

Technical Bulletin

Nissan / Renault / Toyota - Suction Control Valve Diagnosis and Replacement

Applicable References: ADT36846C

Applications: Nissan Primera P12 2002>2006 , X-Trail 2001>2003, / Renault Espace 2002>, Vel Satis 2006> / Toyota Avensis 2.0 D-4D (CDT220) 1999>2003, Avensis Verso 2.0 D-4D (CLM20) 2001>2005, Corolla 2.0 D-4D (CDE110) 2000>2001, Corolla Verso 2.0 D-4D (CDE120) 2001>2004, Corolla 2.0 D-4D (CDE120) 2001>2007 (90bhp & 109bhp), Previa 2.0 D-4D (CLR30) 2001>2007, RAV4 2.0 D-4D (CLA20/21) 2001>2006, Landcruiser 90 3.0 D-4D 2000>2002, Landcruiser 120 3.0 D-4D 2002>2004

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Vehicles fitted with the Denso HP2 fuel system can suffer with running issues such as surging, erratic idle and a sudden lack of power which can be intermittent.

The Denso HP2 electronic high-pressure fuel pump is fitted with a pair of Suction Control Valves (SCVs), sometimes referred to as Inlet Metering Valves, which control the fuel rail pressure and volume of fuel.

SCVs are solenoid controlled and have extremely fine tolerances within their moving parts which are quickly affected by dirt and or contaminated fuel.

Worn or contaminated SCVs will cause the HP2 pump to deliver an inconsistent fuel pressure to what is being requested by the engine ECU. Inconsistent fuel pressure at the injectors can cause surging as the ECU attempts to find the correct operating fuel pressure.

The original SCVs can also suffer with a 'slowing' of their operation caused by valve seat wear.

Connecting an affected vehicle to suitable diagnostic equipment should show varying fuel pressures outside of manufacturers tolerances.

It may also display the following diagnostic trouble codes:

P0627 (fuel pump control circuit open)

DTC No.	DTC Detection Condition	Trouble Area
P0627	<ul style="list-style-type: none">• No fuel feed• Internal fuel pressure is below the target fuel pressure despite the engine ECU opens the suction control valve (1 trip detection logic)	<ul style="list-style-type: none">• Open in supply pump (suction control valve) circuit• Supply pump (Suction control valve)• Supply pump (Suction control valve stuck closed)• Engine ECU

or **78 (fuel circuit malfunction)** - this is a 'Toyota specific' code

If either of these codes exist then replacing the SCV's is likely to rectify the fault.

NOTE: Toyota D-4D engines can suffer additional problems with the fuel pumps, injectors, EGR systems and Vacuum Switching Valves, so whilst SCV replacement will have a high success rate it is not a 'fix-all' part.

Blue Print's suction control valves – ADT36846 – have been modified from the original specification meaning they should last longer than the valves originally fitted, and being a Blue Print part means they are covered by a 3 year unlimited mileage warranty.

Blue Print has produced the following guide for replacing SCVs on a Toyota RAV4 and the basic principles will be the same for other vehicles fitted with the Denso HP2 pump.

When replacing the SCVs on Nissan models it is advised that you also perform a 'Fuel pump ECU reset' using suitable diagnostic equipment, or using the manufacturer's manual procedure.

Repair time approximately 45 minutes.

Please turn over...

2003 Toyota RAV4 2.0D-4D engine compartment



- Unbolt the radiator expansion bottle (2 nuts) and move it to one side to gain access to the fuel pump. (You may wish to disconnect the upper hose and plug it to give you more room.)
- Remove the air intake/intercooler pipe.



- The fuel pump is now visible (just to the left of the starter motor). Make sure the area around the green and red SCV's is as clean as possible to reduce the risk of debris entering the pump. **NOTE:** Debris entering the pump can cause injector malfunction leading to possible catastrophic engine failure.
- Disconnect the wiring connectors from the SCV's.



- Remove the four SCV mounting bolts (two per valve) and then remove the two valves from the pump making sure you note the positions of the red and green valves. (red at the front)
- Although the seals on the new valves are pre-lubricated, it is good practice to apply a little engine oil to the seals to reduce the risk of damage during fitting.



- Ensuring the mounting area is clean, install the valves carefully making sure that they are installed in their correct positions and that the valve flange fits flush to the pump before tightening the fixing bolts to 13Nm (10lb-ft).
- The rest of the fitting procedure is the reverse of the removal.
- Reset the engine diagnostic trouble codes using a suitable diagnostics tool (or by removing the ECU fuse for a couple of minutes) before road testing vehicle.