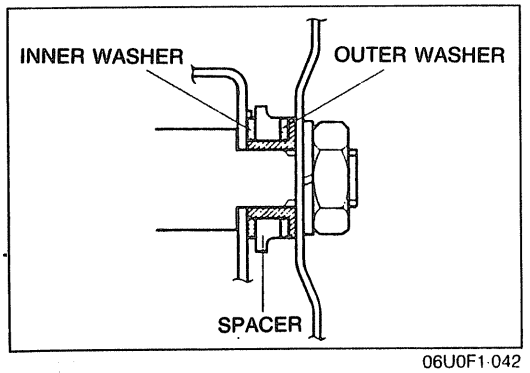
1. Check that the inner washer is in the proper position as shown in the figure.
2. Assemble the spacer and outer washer and install them onto the throttle shaft.
3. Install the throttle lever onto the throttle shaft.

Caution

- **When tightening the throttle lever nut, hold the throttle valves fully closed to prevent bending the stopper lever.**

4. Tighten the throttle lever nut.

Tightening torque:
16—23 N·m (1.6—2.3 m-kg, 12—17 ft-lb)



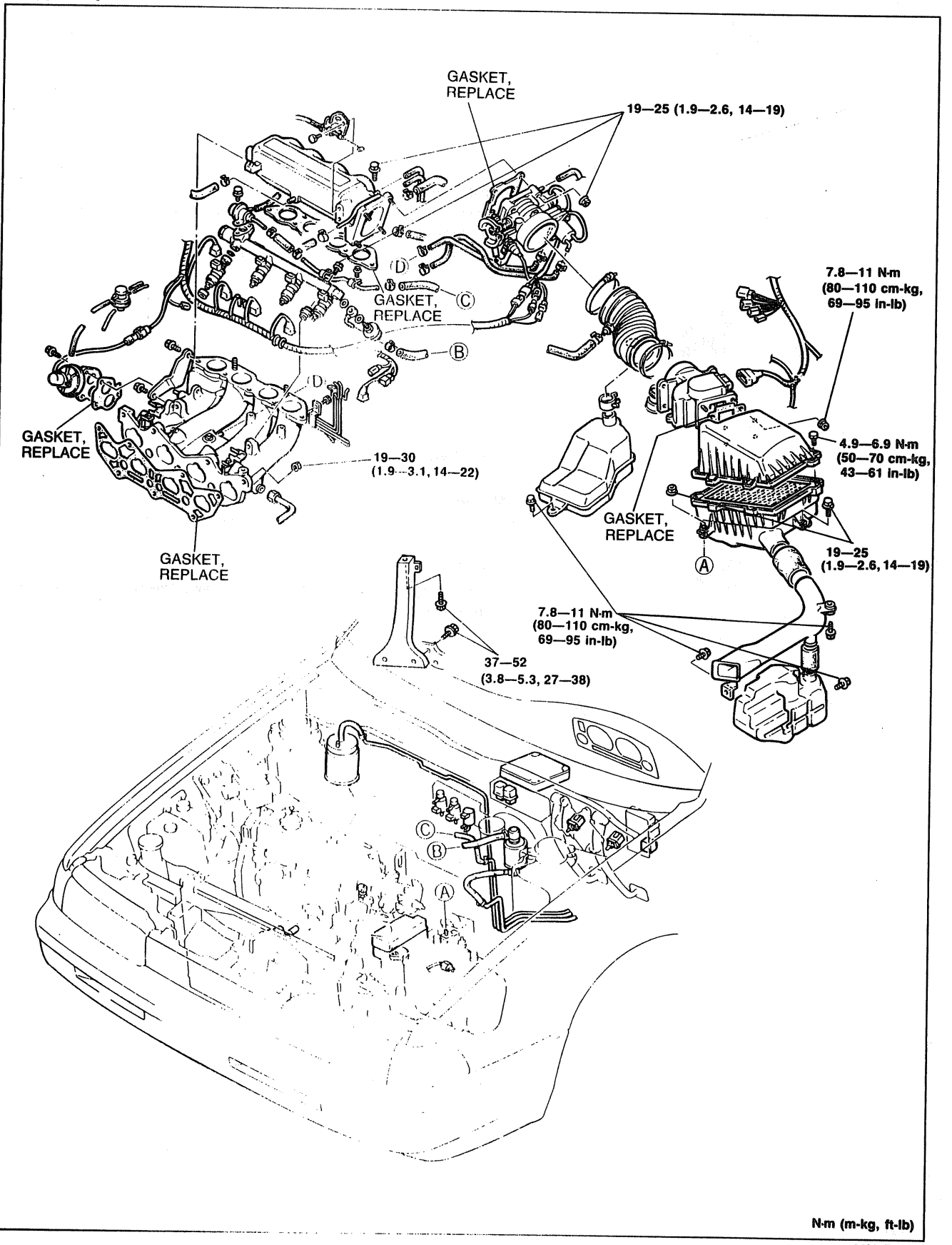
06U0F1-042

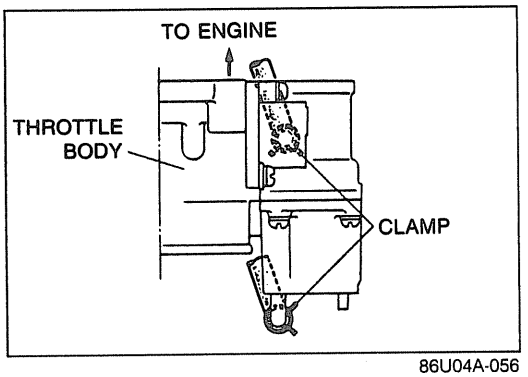
5. Check that the inner and outer washer and spacer are assembled correctly as shown.
6. Check that No.1 and No.2 throttle valves move smoothly and that No.2 throttle valve is closed completely when the No.1 throttle valve is closed.
7. Check the operation of the idle switch.
(Refer to page F1–99.)

INSTALLATION

Install in the reverse order of removal, referring to **Installation Note**.

Torque Specifications

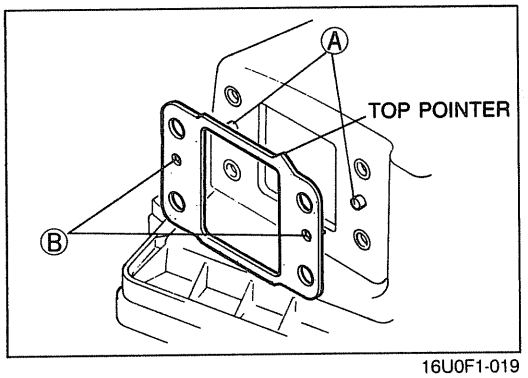




86U04A-056

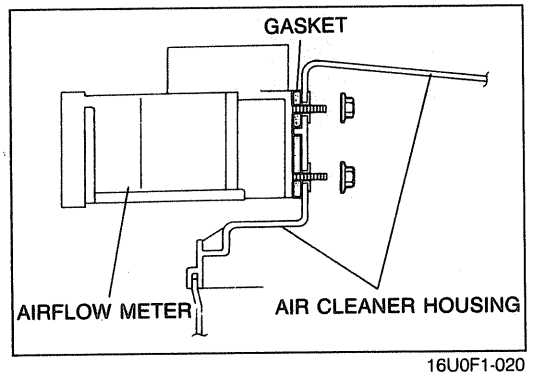
Installation Note
Water hose spring clamps
Face the clamp end as shown in the figure.

Gasket
Use new gaskets at the intake manifold, dynamic chamber, and throttle body.



16U0F1-019

Airflow meter
1. Mount the gasket onto the air cleaner housing, being sure that holes Ⓑ are fit over pins Ⓐ.
2. Make sure the top pointer of the gasket faces upward.



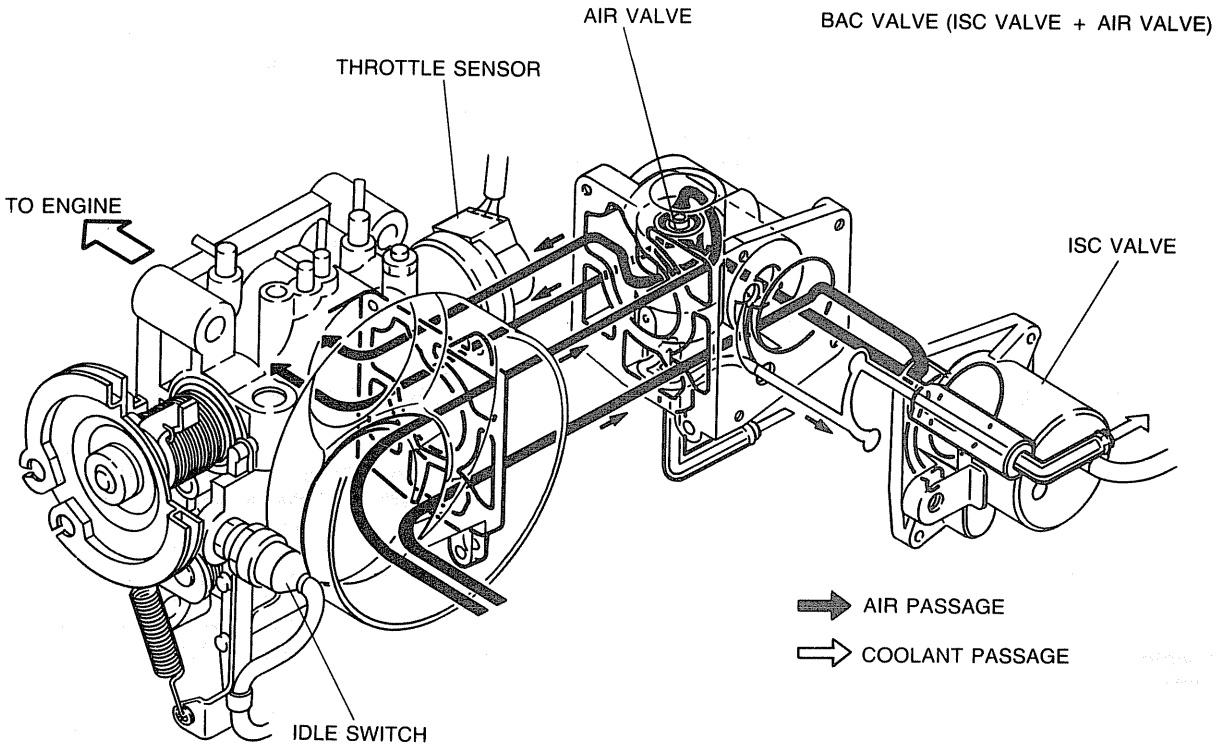
16U0F1-020

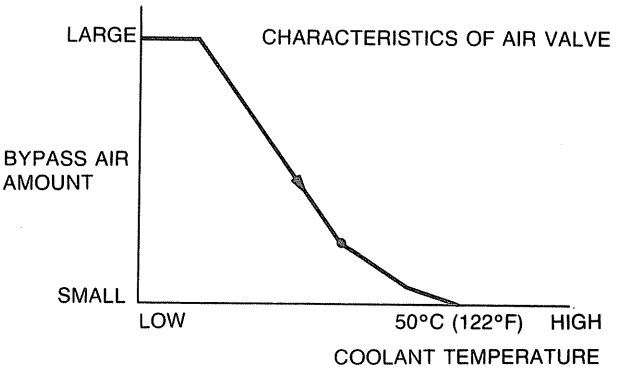
3. Install the airflow meter.

Torque specification:
7.8—11 N·m (80—110 cm-kg, 69—95 in-lb)

Caution
- **If the nuts are tightened to less than the specified torque, they may loosen and cause engine damage.**

IDLE SPEED CONTROL (ISC) SYSTEM





86U04A-057

To improve idle smoothness, the ISC system controls the intake air amount by regulating the bypass air amount that passes through the throttle body.
This system consists of the BAC valve and the control system.

The BAC valve consists of the air valve which functions only during cold engine conditions **(below 50°C [122°F])** and the ISC valve which works throughout the entire engine speed range.

COMPONENT DESCRIPTIONS

Component	Function	Remarks
Air valve	When cold, supplies bypass air into dynamic chamber	• Engine speed increased to shorten warm-up period • Thermo wax type • Installed in BAC valve
A/C switch	Detects A/C operation; sends signal to control unit	
Blower switch	Detects blower motor operation; sends signal to control unit	"3rd" and "4th" positions
Clutch switch (MTX)	Detects in-gear condition; sends signal to control unit	Switch ON when clutch pedal released
Engine control unit	Detects signals from input sensors and switches; controls solenoid valve (Idle speed control)	
Idle switch	Detects when throttle valve fully closed; sends signal to control unit	Installed on throttle body
Ignition coil (–) terminal	Detects engine speed; sends signal to control unit	
Inhibitor switch (ATX)	Detects in-gear condition; sends signal to engine control unit	Switch ON in "N" or "P" range
ISC valve	Controls bypass air amount	• Controlled by duty signal from control unit • With integrated air valve • Works idle-up
Neutral switch (MTX)	Detects in-gear condition; sends signal to control unit	Switch ON when in-gear
No.2 water thermoswitch (Electrical fan)	Detects electrical fan operation; sends signal to control unit	Switch ON above 108°C (226°F)
P/S pressure switch	Detects P/S operation; sends signal to control unit	P/S: ON when steering wheel turned right or left
Rear window defroster switch	Detects rear window defroster operation; sends signal to control unit	
Test connector	For Self-Diagnosis Checker and idle speed adjustment	1-pin connector (Green)
Throttle sensor	Detects throttle valve opening angle; sends signal to control unit	Installed on throttle body
Water thermoswitch (Electrical fan)	Detects electrical fan operation; sends signal to control unit	Switch ON above 97°C (207°F)

16U0F1-005

TROUBLESHOOTING

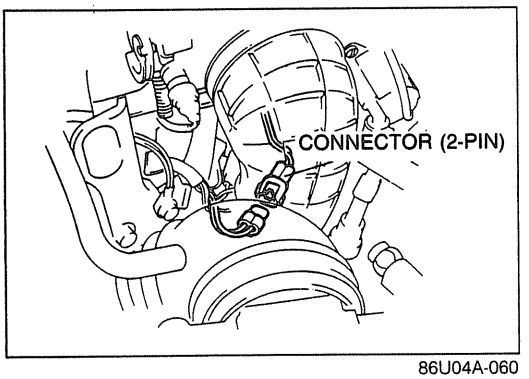
Check the condition of the wiring harness and connectors before checking the sensors or switch.

Note

- **Make the system inspection first. If no problem is found, continue with the next system inspection of the Troubleshooting Guide. (Refer to pages F1–10 and 11.)**

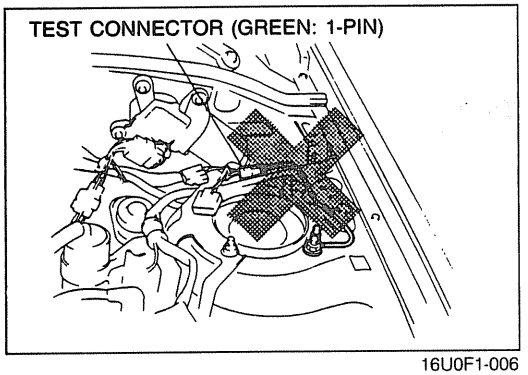
Possible cause / Page / Symptom		Air valve	ISC valve	Engine control unit terminal							System inspection
				1K (MTX) 1I (ATX)	1P (MTX) 1N (ATX)	1R (MTX) 2D (ATX)	1S (MTX) 1P (ATX)	1T (MTX) 1J (ATX)	2G (ATX)	2W (MTX) 3Q (ATX)	
		F1–42	F1–42	F1–87 F1–90	F1–87 F1–90	F1–87 F1–91	F1–88 F1–90	F1–88 F1–90	F1–91	F1–89 F1–92	F1–42
Engine stalls	While warming up	4	1	2						3	
	After warming up		1	7	2	3	4	5	6	8	
Rough idle	While warming up	5	2	3						4	1
	After warming up		2	8	3	4	5	6	7	9	1
High idle speed after warming up		8	2	8	3	4	5	6	7	9	1
Runs rough on deceleration			2	3						4	1
Afterburn in exhaust system		5	2	3						4	1

06U0F1-046



86U04A-060

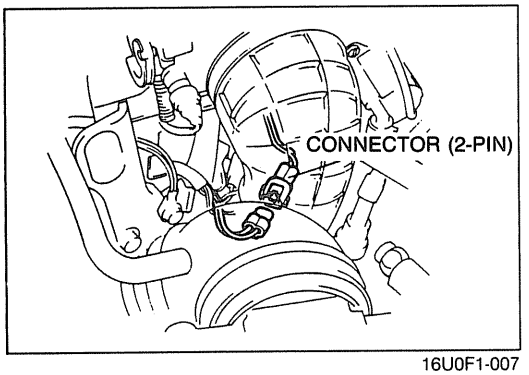
System Inspection
(Air valve)
1. Disconnect the ISC valve connector when the engine is cold and idling.
2. Note the engine speed and reconnect the connector.
3. Warm up the engine to the normal operating temperature and disconnect the connector again.
4. Check that the engine speed is lower when the connector is disconnected warm than when disconnected when it is cold.



16U0F1-006

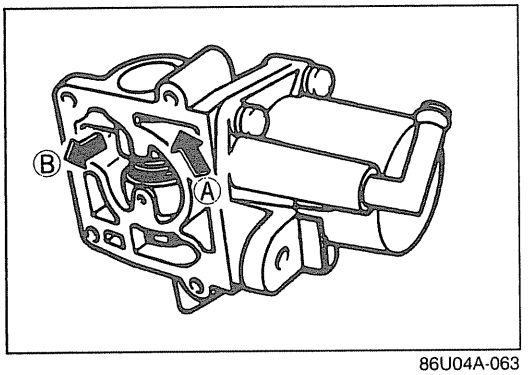
(ISC valve)
1. Connect the ISC valve connector.

Note
- **Make sure that the test connector is not grounded and that the idle speed is set to specification.**



16U0F1-007

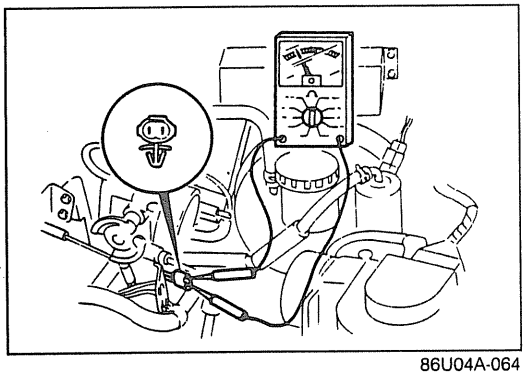
2. Again disconnect the ISC valve connector with the engine is at normal operating temperature.
3. Check that the engine speed decreases.
4. Reconnect the ISC valve connector.



86U04A-063

BAC Valve
Air valve
1. Remove the BAC valve from the throttle body.
2. Blow air through the valve from port A and check that air comes out of port B when the BAC valve is cold.
3. If not correct, replace the BAC valve.

Note
- **Refer to "Installation" on this page for the BAC valve installation.**

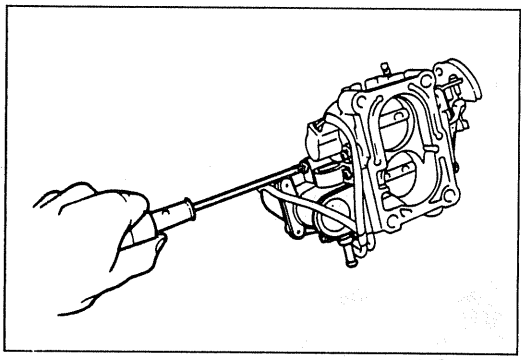


86U04A-064

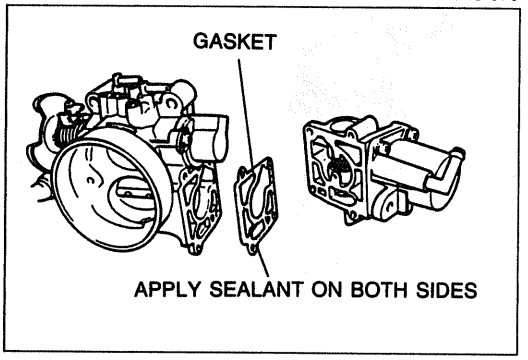
ISC valve
1. Disconnect the ISC valve connector.
2. Connect an ohmmeter to the terminals of the ISC valve.
3. Check the resistance.

Resistance (normal operating temperature):
6.3—9.9Ω

4. If not correct, replace the BAC valve.



69G04C-070



69G04C-071

Removal

1. Remove the screws.
2. Remove the BAC valve from the throttle body.

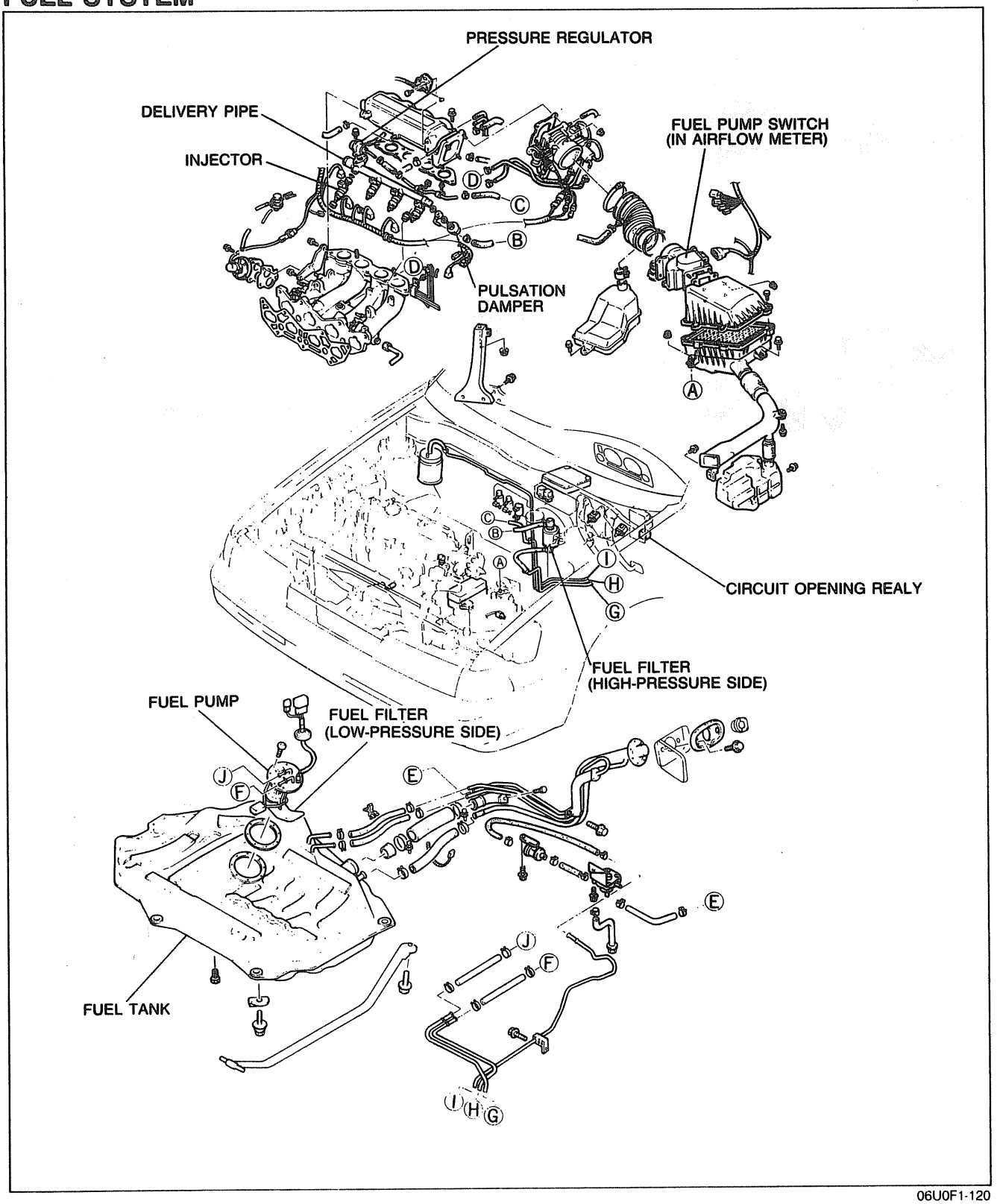
Installation

Caution

- **Use a new gasket.**

1. Remove any dirt or old sealant from the contact surfaces.
2. Apply sealant to both sides of the gasket.
3. Tighten the screws.

FUEL SYSTEM



06U0F1-120

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

COMPONENT DESCRIPTIONS

Component	Function	Remarks
Airflow meter	Detects amount of intake air; sends signal to control unit	Intake air thermosensor and fuel pump switch are integrated
Atmospheric pressure sensor	Detects atmospheric pressure; sends signal to control unit	
Circuit opening relay	Voltage for fuel pump while engine running	
Clutch switch (MTX)	Detects in-gear condition; sends signal to control unit	Switch ON when clutch pedal released
Engine control unit	Detects signals from input sensors and switches; controls injector operation	
Fuel filter	Filters particles from fuel	
Fuel pump	Provides fuel to injectors	• Operates while engine running • Installed in fuel tank
Idle switch	Detects when throttle valve fully closed; sends signal to control unit	Installed on throttle body
Ignition coil (–) terminal	Detects engine speed; sends signal to control unit	
Ignition switch (ST position)	Sends engine cranking signal to control unit	
Inhibitor switch (ATX)	Detects in-gear condition; sends signal to engine control unit	Switch ON in "N" or "P" range
Injector	Injects fuel into intake port	• Controlled by signals from control unit • High-ohmic injector
Intake air thermosensor	Detects intake air temperature; sends signal to control unit	Installed in airflow meter
Main relay	Supplies electric current to injectors and control unit	
Neutral switch (MTX)	Detects in-gear condition; sends signal to control unit	Switch ON when in-gear
Oxygen sensor	Detects Oxygen concentration; sends signal to control unit	Zirconia ceramic and platinum coating
Pressure regulator	Adjusts fuel pressure supplied to injectors	
Pulsation damper	Absorbs fuel pulsation	
Speedometer	Detects vehicle speed; sends signal to control unit	ON: Above 113 mph (180 km/h)
Throttle sensor	Detects throttle valve opening angle; sends signal to control unit	Installed on throttle body
Water thermosensor	Detects coolant temperature; sends signal to control unit	

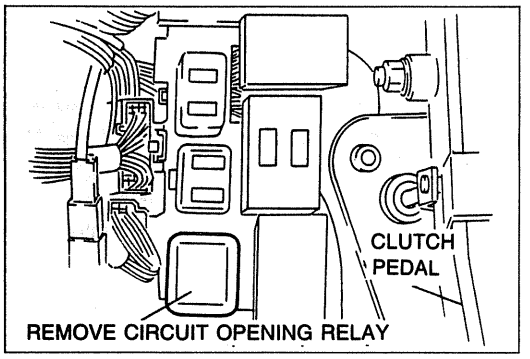
06U0F1-047

TROUBLESHOOTING

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

Symptom \ Possible cause / Page		Airflow meter	Oxygen sensor	Throttle sensor	Water thermosensor	Fuel pump	Injector	Fuel pressure	Engine control unit terminal	
									2U and 2V (MTX) 3U and 3V (ATX)	1C
		F1–96	F1–100	F1–97	F1–99	F1–53	F1–55	F1–48	F1–88 F1–92	F1–87 F1–90
Hard start or won't start (Cranks OK)					4	1	3			2
Engine stalls	While warming up	4					2	1	5	
	After warming up						3	2	4	
Rough idle	While warming up	4			3		2	1		
	After warming up	1					3	2		
Poor acceleration, hesitation, or lack of power		1		3			4	2		
Runs rough on deceleration		1					2			
Afterburn on deceleration		1					2			
Poor fuel consumption		5		4		3		2	1	
Engine stalls or rough after hot starting		1					3	2		

06U0F1-048



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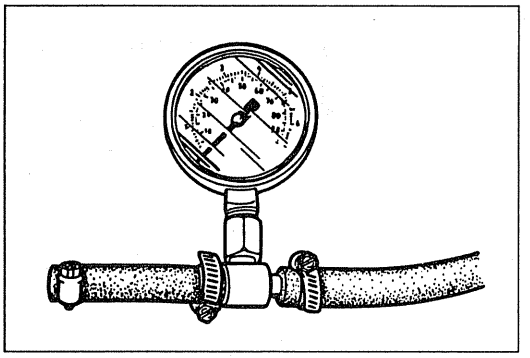

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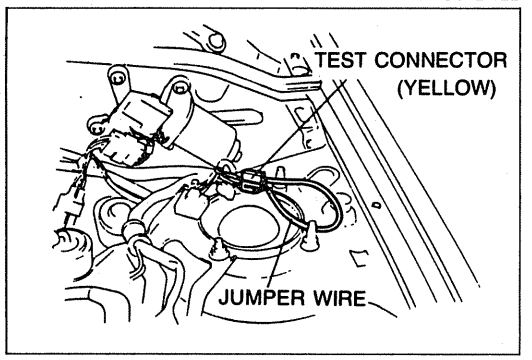


9MU0F2-123

PRECAUTION

Fuel Pressure Release and Servicing Fuel System

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

a) Before disconnecting any fuel line, release the fuel pressure from the fuel system to reduce the possibility of injury or fire.
   1. Start the engine.
   2. Disconnect the circuit opening relay connector.
   3. After the engine stalls, turn off the ignition switch.
   4. Reconnect the circuit opening relay connector.

b) Use a rag as protection from fuel spray when disconnecting the hoses.
   Plug the hoses after removal.

c) When inspecting the fuel system, use a suitable fuel pressure gauge.

