Technical - Rebuilding an S.U Fuel Pump

Jaguar used the SU fuel pump right through its classic period, until fuel injection came along. So, it doesn't matter if you have a 2.4 saloon, E-type, Mk X or XJ - the same principals apply.

Any of this rebuild information can be found in Jaguar workshop manuals or in the normally excellent notes that accompany rebuild kits. This article tells more or less the same story, but there is extra information relating to rust proofing in certain areas.

To begin with, don't take it for granted that as you can hear a 'tick tick' noise, all is well!

Originally the pumps were triggered by a set of points. These points are attached to a rocker pedestal, sitting on top of the coil housing assembly. When not in use, the points remain closed.

Apply power, though, and it travels through the coil to the spring blade part of the points and on to earth, energising the coil and lifting the armature (linked to the diaphragm) against pressure applied by the armature spring.

As the armature reaches the end of its travel, a throw over mechanism pushes the points apart, breaking the connection, allowing the armature to return against its spring. This up and down movement allows the diaphragm to draw in fuel through the inlet one-way valve, then expels it through the outlet one-way valve and on to the carburettors.

All sorts of problems with the pumps can occur, mainly through age and owners' complacency. Different fuels can affect the internal parts, especially the diaphragm, while silt can build up in the various chambers. Then the points burn and effectively cease connecting.

These days there are alternative options of fitting efficient electronic packages, thereby replacing the points assembly. Nevertheless, many still like the points system so these, of course, remain in constant demand.

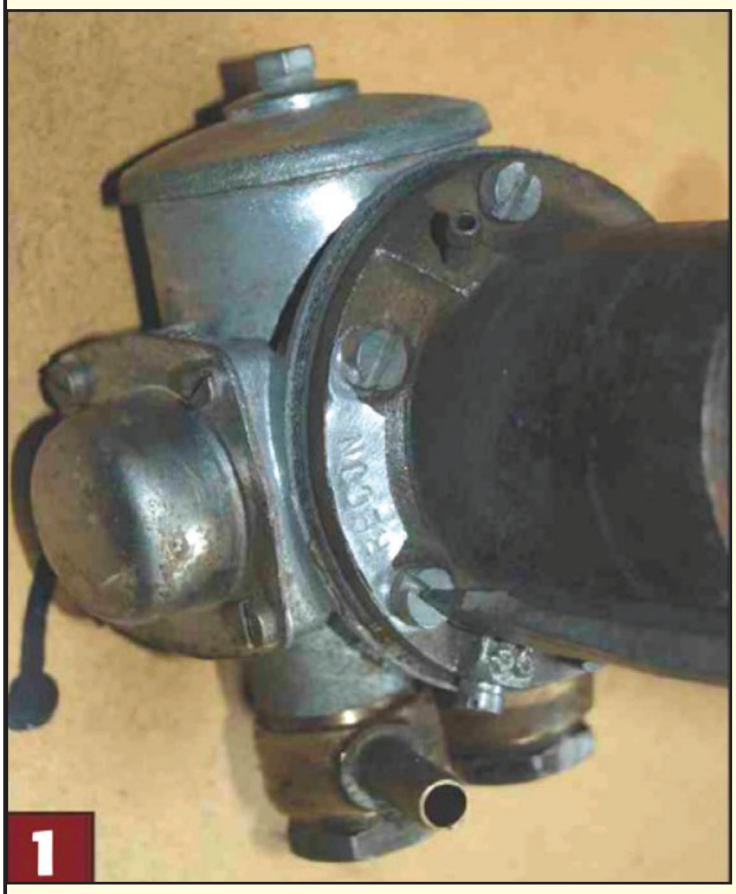
Burien Fuel Systems UK, holders of the SU name and original equipment manufacturers, supply all the parts needed for a full rebuild.

Part 1

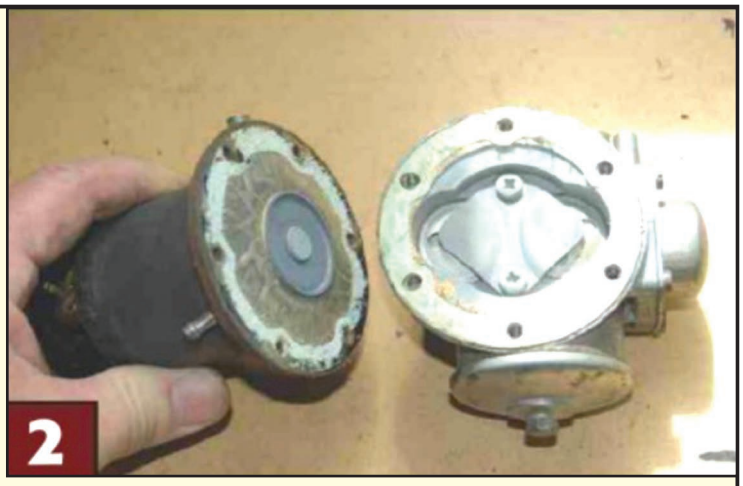
Rebuilding a pump to original spec.

