DTC	P0340	Camshaft Position Sensor Circuit Malfunction
DTC	P0342	Camshaft Position Sensor "A" Circuit Low Input (Bank 1 or Single Sensor)
DTC	P0343	Camshaft Position Sensor "A" Circuit High Input (Bank 1 or Single Sensor)

DESCRIPTION

The camshaft position sensor for intake camshaft (G2 signal sensor) consists of a magnet and MR element.

The camshaft has a timing rotor for the camshaft position sensor. When the camshaft rotates, changes occur in the air gaps between the timing rotor and MR element, which affects the magnet. As a result, the resistance of the MRE material fluctuates. The camshaft position sensor converts the camshaft rotation data to pulse signals, and uses the pulse signals to determine the camshaft angle, which it sends to the ECM. Then the ECM uses this data to control fuel injection time and injection timing.

DTC No.	DTC Detection Condition	Trouble Area
P0340	When ether of following conditions is met: • No camshaft position sensor signal to ECM at engine speed 600 rpm or more (1 trip detection logic) • Missing camshaft position sensor signal despite crankshaft position sensor inputs normal at engine speed of 600 rpm or more (1 trip detection logic)	• Open or short in camshaft position sensor circuit • Camshaft position sensor • Intake camshaft • Jumped tooth of timing chain for intake camshaft • ECM
P0342	Output voltage of camshaft position sensor less than 0.3 V for 4 seconds (1 trip detection logic)	• Open or short in camshaft position sensor circuit • Camshaft position sensor • Intake camshaft • Jumped tooth of timing chain for intake camshaft • ECM
P0343	Output voltage of 4.7 V for 4 seconds (1 trip detection logic)	• Open or short in camshaft position sensor circuit • Camshaft position sensor • Intake camshaft • Jumped tooth of timing chain for intake camshaft • ECM

HINT:

DTC P0340 indicates a malfunction relating to the camshaft position sensor circuit (the wire harness between the ECM and camshaft position sensor, and the camshaft position sensor itself).

Reference: Inspection using an oscilloscope INFO.

MONITOR DESCRIPTION

If no signal is transmitted by the camshaft position sensor despite the engine revolving, or the rotation of the camshaft and the crankshaft is not synchronized, the ECM interprets this as a malfunction of the sensor.

If the malfunction is not repaired successfully, the DTC is set 10 seconds after the engine is nest started.

MONITOR STRATEGY

Related DTCs	P0340: Camshaft position sensor verify pulse input P0342: Camshaft position sensor range check (Low voltage) P0343: Camshaft position sensor range check (High voltage)
Required Sensors/Components (Main)	Camshaft position sensor
Required Sensors/Components (Related)	Crankshaft position sensor
Frequency of Operation	Continuous
Duration	5 seconds: Camshaft position /sensor verify pulse input 4 seconds: Camshaft position sensor range check (Low voltage, high voltage)
MIL Operation	Immediately
Sequence of Operation	None

TYPICAL ENABLING CONDITIONS

All

Monitor runs whenever following DTCs are not present	None

P0340: Camshaft Position Sensor Verify Pulse Input

Engine speed	600 rpm or more
Starter	OFF
Camshaft position sensor range check fail (P0342, P0343)	Not detected
Camshaft position sensor voltage	0.3 to 4.7 V
Lost communication of power management control ECU (U0293)	Not detected

P0342, P0343: Camshaft Position Sensor Range Check (Low Voltage, High Voltage)

Starter	OFF
Time after power switch OFF to on (IG)	2 seconds or more
Camshaft position sensor verify pulse input fail (P0340)	Not detected

Battery voltage	8 V or more

TYPICAL MALFUNCTION THRESHOLDS

P0340: Camshaft Position Sensor Verify Pulse Input

Camshaft position and crankshaft position alignment	Misalignment
Camshaft position sensor signal	No signal

P0342: Camshaft Position Sensor Range Check (Low Voltage)