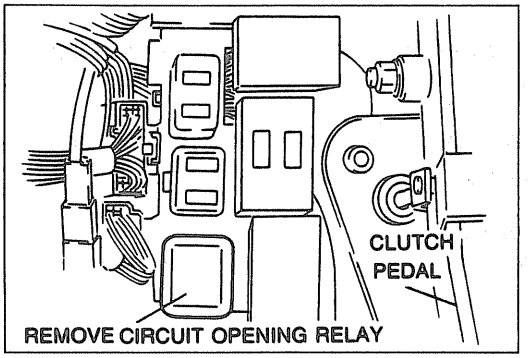
Caution

- **Install hose clamps to secure the fuel pressure gauge to the fuel filter and the fuel main hose to prevent fuel leakage.**

Priming Fuel System

After releasing the fuel system pressure for repairs or inspection the system must be primed to avoid excessive cranking when first starting the engine. Follow the steps below.

1. Connect the terminals of the test connector (Yellow: 2-pin) with a jumper wire.
2. Turn the ignition switch ON for **approx. 10 sec.** and check for fuel leaks.
3. Turn the ignition switch OFF and remove the jumper wire.



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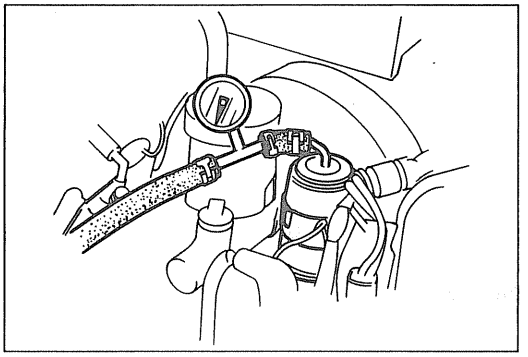

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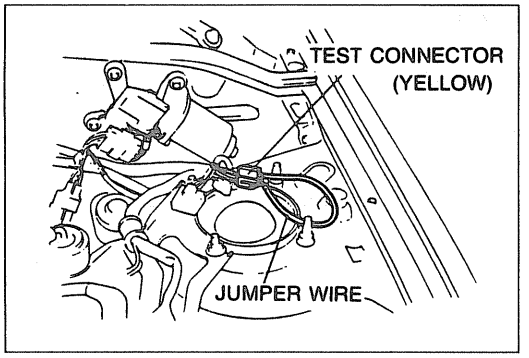

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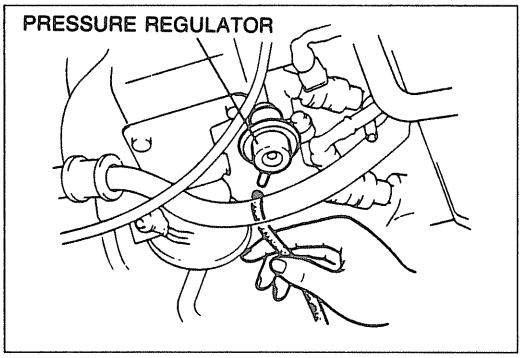


06U0F1-051

FUEL PRESSURE

Warning

- **Before performing the following operation, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F1–47.)**

1. Disconnect the negative battery terminal.
2. Install the fuel pressure gauge between the fuel filter and the fuel main hose. (Install clamps as shown.)
3. Connect the negative battery terminal.
4. Connect the terminals of the test connector (Yellow: 2-pin) with a jumper wire.
5. Turn the ignition switch ON.
6. Measure the fuel line pressure.

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

Low pressure— Check for fuel leakage.
Check fuel pump maximum pressure. (Refer to page F1–54.)
High pressure— Check fuel line and fuel filter for clogging.
Replace the pressure regulator. (Refer to page F1–59.)

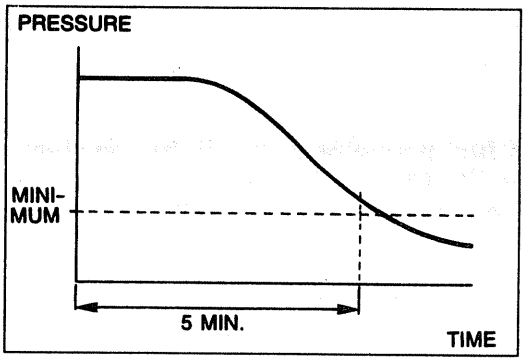
7. Remove the jumper wire from the test connector.
8. Start the engine and run it at idle.
9. Disconnect the vacuum hose from the pressure regulator and plug it.
10. Measure the fuel line pressure at idle.

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

11. Reconnect the vacuum hose to the pressure regulator.
12. Measure the fuel pressure at idle.

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

13. If not as specified, check the vacuum hose to the pressure regulator.
If the vacuum hose is OK, replace the pressure regulator.



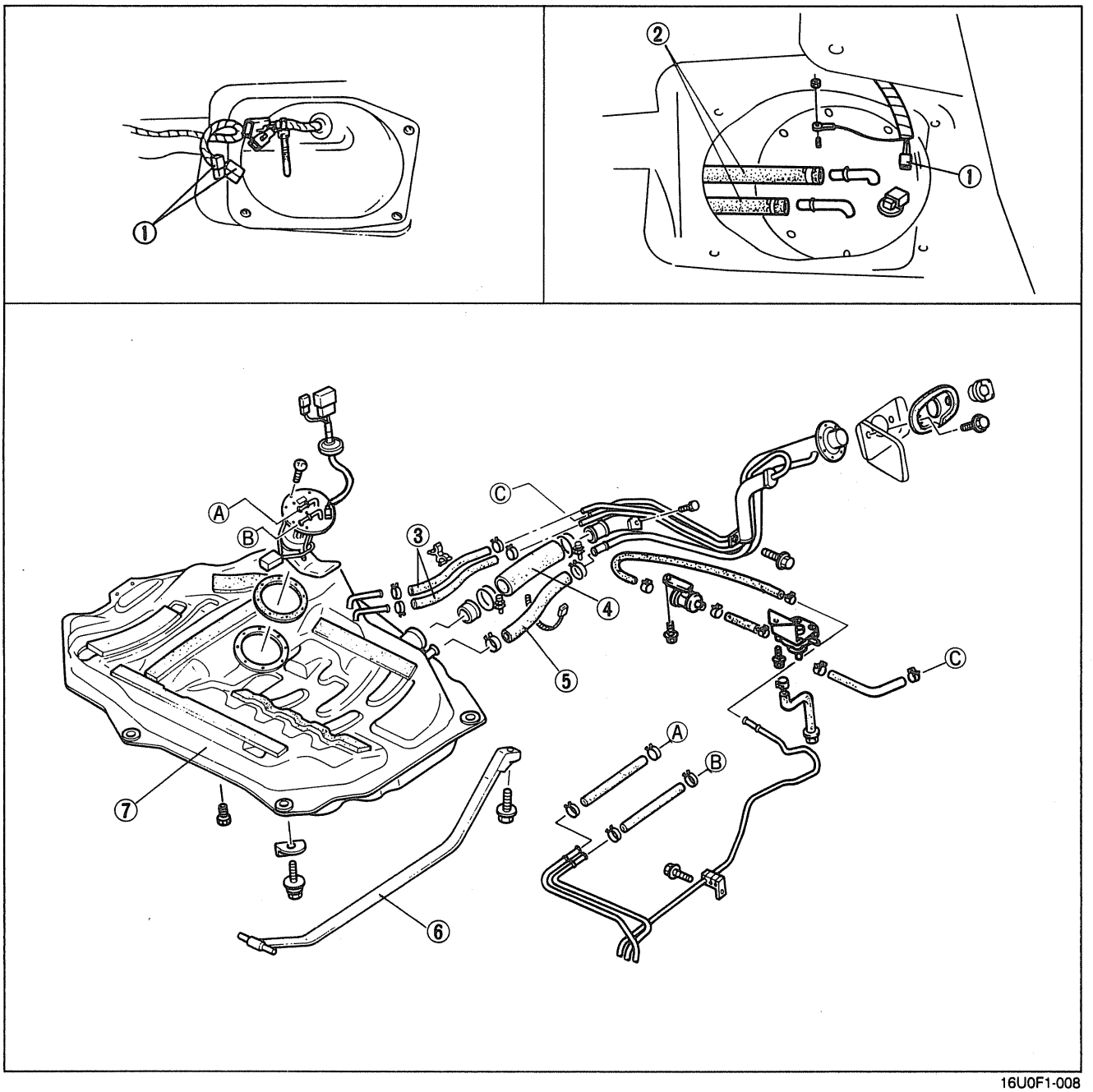
06U0F1-052

14. Stop the engine and check that the fuel pressure remains **above 21 psi (1.5 kg/cm^2, 147 kPa) for 5 min.** after the engine is turned off.
15. If not as specified, check the following.
    - Fuel pump hold pressure. (Refer to page F1–53.)
    - Pressure regulator hold pressure. (Refer to page F1–59.)
    - Injector fuel leakage. (Refer to page F1–57.)

FUEL TANK
Removal

Caution
- **Before performing the following procedure, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F1–47.)**
- **When removing the fuel tank, keep sparks, cigarettes, and open flames away from the fuel tank.**

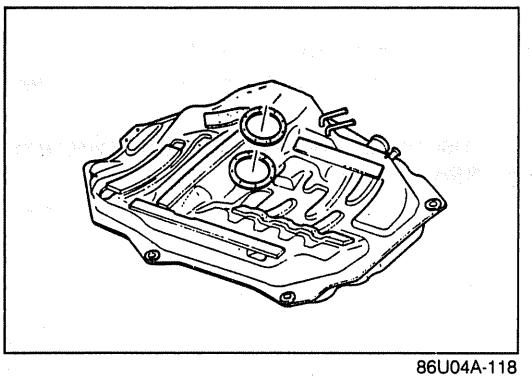
Remove in the order shown in the figure.



16U0F1-008

Note
- **Drain the fuel from the fuel tank before removing the tank.**

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



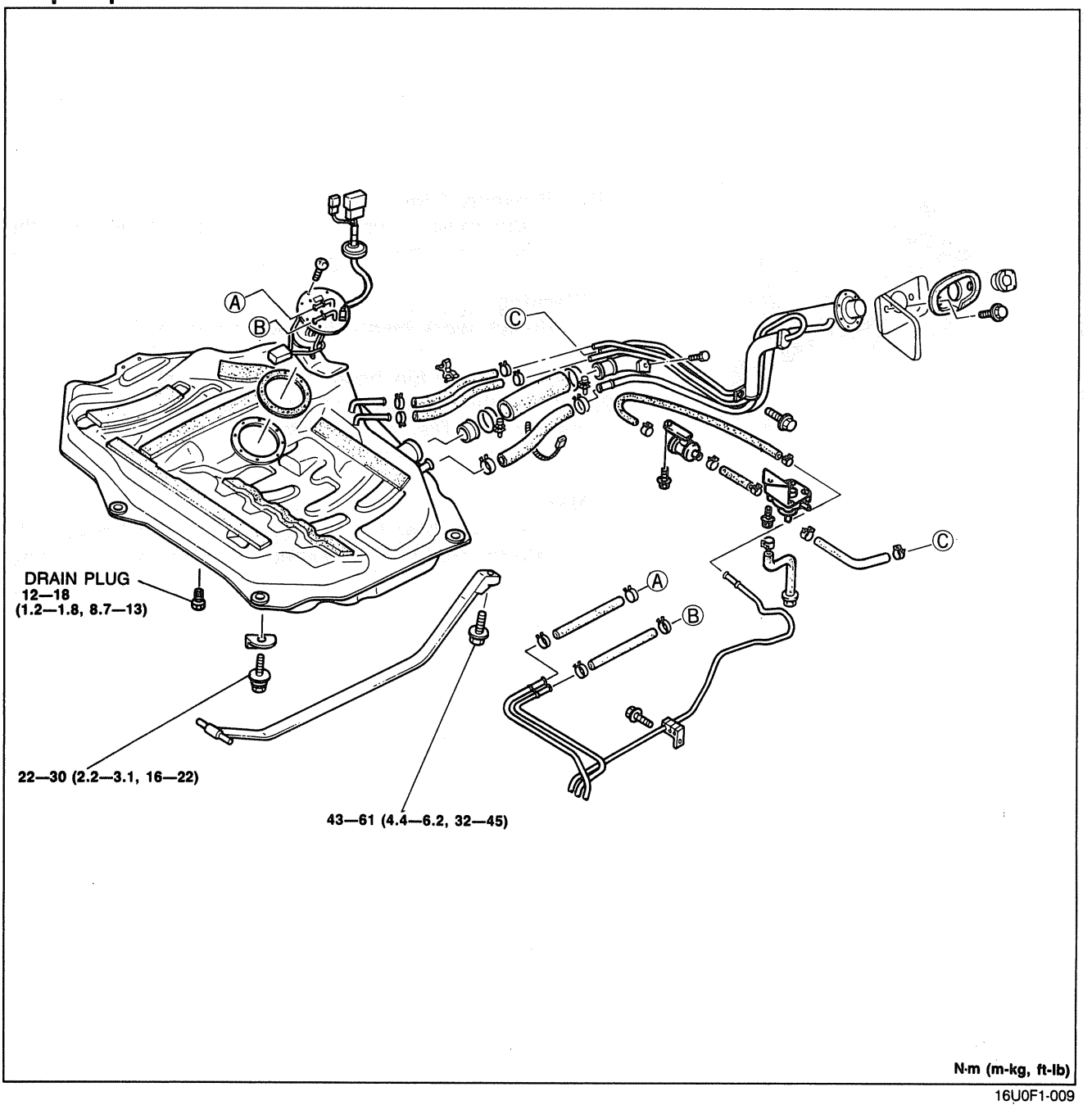
86U04A-118

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

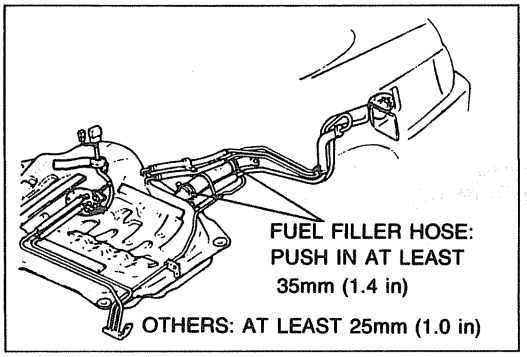
Warning
- **Before repairing, clean the fuel tank thoroughly with steam to sufficiently remove all explosive gas.**

Installation
Install in the reverse order of removal, referring to **Installation Note**.

Torque Specifications



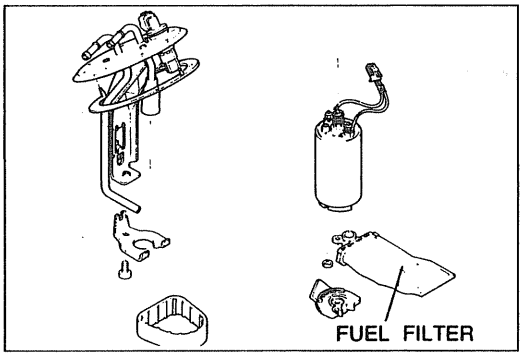
16U0F1-009



86U04A-120

Installation note

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



06U0F1-054

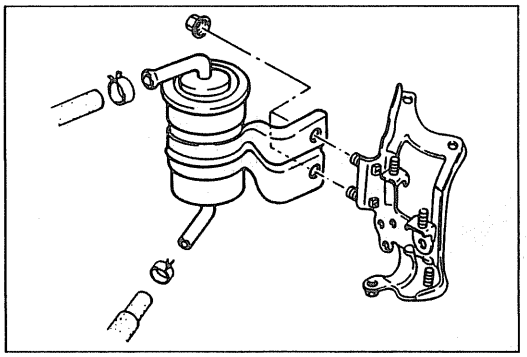
FUEL FILTER

Low Pressure Side

Refer to page F1–55.

High Pressure Side

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



86U04A-116

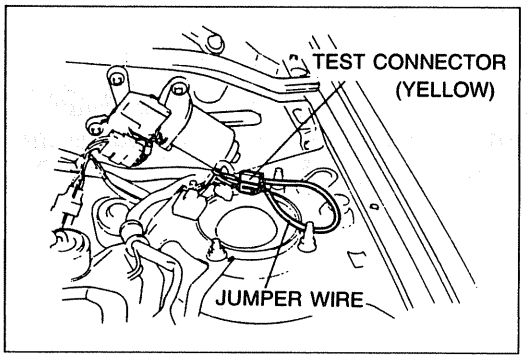
Warning

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

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

Note

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

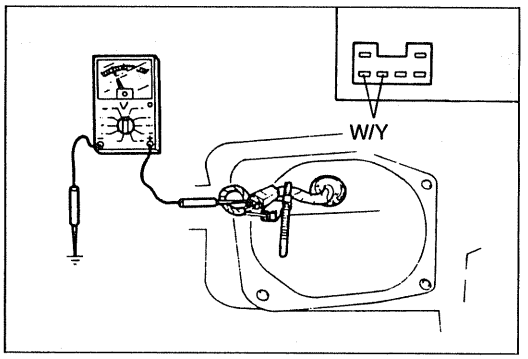


86U04A-079

FUEL PUMP

Operation Test

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

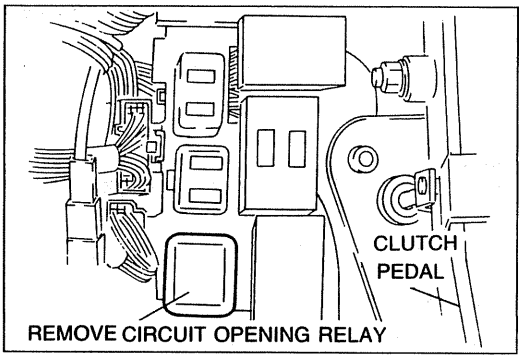


06U0F1-055

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

Voltage: 12V

7. If the voltage is normal, replace the fuel pump.
8. If not correct, check the circuit opening relay. (Refer to page F1–80.) and its circuits.
9. Disconnect the jumper wire.



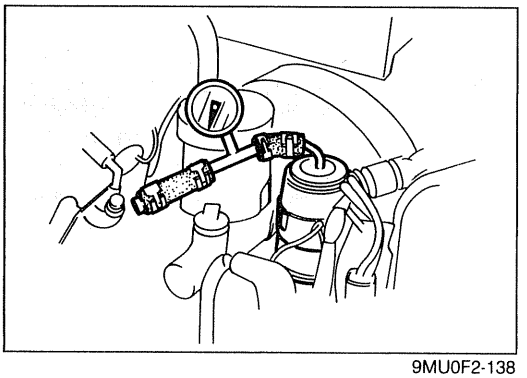
06U0F1-056

Hold Pressure

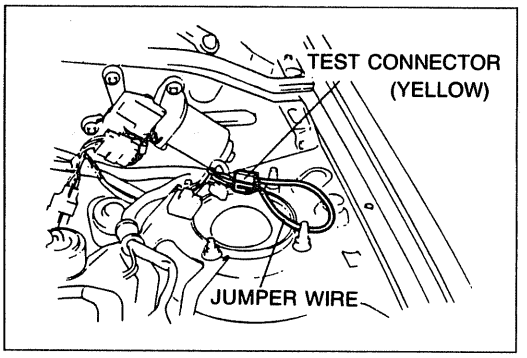
Only if fuel system pressure drop is not as specified, check fuel pressure drop for fuel pump.

Warning

- **Before performing the following operation,release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F1–47.)**


9MU0F2-138

1. Disconnect the negative battery terminal.
2. Install a fuel pressure gauge to the outlet of the fuel filter and plug the outlet of the fuel pressure gauge as shown. (Install clamps as shown.)
3. Connect the negative battery terminal.

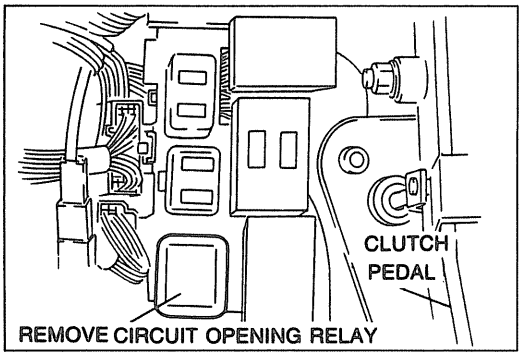


9BU0F2-084

4. Connect the terminals of the test connector (Yellow: 2-pin) with a jumper wire.
5. Turn the ignition switch ON **for 10 seconds** to operate the fuel pump.
6. Turn the ignition switch OFF and disconnect the jumper wire.
7. Observe the fuel pressure **after 5 minutes**.

Fuel pressure:
More than 343 kPa (3.5 kg/cm^2, 50 psi)

8. If not as specified, replace the fuel pump.



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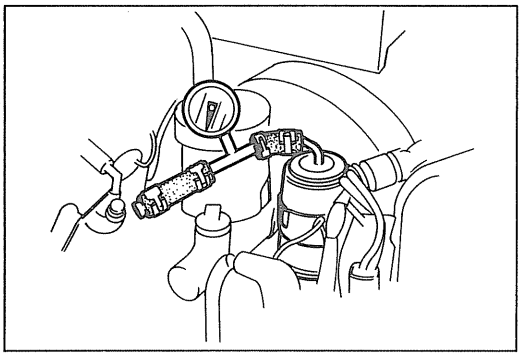
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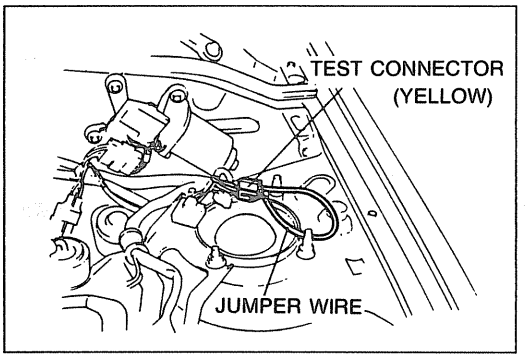

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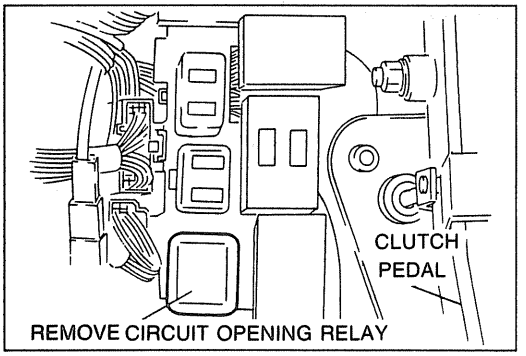
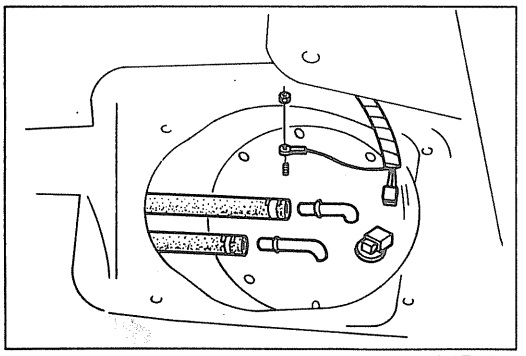


06U0F1-058


06U0F1-059

Fuel pump maximum pressure

Warning
- **Before performing the following operation, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F1–47.)**

1. Disconnect the negative battery terminal.
2. Install a fuel pressure gauge to the outlet of the fuel filter and plug the outlet of the fuel pressure gauge as shown.(Install clamps as shown.)
3. Connect the negative battery terminal.
4. Connect the terminals of the test connector (Yellow: 2-pin) with a jumper wire.
5. Turn the ignition switch ON to operate the fuel pump.
6. Measure the fuel pump maximum pressure.

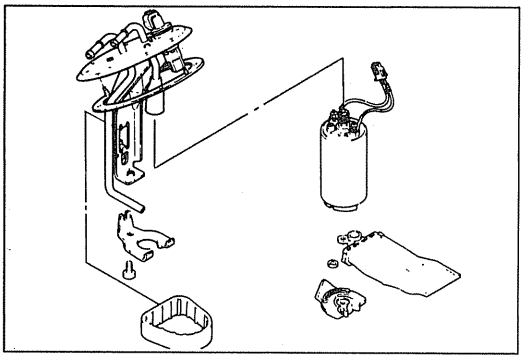
Fuel pump maximum pressure:
441—588 kPa (4.5—6.0 kg/cm^2, 64—85 psi)

7. Turn the ignition switch OFF and disconnect the jumper wire.
8. If not as specified, replace the fuel pump.

Replacement

Caution
- **Before performing the following procedure, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F1–47.)**
- **When servicing the fuel system, keep sparks, cigarettes, and open flames away from the fuel.**

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

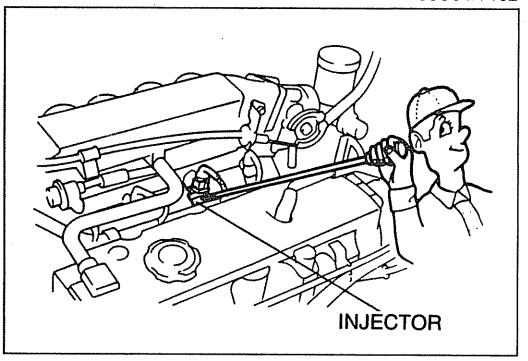


86U04A-102

5. Replace the fuel pump.

Caution
- **Secure the fuel pump terminals and fuel hoses securely.**

6. Install in the reverse order of removal.



86U04A-084

INJECTOR

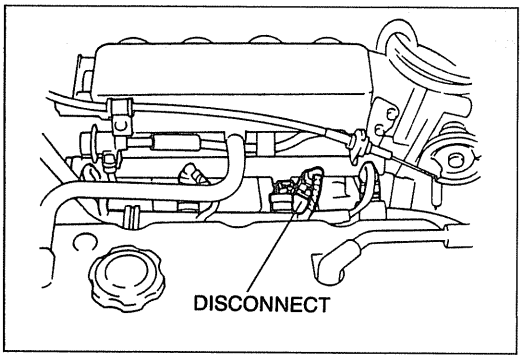
On-vehicle Inspection

Engine does not start

Perform "Quick Inspection for Electrical Signal" below.

