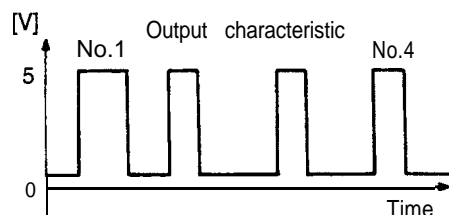
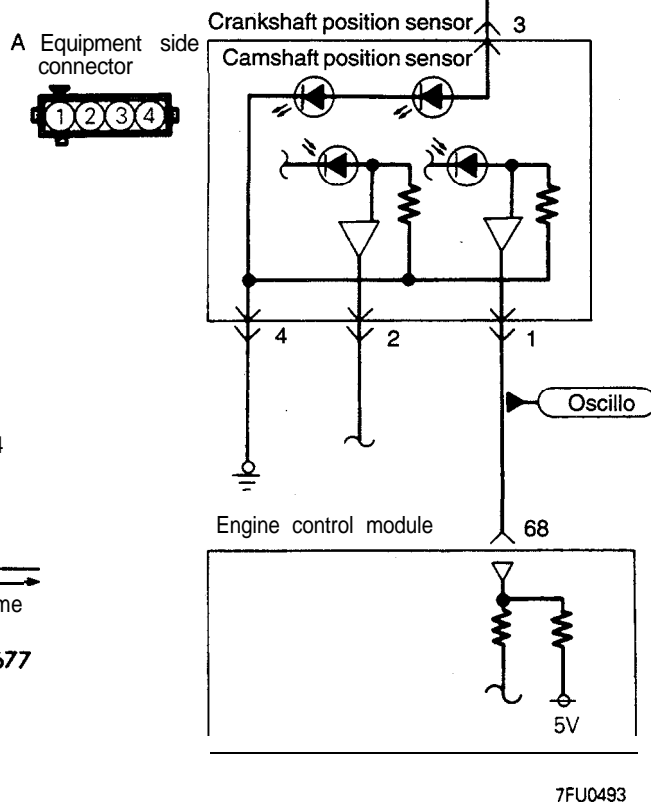
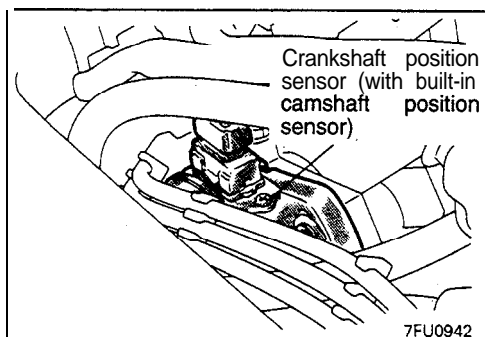


CAMSHAFT POSITION SENSOR <1 992 models>



7FU0493

7FU1584

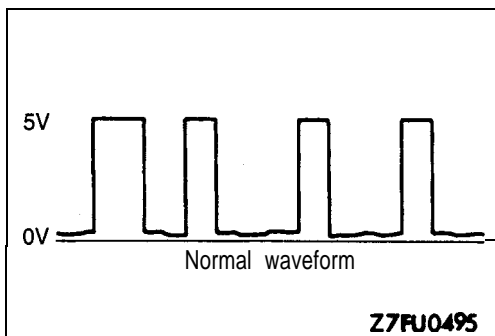
OPERATION

- The camshaft position sensor senses the top dead center on compression stroke of the No.1, No.3 and No.5 cylinders, converts it into a pulse signal and inputs it to the engine control module, which then controls the fuel injection sequence, etc. based on the input signal.
- Power to the camshaft position sensor is supplied from the MFI relay and is grounded to the body. The camshaft position sensor generates a pulse signal as it repeatedly connects and disconnects between 5 V voltage supplied from the engine control module and ground.

TROUBLESHOOTING HINTS

Hint 1: If the camshaft position sensor does not function correctly, correct sequential injection is not made so that the engine may stall, run irregularly at idle or fail to accelerate normally.

Hint 2: If the sensor outputs a pulse signal when the ignition switch is turned ON (with the engine not running), a faulty camshaft position sensor or engine control module is suspected.

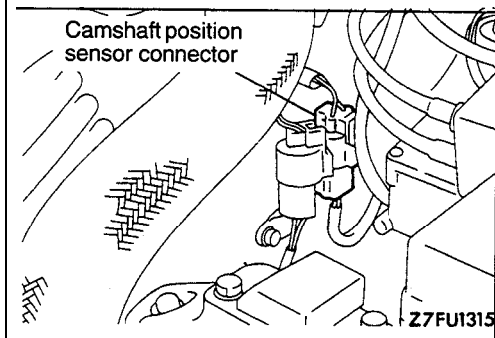
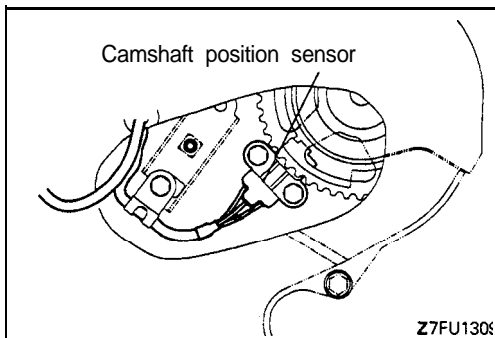
**INSPECTION****Using Oscilloscope**

- (1) Run the engine at an idle speed.
- (2) Connect the probe to the oscilloscope pick-up point as shown in the circuit diagram, and check the waveform.

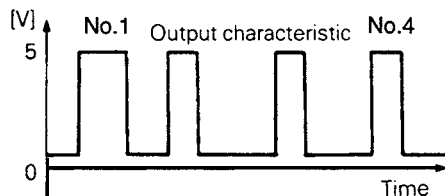
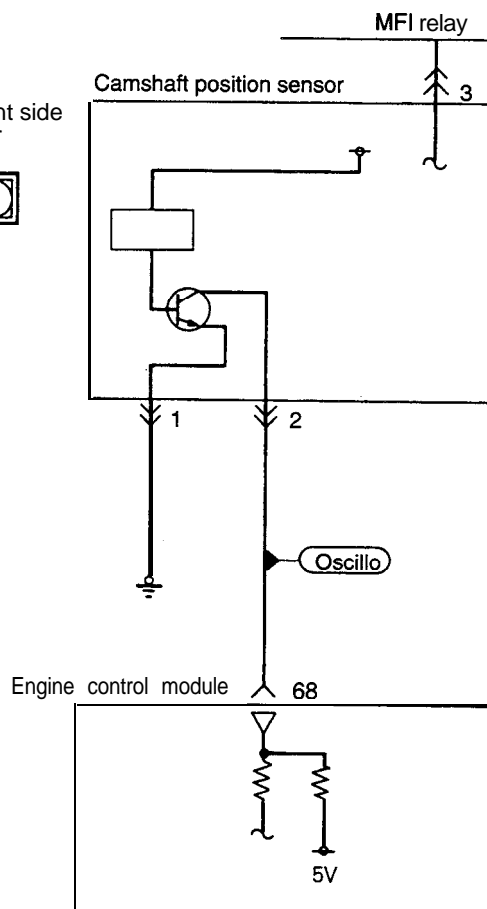
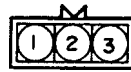
HARNESS INSPECTION

