

FUEL AND EMISSION CONTROL SYSTEMS (FUEL INJECTION FE DOHC)

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FEATURES

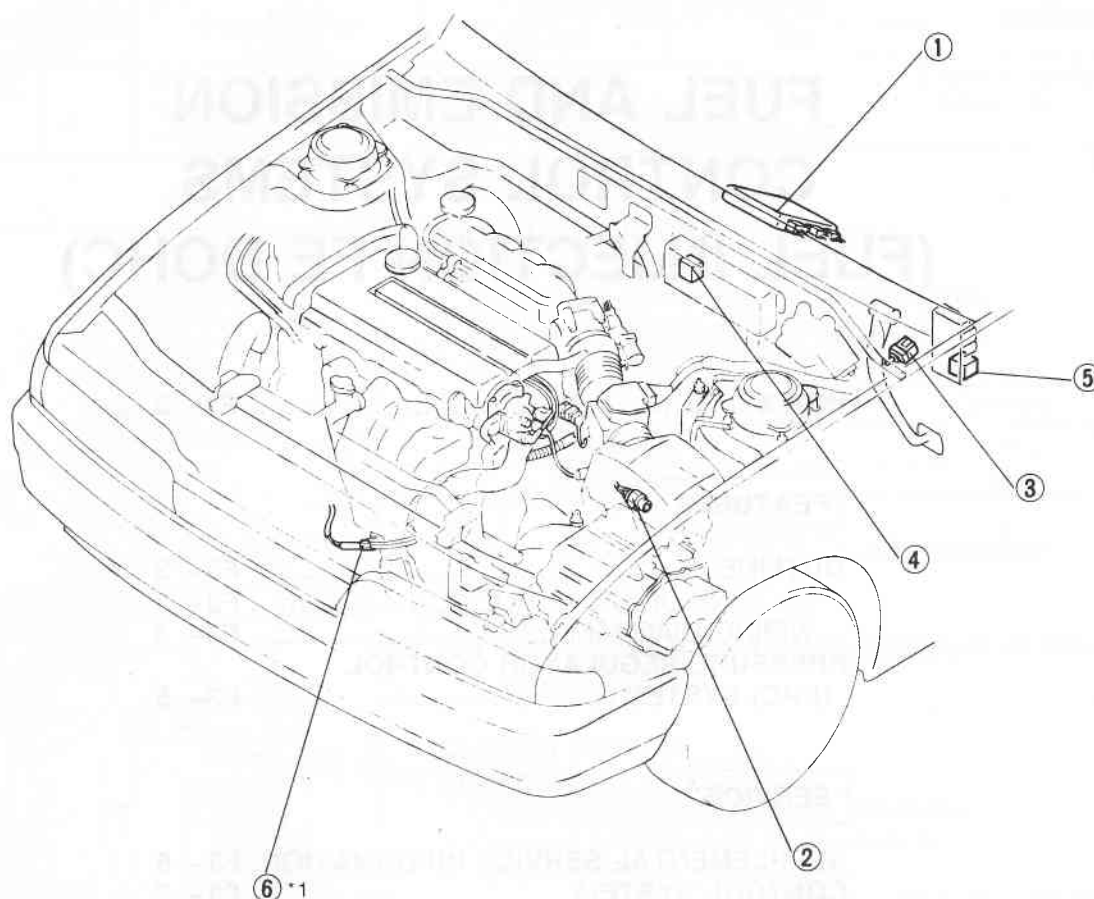
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*1...UNLEADED FUEL ONLY

