

FUEL

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FUEL SYSTEM <6G72-24 Valve Engine, 6G74 Engine>

GENERAL

OUTLINE OF CHANGES

The maintenance service points below have been established to correspond to the following changes.

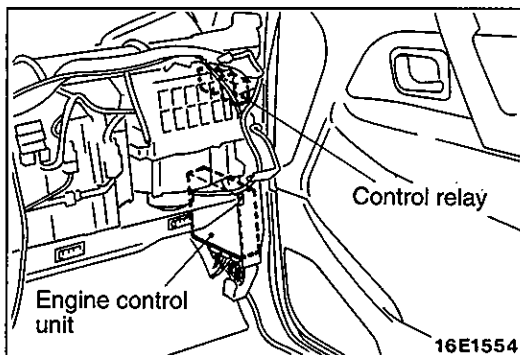
- Changes in the engine-ECU
- Separation of the engine control relay and fuel pump control relay which were previously integrated

GENERAL INFORMATION

Items			Specifications
Engine ECU	Identification model No.	SOHC	E2T37498 E2T37499 <Vehicles with immobilizer system>
		DOHC	E2T39987 E2T39988 <Vehicles with immobilizer system>

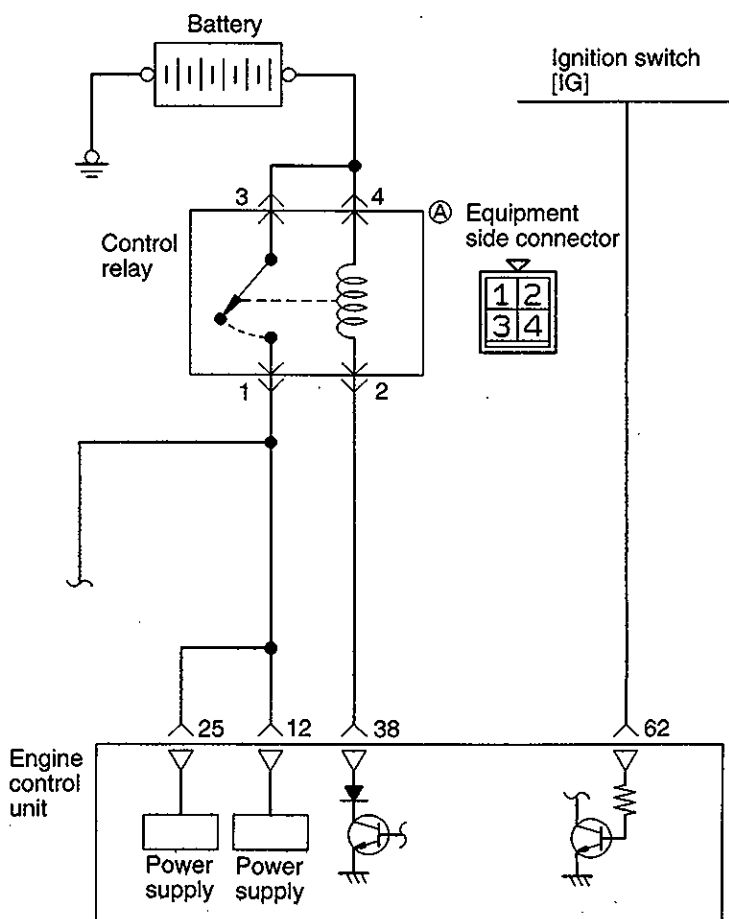
ON-VEHICLE INSPECTION OF MPI COMPONENTS

POWER SUPPLY (Control relay) AND IGNITION SWITCH-IG



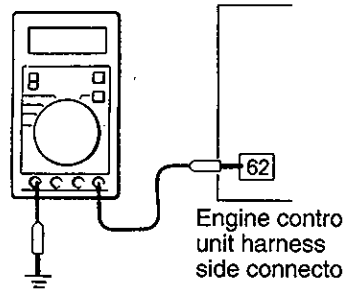
Engine control unit

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	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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HARNESS INSPECTION