Engine runs

1. Warm up the engine and run it at idle.
2. Listen for operational sound of the injector with a screwdriver or a sound scope.

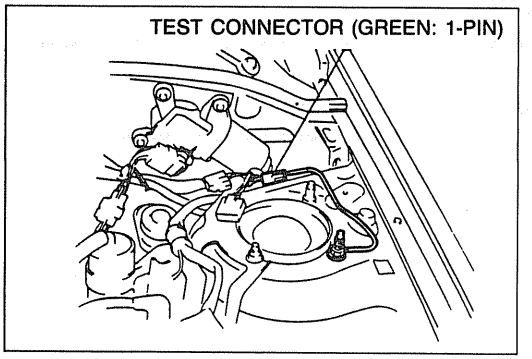


86U04A-085

3. Disconnect the connector from each injector respectively.
4. Check that the engine speed decreases about **100—200 rpm** each time.
5. If not correct, check the following:

No operating sound and no speed drop
Perform "Quick Inspection for Electrical Signal" below.

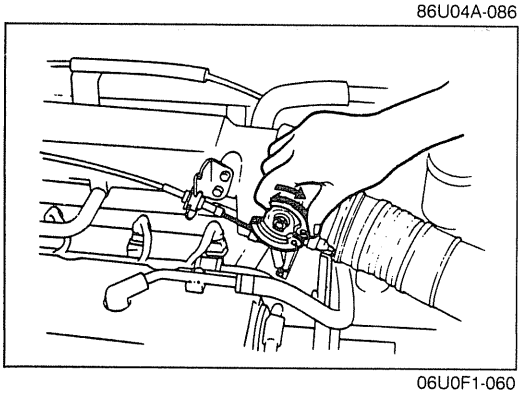
No speed drop only
Injector resistance
Injection volume of injector



86U04A-086

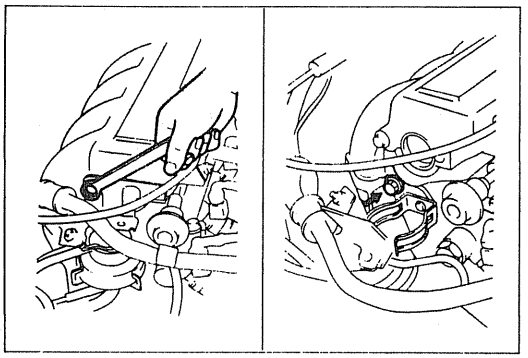
Quick Inspection for Electrical Signal

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



06U0F1-060

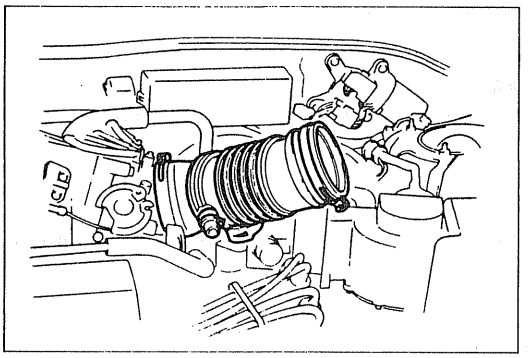
2. Turn the ignition switch ON.
3. Open the throttle valve and check for a "click" at the injector with a screwdriver or sound scope as it is opened.
4. If nothing is heard, check the injector wiring circuit.
5. If nothing is heard at all injectors, check the main relay. (Refer to page F1–80.) and circuit.



06U0F1-061

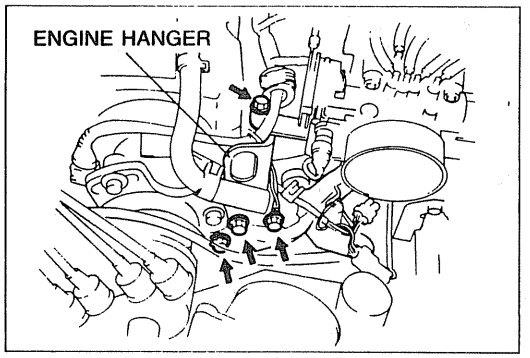
Removal

1. Remove the wiring harness bracket.
2. Remove the EGR modulator valve bracket.
3. Disconnect the vacuum pipe mounting bolts.



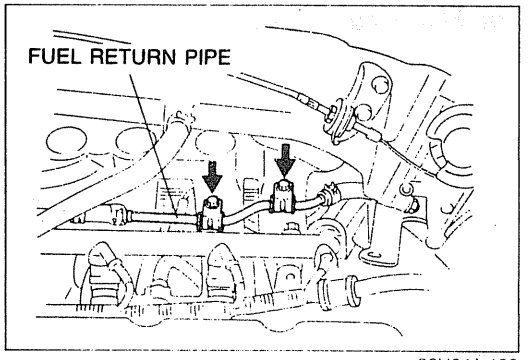
86U04A-104

4. Disconnect the air hose from the throttle body.



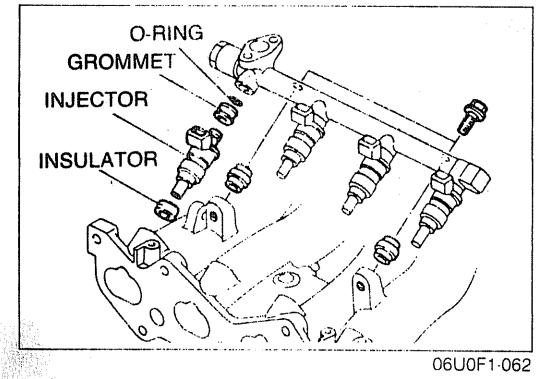
86U04A-105

5. Remove the engine hanger.
6. Remove the dynamic chamber mounting bolts and nuts.



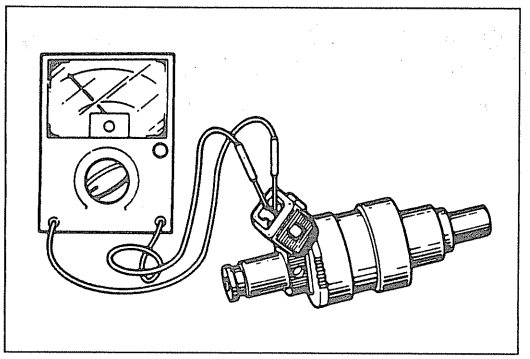
86U04A-106

7. Lift the dynamic chamber.
8. Disconnect the fuel return pipe bracket from the intake manifold.
9. Disconnect the injector connectors.
10. Remove the delivery pipe along with the pressure regulator and pulsation damper.

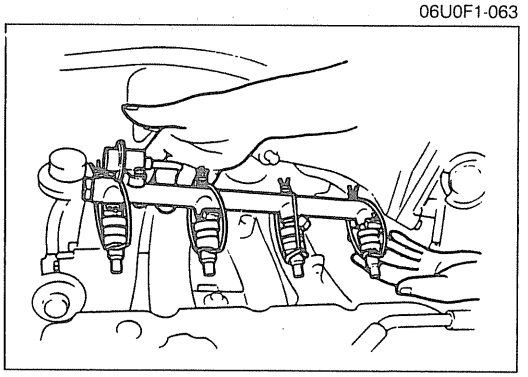


06U0F1-062

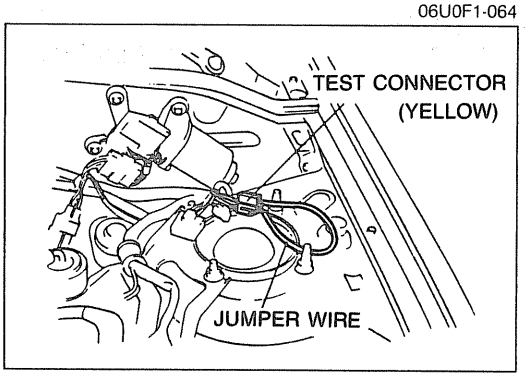
11. Remove the grommets, injectors, and insulators.



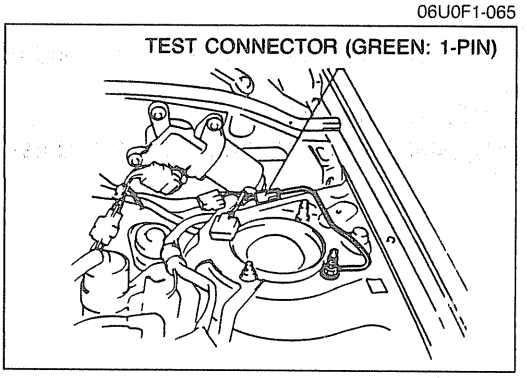
06U0F1-063



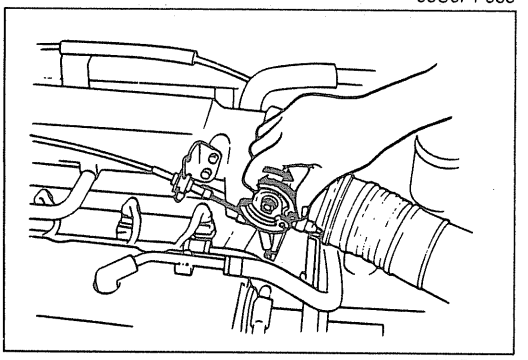
06U0F1-064



06U0F1-065



06U0F1-066



06U0F1-067

Inspection

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

Resistance

1. Remove the injectors from the engine. (Refer to page F1–56.)
2. Check the resistance of each injector with an ohmmeter.
3. If not correct, replace the injector.

Resistance: 12—16Ω

Fuel leakage test

1. Lift the dynamic chamber upward.
2. Remove the injectors and delivery pipe. (Refer to pages F1–56.)
3. Affix the injectors to the delivery pipe with wire.

Caution

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

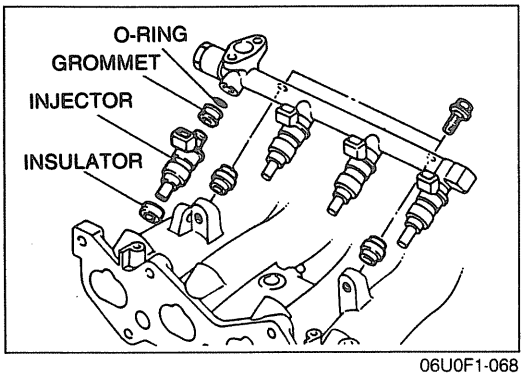
Warning

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

4. Connect the terminals of the fuel pump test connector with a jumper wire. Turn the ignition switch ON.
5. Cover the injector nozzles with a rag.
6. Ground the test connector (Green: 1-pin) with a jumper wire.
7. Open the throttle valve and release the air in the injectors.
8. Clean the nozzle.
9. Check that no fuel leaks from the injector nozzles.

Note

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



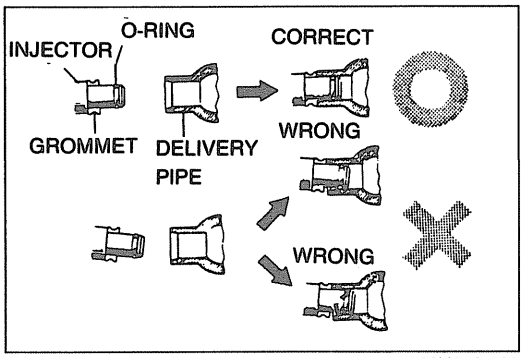
06U0F1-068

Installation

1. Install in the reverse order of removal, referring to **installation Note**.

Tightening torque:

Delivery pipe	**19—25 N·m**
Dynamic chamber	**(1.9—2.6 m-kg, 14—19 ft-lb)**
Engine hanger	

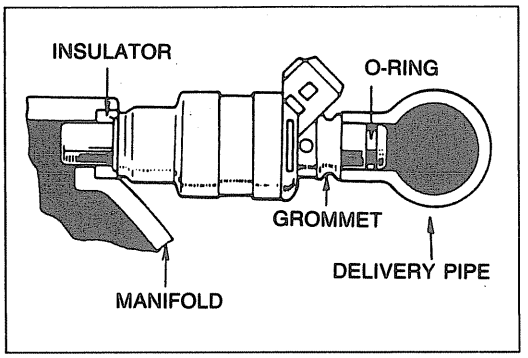


86U04A-108

Installation note

Injector

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



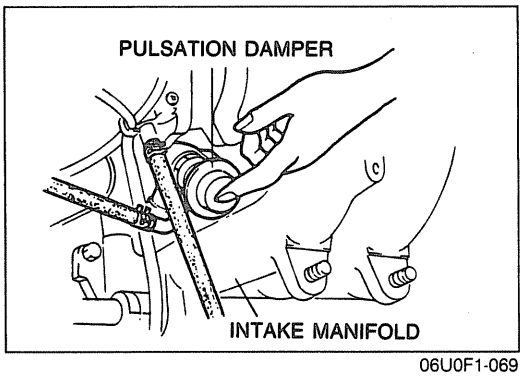
86U04A-109

3. Install the injectors and the injector insulators.

PULSATION DAMPER

Inspection

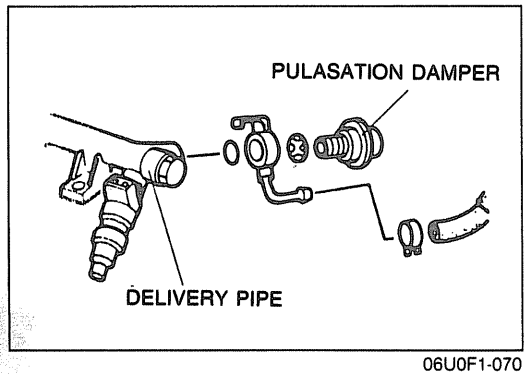
1. Run the engine at idle.
2. Place a finger on the screw of the pulsation damper head.
3. Check that pulsation is felt.



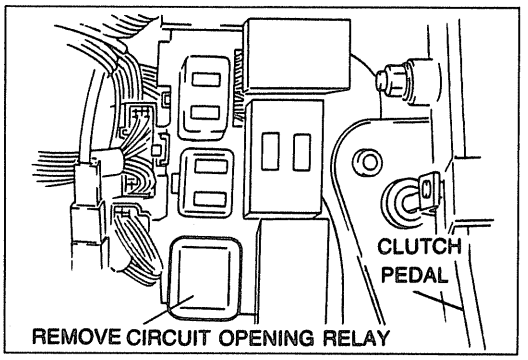
06U0F1-069

Replacement

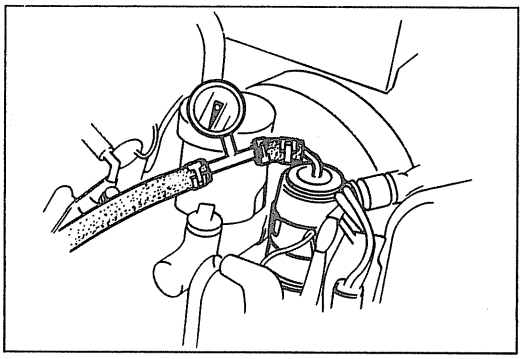
1. Perform steps 1 to 7 of removal procedure for the injectors. (Refer to page F1–56.)
2. Remove the pulsation damper.
3. Install in the reverse order of removal.

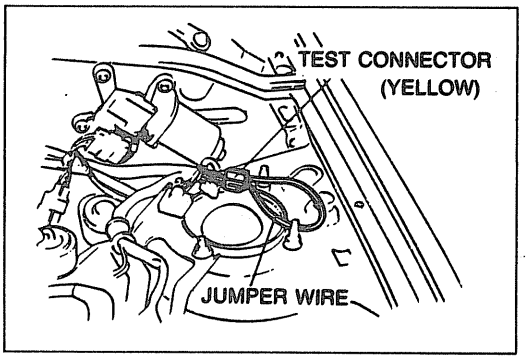


06U0F1-070

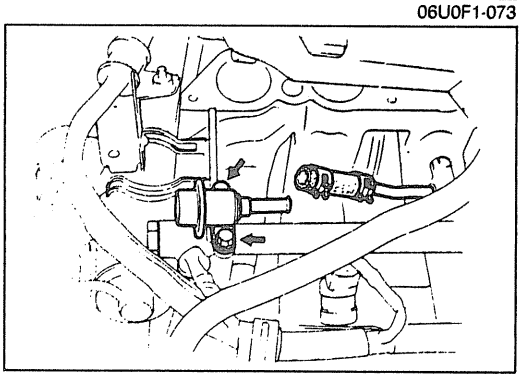


06U0F1-071


06U0F1-072



06U0F1-073


06U0F1-074

PRESSURE REGULATOR

Hold Pressure

Only if fuel system pressure drop is not as specified and fuel pump pressure drop is as specified.

Warning

- **Before performing the following operation, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F1–47.)**

1. Disconnect the negative battery terminal.
2. Install a fuel pressure gauge between the fuel filter and the fuel main hose. (Install clamps as shown.)
3. Connect the negative battery terminal.
4. Connect the terminals of the test connector (Yellow: 2-pin) with a jumper wire.
5. Turn the ignition switch ON **for 10 seconds** to operate the fuel pump.
6. Turn the ignition switch OFF and disconnect the jumper wire.
7. Plug the fuel return hose from the pressure regulator.
8. Observe the fuel pressure **after 5 minutes**.

Fuel pressure:
More than 147 kPa (1.5 kg/cm^2, 21 psi)

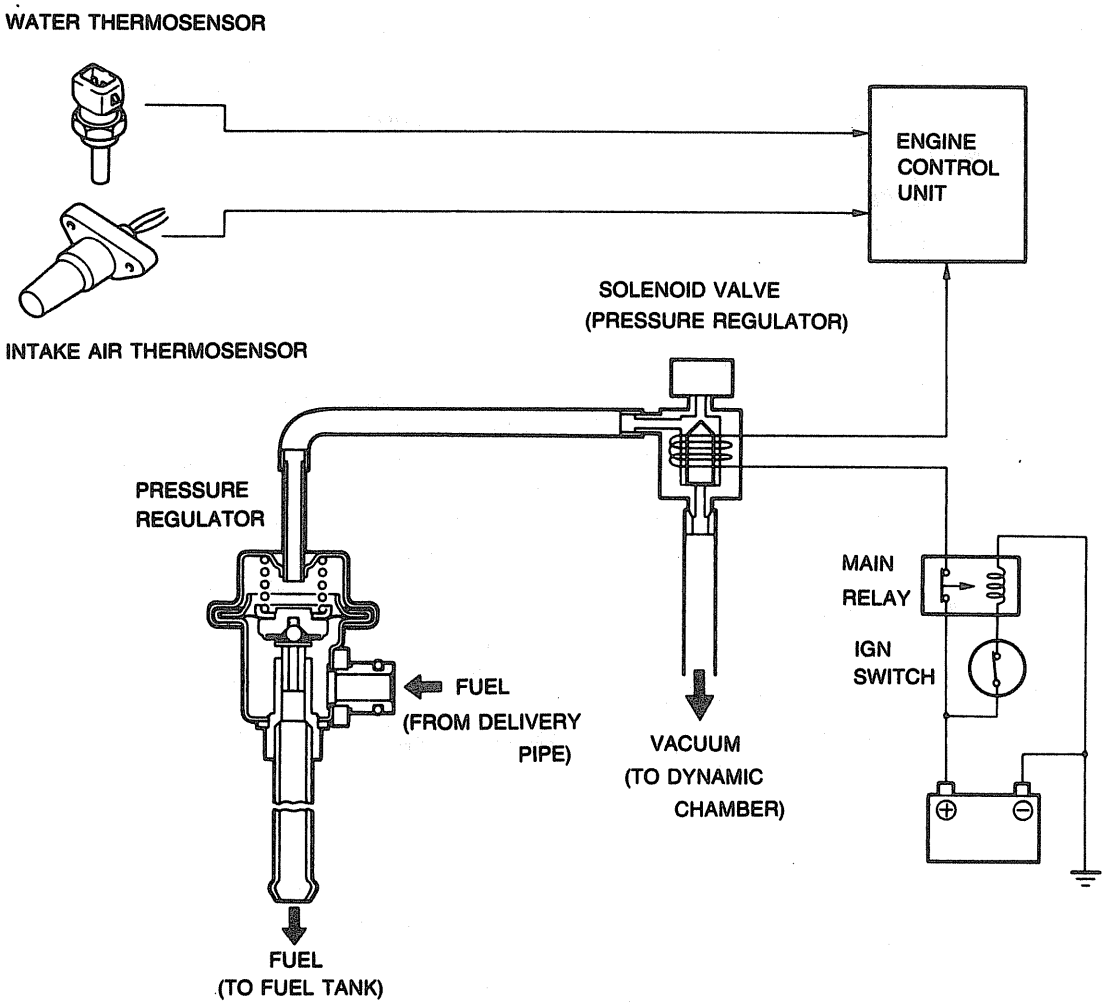
9. If as specified, replace the pressure regulator.

Replacement

1. Perform steps 1 to 8 of removal procedure for the injector. (Refer to page F1–56.)
2. Disconnect the vacuum hose and fuel return hose.
3. Remove the pressure regulator.
4. Install in the reverse order of removal.

Tightening torque:
7.8—11 N·m (80—110 cm-kg, 69—95 in-lb)

PRESSURE REGULATOR CONTROL SYSTEM



06U0F1-075

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

Specified time: Approx. 120 sec.
Operating condition: Coolant temperature — above 70°C (158°F)
Intake air temperature — above 20°C (68°F)

COMPONENT DESCRIPTIONS

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

06U0F1-076

TROUBLESHOOTING

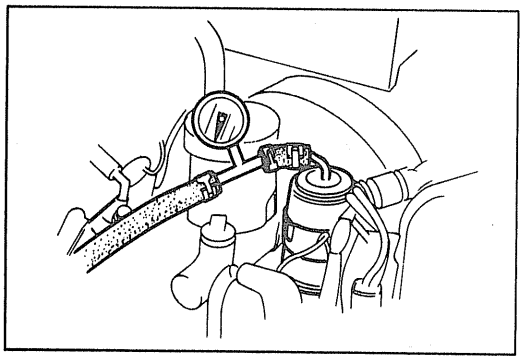
Check the condition of the wiring harness and connections before checking the sensors or switches below.

Note

- **Make the system inspection first. If no problem is found, continue with the next system inspection of the Troubleshooting Guide. (Refer to pages F1–10 and 11.)**

Possible cause / Page / Symptom	Solenoid valve (Pressure regulator control)	Water thermosensor	Intake air thermosensor	Throttle sensor	Engine control unit terminal 2T (MTX) 3M (ATX)	System inspection
	F1–62	F1–99	F1–96	F1–97	F1–88 F1–92	F1–61
Engine stalls or rough after hot starting	2	3	4	5	6	1

06U0F1-077



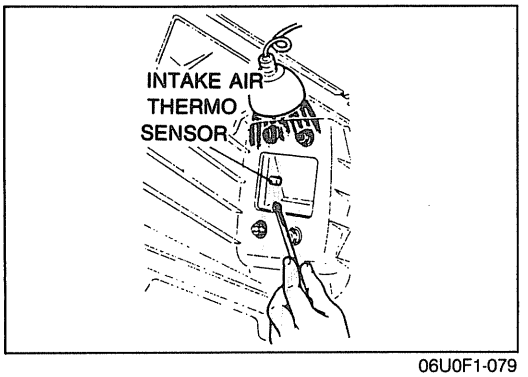
06U0F1-078

System Inspection

Warning

- **Before performing the following operation, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F1–47.)**

1. Disconnect the negative battery terminal.
2. Install a fuel pressure gauge between the fuel filter and the fuel main hose. (Install clamps as shown.)
3. Connect the negative battery terminal.



06U0F1-079

Operating time	Fuel line pressure kPa (kg/cm², psi)
After starting: for 120 sec.	235—275 (2.4—2.8, 34—40)
After 120 sec.	186—226 (1.9—2.3, 27—33)

06U0F1-080

4. Start the engine.
5. Warm up the engine to normal operating temperature and stop the engine.

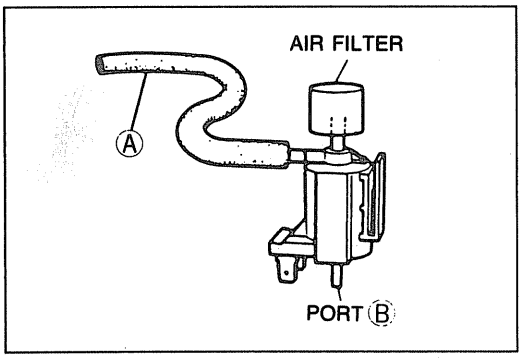
Note
- **Radiator must be not. (Above 70°C [158°F])**

6. Keep the hood closed and heat soak the engine compartment for **3—5 min** (Intake air thermosensor in airflow meter must be **more than 30°C [86°F]**.
   If this temperature cannot be obtained, lift the air cleaner upper cover and heat the intake air thermosensor to **more than 30°C [86°F]**.)
7. Restart the engine.
8. Check the fuel line pressure and operating times as shown in the chart.

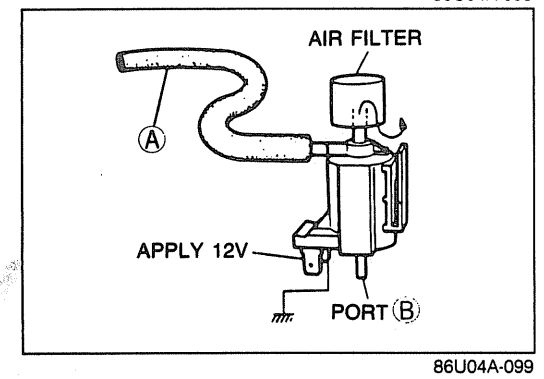
Vacuum Hose Inspection

1. Check vacuum hoses from engine to solenoid valve and from solenoid valve to pressure regulator.
   Replace the hoses, if necessary.