1 	<p>Measure the power supply voltage.</p> <ul style="list-style-type: none"> • Connector: Disconnected • Ignition: switch ON <p>Battery voltage</p> <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> <p>OK →</p> <p>✗ →</p> </div> <div> <p>2</p> <p>Repair the harness. (A3 – MFI relay)</p> </div> </div>
2 	<p>Check for continuity of the ground circuit</p> <ul style="list-style-type: none"> • Connector: Disconnected <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> <p>OK →</p> <p>✗ →</p> </div> <div> <p>3</p> <p>Repair the harness. (A4 – Ground)</p> </div> </div>
3 	<p>Check the voltage of the output circuit</p> <ul style="list-style-type: none"> • Connector: Disconnected • ignition switch: ON <p>4.8–5.2 V</p> <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> <p>OK →</p> <p>✗ →</p> </div> <div> <p>STOP</p> <p>Repair the harness. (A1–68)</p> </div> </div>

CAMSHAFT POSITION SENSOR <From 1993 models>



A Equipment side connector



Z7FU0677

Engine control module connector

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

7FU0653

Z6AF0054

7FU1585

OPERATION

- The camshaft position sensor senses the top dead center on compression stroke, converts it into a pulse signal and inputs it to the engine control module, which then controls the fuel injection sequence, etc. based on the input signal.
- Power to the camshaft position sensor is supplied from the MFI relay and is grounded to the body. The camshaft position sensor generates a pulse signal as it repeatedly connects and disconnects between 5 V voltage supplied from the engine control module and ground.

TROUBLESHOOTING HINTS

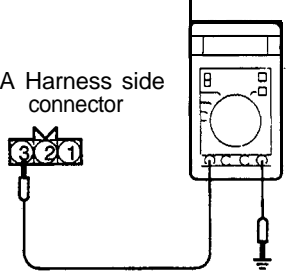
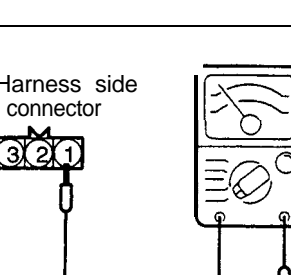
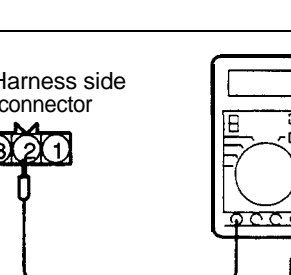
Hint 1: If the camshaft position sensor does not function correctly, correct sequential injection is not made so that the engine may stall, run irregularly at idle or fail to accelerate normally.

Hint 2: If the sensor outputs a pulse signal when the ignition switch is turned ON (with the engine not running), a faulty camshaft position sensor or engine control module is suspected.

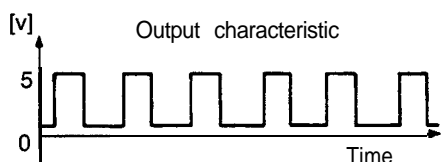
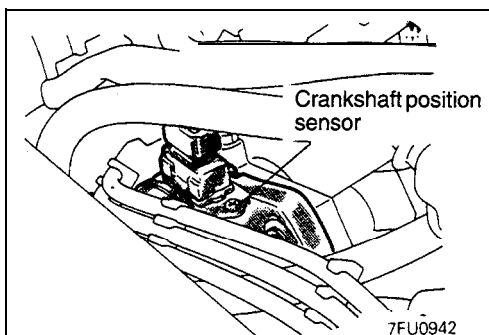
INSPECTION

Refer to P.13A-104.

HARNESS INSPECTION

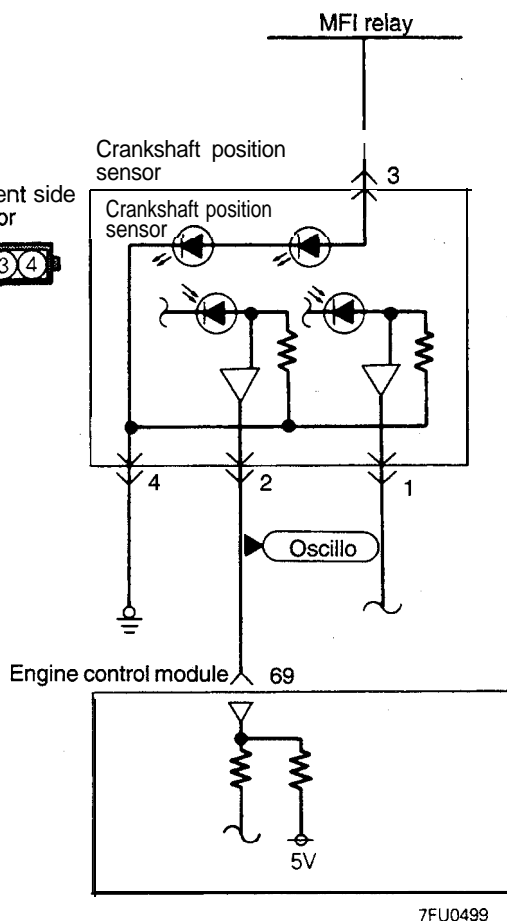
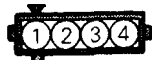
<p>1</p> <p>A Harness side connector</p>  <p>Z7FUI330</p>	<p>Measure the power supply voltage.</p> <ul style="list-style-type: none"> • Connector: Disconnected • Ignition switch: ON <p>Battery voltage</p> <div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <p>OK → 2</p> <p>✗ → Repair the harness. (A3 – MFI relay)</p> </div> </div>
<p>2</p> <p>A Harness side connector</p>  <p>Z6AF0057</p>	<p>Check for continuity of the ground circuit.</p> <ul style="list-style-type: none"> • Connector: Disconnected <div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <p>OK → 3</p> <p>✗ → Repair the harness. (A1 – Ground)</p> </div> </div>
<p>3</p> <p>A Harness side connector</p>  <p>Z6AF0059</p>	<p>Measure the impressed voltage.</p> <ul style="list-style-type: none"> • Connector: Disconnected • Ignition switch: ON <p>4.8–5.2 V</p> <div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <p>OK → STOP</p> <p>✗ → Repair the harness. (A2–68)</p> </div> </div>

CRANKSHAFT POSITION SENSOR <1 992 models>



Z7FU0682

A Equipment side connector



7FU0493

7FU1586

OPERATION

- The crankshaft position sensor senses the crank angle (piston position) of each cylinder, converts it into a pulse signal and inputs it to the engine control module, which then controls the engine speed and controls the fuel injection timing and ignition timing based on the input signal.
- Power to the crankshaft position sensor is supplied from the MFI relay and is grounded to the body. The crankshaft position sensor generates a pulse signal as it repeatedly connects and disconnects between 5 V voltage supplied from the engine control module and ground.

TROUBLESHOOTING HINTS

- Hint 1: If unexpected shocks are felt during driving or the engine stalls suddenly during idling, shake the crankshaft position sensor harness. If this causes the engine to stall, poor contact of the sensor connector is suspected.
- Hint 2: If the crankshaft position sensor outputs a pulse signal when the ignition switch is turned ON (with the engine not running), a faulty crankshaft position sensor or engine control module is suspected.
- Hint 3: If the tachometer reads 0 rpm when the engine that has failed to start is cranked, faulty crankshaft position sensor or broken timing belt is suspected.
- Hint 4: If the tachometer reads 0 rpm when the engine that has failed to start is cranked, the primary current of the ignition coil is not turned on and off. Therefore, troubles in the ignition circuit and ignition coil or faulty ignition power transistor is suspected.
- Hint 5: If the engine can be run at idle even though the crankshaft position sensor reading is out of specification, troubles are often in other than the crankshaft position sensor.