1



Engine control unit harness side connector

01L0427

Measure the ignition switch (IG) terminal input voltage

- Engine control unit connector: Disconnected

Ignition switch	Voltage (V)
OFF	0 – 1
ON	SV

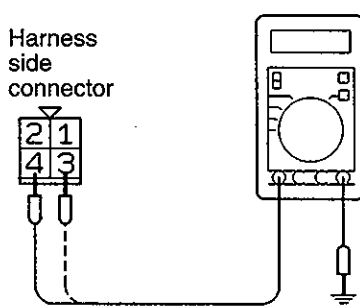
OK → **2**

✗ → Repair the harness. (Ignition switch – 62) or check the ignition switch

2

Harness side connector

Ⓐ



7FU1928

Measure the power supply voltage of the control relay.

- Ignition switch: OFF
- Control relay connector: Disconnected

Voltage (V)
SV

OK → **3**

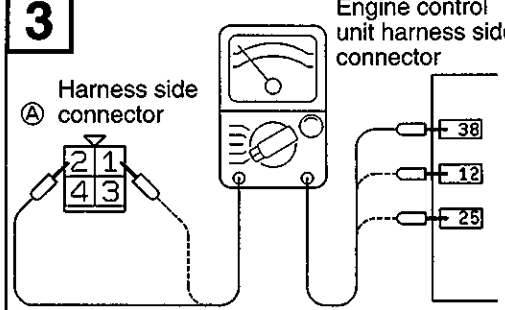
✗ → Repair the harness. (Battery – Ⓐ 3, Ⓐ 4)

3

Harness side connector

Ⓐ

Engine control unit harness side connector



7FU1944

Check for an open-circuit, or a short-circuit to earth, between the engine control unit and the control relay.

- Engine control unit connector: Disconnected
- Control relay connector: Disconnected

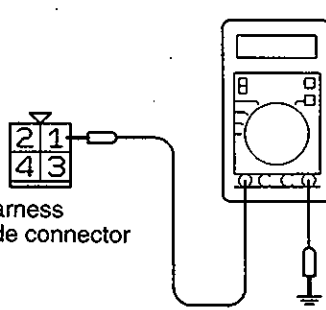
OK → **4**

✗ → Repair the harness. (Ⓐ 2 ~ 38), (Ⓐ 1 ~ 12, 25)

4

Harness side connector

Ⓐ



7FU1930

Measure power voltage to the actuator.

- Control relay connector: Connected
- Engine control unit connector: Connected

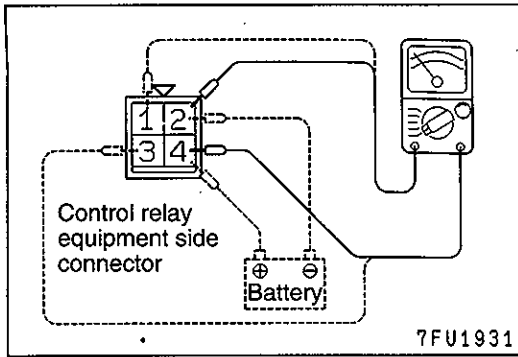
Engine	Voltage (V)
Cranking	8V oder higher
Racing	SV

OK → **STOP**

✗ → Replace the control relay or defective engine control unit

13-4 FUEL SYSTEM <6G72-24 Valve Engine, 6G74 Engine> – On-Vehicle Inspection of MPI Components

