

## Rover SD1 Auto Efi/Vitesse – Engine Stalling Under Additional Load

Some time after introduction of the Rover SD1 Auto Efi Vdp and Auto Vitesse, Rover started to receive reports of engine stalling when Drive was selected, particularly when other loads such as Power Steering and Air Conditioning were simultaneously being applied to the engine.

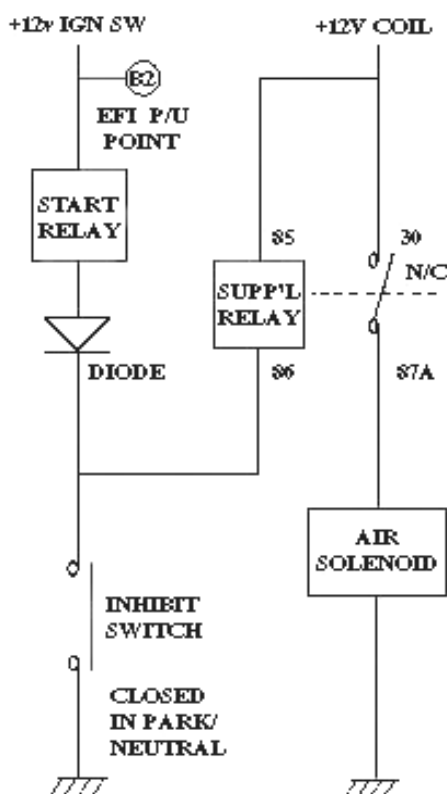
To overcome this, a modification incorporating a supplementary air valve was devised. The valve would open when Drive/Reverse is selected and prevent stalling by correcting the air/fuel mixture.

When the problem was confirmed on a customer's car, the alteration was carried out at dealer level. Although the dealerships retained details of the change, no documentation ever appeared in the Rover Workshop Manual or the Haynes version of the same, but the list of components did appear on the parts microfiche.

About 1000 Efi Vdp's were manufactured and perhaps a few dozen Vitesse versions. Over time, as ownership of these vehicles changed, less dealership servicing was performed and knowledge of the alteration became diluted or even lost, particularly for the newer owners.

The modifications then started to fail, typically due to a faulty inhibitor switch being bypassed with (say) a Scotch connector or a failed relay or air-valve, thus alterations became corrupted and eventually even partially dismantled. Consequently, to all intents and purposes, of the few versions of these cars remaining, hardly any will still have a working modification and if any current working system fails, diagnosis is extremely difficult because of the total lack of documentation.

I came across two faulty dealer modifications on a couple of Efi Vdp's owned personally. Both had remnants of the original wiring and components variously fitted to the original standard scheme. Diligent tracing of the components and wiring made it possible to reconstruct the working modification on the 2nd car, which then continued to function for over 8 years since resurrection.



Some time after I solved the riddle, a copy of the original Rover technical instructions for retrofitting this modification came to light, via a club member who had the modification installed professionally by a Rover dealer.

How then, did Rover solve the problem originally and how did the system actually function?

The key element is that the transmission "Start Inhibit Switch" must be functional and control the start relay as normal. Thus, when the car is put into Drive/Reverse the inhibit switch operates a supplementary relay to activate an Air Solenoid, which bleeds metered air from the Air Rail into the Plenum Chamber increasing idle speed sufficiently to offset the additional load applied by the torque converter and transmission.

Mounted centrally at the rear of the plenum, the solenoid is connected by metal Tee Pieces let into the air rail adjacent to the throttle shaft and the output pipe from the Extra Air Valve to the plenum.

In detail, then, the circuit diagram shows a diode inserted in the circuit adjacent to the start relay to prevent an unwanted +12 volt signal from the coil reaching the Efi pick-up point "B2" via the start relay.

With engine running and transmission in Park/ Neutral, the supplementary relay is energised and the air solenoid is not activated. As transmission goes to Drive/Reverse the relay is de-energised and switches on the solenoid, which delivers the additional air.

The changes do not upset the Efi system as the ECU simply responds by providing more fuel in the correct ratio to boost idle speed. It is as if the throttle is marginally opened as the car goes into gear!

Neither do the modifications affect the system when driving as the small amount of extra air introduced by the valve is insignificant during normal operation.

Below are details extracted from the latterly found technical material that will enable owners of these SD1 variants to retro-fit the system to a car that exhibits the stalling symptoms described, or, perhaps more crucially, access sufficient information to diagnose faults or shortcomings on an existing system.