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OUTLINE

OUTLINE OF CONSTRUCTION

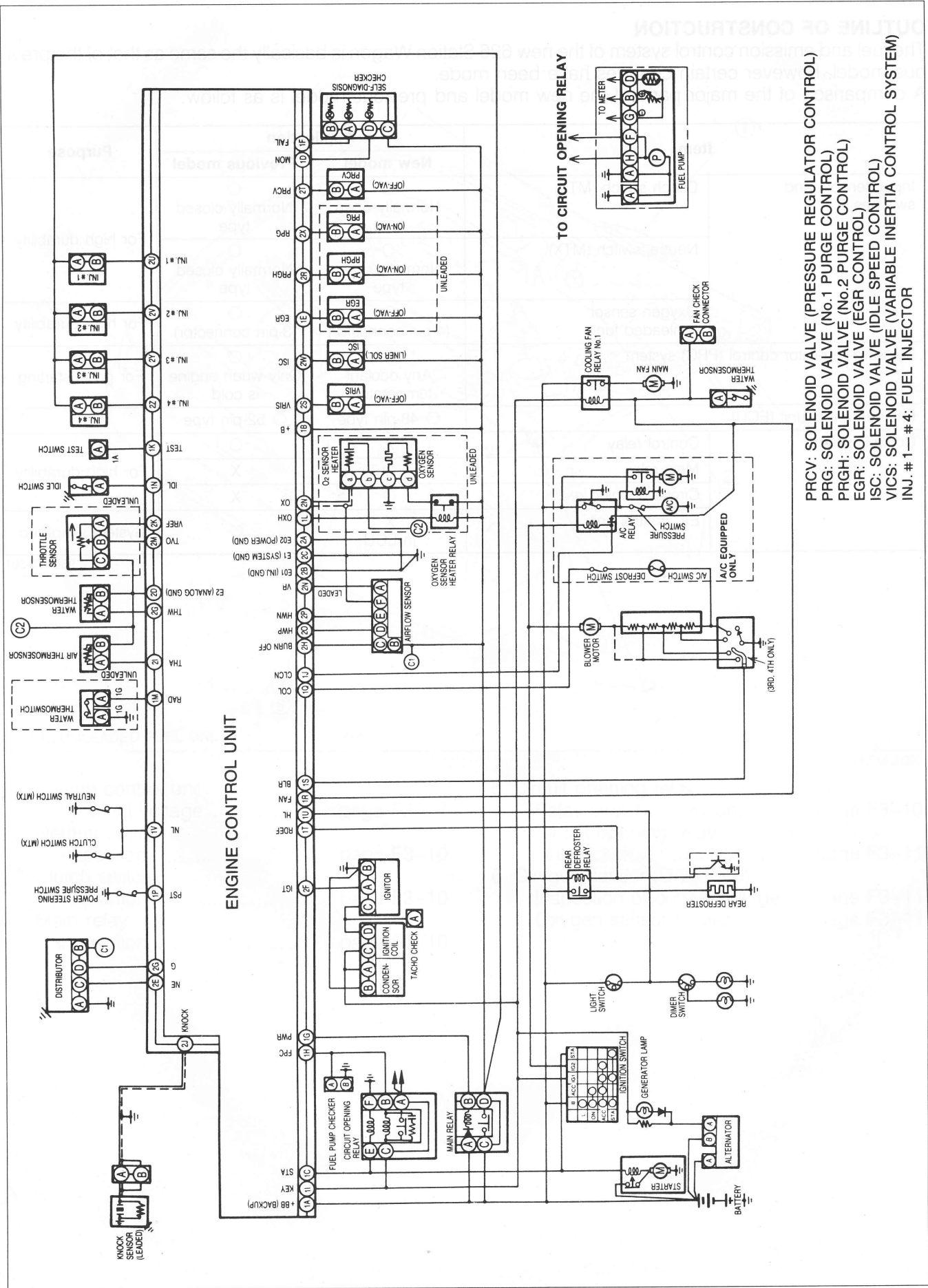
The fuel and emission control system of the new 626 Station Wagon is basically the same as that of the previous model, however certain changes have been made.

A comparison of the major parts of the new model and previous model is as follow.

