## NO.5 ENGINE STALLS-AFTER START/AT IDLE [SKYACTIV-G 2.0, SKYACTIV-G 2.5]

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| 5 | ENGINE STALLS-AFTER START/AT IDLE |
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| **DESCRIPTION** | • Engine stops unexpectedly at idle, after start, or both. |
| **POSSIBLE CAUSE** | • Engine overheating<br>• PCM DTC is stored<br>• Erratic signal to PCM<br>— APP sensor or related circuit malfunction<br>— ECT sensor or related circuit malfunction<br>— MAF sensor or related circuit malfunction<br>— MAP sensor or related circuit malfunction<br>— A/F sensor or related circuit malfunction<br>— HO2S or related circuit malfunction<br>— Improper air/fuel mixture ratio control<br>• Improper operation of A/C system<br>• Improper operation of drive-by-wire control system<br>• Purge solenoid valve malfunction<br>• Open circuit in MAF sensor ground circuit<br>• Intermittent open circuit in PCM ground circuit<br>• Poor fuel quality<br>• Air leakage from intake-air system<br>• Intake-air system restriction<br>• Electrical connector disconnected<br>• No battery power supply to PCM or poor ground<br>• Fuel leakage<br>• Vacuum leakage<br>• Erratic signal from CMP sensor<br>— Loose installation<br>— Damaged trigger wheel (intake camshaft and/or exhaust camshaft)<br>— Open or short circuit in related wiring harness<br>• No signal from CKP sensor<br>— Loose installation<br>— Damaged trigger wheel (crankshaft pulley)<br>— Open or short circuit in related wiring harness<br>• Inadequate fuel pressure (high or low pressure side)<br>— Open or short circuit in the fuel pump (low-side) body or related wiring harness<br>— Fuel pressure sensor or related circuit malfunction<br>— Fuel pump (low-side) body mechanical malfunction<br>— High pressure fuel pump malfunction<br>— Spill valve control solenoid valve control circuit malfunction (damage to driver in PCM caused by short circuit to ground system)<br>— Spill valve control solenoid valve malfunction (built-into high pressure fuel pump)<br>— Relief valve (built-into high pressure fuel pump) malfunction<br>— Fuel line restriction<br>— Fuel filter clogged<br>• Fuel injector malfunction<br>• Incorrect fuel injection timing<br>• Improper operation of electric variable valve timing control system (PCM DTC is stored.)<br>• Improper operation of hydraulic variable valve timing control system<br>• Ignition system malfunction<br>• Ignition coil malfunction<br>• Low engine compression<br>• Improper intake valve timing<br>• Improper exhaust valve timing<br>• Exhaust system and/or TWC restricted<br>• PCV valve malfunction<br>• Injector driver (built-into PCM) malfunction |

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| POSSIBLE CAUSE | **Warning**<br>**The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before performing the fuel system services:**<br>**• Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.**<br>**• Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injury or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE SERVICE PRECAUTION" and "AFTER SERVICE PRECAUTION" described in this manual. (See BEFORE SERVICE PRECAUTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].) (See AFTER SERVICE PRECAUTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)**<br><br>**Caution**<br>**• Disconnecting/connecting the quick release connector without cleaning it may possibly cause damage to the fuel pipe and quick release connector. Always clean the quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign matter.** |

## Diagnostic Procedure

| STEP | INSPECTION | RESULTS | ACTION |
|---|---|---|---|
| 1 | **VERIFY IF MALFUNCTION CAUSE IS OVERHEATING**<br><br>**Caution**<br>**• While performing this step, always operate the vehicle in a safe and lawful manner.**<br>**• When the M-MDS is used to observe monitor system status while driving, be sure to have another technician with you, or record the data in the M-MDS using the PID/DATA MONITOR AND RECORD capturing function and inspect later.**<br><br>• Access the ECT PID using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)<br>• Is the ECT PID value **less than 116 °C {241 ° F}** during driving? | Yes | Go to the next step. |
| | | No | The cause of this concern could be from the cooling system overheating.<br>• Perform the symptom troubleshooting "NO.17 COOLING SYSTEM CONCERNS-OVERHEATING". (See NO.17 COOLING SYSTEM CONCERNS-OVERHEATING [SKYACTIV-G 2.0, SKYACTIV-G 2.5].) |
| 2 | **VERIFY PCM DTC**<br>• Retrieve any DTCs using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)<br>• Are any DTCs present? | Yes | Go to the applicable DTC inspection. (See DTC TABLE [SKYACTIV-G 2.0, SKYACTIV-G 2.5].) |
| | | No | Go to the next step. |