### **Engine Stalling Under Additional Load – Parts Required**

<b><u>Description</u></b>	<b><u>Original P/No</u></b>	<b><u>Description</u></b>	<b><u>Original P/No</u></b>
Supplementary Air Valve* (* Also Tecalemit P/No)	EAC 6534D TDA47-102	1m of 8.77 mm hose	CAC 5868D
Relay	AHU 1061	Diode	DRC 8121
Tee piece	EAC 6804D	Tee piece	EAC 6433D
Clips, 4 off	EAC 3215/2D	Clips, 4 off	EAC 3215/6D

The above parts were also available as a kit-under part number BHM 1570

### **Fitting Procedure for Valve and Hose.**

1. Mount the supplementary air valve on the bottom bolt of the over-run valve fixing, 'A' in fig. 1, at rear of plenum. The flow arrow should point away from throttle body side of engine. It may be necessary to adjust the valve-fixing strap to allow the outer hole to be used.
2. Cut the hose running from near the idle screw gallery to the air rail input at position 'P' in fig. 1 and insert the unrestricted Tee piece. It is necessary to shorten the cut hose to avoid fouling the throttle mechanism (Important: Make a further check upon completion).
3. Using a suitable length cut from the new hose; connect the Tee piece to the new air valve.
4. Cut the hose running from the Efi Extra Air valve ('X') to plenum chamber at position 'S:' in fig. 1 and insert the restricted Tee piece (hole dia. 6mm). Shorten the cut hose as required.
5. Using a suitable length of new hose, connect the Tee piece to the air valve and secure hose in position with clips located in fixings used for injector wiring harness.

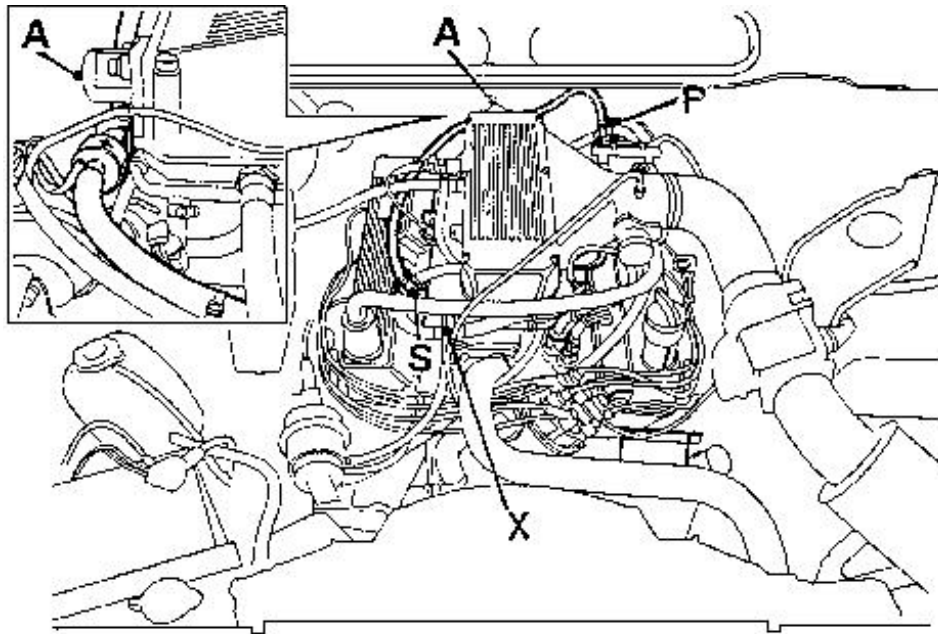


Fig.1

**Electrical connections** (Use appropriate coloured cable, connectors and accessories).

6. Locate gearbox/main harness multiplug (A in fig. 2) situated at N/S bulkhead. Remove white/red leads from the main harness connector (X & Y in fig. 2). Join together and insulate joint.
7. At start relay situated in O/S front wing valance, (B in fig. 2) disconnect and tie back to harness the black wire connected to terminal 85 (86 on some models) of the start relay.
8. Mount the additional relay for supplementary air valve beside existing relays above N/S glove box. Or alternatively, for convenience, on a bracket mounted adjacent to the ignition coil.
9. Connect additional and modified wiring, using 14/030 colour cable and connectors, as follows:

**White/red (W/R in fig. 2):**

- a. Vacated terminal (85) of start relay (B in fig.2) to negative (-) terminal of diode (C in fig. 2).
- b. One vacated terminal of multi-plug (A in fig. 2) to positive (+) terminal of diode (C in fig. 2).
- c. The same terminal as in b. to terminal 86 of additional relay (D in fig 2).

**Black (B in fig. 2):**

- d. Either terminal of air valve (E in fig. 2) to adjacent earth.
- e. Remaining vacated terminal of multi-plug (A in fig. 2) to any adjacent earth.

**White (W in fig. 2):**

- f. Ignition switch positive (+) feed at coil (Z in fig. 2) to terminals 30 & 85 of additional relay (D in fig. 2).