CONTROL RELAY INSPECTION

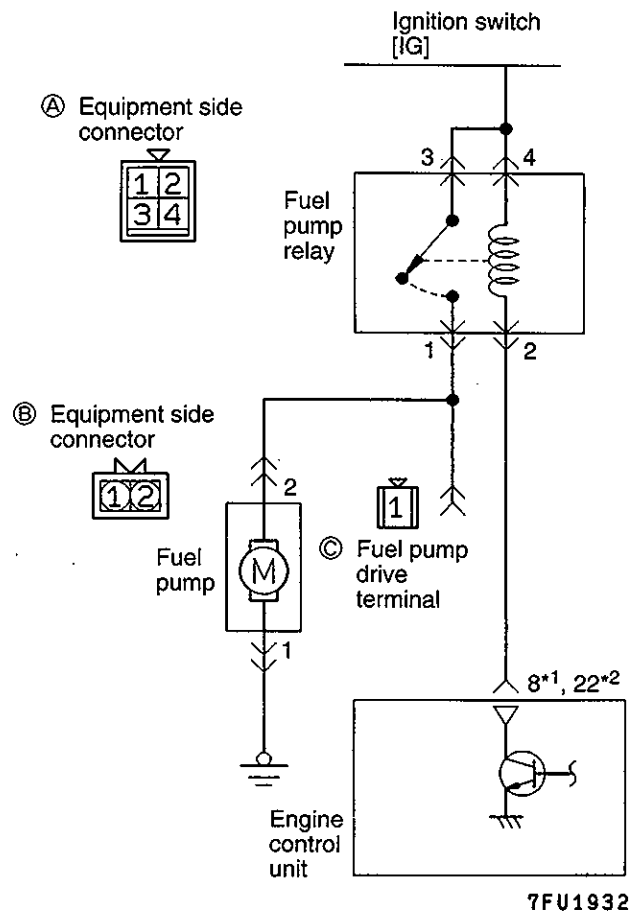
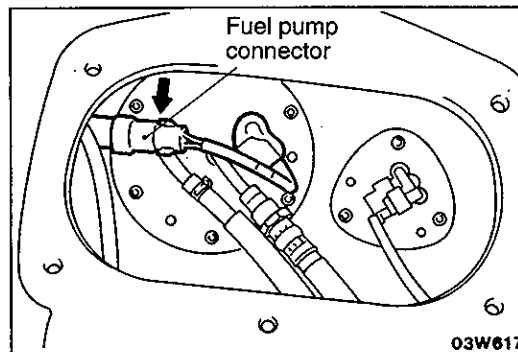
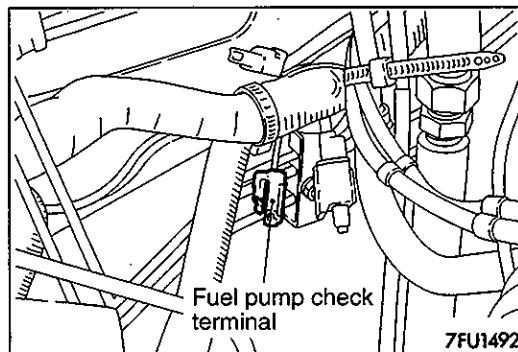
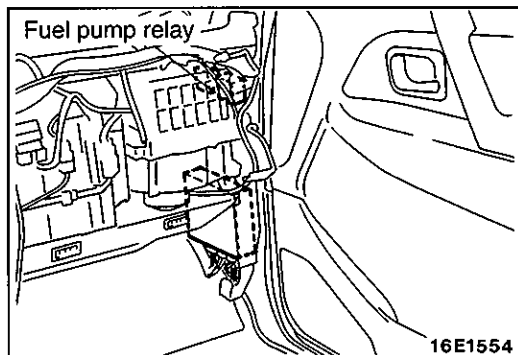


- (1) Disconnect the control relay.

Battery voltage	Terminal No.			
	1	2	3	4
Not supplied		○		○
Supplied	○	⊖	○	⊕

- (2) Replace the control relay if faulty.