06U0F1-081



86U04A-098

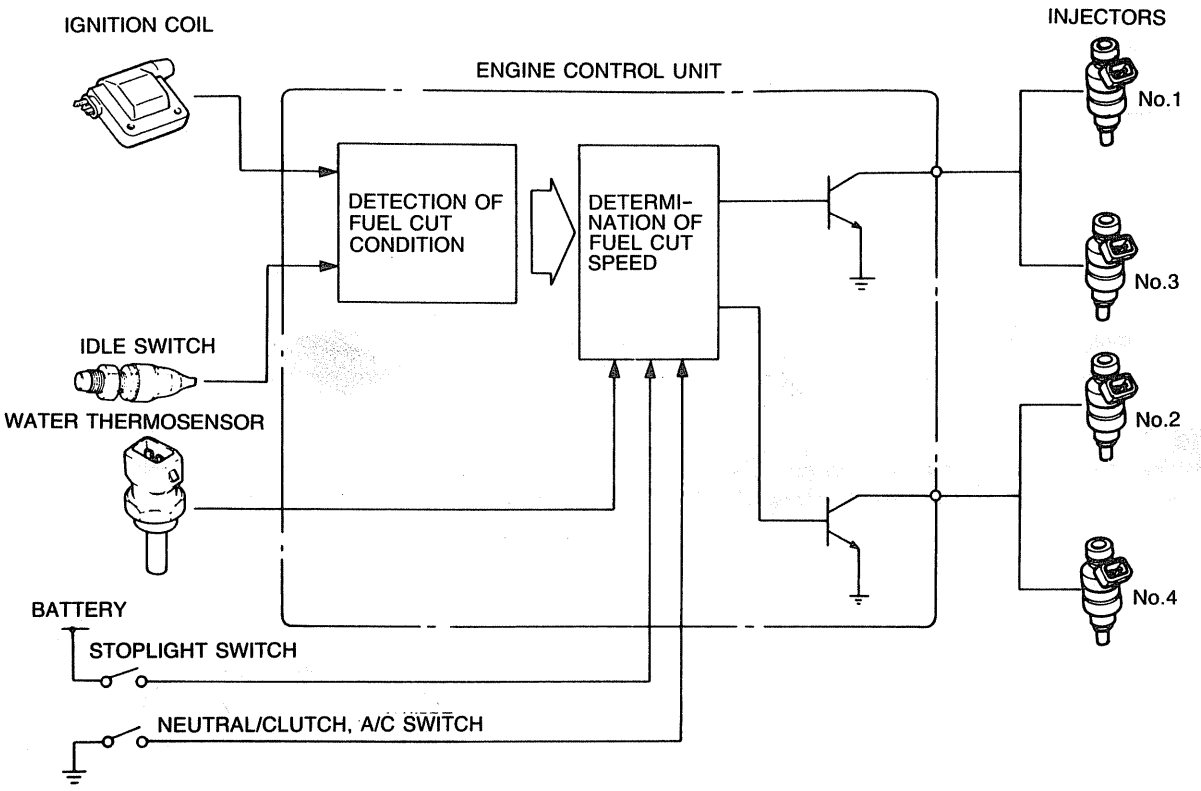


86U04A-099

Solenoid Valve (Pressure Regulator Control) Inspection

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

DECELERATION CONTROL SYSTEM



86U04A-121

The fuel cut system is provided as a deceleration control system.
This system is to improve fuel economy.

COMPONENT DESCRIPTIONS

Component	Function	Remarks
Stoplight switch	Detects braking operation (deceleration); sends signal to control unit	
Clutch switch (MTX)	Detects in-gear condition; sends signal to control unit	Switch ON when clutch pedal released
Engine control unit	Detects signals from input sensors and switches; cuts fuel injection	
Idle switch	Detects when throttle valve fully closed; sends signal to control unit	Installed on throttle body
Ignition coil (–) terminal	Detects engine speed; sends signal to control unit	
Inhibitor switch (ATX)	Detects in-gear condition; sends signal to engine control unit	Switch ON in "N" or "P" range
Neutral switch (MTX)	Detects in-gear condition; sends signal to control unit	Switch ON when in-gear
Water thermosensor	Detects coolant temperature; sends signal to control unit	

06U0F1-082

TROUBLESHOOTING

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

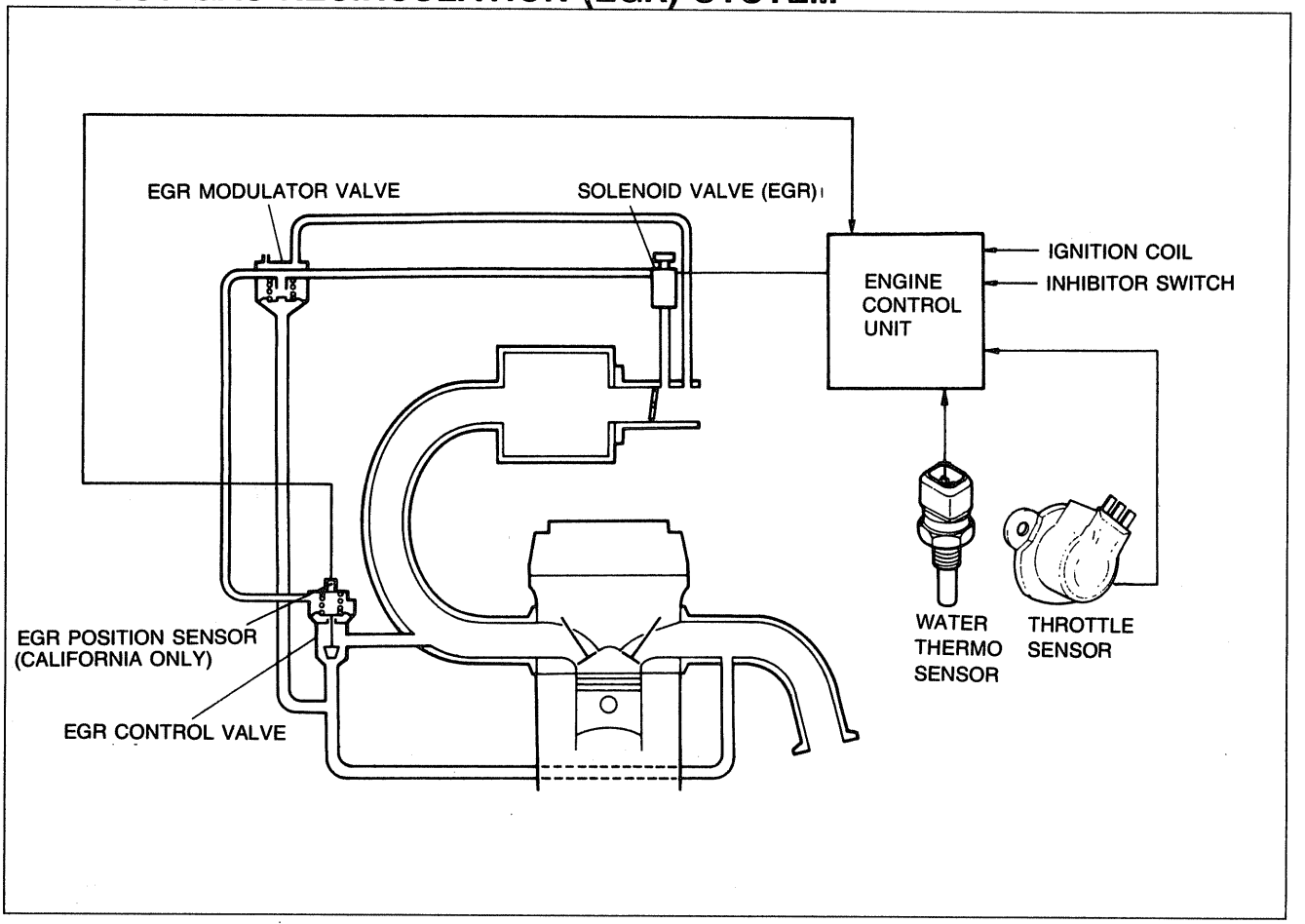
Note

- **Make the system inspection first. If no problem is found, continue with the next system inspection of the Troubleshooting Guide. (Refer to pages F1–10 and 11.)**

Possible cause	Water thermosensor	Engine control unit
		2U or 2V (MTX) 3U or 3V (ATX)
Page	**F1–99**	**F1–88 F1–92**
Checking order	2	1

06U0F1-083

EXHAUST GAS RECIRCULATION (EGR) SYSTEM



06U0F1-084

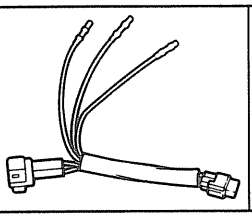
This system introduces exhaust gas into the intake manifold to reduce NOx in the exhaust gas. It operates depending on the engine load, engine speed **(above 1,500 rpm)**, engine coolant temperature **(above 70°C, 158°F)**.

COMPONENT DESCRIPTIONS

Component	Function	Remarks
EGR control valve	Recirculates portion of exhaust gas	
EGR modulator valve	Controls vacuum acting on EGR control valve	
EGR position sensor (California only)	Detects EGR control valve lift amount; send signal to control unit	Variable resistor
Engine control unit	Detects signals from input sensors and switches; controls solenoid valve (EGR)	
Ignition coil (–) terminal	Detects engine speed; sends signal to control unit	
Solenoid valve (EGR)	Controls vacuum line to EGR control valve	
Throttle sensor	Detects throttle valve opening angle; sends signal to control unit	Installed on throttle body
Water thermosensor	Detects coolant temperature; sends signal to control unit	

06U0F1-085

PREPARATION
SST

49 G018 901 Adapter harness		For inspection of EGR position sensor

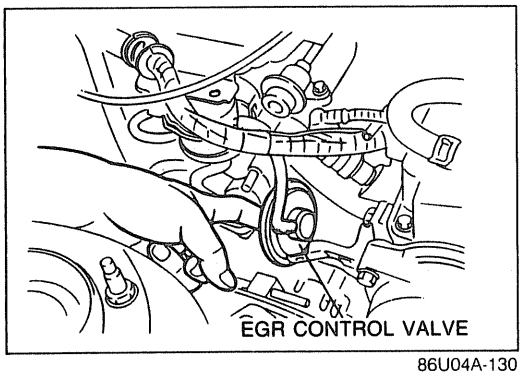
06U0F1-086

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

Note
- **Make the system inspection first. If no problem is found, continue with the next system inspection of the Troubleshooting Guide. (Refer to pages F1–10 and 11.)**

Possible cause	Solenoid valve (EGR)	EGR modulator valve	EGR control valve	Water thermo-sensor	EGR position sensor (California)	Engine control unit terminal	System inspection
						2Y (MTX) 30 (ATX)	
Page	F1–67	F1–67	F1–67	F1–99	F1–68	F1–89 F1–92	F1–66
Checking order	3	2	4	6	5	7	1

06U0F1-087

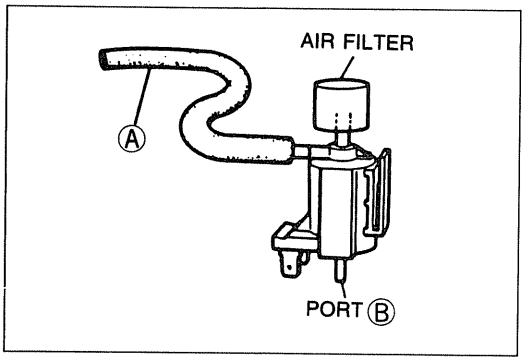


86U04A-130

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

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

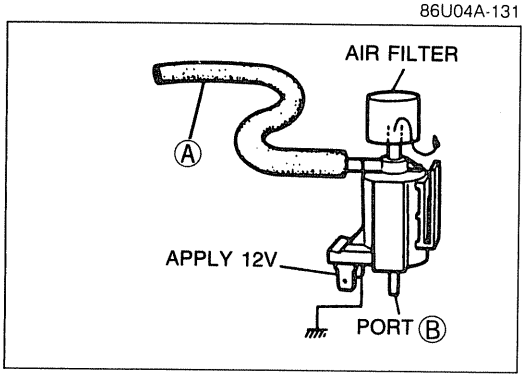
4. Accelerate the engine and check that the diaphragm of the EGR control valve moves upward.



86U04A-131

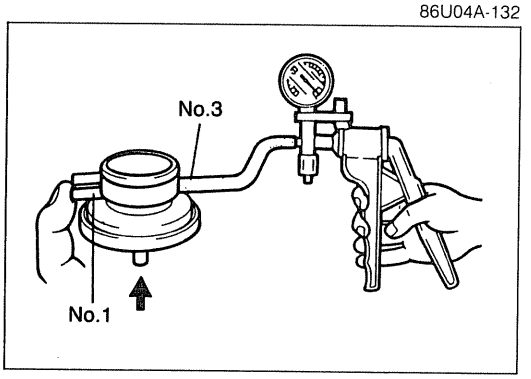
Solenoid Valve (EGR)

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



86U04A-132

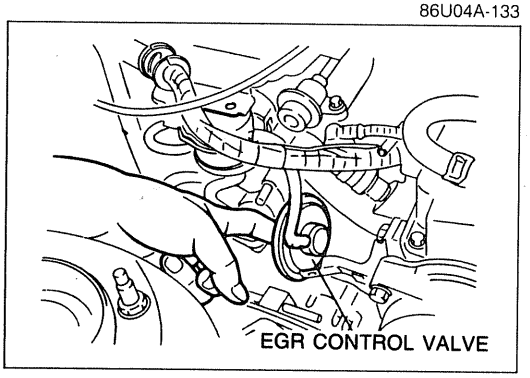
4. Disconnect the solenoid valve connector.
5. Connect 12V and a ground to the terminals of the solenoid valve.
6. Blow through the solenoid valve from vacuum hose A.
7. Check that air flows from the valve air filter.



86U04A-133

EGR Modulator Valve

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



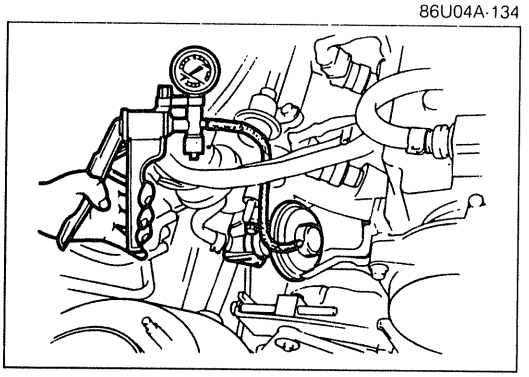
86U04A-134

EGR Control Valve

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

Note

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

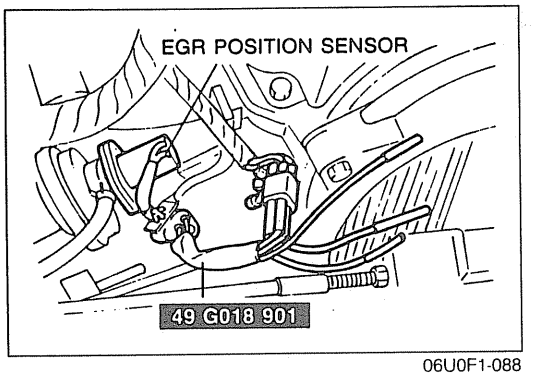


86U04A-135

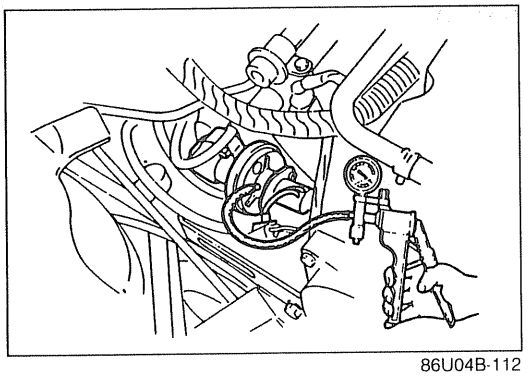
3. Warm up the engine and run it at idle.
4. Connect a vacuum pump to the valve and apply vacuum.
5. Check that the engine runs roughly or stalls at more than the specified vacuum.

Specification: 40—60 mmHg (1.6—2.4 inHg)

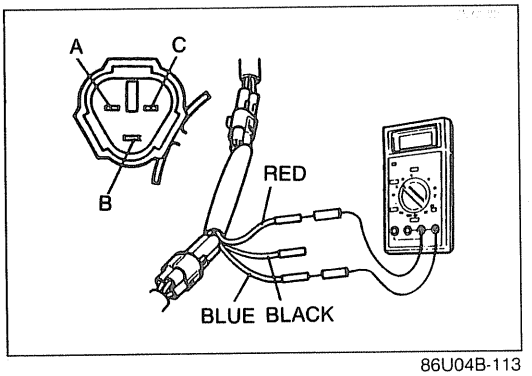
6. If not correct, replace the EGR control valve.



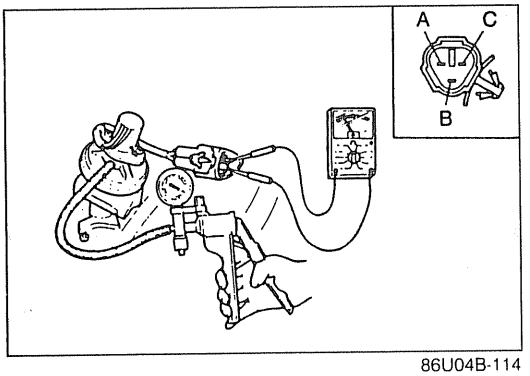
06U0F1-088



86U04B-112



86U04B-113



86U04B-114

EGR Position Sensor (California Only)

Inspection of output voltage

1. Disconnect the EGR position sensor connector.
2. Connect the **SST** between the EGR position sensor and wiring harness.
3. Disconnect the vacuum hose from the EGR control valve and connect the vacuum pump.
4. Turn the ignition switch ON.
5. Check voltage of each terminal in the conditions shown in the table.

Terminal	**SST** wire color	Vacuum	
		0	120 mmHg (4.7 inHg)
C	Red	0.25—0.95V	Approx. 4.0V
B	Blue	Below 1.5V	
A	Black	4.5—5.5V	

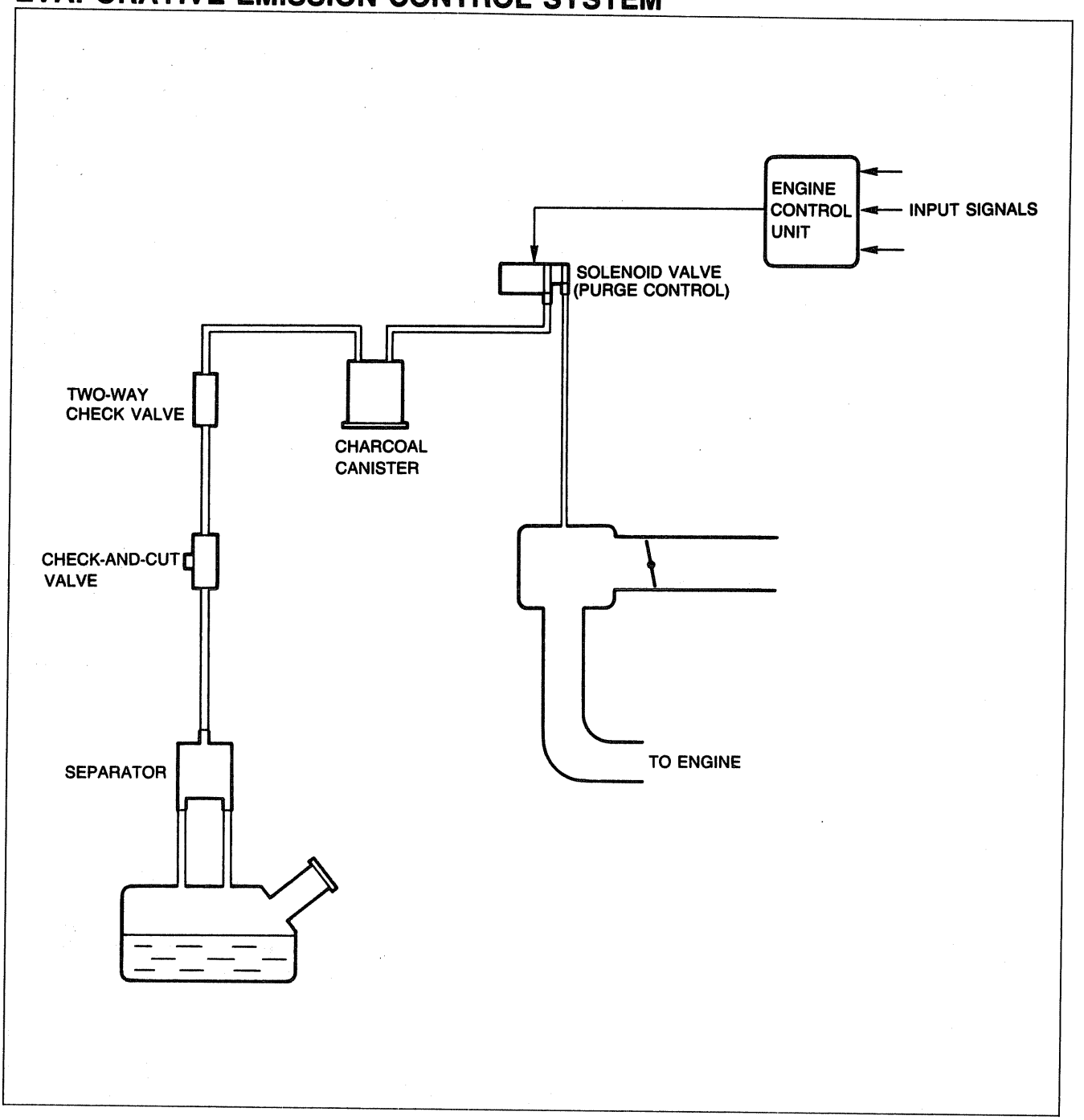
6. If not correct at A and B terminal, check the wiring harness and 2A and 2C terminals of the engine control unit.
7. If not correct at C terminal, check the sensor resistance, then the wiring harness and the engine control unit 2F terminal.
8. Disconnect the **SST** and reconnect the EGR position sensor connector.

Inspection of resistance

1. Disconnect the EGR position sensor connector.
2. Check as shown resistance between the terminals as shown.

Terminals	Resistance
A—B	5 kΩ
A—C	0.7—5 kΩ
B—C	0.7—5 kΩ

EVAPORATIVE EMISSION CONTROL SYSTEM



06U0F1-089

The evaporative emission control system consists of the separator. The check-and-cut valve, the two-way check valve, the charcoal canister, the solenoid valve (purge control), the engine control unit, and the input devices. The amount of evaporative fumes introduced into the engine and burned is controlled by the solenoid valve to correspond to the engine's operating conditions. To maintain best engine performance, the solenoid valve is controlled by the engine control unit.

Operation

The solenoid valve (purge control) is controlled by duty signals from the engine control unit to perform purging of the charcoal canister. Purging is done when these conditions are met:

(1) After warm up
(2) Driving in gear
(3) Accelerator pedal depressed (idle switch OFF)
(4) Oxygen sensor functioning normally

COMPONENT DESCRIPTIONS

Component	Function	Remarks
Airflow meter	Detects amount of intake air; sends signal to control unit	Intake air temp sensor and fuel pump switch are integrated
Charcoal canister	Stores gas tank fumes when engine stopped	
Check-and-cut valve	Releases excessive pressure or vacuum in fuel tank to atmosphere	
Clutch switch	Detects in-gear condition; sends signal to control unit	Switch ON when clutch pedal released
Engine control unit	Detects signals from input sensors and switches; controls solenoid valve (Purge control)	
Idle switch	Detects when throttle valve fully closed; sends signal to control unit	Installed on throttle body
Ignition coil (–) terminal	Detects engine speed; sends signal to control unit	
Inhibitor switch	Detects in-gear condition; sends signal to control unit	Switch On in "N" or "P" range
Neutral switch	Detects in-gear condition; sends signal to control unit	Switch ON when in-gear
Oxygen sensor	Detects Oxygen concentration; sends signal to control unit	Zirconia ceramic and platinum coating
Separator	Prevents fuel from flowing into charcoal canister	
Solenoid valve (Purge control)	Controls vacuum line to vacuum switch valve	
Two-way check valve	Controls pressure in fuel tank	
Water thermosensor	Detects coolant temperature; sends signal to control unit	

06U0F1-090

TROUBLESHOOTING

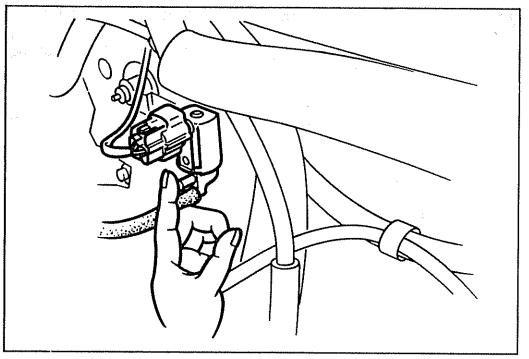
Check the condition of the wiring harness or connectors before checking the sensors or switches.

Note

- **Make the system inspection first. If no problem is found, continue with the next system inspection of the Troubleshooting Guide. (Refer to pages F1–10 and 11.)**

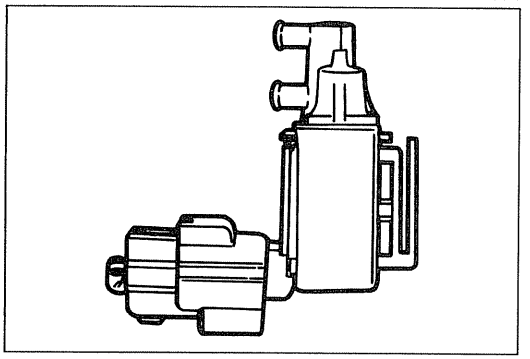
Possible cause	Solenoid valve (Purge control)	Two-way check valve	Check-and-cut valve	Separator	Engine control unit
					2X (MTX) 2O (ATX)
Page	F1–71	F1–71	F1–72	F1–71	F1–89 F1–91
Checking order	1	3	4	5	2

06U0F1-091



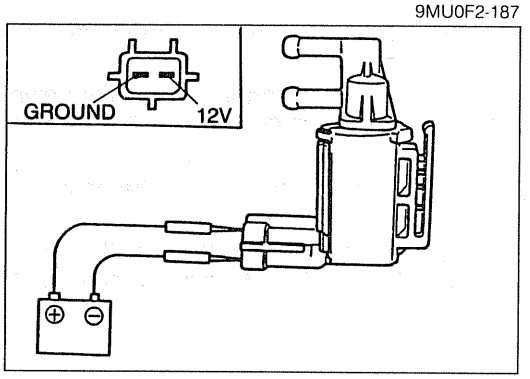
06U0F1-092

Solenoid Valve (Purge Control)
On-vehicle inspection
1. Warm up the engine to normal operating temperature.
2. Run the engine at idle.
3. Disconnect the vacuum hose (White) from the solenoid valve and check that no vacuum is felt at the solenoid valve.
4. If not as specified, check the solenoid valve.



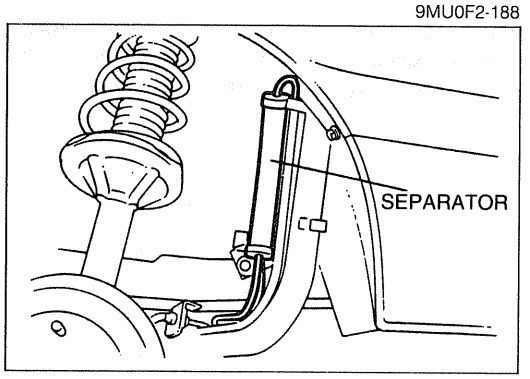
9MU0F2-187

Solenoid valve (Purge control)
1. Disconnect the vacuum hoses from the charcoal canister and the dynamic chamber.
2. Check that no air flows through the valve.



