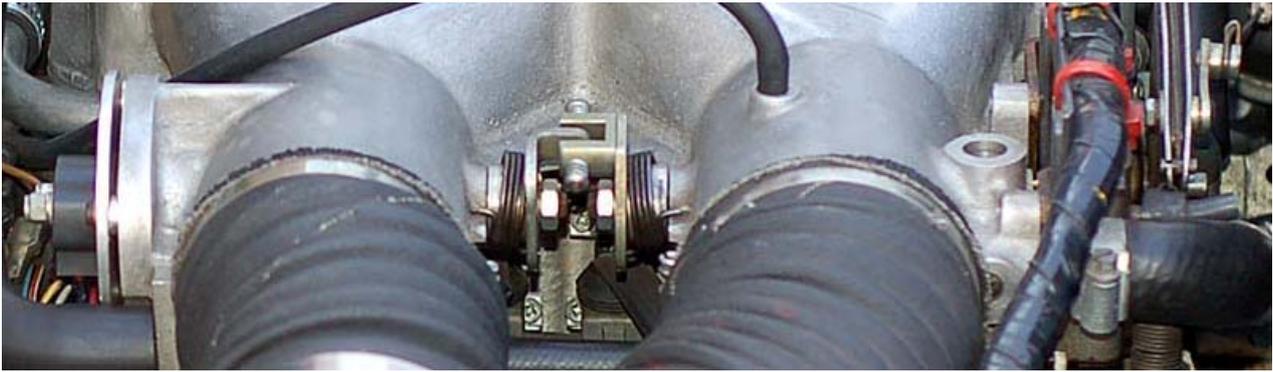


## Engine Idling Problems on Rover SD1 Vitesse with Twin Throttle Plenum



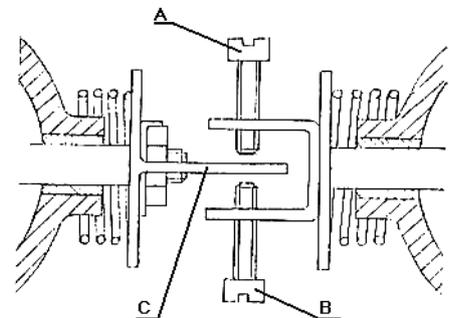
A common fault on this mechanism is “Idle Speed Hang-up”. Friction anywhere in the assembly is the killing factor caused variously by damage, misalignment, contamination and maladjustment. Blocked airways and air leaks are also a concern. This action program will resolve the problem.

### Ensure that the accelerator cable is correctly adjusted

- Allow some free play but without undue slack. If excessively high idling speed cannot be reduced by turning the idle air adjusting screw clockwise, take the following action.

### Check that the front throttle closes fully

- Warning: Throttles must never be moved by turning the interconnecting joint, as this will cause the rear spindle to distort or break.
- If necessary, adjust the two screws on the interconnecting joint as follows:
- Turn screw “A” until there is a gap between it and lever “C” of about 3 mm. Repeat with screw “B”.
- Turn screw “A” until it is about to, but does not quite touch lever “C”. Repeat with screw “B”.



### Check that the rear throttle closes fully

- The quadrant to jackshaft fit is carefully adjusted during manufacture and would not normally be disturbed, except, as most systems were manufactured more than 20 years ago, incorrect fit due to worn parts is now quite common. The following actions can be taken.
- Disconnect the throttle cable from the quadrant and remove the return spring.
- Undo the quadrant securing set-screw/nut/washers and remove the quadrant from the shaft.
- Check the hub area of quadrant for distortion and undue wear preventing it from securely gripping the jackshaft. If damaged, it would normally be discarded and a new one fitted.
- New items may be difficult to obtain but it is possible for the quadrant hub to be dressed and adjusted to restore its grip. This requires careful use of a small hacksaw to open the hub slot and a small file to reshape the seats for the securing set-screw, nut and washers.

- Check the jackshaft for scoring. Use fine emery paper to smooth off any wear and refit the quadrant, ensuring secure attachment of both items to the throttle bracket.
- Adjust the quadrant on the jackshaft so that the rear throttle just begins to open as the quadrant moves away from the stop.
- If after the above actions the engine idling speed is still excessive, it may be necessary to remove the plenum chamber to check the following:

#### **Air tight connection between the plenum chamber and the trumpet housing**

- If unable to locate an air leak with the engine running whilst squirting some WD40 along this joint, remove the plenum chamber and check that an incomplete seal between the face of the plenum chamber and the trumpet housing is not allowing air to enter the plenum chamber along that location.

