DTC P0300:00 [SKYACTIV-G 2.0]

id0102h1703200

DTC P0300:00	Random misfire detected
DETECTION CONDITION	• The PCM monitors the CKP sensor input signal interval time. The PCM calculates the change of interval time for each cylinder. If the change of interval time exceeds the preprogrammed criteria, the PCM detects a misfire in the corresponding cylinder. While the engine is running, the PCM counts the number of misfires that occurred at **200 crankshaft revolutions** or **1000 crankshaft revolutions** and calculates the misfire ratio for each crankshaft revolution. If the ratio exceeds the preprogrammed criteria, the PCM determines that a misfire, which can damage the catalytic converter or affect emission performance, has occurred. **Diagnostic support note** • This is a continuous monitor (misfire). • The check engine light illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • The check engine light flashes if the PCM detects the misfire which can damage the catalytic converter during first drive cycle. • PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA (Mode 2)/Snapshot data is available. • The DTC is stored in the PCM memory.
FAIL-SAFE FUNCTION	• Limits the intake air amount.

DTC P0300:00	Random misfire detected
POSSIBLE CAUSE	• Erratic signal to PCM — APP sensor signal malfunction — ECT sensor signal malfunction — IAT sensor No.1 signal malfunction — MAF sensor signal malfunction — CKP sensor signal malfunction — TP sensor signal malfunction — VSS signal malfunction — Related connector or terminals malfunction — Related wiring harness malfunction • Excessive air suction in intake air system (between MAF sensor and intake manifold) • MAF sensor malfunction • Improper operation of electric variable valve timing control system — Electric variable valve timing driver malfunction — Electric variable valve timing motor malfunction — Electric variable valve timing actuator malfunction • Improper operation of hydraulic variable valve timing control system • Improper operation of purge solenoid valve • Exhaust CMP sensor malfunction • CKP sensor loose • High-pressure side fuel delivery system malfunction — Fuel pressure sensor malfunction — Spill valve control solenoid valve control circuit malfunction (damage to driver in PCM caused by short circuit to ground system) — Spill valve control solenoid valve (built-into high pressure fuel pump) malfunction — Relief valve (built-into high pressure fuel pump) malfunction — High pressure fuel pump malfunction • Low-pressure side fuel delivery system malfunction — Fuel leakage in fuel line — Restricted fuel line — Restricted fuel filter — Fuel pressure regulator (built-into fuel pump unit) malfunction — Fuel pump unit malfunction — Fuel runout • Ignition system malfunction — Spark plug is wet or covered with carbon — Spark plug malfunction — Ignition coil malfunction — Ignition coil related wiring harness malfunction • Engine malfunction — Insufficient engine compression — Engine coolant leakage to combustion chamber • PCV valve malfunction • Poor quality fuel • PCM malfunction
SYSTEM WIRING DIAGRAM	—

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA (MODE 2)/ SNAPSHOT DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED** • Have the FREEZE FRAME DATA (Mode 2)/ snapshot data and DIAGNOSTIC MONITORING TEST RESULTS (misfire related) been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA (Mode 2)/snapshot data and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	**VERIFY RELATED SERVICE INFORMATION AVAILABILITY** • Verify related Service Information availability. • Is any related Service Information available?	Yes	Perform repair or diagnosis according to the available Service Information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
3	**VERIFY RELATED PENDING CODE AND/OR DTC** • Switch the ignition to off, then to ON (engine off). • Perform the Pending Trouble Code Access Procedure and DTC Reading Procedure. (See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-G 2.0].) • Are any other PENDING CODEs and/or DTCs present?	Yes	Go to the applicable PENDING CODE or DTC inspection. (See DTC TABLE [SKYACTIV-G 2.0].)
		No	Go to the next step.
4	**VERIFY CURRENT INPUT SIGNAL STATUS (KEY TO ON/IDLE)** • Access the following PIDs using the M-MDS: (See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-G 2.0].) — APP1 — APP2 — ECT — IAT — MAF — RPM — TP REL — VSS • Is there any signal that is far out of specification when the ignition is switched to ON and the engine idles? (See PCM INSPECTION [SKYACTIV-G 2.0].)	Yes	Inspect the suspected sensor and related wiring harness. Repair or replace the malfunctioning part according to the inspection results, then go to Step 30.
		No	Go to the next step.
5	**VERIFY CURRENT INPUT SIGNAL STATUS UNDER FREEZE FRAME DATA (MODE 2) CONDITION** **Caution** **• While performing this step, always operate the vehicle in a safe and lawful manner.** **• 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.** • Access the same PIDs as in Step 4 while the simulating under the FREEZE FRAME DATA (Mode 2) conditions. (See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-G 2.0].) • Is there any signal which causes drastic changes?	Yes	Inspect the suspected sensor and related wiring harness. Repair or replace the malfunctioning part according to the inspection results, then go to Step 30.
		No	Go to the next step.
6	**VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR** • Start the engine. • Access the MAF PID using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-G 2.0].) • Verify that the MAF PID value changes quickly while increasing (racing) the engine rpm. • Is the MAF PID response normal? (See PCM INSPECTION [SKYACTIV-G 2.0].)	Yes	Go to Step 8.
		No	Go to the next step.

