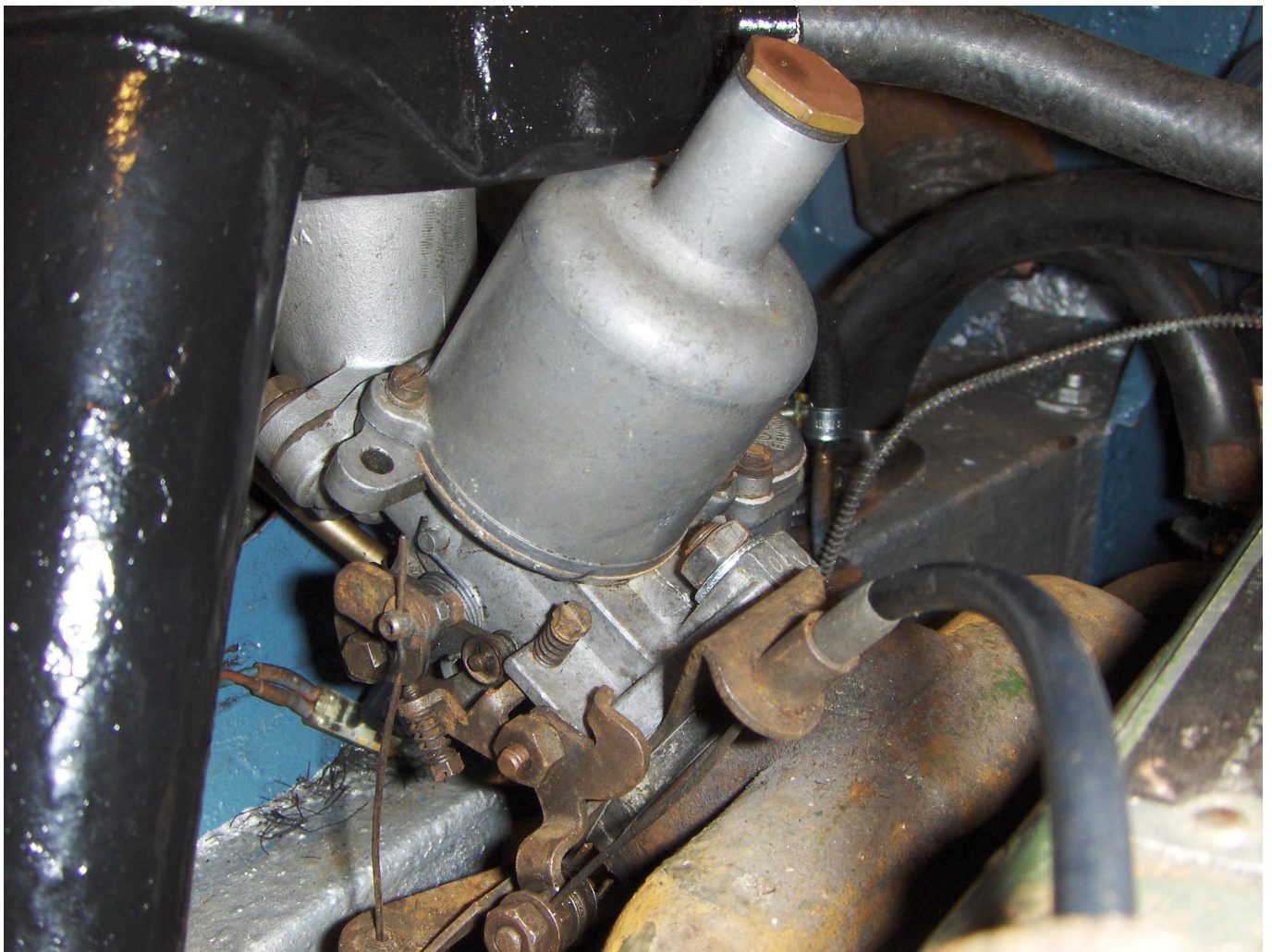


## 'Need to Know' Series, No. 3: SU Carburettors – Part 1 – The History

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Typical single SU carburettor installation, in this case on an early BMC Mini 850. Similar instruments were fitted to a host of BMC/BL cars.



