

Classic car care

SU Pump rebuild

Peter Wallage looks at the heart of many British fuel systems

MANY British classics, Morris, Wolseley, MG, most Austins after the BMC merger and most of the makes now under the Leyland banner as well as many independents, fitted SU fuel pumps. They're not difficult pumps to overhaul, and most of the parts even for early ones are still available, or parts from current pumps are interchangeable. The basic principle of the pump hasn't altered over the years, but there have been quite a few different types, so this month I want to go through the complete overhaul of an SU, including most if not all of the variants likely to be met.

Before we start on the actual stripping down, it might be as well to sort the different models out. Up to about the mid 1950s, there were three main types, the L which is the basic pump fitted to a large number of pre and post war cars up to about 12 or 14hp, the HP which is almost identical to the L except that it delivers fuel at a higher pressure. The larger, high-pressure LCS which is easily recognisable because it has a rectangular box-shaped body and, coming post-war, the SP which took the place of both the L and HP. This was cheaper to make and was the first pump to use plastic valves in place of brass ones. There are also double L and double HP pumps, very similar to the L and HP but with a solenoid and diaphragm on both sides of the body. They deliver twice the amount of fuel in the same time.

Then SU rationalised its range of pumps and started calling them by their specification

number which always starts with the letters AUF. There are the AUF 200, 300, 400 and 500 series, with AUF 200 to 299 corresponding to the L, HP and SP, AUF 300 to 399 corresponding to the LCS, AUF 400 to 499 corresponding to the dual HP, and AUF 500 to 599 being a new double-entry pump intended for cars with twin fuel tanks. All the AUF pumps in any one series are basically the same and pretty well interchangeable in use, but when a change in the specification was introduced, such as a vented cover or a different diaphragm material or different design of contact breaker, the next number in the series was taken, such as AUF 201, AUF 202 and so on. The specification number is stamped on a small aluminium plate held under two of the screws which hold the solenoid to the pump body, and you should always quote it when you go for spare parts.

The older lettered pumps were kept in production for some time after the AUF series was introduced, and are still accepted back for reconditioning. When they are reconditioned they are also given a specification number starting with AUA or AUB. Some of these pumps will have components from the later AUF series used in reconditioning, so again it's essential to quote the specification number if the plate is there. If you want parts for a pump without a specification plate, take the old parts along. You may be given identical parts, or you may get later parts which are not quite the same, but which are interchangeable.

I'll deal with the AUF series, later in this fea-

ture, but I'll start with the complete overhaul of a basic L type pump with the older type of contact breaker because this was the basic pump and all the others are derived from it.

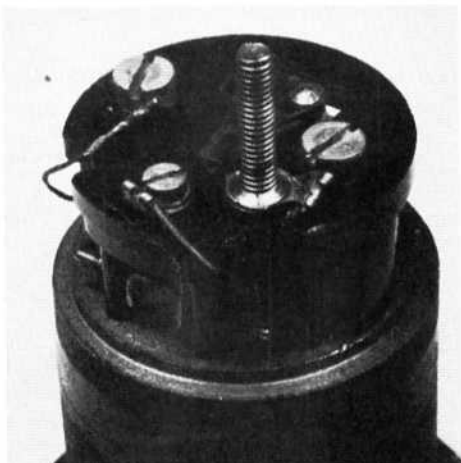
Most people, when they start to work on an SU pump, take the Bakelite cover off the end first, but if you're going to have the whole pump to pieces it's better to start at the other end and take out the unions and valves first because you can't get the contact breaker rockers off till the solenoid's separated from the pump body.

Start by taking out the inlet filter which is under the blank plug at the bottom of the body. This is a tubular gauze filter which used to be made all of brass, but the replacement type has a plastic cage with brass gauze. They're interchangeable, so if the old one's damaged or caked with dried petrol gum, get a new one. If the inside of the pump's full of old gum you may have a job getting the filter out, but soaking in methylated spirit will usually shift it.

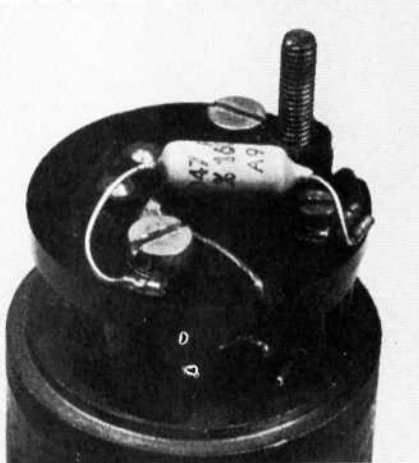
At the top of the body are the two unions for the inlet and outlet, the outlet one being at the top and the inlet at about 2 o'clock when viewed from the back of the pump. There's nothing under the inlet union except a sealing washer. All the valves are under the outlet union.

