SU FUEL PUMPS FACTS AND MYTHS
by Dave DuBois

In line, high efficiency filters added to the inlet side of the pump to protect them

SU pumps are able to pass most debris right through them without causing any problems. The filters that are built in them are designed to stop rocks and small birds. Placing a high efficiency filter on the inlet side of a SU pump is something to be avoided because if the filter clogs to the point where it will not allow fuel to pass through it, the pump will stall in a current on condition. This situation, if the power is left on for any period of time (such as while troubleshooting) will cause the coil to overheat and will burn out the internal swamping resistor (see picture below). Unfortunately, since the resistor is internal to the coil housing, the damage goes unnoticed but the result is that the points will start arcing excessively and burn out prematurely (This occurs because the internal swamping resistor is part of the arc suppression circuit). Worse still, if the burned points are replaced, the replacement points too, will burn out very rapidly, leaving another British car driver cursing the SU fuel pumps as worthless pieces of _____ (you fill in the blank).

The above description is for a points style fuel pump. The results are even more severe if you have an all electronic pump. I have been told by one of the technicians at Burlen Fuel Systems (makers of all things SU) that when the swamping resistor in the all electronic pumps burns out, the pump won't function at all. Further, if the power is left on long enough while an all electronic pump is stalled in a current on condition, damage will be done to the circuit board.

The bottom line here is that if you are having a sediment and/or rust problem with the fuel tank that is severe enough to require a filter, then the tank should be removed, cleaned and sealed, or a new tank installed. Sticking a high efficiency filter between the tank will not protect your SU fuel pump, instead it will result in damage to your pump if it becomes clogged. If you have a great compulsion to stick a filter in the fuel system, place it between the pump and the carburetors where it will not cause damage to the pump.

Finally, all of the above information applies only to the SU fuel pumps and some of the German and New Zealand clones. If you are using one of the little, square, run all the time, make a lot of noise, Facet pumps none of the above applies (they even come with a filter on the inlet side). Besides, I really am not concerned what happens to them as they are a throw away device anyway and I don't have to repair them.

Transistorized, solid state or all electronic fuel pumps will fail in high temperature environments.

I first heard this little myth in the late '70s from a member of our local 'T' Register after returning from GoF West in California. He told me that he had heard this from someone at the GoF and wondered about the validity of it. Unfortunately, this is still being passed around today, particularly amongst people with T series cars where the pumps are mounted in the engine compartment. This is one of those stories that may have been true back in the '50s, when transistors were in their infancy and most solid state devices were made with germanium, which was very temperature sensitive. However in this day of home computers, cell phones and electronic devices that are sent into outer space, all of which have micro chips to drive them, it is absolutely not true. Today's solid state devices are made with silicon and they will operate in very high temperature environments without any degradation. In fact the solid state devices that I use in my solid state modification of the SU fuel pumps and that Burlen Fuel Systems use in their all electronic SU fuel pumps are rated to operate in the temperature range of –67°F to 347°F. Obviously, these devices would continue to operate in temperatures at which the engines in the T series cars would have long since stopped operating.

"Pusher" vs. "Puller" fuel pumps

Pusher and/or puller fuel pumps is a misnomer. Pusher or puller more accurately describes where the pump is mounted. A pump mounted in the engine compartment is being used as a puller pump in that it is pulling fuel from the tank, into the engine compartment. Conversely a pump mounted near the fuel tank is being used as a pusher pump because it pushing the fuel forward to the engine compartment and the carburetors. Any SU fuel pump (or any other brand of pump), regardless of whether is low pressure or high pressure will generate 4 to 10 inHg of vacuum or more, sufficient to lift fuel 6 to 12 feet or higher. The low pressure SU fuel pumps, which are intended to be mounted in the engine compartment (and thus have been called "puller" pumps actually generates less vacuum than the later, high pressure ("pusher") pumps. Fletcher Millmore (a frequent contributor to the Bulletin Boards and Forums), states it very well when he says "No pump will ever pull fuel as well as it will push it – that's physics, not pump design." All pumps will be slowed down by having to pull the fuel very far up, even within the rated inlet head for the pump.

Vapor lock

Fletcher Millmore also tells us that "True vapor lock is a result of the fuel on the inlet side vaporizing as the pump drops the pressure on the suction line (inlet side of the pump). It is easily avoided by putting the pump as low and as close to the fuel source as possible", which is the reason that MG went to a pump mounted in the back of the car by the fuel tank instead of in the

engine compartment as on the T series and earlier cars. Additionally "for all pumps, it is desirable – to – essential to have the outlet above the inlet to avoid trapping vapor in the pump chamber". The "vapor lock" that is often experienced in the carburetors is really the result of the fuel boiling and causing pockets of vapor in the float bowls and the connecting passages in the carburetors rather than in the fuel line between the fuel tank and the pump or between the pump and the carburetors.

Why do SU fuel pumps stop and start running while an aftermarket pump runs continuously?

Most after market pumps, such as the Facet, run continuously due to their having a bypass valve in them (this is how they regulate the outlet pressure). These pumps don't care if the fuel flow is interrupted on either the inlet or outlet side, they just continue to chatter away happily regardless. All SU fuel pumps, points style or all electronic will shut off, once the float bowls are full and then only tick periodically as the fuel in the bowls is used up. SU fuel pumps will also stop if there is a clog on the inlet side of the pump. When this occurs, bad things happen to the pump (see the section on In line, high efficiency filters added to the inlet side of the pump to protect them). In addition to stopping when the float bowl is full or the inlet line to the pump is clogged, the SU fuel pump will stop if there is a clog on the outlet side of the pump, only in this case bad things don't happen to the pump (just to the progression of your trip). To prevent unintended stopping of the SU fuel pump as a result of clogs, either on the inlet or outlet side, keep your fuel system clean and free from rust and sediment.