(Assumes that you have the pump removed).

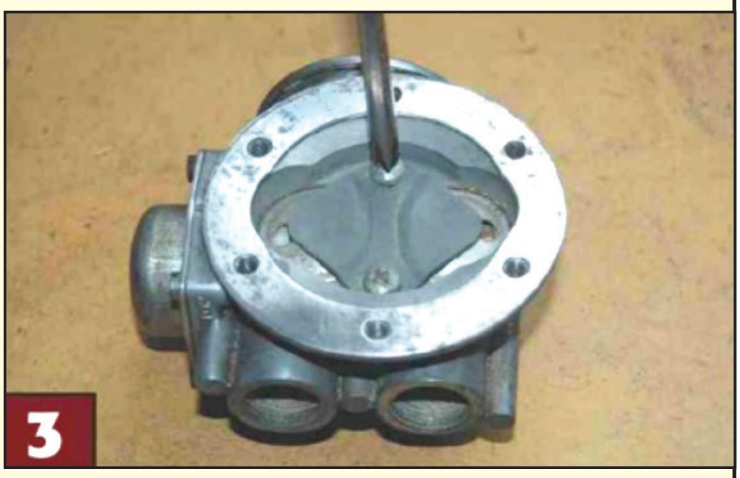
Body and valves



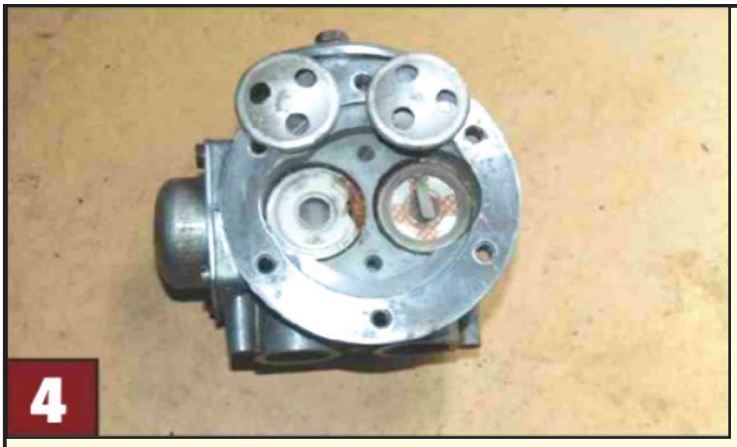
Remove the coil housing screws from the body. Try to use a screwdriver that fits well to avoid burring the edges. Note this pump is a reconditioned unit.



Separate the body from the coil housing. The diaphragm can be damaged by modern fuels.



Now release the two screws securing the bridge piece which holds the valves in place.



Flip out the Valve cap then ease out each non-return valve, noting their positions and which parts fit which side. Making a sketch is a good idea at this stage.

Release the 2BA bolt and remove the air-bottle inlet cover (inset). Then remove the cork joint making sure that every trace of cork is taken out completely.

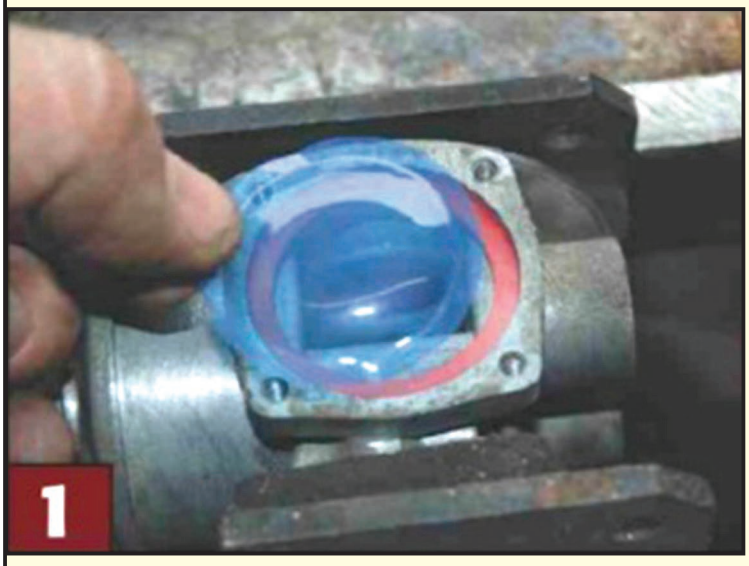
Remove the four 3BA screws holding the cover over the delivery flow smoothing device, then lift out both the 'O' ring and plastic 'bubble'.