| STEP | INSPECTION | RESULTS | ACTION |
|---|---|---|---|
| 3 | **VERIFY CURRENT INPUT SIGNAL STATUS**<br><br>**Caution**<br>**• While performing this step, always operate the vehicle in a safe and lawful manner.**<br>**• When the M-MDS is used to observe monitor system status while driving, be sure to have another technician with you, or record the data in the M-MDS using the PID/DATA MONITOR AND RECORD capturing function and inspect later.**<br><br>• Access the following PIDs using the M-MDS:<br>(See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)<br>— APP1<br>— APP2<br>— ECT<br>— MAF<br>— MAP<br>— O2S11<br>— O2S12<br>— SHRTFT1<br>— LONGFT1<br>• Do the PIDs indicate the correct values under the malfunction condition?<br>(See PCM INSPECTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].) | Yes | Go to the next step. |
| | | No | APP1, APP2 PIDs are not as specified:<br>• Inspect the APP sensor.<br>(See ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)<br>ECT PID is not as specified:<br>• Inspect the ECT sensor.<br>(See ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)<br>MAF PID is not as specified:<br>• Inspect the MAF sensor.<br>(See MASS AIR FLOW (MAF) SENSOR INSPECTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)<br>MAP PID is not as specified:<br>• Inspect the MAP sensor.<br>(See MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR INSPECTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)<br>O2S11, SHRTFT1, LONGFT1 PIDs are not as specified:<br>• Inspect the A/F sensor.<br>(See AIR FUEL RATIO (A/F) SENSOR INSPECTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)<br>O2S12 PID is not as specified:<br>• Inspect the HO2S.<br>(See HEATED OXYGEN SENSOR (HO2S) INSPECTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)<br>Repair or replace the malfunctioning part according to the inspection results.<br>• If the malfunction remains:<br>— Perform the “INTERMITTENT CONCERN TROUBLESHOOTING” procedure.<br>(See INTERMITTENT CONCERN TROUBLESHOOTING [SKYACTIV-G 2.0, SKYACTIV-G 2.5].) |
| 4 | **INSPECT PCM POWER SUPPLY VOLTAGE**<br>• Access the VPWR PID using the M-MDS.<br>(See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)<br>• Is the VPWR PID value **B+**? | Yes | Go to the next step. |
| | | No | Repair or replace the wiring harness between main relay terminal C and PCM terminal 2S and 1CK. |
| 5 | **INSPECT A/C CUT-OFF CONTROL SYSTEM OPERATION**<br>• Perform the A/C Cut-off Control System Inspection.<br>(See ENGINE CONTROL SYSTEM OPERATION INSPECTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)<br>• Does the A/C cut-off operation work properly? | Yes | Go to the next step. |
| | | No | Repair or replace the malfunctioning part according to the inspection results. |
| 6 | **DETERMINE IF MALFUNCTION CAUSE IS DRIVE-BY-WIRE CONTROL SYSTEM OR OTHER**<br>• Will the engine run smoothly at part throttle? | Yes | Go to Step 8. |
| | | No | Go to the next step. |
| 7 | **INSPECT DRIVE-BY-WIRE CONTROL SYSTEM OPERATION**<br>• Perform the TP sweep inspection.<br>(See ENGINE CONTROL SYSTEM OPERATION INSPECTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)<br>• Does the drive-by-wire control system work properly? | Yes | Visually inspect the throttle body (damage/scratching).<br>• If there is any malfunction:<br>— Repair or replace the malfunctioning part according to the inspection results.<br>• If there is no malfunction:<br>— Go to the next step. |
| | | No | Repair or replace the malfunctioning part according to the inspection results. |