[Examples]

- (1) Faulty engine coolant temperature sensor
- (2) Faulty idle air control motor
- (3) Poorly adjusted reference idle speed

TSB Revision

INSPECTION

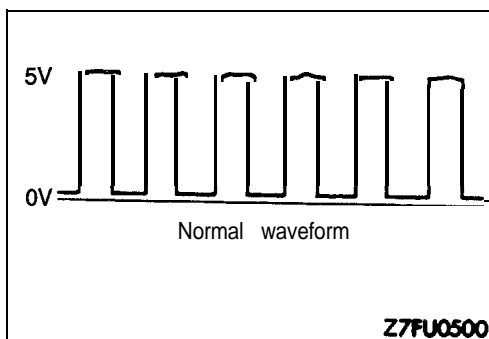
Using Scan Tool

Function	Item No.	Data display	Check condition	Check content	Normal state
Data reading	22	Cranking speed	<ul style="list-style-type: none"> Engine cranking Tachometer connected (check on and off of primary current of ignition coil by tachometer) 	Compare cranking speed and scan tool reading	Indicated speed to agree

NOTE

- (1) The tachometer indicates a third of the actual engine speed. Therefore, 3 times the tachometer indication is the actual engine speed.
- (2) When the tachometer is set to the 2-cylinder range, it indicates actual engine speed.

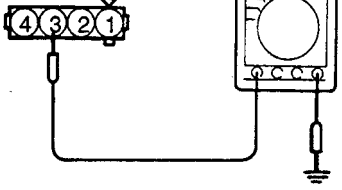
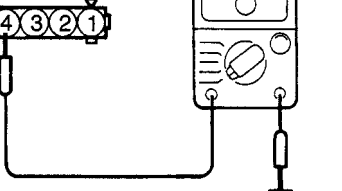
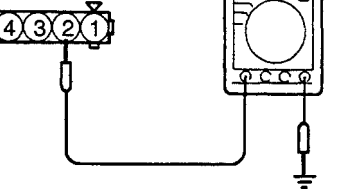
Function	Item No.	Data display	Check condition	Coolant temperature	Standard value
Data reading	22	Idle speed	<ul style="list-style-type: none"> Engine: Running at idle Closed throttle position switch: ON 	At -20°C (-4°F)	1,300–1,500 rpm
				At 0°C (32°F)	1,250–1,450 rpm
				At 20°C (68°F)	1,100–1,300 rpm
				At 40°C (104°F)	950–1,150 rpm
				At 80°C (176°F)	600–800 rpm



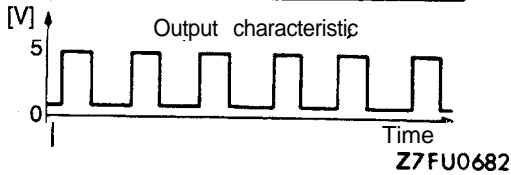
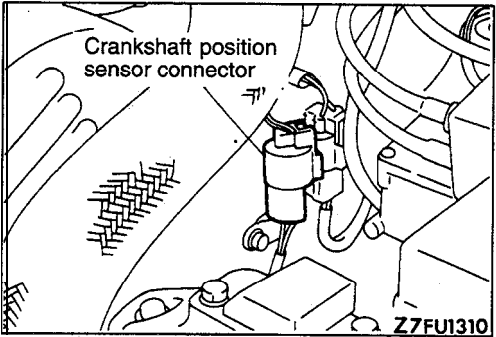
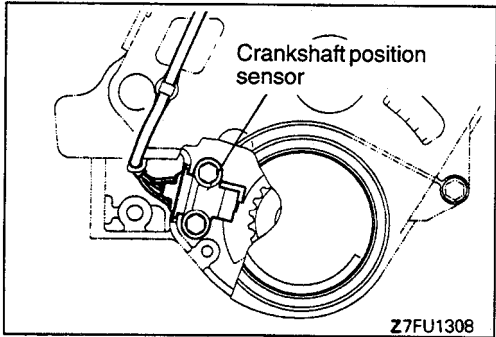
Using Oscilloscope

- (1) Run the engine at idle speed.
- (2) Connect the probe to the oscilloscope pick-up point as shown in the circuit diagram, and check the waveform.

HARNESS INSPECTION

<p>1</p> <p>A Harness side connector</p>  <p>Z7FU0496</p>	<p>Measure the power supply voltage.</p> <ul style="list-style-type: none"> • Connector: Disconnected • Ignition switch: ON <p>Battery voltage</p> <div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <p>OK → 2</p> <p>✗ → Repair the harness. (A3 – MFI relay)</p> </div> </div>
<p>2</p> <p>A Harness side connector</p>  <p>Z7FU0497</p>	<p>Check for continuity of the ground circuit.</p> <ul style="list-style-type: none"> • Connector Disconnected <div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <p>OK → 3</p> <p>✗ → Repair the harness. (A4 – Ground)</p> </div> </div>
<p>3</p> <p>A Harness side connector</p>  <p>Y7FU0498</p>	<p>Check the voltage of the output circuit.</p> <ul style="list-style-type: none"> • Connector: Disconnected • Ignition switch: ON <p>4.8–5.2 V</p> <div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <p>OK → STOP</p> <p>✗ → Repair the harness. (A2–69)</p> </div> </div>

CRANKSHAFT POSITION SENSOR <From 1993 models>

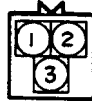


Engine control module connector

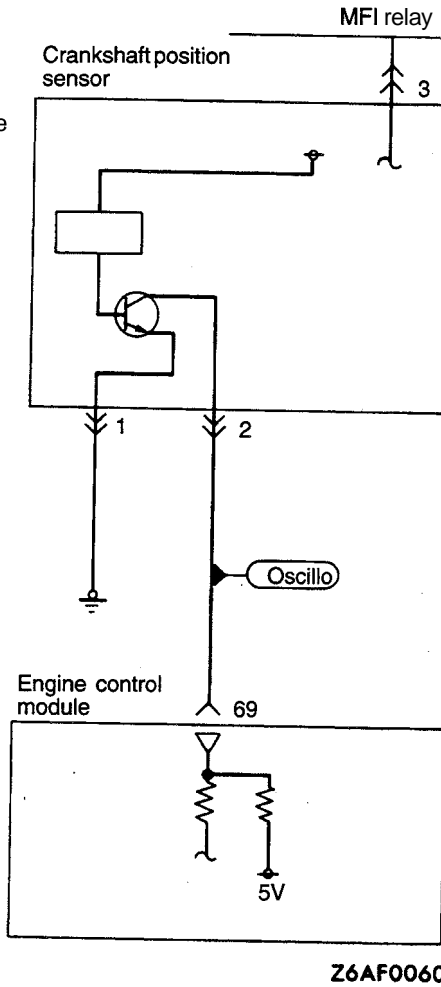
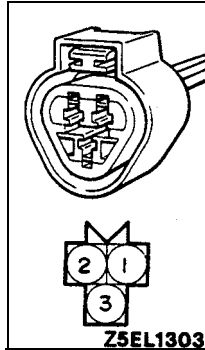
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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72

7FU0653

A Equipment side connector



A Harness side connector



7FU1587

OPERATION

Refer to P.13A-107.

TROUBLESHOOTING HINTS

Refer to P.13A-107.

INSPECTION

Refer to P.13A-108.