Ease back the diaphragm (above) and then flip out the centre-ring plates (below). Then grasp the diaphragm and unscrew it from the coil body - the shaft is held in the points rocker mechanism.

Thoroughly clean the body of any debris and examine for corrosion. (You may need to use commercial bead-blasting services, but thoroughly clean afterwards).

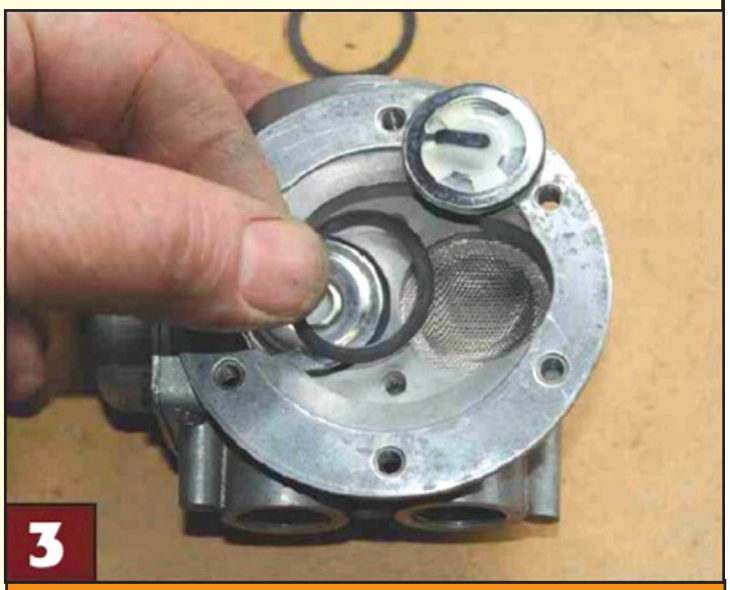
Rebuilding the body

Note: When the pump body is held in the vice, use a protective material to prevent damage. (A couple of redundant brake pads are ideal).

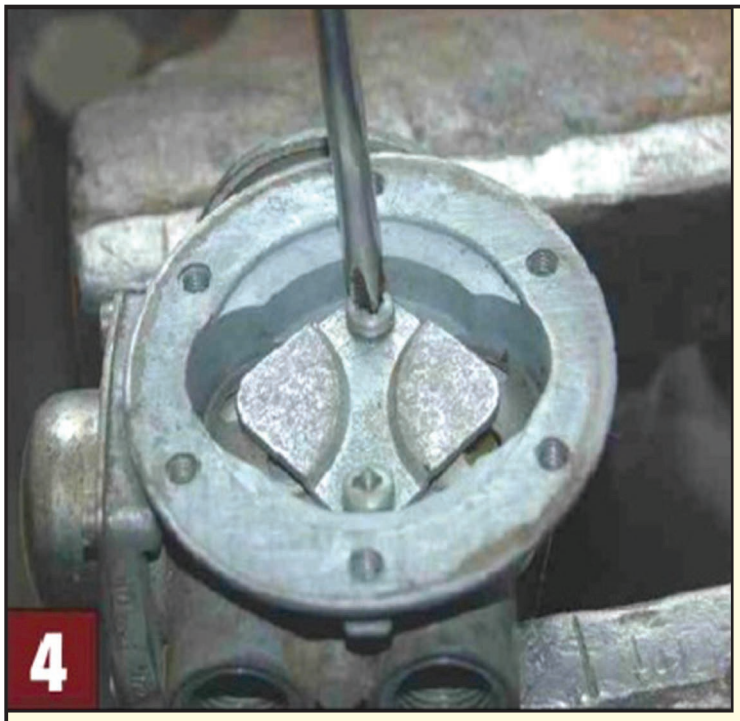


Fit the gasket followed by the plastic bubble and 'O' ring and refit the outer cap. Tighten the screws gradually as the sealing is done by the 'O' ring and tension needs to be evenly distributed.

Using a new joint, refit the inlet air bottle cover.



When fitting the one-way valves, make sure that the parts are in the correct order and position. Here in the deeper of the holes is a sealing washer, gauze filter, sealing washer and inlet valve.