| STEP | INSPECTION | RESULTS | ACTION |
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| 8 | **INSPECT PURGE CONTROL SYSTEM OPERATION**<br>• Perform the Purge Control System Inspection. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)<br>• Does the purge solenoid valve work properly? | Yes | Go to the next step. |
| | | No | Repair or replace the malfunctioning part according to the inspection results. |
| 9 | **INSPECT MAF SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT**<br>• Inspect the MAF sensor for the following:<br>— MAF sensor terminal B voltage (ground circuit)<br>• Is there any malfunction? | Yes | Repair or replace the suspected wiring harness. |
| | | No | Go to the next step. |
| 10 | **INSPECT PCM FOR POOR GROUND**<br>• Verify the PCM ground point condition.<br>• Is there any ground point loose or lifting in the PCM? | Yes | Repair the ground point. |
| | | No | Go to the next step. |
| 11 | **INSPECT RELATED PART CONDITION**<br>• Inspect the following:<br>— Fuel quality (proper octane, contamination, winter/summer blend)<br>— Intake-air system leakage or restriction<br>— Electrical connectors<br>— Poor connection for PCM ground and body ground<br>— Fuel leakage<br>— Vacuum leakage<br>— CKP sensor, intake CMP sensor and exhaust CMP sensor<br>• Installation condition (See CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].) (See CAMSHAFT POSITION (CMP) SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)<br>• Damaged trigger wheel, intake camshaft and exhaust camshaft<br>• Is there any malfunction? | Yes | Service if necessary.<br>• Repeat this step. |
| | | No | Go to the next step. |
| 12 | **INSPECT FUEL PRESSURE (HIGH-SIDE)**<br>• Start the engine and warm it up completely.<br>• Access the FUEL_PRES PID using the M-MDS at idle. (See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)<br>• Is the FUEL_PRES PID value **approx. 3 MPa {31 kgf/cm$^2$, 435 psi}**? | Yes | Go to Step 16. |
| | | No | Lower than **3 MPa {31 kgf/cm2, 435 psi}**:<br>• Inspect the following:<br>— Fuel leakage at the fuel line and fuel injector<br>— Fuel pump<br>• Perform the Fuel Pump (Low-pressure Side) Operation Inspection. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)<br>— Fuel pressure sensor (See FUEL PRESSURE SENSOR INSPECTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)<br>— High pressure fuel pump (See HIGH PRESSURE FUEL PUMP INSPECTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)<br>• If there is any malfunction:<br>— Repair or replace the malfunctioning part according to the inspection results.<br>• If there is no malfunction:<br>— Go to Step 15.<br>Higher than **3 MPa {31 kgf/cm2, 435 psi}**:<br>• Go to the next step. |

| STEP | INSPECTION | RESULTS | ACTION |
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| 13 | **DETERMINE IF MALFUNCTION CAUSE IS FUEL PRESSURE SENSOR OR HIGH PRESSURE FUEL PUMP**<br>• Is the vehicle acceleration performance normal? | Yes | Go to the next step. |
| | | No | Go to Step 15. |
| 14 | **INSPECT FUEL PRESSURE SENSOR**<br>• Inspect the fuel pressure sensor. (See FUEL PRESSURE SENSOR INSPECTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)<br>• Is there any malfunction? | Yes | Replace the fuel distributor. (See FUEL INJECTOR REMOVAL/INSTALLATION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].) |
| | | No | Go to Step 16. |
| 15 | **INSPECT SPILL VALVE CONTROL SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO GROUND**<br>• Switch the ignition off.<br>• Disconnect the high pressure fuel pump and PCM connectors.<br>• Inspect for continuity between high pressure fuel pump terminal A (wiring harness-side) and body ground.<br>• Is there continuity? | Yes | Repair or replace the wiring harness for a possible short to ground.<br>• If the malfunction remains:<br>— Replace the PCM. (damage to driver in PCM) (See PCM REMOVAL/INSTALLATION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].) |
| | | No | Replace the high pressure fuel pump. (See HIGH PRESSURE FUEL PUMP REMOVAL/INSTALLATION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].) |
| 16 | **INSPECT FUEL PRESSURE (LOW-SIDE)**<br>• Connect the fuel pressure gauge between fuel pump and high pressure fuel pump.<br>• Measure the low side fuel pressure. (See FUEL LINE PRESSURE INSPECTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)<br>• Is the low side fuel pressure within specification?<br>**Specification:**<br>• **405—485 kPa {4.13—4.94 kgf/cm$^2$, 58.8—70.3 psi}** | Yes | Go to the next step. |
| | | No | Inspect the following:<br>• Fuel line restriction<br>• Fuel filter clogged<br>— If there is any malfunction:<br>• Repair or replace the malfunctioning part according to the inspection results.<br>— If there is no malfunction:<br>• Replace the fuel pump unit. (See FUEL PUMP UNIT REMOVAL/INSTALLATION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].) |
| 17 | **INSPECT FUEL INJECTOR OPERATION**<br>• Perform the Fuel Injector Operation Inspection. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)<br>• Do the fuel injectors operate properly? | Yes | Go to the next step. |
| | | No | Repair or replace the malfunctioning part according to the inspection results. |
| 18 | **INSPECT HYDRAULIC VARIABLE VALVE TIMING CONTROL SYSTEM OPERATION**<br>• Perform the Hydraulic Variable Valve Timing Control System Operation Inspection. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)<br>• Does the hydraulic variable valve timing control system work properly? | Yes | Go to the next step. |
| | | No | Repair or replace the malfunctioning part according to the inspection results. |