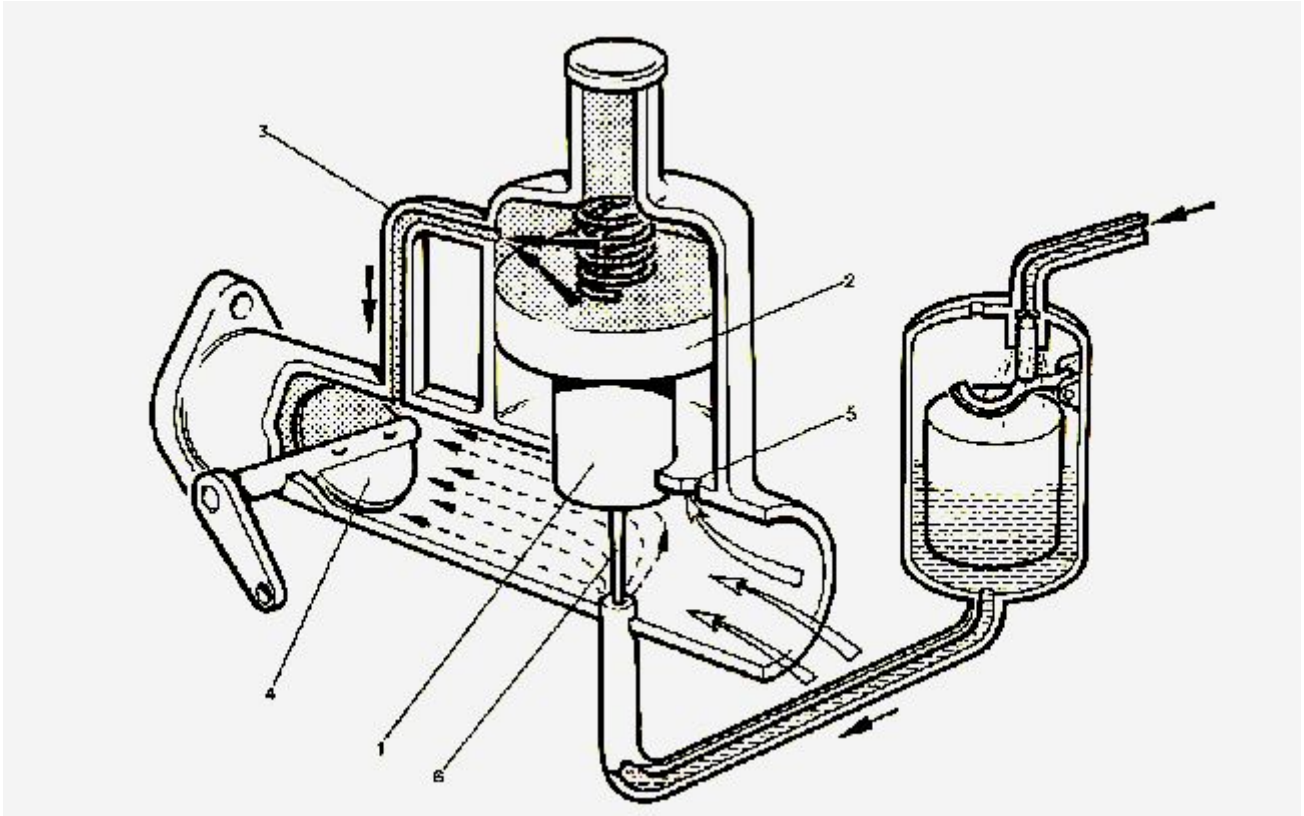
Find out more about the SU carburettor...

...a clever instrument found under the bonnets of many classic vehicles. Our three part series explains its history and construction, and how to maintain/overhaul the unit to optimise performance and minimise petrol consumption.