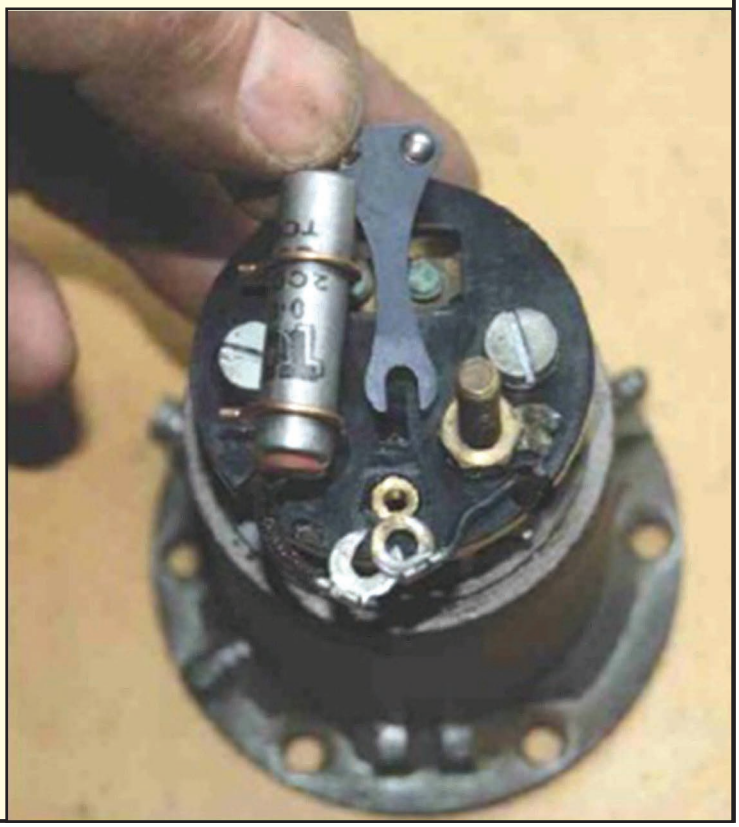


Refit the clamp plate evenly ensuring that both inlet and outlet valves are correctly seated.

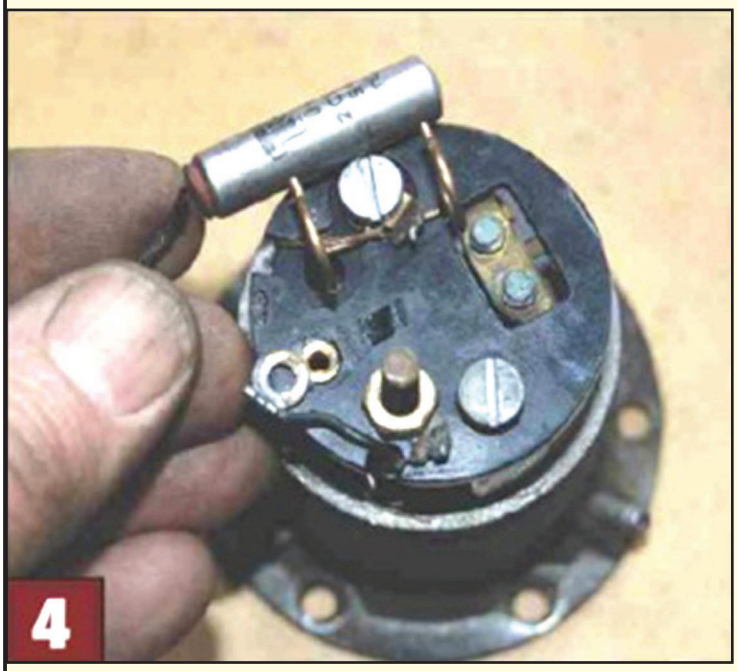
Points assembly removal

After removing the fuel pipes and insulating sleeve, loosen the 2BA nut and remove the connector before lifting off the outer plastic cover.

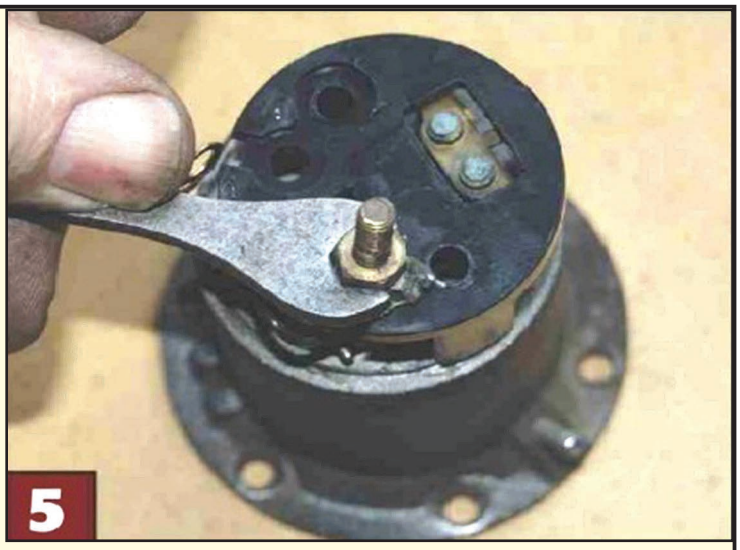
Now remove the screw holding the contact blade and lift away. Check to see if the points are corroded.



