THE SPEEDOSTAT

Andrew Sait kindly shared his experience with overhauling this complicated little gadget that was the Factory's seminal effort to provide customers with a cruise control. Actually known as the Wilmot Speed Control ("Speedostat" is not really RR language is it?) the gadget first appeared in the early seventies and if it `failed to control' you simply replaced it! The mind boggles at what it must have cost. Presumably for this reason instructions were never issued, as far as we can gather, on how to overhaul the things. Like all of us they are feeling their age and as will be apparent when you read Andrew's article the `rottable' bits are certainly fulfilling their destiny!

The following article was extracted from Issue 76 of Tee One Topics for ease of reference and is available to all and any intrepid souls who will have a go at fixing the things.

SPEEDOSTAT SPEED CONTROL UNIT

Andrew Sait

The dismantling and overhaul of the unit was prompted after I discovered that the rough idling on my car was caused by air leaking into the inlet manifold via the rubber pipe from the speed control unit; whatever component was meant to close off the pipe was clearly not working. Removing the unit is easy enough; unscrew the two speedo cables, pull the two rubber pipes off the back, pull off the multiplug unit and single wire and undo the two mounting bolts on the back. The unit can then be removed from the car. Removing the windscreen washer bottle facilitated access.

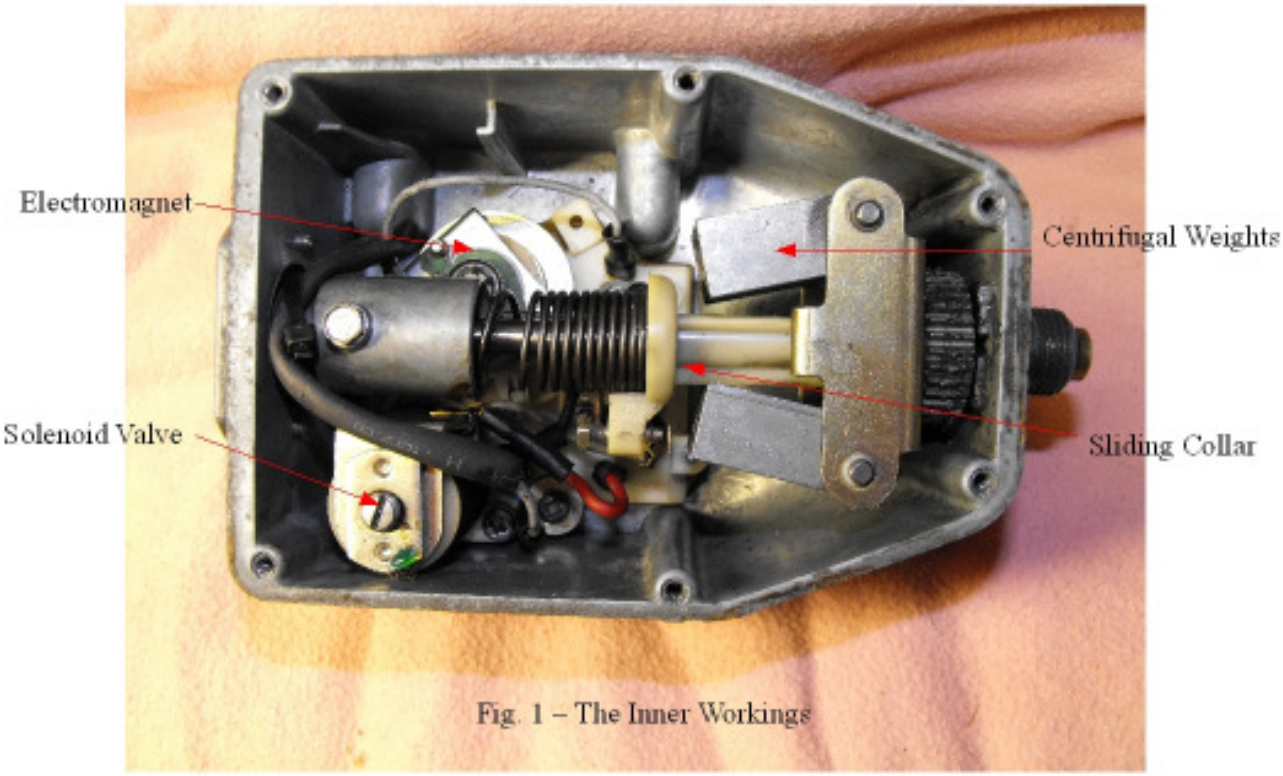


Fig. 1 – The Inner Workings

Once on the workbench remove the six screws securing the top cover which lifts off to reveal the inner workings (Fig.1).

