

## ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (ZM)]

STEP	INSPECTION	ACTION	
7	<b>INSPECT TP SENSOR</b> <ul style="list-style-type: none"> <li>Check resistance between TP sensor terminals A and C (part-side).</li> <li>Does resistance smoothly change while gradually opening throttle valve?</li> </ul>	Yes	Go to next step.
		No	Replace TP sensor, then go to Step 9.
8	<b>CHECK PCM TERMINALS FOR ELECTRICAL CORROSION</b> <ul style="list-style-type: none"> <li>Disconnect PCM connector.</li> <li>Check for electrical corrosion on PCM and PCM connector male and female terminals.</li> <li>Is any electrical corrosion found?</li> </ul>	Yes	Repair terminal, then go to next step.
		No	Go to next step.
9	<b>VERIFY TROUBLESHOOTING OF DTC P1123 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Start engine.</li> <li>Clear DTC from PCM memory using WDS or equivalent generic OBD-II function.</li> <li>Access RPM, TP and MAF PIDs using WDS or equivalent.</li> <li>Verify TP PID is reading <b>below 50%</b> while MAF PID is <b>below 4.8 g/s {0.63 lb/min}</b> and RPM PID is <b>above 500 rpm</b>.</li> <li>Is pending code of same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.
		No	Go to next step.
10	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE [ZM].)</li> <li>Is there any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-15 DTC TABLE [ZM].)
		No	Troubleshooting completed.

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### DTC P1170 [ZM]

A3U010201083W21

DTC P1170	HO2S (front) no inversion
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM monitors input voltage from HO2S (front) when the following monitoring conditions are met. If input voltage from sensor remains <b>below or above 0.45 V</b> for <b>42.9 s</b>, PCM determines that there is no HO2S (front, RH) inversion.</li> </ul> <b>MONITORING CONDITIONS</b> <ul style="list-style-type: none"> <li>Engine speed is <b>above 1,500 rpm</b>.</li> <li>Engine coolant temperature is <b>above 80 °C {176 °F}</b>.</li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>HO2S (front) malfunction</li> <li>HO2S (front) heater malfunction</li> <li>Fuel injector malfunction</li> <li>Pressure regulator malfunction</li> <li>Fuel pump malfunction</li> <li>Fuel delivery hose clogging or leakage</li> <li>Fuel filter clogging</li> <li>Fuel return hose clogging or leakage</li> <li>Air suction or leakage</li> <li>PCV valve malfunction</li> <li>Purge solenoid valve malfunction</li> <li>Purge solenoid hoses are hooked up incorrectly.</li> <li>Ignition coil malfunction</li> <li>Insufficient compression</li> <li>Engine malfunction</li> </ul>