First under the outlet union, after the sealing washer, is the outlet valve cage, made of brass, in which the flat brass outlet valve disc is held by a spring clip. You might find the outlet valve cage difficult to get out. If there's any dried gum about it can be a real brute to shift, so if it doesn't come out easily lift out the spring clip and the disc valve and soak the cage in methylated spirit. Ten minutes or so soaking will usually help to free it, but you might have to use a hooked piece of wire in one of the holes in the lower part of the cage to help it on its way. It's a fairly solid piece of brass, and a few scratches won't hurt it, but be very careful not to damage the seating ring on which the disc valve sits. If this gets dented, as some I've found have been, the disc will never seat properly and the pump won't deliver fuel. It's possible to get new outlet valve cages, but they aren't normally held in stock by dealers, and you may wait some time to get one. You can use the cage from an old secondhand pump if you can find one. The L and HP cages are both the same size, but the HP cage has four holes on the lower part where the L cage has only two. You can put an HP cage into an LP pump, but you shouldn't strictly speaking put an L cage into an HP pump, though the pump will probably still work perfectly well.

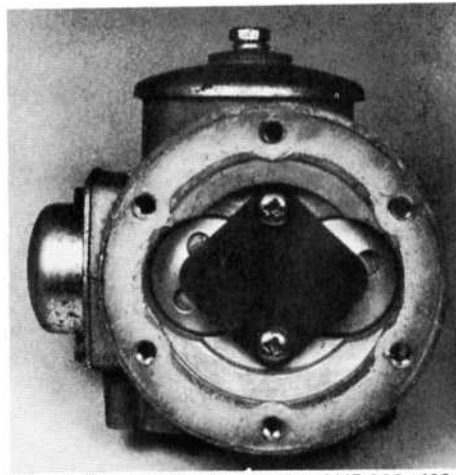
Under the cage is another sealing washer, usually black to distinguish it easily from the



The lead washer under the concave nut on the terminal screw should be squashed to a neat dome. It has to be cut away when you take the pump apart, and a new one used.



If you want to fit a suppression capacitor to stop radio interference, it goes between the screw for the spring blade contact point and the earth terminal screw holding the pedestal.



The Melinex valves inside the AUF 300, 400 and 500 series pumps are held by a retainer plate and domed discs.



An older L type pump stripped down. From left to right, the top row is: inlet union, solenoid body, inlet valve, outlet valve cage, outlet valve, spring clip, outlet union. Middle row: diaphragm with rollers, pump body, sandwich plate, end cap and rubber dust ring.

Bottom row: body screws and type number plate, diaphragm spring and impact washer, inlet filter and plug, spring blade contact and screw, rocker contact, terminal nut and lock nut, terminal screw, concave nut, pedestal holding screws and pedestal.

other sealing washers which are thicker. Don't use a thick one when you replace it. Also under the cage is the inlet disc valve, identical to the outlet valve. This also sits on a round seating, and again be very careful not to damage the seat when you clean the body. Sometimes there may be a light coil spring on top of the inlet valve disc, held down by the outlet valve cage, but more often the valve is left to float. It doesn't seem to make much difference to the efficiency of the pump provided it's mounted so that the outlet union is at the top.

Next, take the solenoid housing off the pump body. On early pumps there will be five cheese headed screws and a stud which doubles as an earth terminal, but later pumps have six screws with a separate earth terminal on the side of the solenoid housing. Mark the pump body, the solenoid housing and the sandwich plate between them as a guide to putting them back in the same relative positions. There's a paper gasket between the sandwich plate and the pump body, but no gaskets either side of a standard neoprene diaphragm. If a special low-temperature diaphragm is fitted, which can be identified by having a translucent plastic leaf as well as neoprene, then paper gaskets go on both sides of the diaphragm.

The diaphragm, flat steel disc armature and the operating rod are riveted together and, if necessary, replaced as an assembly. They unscrew out of the solenoid housing with a normal right hand thread. Between the flexible diaphragm and the disc armature is a ring of brass rollers, 11 of them, which usually fall out when you unscrew it, so hold the pump over a box to catch them or you'll spend a happy ten minutes crawling round the floor finding them all. I know, I've done it.