STEP	INSPECTION		ACTION
7	**INSPECT INTAKE AIR SYSTEM FOR AIR SUCTION** • Inspect for air leakage between the following: — MAF sensor and throttle body — Throttle body and intake manifold **Note** • Engine speed may change when rust penetrating agent is sprayed on the air suction area. • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results, then go to Step 30.
		No	Replace the MAF sensor/IAT sensor No.1, then go to Step 30. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [SKYACTIV-G 2.0].)
8	**INSPECT ELECTRIC VARIABLE VALVE TIMING DRIVER** • Inspect the electric variable valve timing driver. (See ELECTRIC VARIABLE VALVE TIMING MOTOR/DRIVER INSPECTION [SKYACTIV-G 2.0].) • Is there any malfunction?	Yes	Replace the electric variable valve timing motor/driver, then go to Step 30. (See ELECTRIC VARIABLE VALVE TIMING MOTOR/ DRIVER REMOVAL/INSTALLATION [SKYACTIV-G 2.0].)
		No	Go to the next step.
9	**INSPECT ELECTRIC VARIABLE VALVE TIMING MOTOR** • Inspect the electric variable valve timing motor. (See ELECTRIC VARIABLE VALVE TIMING MOTOR/DRIVER INSPECTION [SKYACTIV-G 2.0].) • Is there any malfunction?	Yes	Replace the electric variable valve timing motor/driver, then go to Step 30. (See ELECTRIC VARIABLE VALVE TIMING MOTOR/ DRIVER REMOVAL/INSTALLATION [SKYACTIV-G 2.0].)
		No	Go to the next step.
10	**INSPECT ELECTRIC VARIABLE VALVE TIMING ACTUATOR** • Inspect the electric variable valve timing actuator. (See ELECTRIC VARIABLE VALVE TIMING ACTUATOR INSPECTION [SKYACTIV-G 2.0].) • Is there any malfunction?	Yes	Replace the electric variable valve timing actuator, then go to Step 30. (See ELECTRIC VARIABLE VALVE TIMING ACTUATOR, HYDRAULIC VARIABLE VALVE TIMING ACTUATOR REMOVAL/INSTALLATION [SKYACTIV-G 2.0].)
		No	Go to the next step.
11	**INSPECT HYDRAULIC VARIABLE VALVE TIMING CONTROL SYSTEM OPERATION** • Perform the Hydraulic Variable Valve Timing Control System Operation Inspection. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [SKYACTIV-G 2.0].) • Is there any malfunction?	Yes	Repair or replace the malfunctioning part according to the inspection results, then go to Step 30.
		No	Go to the next step.
12	**INSPECT PURGE SOLENOID VALVE OPERATION** • Switch the ignition to off. • Connect the vacuum pump to the purge solenoid valve and apply vacuum to the solenoid. • Verify that the solenoid holds vacuum. • Switch the ignition ON (engine off). • Access the EVAPCP PID of simulation item using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-G 2.0].) • Set the purge solenoid value to **100 %** for the EVAPCP PID. • Apply vacuum while turning the solenoid from OFF to ON and simulating the EVAPCP PID with a **100 %** duty value. • Verify that the purge solenoid value releases vacuum while the solenoid is turned on. • Is the purge solenoid valve operation normal?	Yes	Go to the next step.
		No	Replace the purge solenoid valve, then go to Step 30. (See PURGE SOLENOID VALVE REMOVAL/ INSTALLATION [SKYACTIV-G 2.0].)