FUEL PUMP



Engine control unit 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	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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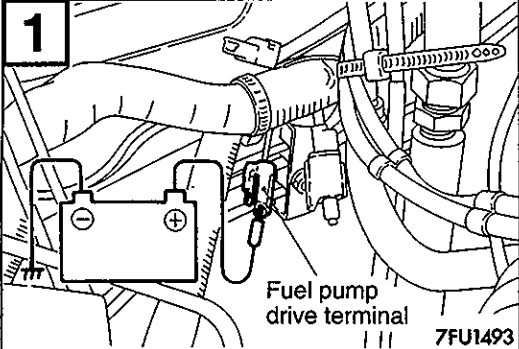
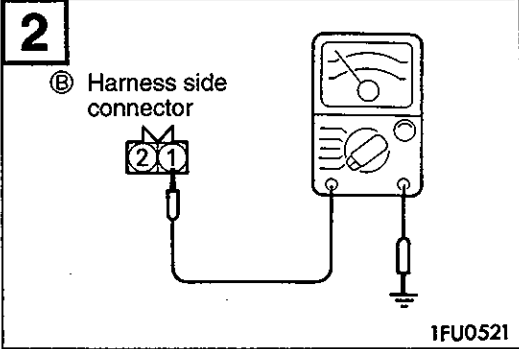
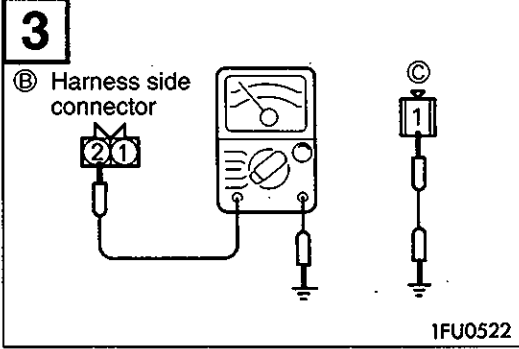
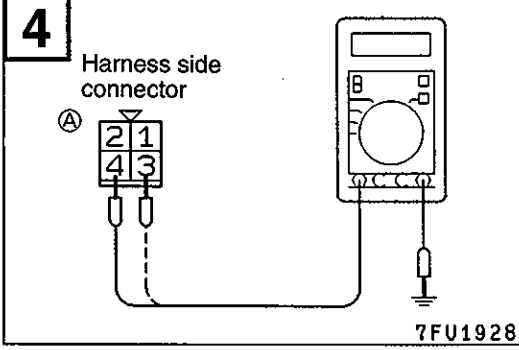
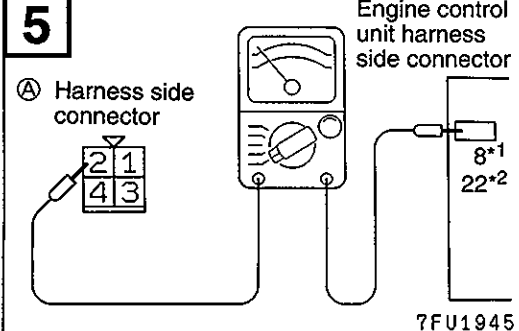
9FU0101

NOTE

*1 : Vehicle without immobilizer system

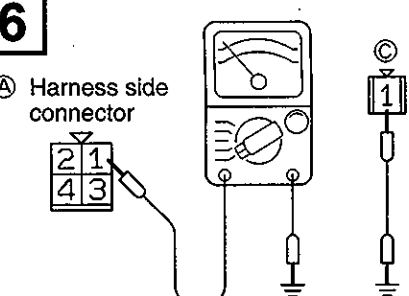
*2 : Vehicles with immobilizer system

HARNESS INSPECTION

<p>1</p>  <p>Fuel pump drive terminal 7FU1493</p>	<p>Check the fuel pump</p> <ul style="list-style-type: none"> Apply battery voltage to the fuel pump drive terminal and operate the pump <p>OK → 4</p> <p>✗ → 2</p>						
<p>2</p> <p>Ⓑ Harness side connector</p>  <p>1FU0521</p>	<p>Check for continuity of the fuel pump earthing line.</p> <ul style="list-style-type: none"> Fuel pump connector: Disconnected <p>OK → 3</p> <p>✗ → Repair the harness. (Ⓑ 1 – Earth)</p>						
<p>3</p> <p>Ⓑ Harness side connector</p>  <p>1FU0522</p>	<p>Check for open-circuit or short-circuit between the fuel pump and the fuel pump drive terminal.</p> <ul style="list-style-type: none"> Fuel pump connector: Disconnected Fuel pump relay connector: Disconnected <p>OK → 4</p> <p>✗ → Repair the harness. (Ⓑ 2 – Ⓒ 1)</p>						
<p>4</p> <p>Ⓐ Harness side connector</p>  <p>7FU1928</p>	<p>Measure the power supply voltage of the fuel pump relay.</p> <ul style="list-style-type: none"> Fuel pump relay connector: Disconnected <table border="1" data-bbox="646 1471 1092 1594"> <thead> <tr> <th>Ignition switch</th> <th>Voltage (V)</th> </tr> </thead> <tbody> <tr> <td>OFF</td> <td>0 – 1</td> </tr> <tr> <td>ON</td> <td>SV</td> </tr> </tbody> </table> <p>OK → 5</p> <p>✗ → Repair the harness. (Ignition switch – Ⓐ 3 4) or check for ignition switch.</p>	Ignition switch	Voltage (V)	OFF	0 – 1	ON	SV
Ignition switch	Voltage (V)						
OFF	0 – 1						
ON	SV						
<p>5</p> <p>Ⓐ Harness side connector</p>  <p>Engine control unit harness side connector 8*1 22*2 7FU1945</p>	<p>Check for an open-circuit, or a short-circuit to earth between the fuel pump relay and the engine control unit.</p> <ul style="list-style-type: none"> Fuel pump relay connector: Disconnected Engine control unit connector: Disconnected <p>OK → 6</p> <p>✗ → Repair the harness. (Ⓐ 2 – 8)*1 (Ⓐ 2 – 22)*2</p>						