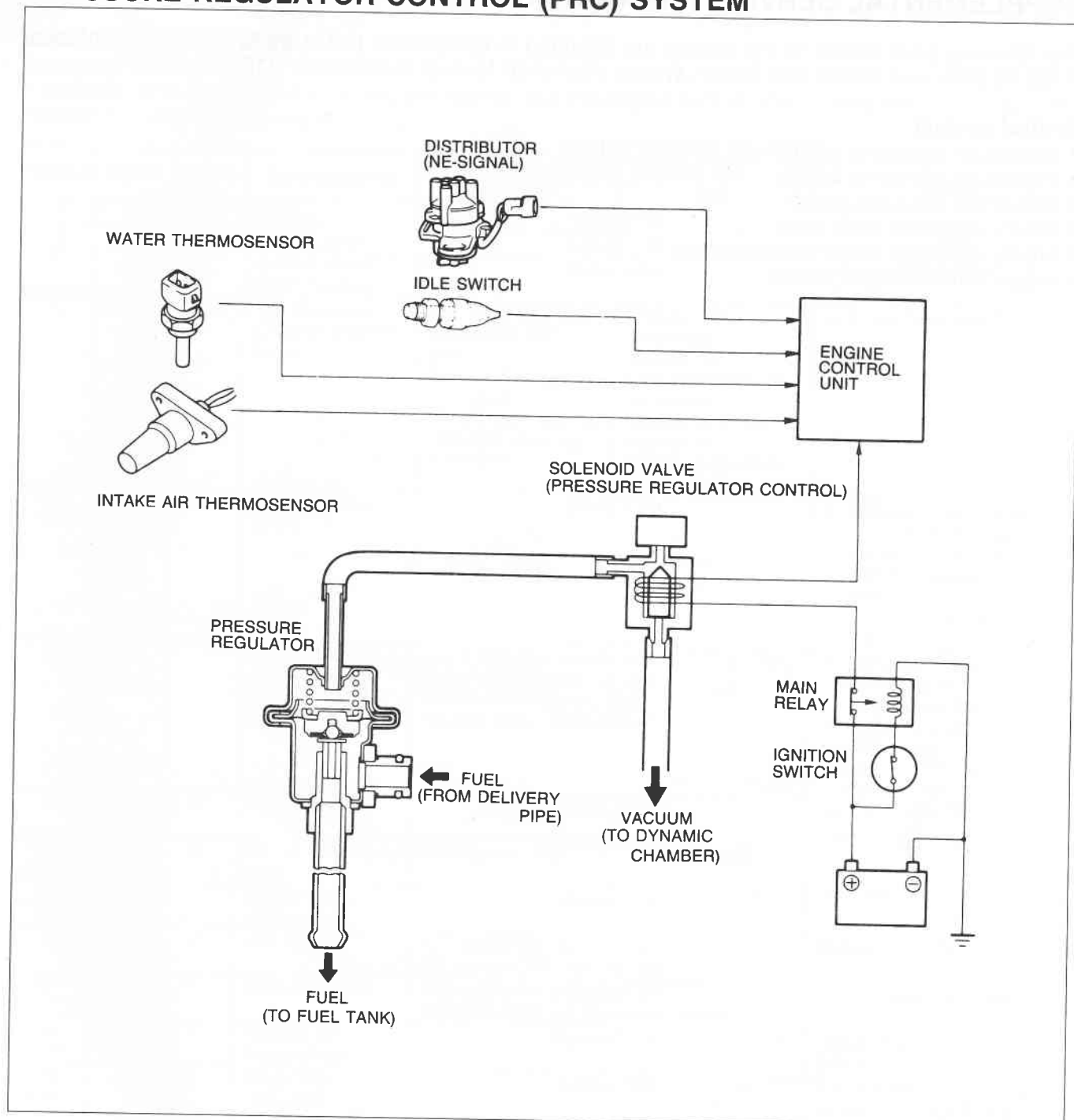
Item		Application		Purpose
		New model	Previous model	
Input sensors and switches	Clutch switch (MTX)	○ Normally open type	○ Normally closed type	For high durability
	Neutral switch (MTX)	○ Normally open type	○ Normally closed type	
	Oxygen sensor (Unleaded fuel)	○ (4-pin connector)	○ (3-pin connector)	For high durability
Pressure regulator control (PRC) system		○ Any coolant temperature	○ Only when engine is cold	For good starting
Engine control unit (ECU)		○ 48-pin type	○ 52-pin type	—
Control system	Control relay	X	○	For high durability
	Main relay	○	X	
	Circuit opening relay	○	X	
	E/L control unit	X In ECU	○	System simplified