Camshaft position sensor voltage	Less than 0.3 V

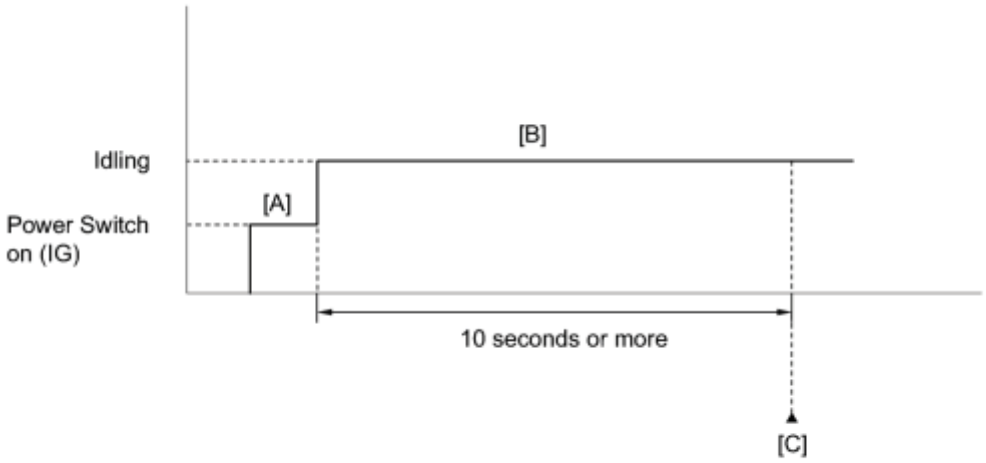
P0343: Camshaft Position Sensor Range Check (High Voltage)

Camshaft position sensor voltage	More than 4.7 V

COMPONENT OPERATING RANGE

Camshaft position sensor	Camshaft position sensor output voltage fluctuates while camshaft revolving 3 camshaft position sensor signals per 2 crankshaft revolutions
Camshaft position sensor voltage	0.3 to 4.7 V

CONFIRMATION DRIVING PATTERN



1. Connect the Techstream to the DLC3.

2. Turn the power switch on (IG) and turn the Techstream on.
3. Clear the DTCs (even if no DTCs are stored, perform the clear DTC procedure) INFO.
4. Turn the power switch off and wait for 30 seconds.
5. Turn the power switch on (IG) and turn the Techstream on [A].
6. Put the engine in inspection mode INFO.
7. Start the engine.
8. Idle the engine for 10 seconds or more [B].
9. Enter the following menus: Powertrain / Engine and ECT / Trouble Codes.
10. Read the DTC [C].
11. If a DTC is output, the system is malfunctioning.

    HINT:

    If a DTC is not output, perform the following procedure.

12. Enter the following menus: Powertrain / Engine and ECT / Utility / All Readiness.
13. Input the DTC: P0340, P0342 or P0343.
14. Check the DTC judgment result.

Techstream Display	Description
NORMAL	○ DTC judgment completed ○ System normal
ABNORMAL	○ DTC judgment completed ○ System abnormal
INCOMPLETE	○ DTC judgment not completed ○ Perform driving pattern after confirming DTC enabling conditions
UNKNOWN	○ Unable to perform DTC judgment ○ Number of DTCs which do not fulfill DTC preconditions has reached ECU memory limit

    HINT:

    - If the judgment result shows ABNORMAL, the system has a malfunction.
    - If the judgment result shows NORMAL, the system is normal.
    - If the judgment result shows INCOMPLETE or UNKNOWN, perform step [B] again.

15. Enter the following menus: Powertrain / Engine and ECT / Utility / All Readiness.
16. Check the judgment result.

    HINT:

    - If the judgment result shows ABNORMAL, the system has a malfunction.
    - If the judgment result shows NORMAL, the system is normal.

17. If the test result is INCOMPLETE or UNKNOWN and no DTC is output, perform a universal trip and check for permanent DTCs INFO.

HINT:

- If a permanent DTC is output, the system is malfunctioning.
- If no permanent DTC is output, the system is normal.