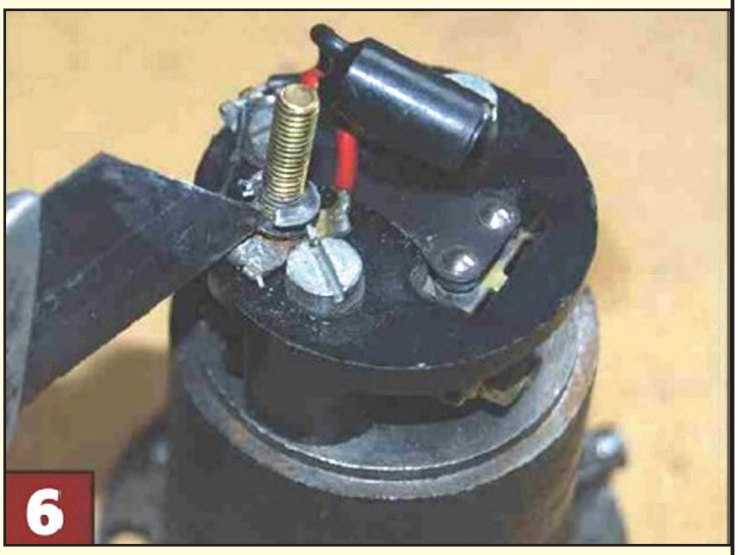
Now loosen one of the 2BA screws securing the pedestal to the coil body.



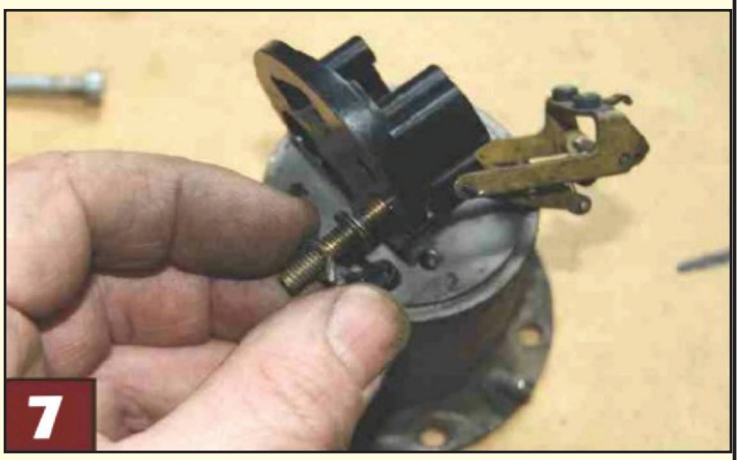
Push out the condenser from its holder, (type varies between models) and then completely remove the two 2BA pedestal securing screws. (Note: a diode resistor replaces the condenser in the rebuild kit).



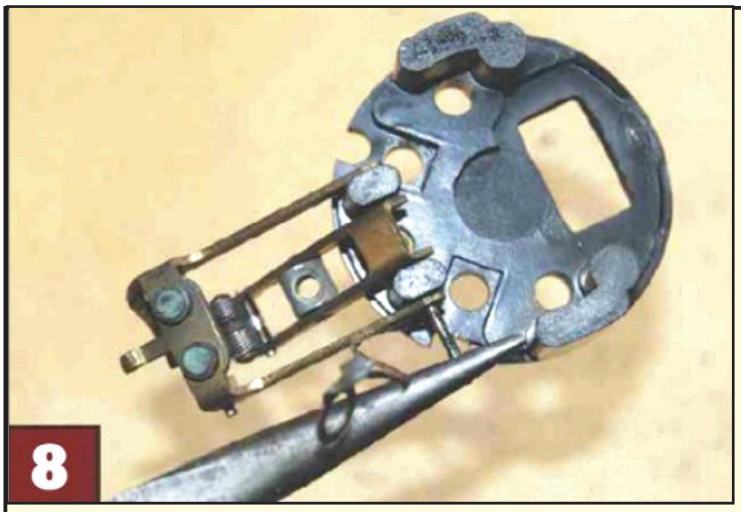
Undo the 2BA nut securing the terminal stud.



Beneath the stud is a lead washer. The easiest way to remove it is to cut with a sharp blade. (Different pump with the alternative resistor shown).

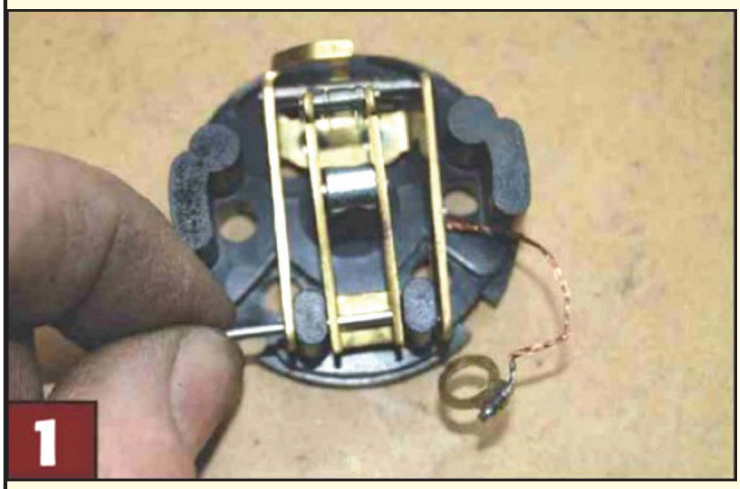


Tilt the pedestal to allow removal of the terminal stud, once the connections and the double spring washer have been lifted completely away.