HARNESS INSPECTION

1

A Harness side connector

Z7FU1331

Measure the power supply voltage.

- Connector: Disconnected
- Ignition switch: ON

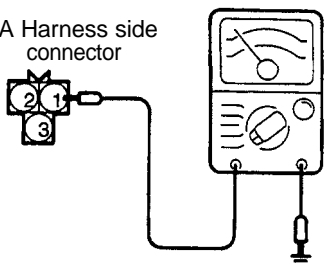
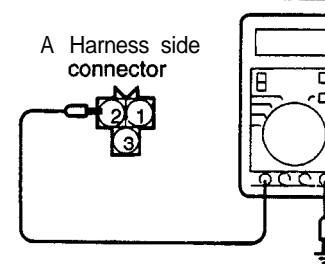
Battery voltage

OK →

2

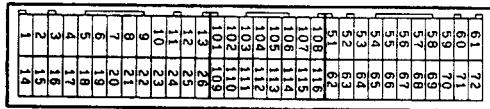
✗ →

Repair the harness.
(A3 – MFI relay)

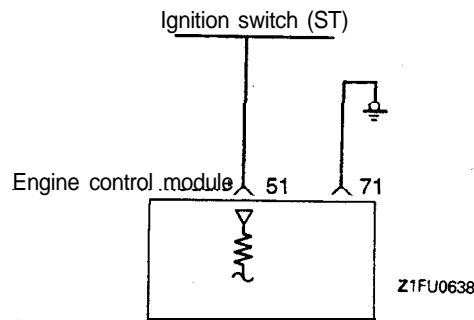
<p>2</p> <p>A Harness side connector</p>  <p>Z6AF0062</p>	<p>Check for continuity of the ground circuit.</p> <ul style="list-style-type: none"> Connector: Disconnected <p>OK → 3</p> <p>✗ → Repair the harness. (A1 – Ground)</p>	
<p>3</p> <p>A Harness side connector</p>  <p>Z6AF0064</p>	<p>Measure the impressed voltage.</p> <ul style="list-style-type: none"> Connector: Disconnected Ignition switch: ON <p>4.8–5.2 V</p> <p>OK → STOP</p> <p>✗ → Repair the harness. (A2–69)</p>	

IGNITION SWITCH-ST <M/T>

Engine control module connector



Z7FU0653



7FU1588

OPERATION

- The ignition switch-ST inputs a high signal to the engine control module while the engine is cranking. The engine control module provides fuel injection control, etc., at engine startup based on this signal.
- When the ignition switch is set to START, the battery voltage at cranking is applied through the ignition switch to the engine control module, which detects that the engine is cranking.

INSPECTION

Using Scan Tool

Function	Item No.	Data display	Check condition	Engine	Normal indication
Data reading	18	Switch state	ignition switch: ON	Stop	OFF
				Cranking	ON

HARNESS INSPECTION

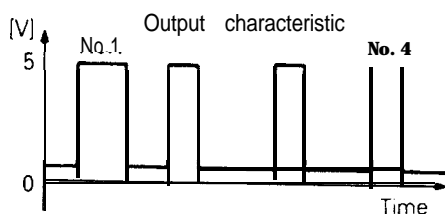
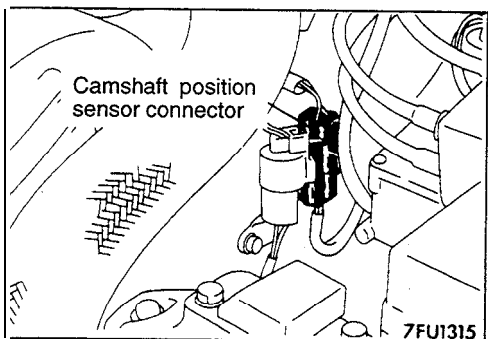
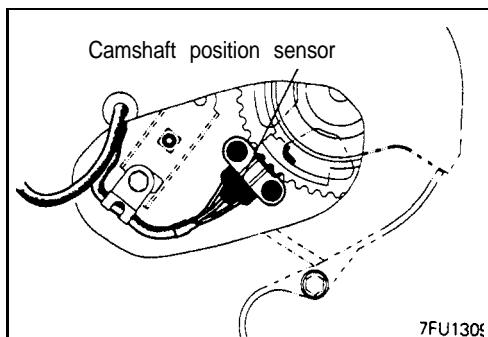
1 Engine control module harness side connector Z6FU1258	Measure the input voltage to the engine control module. • Engine control module connector: Disconnected • Ignition switch: START 8 V or more <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> OK </div> <div> 2 Repair the harness. (51 – Ignition switch) </div> </div>
2 Engine control module harness side connector Z6FU1259	Check for continuity of the ground circuit. • Engine control module connector: Disconnected <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> OK </div> <div> Repair the harness. (71 – Ground) </div> </div>

Terminal No.	Check point	Check conditions (Engine conditions)		Standard value	Remarks
70	Volume air flow sensor	Engine: Idle		2.2–3.2 V	–
		Engine: 2,000 rpm			
19	Volume air flow sensor reset signal	Engine: Idle		0–1 V	–
		Engine: 3,000 rpm		6–9 V	
52	Intake air temperature sensor	Ignition switch: ON	When intake temperature is 0°C (32°F)	3.2–3.8 V	–
			When intake temperature is 20°C (68°F)	2.3–2.9 V	
			When intake temperature is 40°C (104°F)	1.5–2.1 V	
			When intake temperature is 80°C (176°F)	0.4–1.0 V	
65	Barometric pressure sensor	Ignition switch: ON	When altitude is 0 m (0 ft.)	3.7–4.3 V	–
			When altitude is 1,200 m (3,937 ft.)	3.2–3.8 V	
63	Water temperature sensor	Ignition switch: ON	When water temperature is 0°C (32°F)	3.2–3.8 V	–
			When water temperature is 20°C (68°F)	2.3–2.9 V	
			When water temperature is 40°C (104°F)	1.3–1.9 V	
			When water temperature is 80°C (176°F)	0.3–0.9 V	
64	Throttle position sensor	Ignition switch: Kept in ON state for more than 15 seconds	Idle	0.3–1.0 V	–
			Wide open throttle	4.5–5.5 V	
67	Closed throttle position switch	Ignition switch: ON	Throttle valve placed in idle position	0–1 V	–
			Throttle valve placed in slightly opened position	4 V or more	
68	Camshaft position sensor	Engine: Cranked		0.2–3.0 V	–
		Engine: Idle			
69	Crankshaft position sensor	Engine: Cranked		0.2–3.0 V	–
		Engine: Idle			
51	Ignition switch-ST	Engine: Cranked		8 V or more	M/T
71	Park/Neutral position switch	Ignition switch: ON	Selector lever set to P or N	0–3 V	A/T
			Selector lever set to D, 2, L or R	8–14 V	