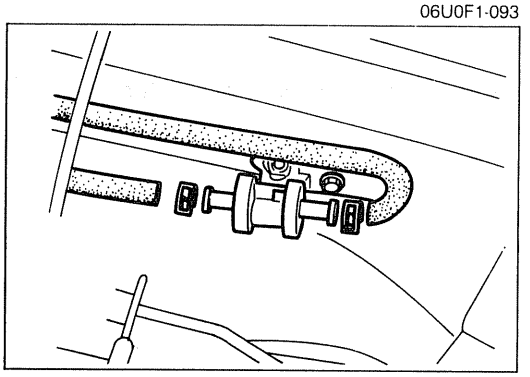
9MU0F2-188

3. Disconnect the solenoid valve connector and connect **12V** and a ground to the terminals of the solenoid valve.
4. Check that the air flows through the valve.
5. If not as specified, replace the solenoid valve.



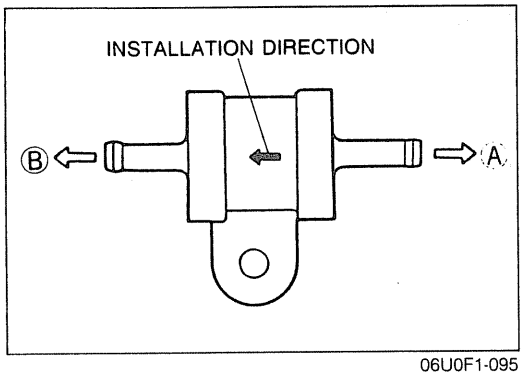
06U0F1-093

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



06U0F1-094

Two-way Check Valve
Inspection
1. Remove the valve.

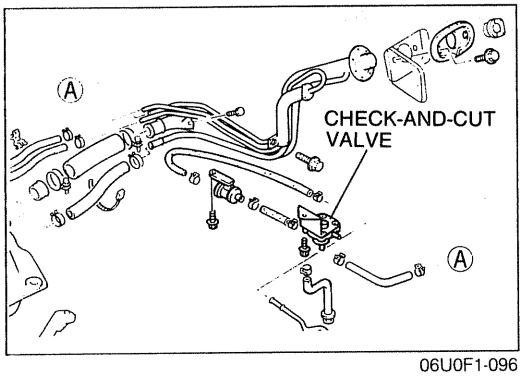


06U0F1-095

2. Check the operation of the valve with a vacuum pump.

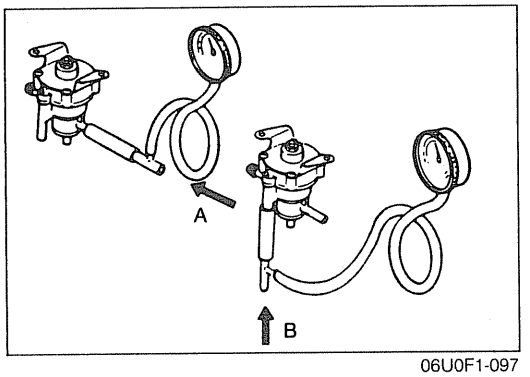
Apply approx. 37 mmHg (1.46 inHg) vacuum at port A	Airflow
Apply approx. 44 mmHg (1.73 inHg) vacuum at port B	Airflow

3. Replace the valve, if necessary.



06U0F1-096

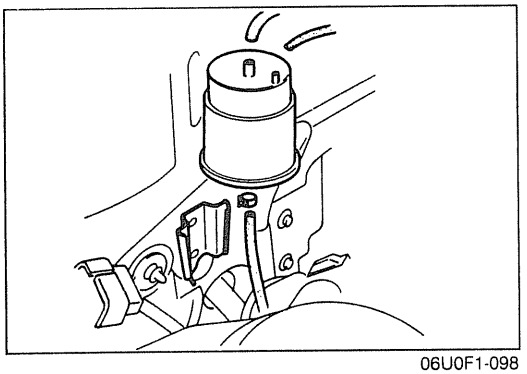
Check-and-Cut Valve
Inspection
1. Remove the check-and-cut valve.



06U0F1-097

2. Connect a pressure gauge to the passage connected to the fuel tank.
3. Blow through the valve from port A and verify that the valve opens at **5.39—6.87 kPa (0.055—0.07 kg/cm^2, 0.78—1.00 psi)**.
4. Remove the pressure gauge and connect it to the passage to atmosphere.
5. Blow through the valve from port B and verify that the valve opens at **0.98—4.91 kPa (0.01—0.05 kg/cm^2, 0.14—0.71 psi)**.

Note
- **The test must be performed with the valve held horizontally. Otherwise, the ball in the valve will move out of position and close the passage.**

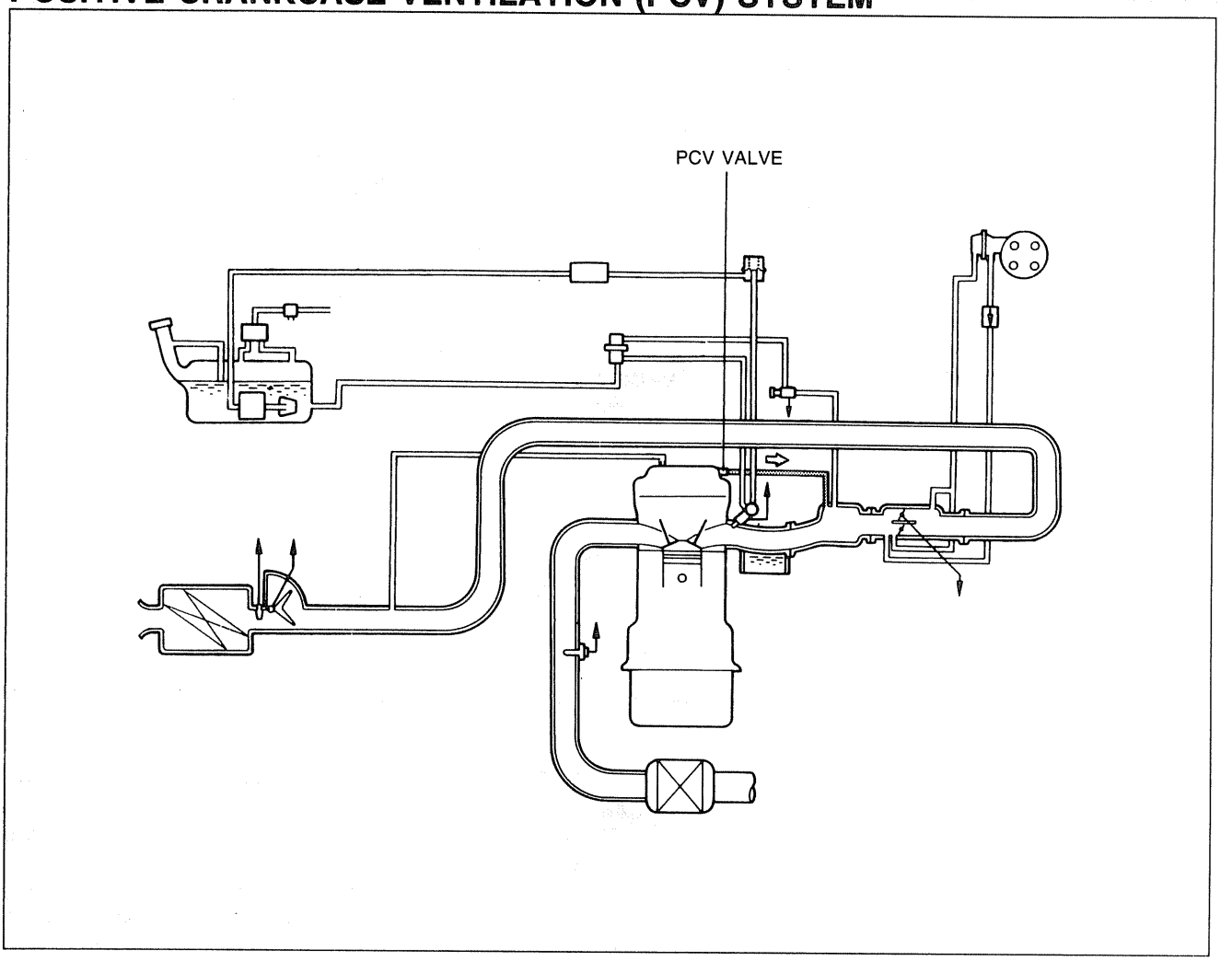


06U0F1-098

Charcoal Canister
Inspection
Visually check for damage and replace the charcoal canister if necessary.

Replacement
1. Slide the charcoal canister out of the bracket.
2. Disconnect the three hoses.
3. Install in the reverse order of removal.

POSITIVE CRANKCASE VENTILATION (PCV) SYSTEM

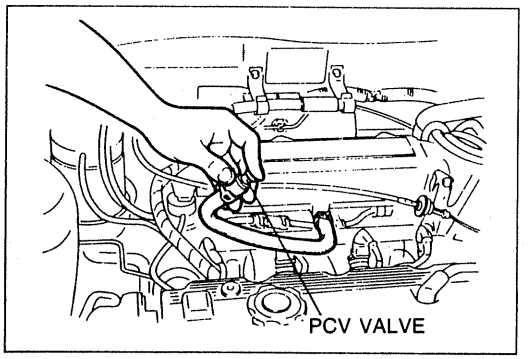


06U0F1-099

The PCV valve is operated by the intake manifold vacuum.
When the engine is running at idle, the PCV valve is opened slightly and a small amount of blow-by gas is drawn into the dynamic chamber.
At high engine speeds, the PCV valve is further opened and a larger amount of blow-by gas is drawn into the dynamic chamber.

COMPONENT DESCRIPTION

Component	Function	Remarks
PCV valve	Controls blowby gas amount pulled into engine	



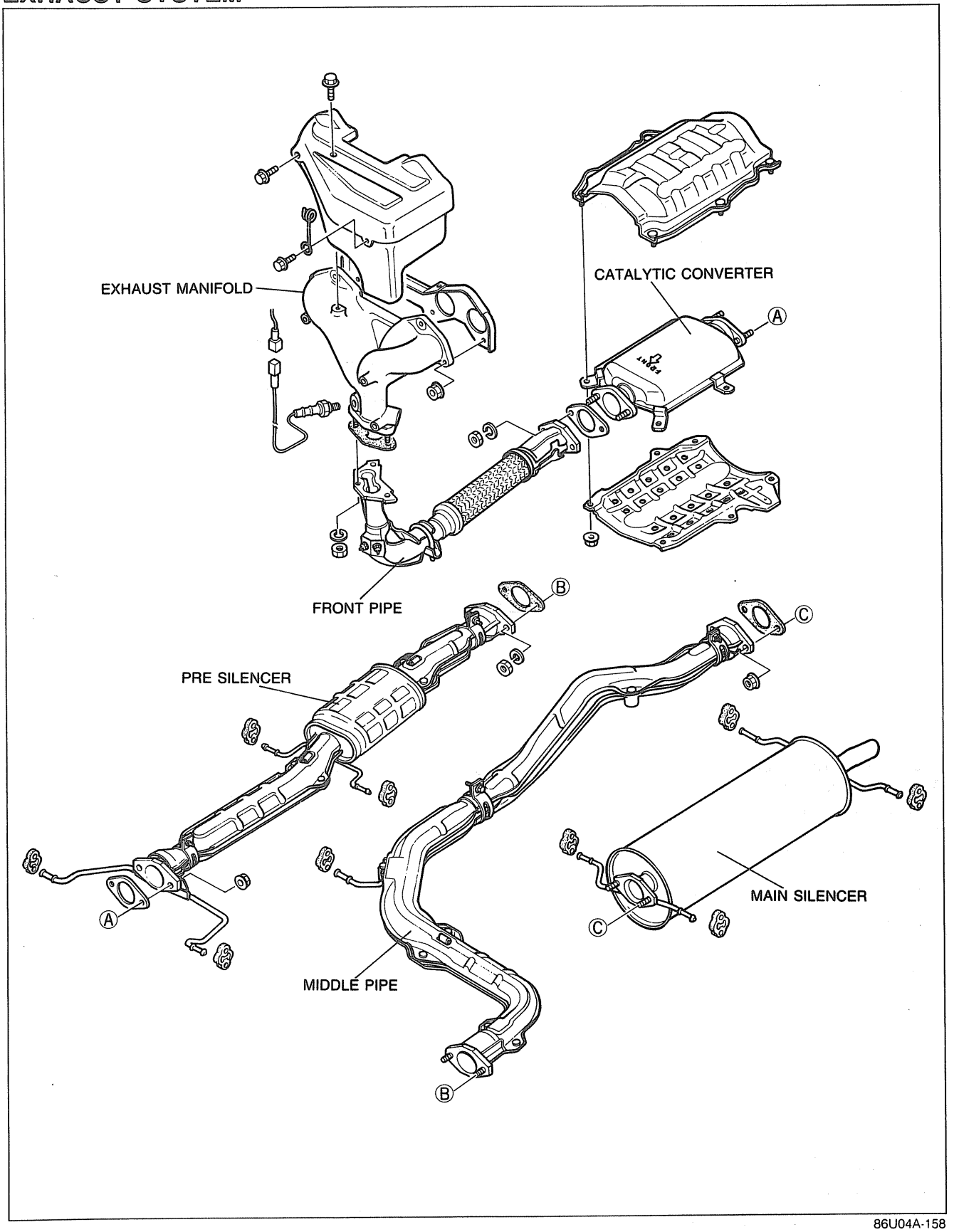
16U0F1-011

PCV VALVE

Inspection

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

EXHAUST SYSTEM



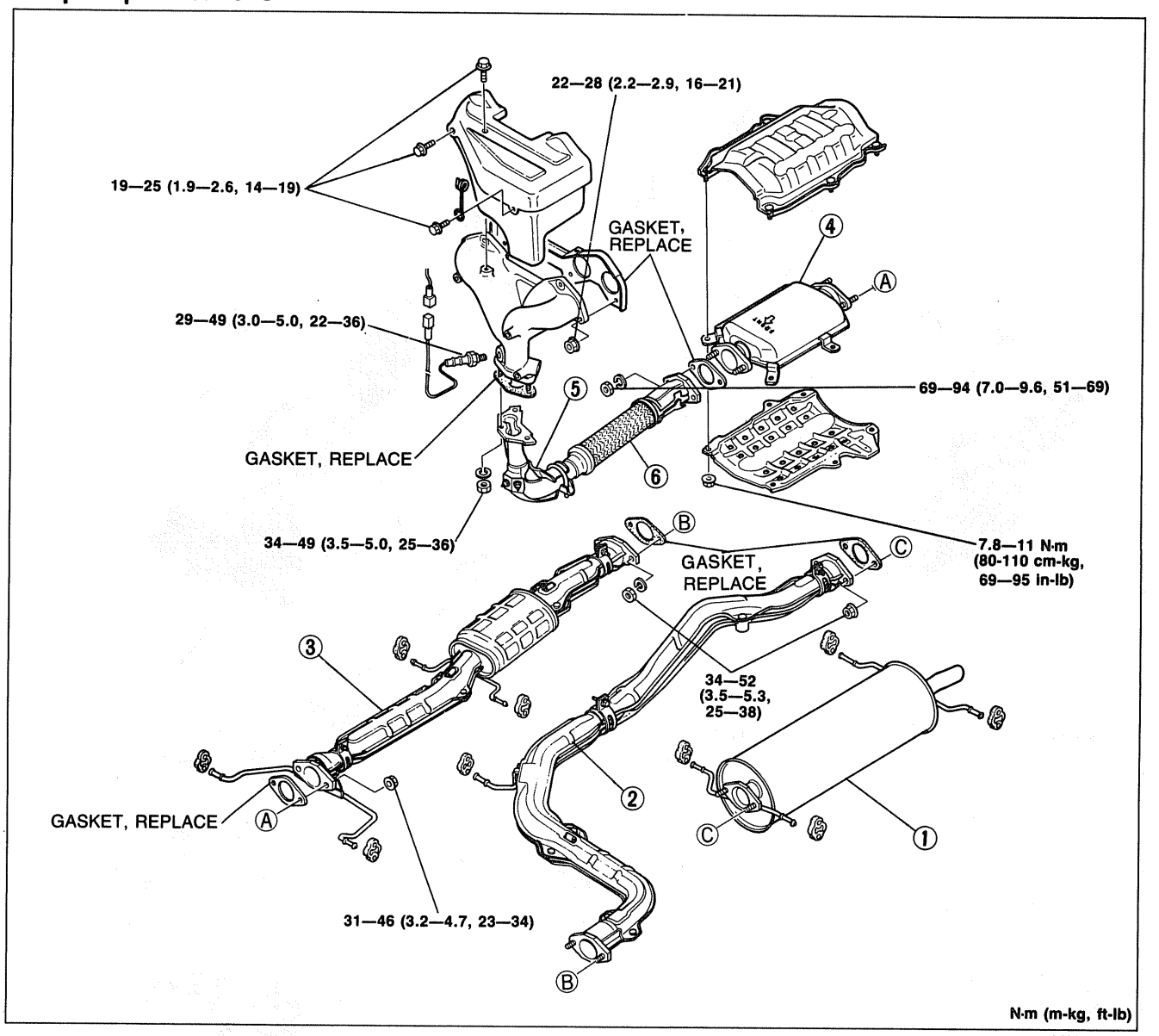
86U04A-158

The catalytic converter is used to reduce CO, HC and NOx. The converter contains a compound of platinum and rhodium. It is a three-way catalyst type with a volume of **2,100 cc (128 cu in)**.

REMOVAL / INSTALLATION

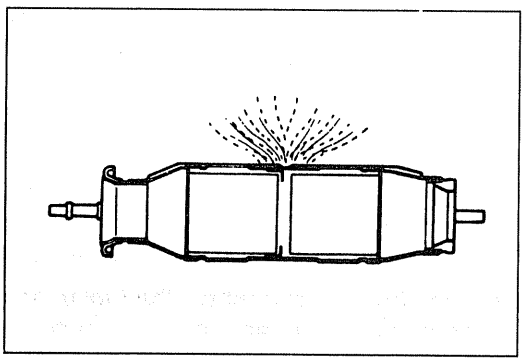
1. Remove in the sequence shown in the figure.
2. Install in the reverse order of removal.

Torque Specifications



86U04A-159

1. Main silencer
2. Middle pipe
3. Pre-silencer
4. Catalytic converter
5. Bracket
6. Front pipe



86U04A-160

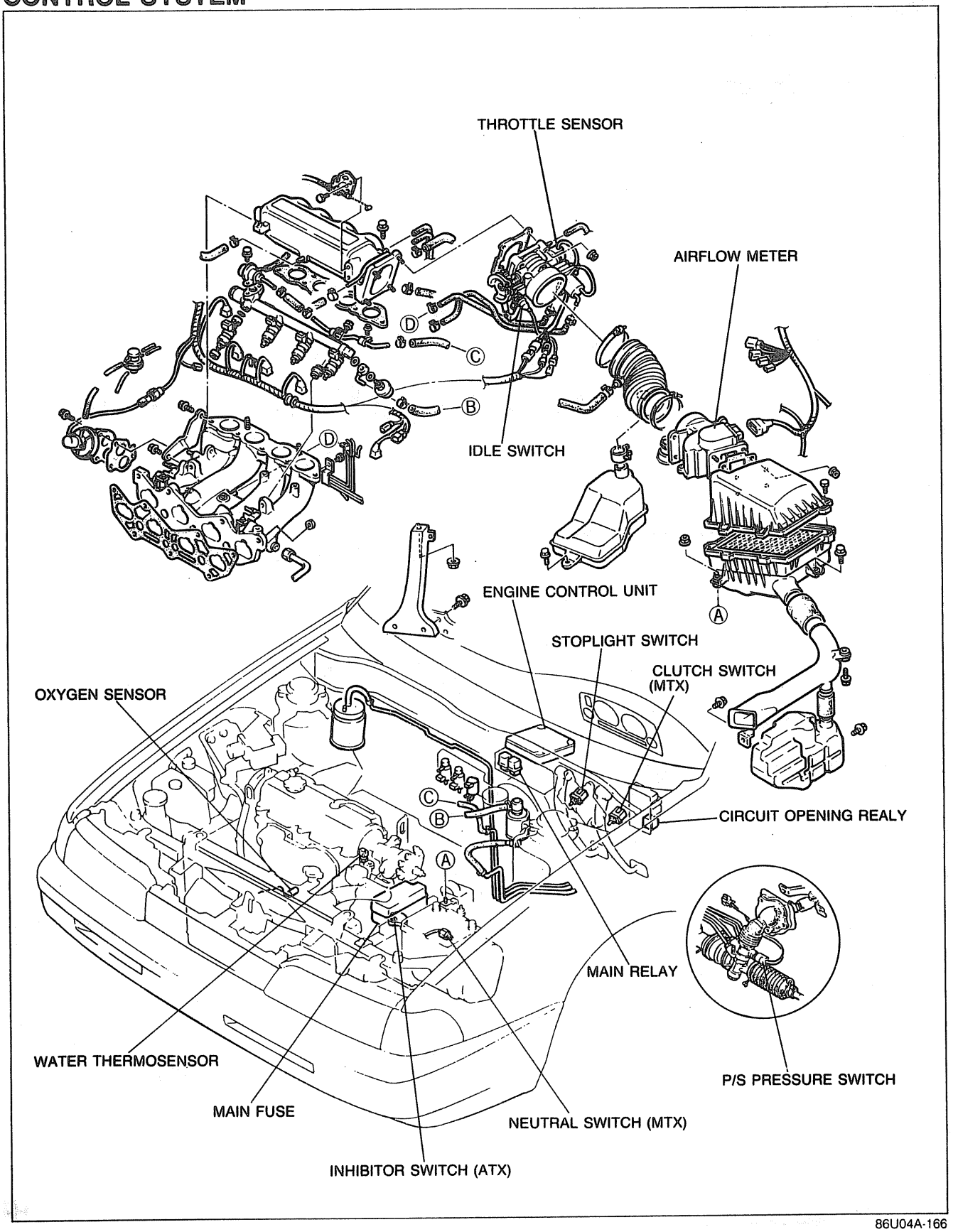
INSPECTION

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

Note

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

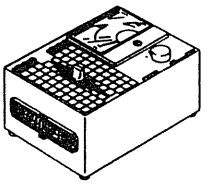
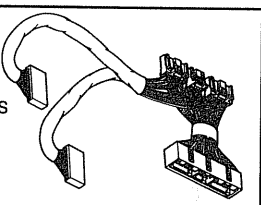
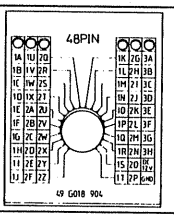
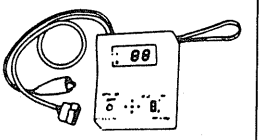
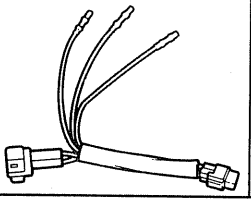
CONTROL SYSTEM



86U04A-166

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

PREPARATION
SST

49 9200 162 Engine Signal Monitor 	For inspection of engine control unit	49 G018 903 Adapter harness 	For inspection of engine control unit
49 G018 904 Sheet 	For inspection of engine control unit	49 H018 9A1 Self-Diagnosis Checker 	For inspection of oxygen sensor
49 G018 901 Adapter harness 	For inspection of throttle sensor		

06U0F1-100

RELATIONSHIP CHART
Output Devices and Input Devices

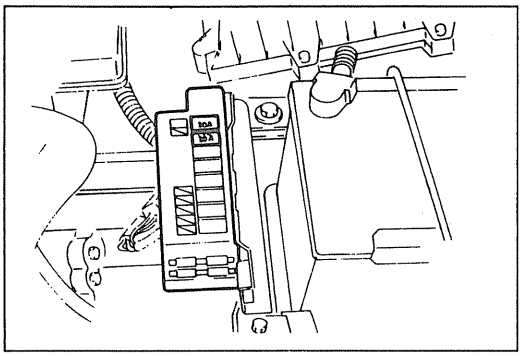
○: Related ×: Not related

INPUT DEVICES \ OUTPUT DEVICES	INJECTOR: FUEL INJECTION AMOUNT	INJECTOR: FUEL INJECTION TIMING	BAC VALVE: AIR VALVE	BAC VALVE: ISC VALVE	SOLENOID VALVE (EGR)	SOLENOID VALVE (PURGE)	SOLENOID VALVE (PRESSURE REGULATOR)
TEST CONNECTOR	×	×	×	○	×	×	×
STOPLIGHT SWITCH	○	×	×	×	×	×	×
VEHICLE SPEED SWITCH	○	×	×	×	×	×	×
ELECTRICAL LOAD	×	×	×	○	×	×	×
P/S PRESSURE SWITCH	×	×	×	○	×	×	×
A/C SWITCH	○	×	×	○	×	×	×
IGNITION SWITCH (STA POSITION)	○	○	×	×	×	×	○
INHIBITOR SWITCH	○	×	×	○	○	○	×
NEUTRAL AND CLUTCH SWITCH	○	×	×	○	×	○	×
OXYGEN SENSOR	○	×	×	×	×	○	×
ATMOSPHERIC PRESSURE SENSOR	○	×	×	○	×	○	×
INTAKE AIR THERMOSENSOR	○	×	×	○	×	○	○
WATER THERMOSENSOR	○	×	×	○	○	○	○
IDLE SWITCH	○	○	×	○	×	×	×
THROTTLE SENSOR	○	○	×	○	○	○	○
AIRFLOW METER	○	×	×	×	×	○	×
IGNITION COIL	○	○	×	○	○	○	○

06U0F1-101

Output Devices and Engine Conditions

OUTPUT DEVICES \ ENGINE CONDITIONS		CRANKING (COLD ENGINE)	WARNING UP (DURING IDLE)	MEDIUM LOAD		ACCEL-ERATION	HEAVY LOAD	DECEL-ERATION	IDLE (THROT-TLE VALVE FULLY CLOSED)	IGN: ON (ENGINE NOT RUNNING)	REMARKS
				COLD	WARM						
INJECTOR	INJECTION	Rich			Rich and lean	Rich		Fuel cut	Rich and lean	No injection	
	INJECTION TIMING	1 group (once per revolution)				1 group (once per revolution) (once per two revolutions)*			1 group (once per revolution)		Above 6,300 rpm: fuel cut *Above 4,500 rpm
BAC VALVE	AIR VALVE	Open*			Close						*Coolant temp: below 50°C (122°F)
	ISC VALVE	Large amount of bypass air	Large amount of bypass air*	Small amount of bypass air						No bypass	*In extreme cold condition
SOLENOID VALVE (EGR)		ON (EGR cut)			OFF (EGR)	ON (EGR cut)	OFF (EGR)	ON (EGR cut)	ON (EGR cut)*	ON	*ATX D range: OFF (NO EGR due to no vacuum to system)
SOLENOID VALVE (PURGE)		OFF (Purge cut)			Operates (Duty valves [purge gas amount] change*)			OFF (Purge cut)			*Depends on engine condition
SOLENOID VALVE (PRESSURE REGULATOR CONTROL)		OFF (Vacuum to pressure regulator)							After starting*: ON (Vacuum cut)	OFF	*During hot start only

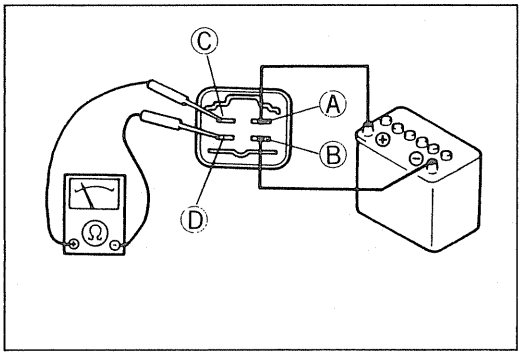


69G04A-161

EGI MAIN FUSE

Inspection

Check the continuity of EGI main fuse.