STEP	INSPECTION		ACTION
13	**INSPECT EXHAUST CMP SENSOR** • Inspect the exhaust CMP sensor. (See CAMSHAFT POSITION (CMP) SENSOR INSPECTION [SKYACTIV-G 2.0].) • Is there any malfunction?	Yes	Inspect the installation condition for damage to the timing chain and gears. • If there is any malfunction: — Repair or replace the malfunctioning part according to the inspection results. • If there is no malfunction: — Replace the exhaust CMP sensor. (See CAMSHAFT POSITION (CMP) SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.0].) Go to Step 30.
		No	Go to the next step.
14	**INSPECT INSTALLATION OF CKP SENSOR** • Inspect installation of CKP sensor. • Is the CKP sensor installed securely?	Yes	Go to the next step.
		No	Retighten the CKP sensor, then go to Step 30. (See CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.0].)
15	**INSPECT FUEL LINE PRESSURE (LOW-SIDE)** • Inspect the fuel line pressure. (See FUEL LINE PRESSURE INSPECTION [SKYACTIV-G 2.0].) • Is there any malfunction?	Yes	If the fuel line pressure is too low: • Go to the next step. If the fuel line pressure is too high: • Replace the fuel pump unit, then go to Step 30. (See FUEL PUMP UNIT REMOVAL/INSTALLATION [SKYACTIV-G 2.0].)
		No	Go to Step 18.
16	**INSPECT FOR FUEL LINE LEAKAGE** • Visually inspect for leakage from fuel line between fuel distributor and fuel pump. • Is there any leakage?	Yes	Repair or replace the malfunctioning part according to the inspection results, then go to Step 30.
		No	Go to the next step.
17	**INSPECT FUEL FILTER** • Visually inspect for foreign materials or stain inside fuel filter (low-pressure side). • Is there any foreign materials or stain?	Yes	Clean the fuel tank and filter (low-pressure side), then go to Step 30.
		No	Replace the fuel pump unit, then go to Step 30. (See FUEL PUMP UNIT REMOVAL/INSTALLATION [SKYACTIV-G 2.0].)
18	**INSPECT FUEL PRESSURE (HIGH-SIDE)** • Start the engine and warm it up completely. • Access the FUEL_PRES PID using the M-MDS at idle. (See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-G 2.0].) • Is the FUEL_PRES PID value **approx. 3 MPa {31 kgf/cm^2, 435 psi}**?	Yes	Go to Step 22.
		No	Lower than **3 MPa {31 kgf/cm2, 435 psi}**: • Inspect the following: — Fuel leakage at the fuel line and fuel injector — Fuel pump • Perform the Fuel Pump (Low-pressure Side) Operation Inspection. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [SKYACTIV-G 2.0].) — Fuel pressure sensor (See FUEL PRESSURE SENSOR INSPECTION [SKYACTIV-G 2.0].) — High pressure fuel pump (See HIGH PRESSURE FUEL PUMP INSPECTION [SKYACTIV-G 2.0].) • If there is any malfunction: — Repair or replace the malfunctioning part according to the inspection results, then go to Step 30. • If there is no malfunction: — Go to Step 21. Higher than **3 MPa {31 kgf/cm2, 435 psi}**: • Go to the next step.
19	**IDENTIFY CAUSE BY FUEL PRESSURE SENSOR OR HIGH PRESSURE FUEL PUMP** • Is the vehicle acceleration performance normal?	Yes	Go to the next step.
		No	Go to Step 21.
20	**INSPECT FUEL PRESSURE SENSOR** • Inspect the fuel pressure sensor. (See FUEL PRESSURE SENSOR INSPECTION [SKYACTIV-G 2.0].) • Is there any malfunction?	Yes	Replace the fuel distributor, then go to Step 30. (See FUEL INJECTOR REMOVAL/INSTALLATION [SKYACTIV-G 2.0].)
		No	Go to Step 22.

STEP	INSPECTION		ACTION
21	**INSPECT SPILL VALVE CONTROL SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO GROUND** • Switch the ignition to off. • Disconnect the high pressure fuel pump and PCM connectors. • Inspect for continuity between high pressure fuel pump terminal A (wiring harness-side) and body ground. • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to ground, then go to Step 30.
		No	Replace the high pressure fuel pump, then go to Step 30. (See HIGH PRESSURE FUEL PUMP REMOVAL/ INSTALLATION [SKYACTIV-G 2.0].)
22	**INSPECT FUEL PRESSURE (LOW-SIDE)** • Connect the fuel pressure gauge between fuel pump and high pressure fuel pump. • Measure the low side fuel pressure. (See FUEL LINE PRESSURE INSPECTION [SKYACTIV-G 2.0].) • Is the low side fuel pressure within specification? **Specification:** **• 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: • Fuel line restriction • Fuel filter clogged — If there is any malfunction: • Repair or replace the malfunctioning part according to the inspection results. — If there is no malfunction: • Replace the fuel pump unit. (See FUEL PUMP UNIT REMOVAL/INSTALLATION [SKYACTIV-G 2.0].) Go to Step 30.
23	**INSPECT IGNITION SYSTEM OPERATION** • Perform the Spark Test. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [SKYACTIV-G 2.0].) • Is a strong blue spark visible at each cylinder?	Yes	Go to Step 26.
		No	Go to the next step.
24	**INSPECT SPARK PULG** • Inspect the spark plugs for all cylinders. (See SPARK PLUG INSPECTION [SKYACTIV-G 2.0].) • Is there any malfunction?	Yes	Replace the suspected spark plug, then go to Step 30. (See SPARK PLUG REMOVAL/INSTALLATION [SKYACTIV-G 2.0].)
		No	Go to the next step.
25	**INSPECT IGNITION COIL** • Inspect the ignition coils for all cylinders. (See IGNITION COIL INSPECTION [SKYACTIV-G 2.0].) • Is there any malfunction?	Yes	Replace the suspected ignition coil, then go to Step 30. (See IGNITION COIL/ION SENSOR REMOVAL/ INSTALLATION [SKYACTIV-G 2.0].)
		No	Inspect the ignition coil related wiring harness condition (intermittent open or short) for all cylinders. Repair or replace the suspected wiring harness, then go to Step 30.
26	**VERIFY DTC TROUBLESHOOTING COMPLETED** **Note** • Because the malfunction may have been resolved by removing the carbon adhered to the spark plug during the spark inspection for the spark plug, verify that the repairs have been completed. • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. (See AFTER REPAIR PROCEDURE [SKYACTIV-G 2.0].) • Perform the Pending Trouble Code Access Procedure. (See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-G 2.0].) • Is the PENDING CODE for this DTC present?	Yes	Go to the next step.
		No	Go to Step 31.