| STEP | INSPECTION | RESULTS | ACTION |
|---|---|---|---|
| 19 | **INSPECT ENGINE COMPRESSION**<br>• Measure the compression pressure for each cylinder.<br>(See COMPRESSION INSPECTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)<br>• Are compression pressures within specification?<br>**Specification:**<br>• Compression [SKYACTIV-G 2.0, European (L.H.D. U.K.) specs.]<br>— Standard: **978 kPa {9.97 kgf/cm$^2$, 142 psi} (300 rpm)**<br>— Minimum: **783 kPa {7.98 kgf/cm$^2$, 114 psi} (300 rpm)**<br>— Maximum difference between cylinders: **166 kPa {1.69 kgf/cm$^2$, 24.1 psi}** (**300 rpm**)<br>• Compression [SKYACTIV-G 2.0, Except European (L.H.D. U.K.) specs.]<br>— Standard: **885 kPa {9.02 kgf/cm$^2$, 128 psi} (300 rpm)**<br>— Minimum: **708 kPa {7.22 kgf/cm$^2$, 103 psi} (300 rpm)**<br>— Maximum difference between cylinders: **150 kPa {1.53 kgf/cm$^2$, 21.8 psi}** (**300 rpm**)<br>• Compression [SKYACTIV-G 2.5]<br>— Standard: **954 kPa {9.73 kgf/cm$^2$, 138 psi} (300 rpm)**<br>— Minimum: **763 kPa {7.78 kgf/cm$^2$, 111 psi} (300 rpm)**<br>— Maximum difference between cylinders: **161 kPa {1.64 kgf/cm$^2$, 23.4 psi}** (**300 rpm**)<br>**Note**<br>• Because the SKYACTIV-G 2.0 and SKYACTIV-G 2.5 retards the intake valve closing timing, compression pressure is low. | Yes | Go to the next step. |
| | | No | Inspect the following:<br>• Damaged valve seat<br>• Worn valve stem and valve guide<br>• Worn or stuck piston ring<br>• Worn piston, piston ring or cylinder<br>• Improper intake valve timing<br>• Improper exhaust valve timing<br>Service if necessary. |
| 20 | **INSPECT IGNITION SYSTEM OPERATION**<br>• Perform the Spark Test.<br>(See ENGINE CONTROL SYSTEM OPERATION INSPECTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)<br>• Is a strong blue spark visible at each cylinder? | Yes | Go to the next step. |
| | | No | Repair or replace the malfunctioning part according to the inspection results. |
| 21 | **INSPECT EXHAUST SYSTEM FOR RESTRICTION**<br>• Inspect for restriction in the exhaust system and the TWC.<br>• Is there any restriction? | Yes | Repair or replace the malfunctioning part according to the inspection results. |
| | | No | Go to the next step. |
| 22 | **INSPECT IF MALFUNCTION CAUSE IS PCV VALVE OR INJECTOR DRIVER (PCM INTEGRATED)**<br>• Inspect the PCV valve.<br>(See POSITIVE CRANKCASE VENTILATION (PCV) VALVE INSPECTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)<br>• Is there any malfunction? | Yes | Replace the PCV valve.<br>(See POSITIVE CRANKCASE VENTILATION (PCV) VALVE REMOVAL/INSTALLATION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].) |
| | | No | Injector driver malfunction.<br>• Replace the PCM.<br>(See PCM REMOVAL/INSTALLATION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)<br>If the problem remains, overhaul the engine. |

| STEP | INSPECTION | RESULTS | ACTION |
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| 23 | Verify the test results.<br>• If normal, return to the diagnostic index to service any additional symptoms.<br>(See SYMPTOM DIAGNOSTIC INDEX [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)<br>• If a malfunction remains, inspect the related Service Information and perform the repair or diagnosis.<br>— If the vehicle is repaired, troubleshooting is completed.<br>— If the vehicle is not repaired or additional diagnostic information is not available, replace the PCM.<br>(See PCM REMOVAL/INSTALLATION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].) | | |