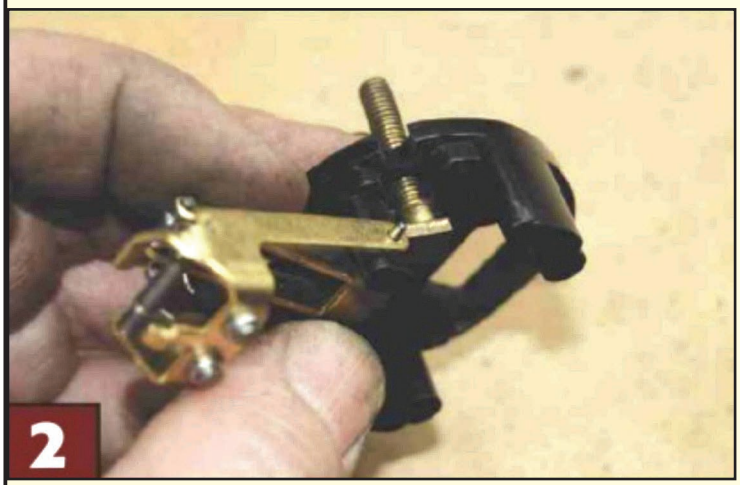


Using pliers, remove the hardened steel pin from the pedestal allowing removal of the rocker mechanism.

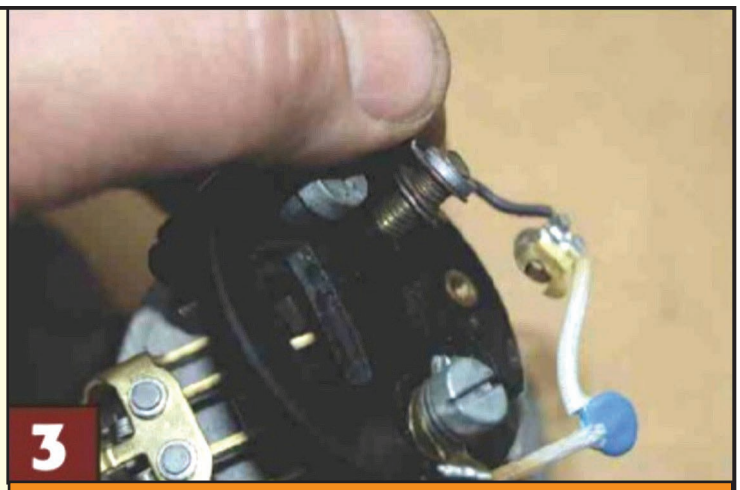
Points assembly replacing



Fit the new rocker mechanism to the pedestal using a new hardened steel retaining pin.



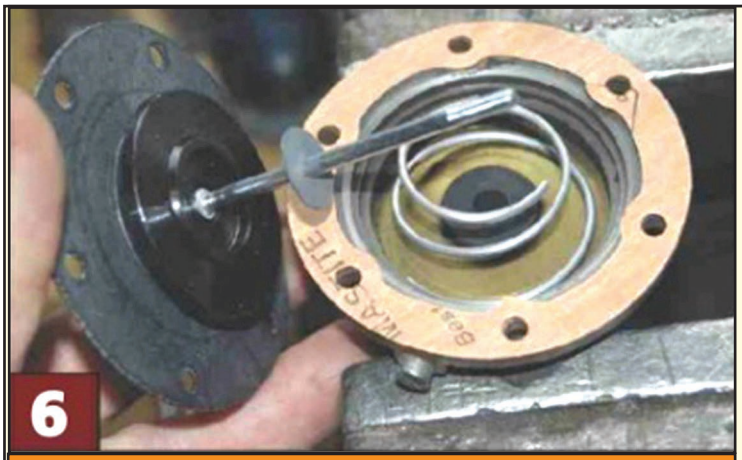
Before going any further, fit the terminal stud.



Fit the pedestal to the coil body and fit the diode resistor with one end over the terminal stud, the other to earth beneath a securing screw. The holes are sized, and can only fit one way. Note the new lead washer on the terminal stud.

Loosely fit the top blade - not forgetting to include the third connection on the diode resistor - but be sure not to tighten at this stage

Now the shaped nut can be fitted to the terminal stud. It is concave and when tightened down onto the lead washer, it makes a permanent fit.