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### Diagnostic procedure

STEP	INSPECTION		ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins availability.</li> <li>Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnosis according to available repair information. <ul style="list-style-type: none"> <li>If vehicle is not repaired, go to next step.</li> </ul>
		No	Go to next step.
3	<b>VERIFY RELATED PENDING AND STORED DTCs</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF, then start engine.</li> <li>Verify pending and stored DTCs using WDS or equivalent.</li> <li>Are other DTCs present?</li> </ul>	Yes	Go to appropriate DTC troubleshooting procedures.
		No	Go to next step.
4	<b>IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA</b> <ul style="list-style-type: none"> <li>Is DTC P1170 on FREEZE FRAME DATA?</li> </ul>	Yes	Go to next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	<b>VERIFY CURRENT INPUT SIGNAL STATUS IS CONCERN INTERMITTENT OR CONSTANT</b> <ul style="list-style-type: none"> <li>Warm up engine.</li> <li>Access O2S11 PID using WDS or equivalent.</li> <li>Verify PID while racing engine (in PARK).</li> <li>Is PID reading okay? <ul style="list-style-type: none"> <li><b>More than 0.45 V</b> when suddenly depressing accelerator pedal (rich condition)</li> <li><b>Less than 0.45 V</b> just after release of accelerator pedal (lean condition)</li> </ul> </li> </ul>	Yes	Go to next step.
		No	Replace HO2S (front), then go to Step 21.
6	<b>INSPECT LONG TERM FUEL TRIM</b> <ul style="list-style-type: none"> <li>Access LONGFT1 PID using WDS or equivalent.</li> <li>Compare it with FREEZE FRAME DATA recorded at Step 1.</li> <li>Is it decreased?</li> </ul>	Yes	Engine is driven under rich condition. Go to next step.
		No	Engine is driven under lean condition. Go to Step 10.
7	<b>INSPECT FUEL LINE PRESSURE (EXCESSIVE FUEL LINE PRESSURE)</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Inspect fuel line pressure. (See 01-14-6 FUEL PRESSURE INSPECTION.)</li> <li>Is fuel line pressure <b>more than 150 kPa {1.5 kgf/cm<sup>2</sup>, 22 psi}</b>?</li> </ul>	Yes	Go to Step 9.
		No	Go to next step.
8	<b>VERIFY VACUUM IS LEADING TO PRESSURE REGULATOR</b> <ul style="list-style-type: none"> <li>Disconnect vacuum hose from pressure regulator.</li> <li>Verify that vacuum is felt at opening port of disconnected vacuum hose.</li> <li>Is vacuum felt?</li> </ul>	Yes	Inspect following parts and repair or replace if necessary: <ul style="list-style-type: none"> <li>Fuel pump maximum pressure</li> <li>Fuel return pipe for clogging <ul style="list-style-type: none"> <li>If all items above are okay, replace pressure regulator. Then, go to Step 21.</li> </ul> </li> </ul>
		No	Verify vacuum hoses are connected correctly. <ul style="list-style-type: none"> <li>If okay, replace PRC solenoid valve. Then go to Step 21.</li> <li>If not, reconnect vacuum hoses to correct position. Then go to Step 21.</li> </ul>
9	<b>INSPECT PURGE SOLENOID VALVE FOR WHETHER STUCK OPEN</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Disconnect both hoses from purge solenoid valve.</li> <li>Blow air through purge solenoid valve.</li> <li>Does air blow through?</li> </ul>	Yes	Replace purge solenoid valve. Go to Step 21.
		No	Go to Step 14.
10	<b>INSPECT PCV VALVE OPERATION</b> <ul style="list-style-type: none"> <li>Inspect PCV valve operation. (See 01-16-18 POSITIVE CRANKCASE VENTILATION (PCV) VALVE INSPECTION.)</li> <li>Is PCV valve okay?</li> </ul>	Yes	Go to next step.
		No	Replace PCV, then go to Step 21.

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STEP	INSPECTION	ACTION	
11	<b>INSPECT FUEL LINE PRESSURE (LOW FUEL LINE PRESSURE)</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Inspect fuel line pressure. (See 01-14-6 FUEL PRESSURE INSPECTION.)</li> <li>Is fuel line pressure <b>more than 150 kPa {1.5 kgf/cm<sup>2</sup>, 22 psi}</b>?</li> </ul>	Yes	Go to Step 14.
		No	Go to next step.
12	<b>INSPECT FUEL PUMP MAXIMUM PRESSURE</b> <ul style="list-style-type: none"> <li>Stop engine.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Perform fuel pump maximum pressure test. (See 01-14-17 Fuel Pump Maximum Pressure Inspection.)</li> <li>Is fuel pump maximum pressure <b>within 450—630 kPa {4.5—6.5 kgf/cm<sup>2</sup>, 64—92 psi}</b>?</li> </ul>	Yes	Go to next step.
		No	Inspect fuel pump circuit for open or poor connection. <ul style="list-style-type: none"> <li>Repair or replace suspected circuit.</li> <li>If circuit is okay, replace fuel pump. Then go to Step 21.</li> </ul>
13	<b>INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PUMP</b> <ul style="list-style-type: none"> <li>Visually inspect fuel line for any leakage.</li> <li>Is any fuel leakage found?</li> </ul>	Yes	Replace suspected fuel line, then go to Step 21.
		No	Inspect fuel filters for following: <ul style="list-style-type: none"> <li>Restriction or clogging at fuel filter (high-pressure)</li> <li>Foreign material or stain inside fuel filter (low-pressure)               <ul style="list-style-type: none"> <li>If restriction or clogging is found at fuel filter (high-pressure), replace fuel filter (high-pressure).</li> <li>If foreign material or stain is found inside fuel filter (low-pressure), clean fuel tank and fuel filter (low-pressure).</li> <li>If all items above are okay, replace pressure regulator. Then, go to Step 21.</li> </ul> </li> </ul>
14	<b>CHECK IGNITION COIL OPERATION AND HIGH-TENSION LEAD WITH TIMING LIGHT</b> <ul style="list-style-type: none"> <li>Verify blinking condition on each cylinder using timing light at idle.</li> <li>Do all cylinders show blinking condition?</li> </ul>	Yes	Go to Step 18.
		No	Go to next step.
15	<b>CHECK HIGH-TENSION LEADS OF NON-BLINKING CYLINDER</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Inspect high-tension leads for installation condition, corrosion on terminal, open lead and damaged cover.</li> <li>Is condition of high-tension lead okay?</li> </ul>	Yes	Go to next step.
		No	Replace faulty high-tension lead, then go to Step 21.
16	<b>INSPECT POWER SUPPLY TERMINAL AT IGNITION COIL CONNECTOR</b> <ul style="list-style-type: none"> <li>Disconnect ignition coil connector.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Measure voltage between ignition coil connector terminal D (harness-side) and body ground.</li> <li>Is voltage reading <b>B+</b>?</li> </ul>	Yes	Go to next step.
		No	Check for open circuit between ignition coil connector and ignition switch. Repair or replace wiring harness, then go to Step 21.
17	<b>INSPECT IGNITION COIL RESISTANCE</b> <ul style="list-style-type: none"> <li>Check ignition coil resistance. (See 01-18-2 IGNITION COIL INSPECTION.)</li> <li>Is coil resistance okay?</li> </ul>	Yes	Go to next step.
		No	Replace ignition coil, then go to Step 21.
18	<b>INSPECT ENGINE COMPRESSION</b> <ul style="list-style-type: none"> <li>Inspect engine compression. (See 01-10A-8 COMPRESSION INSPECTION [ZM].)</li> <li>Is it okay?</li> </ul>	Yes	Go to next step.
		No	Implement engine overhaul for repairs, then go to next step.
19	<b>INSPECT FUEL INJECTOR OPERATION</b> <ul style="list-style-type: none"> <li>Turn ignition key to OFF.</li> <li>Inspect injector. (See 01-14-24 FUEL INJECTOR INSPECTION.)</li> <li>Is injector okay?</li> </ul>	Yes	Go to next step.
		No	Replace injector, then go to Step 21.