STEP	INSPECTION		ACTION
27	**INSPECT ENGINE COMPRESSION** • Inspect the engine compression. (See COMPRESSION INSPECTION [SKYACTIV-G 2.0].) • Are compression pressures within specification? **Specification:** • Compression [European (L.H.D. U.K.) specs.] — Standard: **978 kPa {9.97 kgf/cm^2, 142 psi} (300 rpm)** — Minimum: **783 kPa {7.98 kgf/cm^2, 114 psi} (300 rpm)** — Maximum difference between cylinders: **166 kPa {1.69 kgf/cm^2, 24.1 psi}** • Compression [Except European (L.H.D. U.K.) specs.] — Standard: **885 kPa {9.02 kgf/cm^2, 128 psi} (300 rpm)** — Minimum: **708 kPa {7.22 kgf/cm^2, 103 psi} (300 rpm)** — Maximum difference between cylinders: **150 kPa {1.53 kgf/cm^2, 21.8 psi}** **Note** • Because the SKYACTIV-G 2.0 retards the intake valve closing timing, compression pressure is low.	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to the inspection results, then go to Step 30.
28	**INSPECT SEALING OF ENGINE COOLANT PASSAGE** • Perform the “ENGINE COOLANT LEAKAGE INSPECTION”. (See ENGINE COOLANT LEAKAGE INSPECTION [SKYACTIV-G 2.0].) • Does the radiator cap tester needle drop even though there is no engine coolant leakage from the radiator or the hoses?	Yes	Engine coolant leakage from the engine (between the combustion chamber and the engine coolant passage) may have occurred. • Verify the conditions of the gasket and the cylinder head. — If there is any malfunction: • Repair or replace the malfunctioning part according to the inspection results, then go to Step 30.
		No	Go to the next step.
29	**INSPECT PCV VALVE OPERATION** • Switch the ignition to off. • Remove the PCV valve. (See POSITIVE CRANKCASE VENTILATION (PCV) VALVE REMOVAL/INSTALLATION [SKYACTIV-G 2.0].) • Inspect the PCV valve. (See POSITIVE CRANKCASE VENTILATION (PCV) VALVE INSPECTION [SKYACTIV-G 2.0].) • Is there any malfunction?	Yes	Replace the PCV valve, then go to the next step. (See POSITIVE CRANKCASE VENTILATION (PCV) VALVE REMOVAL/INSTALLATION [SKYACTIV-G 2.0].)
		No	Poor quality fuel is used. • Replace the fuel, then go to the next step.
30	**VERIFY DTC TROUBLESHOOTING COMPLETED** • Make sure to reconnect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. (See AFTER REPAIR PROCEDURE [SKYACTIV-G 2.0].) • Perform the Pending Trouble Code Access Procedure. (See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-G 2.0].) • Is the PENDING CODE for this DTC present?	Yes	Repeat the inspection from Step 1. • If the malfunction recurs, replace the PCM. (See PCM REMOVAL/INSTALLATION [SKYACTIV-G 2.0].) Go to the next step.
		No	Go to the next step.

STEP	INSPECTION		ACTION
31	**VERIFY AFTER REPAIR PROCEDURE** • Perform the “AFTER REPAIR PROCEDURE”. (See AFTER REPAIR PROCEDURE [SKYACTIV-G 2.0].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [SKYACTIV-G 2.0].)
		No	DTC troubleshooting completed.