13-6 FUEL SYSTEM <6G72-24 Valve Engine, 6G74 Engine> – On-Vehicle Inspection of MPI Components


6




7FU1934

Check for continuity between the fuel pump drive terminal and the fuel pump relay.

- Fuel pump relay connector: Disconnected
- Fuel pump connector: Disconnected

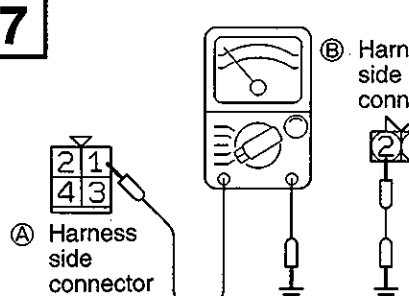

→

7


→

Repair the harness.
(A) 1 –
(C) 1)


7




7FU1935

Check for an open-circuit, or a short-circuit to earth between the fuel pump relay and the fuel pump.

- Fuel pump relay connector: Disconnected
- Fuel pump connector: Disconnected

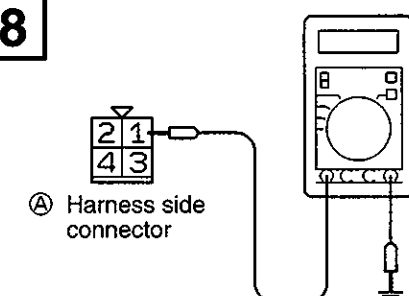

→

8


→

Repair the harness.
(A) 1 –
(B) 2)

8




7FU1930


Measure the power supply voltage of the fuel pump.

- Fuel pump relay connector: Connected
- Engine control unit connector: Connected

Engine	Voltage (V)
Cranking	8V or more
Racing	SV


→

STOP


→

Fuel pump relay or engine control unit is defective.

FUEL PUMP RELAY INSPECTION

Refer to P.13-4.

AIR FLOW SENSOR HARNESS INSPECTION

<p>1</p> <p>Ⓐ Harness side connector</p> <p>Ⓑ Control relay harness side connector</p> <p>7FU1946</p>	<p>Check the continuity between the air flow sensor and the control relay.</p> <ul style="list-style-type: none"> Control relay connector: Disconnected Air flow sensor connector: Disconnected <p>NOTE Touch the circuit tester probes to both ends of the harness.</p>	<p>OK → 2</p> <p>✗ → Repair the harness. (Ⓐ [4] – Ⓑ [1])</p>		
<p>2</p> <p>Ⓐ Harness side connector</p> <p>7FU0657</p>	<p>Check for continuity of the earth circuit.</p> <ul style="list-style-type: none"> Connector: Disconnected 	<p>OK → 3</p> <p>✗ → Repair the harness. (Ⓐ [5] – [72])</p>		
<p>3</p> <p>Ⓐ Harness side connector</p> <p>Engine control unit harness side connector</p> <p>7FU1222</p>	<p>Check for open-circuit or short-circuit between the air flow sensor and the engine control unit.</p> <ul style="list-style-type: none"> Air flow sensor connector: Disconnected Engine control unit connector: Disconnected 	<p>OK → 4</p> <p>✗ → Repair the harness. (Ⓐ [3] – [70]) (Ⓐ [7] – [19])</p>		
<p>4</p> <p>Ⓐ Harness side connector</p> <p>7FU0656</p>	<p>Measure the applied voltage.</p> <ul style="list-style-type: none"> Air flow sensor connector: Disconnected Engine control unit connector: Connected Ignition switch: ON <table border="1" data-bbox="654 1549 1101 1635"> <thead> <tr> <th>Voltage (V)</th> </tr> </thead> <tbody> <tr> <td>4.8 – 5.2</td> </tr> </tbody> </table>	Voltage (V)	4.8 – 5.2	<p>OK → STOP</p> <p>✗ → Replace the engine control unit.</p>
Voltage (V)				
4.8 – 5.2				

