



Technical Service Bulletin

Model All Model
Group Fuel System(14)
Number KT2009050801

Subject

Constant Variable Valve Timing Oil Control Valve Inspection (Engine - 046)

Date Monday, May 11, 2009
Area N. America

- Description

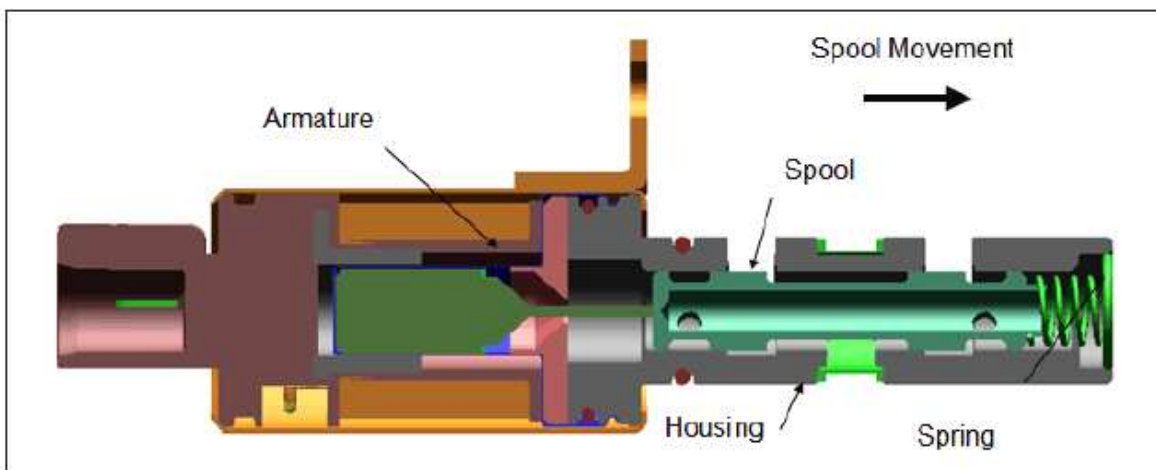
This bulletin provides information related to the Oil Control Valve (OCV) used in Constant Variable Valve Timing (CVVT). If at any time the OCV is suspected as a cause of rough idling, poor acceleration, camshaft timing misalignment-related trouble codes, misfire-related trouble codes, etc., on a Kia vehicle equipped with Continuously Variable Valve Timing (CVVT) system, be sure to perform the OCV inspection procedure below before replacement.

If the OCV operates normally, inspect for other engine malfunctions. Do not replace the OCV.

*NOTICE

TECH TIP:

Make sure the oil filter is OE; aftermarket oil filter flow rates differ and may affect the CVVT system performance.



Delphi Oil Control Valve (OCV) Shown - Denso Similar

Engine	Vehicle Model	OCV Supplier
Alpha 1.6L/Gamma 1.6L	Rio (JB), Soul (AM)	Denso
Theta 2.0L, 2.4L	Optima (MG), Rondo (UN), Forte (TD)	Denso
Beta 2.0L	Spectra (LD), Sportage (KM)	Siemens
Mu 2.7L	Optima (MG), Sedona (VQ)	Delphi
Lambda 3.3L/3.8L	Amanti (GH), Borrego (HM), Sedona (VQ), Sorento (BL)	Delphi
Tau 4.6L	Borrego (HM)	Delphi

Related Diagnostic Trouble Codes	
P0011	'A' camshaft position - Timing over-advanced or System performance (Bank 1)
P0012	'A' camshaft position - Timing over-retarded (Bank 1)
P0014	'B' camshaft position - Timing over-advanced or System performance (Bank 1)
P0015	'B' camshaft position - Timing over-retarded (Bank 1)
P0016	Crankshaft position-Camshaft position correlation (Bank 1, Sensor A)
P0018	Crankshaft position-Camshaft position correlation (Bank 2, Sensor A)
P0021	'A' camshaft position - Timing over-advanced or System performance (Bank 2)
P0022	'A' camshaft position - Timing over-retarded (Bank 2)
P0300	Random/Multiple cylinder misfire detected