Dismantling starts by removing the two screws securing the end cap supporting the end of the spindle holding the centrifugal weights and sliding collar. The end cap is in two parts: the end cap itself and a collar that is fixed in position by a hexagon headed screw that locks the compression of the spring.

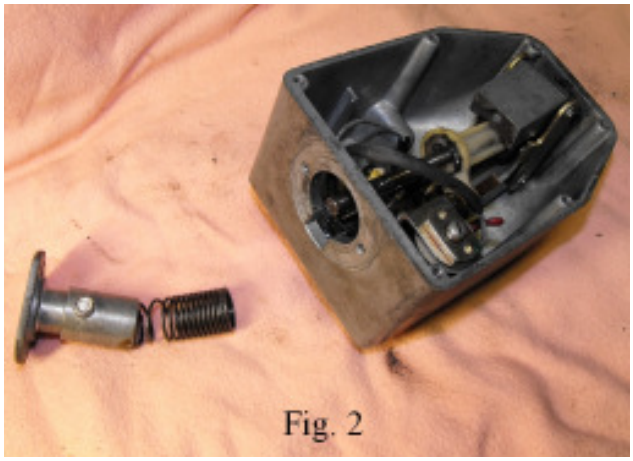


Fig. 2

There is a cut-out in the casing so that once the two fixing screws are undone the whole end-cap assembly can be rotated through 180 enabling the it to be removed without undoing the locking screw (Fig 2).

If the locking screw is removed it will have left a mark on the barrel of the end cap making re-assembly in the same position possible by completely removing the locking screw and lining the mark up with the screw-hole in the collar. The spindle/centrifugal weight/sliding collar assembly is connected by a sliding spring mechanism to a pin on the electromagnet. To remove the whole spindle assembly from the casing it is therefore necessary to unhook the spring mechanism from the electromagnet. Once this is done it is possible to carefully manoeuvre the spindle assembly to the left (best done with the weights in the vertical plane) until the speedometer cable union is free of its bush; the whole assembly can then be lifted up and out of the casing.


Fig. 3

Now the base plate holding the solenoid valve and electromagnet can be unscrewed. There are three screws inside the casing plus one screw on the back of the casing adjacent to the multiplug connector. The base plate has a paper gasket to seal it to the casing. I found that this had become almost welded to the base plate and casing and it tore as the two parts were separated. It was, however, straightforward to cut a new one out of gasket paper using the base plate as a template. We have now separated all of the main components (Fig 3). It is unlikely the casing, end-cap or spindle will need any servicing other than a clean and a small amount of grease on the bushes and bearings. It is the base plate assembly that in this instance has caused the problems and needed to be taken apart for cleaning and repair.

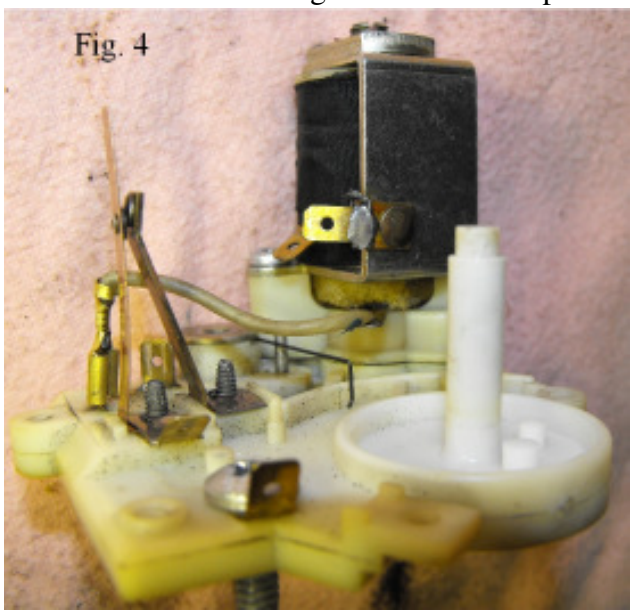
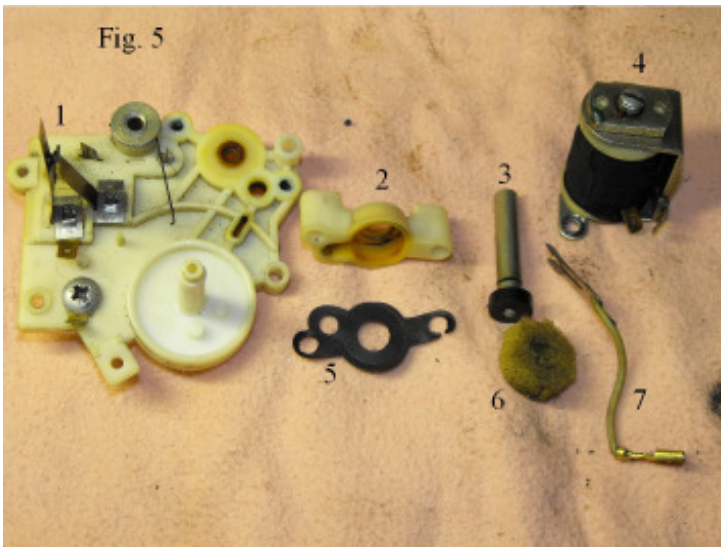