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WIRING DIAGRAM



PRESSURE REGULATOR CONTROL (PRC) SYSTEM



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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 30°C (86°F)....Unleaded fuel
 above 50°C (122°F)....Leaded fuel

Specified time: Approx. 3 sec.

Operating condition: Coolant temperature — above 17°C (63°F)

Specified time: Approx. 10 sec.

Operating condition: Coolant temperature — Between -5°C (23°F) to 17°C (63°F)

SUPPLEMENTAL SERVICE INFORMATION

The following point shown in this section are changed in comparison to Mazda 626 Workshop Manual (1163-10-87G) and Mazda 626 Station Wagon Workshop Manual Supplement (1182-10-88B).

Control system

- Inspection of engine control unit terminal voltage
- Inspection of neutral switch
- Inspection of clutch switch
- Newly equipped main relay
- Newly equipped circuit opening relay
- Inspection of oxygen sensor

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CONTROL SYSTEM

ENGINE CONTROL UNIT (ECU)

Terminal Voltage

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

Terminal	Input	Output	Connection to	Voltage (After warming-up)		Remark
				Ign: ON	Idle	
1A	—	—	Battery	Approx. 12V		For back-up
1B	○	—	Control relay	Approx. 12V		—
1C	○		Ignition switch (Start position)	Below 2.5V		While cranking: Approx. 10V
1D		○	Self-Diagnosis Checker (Monitor lamp)	For 3 sec. after ignition switch OFF → ON: Approx. 5V (light illuminates) After 3 sec.: Approx. 12V (light does not illuminate)	(Test connector grounded) Approx. 5V (Test connector not grounded) Monitor lamp ON: Approx. 5V Monitor lamp OFF: Approx. 12V	With Self-Diagnosis Checker
1E (U/F)		○	Solenoid valve (EGR)	Below 2.5V		<ul style="list-style-type: none"> Radiator temp. below 17°C (62.6°F) or coolant temp. below 70°C (158°F): constant below 2.5V 1,500—3,500 rpm: Approx. 12V
1F		○	Self-Diagnosis Checker (Code No.)	For 3 sec. after ignition switch OFF → ON: Below 2.5V (Buzzer sounds) After 3 sec.: Approx. 12V (Buzzer does not sound)		<ul style="list-style-type: none"> Using Self-Diagnosis Checker and test connector grounded Buzzer sounds: Below 2.5V Buzzer does not sound: Approx. 12V
1G		○	Main relay	Below 2.5V		Ignition switch OFF: Approx. 12V
1H		○	Circuit opening relay	Approx. 12V	Below 2.5V	—
1I	○		Ignition switch (ON position)	Approx. 12V		—
1J		○	A/C relay	A/C switch ON: Below 2.5V A/C switch OFF: Approx. 12V		Blower motor ON
1K	○		Test connector	Test connector grounded: 0V Test connector not grounded: Approx. 12V		Green connector, 1-pin
1L (U/F)		○	Oxygen sensor heater (Relay)	Approx. 12V		Above 3,000 rpm: Below 2.5V
1M (U/F)	○		Water thermostat	Approx. 12V		Radiator temp.: Below 17°C (63°F)
				0V		Radiator temp.: Above 17°C (63°F)
1N	○		Idle switch	Accelerator pedal released: 0V Accelerator pedal depressed: approx. 12V		—
1O	—	—	—	—		—
1P	○		P/S pressure switch	Constant approx. 12V	P/S ON: Below 2.5V P/S OFF: Approx. 12V	—
1Q	○		A/C switch	A/C switch ON: Below 2.5V A/C switch OFF: Approx. 12V		Blower motor: ON

Note

- Terminals labeled "U/F" are only for unleaded fuel.