#### **Fit of the throttle discs to the air intake tunnels of the plenum chamber**

- There is no throttle-stop adjustment screw on the Twin Plenum system and an airtight fit between both throttle discs and the intake tunnels is required. Set the quadrant as described using a torch to check the gap. Suspect discs can be changed if replacements are available, otherwise clean off all deposits and polish the edges and faces for significant improvement.
- Use needle pliers to close the split thread of the disc fixing screws before they are removed. Make an identity mark on one disc to ensure they can be refitted in their original tunnels. Inspect edges for dents or distortion and take extreme care with any renovation of the edges.
- Check the shafts for excessive wear or distortion and replace them if required. If new items are unavailable, again, the existing shafts might be significantly improved by cleaning and polishing. The shafts provide primary bearing surfaces so polishing in that area should be minimised. Dress the slots with fine abrasive paper and needle files to remove burrs or dents and ensure that each throttle disc slides smoothly in its respective slot to aid re-assembly.
- Upon re-assembly, smooth operation without friction in the intake tunnels is paramount. This depends upon axial location of the discs in their slots after the retaining screws are tightened. If a disc interferes with its tunnel, slacken the fixing screws with the throttle closed to allow the disc to centralise itself before retightening the screws. Incorrect axial or radial alignment will also result in unwanted air ingress around the discs. Use a thin blade screwdriver to lock the fixing screws by slightly opening their split threads.
- Central return springs are handed, so ensure correct location to avoid undue spring pressure.

#### **Cleanliness of the overall air intake areas and galleries**

- With the plenum chamber removed from the inlet manifold clean the whole area of sticky oil and carbon deposits particularly the tunnels and breather/idle speed adjustment galleries. Cellulose thinner is an ideal solvent and pipe cleaners are good for cleaning airways. Replace old work hardened seals with new items to reduce air leaks along the shaft bearings.
- Upon refitting the plenum chamber use a thin smear of instant gasket on the joint and ensure there are no other air leaks anywhere in the intake system otherwise the ECU cannot adjust the petrol/air mixture correctly according to the airflow as measured by the airflow meter.

- It should now be possible to set the idle speed at a consistent 825 - 875 rpm, to remain the same each time the throttle is closed and maintain the CO level at 1.5% +/- 0.5%

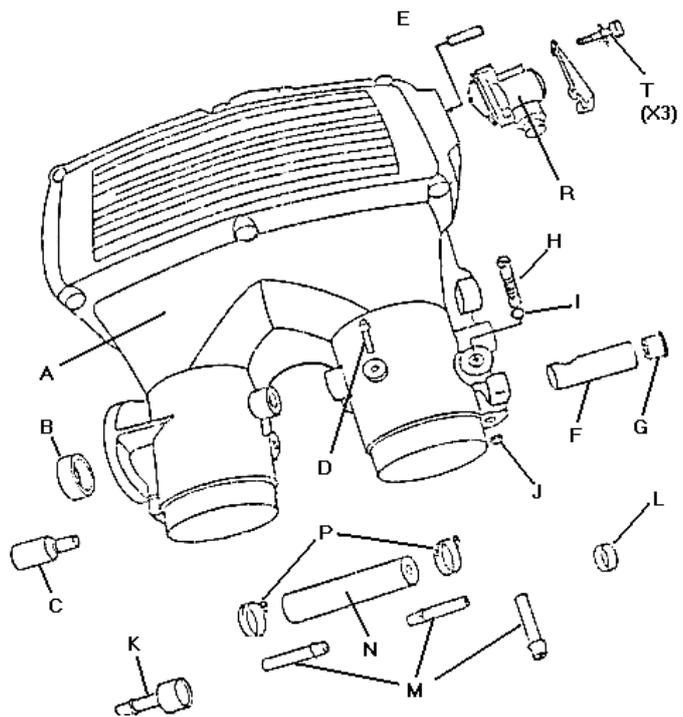
### Additional Spring Assembly

- Some cars have an additional return spring variously retro-fitted to the interconnecting joint to assist closure of the throttle discs. Sadly, the spring resistance also serves to induce extra strain/wear on the front shaft as well as the rest of a system already prone to unwanted friction. Correctly adjusted as described, an additional return spring should not be necessary.