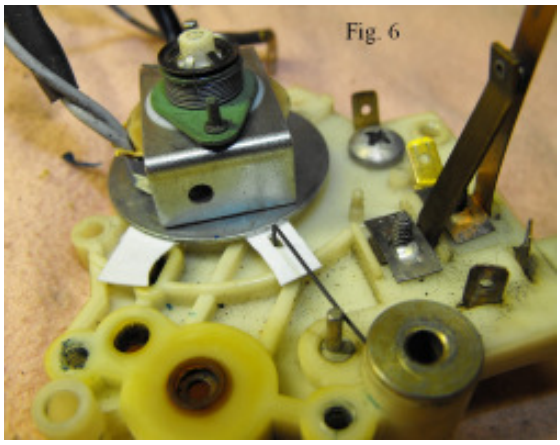
Fig. 4

Figure 4 is a close up of the solenoid valve mounted on the base plate. It can be dismantled once the two screws securing it to the base plate are undone. The valve can then be fully taken apart. Figure 5 below shows the constituent parts of the valve. The problem I experienced was that the foam spring that returns the solenoid plunger to the closed position had disintegrated away to dust. The one in the photo is a piece I cut from a block of foam I keep in the garage for kneeling on. It was the dust from the foam

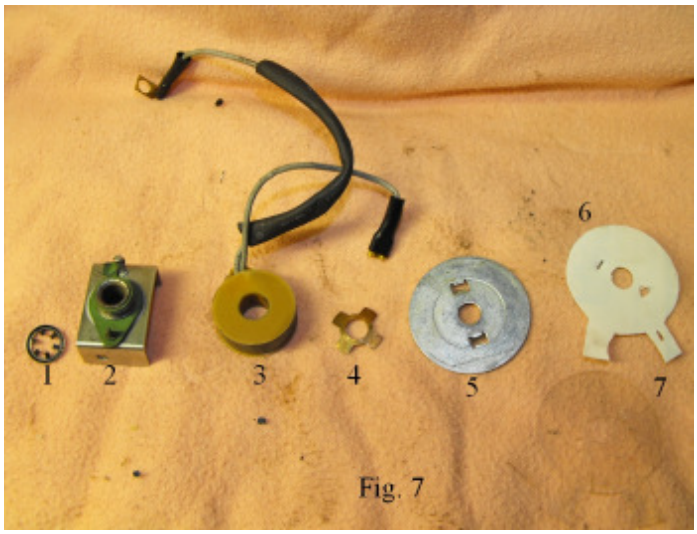
that had been sucked into valve and was caked around the plunger seal stopping it seating properly and thereby leaking air into the system



Key	Fig. 5 - Solenoid Valve
1	Base plate
2	Valve housing
3	Solenoid valve plunger
4	Solenoid winding
5	Gasket
6	Foam collar for plunger
7	Wire for loop circuit



To remove the electromagnet it is necessary to carefully prise off the crown washer. Once this is removed the spindle connector and coil can be removed. Before the bottom plate and air bleed valve can be removed the return spring needs to be carefully disconnected from the cut-out in the air bleed valve. Figure 6 is a close up of the electromagnet and Figure 7 the unit fully dismantled. The flap of the original air bleed valve had become scared and would not seal properly. Being made of transparent plastic it does not photograph very clearly. A replacement was made from suitably thin plastic.