Terminal	Input	Output	Connection to	Voltage (After warming-up)		Remark
				Ign: ON	Idle	
1R	○		Electrical fan (Water thermostat switch)	Battery voltage		Coolant temp.: Below 97°C (207°F)
				Below 1.5V		Coolant temp.: Above 97°C (207°F)
1S	○		Blower fan switch	<ul style="list-style-type: none"> Switch less than 2nd position: Battery voltage Switch 3rd or 4th position: Below 1.5V 		—
1T	○		Rear defroster switch	<ul style="list-style-type: none"> Switch OFF: Battery voltage Switch ON: Below 1.5V 		—
1U	○		Headlight switch	<ul style="list-style-type: none"> Headlight OFF: Below 1.5V Headlight ON: Battery voltage 		—
1V	○		Neutral or clutch switch	In-gear condition Clutch pedal depressed: 0V Clutch pedal released: Approx. 12V		MTX (Neutral: constant 0V)
2A	—	—	Ground (E02)	0V		—
2B	—	—	Ground (E01)	0V		—
2C	—	—	Ground (E1)	0V		—
2D	—	—	Ground (E2)	0V		—
2E	○		Distributor (Ne signal)	0V or 5V	Approx. 2.0V	—
2F		○	Igniter	Approx. 12V	*Approx. 1V	*Engine Signal Monitor: green and red lights flash
2G	○		Distributor (G signal)	0V or 5V	Approx. 1.2V	—
2H		○	Airflow sensor (Burn-off control)	Below 2.5V		While burning off: Approx. 8—12V
2I	○		Intake air thermostat sensor (Dynamic chamber)	Approx. 2.5V at 20°C (68°F)		—
2J (L/F)	○		Knock sensor	Approx. 0V		—
2K (U/F)		○	V ref	4.5—5.5V		—
2L	—	—	—	—		—
2M (U/F)	○		Throttle sensor	Accelerator pedal released: Approx. 0.5V		Max. voltage (Throttle valve fully opened): Approx. 4.3V
2N (U/F)	○		Oxygen sensor	0V	0—1.0V	<ul style="list-style-type: none"> Cold engine: 0V at idle After warming-up: Increase engine speed: 0.7—1.0V Deceleration: 0—0.2V
2N (L/F)	○		Airflow sensor (Variable resistor)	0—5V		Depends on adjustment
2O	○		Airflow sensor (Intake air mass)	1.0—1.6V	1.7—2.3V	Increase engine speed: voltage increases
2P	○		Airflow sensor (Ground)	0V		—
2Q	○		Water thermostat sensor	Approx. 0.4V		Engine coolant temp. 20°C (68°F): Approx. 2.5
2R (U/F)		○	Solenoid valve (No.2 purge control)	Approx. 12V		<ul style="list-style-type: none"> Coolant temp. Below 75°C (167°F): Constant approx. 12V During medium and high load of above 1,700 rpm: Below 2.5V

Note

- Terminals labeled “U/F” are only for unleaded fuel.
- Terminals labeled “L/F” are only for leaded fuel.