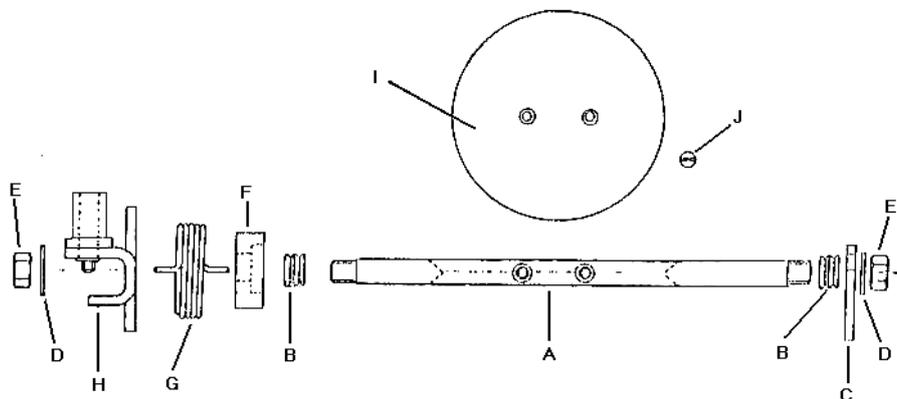
The following tables and drawings show all the component parts of the Twin Throttle Plenum.

### Plenum Chamber Assembly

- A. Plenum chamber ETC 6006A
- B. Throttlepot centralising ring ETC 6015A
- C. Engine breather tube ETC 6034A
- D. Vacuum advance sensor pipe 613070A
- E. Fuel pressure sensor pipe 603276A
- F. Air rail tube ERC 3845A
- G. Air rail tube restrictor ERC 9783A
- H. Idle speed adjust screw ETC 6042A
- I. Idle screw "O" ring ETC 6044A
- J. Blanking plug ERC 255A
- K. Water supply pipe ETC 6033A
- L. Blanking plug 603224A
- M. Water return pipe (3 off) ERC 377A
- N. Hose ETC 6031A
- O. Hose clip (2 off) UKC 6722A
- P. Decelerator(OverRun)valve ERC 9786A
- T. Screw 5/16 x 3/4 UNC and spring washer (3 off) SS505061 & GHF 322