Key	Fig 7 - Electromagnet
1	Crown washer
2	Spring loaded locking plate
3	Winding
4	Spring washer
5	Base Plate
6	Replacement air bleed valve
7	Original air bleed valve

Key	Fig 8 - Spindle
1	Spring loaded slider
2	Low speed points adjusting screw
3	Sliding collar
4	Bearing
5	Centrifugal weights
6	Transfer gear to speedo cable
7	Input shaft for cable from gearbox

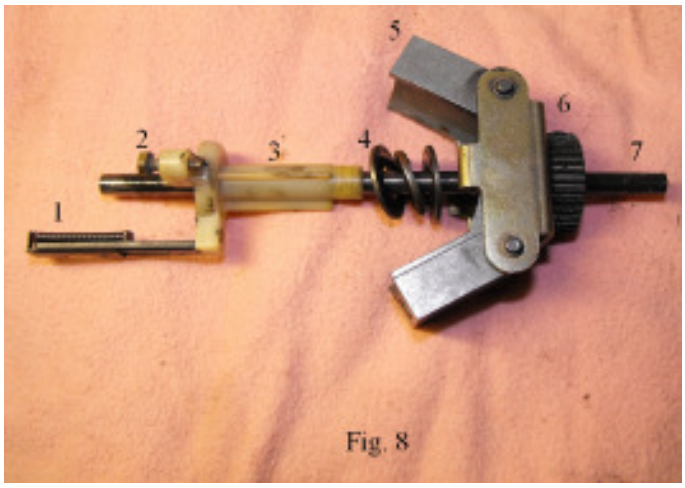
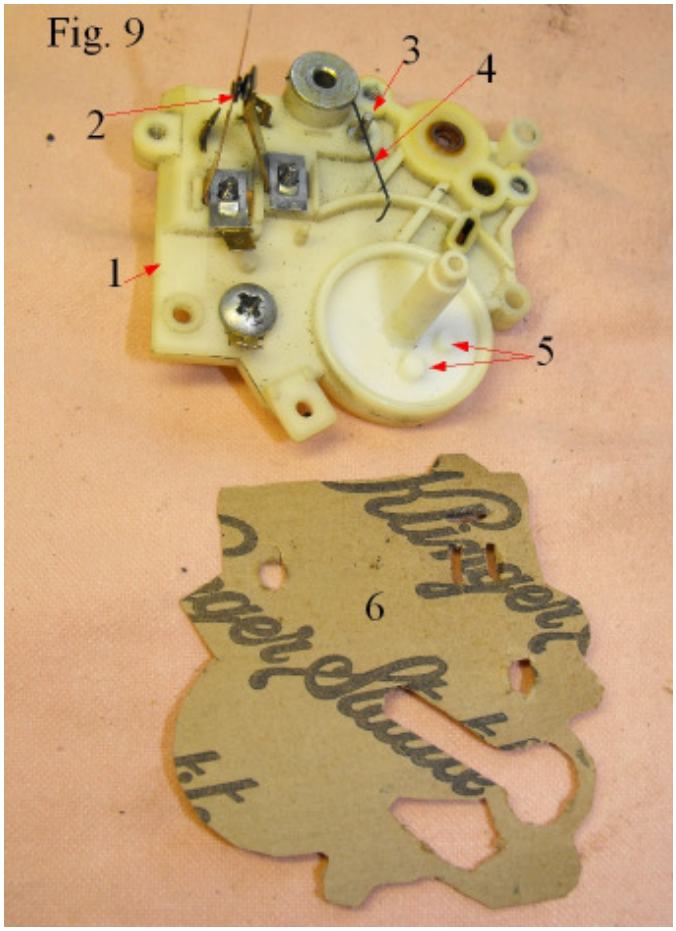


Figure 8 shows the components of the spindle assembly:

The final piece of the jigsaw is the base plate. The valve seat and other apertures need to be clean and check the low speed points are closing properly. It is unlikely the tension of the Bleed valve return spring will need adjusting, but if it does this is carried out by means of an Allen key inserted in the back of the eccentric

Key	Fig 9 – Base Plate
1	Base plate
2	Low speed points
3	Eccentric for adjusting bleed valve return spring
4	Bleed valve return spring
5	Lugs for tab on electromagnet base plate
6	New gasket cut from gasket paper



What Goes Wrong

Generally speaking the unit appears fairly robust and well made. However, its Achilles heel is the use of foam rubber to act as the return spring for the solenoid plunger. With age and heat from the exhaust manifold the foam rubber disintegrates to dust which is sucked into the mechanism by the vacuum. Once this

happens the plunger will not return to its closed position allowing air into the system which will upset the carburetion when the engine is idling. The dirt allowed into the system may also damage the plastic air bleed valve, as happened with my car.