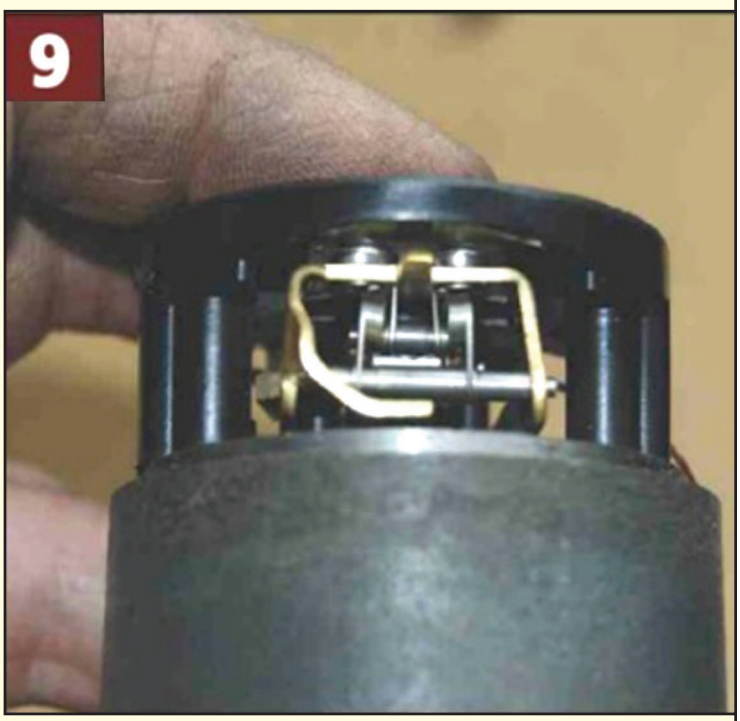


Offer the diaphragm to the coil body with the spring smallest end to the diaphragm. Make sure that the small impact washer is in place. The gasket should be positioned on the body but this can also be inserted after rolling back the diaphragm.

The diaphragm is pushed through the coil body until the threaded end engages with the rocker mechanism. It is usually a bit fiddly to get the thread engaged.

Slide in the guide plates under the diaphragm into the slot between the diaphragm and the coil body.

To determine how far the diaphragm is screwed in, hold the coil housing in one hand, while pushing on the diaphragm with the other. Keep adjusting and pushing until the rocker mechanism just 'throws over' (see photo below'. Then turn back the diaphragm until it lines up with the nearest bolt hole in the body and turn back a further four holes (Equal to two third's of a turn).

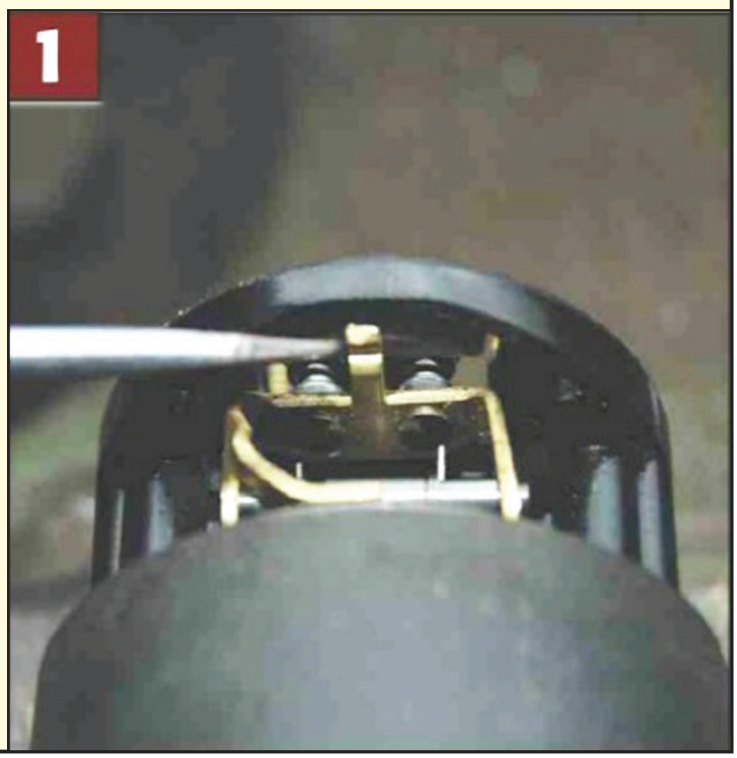


Line up the body with the coil housing, noting that all bolt holes are in line. Make sure that the cast lugs on the coil are at the bottom of the body. Loosely fit the six screws and gradually tighten evenly.