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## ON-BOARD DIAGNOSTIC [ENGINE CONTROL SYSTEM (ZM)]

STEP	INSPECTION	ACTION	
20	<b>INSPECT SEALING OF ENGINE COOLANT PASSAGE</b>  <b>Warning</b> <ul style="list-style-type: none"> <li>Removing radiator cap when radiator is hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury.</li> <li>When removing radiator cap, wrap a thick cloth around and turn it slowly.</li> </ul> <ul style="list-style-type: none"> <li>Remove radiator cap.</li> <li>Implement procedure to bleed air from engine coolant, then run engine at idle.</li> <li>Is there any small bubble which makes engine coolant white at filling opening?</li> </ul> <b>Note</b> <ul style="list-style-type: none"> <li>Large bubbles are normal since they are remaining air coming out from engine coolant passage.</li> </ul>	Yes	Air gets in from poor sealing to head gasket or other areas between combustion chamber and engine coolant passage. Repair or replace faulty parts, then go to next step.
		No	Go to next step.
21	<b>VERIFY TROUBLESHOOTING OF DTC P1170 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Turn ignition key to ON (Engine OFF).</li> <li>Clear DTC from memory using WDS or equivalent.</li> <li>Start engine.</li> <li>Access ECT and RPM PIDs using WDS or equivalent.</li> <li>Make sure that ECT PID is <b>above 80 °C {176 °F}</b>.</li> <li>Increase and keep engine speed <b>above 1,500 rpm</b> for at <b>least 1 minute</b>.</li> <li>Is pending code of same DTC present?</li> </ul>	Yes	Replace or reprogram PCM. Then go to next step.
		No	Go to next step.
22	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure". (See 01-02A-10 AFTER REPAIR PROCEDURE [ZM].)</li> <li>Is there any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See 01-02A-15 DTC TABLE [ZM].)
		No	Troubleshooting completed.

### DTC P1250 [ZM]

A3U010201083W22

DTC P1250	Pressure regulator control (PRC) valve circuit malfunction
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM monitors input voltages from PRC solenoid valve. If voltage at PCM terminal 95 remains low or high, PCM determines that PRC solenoid valve circuit has malfunction.</li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>PRC solenoid valve malfunction</li> <li>Connector or terminal malfunction</li> <li>Short to ground in wiring between PRC solenoid valve terminal B and PCM terminal 95</li> <li>Open circuit in wiring between main relay terminal D and PRC solenoid valve terminal A</li> <li>Open circuit in wiring between PRC solenoid valve terminal B and PCM terminal 95</li> <li>Short to power circuit between PRC solenoid valve terminal B and PCM terminal 95</li> <li>PCM malfunction</li> </ul>