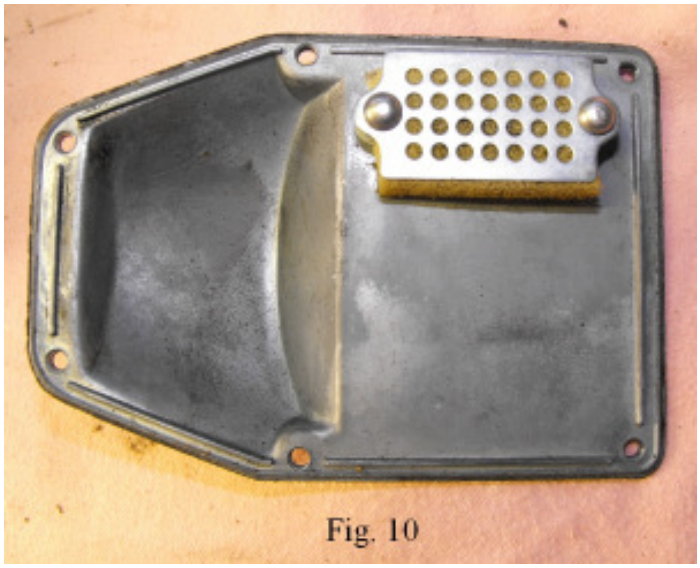


Fig. 10

If the plastic of the air bleed valve is damaged a replacement can be made from suitably this plastic; in fact I cut my replacement from the lid of a margarine tub. It is important to get its relationship to the electromagnet base plate, which I managed by roughly cutting it to size but then mounting both it and the original on the base plate. I then used a fine craft knife to sculpt the replacement to exactly the same dimensions as the original.

The cover plate of the Speedostat has an air inlet which also has a piece of foam rubber to act as a filter (Fig. 10). This had suffered the same fate and had disintegrated, no doubt in turn being sucked into the mechanism. Once again a replacement was made from a piece cut from my kneeling cushion.

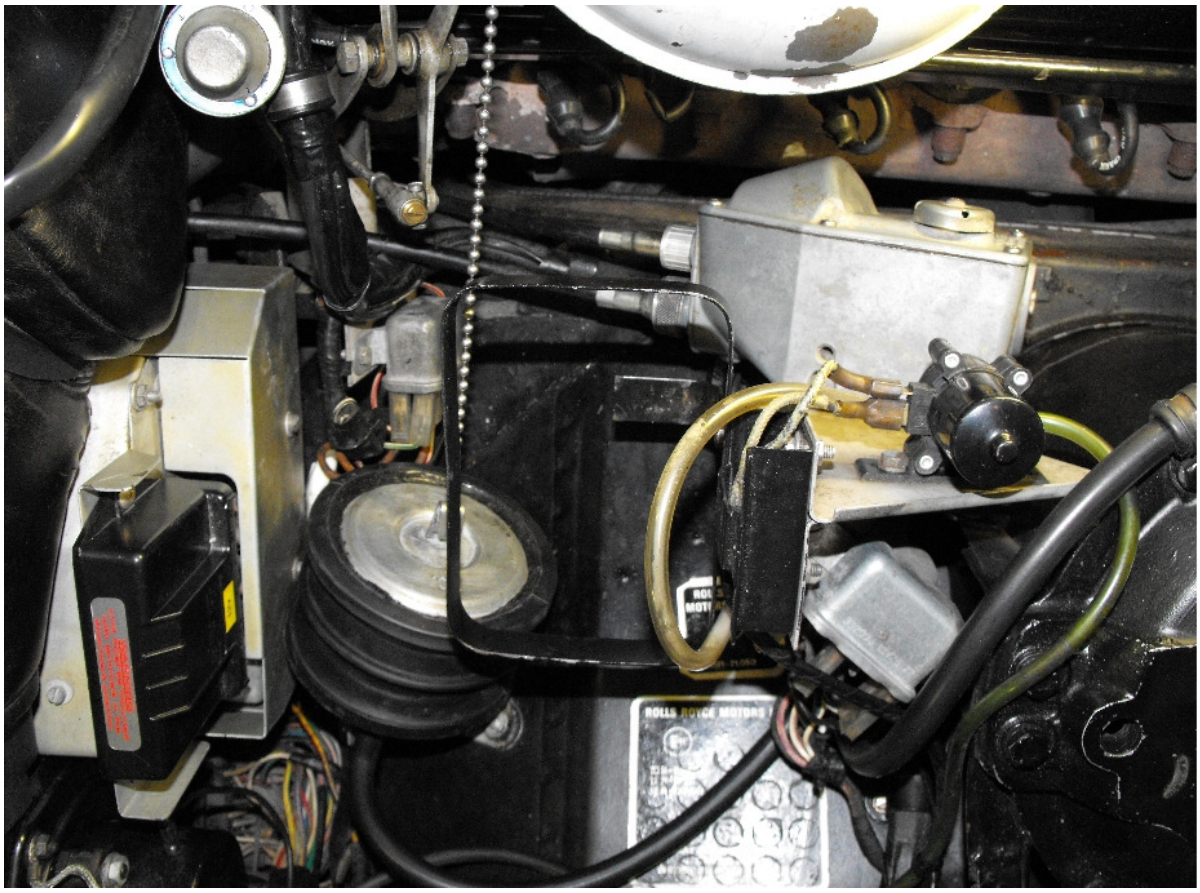
How it all operates (I think)