Terminal No.	Check point	Check conditions (Engine conditions)		Standard value	Remarks
66	Vehicle speed sensor	<ul style="list-style-type: none"> Ignition switch: ON Move the vehicle slowly forward 		0 ↔ 5 V (Changes repeated)	—
107	Power steering pressure switch	Engine: Idle, warm	Steering wheel placed in neutral (straight ahead) position	B+	
			Steering wheel turned half a turn	0-3 V	
115	Air conditioning switch 1	Engine: Idle	Air conditioning switch set to OFF	0-3 V	—
			Air conditioning switch set to ON (Air conditioning compressor in driven state)	B+	
20	Airconditioning switch 2	Engine: Running at idle	Air conditioning switch set to OFF	0-3 V	
			<ul style="list-style-type: none"> Air conditioning switch set to ON Indoor set temperature brought closer to atmospheric temperature 	B+	
22	Air conditioning relay	<ul style="list-style-type: none"> Engine: Idle Air conditioning switch: OFF → ON (Air compressor in driven state) 		B+ or 6 V or more for a moment → 0-3 V as A/C clutch cycles	—
6	Fan motor relay (Lo)	Radiator fan not operating (Coolant temperature: below 90°C [194°F])		B+	1994 and later Federal model
		Radiator fan operating at low speeds (Coolant temperature: 95–105°C [203–221 °F])		0-3 v	
53	Fan motor relay (Hi)	Radiator fan not operating (Coolant temperature: below 90°C [194°F])		B+	1994 and later Federal model
		Radiator fan operating at high speeds (Coolant temperature: above 105°C [221°F])		0-3 v	
24	Electric load switch	Engine: Running at idle	Lighting switch set to OFF	0-3 v	
			Lighting switch set to ON	B+	
56 55	Heated oxygen sensor	Engine: Warm, 2000 rpm (Digital voltmeter to be used for checking)		0 ↔ 0.8 V (Changes repeated)	Terminal 55 for rear bank of turbo-charged engine
1	No.1 injector	Engine: Running at idle after warmup, and accelerated abruptly by depressing accelerator pedal		Falls temporarily a little from 11-14 v	—
14	No.2 injector				
2	No.3 injector				
15	No.4 injector				
3	No.5 injector				
16	No.6 injector				

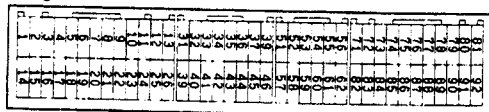
Terminal No.	Check point	Check conditions (Engine conditions)		Standard value	Remarks
4	Stepper motor coil <A1>	Engine: Warm Check immediately after hot restart		B+ ↔ 0–3 V (Changed repeated)	–
17	Stepper motor coil <A2>				
5	Stepper motor coil <B1>				
18	Stepper motor coil <B2>				
10	Ignition power transistor unit A	Engine speed: 3,000 rpm		0.3-3 v	
23	Ignition power transistor unit B				
11	Ignition power transistor unit C				
9	Evaporative emission purge solenoid	Ignition switch: ON		B+	
		Engine: Warm, 3,000 rpm		0-3 v	
7	Fuel pressure solenoid	Ignition switch: ON		B+	Turbo
		Engine: Warm, 3,000 rpm		0–3 V → B+	
105	Turbocharger waste gate solenoid	Ignition switch: ON		B+	Turbo
		Engine: Idle (when the premium gasoline is used)		0-3 V	
11	Turbo meter	Ignition switch: ON		4-13 v	Turbo
		Engine: Depress the accelerator pedal abruptly while the engine is idling		Falls temporarily from B+	
21	Fuel pump relay 2	Engine: Depress the accelerator pedal abruptly while the engine is idling		Rises temporarily from 0-3 v	Turbo
101	Engine ignition signal	Engine: 3,000 rpm		0.3-3 v	
102	Valve opened or closed indication signal	Muffler mode change-over switch: ON	Engine: Idle	0-3 v	Turbo
			Engine: 4,500 rpm	B+	
103	Muffler mode change-over switch	Ignition switch: ON	Changeover switch set to ON (TOUR)	0-3 V	Turbo
			Changeover switch set to OFF (SPORT)	B+	
104	Ignition timing adjustment terminal	Ignition switch: ON	Ignition timing adjustment terminal connected to ground	0-1 V	
			Ignition timing adjustment terminal disconnected from ground	4.0-5.5 V	
106	Check engine/malfunction indicator lamp	Ignition switch: OFF → ON		0–3 V → 9-13 v (Several seconds later)	–

CAMSHAFT POSITION SENSOR

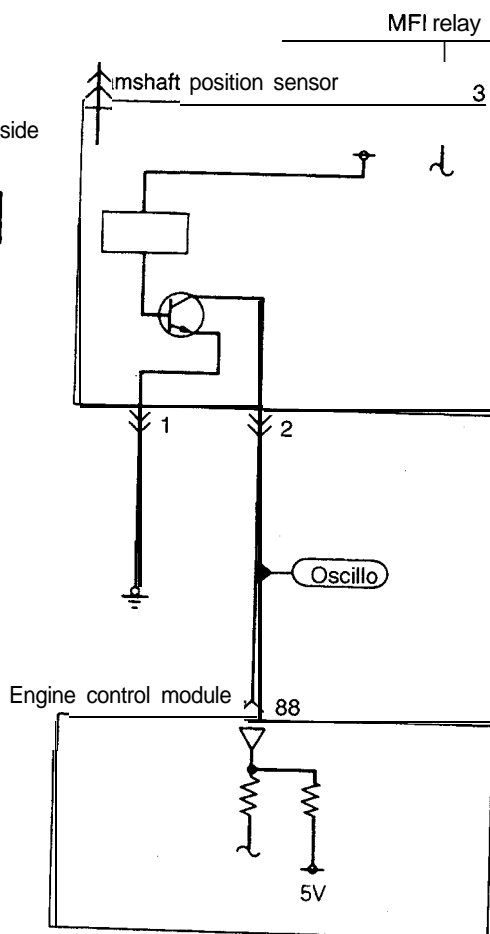


Z7FU0677

Engine control module connector



A Equipment side connector



6A F0054

7FU1627

OPERATION

Refer to P.13A-103.

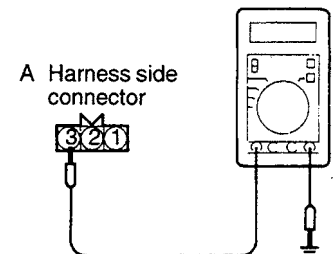
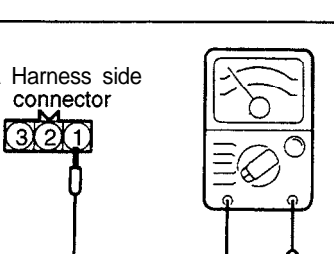
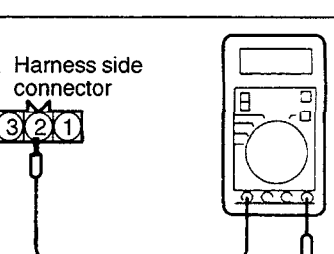
TROUBLESHOOTING HINTS

Refer to P.13A-103.

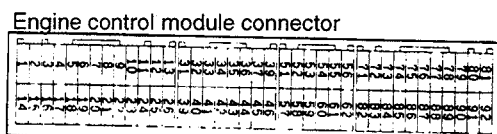
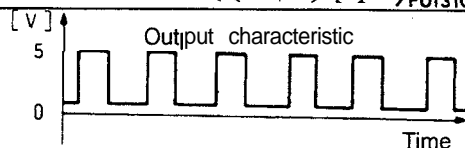
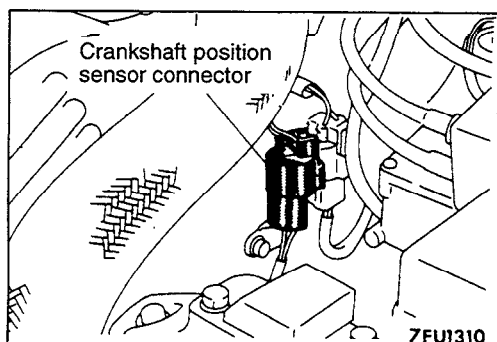
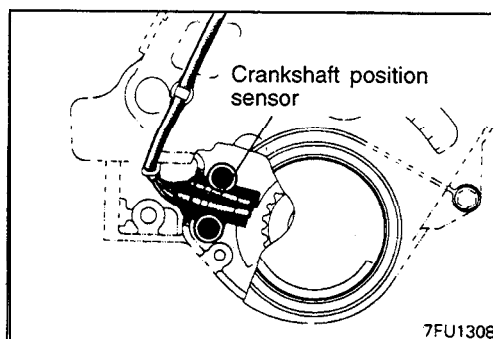
INSPECTION

Refer to P.13A-104.