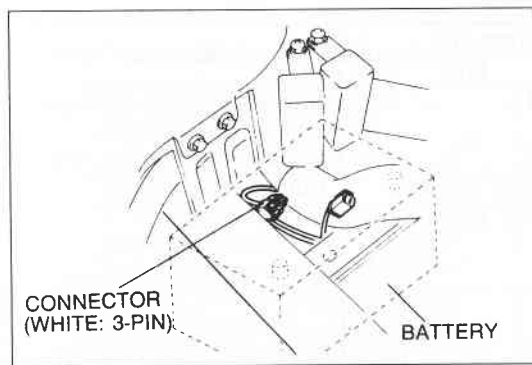
Terminal	Input	Output	Connection to	Voltage (After warming-up)		Remark
				Ign: ON	Idle	
2S		○	Solenoid valve (Variable inertia control)	Approx. 12V		Above 5,200 rpm (Unleaded fuel) or 5,400 rpm (Leaded fuel): Below 2.5V
2T		○	Solenoid valve (Pressure regulator control)	For 120 sec. after ignition switch OFF → ON: Below 2.5V	For 120. sec after starting: Below 2.5V	During hot condition: Coolant temp. Above 70°C (158°F) Intake air temp. Above 30°C (86°F) ...Unleaded fuel Above 50°C (122°F) ...Leaded fuel
				Approx. 12V		
2U		○	Injector (No.1)	Approx. 12V	*1 Approx. 12V	*1 Engine Signal Monitor: green and red lights flash
2V		○	Injector (No.2)	Approx. 12V	*1 Approx. 12V	*1 Engine Signal Monitor green and red lights flash
2W		○	Solenoid valve (Idle speed control)	Approx. 9—11V		—
2X (U/F)		○	Solenoid valve (No.1 purge control)	Below 2.5V		Coolant temp. below 70°C (158°F): Approx. 12V
2Y		○	Injector (No.3)	Approx. 12V	*Approx. 12V	*1 Engine Signal Monitor: green and red lights flash
2Z		○	Injector (No.4)	Approx. 12V	*1 Approx. 12V	*1 Engine Signal Monitor: green and red lights flash

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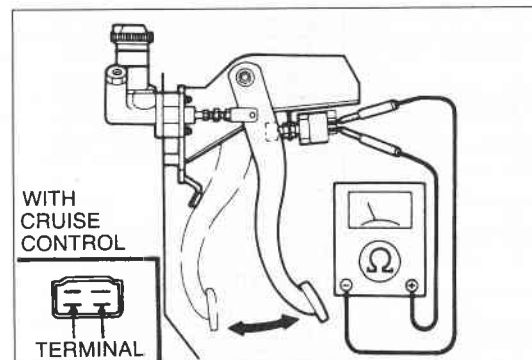
Note

- Terminals labeled “U/F” are only for unleaded fuel.

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



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NEUTRAL SWITCH

Inspection

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

Transmission	Continuity
In neutral	Yes
In other ranges	No

4. Reconnect the switch connector.

Note

- Refer to Section J for replacement of the neutral switch.

CLUTCH SWITCH

Inspection

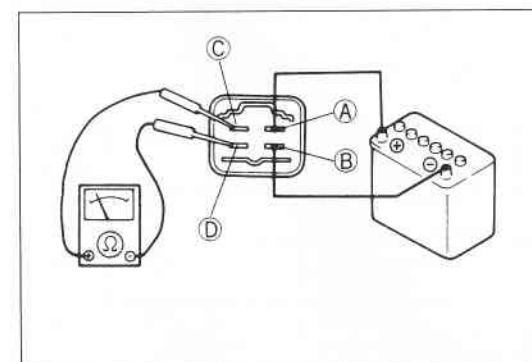
1. Disconnect the clutch switch connector.
2. Connect an ohmmeter to the switch.
3. Check continuity of the switch.

Pedal	Continuity
Depressed	Yes
Released	No

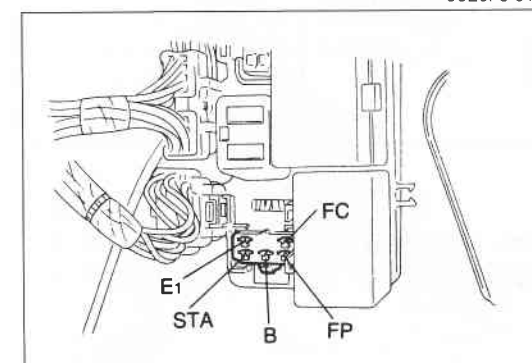
4. Reconnect the switch connector.