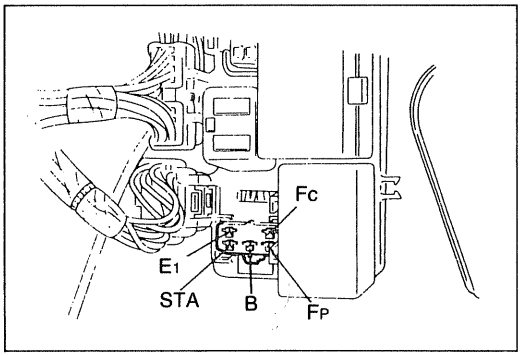
16U0F1-012

MAIN RELAY

Inspection

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

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



16U0F1-013

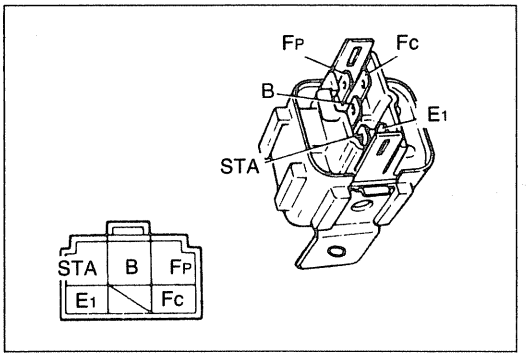
CIRCUIT OPENING RELAY

Inspection

Relay Circuit

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

Terminal	Checking item	Correct result
Fp	Resistance	0.2—30Ω
Fc	Continuity (cranking)	∞
B	Voltage (Ign: ON)	Battery voltage
STA	Voltage (Cranking)	Approx. 9V
E_1	Continuity	∞



06U0F1-103

Circuit Opening Relay

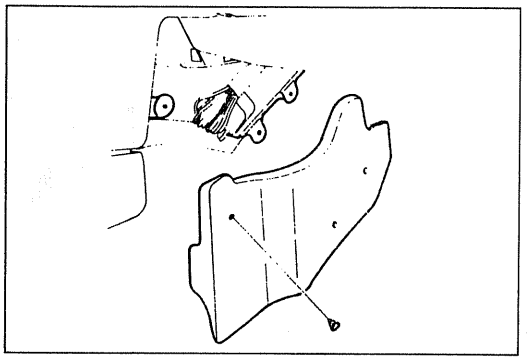
1. Apply 12V and a ground to the terminals below and check the circuit opening relay as described.

12V	Grounded	Correct result
STA	E_1	B ↔ FP: Continuity
B	Fc	Fp: Battery voltage

Resistance

Check the resistance between the terminals using an ohmmeter.

Between terminals	Resistance (Ω)
STA ↔ E1	21—43
B ↔ Fc	109—226
B ↔ Fp	∞

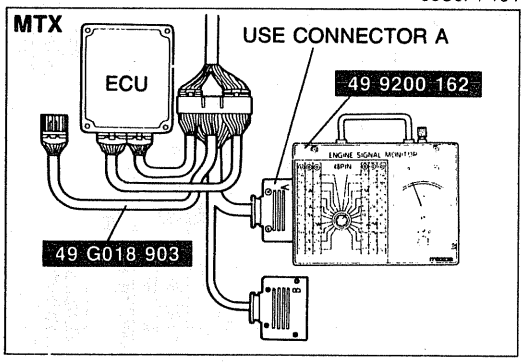


06U0F1-104

ENGINE CONTROL UNIT

Inspection

1. Remove the front console cover of the passenger's side.

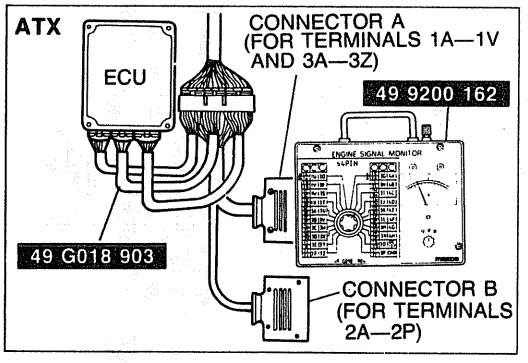


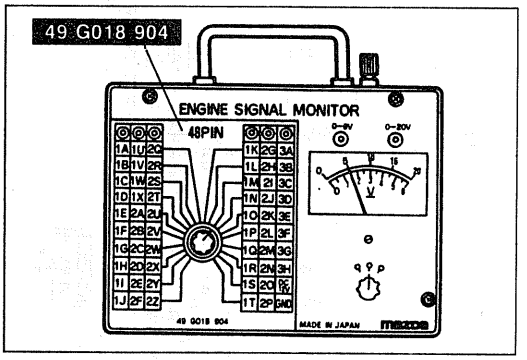
06U0F1-105

2. Connect the **SST (Engine Signal Monitor)** between the engine control unit and the wiring harness using the **SST (Adapter)** as shown.

Note

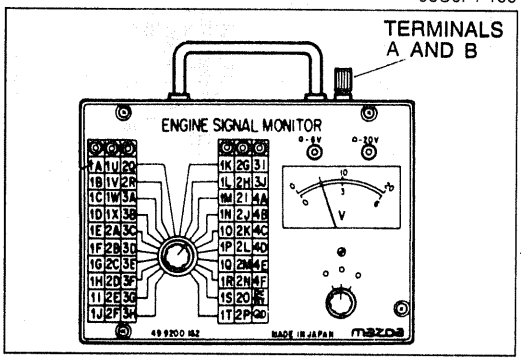
- **For MTX models, use connector A of the Adapter.**
- **For ATX models, use connector A of the Adapter to check voltages at the terminals 1A through 1V and 3A through 3Z, and use connector B to check the voltages at the terminals 2A through 2P.**





06U0F1-106

3. Place the **SST (Sheet)** on the **SST (Engine Signal Monitor)**.
4. Measure the voltage at each terminal.
   (Refer to pages F1–87 to F1–92.)
5. If any engine control unit terminal voltage is incorrect, check the input or output device and related wiring.
   If they are normal, replace the engine control unit.
   (Refer to page F1–94.)

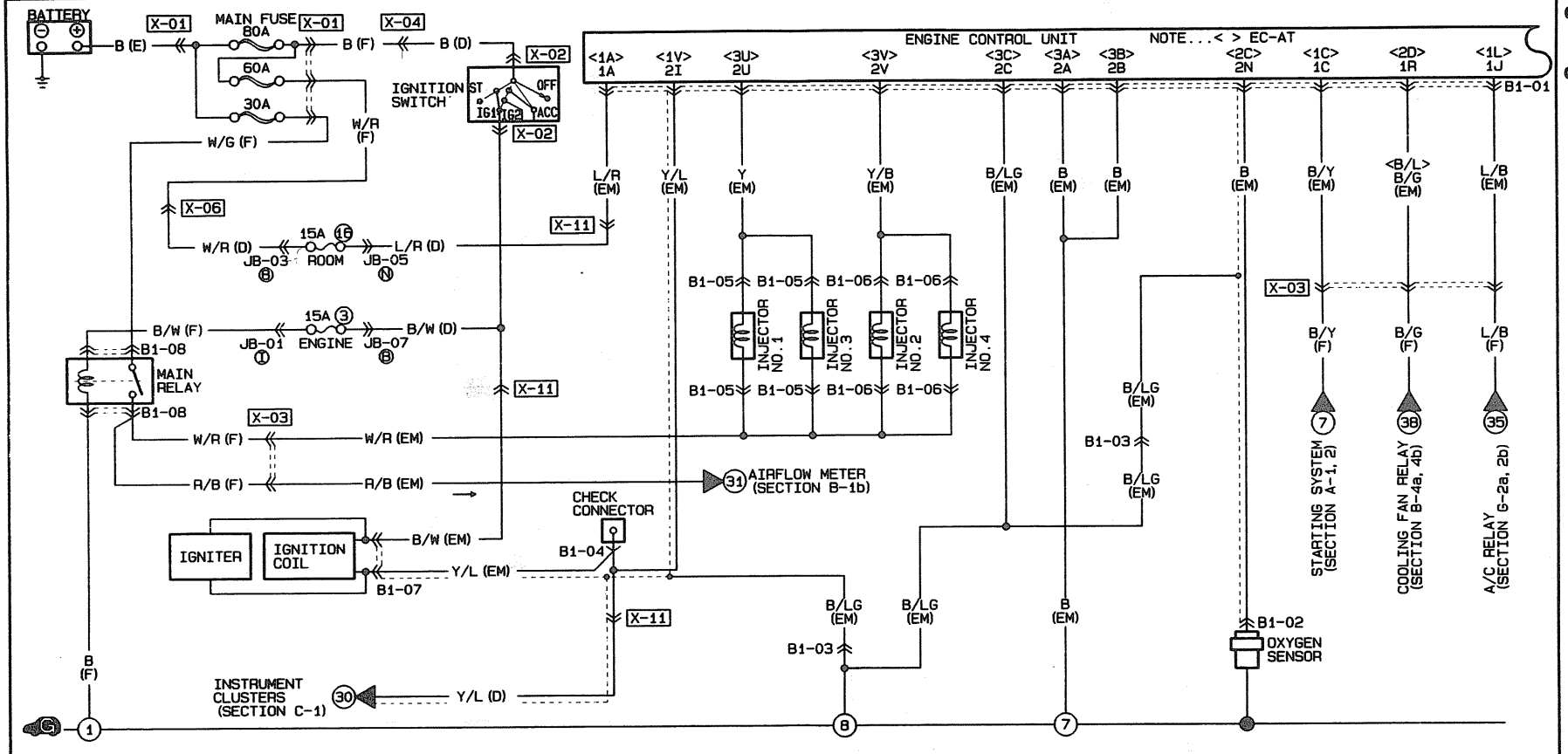


9MU0F2-191

Caution

- **Never apply voltage to SST terminals A and B.**

NON TURBO ■ IGNITION SYSTEM ■ ENGINE CONTROL SYSTEM



B1-01 ENGINE CONTROL UNIT (EM)

EC-AT

1U	1S	1Q	1O	1M	1K	1I	1G	1E	1C	1A
B/W	✳	W/G	G/B	G/R	✳	R/W	✳	W/L	B/Y	L/R
Y/L	BR	B/Y	L/B	BR/R	L/B	B/L	W	LG/B	W/Y	R/B
1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B

2O	2M	2K	2I	2G	2E	2C	2A
W/B	Y/G	R	LG/R	L/R	Y/B	B	R/W
BR/Y	Y/L	LG/R	Y/L	BR/B	LG/W	B/L	R/B
2P	2N	2L	2J	2H	2F	2D	2B

3Y	3W	3U	3S	3Q	3O	3M	3K	3I	3G	3E	3C	3A
L/R	L	Y	✳	W	W/L	W/R	✳	✳	Y/W	Y	B/LG	B
L/W	L/B	Y/B	✳	✳	✳	L/G	BR/B	✳	Y/B	G	LG/Y	B
3Z	3X	3V	3T	3R	3P	3N	3L	3J	3H	3F	3D	3B

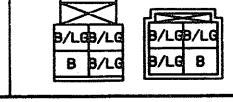
MTX

1U	1S	1Q	1O	1M	1K	1I	1G	1E	1C	1A
W	L/B	G/B	W/G	G	R/W	✳	✳	W/L	B/Y	L/R
LG/B	B/L	B/G	BR/R	BR	✳	L/B	✳	LG/B	W/Y	R/B
1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B

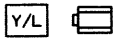
2Y	2W	2U	2S	2Q	2O	2M	2K	2I	2G	2E	2C	2A
W/L	W	Y	✳	Y/B	R/B	LG/W	LG/R	Y/L	Y/W	✳	B/LG	B
✳	W/B	Y/B	W/R	✳	R	B	Y/L	R/W	✳	✳	LG/Y	B
2Z	2X	2V	2T	2R	2P	2N	2L	2J	2H	2F	2D	2B

B1-02 OXYGEN SENSOR (EM)

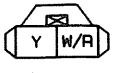
B1-03 JOINT CONNECTOR (EM)



B1-04 CHECK CONNECTOR (EM)

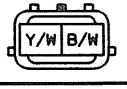


B1-05 INJECTOR NO.1, 3 (EM)

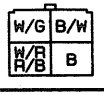


B1-06 INJECTOR NO.2, 4 (EM)

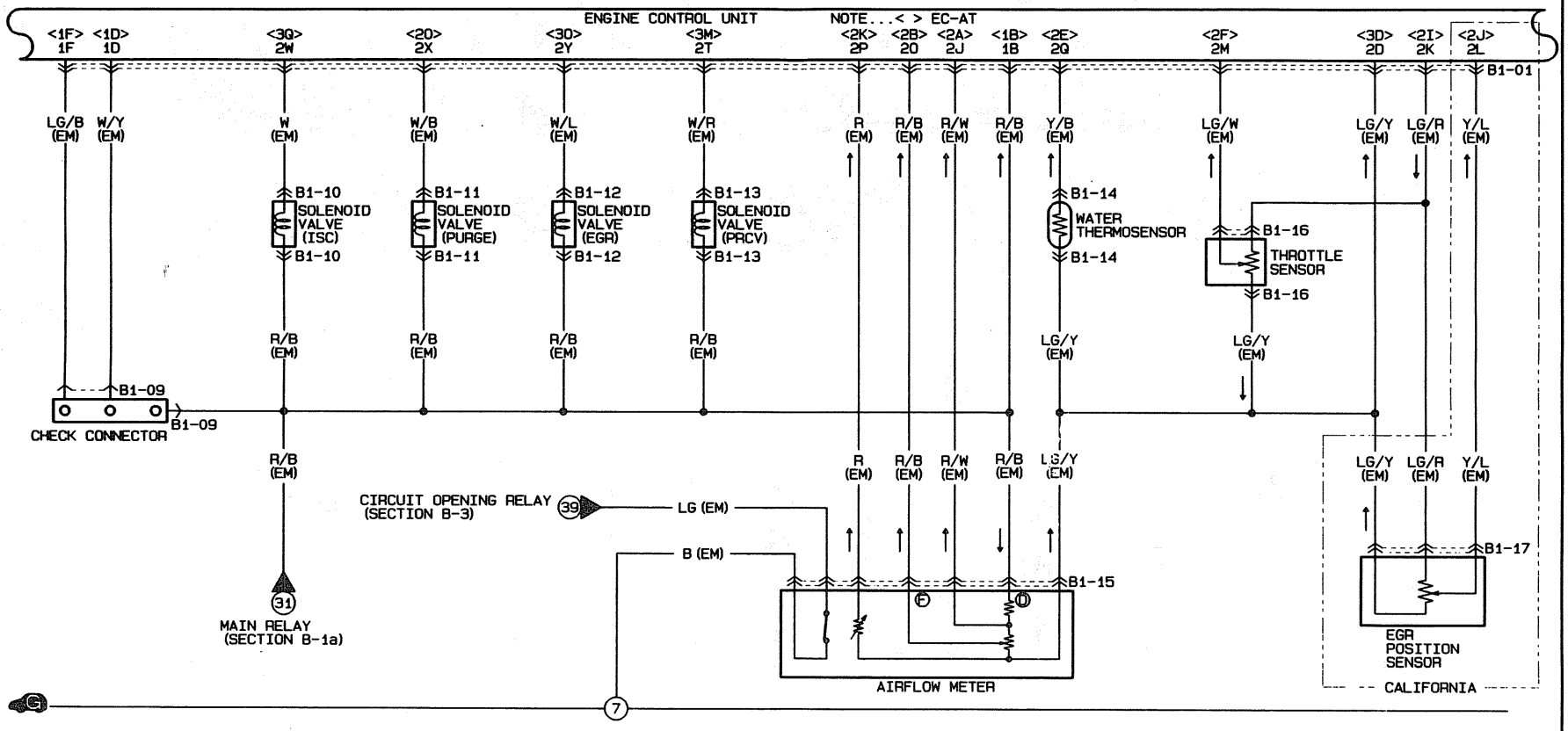
B1-07 IGNITION COIL (EM)



B1-08 MAIN RELAY (F)



NON TURBO ■ ENGINE CONTROL SYSTEM



B1-01 ENGINE CONTROL UNIT (EM)

1U	1S	1Q	1O	1M	1K	1I	1G	1E	1C	1A
B/W	*	W/G	G/B	G/R	*	R/W	*	W/L	B/Y	L/R
Y/L	BR	B/Y	L/B	BR/R	L/B	B/L	W	LG/B	W/Y	R/B
1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B

EC-AT

2O	2M	2K	2I	2G	2E	2C	2A
W/B	Y/G	R	LG/R	L/R	Y/B	B	R/W
BR/Y	Y/L	LG/R	Y/L	BR/B	LG/W	B/L	R/B
2P	2N	2L	2J	2H	2F	2D	2B

3Y	3W	3U	3S	3Q	3O	3M	3K	3I	3G	3E	3C	3A
L/R	L	Y	*	W	W/L	W/R	*	*	Y/W	Y	B/LG	B
L/W	L/B	Y/B	*	*	*	L/G	BR/B	*	Y/B	G	LG/Y	B
3Z	3X	3V	3T	3R	3P	3N	3L	3J	3H	3F	3D	3B

MTX

1U	1S	1Q	1O	1M	1K	1I	1G	1E	1C	1A
W	L/B	G/B	W/G	G	R/W	*	*	W/L	B/Y	L/R
LG/B	B/L	B/G	BR/R	BR	*	L/B	*	LG/B	W/Y	R/B
1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B

2Y	2W	2U	2S	2Q	2O	2M	2K	2I	2G	2E	2C	2A
W/L	W	Y	*	Y/B	R/B	LG/W	LG/R	Y/L	Y/W	*	B/LG	B
*	W/B	Y/B	W/R	*	R	B	Y/L	R/W	*	*	LG/Y	B
2Z	2X	2V	2T	2R	2P	2N	2L	2J	2H	2F	2D	2B

B1-09 CHECK CONNECTOR (EM)

*	R/B	LG/B
*	W/Y	*

B1-10 SOLENOID VALVE (ISC) (EM)

W	R/B

B1-11 SOLENOID VALVE (PURGE) (EM)

W/B	R/B

B1-12 SOLENOID VALVE (EGR) (EM)

W/L	R/B

B1-13 SOLENOID VALVE (PRCV) (EM)

W/R	R/B

B1-14 WATER THERMOSENSOR (EM)

LG/Y	Y/B

B1-15 AIRFLOW METER (EM)

Ⓕ						Ⓓ
R	R/B	R/W	R/B	LG/Y	B	LG

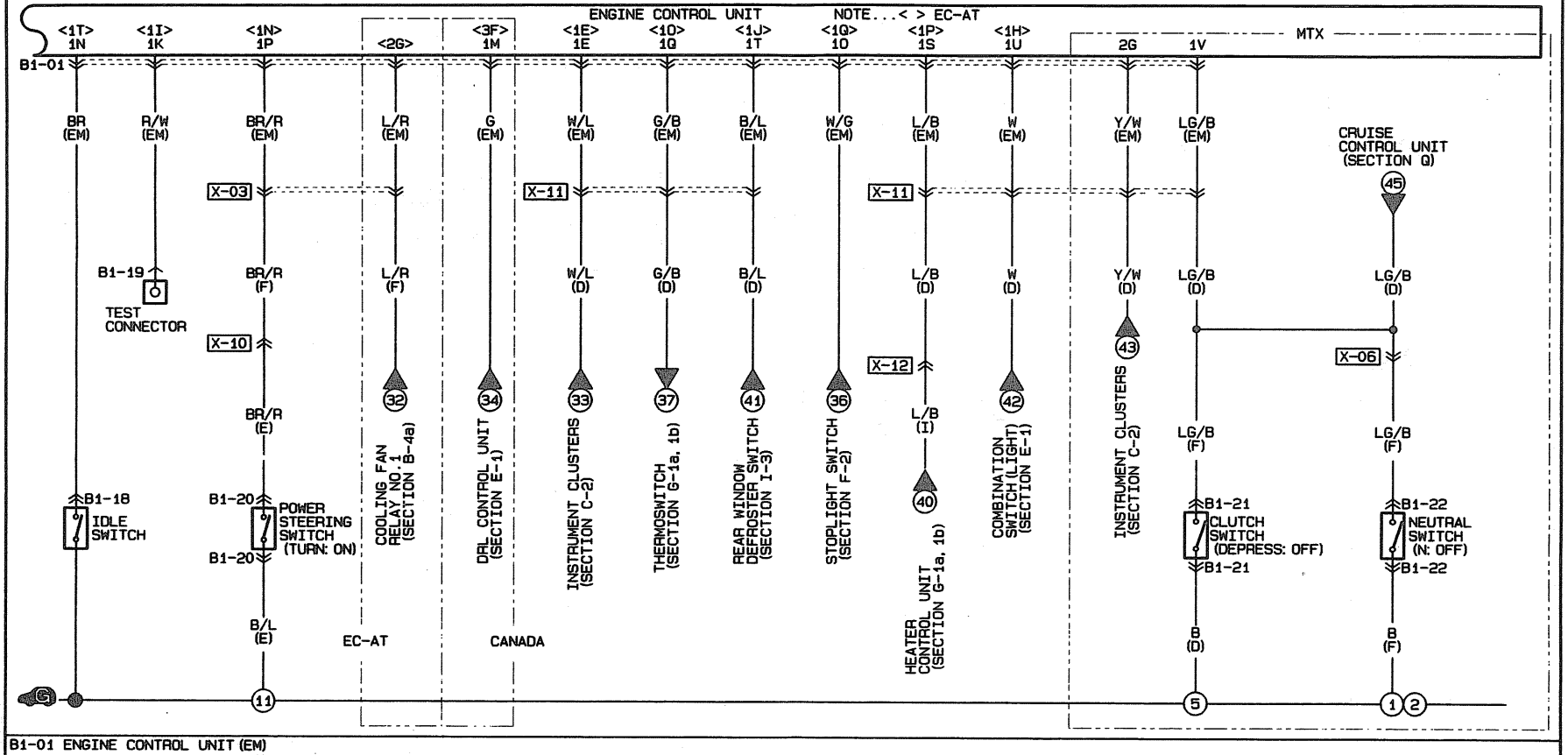
B1-16 THROTTLE SENSOR (EM)

	LG/Y	LG/R
	LG/W	

B1-17 EGR POSITION SENSOR (EM)

	LG/R	Y/L
	LG/Y	

NON TURBO ■ ENGINE CONTROL SYSTEM



B1-01 ENGINE CONTROL UNIT (EM)

EC-AT

1U	1S	1Q	1O	1M	1K	1I	1G	1E	1C	1A
B/W	*	W/G	G/B	G/R	*	R/W	*	W/L	B/Y	L/R
Y/L	BR	B/Y	L/B	BR/R	L/B	B/L	W	LG/B	W/Y	R/B
1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B

2O	2M	2K	2I	2G	2E	2C	2A
W/B	Y/G	R	LG/R	L/R	Y/B	B	R/W
BR/Y	Y/L	LG/R	Y/L	BR/B	LG/W	B/L	R/B
2P	2N	2L	2J	2H	2F	2D	2B

3Y	3W	3U	3S	3Q	3O	3M	3K	3I	3G	3E	3C	3A
L/R	L	Y	*	W	W/L	W/R	*	*	Y/W	Y	B/LG	B
L/W	L/B	Y/B	*	*	*	L/G	BR/B	*	Y/B	G	LG/Y	B
3Z	3X	3V	3T	3R	3P	3N	3L	3J	3H	3F	3D	3B

MTX

1U	1S	1Q	1O	1M	1K	1I	1G	1E	1C	1A
W	L/B	G/B	W/G	G	R/W	*	*	W/L	B/Y	L/R
LG/B	B/L	B/G	BR/R	BR	*	L/B	*	LG/B	W/Y	R/B
1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B

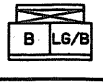
2Y	2W	2U	2S	2Q	2O	2M	2K	2I	2G	2E	2C	2A
W/L	W	Y	*	Y/B	R/B	LG/W	LG/R	Y/L	Y/W	*	B/LG	B
*	W/B	Y/B	W/R	*	R	B	Y/L	R/W	*	*	LG/Y	B
2Z	2X	2V	2T	2R	2P	2N	2L	2J	2H	2F	2D	2B

B1-18 IDLE SWITCH (EM)

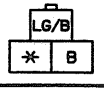
B1-19 TEST CONNECTOR (EM)

B1-20 POWER STEERING SWITCH (EM)

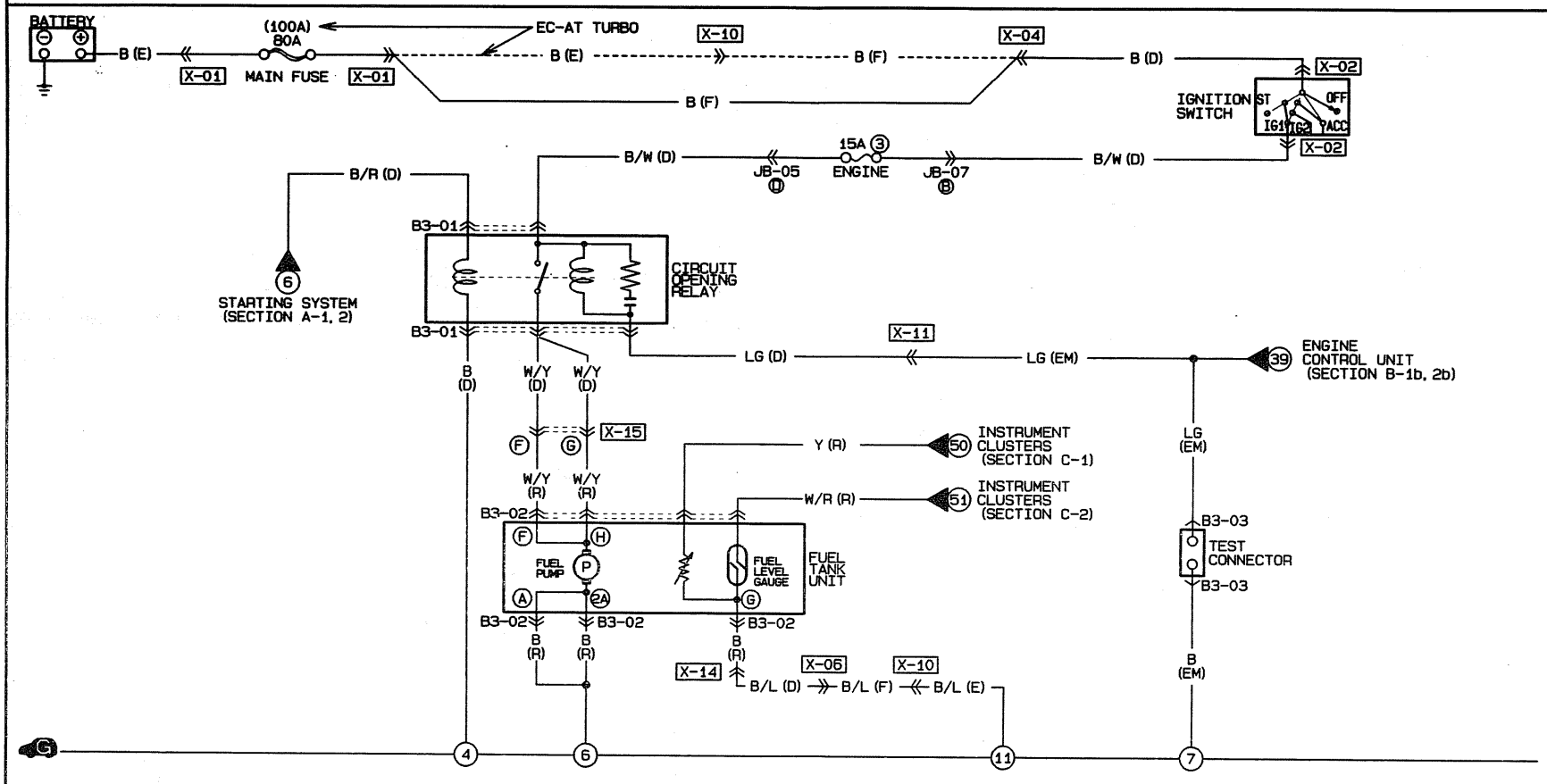
B1-21 CLUTCH SWITCH (D)

