

DTC P0301:00, P0302:00, P0303:00, P0304:00 [SKYACTIV-D 2.2]

id0102s4703300

DTC P0301:00	Cylinder No.1 misfire detected
DTC P0302:00	Cylinder No.2 misfire detected
DTC P0303:00	Cylinder No.3 misfire detected
DTC P0304:00	Cylinder No.4 misfire detected
DETECTION CONDITION	<ul style="list-style-type: none"> The misfire rate of specific cylinders for the crankshaft speed exceeds the specification for a continuous 16 s when the following conditions are met: MONITORING CONDITIONS <ul style="list-style-type: none"> Battery voltage: 8—20 V Engine speed: 1,200 rpm or less Fuel injection amount: 25 mm³/stroke or less Engine coolant temperature: above 60 °C {140 °F} Diesel particulate filter regeneration control is not performed Diagnostic support note This is an intermittent 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 the first drive cycle. FREEZE FRAME DATA (Mode 2)/Snapshot data is available. DTC is stored in the PCM memory.
FAIL-SAFE FUNCTION	<ul style="list-style-type: none"> Inhibits the diesel particulate filter regeneration control. Inhibits engine-stop by operating the i-stop function. PCM restricts engine-transaxle integration control.
POSSIBLE CAUSE	<ul style="list-style-type: none"> Fuel shortage in fuel tank Erratic signal to PCM <ul style="list-style-type: none"> ECT sensor signal malfunction IAT sensor No.1 signal malfunction MAF sensor signal malfunction CKP sensor signal malfunction CMP sensor signal malfunction APP sensor signal malfunction A/F sensor signal malfunction EGR valve position sensor signal malfunction VSS signal malfunction Related connector or terminals malfunction Related wiring harness malfunction CMP sensor malfunction Air suction or restriction in intake-air system (between MAF sensor and intake manifold) MAF sensor malfunction Turbocharger malfunction (turbine wheel and/or compressor wheel damaged, stuck) CKP sensor malfunction Fuel injector malfunction Fuel system malfunction <ul style="list-style-type: none"> Fuel line restricted or leakage Engine malfunction <ul style="list-style-type: none"> Insufficient engine compression Engine coolant leakage to combustion chamber Poor fuel quality PCM malfunction
SYSTEM WIRING DIAGRAM	Not applicable

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	VERIFY FREEZE FRAME DATA (MODE 2)/ SNAPSHOT DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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.
3	VERIFY RELATED PENDING CODE AND/OR DTC <ul style="list-style-type: none"> Switch the ignition off, then ON (engine off). Perform the Pending Trouble Code Access Procedure and DTC Reading Procedure. (See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-D 2.2].) Is the PENDING CODE/DTC P115A:00, P0313:00 or P115B:00 also present? 	Yes	Go to the applicable PENDING CODE or DTC inspection. (See DTC P115A:00 [SKYACTIV-D 2.2].) (See DTC P0313:00 [SKYACTIV-D 2.2].) (See DTC P115B:00 [SKYACTIV-D 2.2].)
		No	Go to the next step.
4	VERIFY CURRENT INPUT SIGNAL STATUS (KEY TO ON/IDLE) <ul style="list-style-type: none"> Start the engine. Access the following PIDs using the M-MDS: (See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-D 2.2].) <ul style="list-style-type: none"> ECT IAT MAF RPM APP1 APP2 O2S11 EGRP VSS Is there any signal that is far out of specification when the ignition is switched ON and the engine idles? (See PCM INSPECTION [SKYACTIV-D 2.2].) 	Yes	Inspect the suspected sensor and related wiring harness. Repair or replace the malfunctioning part according to the inspection results, then go to Step 17.
		No	Go to the next step.
5	VERIFY CURRENT INPUT SIGNAL STATUS UNDER FREEZE FRAME DATA (MODE 2) CONDITION <p>Caution</p> <ul style="list-style-type: none"> 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. <ul style="list-style-type: none"> Access the same PIDs as in Step 4 while simulating under the FREEZE FRAME DATA (Mode 2) conditions. (See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-D 2.2].) 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 17.
		No	Go to the next step.