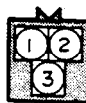
HARNESS INSPECTION

<div>1</div> <div>A Harness side connector</div>  <div>Z7FU1330</div>	<p>Measure the power supply voltage.</p> <ul style="list-style-type: none">• Connector: Disconnected• Ignition switch: ON <p>Battery voltage</p>	<div>OK</div> <div>2</div> <div>Repair the harness. (A3 – MFI relay)</div>
<div>2</div> <div>A Harness side connector</div>  <div>Z6AF0057</div>	<p>Check for continuity of the ground circuit.</p> <ul style="list-style-type: none">• Connector: Disconnected	<div>OK</div> <div>3</div> <div>Repair the harness. (A1 – Ground)</div>
<div>3</div> <div>A Harness side connector</div>  <div>Z6AF0059</div>	<p>Measure the impressed voltage.</p> <ul style="list-style-type: none">• Connector: Disconnected• Ignition switch: ON <p>4.8–5.2 V</p>	<div>OK</div> <div>STOP</div> <div>Repair the harness. (A2–88)</div>

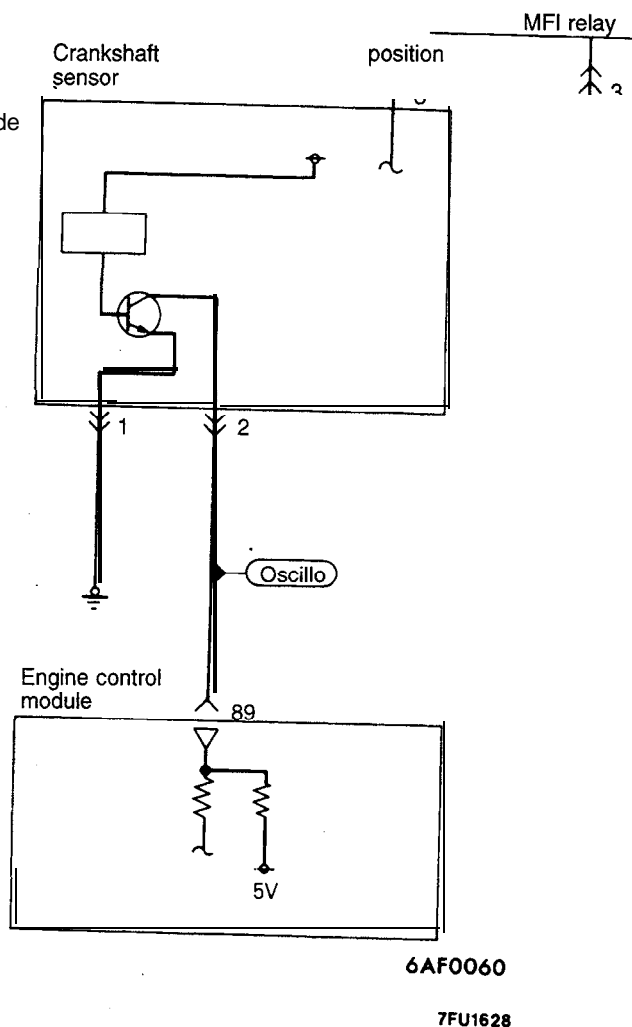
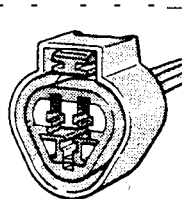
CRANKSHAFT POSITION SENSOR



A Equipment side connector



A Harness side connector



OPERATION

Refer to P.13A-107.

TROUBLESHOOTING HINTS

Refer to P.13A-107.

INSPECTION

Using Scan Tool

Function	Item No.	Data display	Check condition	Check content	Normal state
Data reading	22	Cranking speed	<ul style="list-style-type: none"> Engine cranking Tachometer connected (check on and off of primary current of ignition coil by tachometer) 	Compare cranking speed and scan tool reading	Indicated speed to agree

NOTE

(1) The tachometer indicates a third of the actual engine speed. Therefore, 3 times the tachometer indication is the actual engine speed.

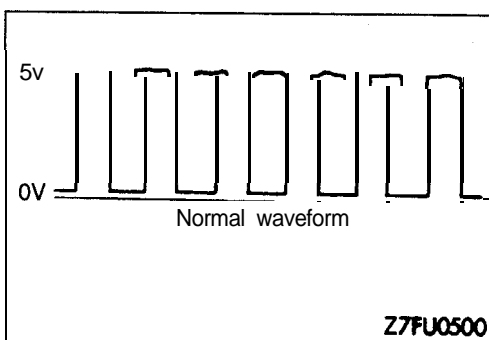
(2) When the tachometer is set to the 2-cylinder range, it indicates actual engine speed.

Function	Item No.	Data display	Check condition	Coolant temperature	Standard value
Data reading	22	Idle speed	<ul style="list-style-type: none"> Engine: Running at idle Closed throttle position switch: ON 	At -20°C (-4°F)	1,275–1,475 rpm*1 1,300–1,500 rpm*2
				At 0°C (32°F)	1,225–1,425 rpm*1 1,300–1,500 rpm*2
				At 20°C (68°F)	1,100–1,300 rpm*1 1,300–1,500 rpm*2
				At 40°C (104°F)	950–1,150 rpm*1 1,050–1,250 rpm*2
				At 80°C (176°F)	600–800 rpm

NOTE

*1: Non Turbo, Turbo Up to 1995 models

*2: Turbo From 1996 models



Using Oscilloscope

- (1) Run the engine at idle speed.
- (2) Connect the probe to the oscilloscope pick-up point as shown in the circuit diagram, and check the waveform.

HARNESS INSPECTION

1

A Harness side connector

Z7FU1331

Measure the power supply voltage.

- Connector: Disconnected
- Ignition switch: ON

Battery voltage

OK

✗

→ **2**

Repair the harness.
(A3 – MFI relay)

2

A Harness side connector

Z6AF0062

Check for continuity of the ground circuit.