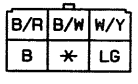
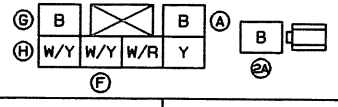


B1-22 NEUTRAL SWITCH (F)

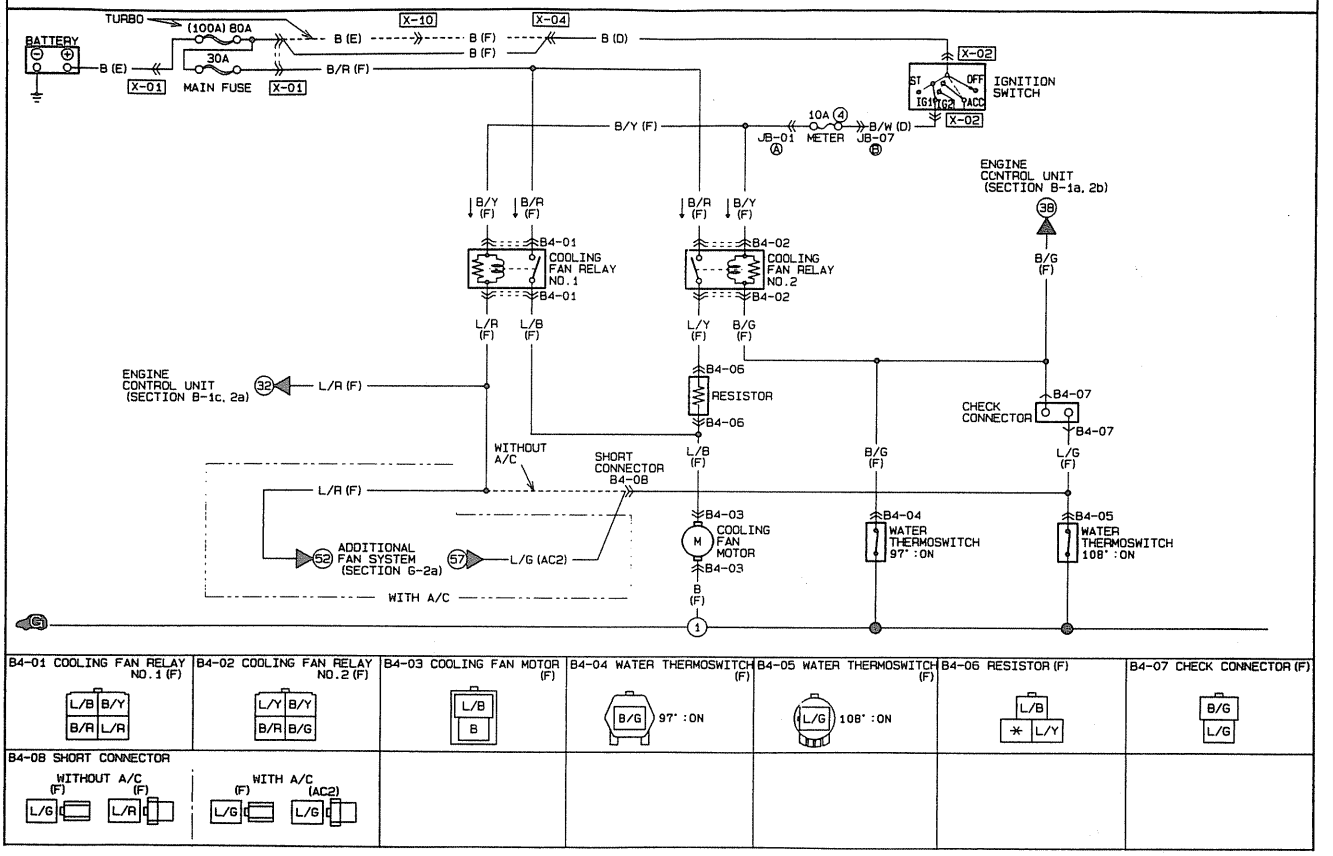


■ FUEL CONTROL SYSTEM



B3-01 CIRCUIT OPENING RELAY (D)	B3-02 FUEL TANK UNIT (R)	B3-03 TEST CONNECTOR (EM)			
					

EC-AT ■ COOLING FAN SYSTEM

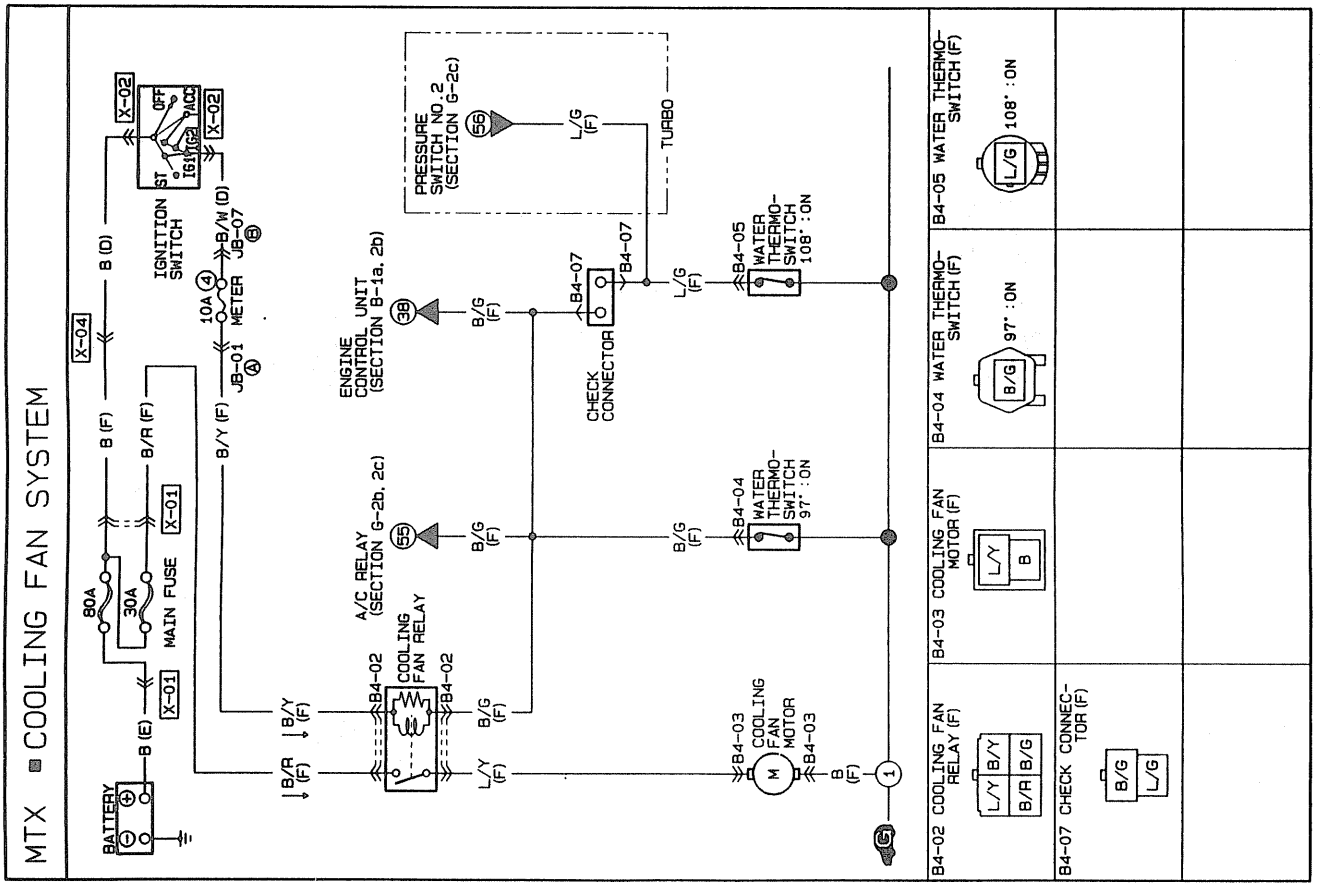


B4-01 COOLING FAN RELAY NO.1 (F)	B4-02 COOLING FAN RELAY NO.2 (F)	B4-03 COOLING FAN MOTOR (F)	B4-04 WATER THERMOSWITCH (F)	B4-05 WATER THERMOSWITCH (F)	B4-06 RESISTOR (F)	B4-07 CHECK CONNECTOR (F)
L/B B/Y / B/R L/R	L/Y B/Y / B/R B/G	L/B / B	B/G 97° :ON	L/G 108° :ON	L/B / ✳ L/Y	B/G / L/G

B4-08 SHORT CONNECTOR

WITHOUT A/C	WITH A/C
(F) L/G, (F) L/R	(F) L/G, (AC2) L/G

MTX ■ COOLING FAN SYSTEM



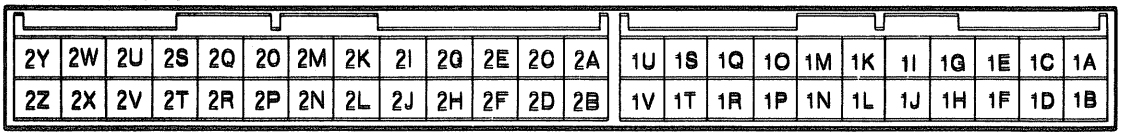
Terminal voltage
MTX

Terminal	Input	Output	Connected to	Voltage (After warming-up)		Remark
				IGN: ON	Idle	
1A	—	—	Battery	Battery voltage		For backup
1B	—	—	Main relay	Battery voltage		—
1C	○		Ign. switch (START)	Below 2.5V		While cranking: Battery voltage
1D		○	Self-Diagnosis Checker (Monitor lamp)	Test connector grounded • For 3 sec. after ign. switch OFF→ON: Below 6.2V (lamp illuminates) • After 3 sec.: Battery voltage (lamp does not illuminate)	Test connector not grounded • Lamp illuminates: Below 6.2V • Lamp does not illuminate: Battery voltage Test connector grounded: Approx. 5V	Using Self-Diagnosis Checker
1E		○	Malfunction indicator lamp (MIL)	• For 3 sec. after ign. switch OFF→ON: Below 4.8V (lamp illuminates) • After 3 sec. : Battery voltage (lamp does not illuminate)		• Test connector grounded • Lamp illuminates: Below 4.8V • Lamp does not illuminate: Battery voltage
1F		○	Self-Diagnosis Checker (Code number)	• For 3 sec. after ign. switch OFF→ON: Below 6.2V (Buzzer sounds) • After 3 sec. : Battery voltage (Buzzer does not sound)		• Using Self-Diagnosis Checker and test connector grounded • Buzzer sounds: Below 6.2V • Buzzer does not sound: Battery voltage
1G	—	—	—	—		—
1H	—	—	—	—		—
1I	—	—	—	—		—
1J		○	A/C relay	Battery voltage	• A/C switch ON: Below 2.5V • A/C switch OFF: Battery voltage	Blower motor ON
1K	○		Test connector	• Test connector grounded: Below 1.5V • Test connector not grounded: Above 10.5V		Test connector: 1-pin, Green connector
1L	—	—	—	—		—
1M	○		Daytime running light control unit (Canada only)	• Parking brake lever pulled up: Battery voltage • Parking brake lever released: Below 1.5V		
1N	○		Idle switch	• Accelerator pedal released: Below 0.5V • Accelerator pedal depressed: Above 7.7V		—
1O	○		Stoplight switch	• Brake pedal released: Below 3.6V • Brake pedal depressed: Above 10.0V		
1P	○		Power steering pressure switch	Above 10.5V	• P/S ON: Below 1.5V • P/S OFF: Above 10.5V	—
1Q			A/C switch	• A/C switch ON: Below 1.5V • A/C switch OFF: Above 10.0V		Blower motor ON
1R	○		Electrical fan (Water thermoswitch)	Battery voltage		Coolant temp. : Below 97C° (207°F)
				Below 1.5V		Coolant temp. : Above 97C° (207°F)

Terminal	Input	Output	Connected to	Voltage (After warming-up)		Remark
				IGN: ON	Idle	
1S	○		Blower fan switch	• Switch less than 2nd position: Battery voltage • Switch 3rd or 4th position: Below 1.5V		
1T	○		Rear window defroster switch	• Switch OFF: Battery voltage • Switch ON: Below 1.5V		—
1U	○		Headlight switch	• Headlight OFF: Below 1.5V • Headlight ON: Battery voltage		—
1V	○		Neutral and clutch switch	In-gear condition • Clutch pedal depressed: Below 0.5V • Clutch pedal released: Battery voltage		Neutral: Below 0.5V
2A	—	—	Ground (EO1)	0V		—
2B	—	—	Ground (EO2)	0V		—
2C	—	—	Ground (E1)	0V		—
2D	—	—	Ground (E2)	0V		—
2E	—	—	—	—		—
2F	—	—	—	—		—
2G	○		Speedometer	Battery voltage		Above 113 mph (180 km/h): Below 1.0V
2H	—	—	—	—		—
2I	○		ignition coil-terminal	Battery voltage	*Battery voltage	*Engine signal monitor green and red lamp flash
2J	○		Airflow meter (Vc)	7—9V		—
2K	—	—	Vref	4.5—5.5V		—
2L	○		EGR position sensor (California only)	0.25—0.95V		
2M	○		Throttle sensor	Accelerator pedal released: Approx. 0.5V (depends on terminal voltage)		Throttle valve fully open: 4.3V
2N	○		Oxygen sensor	0V	0—1.0V	• Cold engine at idle: 0V • After warming-up Acceleration: 0.5—1.0V Deceleration: 0—0.4V
2O	○		Airflow meter (Vs)	Approx. 1.7V	Approx. 3—5V	Increase engine speed: voltage increase
2P	○		Air flow meter (Intake air thermo-sensor)	Approx. 2.5V at 20°C (68°F)		—
2Q	○		Water thermosensor	0.3—0.6V		Coolant temp. 20°C (68°F): Approx. 2.5V
2R	—	—	—	—		—
2S	—	—	—	—		—
2T		○	Solenoid valve (Pressure regulator control)	For 120 sec. after ign. switch OFF ON: Below 3.5V	For 120 sec. after starting: Below 3.5V	Coolant temp. above 70°C (158°F) and intake air temp. above 20°C (68°F)
2U		○	Injector (No.1 and No.3)	Battery voltage	*Battery voltage	*Engine signal monitor green and red lamps flash
2V		○	Injector (No.2 and No.4)	Battery voltage	*Battery voltage	*Engine signal monitor green and red lamps flash

Terminal	Input	Output	Connected to	Voltage (After warming-up)		Remark
				IGN: ON	Idle	
2W		O	ISC valve	Engine signal monitor green and red lamps flash		—
2X		O	Solenoid valve (Purge control)	Battery voltage		—
2Y		O	Solenoid valve (EGR)	Below 3.5V		• Engine coolant temp. —below 50°C Below 3.5V • Engine speed above approx. 1,500 rpm: Battery voltage
2Z	—	—	—	—		—

Terminal locations



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ATX

Terminal	Input	Output	Connected to	Voltage (After warming-up)		Remark
				IGN: ON	Idle	
1A	—	—	Battery	Battery voltage		For back-up
1B	—	—	Main relay	Battery voltage		—
1C	○		Inhibitor switch (ATX)	Below 2.5V		While cranking: Battery voltage
1D		○	Self-Diagnosis Checker (Monitor lamp)	Test connect grounded • For 3 sec. after ign. switch OFF→ON: Below 6.2V (lamp illuminates) • After 3 sec.: Battery voltage (lamp does not illuminate)	Test connector not grounded • Lamp illuminates: Below 6.2V • Lamp does not illuminate: Battery voltage Test connector grounded: Approx. 5V	Using Self-Diagnosis Checker
1E		○	Malfunction indicator lamp (MIL)	• For 3 sec. after ign. switch OFF→ON: Below 4.8V (lamp illuminates) • After 3 sec.: Battery voltage (lamp not illuminate)		• Test connector grounded • Lamp illuminates: Below 4.8V • Lamp does not illuminate: Battery voltage
1F		○	Self-Diagnosis Checker (Code number)	• For 3 sec. after ign. switch OFF→ON: Below 6.2V (Buzzer sounds) • After 3 sec.: Battery voltage (Buzzer not sound)		• Using Self-Diagnosis Checker and test connector grounded • Buzzer sounds: Below 6.2V • Buzzer not sound: Battery voltage
1G	—	—	—	—		—
1H	○		Headlight switch	• Headlight OFF: Below 1.5V • Headlight ON: Battery voltage		—
1I	○		Test connector	• Test connector grounded: Below 1.5V • Test connector not grounded: Above 10.5V		Test connector: 1-pin, Green connector
1J	○		Rear window defroster switch	• Switch OFF: Battery voltage • Switch ON: Below 1.5V		—
1K	—	—	—	—		—
1L		○	A/C relay	Battery voltage	• A/C switch ON: Below 2.5V • A/C switch OFF: Battery voltage	Blower motor ON
1M	○		Vehicle speed sensor	Approx. 4.5V or below 1.5V		During driving: Approx: 4.5V
1N	○		Power steering pressure switch	Above 10.5V	• P/S ON: Below 1.5V • P/S OFF: Above 10.5V	—
1O			A/C switch	• A/C switch ON: Below 1.5V • A/C switch OFF: above 10.0V		Blower motor ON
1P	○		Blower fan switch	• Switch less than 2nd position: Battery voltage • Switch 3rd or 4th position: Below 1.5V		
1Q	○		Stoplight switch	• Brake pedal released: Below 3.6V • Brake pedal depressed: Above 10.0V		
1R	○		Inhibitor switch (N and P range)	• N or P range: Below 1.5V • Others: Battery voltage		

Terminal	Input	Output	Connected to	Voltage (After warming-up)		Remark
				IGN: ON	Idle	
1S	○		Blower fan switch	• Switch less than 2nd position: Battery voltage • Switch 3rd or 4th position: Below 1.5V		
1T	○		Idle switch	• Accelerator pedal released: Below 0.5V • Accelerator pedal depressed: Above 7.7V		—
1U	—	—	Ignition switch (IG1)	Battery voltage		For EC-AT shift-solenoid valves
1V	○		Ignition coil ⊖ terminal	Battery voltage	*Battery voltage	*Engine signal monitor: green and red lamp flash
2A	○		Airflow meter (Vc)	7—9V		—
2B	○		Airflow meter (Vs)	Approx. 1.7V	Approx. 3—5V	Increase engine speed: voltage increase
2C	○		Oxygen sensor	0V	0—10V	• Cold engine at idle: 0V • After warming-up Acceleration: 0.5—1.0V Deceleration: 0—0.4V
2D	○		Electrical fan [Low] (No.1 water thermoswitch)	Battery voltage		Coolant temp.: Below 97°C (207°F)
				Below 1.5V		Coolant temp.: Above 97°C (207°F)
2E	○		Water thermosensor	0.3—0.6V		Coolant temp. 20°C (68°F): Approx. 2.5V
2F	○		Throttle sensor	Accelerator pedal released: Approx. 0.5V (depends on 2I terminal voltage)		Throttle valve fully open: 4.3V
2G	○		Electrical fan [High] (No.2 thermoswitch)	Battery voltage		Coolant temp.: Below 108°C (226°F)
				Below 1.5V		Coolant temp.: Above 108°C (226F°)
2H	○		Hold switch	• Switch depressed: Battery voltage • Switch released: Below 1.5V		—
2I	—	—	Vref	4.5—5.5V		—
2J	○		EGR position sensor (California only)	0.25—0.95V		
2K	○		Airflow meter (Intake air thermosensor)	Approx. 2.5V at 20°C (68°F)		—
2L	○		Mode switch (Power side)	• POWER mode: Below 1.5V • ECONOMY mode or HOLD mode: Battery voltage		
2M	○		Pulse generator	Below 1.5V	*Battery voltage	*P or N range
2N	—	—	Pulse generator	Below 1.5V		Ground
2O		○	Solenoid valve (Purge control)	Battery voltage		—
2P		○	Hold indicator	• Hold mode: Below 1.5V • Other modes: Battery voltage		—
3A	—	—	Ground (EO1)	0V		—
3B	—	—	Ground (EO2)	0V		—
3C	—	—	Ground (E1)	0V		—
3D	—	—	Ground (E2)	0V		—
3E	○		Inhibitor switch (D range)	• D range: Battery voltage • Other range: Below 1.5V		—

Terminal	Input	Output	Connected to	Voltage (After warming-up)		Remark
				IGN: ON	Idle	
3F	○		Daytime running light control unit (Canada only)	• Parking brake lever pulled up: Battery voltage • Parking brake lever released: Below 1.5V		
3G	○		Inhibitor switch (L range)	• L range: Battery to voltage • Other range: Below 1.5V		—
3H	○		Inhibitor switch (S range)	• S range: Battery voltage • Other range: Below 1.5V		—
3I	—	—	—	—		—
3J	—	—	—	—		—
3K	—	—	—	—		—
3L		○	Mode indicator	• HOLD mode: Battery voltage • POWER or ECONOMY mode: Below 1.5V		
3M		○	Solenoid valve (Pressure regulator control)	For 120 sec. after ign. Switch OFF→ON: Below 3.5V	For 120 sec. after starting: Below 3.5V	Coolant temp. above 70°C (158°F) and intake air temp. above 20°C (63°F)
3N	○		Fluid thermoswitch	• Fluid temp. below 143°C (389°F): Approx.10—12V • Fluid temp. above 150°C (302°F): Below 1.5V		—
3O		○	Solenoid valve (EGR)	Below 3.5V		• Engine coolant temp. —below 50°C Below 3.5V • Engine speed above approx. 1,500 rpm: Battery voltage
3P	—	—	—	—		—
3Q		○	ISC valve	Engine signal monitor green and red lamps flash		—
3R	—	—	—	—		—
3S	—	—	—	—		—
3T	—	—	—	—		—
3U		○	Injector (No.1 and No.3)	Battery voltage	*Battery voltage	*Engine signal monitor green and red lamps flash
3V		○	Injector (No.2 and No.4)	Battery voltage	*Battery voltage	*Engine signal monitor green and red lamps flash
3W		○	1—2 shift solenoid valve	• Solenoid valve ON: Battery voltage • Solenoid valve OFF: Below 1.5V		Refer to next page
3X		○	2—3 shift solenoid valve	• Solenoid valve ON: Battery voltage • Solenoid valve OFF: Below 1.5V		Refer to next page
3Y		○	3—4 shift solenoid valve	• Solenoid valve ON: Battery voltage • Solenoid valve OFF: Below 1.5V		Refer to next page
3Z		○	Lockup solenoid valve	• Lockup: Battery voltage • No lockup: Below voltage		Refer to next page

Terminal locations

3Y	3W	3U	3S	3Q	3O	3M	3K	3I	3G	3E	3C	3A	2O	2M	2K	2I	2G	2E	2C	2A	1U	1S	1Q	1O	1M	1K	1I	1G	1E	1C	1A
3Z	3X	3V	3T	3R	3P	3N	3L	3J	3H	3F	3D	3B	2P	2N	2L	2J	2H	2F	2D	2B	1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B

16U0F1-014

Solenoid valve operation table

RANGE	GEAR			SOLENOID VALVES			
				1-2	2-3	3-4	Lock-up
P	Non					ON	
R	Reverse			ON			
N	—	Below approx. 6 km/h (3.7 mph)				ON	
		Above approx. 6 km/h (3.7 mph)		ON			
D	1st				ON	ON	
	2nd			ON	ON	ON	
	3rd	Below approx. 40 km/h (25 mph)					
		Above approx. 40 km/h (25 mph)	Lock-up OFF	ON			
			Lock-up ON	ON			ON
	OD	Lock-up OFF		ON		ON	
		Lock-up ON		ON		ON	ON
S	1st				ON	ON	
	2nd			ON	ON	ON	
	3rd	Below approx. 40 km/h (25 mph)					
		Above approx. 40 km/h (25 mph)		ON			
L	1st				ON	ON	
	2nd	Below approx. 110 km/h (68 mph)		ON	ON		
		Above approx. 110 km/h (68 mph)		ON			
HOLD D	2nd			ON	ON	ON	
	3rd	Below approx. 40 km/h (25 mph)					
		Above approx. 40 km/h (25 mph)		ON			
HOLD S	2nd			ON	ON		
	3rd	Below approx. 40 km/h (25 mph)					
		Above approx. 40 km/h (25 mph)		ON			
HOLD L	1st				ON		
	2nd	Below approx. 110 km/h (68 mph)		ON	ON		
		Above approx. 110 km/h (68 mph)		ON			

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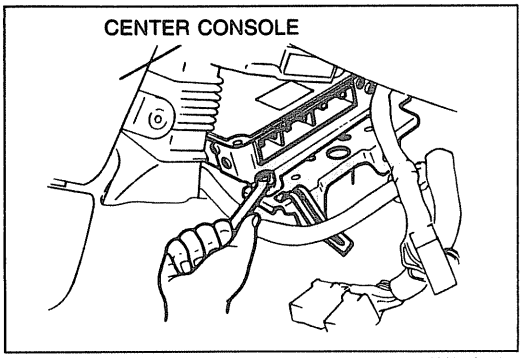

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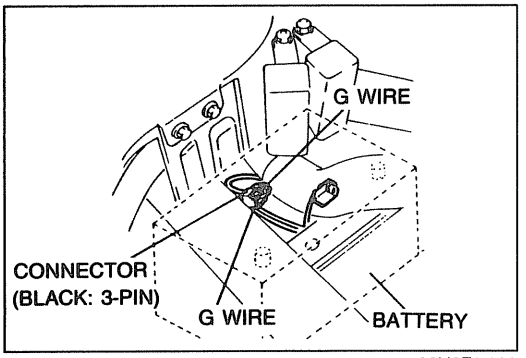

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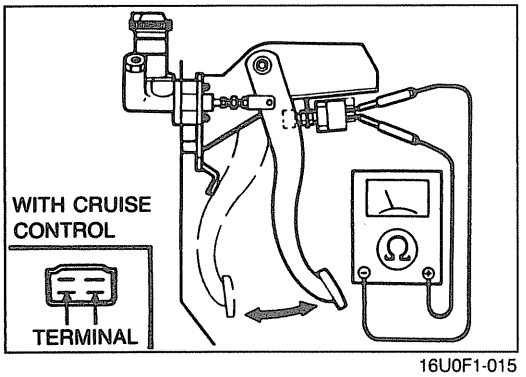

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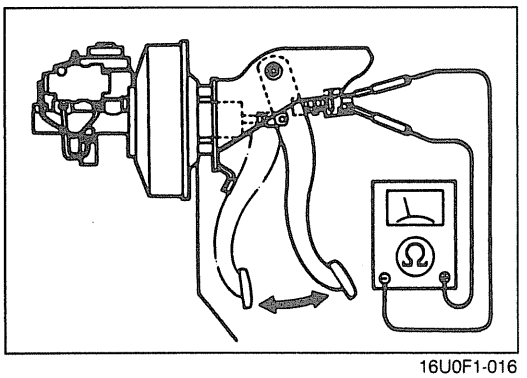

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Replacement

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

NEUTRAL SWITCH (MTX)

Inspection

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

Transmission	Continuity
In neutral	Yes
In other ranges	No

4. After checking, connect the switch connector.

Note

- **Refer to section J for replacement of the neutral switch.**

CLUTCH SWITCH (MTX)

Inspection

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

Pedal	Continuity
Depressed	Yes
Released	No

4. After checking, connect the switch connector.

Note

- **Refer to section T for replacement of the clutch switch.**

STOPLIGHT SWITCH

Inspection

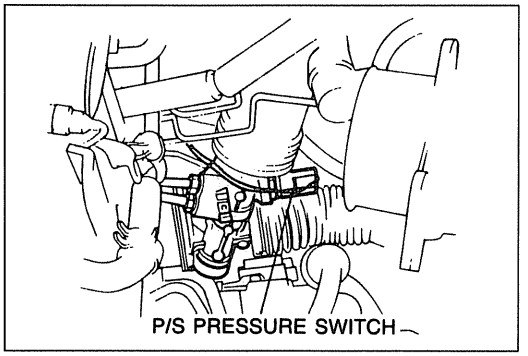
1. Disconnect the stoplight switch connector.
2. Connect an ohmmeter to the switch.
3. Check the continuity of the switch.