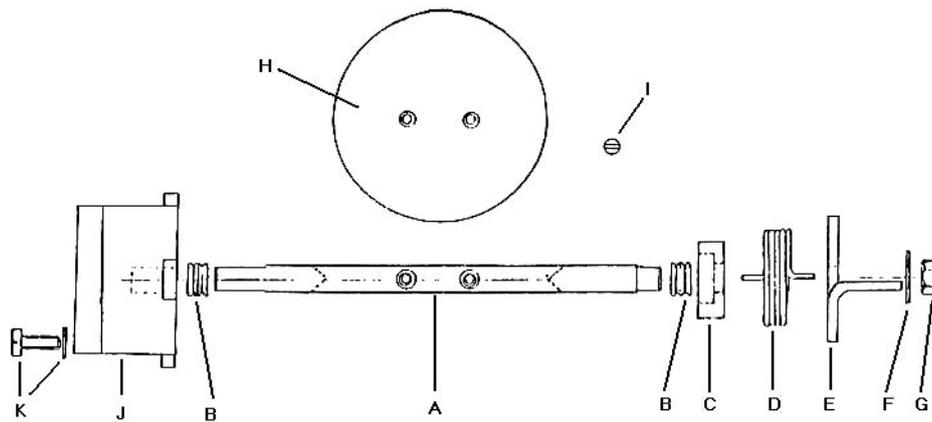


### Rear Throttle Assembly



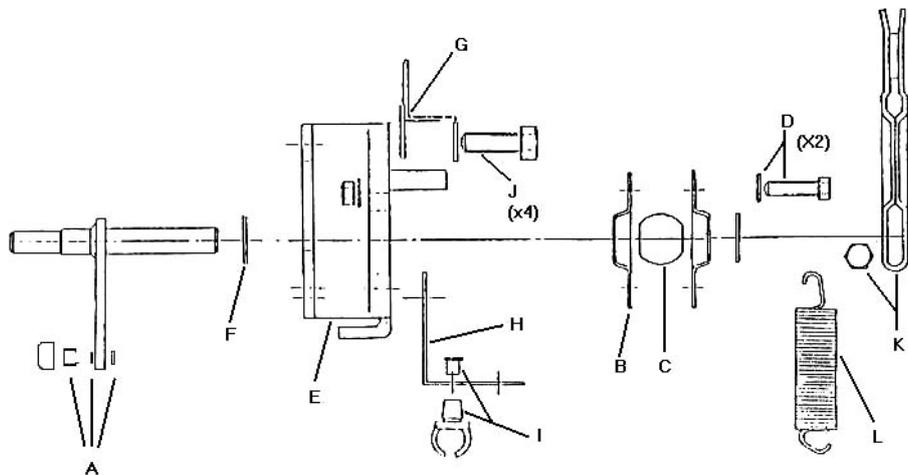
- |  |  |
|--|--|
| A. Rear spindle ETC 6014A              | F. Guide ring ETC 6040A                    |
| B. Spindle seal (2 off) AUD 3577       | G. Rear return spring ETC 6017A            |
| C. Slotted lever ETC 6020A             | H. Rear Adjustment lever ETC 6019A         |
| D. Tab lock washer C43231A             | I. Disc ERC 9112A                          |
| E. Half Nut 5/16" UNF (2 off) NT605041 | J. Countersunk split screw (2 off) 611950A |

## Front Throttle Assembly



- |                                    |   |
|------------------------------------|---|
| A. Front spindle ETC 6013A         | G. Half nut – 5.16” UNF NT605041                |
| B. Spindle seal (2 off) AUD 3577   | H. Disc ERC 9112A                               |
| C. Guide ring ETC 6040A            | I. Countersunk split screw (2 off) 611950A      |
| D. Front return spring ETC 6016A   | J. Throttlepot ERC 3619A                        |
| E. Front adjustment lever ETC6018A | K. Screw and plain washer SC104141/<br>WA104001 |
| F. Tab lock washer C43231A         |   |

## Plenum Chamber Throttle Linkage



- |   |   |
|---|---|
| A. Jackshaft assembly, bearing pin, roller and circlip ETC 6022A                                    | G. Cable tray DRC 5464  |
| B. Spherical housing (2 off) ERC 4211A  | H. Pipe support and spring anchor plate ETC 6056A   |
| C. Spherical bush ERC 4215A   | I. Fuel pipe clip (2 off) 79121A  |
| D. Set screw 257004A, spring WL700101, plain washer GHF 300 and nut 257011. No. 10 UNF (2 off each) | J. Set screw M6 x 16 SH106161 & washer GHF 381 (2 off each)                                   |
| E. Control bracket ETC 6021A  | K. Quadrant lever assembly, set screw M5 x 25, spring washer, plain washer and nut. ETC 6023A |
| F. “Belleville” washer (2 off) GHF 306  |   |

## **Footnotes and Additional Material**

- Whilst this overall discussion and detail applies to the Twin Throttle Plenum as fitted to the later Rover SD1 Vitesse, specific information related to air leakage, friction in the throttle assembly and cleanliness of the air intake mechanism may be laterally applied to the Single Throttle Plenum as fitted to the earlier Vitesse and the VDP Efi.
- Some Single Plenum assemblies were fitted with a throttle stop adjustment screw and on these there was a recommendation that the gap between the disc and the housing should be set variously between 0.002" and 0.005". It very much depends on how much wear is present and how low the idle speed can be adjusted using the adjustment screw.
- A strange complication occurs on Single Plenum cars fitted with both Hella Cruise Control System and Automatic Transmission. The cruise control quadrant fouls its own support bracket and prevents full throttle opening. Close inspection of this mechanism whilst operating the throttle will reveal this unusual conflict. Removing the bracket and relieving the area fouled by the quadrant with a file or grindstone will cure the fault and allow full open throttle. The acceleration difference is dramatic.
- This material is adapted from a Rover Technical Bulletin not published in the usual Workshop Manuals. However, it covers only a small part of the complete Efi system. If there are other fuel injection problems requiring attention, they can be addressed using a Testing and Adjustment Program to be found via the web site or blog links below.

Ramon

Website: <http://www.vintagemodelairplane.com>

Blog: <http://uk.blog.360.yahoo.com/maureen9235>