WIRING DIAGRAM

Refer to DTC P0335 INFO.

INSPECTION PROCEDURE

HINT:

- Read freeze frame data using the Techstream. The ECM records vehicle and driving condition information as freeze frame data the moment a DTC is stored. When troubleshooting, freeze frame data can be helpful in determining whether the vehicle was running or stopped, whether the engine was warmed up or not, whether the air fuel ratio was lean or rich, as well as other data recorded at the time of a malfunction.
- If no problem is found through this diagnostic troubleshooting procedure, troubleshoot the engine mechanical system.

PROCEDURE

1.	CHECK ANY OTHER DTCS OUTPUT (IN ADDITION TO DTC P0340, P0342 AND P0343)

(a) Connect the Techstream to the DLC3.

(b) Turn the power switch on (IG).

(c) Turn the Techstream on.

(d) Enter the following menus: Powertrain / Engine and ECT / Trouble Codes.

(e) Read the DTCs.

Result:

Result	Proceed to
DTC P0340, P0342 or P0343 is output	A
DTC P0340, P0342 or P0343 and other DTCs are output	B

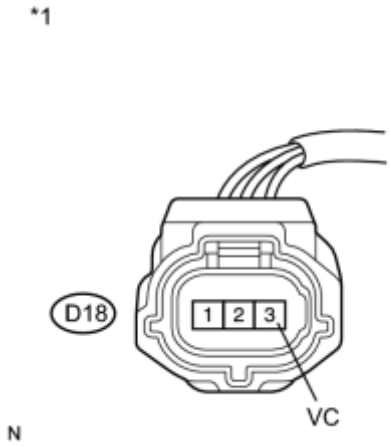
HINT:

If any DTCs other than P0340, P0342 and P0343 are output, troubleshoot those DTCs first.

B GO TO DTC CHART

A

2.	INSPECT CAMSHAFT POSITION SENSOR (POWER SOURCE)



(a) Disconnect the camshaft position sensor connector.

(b) Turn the power switch on (IG).

(c) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

Tester Connection	Switch Condition	Specified Condition
D18-3 (VC) - Body ground	Power switch on (IG)	4.5 to 5.0 V

Text in Illustration

*1	Front view of wire harness connector (to Camshaft Position Sensor)

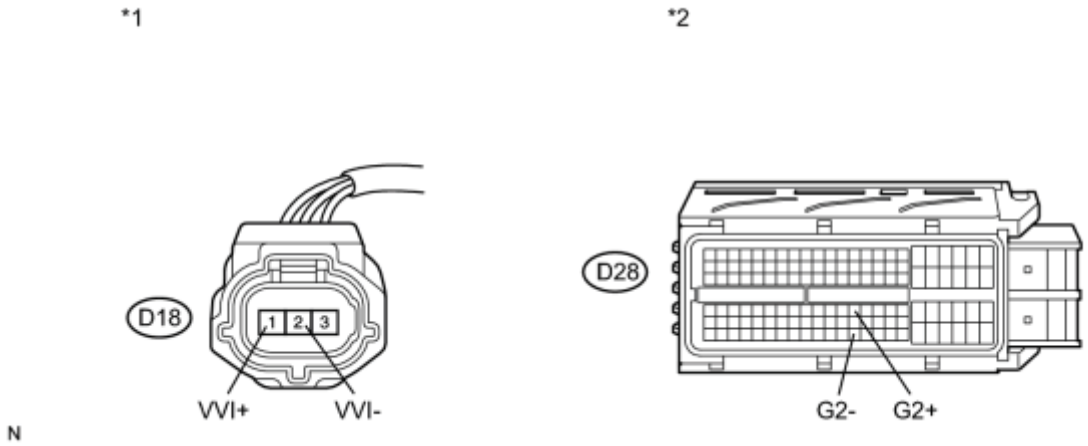
(d) Reconnect the camshaft position sensor connector.