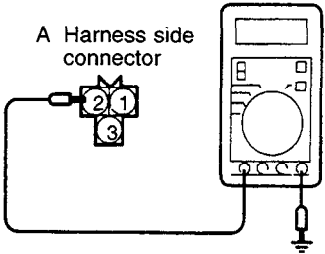



- Connector: Disconnected

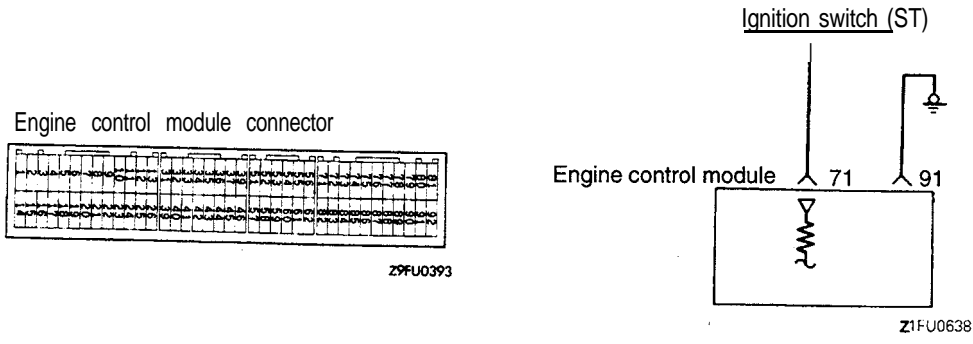
OK

✗

→ **3**

Repair the harness.
(A1 – Ground)

<div>3</div> <div></div> <div>A Harness side connector</div> <div>Z6AF0064</div>	<p>Measure the impressed voltage.</p> <ul style="list-style-type: none">• Connector: Disconnected• Ignition switch: ON <p>4.8–5.2 V</p>	<div> → </div> <div> → Repair the harness. (A2–89)</div>
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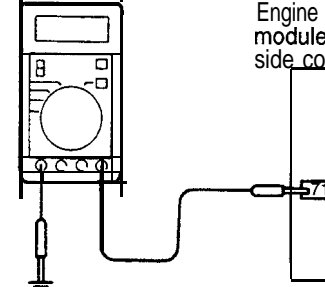


IGNITION SWITCH-ST <M/T>**OPERATION**

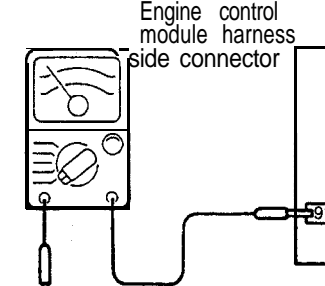



Refer to P.13A-112.

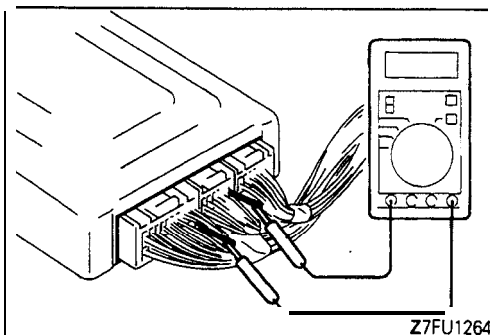
INSPECTION

Refer to P.13A-112.

HARNESS INSPECTION

<div>1</div> <div></div> <div>Engine control module harness side connector</div> <div>Z6FU1258</div>	<p>Measure the input voltage to the engine control module</p> <ul style="list-style-type: none">• Engine control module connector. Disconnected• Ignition switch: START <p>8 V or more</p>	<div> → <div>2</div></div> <div> → Repair the harness. (71 – Ignition switch)</div>
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<div>2</div> <div></div> <div>Engine control module harness side connector</div> <div>Z6FU1259</div>	<p>Check for continuity of the ground circuit.</p> <ul style="list-style-type: none">• Engine control module connector: Disconnected	<div> → </div> <div> → Repair the harness. (91 – Ground)</div>
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ENGINE CONTROL MODULE (ECM) TERMINAL VOLTAGE INSPECTION

- (1) Connect a very thin wire probe (such as a paper clip) to the probe of the voltmeter.
- (2) Insert the very thin probe from the wire side into contact with each of the terminals of the ECM connector and check the voltage, while referring to the check chart.

NOTE

1. Measure a voltage with the ECM connector connected.
2. Measure the voltage between each terminal and the No. 26 terminal (ground terminal).
3. Withdraw the ECM for easier access to the connector terminals.
4. The inspection need not be performed in the order of the chart.

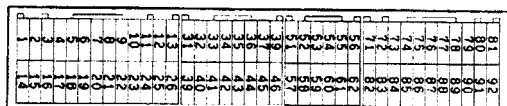
Caution

Short-circuiting the positive (+) probe between a connector terminal and ground could cause damage to the vehicle wiring, sensors or ECM, or all of them. Use care to prevent it!

- (3) If the voltmeter shows any deviation from the standard value, check the corresponding sensor, actuator and related electrical wiring, then repair or replace.
- (4) After repair or replacement, recheck with the voltmeter to confirm that the problem has cleared completely.

TERMINAL VOLTAGE CHECK CHART

Engine Control Module Connector Terminal Configuration



Z9FU0393

Terminal No.	Check point	Check conditions (Engine conditions)	Standard value	Remarks
80	Back-up power supply	Ignition switch: OFF	B+	—
12	power supply	Ignition switch: ON	B+	—
25				
82	Ignition switch: IG	Ignition switch: ON	B+	—
38	MFI relay (power supply)	Ignition switch: OFF	B+	—
		Ignition switch: ON	0–3 V	
8	MFI relay (fuel pump)	Ignition switch: ON	B+	—
		Engine: Idle	0–3 V	
81	Sensor impressed voltage	Ignition switch: ON	4.5–5.5 V	—

Terminal No.	Check point	Check conditions (Engine conditions)		Standard value	Remarks
90	Volume air flow sensor	Engine: Idle		2.2-3.2 V	—
		Engine: 2,000 rpm			
19	Volume air flow sensor reset signal	Engine: Idle		0-1 v	—
		Engine: 3,000 rpm		6-9 V	
72	Intake air temperature sensor	ignition switch: ON	When intake temperature is 0°C (32°F)	3.2-3.8 V	—
			When intake temperature is 20°C (68°F)	2.3-2.9 V	
			When intake temperature is 40°C (104°F)	1.5-2.1 V	—
			When intake temperature is 80°C (176°F)	0- 10 V	
85	Barometric pressure sensor	Ignition switch: ON	When altitude is 0 m (0 ft.)	3.7-4.3 V	—
			When altitude is 1,200 m (3,937 ft.)	3.2-3.8 V	
83	Water temperature sensor	Ignition switch: ON	When water temperature is 0°C (32°F)	3.2-3.8 V	—
			When water temperature is 20°C (68°F)	2.3-2.9 V	
			When water temperature is 40°C (104°F)	1.3–1.9 V	—
			When water temperature is 80°C (176°F)	0.3-0.9 V	
84	Throttle position sensor	Ignition-switch: Kept in ON state for more than 15 seconds	Idle	0.3–1.0 v	—
			Wide open throttle	4.5-5.5 v	
87	Closed throttle position switch	Ignition switch: ON	Throttle valve placed in idle position	0-1 V	—
			Throttle valve placed in slightly opened position	4 V or more	
88	Camshaft position sensor	Engine: Cranked		0.2-3.0 V	—
		Engine: Idle			
89	Crankshaft position sensor	Engine: Cranked		0.2-3.0 V	—
		Engine: Idle			
71	Ignition Switch – ST	Engine: Cranked		8 V or more	M/T
91	Park/Neutral position switch	Ignition switch: ON	Selector lever set to P or N	0-3 v	A/T
			Selector lever set to D, 2, L or R	8-14 V	