Pedal	Continuity
Depressed	Yes
Released	No

4. After checking, connect the switch connector.

Note

- **Refer to Section T for replacement of the stoplight switch.**



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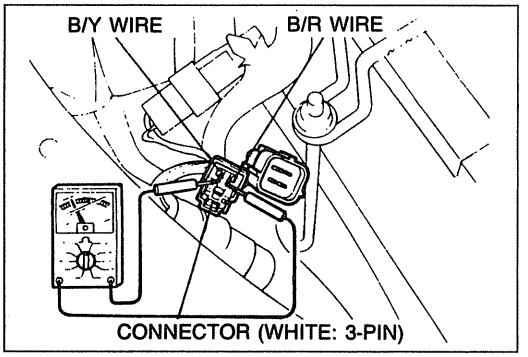

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P/S PRESSURE SWITCH

Inspection

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

P/S	Continuity
Turning	Yes
Not turning	No

4. Connect the switch connector after checking.

Note

- **Refer to section N for replacement of the P/S pressure switch.**

INHIBITOR SWITCH (ATX)

Inspection

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

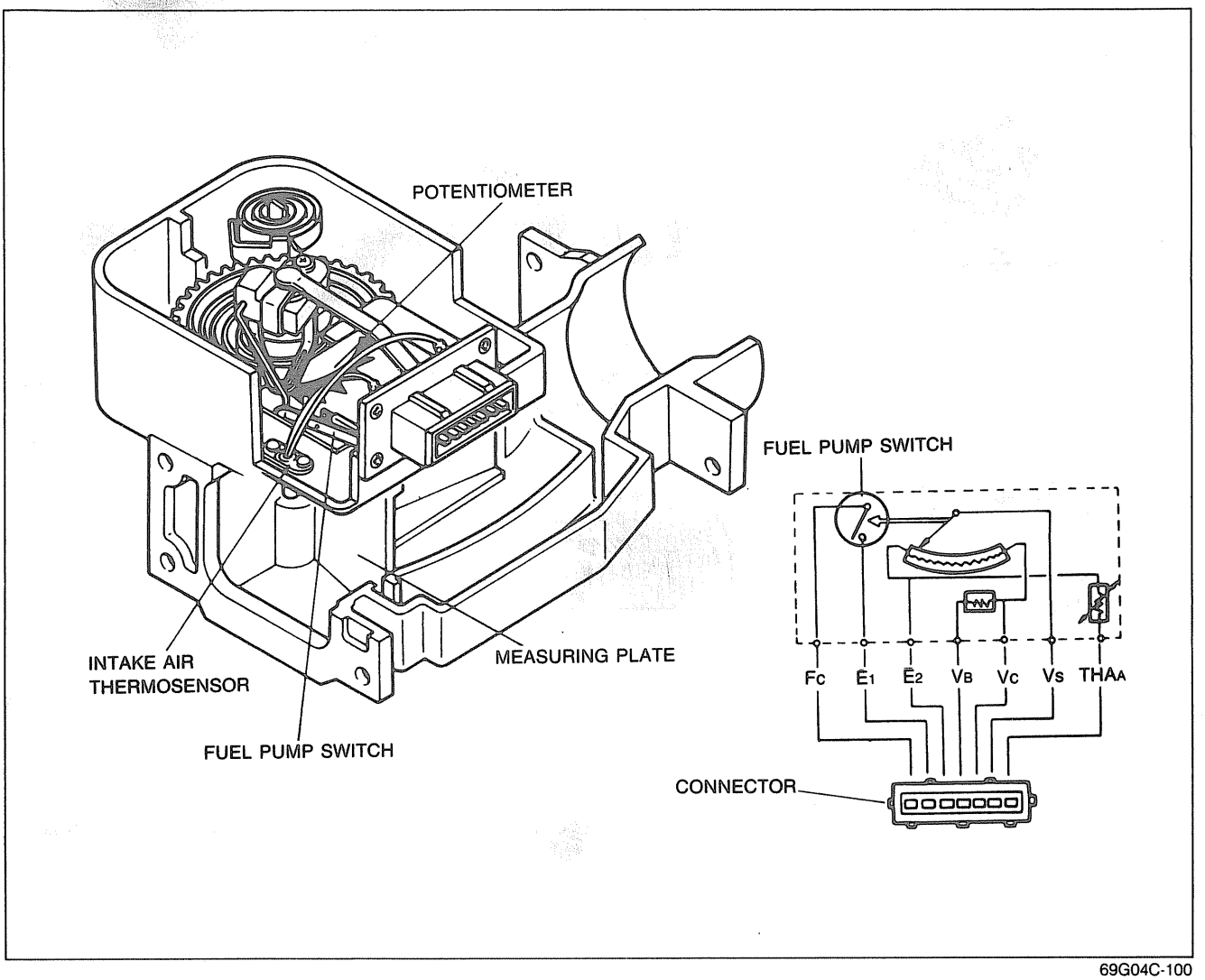
Position	Continuity
P and N ranges	Yes
Other ranges	No

4. Connect the switch connector after checking.

Note

- **Refer to Section K for replacement of the inhibitor switch.**

AIRFLOW METER



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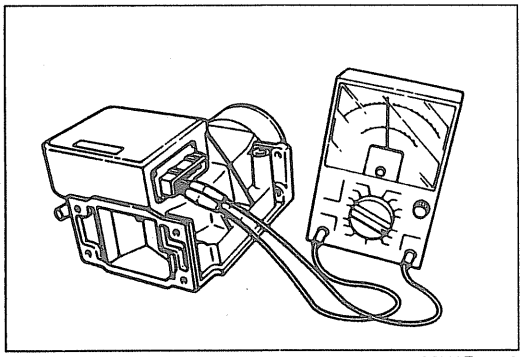

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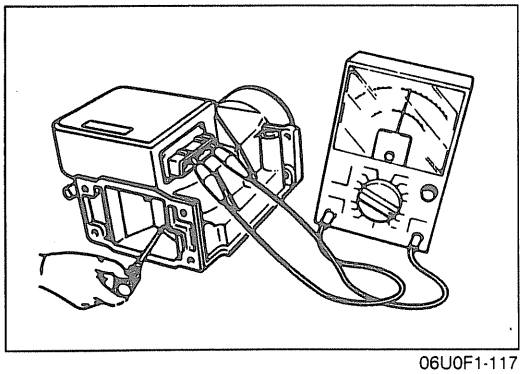

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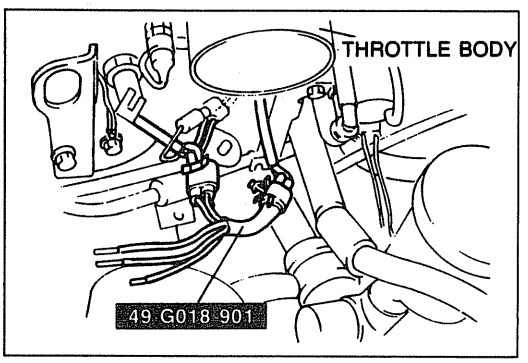
Inspection

1. Remove the airflow meter. (Refer to page F1–34.)
2. Check the airflow meter body for cracks.
3. Verify that the measuring plate moves smoothly.
4. Disconnect the connector from the airflow meter.
5. Using an ohmmeter, check resistance between the terminals with the measuring plate fully closed and fully open.
6. Connect the connector to the airflow meter after inspecting.

Terminal	Resistance (Ω)	
	Fully closed	Fully open
E2↔Vs	20—400	20—1,000
E2↔Vc	100—400	
E2↔VB	200—400	
E2↔THA (Intake air thermosensor)	−20°C (−4°F) 20°C (68°F) 60°C (140°F)	13.6—18.4 kΩ 2.21—2.69 kΩ 493—667 Ω
E1↔Fc	∞	0

Note

- **Refer to page F1–34 for replacement of the airflow meter.**



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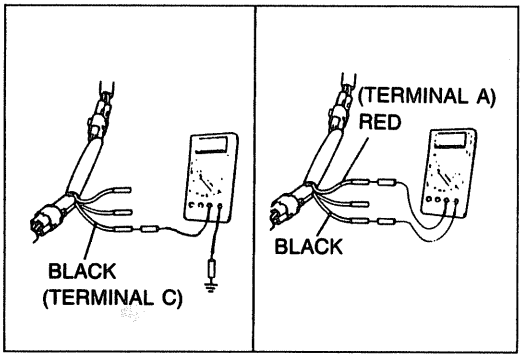

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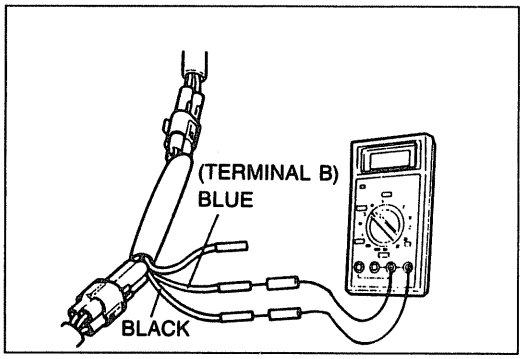

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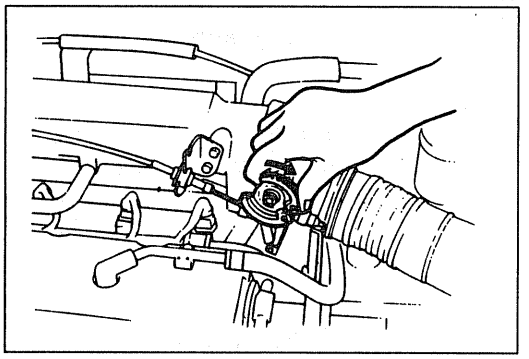

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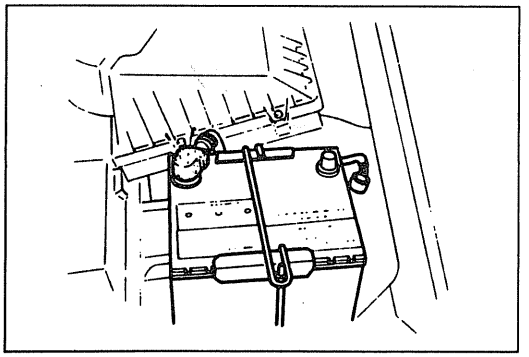

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THROTTLE SENSOR

Caution
- **Use a precision voltmeter with a scale of 0.01V to inspect or adjust the throttle sensor.**

Inspection
1. Remove the air hose from the throttle body.
2. Disconnect the throttle sensor connector (3-pin).
3. Connect the **SST** between the throttle sensor and the wiring harness.
4. Turn the ignition switch ON.
5. Make sure that the throttle valve is fully closed.

6. Measure **BLACK** and **RED** wire voltages. Check that the voltages are as specified.

Specification:
BLACK wire — Approx. 0V
RED wire — 4.5—5.5V

7. If not correct, check the battery voltage and wiring harness. If these are OK, replace the engine control unit.
8. Record the **RED** wire voltage.

9. Check that **BLUE** wire voltage for the recorded **RED** wire voltage is as specified below.

Specification:

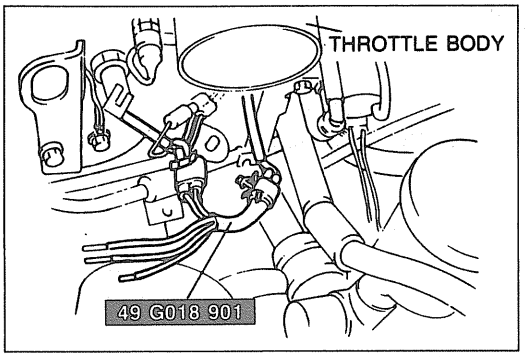
RED wire voltage (V)	BLUE wire voltage (V)	RED wire voltage (V)	BLUE wire voltage (V)
4.50—4.59	0.37—0.54	5.10—5.19	0.42—0.61
4.60—4.69	0.38—0.55	5.20—5.29	0.43—0.62
4.70—4.79	0.39—0.56	5.30—5.39	0.44—0.63
4.80—4.89	0.40—0.57	5.40—5.49	0.44—0.64
4.90—4.99	0.40—0.58	5.50	0.44—0.66
5.00—5.09	0.41—0.60		

10. Hold the throttle valve fully open.
11. Check that **BLUE** wire voltage for the recorded **RED** wire voltage is as specified.

Specification:

RED wire voltage (V)	BLUE wire voltage (V)	RED wire voltage (V)	BLUE wire voltage (V)
4.50—4.59	3.58—4.23	5.10—5.19	4.05—4.79
4.60—4.69	3.66—4.32	5.20—5.29	4.13—4.88
4.70—4.79	3.74—4.41	5.30—5.39	4.21—4.98
4.80—4.89	3.82—4.51	5.40—5.49	4.29—5.07
4.90—4.99	3.90—4.60	5.50	4.29—5.17
5.00—5.09	3.97—4.70		

12. Check that **BLUE** wire voltage increases smoothly when opening the throttle valve from closed to fully open.
13. If not correct, replace the throttle sensor.
14. Turn the ignition OFF.
15. Disconnect the **SST** and reconnect the throttle sensor connector.
16. Disconnect the negative battery terminal and depress the brake pedal for at least 5 seconds to eliminate the control unit malfunction memory.



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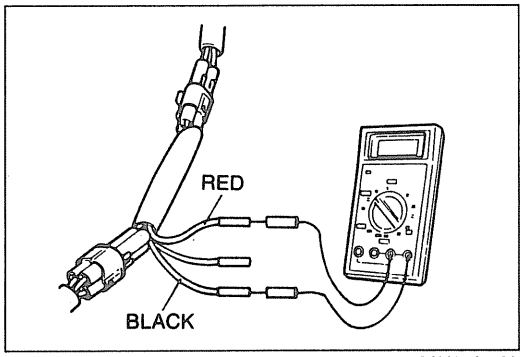

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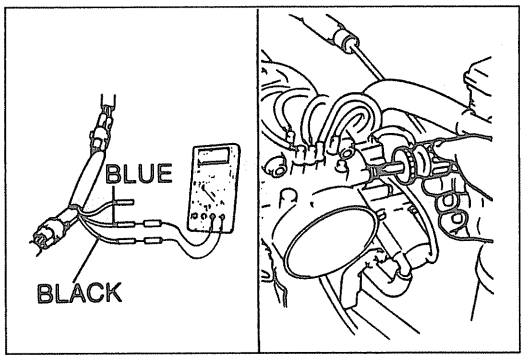

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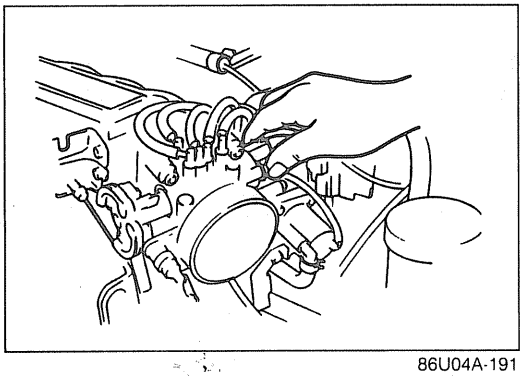

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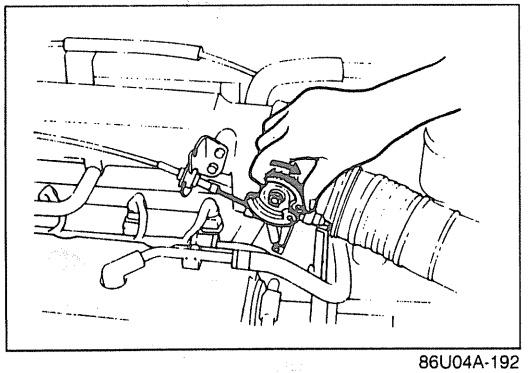


86U04A-192

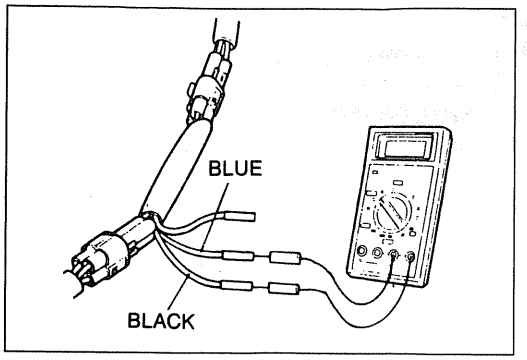
Adjustment

1. Remove the air hose from the throttle body.
2. Disconnect the throttle sensor connector (3-pin).
3. Connect the **SST** between the throttle sensor and the wiring harness.
4. Turn the ignition switch ON.
5. Make sure the throttle valve is fully closed.
6. Measure **RED** wire voltage and record it.
7. Change the voltmeter connection to the **BLUE** wire.
8. Loosen the throttle sensor mounting screws.
9. Turn the throttle sensor to adjust **BLUE** wire voltage within the range specified for the recorded **RED** wire voltage.

Specification:

RED wire voltage (V)	BLUE wire voltage (V)	RED wire voltage (V)	BLUE wire voltage (V)
4.50—4.59	0.37—0.54	5.10—5.19	0.42—0.61
4.60—4.69	0.38—0.55	5.20—5.29	0.43—0.62
4.70—4.79	0.39—0.56	5.30—5.39	0.44—0.63
4.80—4.89	0.40—0.57	5.40—5.49	0.44—0.64
4.90—4.99	0.40—0.58	5.50	0.44—0.66
5.00—5.09	0.41—0.60		

10. Tighten the throttle sensor mounting screws.
11. Recheck that **BLUE** wire voltage is within specification.
12. Hold the throttle valve fully open.



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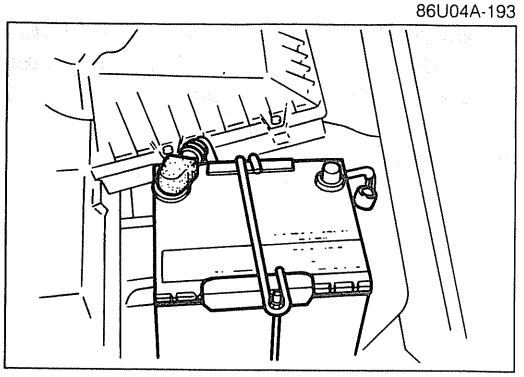
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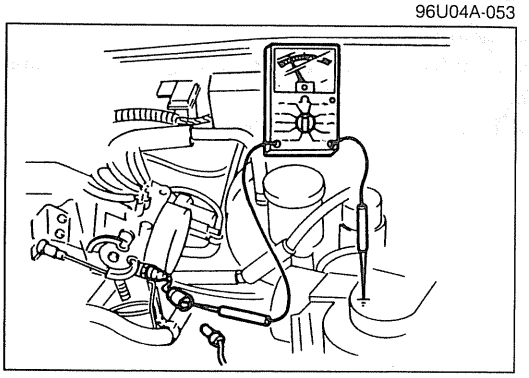
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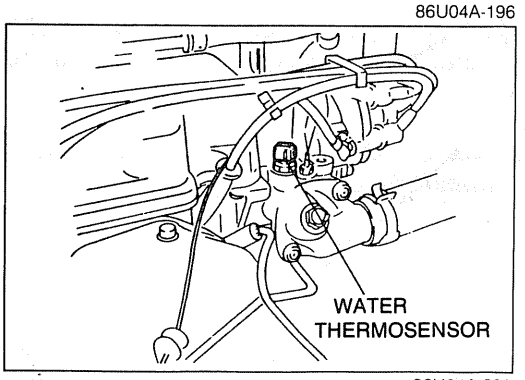

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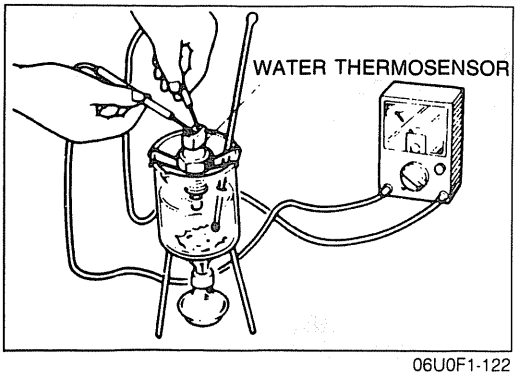


06U0F1-122

13. Check that **BLUE** wire voltage is within specification.

Specification:

RED wire voltage (V)	BLUE wire voltage (V)	RED wire voltage (V)	BLUE wire voltage (V)
4.50—4.59	3.58—4.23	5.10—5.19	4.05—4.79
4.60—4.69	3.66—4.32	5.20—5.29	4.13—4.88
4.70—4.79	3.74—4.41	5.30—5.39	4.21—4.98
4.80—4.89	3.82—4.51	5.40—5.49	4.29—5.07
4.90—4.99	3.90—4.60	5.50	4.29—5.17
5.00—5.09	3.97—4.70		

14. Check that **BLUE** wire voltage increases smoothly when opening the throttle valve from closed to fully open.
15. If not correct, replace the throttle sensor.
16. Turn the ignition OFF.
17. Disconnect the **SST** and reconnect the throttle sensor connector.
18. Disconnect the negative battery terminal and depress the brake pedal for at least 5 seconds to eliminate the control unit malfunction memory.

IDLE SWITCH

Inspection

1. Disconnect the idle switch connector (1-pin).
2. Check continuity between the switch and ground.

Throttle valve condition	Continuity
Fully closed	Yes*
Open	No

* Less than 30Ω is acceptable

3. If not correct, check condition of wiring harness of the idle switch. Replace the idle switch and throttle body as an assembly, if necessary.

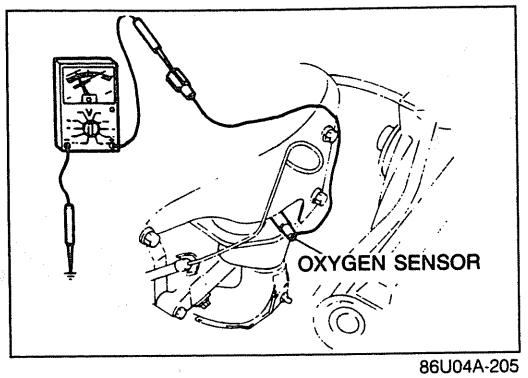
WATER THERMOSENSOR

Inspection

1. Remove the water thermo sensor from the cylinder head.
2. Place the sensor in water with a thermometer and heat the water gradually.
3. Check resistance of the sensor with an ohmmeter.

Coolant	Resistance
−20°C (−4°F)	14.6—17.8 kΩ
20°C (68°F)	2.2—2.7 kΩ
40°C (104°F)	1.0—1.3 kΩ
60°C (140°F)	500—650Ω
80°C (176°F)	290—350Ω

4. If not correct, replace the water thermosensor.



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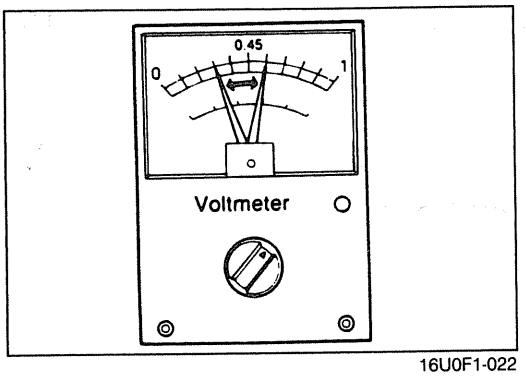
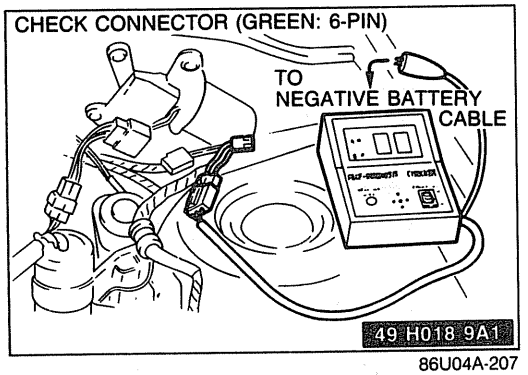


16U0F1-022



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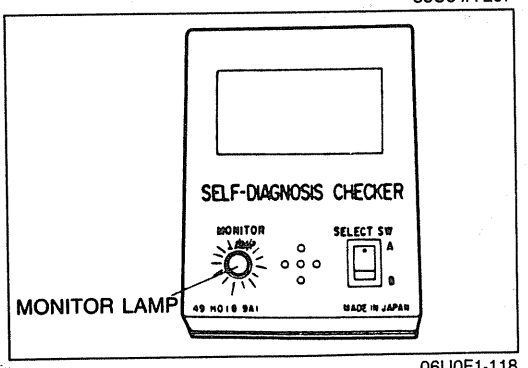

06U0F1-118

OXYGEN SENSOR

Inspection of Output Voltage

1. Warm up the engine and run it at idle.
2. Disconnect the oxygen sensor connector.
3. Connect a voltmeter between the oxygen sensor and ground.
4. Run the engine at **4,500 rpm** until the voltmeter indicates **approx. 0.7V**.
5. Increase and decrease the engine speed suddenly several times. Verify that when the speed is increased the meter reads between **0.5V—1.0V**, and when the speed is decreased it reads between **0V—0.4V**.
6. If not as specified, replace the oxygen sensor.

Inspection of Sensitivity

1. Warm up the engine to the normal operating temperature and run it at idle.
2. Connect the **SST** to the check connector.
3. Increase the engine speed to between **2,000 and 3,000 rpm**, and check that the monitor lamp flashes for 10 seconds.

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

Replacement

Refer to page F1–74.