Note

- Refer to Section H for replacement of the clutch switch.



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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.

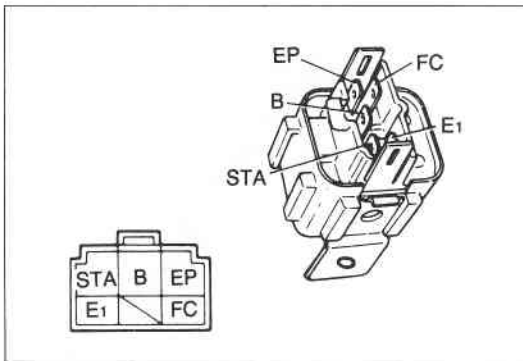
Operation	12V Not applied	12V Applied
Terminals		
Ⓒ — Ⓓ	No continuity	Continuity

CIRCUIT OPENING RELAY

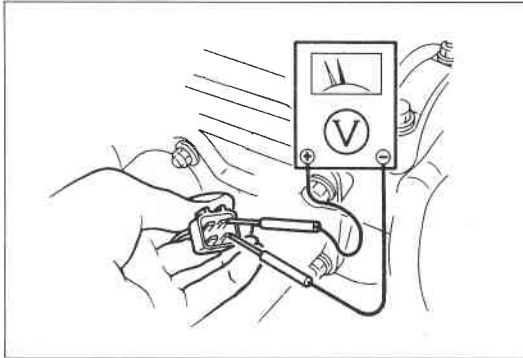
Relay Circuit Inspection

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

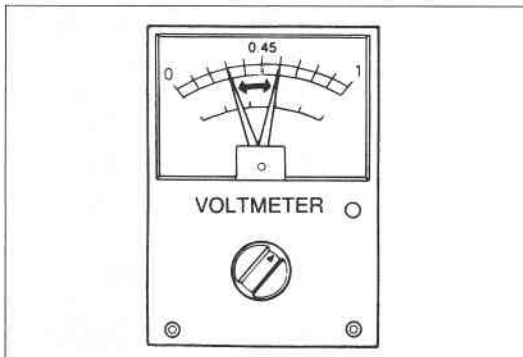
Terminal	Checking item	Correct result
Fp	Resistance	0.2—30Ω
Fc	Continuity (cranking)	∞
B	Voltage (Ign: ON)	Battery voltage
STA	Voltage (Cranking)	Approx. 9V
E1	Continuity	∞



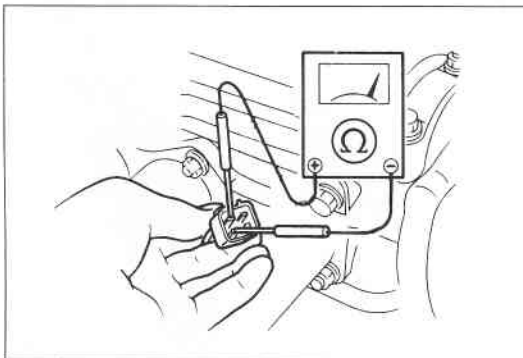
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Circuit Opening Relay Inspection

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

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

Resistance

Check the resistance between the terminals using an ohmmeter.

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

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 terminals A and B.
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. Check to see that when the speed is increased, the meter reads between **0.5V—1.0V**, and when the speed is decreased, it reads between **0V—0.4V**.
6. If the voltmeter does not indicate as specified, replace the oxygen sensor.

Oxygen Sensor Heater

1. Disconnect the oxygen sensor connector.
2. Check resistance between terminals C and D.

Specification: approx. 6Ω