

## DTC P0016:00 [SKYACTIV-D 2.2]

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<b>DTC P0016:00</b>	<b>Camshaft position/Crankshaft position correlation problem</b>
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>CKP sensor and CMP sensor input signal does not match while the crankshaft rotates <b>15 times</b> when the following conditions are met: <b>MONITORING CONDITIONS</b> <ul style="list-style-type: none"> <li>Battery voltage: <b>8—20 V</b></li> <li>Engine speed: <b>700—1,000 rpm</b></li> <li>Engine coolant temperature: <b>-10 °C {14 °F} or more</b></li> </ul> </li> </ul> <b>Diagnostic support note</b> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>The check engine light illuminates if the PCM detects the above malfunction condition during the first drive cycle.</li> <li>FREEZE FRAME DATA (Mode 2)/Snapshot data is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>
<b>FAIL-SAFE FUNCTION</b>	<ul style="list-style-type: none"> <li>Inhibits engine-stop by operating the i-stop function.</li> <li>PCM restricts engine-transaxle integration control.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>CMP sensor connector or terminals malfunction</li> <li>CKP sensor connector or terminals malfunction</li> <li>PCM connector or terminals malfunction</li> <li>Deviation between camshaft and CMP sensor detection area</li> <li>Damage to detection area of CMP sensor</li> <li>CMP sensor malfunction</li> <li>CKP sensor pulse wheel malfunction</li> <li>CKP sensor malfunction</li> <li>Improper valve timing <ul style="list-style-type: none"> <li>Improper installation of timing chain to the camshaft sprocket teeth</li> <li>Timing chain damage</li> <li>Camshaft sprocket damage</li> </ul> </li> <li>PCM malfunction</li> </ul>
<b>SYSTEM WIRING DIAGRAM</b>	Not applicable

## Diagnostic Procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA (MODE 2)/ SNAPSHOT DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA (Mode 2)/snapshot data been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA (Mode 2)/snapshot data on the repair order, then go to the next step.
2	<b>VERIFY RELATED SERVICE INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Information availability.</li> <li>Is any related Service Information available?</li> </ul>	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	<b>VERIFY RELATED PENDING CODE AND/OR DTC</b> <ul style="list-style-type: none"> <li>Switch the ignition off, then ON (engine off).</li> <li>Perform the Pending Trouble Code Access Procedure and DTC Reading Procedure. (See ON-BOARD DIAGNOSTIC TEST [SKYACTIV-D 2.2].)</li> <li>Are any other PENDING CODEs and/or DTCs present?</li> </ul>	Yes Go to the applicable PENDING CODE or DTC inspection. (See DTC TABLE [SKYACTIV-D 2.2].)
		No Go to the next step.
4	<b>INSPECT CMP SENSOR CONNECTOR CONDITION</b> <ul style="list-style-type: none"> <li>Switch the ignition off.</li> <li>Disconnect the CMP sensor connector.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes Repair or replace the connector and/or terminals, then go to Step 10.
		No Go to the next step.

STEP	INSPECTION		ACTION
5	<b>INSPECT CKP SENSOR CONNECTOR CONDITION</b> <ul style="list-style-type: none"> <li>• Disconnect the CKP sensor connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the connector and/or terminals, then go to Step 10.
		No	Go to the next step.
6	<b>INSPECT PCM CONNECTOR CONDITION</b> <ul style="list-style-type: none"> <li>• Disconnect the PCM connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the connector and/or terminals, then go to Step 10.
		No	Go to the next step.
7	<b>INSPECT CMP SENSOR</b> <ul style="list-style-type: none"> <li>• Inspect the CMP sensor. (See CAMSHAFT POSITION (CMP) SENSOR REMOVAL/INSPECTION [SKYACTIV-D 2.2].)</li> <li>• Is there any malfunction?</li> </ul>	Yes	Replace the CMP sensor, then go to Step 10. (See CAMSHAFT POSITION (CMP) SENSOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.
8	<b>INSPECT CKP SENSOR</b> <ul style="list-style-type: none"> <li>• Inspect the CKP sensor. (See CRANKSHAFT POSITION (CKP) SENSOR INSPECTION [SKYACTIV-D 2.2].)</li> <li>• Is there any malfunction?</li> </ul>	Yes	Replace the CKP sensor, then go to Step 10. (See CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.
9	<b>INSPECT TIMING CHAIN INSTALLATION CONDITION</b> <ul style="list-style-type: none"> <li>• Verify the condition of the timing chain assembly (valve timing, looseness, jumping). (See TIMING CHAIN REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the malfunctioning part according to the inspection results. Assemble the timing chain using the correct timing, then go to the next step. (See TIMING CHAIN REMOVAL/INSTALLATION [SKYACTIV-D 2.2].)
		No	Go to the next step.
10	<b>VERIFY DTC TROUBLESHOOTING COMPLETED</b> <ul style="list-style-type: none"> <li>• Always reconnect all disconnected connectors.</li> <li>• Clear the DTC from the PCM memory using the M-MDS. (See AFTER REPAIR PROCEDURE [SKYACTIV-D 2.2].)</li> <li>• Perform the KOER self test. (See KOEO/KOER SELF TEST [SKYACTIV-D 2.2].)</li> <li>• Is the same DTC present?</li> </ul>	Yes	Repeat the inspection from Step 1. • 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.
11	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE [SKYACTIV-D 2.2].)</li> <li>• Are any DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See DTC TABLE [SKYACTIV-D 2.2].)
		No	DTC troubleshooting completed.