NG ▶ CHECK HARNESS AND CONNECTOR (CAMSHAFT POSITION SENSOR - ECM)

OK ▼

3.	CHECK HARNESS AND CONNECTOR (CAMSHAFT POSITION SENSOR - ECM)

(a) Disconnect the camshaft position sensor connector.



(b) Disconnect the ECM connector.

(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance (Check for Open):

Tester Connection	Condition	Specified Condition
D18-1 (VVI+) - D28-76 (G2+)	Always	Below 1 Ω
D18-2 (VVI-) - D28-122 (G2-)	Always	Below 1 Ω

Standard Resistance (Check for Short):

Tester Connection	Condition	Specified Condition
D18-1 (VVI+) or D28-76 (G2+) - Body ground	Always	10 kΩ or higher
D18-2 (VVI-) or D28-122 (G2-) - Body ground	Always	10 kΩ or higher

Text in Illustration

*1	Front view of wire harness connector (to Camshaft Position Sensor)	*2	Front view of wire harness connector (to ECM)

(d) Reconnect the camshaft position sensor connector.

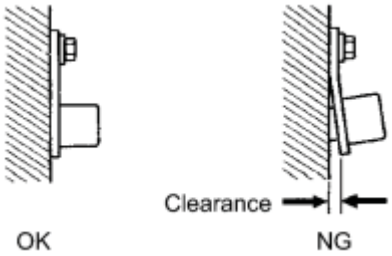
(e) Reconnect the ECM connector.

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (CAMSHAFT POSITION SENSOR - ECM)

OK ▼

4.	CHECK SENSOR INSTALLATION (CAMSHAFT POSITION SENSOR)

(a) Check the camshaft position sensor installation.



OK:

Sensor is installed correctly.

NG ▶ SECURELY REINSTALL SENSOR

OK ▼

5.	INSPECT INTAKE CAMSHAFT (TIMING ROTOR)

(a) Check the timing rotor of the intake camshaft.

OK:

Camshaft timing rotor does not have any cracks or deformation.

NG ▶ REPLACE INTAKE CAMSHAFT

OK ▼

6.	REPLACE CAMSHAFT POSITION SENSOR

(a) Replace the camshaft position sensor INFO.

NEXT ▼

7.	CHECK WHETHER DTC OUTPUT RECURS (P0340, P0342 OR P0343)

(a) Connect the Techstream to the DLC3.

(b) Turn the power switch on (IG).

(c) Turn the Techstream on.

(d) Clear the DTCs INFO.

(e) Put the engine in inspection mode INFO.

(f) Drive the vehicle in accordance with the driving pattern described in the Confirmation Driving Pattern.

(g) Enter the following menus: Powertrain / Engine and ECT / Trouble Codes.

(h) Read the DTCs.

Result:

Result	Proceed to
DTC P0340, P0342 or P0343 is output	A
DTC is not output	B

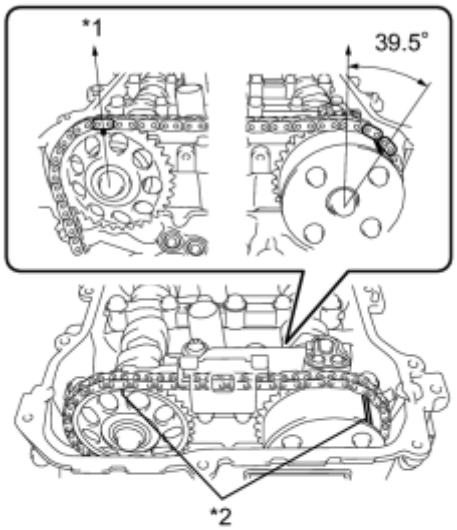
HINT:

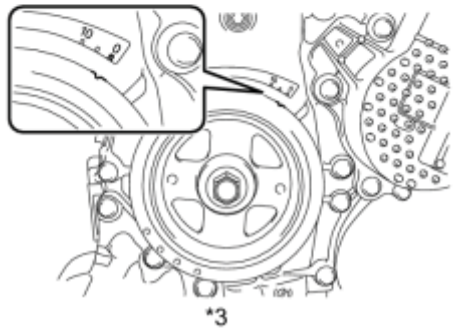
If the engine does not start, replace the ECM.