Terminal No.	Check point	Check conditions (Engine conditions)		Standard value	Remarks
86	Vehicle speed sensor	<ul style="list-style-type: none"> Ignition switch: ON Move the vehicle slowly forward 		0 ↔ 5 V (Changes repeated)	—
37	Power steering pressure switch	Engine: Idle, warm	Steering wheel placed in neutral (straight ahead) position	B+	
			Steering wheel turned half a turn	0-3 V	
45	Air conditioning switch 1	Engine: Idle	Air conditioning switch set to OFF	0-3 V	
			Air conditioning switch set to ON (Air conditioning compressor in driven state)	B+	
59 <Turbo, Non-Turbo up to 1995 models> 61 <Non-Turbo From 1996 models>	Air conditioning switch 2	Engine: Idle	Air conditioning switch set to OFF	0-3 V	
			<ul style="list-style-type: none"> Air conditioning switch set to ON Indoor set temperature brought closer to atmospheric temperature 	B+	
22	Air conditioning relay	<ul style="list-style-type: none"> Engine: Idle Air conditioning switch: OFF → ON (Air compressor in driven state) 		B+ or 6 V or more for a moment → 0-3 V	—
21	Fan motor relay (Lo)	Radiator fan not operating [Coolant temperature: below 90°C (194°F)]		B+	—
		Radiator fan operating at low speeds [Coolant temperature: 95–105°C (203–221 °F)]		0-3 v	
20	Fan motor relay (Hi)	Radiator fan not operating [Coolant temperature: below 90°C (194°F)]		B+	
		Radiator fan operating at high speeds [Coolant temperature: above 105°C (221 °F)]		0-3 v	
24 <Up to 1995 models> 58 <From 1996 models>	Electric load switch	Engine: Running at idle	Lighting switch set to OFF	0-3 v	
			Lighting switch set to ON	B+	
75 76	Heated oxygen sensor(front)	Engine: Warm, 2,000 rpm (Check using a digital type voltmeter.)		0 ↔ 0.8 V (Changes repeatedly)	—

Terminal No.	Check point	Check conditions (Engine conditions)	Standard value	Remarks
60 <Up to 1995 models> 73, 79 <From 1996 models>	Heated oxygen sensor (rear)	<ul style="list-style-type: none"> Transaxle: 2nd gear <M/T>, L range <A/T> Drive with wide open throttle Engine 3,500 rpm or more 	0.6~1.0 V	<California, Federal - from 1996 models>
1	No. 1 injector	Engine: Running at idle after warmup, and accelerated abruptly by depressing accelerator pedal	Falls temporarily a little from 11-14 V.	-
14	No. 2 injector			
2	No. 3 injector			
15	No. 4 injector			
3	No. 5 injector			
16	No. 6 injector			
4	Stepper motor coil <A1>	Engine: Warm Check immediately after hot restart.	B+ ↔ 0-3 V (Changed repeated)	-
17	Stepper motor coil <A2>			
5	Stepper motor coil <B1>			
18	Stepper motor coil <B2>			
10	Ignition power transistor unit A	Engine speed: 3,000 rpm	0.3-3 v	-
23	Ignition power transistor unit B			
11	Ignition power transistor unit C			
9	Evaporative emission purge solenoid	Ignition switch: ON	B+	
		Engine: Warm, 3,000 rpm	0-3 v	
7 cup to 1995 models> 40 <From 1996 models>	Fuel pressure solenoid	Ignition switch: ON	B+	Turbo
		Engine: From cranking to idling (within approx. 2 minutes)	0-3 V → B+	
32	Turbocharger waste gate solenoid	Ignition switch: ON	B+	Turbo
		Engine: Idle (when the premium gasoline is used)	0-3 V	
41 <Up to 1995 models> 39 <From 1996 models>	Turbo meter	Ignition switch: ON	4-13 v	Turbo
		Engine: Depress the accelerator pedal abruptly while the engine is idling	Falls temporarily from B+	

Terminal No.	Check point	Check conditions (Engine conditions)		Standard value	Remarks
31	Fuel pump relay 2	Engine: Depress the accelerator pedal abruptly while the engine is idling		Rises temporarily from 0–3 V	Turbo
58 <Up to 1995 models> 51 <From 1996 models>	Engine ignition signal	Engine: 3,000 rpm		0.3–3 V	–
35 <Up to 1995 models> 7 <From 1996 models>	Valve opened or closed indication signal	Muffler mode change-over switch: ON	Engine: Idle	0–3 V	Turbo
			Engine: 4,500 rpm	B+	
34 <Up to 1995 models> 61 <From 1996 models>	Muffler mode change-over switch	Ignition switch: ON	Changeover switch set to ON (TOUR)	0–3 V	Turbo
			Changeover switch set to OFF (SPORT)	B+	
52	Ignition timing adjustment terminal	Ignition switch: ON	Ignition timing adjustment terminal connected to ground	0–1 V	–
			Ignition timing adjustment terminal disconnected from ground	4.0–5.5 V	
36	Check engine/malfunction indicator lamp	Ignition switch: OFF → ON		0–3 V → 9–13 v (Several seconds later)	–
6	EGR solenoid	Ignition switch: ON		B+	<up to 1995: California – Non Turbo, Turbo> <From 1996: All models>
		Engine: Idle Suddenly depress the accelerator pedal		Falls temporarily from B+.	
73 <Up to 1995 models>	EGR temperature sensor	Ignition switch: ON	When sensor temperature is 50°C (122°F)	3.6–4.4 V	California, Federal – Turbo
			When sensor temperature is 100°C (212°F)	2.2–3.0 V	
74, 77 <Up to 1995 models> 34, 35, 42, 43 <From 1996 models>	Oxygen sensor heater	Engine: Idle, warm		0–3 v	<Up to 1995: California – Non Turbo> <From 1996: All models>
		Engine: 5,000 rpm		B+	

Terminal No.	Check point	Check conditions (Engine conditions)	Standard value	Remarks
41 <Up to 1995 models> 54 <From 1996 models>	Induction control valve position sensor No. 1	Ignition switch: ON	O-I V or 4.5-5.5 v	Non Turbo
		Engine: Slowly accelerated from idling speed to 5,000 rpm	O-I V or 4.5-5.5 v → 1.5-4 v (for a moment)	
33 <Up to 1995 models> 55 <From 1996 models>	Induction control valve position sensor No. 2	Ignition switch: ON	O-I V or 4.5-5.5 v	Non-Turbo
		Engine: Slowly accelerated from idling speed to 5,000 rpm	O-I V or 4.5-5.5 v → 1.5-4 v (for a moment)	
40	Induction control valve (Opened)	Engine: Slowly accelerated from idling speed to 5,000 rpm	O-I V → 4 V or more (for a moment)	Non Turbo
39	Induction control valve (Closed)	Engine: Slowly decelerated from 5,000 rpm to idling speed		
44	Anti-lock braking signal	Engine: Idle	B+	Turbo
		<ul style="list-style-type: none"> When vehicle is put in motion for the first time after the ignition switch was placed in ON position Vehicle speed: 0 → 10 km/h (0 → 0.6 mph) 	B+ → O-3 V (for a moment)	
46	Total control "Reduce torque" request signal 1	Engine: Idle	4.5-5.5 v	A/T
		Engine: Running at idle after warmup and changing speeds	O-I V	
43 <Up to 1995 models> 60 <From 1996 models>	Total control "Reduce torque" request signal 2	Engine: Idle	o-1 v	A/T
		Engine: Running at idle after warmup and changing speeds	I-5.5 V	
7	Total control "Reduce torque" execution signal	Engine: Running at idle with coolant temperature at 50°C (122°F) or lower	O-I V	A/T
		Engine: idle, warm	1-4 V	
74	Manifold differential pressure sensor	Engine: Idle	0.8-2.4 V	A/T
		<ul style="list-style-type: none"> Engine: Idle Suddenly depress the accelerator pedal. 	Voltage rises temporarily from 0.8-2.4 V	