As it is not possible to observe the operation of the Speedostat the following description is my interpretation of its operation based on my observations of the various parts. Therefore, if any of this is wrong, my apologies and I am more than happy to include any corrections (e-mail to andrewsait@aol.com). When switched off the plunger of the solenoid valve is pushed onto its seat by the spring effect of the foam collar thereby closing off the bellows from the vacuum in the inlet manifold. When the car is stationary or travelling at less than approximately 30 mph the sliding collar on the spindle is held to the right of the unit by the spring. At this speed the slow speed points are held open by the set screw in the sliding collar breaking the circuit and preventing the speed control from being used. As the speed increase the centrifugal weights move the sliding collar to the left thereby closing the points and allowing the speed control to be engaged. The Speeedostat and bellows in the engine bay

When the “Engage” button on the dashboard is pressed two things happen simultaneously (1) the solenoid valve is activated opening the bellows to the vacuum from the inlet manifold and (2) the electromagnet is energised causing the locking plate to lock to the base plate. The operation of the solenoid plunger not only opens the valve for the bellows. There is a wire clipped on to the plunger and when the plunger moves up it contacts with the screw located in the top of the solenoid winding. This completes what I have called a “Loop” circuit which keeps the solenoid and electromagnet activated once you take your finger off the “Engage” button.

Left to its own devices the manifold depression would suck the bellows flat accelerating the car to maximum speed and this is where the air bleed valve comes in. The whole electromagnet assembly is connected to the sliding collar by the spring slide but it has a small

amount of rotational movement allowed by the lugs in the base-plate. Once locked, as the engine speeds up the sliding collar moves further to the left causing the electromagnet assembly to rotate clockwise by a small amount. This rotation opens the air bleed valve allowing a small amount of air into the system which releases the bellows which in turn release the accelerator linkage slowing the engine down. If the engine slows down too much the centrifugal weights move the sliding collar to the right which causes the electromagnet assembly to rotate anti-clockwise thereby closing the air bleed valve allowing the vacuum to compress the bellows and accelerating the engine. At whatever cruising speed has been selected the air bleed valve will hold the vacuum to the bellows in balance and will adjust the throttle opening as the car slows down or speeds up when going up or down hill. The air bleed valve will always be returned to its steady state by its return spring (Fig. 9– 4).



Touching the brake pedal causes the speed control to switch off. When this happens it is only the solenoid valve that is de-activated, the electromagnet stays locked to its base plate. As the car slows down so the centrifugal weights cause the sliding collar to move to the right. Once again this causes the whole electromagnet assembly to rotate anti-clockwise closing the air bleed valve. Once the air bleed valve has reached the limit of its movement the spring loaded slide takes up any further movement of the sliding collar. Pressing the “Resume” button re-activates the solenoid valve allowing the vacuum from the inlet manifold to collapse the bellows accelerating the car. The air bleed valve will remain in the closed position while it is still under tension from the sliding collar allowing the bellows to fully collapse under the influence of the vacuum. As the car reaches its previous cruising speed the sliding collar moves to the same position as previously which releases the air bleed valve once more allowing air into the system which then balances the bellows and the speed.