You might find the diaphragm in good condition, and if it feels soft and pliable when you separate the leaves and ruffle them in your fingers you can clean it in petrol and use it

again. If, however, there's any sign of gum deposit in the pump, fit a new diaphragm because the chemicals in the old dried up petrol gum attack the neoprene of the diaphragm, and even though it may feel all right it may not last all that long.

Now you can turn your attention to the other end of the pump and take off the Bakelite cap over the contact breakers. There ought to be a rubber sealing band round the body of the solenoid where the cap joins it to keep out dirt and wet, but on many of the old pumps I've seen this is missing. If you can't get one, a very adequate substitute can be cut from an old bicycle inner tube.

Under the cap, on the same long brass screw that held the terminal, is another brass nut, and when you take this off you'll notice that the underside is concave. A plain lead washer fits under this nut, and the purpose of the concave dish is to squash this lead washer tight round the thread of the screw to make sure there's good electrical contact between the screw and the terminal tag of one of the lead-out wires from the solenoid. You have to cut the old lead washer away with a penknife and use a new one when you put the pump together.

The terminal tag is quite a loose fit over the screw, and if you leave the lead washer out, or replace it with a plain washer, you'll probably get an intermittent contact. I've put new lead washers on several pumps where they've been missing, and in each case it's cured a stop-start fault. Under the lead washer is the terminal tag, and under that should be a flat double-coiled spring washer.

The second lead-out wire from the solenoid also ends in terminal tag, and is held by a smaller screw which also holds the spring blade with one of the contact breaker points. Having disconnected the solenoid wires you can take out the large screws which hold the Bakelite pedestal to the solenoid housing. Under one of

them is another terminal tag with a braided copper wire, the other end of which is soldered to the brass frame of the contact breaker rocker. This is another fruitful source of trouble with SU pumps. Sometimes you find the wire almost broken and hanging on by a thread, or even snapped, because someone has let the terminal tag rotate when they did up the screw. It's easily done. Wrapping the end of the wire under the screw head doesn't give a good contact. You must have terminal tags on all the electrical connections inside an SU pump if it's going to be reliable.

Be careful not to snap the terminal tag off the solenoid wire when you lift the pedestal off. Once again, it's easily done. If you tilt the pedestal over towards the wire you can lift it away sideways without any strain on the connection.

The contact points will probably be burnt, and though it's possible to clean them up on an oilstone it's better to fit new ones. The brass rocker assembly lifts off after you take out its hinge pin, but before you do, swing the rocker up from the pedestal and push the centre arm back and forth a couple of times to make sure you understand how the throw-over action works. Then you'll find it easy to put the new one back correctly — it's possible to get the small coil springs the wrong side of the roller pin and then, of course, the pump doesn't work properly.

The hinge pin isn't fixed, it just pulls out, but some of them are quite stiff. If it's very stiff, go gently because they sometimes corrode inside the Bakelite lugs on the pedestal, and it's easy to break a lug off. On the other hand, the pin may be so loose it just falls out. If this has happened on your pump at some time, and someone's replaced the proper pin with a piece of wire or an old nail, throw it away and get a proper SU pin. These are case hardened to stop the rockers wearing flats, and as they say in the advert, accept no substitute.

And that's as far as you can go in taking the pump apart. On no account try to push the iron core out of the solenoid. There shouldn't be any need to, but you might be tempted to push it up perhaps to solder new wires on the solenoid if the insulation's perished. Don't. The core is put in with a special press tool, and you'll never get it back in a month of Sundays. Unsolder the terminal tags and push insulating sleeves under the wires if you have to, but if the insulation's that bad the windings inside the solenoid are probably a bit rosey too, and you want a complete new one. If things are really bad, you might decide to screw it all together again and exchange it for a reconditioned pump, but think twice if you've got one of the early pumps with a brass body. It's worthwhile going to some trouble to hang on to the brass body for period authenticity, even if you renew everything else on the pump. You'll never get a brass body back in exchange because they're getting quite rare these days.

All you can do on the solenoid is to clean it up and check the windings for continuity or short circuit to the housing with a lamp and battery. Clean the body of the pump and the sandwich plate thoroughly, and get rid of any gum. The standard method of getting rid of gum when all SU pump bodies were made of brass was to boil them in a 20% solution of caustic soda and then dip the parts in strong nitric acid. You'll still find this quoted in some instruction books and manuals, particularly if they're facsimile copies of old ones. But caustic soda and strong nitric aren't very nice things to have around the home workshop, let alone boiling the caustic, and in any case you daren't use the caustic on aluminium alloy bodied pumps; it would eat them away.

It's much better, and a great deal less