Part 1 looks at the origins and development of this amazing and efficient instrument. Dave Moss is your guide...

The Lilley and Skinner boot and shoe manufacturing dynasty might seem an unlikely birthplace for the familiar SU carburettor - but it emerged from the ideas of George Herbert Skinner, born into the family in 1872. Usually known as Herbert by the time he began working in the family business at the very dawn of the motoring age, even at that early stage shoes appear to have been of little interest. Herbert was soon applying for patents on carburation ideas for the new-fangled motor cars then beginning to appear, with his ideas translated into practical reality by his younger brother, Thomas Carlyle (Carl) Skinner. It's not clear what car was used to test these ideas, though possibilities apparently range from a French Léon Bollée to an early Renault or Wolverhampton-built Star. Also unclear is exactly what prompted Herbert to develop his first carburettor design, which involved placing a jet fed with petrol into an air flow which varied in relation to engine load - but it's certainly a long way from making shoes.

This basic principle was patented in 1906. Its secret was near-constant depression and thus air velocity within the instrument - an arrangement believed to be the world's first variable choke carburettor. The earliest working units were machined by George Wailes & Co, based on London's Euston Road, and as they found a market, a production partnership arrangement was set up. By 1908 Herbert had patented a "needle" operated fuel metering arrangement working in an adjustable jet - with what was described as a "collapsible chamber" above it. This brought all the essential basic principles of the future SU carburettor design together for the first time.



Essentially simple but highly efficient... SU carburettors through the years (and shown is a later example) supplied fuel through a variable jet, to mix with incoming air. More detail on this set-up will follow in Part 2 of this feature.

The S.U. company itself was formed in August 1910 by Herbert and Carlyle Skinner, with assistance from their third brother John Skinner - the letters neatly representing their new business partnership, the Skinners Union. In the years before the Great War, from converted horse stables on London's Prince of Wales Road, they supplied both Wolseley Motors and the Rover company with "sloper" carburettors, so called because the needle assembly and suction chamber were noticeably offset from the vertical. In these units - clearly using connections with the family firm - a leather "bellows" arrangement provided the "collapsible chamber", controlling the rise and fall of the "needle".

Wartime production involved Aero engine carburettors and machine gun parts, though surprisingly, after the war for some reason Herbert didn't immediately work towards



overcoming the sloper's biggest practical problem - it lacked cold starting provision. Instead it seems Wolseley engineered a solution, patented in 1918, involving an extra jet with a mechanical, manually operated needle.

Through the financially fraught 1920s, very subdued new vehicle demand saw the company enduring hard times. Some development did continue, resulting in two design hallmarks of future SU products. First, the leather bellows were replaced: An aluminium alloy piston now carried the needle, enclosed in a suction chamber, also in aluminium alloy. Then, shortly before Herbert Skinner left the company in 1926, a new carburettor design known as the 2M was introduced: This was the starting point from which production instruments would be developed and refined far into the future.

Herbert's departure coincided with a deepening crisis at SU. Bankruptcy was narrowly avoided when Carl Skinner approached his firm's biggest customer, William Morris, urgently seeking financial support. At the time Morris was acquiring several of his major suppliers to secure component deliveries for expansion. He clearly had faith in the product, purchasing SU for £100,000 - then a lot of money for a struggling company - and promptly relocated the business from London to the former Wolseley plant, at Adderley Park in Birmingham.

With Carl Skinner installed as Manager, major investment followed - initially to deliver a production target of 1,000 carburettors a week - but as Morris vehicle production soared, so did demand for SU carburettors. Development continued too: Alongside steady improvements and additions to the existing range, a new specialised carburettor was designed for airborne applications. In 1934, the first SU electric petrol pump was introduced. It remained in production with only detail changes for well over thirty years. Two years later, major rationalisation of the Morris empire's structure saw Carl Skinner promoted to managing director of the newly founded S.U Carburettor Company Ltd.