STEP	INSPECTION		ACTION
6	INSPECT CMP SENSOR <ul style="list-style-type: none"> Inspect the CMP sensor. (See CAMSHAFT POSITION (CMP) SENSOR INSPECTION [SKYACTIV-D 2.2].) Is there any malfunction? 	Yes	Replace the CMP sensor, then go to Step 17. (See CAMSHAFT POSITION (CMP) SENSOR REMOVAL/ INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.
7	VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR <ul style="list-style-type: none"> Start the engine. Access the MAF PID using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-D 2.2].) Verify that the MAF PID value changes quickly while increasing (racing) the engine rpm. Is the MAF PID value normal? (See PCM INSPECTION [SKYACTIV-D 2.2].) 	Yes	Go to Step 11.
		No	Go to the next step.
8	INSPECT INTAKE AIR SYSTEM FOR EXCESSIVE AIR SUCTION <ul style="list-style-type: none"> Visually inspect for loose, cracked or damaged hoses on intake air system. <p>Note</p> <ul style="list-style-type: none"> Engine speed may change when rust penetrating agent is sprayed on the air suction area. <ul style="list-style-type: none"> Is there any malfunction? 	Yes	Repair or replace the malfunctioning part according to the inspection results, then go to Step 17.
		No	Go to the next step.
9	INSPECT FOR RESTRICTION OR CLOGGED IN INTAKE AIR SYSTEM <ul style="list-style-type: none"> Verify if there is restriction or clogged into the intake air system (such as between MAF sensor and intake manifold). Is there any malfunction? 	Yes	Repair or replace the malfunctioning part according to the inspection results, then go to Step 17.
		No	Go to the next step.
10	INSPECT TURBOCHARGER <ul style="list-style-type: none"> Inspect the turbocharger. (See TURBOCHARGER INSPECTION [SKYACTIV-D 2.2].) Is there any malfunction? 	Yes	Replace the turbocharger, then go to Step 17. (See TURBOCHARGER REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Replace the MAF sensor/IAT sensor No.1, then go to Step 17. (See MASS AIR FLOW (MAF) SENSOR/INTAKE AIR TEMPERATURE (IAT) SENSOR NO.1 REMOVAL/ INSTALLATION [SKYACTIV-D 2.2].)
11	INSPECT CKP SENSOR <ul style="list-style-type: none"> Inspect the CKP sensor. (See CRANKSHAFT POSITION (CKP) SENSOR INSPECTION [SKYACTIV-D 2.2].) Is there any malfunction? 	Yes	Replace the CKP sensor, then go to Step 17. (See CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.
12	INSPECT FUEL INJECTOR OPERATION <ul style="list-style-type: none"> Perform the Fuel Injector Operation Inspection. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [SKYACTIV-D 2.2].) Is there any malfunction? 	Yes	Repair or replace the malfunctioning part according to the inspection results, then go to Step 17.
		No	Go to the next step.
13	INSPECT FOR LEAKAGE OR CLOGGED IN FUEL LINE <ul style="list-style-type: none"> For the cylinder which outputs a DTC, inspect the following fuel line for fuel leakage or clogging. <ul style="list-style-type: none"> Between supply pump and common rail Between common rail and fuel injector Is there any malfunction? 	Yes	Repair or replace the malfunctioning part according to the inspection results, then go to Step 17.
		No	Go to the next step.

STEP	INSPECTION	ACTION	
14	INSPECT ENGINE COMPRESSION <ul style="list-style-type: none"> Inspect the engine compression. (See COMPRESSION INSPECTION [SKYACTIV-D 2.2].) Are compression pressures within specification? Specification: <ul style="list-style-type: none"> Compression <ul style="list-style-type: none"> Standard: 2,255 kPa {22.99 kgf/cm², 327.1 psi} (180 rpm) Minimum: 1,804 kPa {18.40 kgf/cm², 261.6 psi} (180 rpm) Maximum difference between cylinders: 147 kPa {1.50 kgf/cm², 21.3 psi} (180 rpm) 	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to the inspection results, then go to Step 17.
15	INSPECT SEALING OF ENGINE COOLANT PASSAGE <ul style="list-style-type: none"> Perform the "ENGINE COOLANT LEAKAGE INSPECTION". (See ENGINE COOLANT LEAKAGE INSPECTION [SKYACTIV-D 2.2].) 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. <ul style="list-style-type: none"> Verify the conditions of the gasket and the cylinder head. <ul style="list-style-type: none"> If there is any malfunction: <ul style="list-style-type: none"> Repair or replace the malfunctioning part according to the inspection results, then go to Step 17.
		No	Go to the next step.
16	INSPECT FOR MALFUNCTION DUE TO POOR FUEL <ul style="list-style-type: none"> Replace the fuel. (See FUEL DRAINING PROCEDURE [SKYACTIV-D 2.2].) Clear the DTC from the PCM memory using the M-MDS. (See AFTER REPAIR PROCEDURE [SKYACTIV-D 2.2].) Start the engine and idle it for 1 min. Perform the Pending Trouble Code Access Procedure. (See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-D 2.2].) Is the PENDING CODE for this DTC present? 	Yes	Remove the accumulated matter in the cylinder head using the following procedure, then go to the next step. <ul style="list-style-type: none"> Carbon remover Overhauling
		No	Advise the customer as to the change in the fuel used. Go to Step 18.
17	VERIFY DTC TROUBLESHOOTING COMPLETED <ul style="list-style-type: none"> Always reconnect all disconnected connectors. Clear the DTC from the PCM memory using the M-MDS. (See AFTER REPAIR PROCEDURE [SKYACTIV-D 2.2].) Start the engine and idle it for 1 min. Perform the Pending Trouble Code Access Procedure. (See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-D 2.2].) Is the PENDING CODE for this DTC present? 	Yes	Repeat the inspection from Step 1. <ul style="list-style-type: none"> If the malfunction recurs, replace the PCM. (See PCM REMOVAL/INSTALLATION [SKYACTIV-D 2.2].) Go to the next step.
		No	Go to the next step.
18	VERIFY AFTER REPAIR PROCEDURE <ul style="list-style-type: none"> Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE [SKYACTIV-D 2.2].) Are any DTCs present? 	Yes	Go to the applicable DTC inspection. (See DTC TABLE [SKYACTIV-D 2.2].)
		No	DTC troubleshooting completed.