CAM POSITION SENSOR HARNESS INSPECTION

<p>1</p> <p>Control relay harness side connector</p> <p>Harness side connector</p> <p>7FU1947</p>	<p>Check for continuity between the cam position sensor and control relay.</p> <ul style="list-style-type: none"> Cam position sensor connector: Disconnected Control relay connector: Disconnected <p>NOTE Touch ohmmeter probes to both ends of the harness.</p>	<p>OK → 2</p> <p>✗ → Repair the harness. (A [3] - B [1])</p>		
<p>2</p> <p>Harness side connector</p> <p>6AF0057</p>	<p>Check for continuity of the earth circuit.</p> <ul style="list-style-type: none"> Cam position sensor connector: Disconnected 	<p>OK → 3</p> <p>✗ → Repair the harness. (A [1] - Earth)</p>		
<p>3</p> <p>Harness side connector</p> <p>Engine control unit harness side connector</p> <p>6AF0058</p>	<p>Check for an open-circuit, or a short-circuit to earth between the cam position sensor and the engine control unit.</p> <ul style="list-style-type: none"> Engine control unit connector: Disconnected Cam position sensor connector: Disconnected 	<p>OK → 4</p> <p>✗ → Repair the harness. (A [2] - [68])</p>		
<p>4</p> <p>Harness side connector</p> <p>6AF0059</p>	<p>Measure the impressed voltage</p> <ul style="list-style-type: none"> Cam position sensor connector: Disconnected Engine control unit connector: Connected Ignition switch: ON <table border="1" data-bbox="662 1591 1112 1675"> <thead> <tr> <th>Voltage (V)</th> </tr> </thead> <tbody> <tr> <td>4.8 - 5.2</td> </tr> </tbody> </table>	Voltage (V)	4.8 - 5.2	<p>OK → STOP</p> <p>✗ → Replace the engine control unit.</p>
Voltage (V)				
4.8 - 5.2				

CRANK ANGLE SENSOR

HARNESS INSPECTION

<p>1</p> <p>Control relay harness side connector</p> <p>Harness side connector</p> <p>7FU1948</p>	<p>Check for continuity between the crank angle sensor and the control relay.</p> <ul style="list-style-type: none"> • Crank angle sensor connector: Disconnected • Control relay connector: Disconnected <p>NOTE Touch ohmmeter probes to both ends of the harness</p>	<p>OK → 2</p> <p>✗ → Repair the harness. (A [2] – B [1])</p>		
<p>2</p> <p>Harness side connector</p> <p>6AF0062</p>	<p>Check for continuity of the earth circuit.</p> <ul style="list-style-type: none"> • Crank angle sensor connector: Disconnected 	<p>OK → 3</p> <p>✗ → Repair the harness. (A [2] – Earth)</p>		
<p>3</p> <p>Harness side connector</p> <p>Engine control unit harness side connector</p> <p>6AF0063</p>	<p>Check for an open-circuit, or a short-circuit to earth between the crank angle sensor and the engine control unit.</p> <ul style="list-style-type: none"> • Engine control unit connector: Disconnected • Crank angle sensor connector: Disconnected 	<p>OK → 4</p> <p>✗ → Repair the harness. (A [2] – [69])</p>		
<p>4</p> <p>Harness side connector</p> <p>6AF0064</p>	<p>Measure the impressed voltage.</p> <ul style="list-style-type: none"> • Crank angle sensor connector: Disconnected • Engine control unit connector: Connected • Ignition switch: ON <table border="1" data-bbox="649 1553 1096 1645"> <thead> <tr> <th>Voltage (V)</th> </tr> </thead> <tbody> <tr> <td>4.8 – 5.2</td> </tr> </tbody> </table>	Voltage (V)	4.8 – 5.2	<p>OK → STOP</p> <p>✗ → Replace the engine control unit.</p>
Voltage (V)				
4.8 – 5.2				