During World War II, SU supplied carburettors for the Rolls Royce Merlin engines used by front-line aircraft, particularly Spitfires and Hurricanes, and was also engaged in sensitive



fuel injection pump development work. Production was duplicated at the Coventry Riley factory, an expedient move because in 1940, the Birmingham site took hits from two air raids, resulting in evacuation to Solihull. A shadow factory is also believed to have operated in Yorkshire, though both its precise location, and the work undertaken there, have proven elusive.

Vehicle carburettor and petrol pump production recommenced soon after hostilities ended, though it was July 1947 before all existing facilities were reconstituted under one new factory roof at Erdington, Birmingham. The return was Carl Skinner's swansong, his retirement that December breaking the last direct link to the company's origins. The following year, in a move which - with hindsight - might just have sealed the fate of the entire operation many years later, all interests in design and manufacture of SU fuel injection systems were sold off to an American company. With carburettor demand for Nuffield Group cars booming and the merger which would bring the British Motor Corporation into existence just around the corner, at the time it must have appeared a perfectly rational decision...

The twenty years between Austin and Morris coming together to form BMC in the early 1950s and the early 1970s were golden years for SU production and development. Designs ranging from the early H to HD and later HS series carburettors were fitted to millions of cars for home and export markets - in single, twin, and triple combinations. Production is believed to have peaked at around 30,000 carburettors a week late in the 1960s, around the time the product range expanded to include mechanical as well as electric fuel pumps.

The HIF series integral float carburettor line launched in the 1970s ('IF' standing for 'Integral Float') was the last new instrument in the SU lineage. After this, endless British Leyland restructuring saw SU integrated uncomfortably into a succession of Group subsidiaries, and further development stifled. It returned to BL's light car division as Austin Rover Fuel Systems in 1983, based at Longbridge, where one key introduction was electronic control of the HIF's automatic choke arrangement. Longbridge development expertise was also behind the last development of the HIF unit, known as the KIF.



This was a revised and refined version of its older brother, designed specifically for Rover's brand-new and advanced 1.1 and 1.4 litre 8-valve K Series engines, and introduced with the new Rover 200 range on August 30th 1989. KIF series carburettors majored on fuel economy, and tight, uniform mixture control, to deliver repeatable emissions performance from car to car. Technically this final SU instrument appeared as an independent product, since in 1988 Rover Group divested the SU operation to Hobbourn-Eaton, which was acquired only months later by US Based Eichin Inc.

Inside 12 months it was clear that rapidly advancing development of electronically controlled fuel injection systems would soon make it possible to achieve more reliable and consistent real-world fuel economy, while continuing to meet ever tightening exhaust emission legislation. Having seen this writing on the wall, Rover had already begun SU's diversification into oil pump manufacture, production of sub-assemblies - and Single and Multi Point throttle bodies for their future car range.

KIF series carburettors survived until April 1993 on the entry level Rover 214, and until January 1995 on 1.1 litre 8 valve Rover Metro models. Their demise marked the end of carburettor-fuelled, series-produced British cars, though some production continued until early 1999, when the SU factory at Wood Lane, Erdington, in Birmingham was closed. Within months, with SU effectively then simply a replacement parts supplier, the Eichin Group was acquired by US auto parts conglomerate Dana Inc., and the company became Dana SU.

## Burlen Fuel Systems

Around this time established SU distributor Burlen Fuel Systems successfully negotiated to take over manufacture and supply SU carburettors, pumps and related spare parts. By 2000 the intellectual property rights and SU trademark had also been acquired, and manufacture began. The company has since invested heavily, allowing reintroduction of carburettor types unavailable for many years. Today, over 100 years since SU was founded, the name lives on through Burlen's continuing supply of complete carburettors and spare parts for nearly all models dating back to 1930.



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Down but not out... This long-neglected SU can be brought back to life to provide good service for many years; all parts are available to service/overhaul/restore such units.