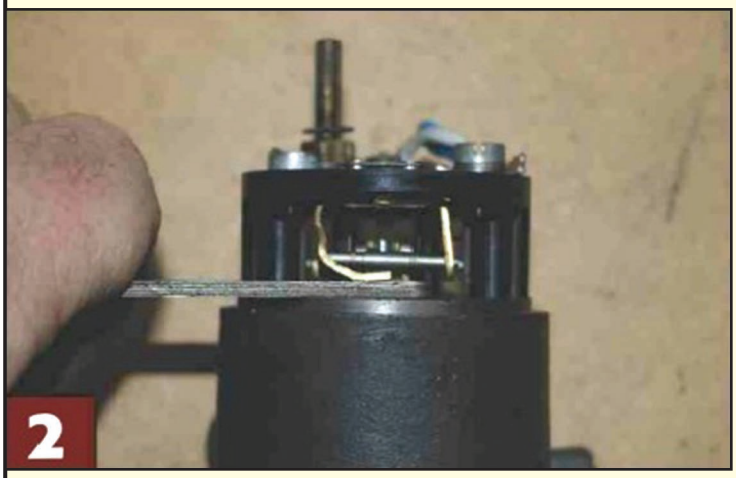
Editor: Information for this technical article sourced from 'Jaguar World' and other websites.

Adjusting the points

First ensure that the top blade points are concentric to the points on the rocker mechanism and fully tighten the blade. To adjust the top blade, insert feeler gauges to the value of 0.035in (0.9mm). To adjust, bend the tag to alter its position in relation to the lower deck of the pedestal.



Adjusting the points (cont)

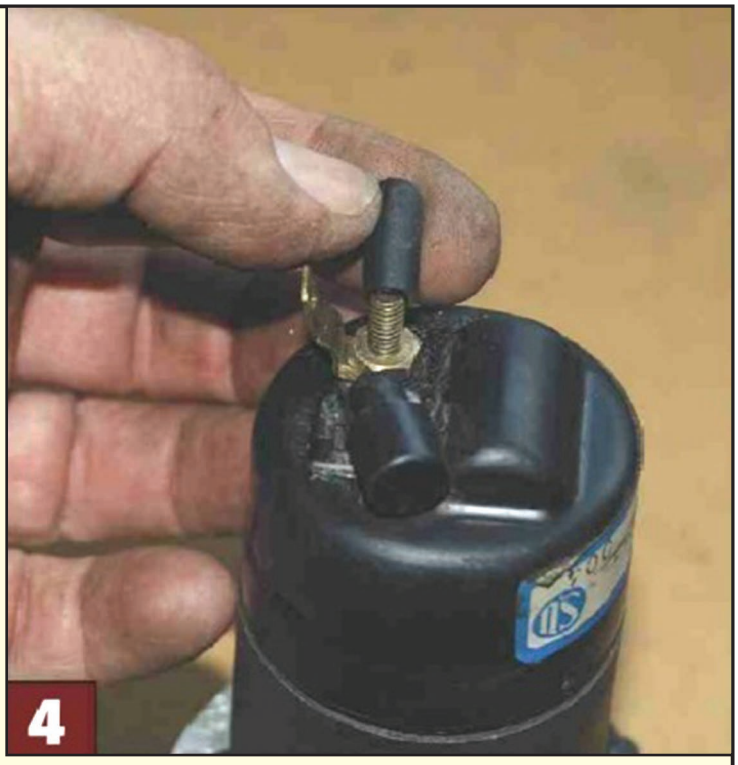


2

To adjust the rocker mechanism, insert feeler gauges to the value of 0.090in (2.3mm) between the top deck of the coil housing and the adjuster tag on the rocker mechanism. To adjust, simply move the tag in the appropriate direction. Be sure to recheck both measurements carefully afterwards.

3

Check the pump for operation by attaching a 12-volt feed wire to the terminal stud and an earth to the body. Make sure the polarity is checked. In this case it is negative to earth.



4

Finally fit the buffer washer over the terminal stud, offer up the end cap and then fit the shake proof washer, the electrical connection between a cable and the terminal, 2BA nut, and tighten. Don't forget the terminal sleeve. A sealing band should also be fitted around the girth, between the cap and body.

Next Month:

Doing away with the points and fitting an electronic conversion.

S.U Carburetter Company.

The change to fuel injection saw carburetter manufacture decline to very small volumes, most of which were for the service market.

This led to S.U negotiating with Burlen Fuel Systems Ltd to take over the responsibility for manufacture and supply of all S.U carburetter units, pumps and spares. In 2002, Burlen acquired the intellectual property rights and the S.U trademark.

In 2007, the name 'S.U Carburetter Company' was re-established and trades as a subsidiary and trading arm of Burlen Fuel Systems Ltd. Along with the 'AMAL Carburetter Company', they supply fuelling products to vintage and classic cars and motorcycles around the world and can supply new carburettors, pumps and spares for almost all models from 1930 to the present day.