OXYGEN SENSOR HARNESS INSPECTION

<div data-bbox="131 243 646 596"> <div>1</div> <p>Ⓐ Harness side connector</p> <p>Ⓑ Control relay harness side connector</p> <p>7FU1949</p> </div>	<div data-bbox="646 243 1325 596"> <p>Check for continuity between the oxygen sensor and the control relay.</p> <ul style="list-style-type: none"> Control relay connector: Disconnected Oxygen sensor connector: Disconnected <p>NOTE Touch the ohmmeter probes to both ends of the harness.</p> </div>	<div data-bbox="1325 243 1515 596"> <div>OK</div> <div>2</div> <div>✗</div> <p>Repair the harness. (Ⓐ [1] – Ⓑ [1])</p> </div>
<div data-bbox="131 625 646 978"> <div>2</div> <p>Ⓐ Harness side connector</p> <p>Engine control unit harness side connector</p> <p>7FU1132</p> </div>	<div data-bbox="646 625 1325 978"> <p>Check for an open-circuit, or a short-circuit to earth, between the engine control unit and the oxygen sensor.</p> <ul style="list-style-type: none"> Oxygen sensor connector: Disconnected Engine control unit connector: Disconnected </div>	<div data-bbox="1325 625 1515 978"> <div>OK</div> <div>3</div> <div>✗</div> <p>Repair the harness. (Ⓐ [4] – [56])</p> </div>
<div data-bbox="131 1008 646 1352"> <div>3</div> <p>Ⓐ Harness side connector</p> <p>7FU1133</p> </div>	<div data-bbox="646 1008 1325 1352"> <p>Check for continuity of the earth circuit.</p> <ul style="list-style-type: none"> Oxygen sensor connector: Disconnected Engine control unit connector: Disconnected </div>	<div data-bbox="1325 1008 1515 1352"> <div>OK</div> <div>STOP</div> <div>✗</div> <p>Repair the harness. (Ⓐ [2] – [72]) (Ⓐ [3] – Earth)</p> </div>

INJECTORS

HARNESS INSPECTION

<p>1</p> <p>Injector intermediate harness female connector (A)</p> <p>Control relay harness side connector (B)</p> <p>7FU1950</p>	<p>Check for continuity between the injectors and the control relay.</p> <ul style="list-style-type: none"> Injector intermediate connector: Disconnected Control relay connector: Disconnected <p>NOTE Touch the ohmmeter probes to both ends of the harness.</p>	<p>OK → 2</p> <p>✗ → Repair the harness. (A [8] - (B [1])</p>
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<p>2</p> <p>Injector intermediate harness female connector (A)</p> <p>7FU1499</p>	<p>Check for an open-circuit, or a short-circuit to earth between the engine control unit and the injector.</p> <ul style="list-style-type: none"> Engine control unit connector: Disconnected Injector intermediate connector: Disconnected 	<p>OK → STOP</p> <p>✗ → Repair the harness. (A [1] - [2]) (A [2] - [14]) (A [3] - [1]) (A [5] - [16]) (A [6] - [3]) (A [7] - [15])</p>
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IDLE SPEED CONTROL SERVO (STEPPER MOTOR TYPE)