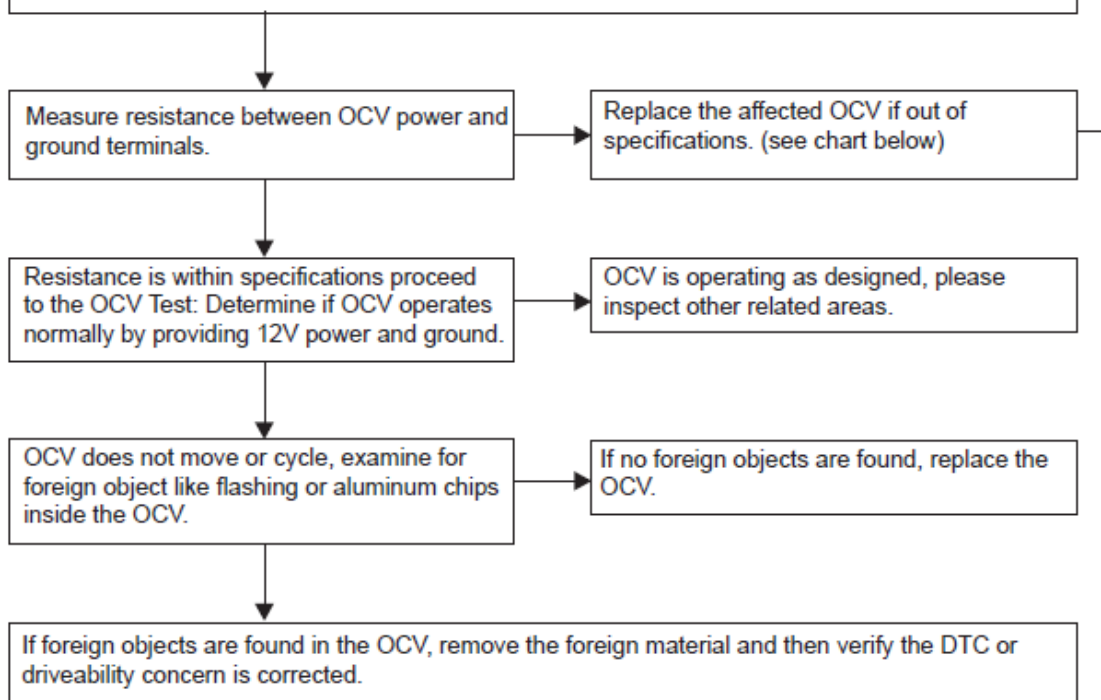
- Service Procedure

Basic Inspections:

- Monitor the waveforms of the crankshaft and camshaft position sensors with GDS.
- Check if the OCV connectors are securely connected and pin tension is correct.
- Check the OCV connector seals are well seated; LH and RH OCV's are installed in place.

***NOTICE**

LH and RH OCV connectors are different in color on V-6 configurations.



OCV Supplier	OCV Coil resistance (at 68° F)
Denso	6.9 ~ 7.9 Ω
Delphi	6.7 ~ 7.7 Ω
Siemens	6.8 ~ 8.0 Ω

1. Measure the resistance between the OCV power and ground terminals.

Measured Resistance (68° F)	Action to Take
Denso (6.9 ~ 7.9 Ω) Delphi	Check if the OCV

(6.7 ~ 7.7Ω) Siemens (6.8 ~ 8.0 Ω)	operates normally by providing 12V power. (See Step 2.)
Infinity	Open circuit →Replace the OCV.
Abnormally low or Zero resistance	Short circuit →Replace the OCV.



2. Check if the OCV operates normally by providing 12V power supply as shown. Do not apply voltage for longer than 5 seconds at a time; Do not overheat OCV windings.



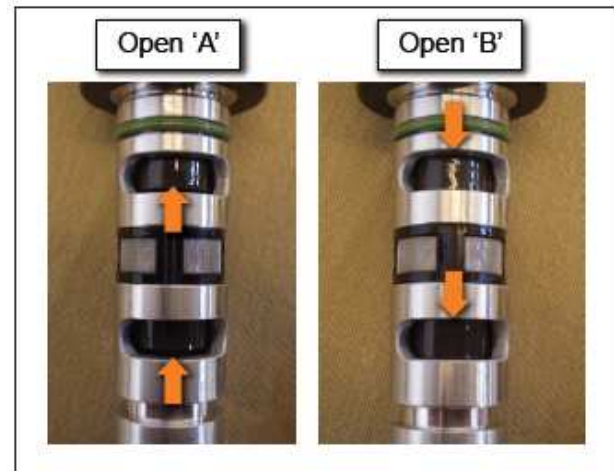
*NOTICE

Careful attention is necessary to avoid short circuit when providing the OCV with 12V power because the spacing between the OCV power and ground terminals is very narrow.

3. When 12V power is provided to the OCV, the OCV must move forward as shown in the right picture.

A: Maximum retarded valve timing condition (12V not provided) Normally Open

B: Maximum advanced valve timing condition (12V provided) Closed when energized.



4. If the OCV does not move forward, examine carefully for a foreign object like an aluminum chip or flashing which maybe jammed inside OCV passage.

- Blow out the foreign object using compressed air, reuse the OCV and then verify that the fault is corrected.

The OCV can be replaced for the following conditions:

- Resistance out of specification
- Valve does not move when voltage is applied
- Foreign debris cannot be removed from the OCV

WARRANTY CLAIM INFORMATION:

Use Normal Warranty Procedures which includes diagnostic time.