B ▶ END

A ▼

8.	ADJUST VALVE TIMING





c

HINT:

There are no marks on the cylinder head to match-up for the purpose of checking valve timing. Valve timing can only be inspected by lining up the colored plates on the timing chain with the marks on the pulleys. It may be necessary to remove and reinstall the chain to match-up the alignment marks INFO.

Text in Illustration

*1	Top
*2	Alignment Mark
*3	No. 1 Cylinder at TDC Compression

NEXT ▼

9.	CHECK WHETHER DTC OUTPUT RECURS (P0340, P0342 OR P0343)

(a) Connect the Techstream to the DLC3.

(b) Turn the power switch on (IG).

(c) Turn the Techstream on.

(d) Clear the DTCs INFO.

(e) Put the engine in inspection mode INFO.

(f) Drive the vehicle in accordance with the driving pattern described in the Confirmation Driving Pattern.

(g) Enter the following menus: Powertrain / Engine and ECT / Trouble codes.

(h) Read the DTCs.

Result:

Result	Proceed to
DTC is not output	A
DTC P0340, P0342 or P0343 is output	B

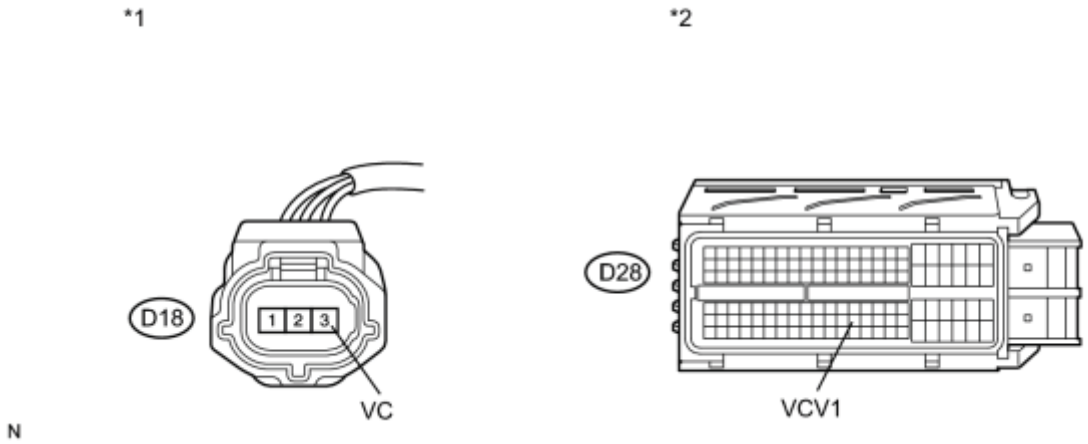
HINT:

If the engine does not start, replace the ECM.

B ▶ REPLACE ECM
A ▶ **END**

10.	CHECK HARNESS AND CONNECTOR (CAMSHAFT POSITION SENSOR - ECM)

(a) Disconnect the camshaft position sensor connector.



(b) Disconnect the ECM connector.

(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance (Check for Open):

Tester Connection	Condition	Specified Condition
D18-3 (VC) - D28-99 (VCV1)	Always	Below 1 Ω

Standard Resistance (Check for Short):

Tester Connection	Condition	Specified Condition
D18-3 (VC) or D28-99 (VCV1) - Body ground	Always	10 kΩ or higher

Text in Illustration

*1	Front view of wire harness connector (to Camshaft Position Sensor)	*2	Front view of wire harness connector (to ECM)

(d) Reconnect the camshaft position sensor connector.

(e) Reconnect the ECM connector.

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (CAMSHAFT POSITION SENSOR - ECM)
OK ▶ **REPLACE ECM**