HARNESS INSPECTION

<p>1</p> <p>Idle speed control servo harness side connector (A)</p> <p>Control relay harness side connector (B)</p> <p>7FU1951</p>	<p>Check for continuity between the idle speed control servo and the control relay.</p> <ul style="list-style-type: none"> Idle speed control servo connector: Disconnected Control relay connector: Disconnected <p>NOTE Touch the ohmmeter probes to both ends of the harness.</p>	<p>OK → 2</p> <p>✗ → Repair the harness. (A [2] - [5]) (B [1])</p>
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<p>2</p> <p>Idle speed control servo harness side connector (A)</p> <p>Engine control unit harness side connector</p> <p>01L0397</p>	<p>Check for an open-circuit, or a short-circuit to earth between the engine control unit and the idle speed control servo.</p> <ul style="list-style-type: none"> Engine control unit connector: Disconnected Idle speed control servo connector: Disconnected 	<p>OK → STOP</p> <p>✗ → Repair the harness. (A [1] - [4]) (A [3] - [17]) (A [4] - [5]) (A [6] - [18])</p>
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VARIABLE INDUCTION CONTROL SOLENOID VALVE <DOHC>

HARNESS INSPECTION

<p>1</p> <p>Control relay harness side connector</p> <p>Harness side connector</p> <p>7FU1952</p>	<p>Check for continuity between variable induction control solenoid valve and control relay.</p> <ul style="list-style-type: none"> Variable induction control solenoid valve connector: Disconnected Control relay connector: Disconnected <p>NOTE Touch the ohmmeter probes to both ends of the harness.</p>	<p>OK → 2</p> <p>✗ → Repair the harness. (A) 1 – (B) 1</p>
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<p>2</p> <p>Harness side connector</p> <p>Engine control unit harness side connector</p> <p>9FU0040</p>	<p>Check for an open-circuit, or a short-circuit to earth, between the variable induction control solenoid valve and the engine control unit.</p> <ul style="list-style-type: none"> Variable induction control solenoid valve connector: Disconnected Engine control unit connector: Disconnected 	<p>OK → STOP</p> <p>✗ → Repair the harness. (A) 2 – (6)</p>
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PURGE CONTROL SOLENOID VALVE

HARNESS INSPECTION

<p>1</p> <p>Control relay harness side connector</p> <p>Harness side connector</p> <p>7FU2034</p>	<p>Check for continuity between the purge control solenoid valve and the control relay.</p> <ul style="list-style-type: none"> Purge control solenoid valve connector: Disconnected Control relay connector: Disconnected <p>NOTE Touch the ohmmeter probes to both ends of the harness.</p>	<p>OK → 2</p> <p>✗ → Repair the harness. (A) 1 – (B) 1</p>
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<p>2</p> <p>Harness side connector</p> <p>Engine control unit harness side connector</p> <p>7FU0526</p>	<p>Check for an open-circuit, or a short-circuit to earth, between the purge control solenoid valve and the engine control unit.</p> <ul style="list-style-type: none"> Purge control solenoid valve connector: Disconnected Engine control unit connector: Disconnected 	<p>OK → STOP</p> <p>✗ → Repair the harness. (A) 2 – (9)</p>
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EGR CONTROL SOLENOID VALVE

HARNESS INSPECTION

<div data-bbox="138 235 186 296">1</div> <p>② Harness side connector</p> <p>① Harness side connector</p> <p>7FU2035</p>	<p>Check for continuity between EGR control solenoid valve and control relay</p> <ul style="list-style-type: none"> • EGR control solenoid valve connector: Disconnected • Control relay connector: Disconnected <p>NOTE Touch the ohmmeter probes to both ends of the harness</p>	<div data-bbox="1153 286 1258 388">OK</div> <div data-bbox="1388 306 1437 367">2</div> <div data-bbox="1153 419 1258 490">✗</div> <p>Repair the harness. (① 1) – (② 1)</p>
<div data-bbox="138 613 186 674">2</div> <p>① Harness side connector</p> <p>Engine control unit harness side connector</p> <p>01A0525</p>	<p>Check for an open-circuit, or a short-circuit to earth, between the EGR control solenoid valve and the engine control unit.</p> <ul style="list-style-type: none"> • EGR control solenoid valve connector: Disconnected • Engine control unit connector: Disconnected 	<div data-bbox="1153 664 1258 766">OK</div> <div data-bbox="1388 664 1485 746">STOP</div> <div data-bbox="1153 797 1258 868">✗</div> <p>Repair the harness. (① 2) – (54)</p>