A Little Further History of the Hillman Imp

Phillip Laughton, Bingley, West Yorkshire

Introduction. My name is Phillip (Phil) Laughton and on leaving school in 1950 at 18 I applied for and was accepted for a pupilage at the Rootes Group.

The general training around the factory involved working in nearly all the departments from the foundry, the machine shops, engine and transmission assembly and test, final vehicle assembly, testing, and quality and service. This was supplemented by theory and practice in the Training Centre and daytime release at the Technical College. As I had always expressed a desire to work on design, the last 18 months were spent in the Research Department at Ryton-on-Dunsmore producing detail drawings for various automatic and semi-automatic transmissions that were being evaluated.

At the drawing board, 1953/'54
Photo supplied by Phillip Laughton

After my National Service from 1954 to 1956 I returned to the Research Department where I found myself under the wing of Leo Kuzmicki who had recently joined us. Instructed by him I designed a twin-overhead camshaft conversion of the 1,500cc Minx engine. This ran on the test bed but was never fitted to a car. Further variations of single-overhead camshaft engines based on the same block followed that *were* fitted to cars and gave quite a few car owners a surprise on the road.

Early days of the Imp. During this time Mike Parkes, who had been a fellow pupil, was working with Tim Fry, at Ryton, on what was to become the Imp. This is well documented in *Apex: The Inside Story of the Hillman Imp* by David and Peter Henshaw. The design and development of the engine is also described by Leo Kuzmicki in his I. Mech E. paper.

After the 750cc Coventry Climax engine had been grafted into the back of the first car a decision to go further had been made. I was sent to Coventry Climax to work with their senior designer Ron Burr on the very first prototype design schemes of the Imp engine.

It had been intended to produce the cylinder block by High Pressure Die Casting (HPDC) and a joint venture with Doehler Jarvis of America had been intended. However, the negotiations broke down and a company called Alumasc, who had developed a low pressure technique for aluminium beer barrels, saved the day. Fortunately the design for HPDC was eminently suitable for this process.

An office was set up under Roy McLachlan to continue with the detail and production design. Initially this was for an 800cc engine but eventually grew through 850cc to the final 875cc. As

much as possible was to be produced by HPDC and although DJ was out of the picture an 'in house' plant was set up at Linwood. One problem was caused by this; the design of the inlet manifold was compromised by the need to withdraw the main parts of the die. The subsequent adverse draft angle caused puddles of fuel to collect at the extreme ends of the main section of the manifold and contributed to poor fuel consumption. This was later rectified when a CD carburettor was fitted with a different manifold.

Prior to the announcement of the Imp there had been a problem with the height of the side lights and the front end of the car had been raised with lengthened springs to overcome this. It immediately became apparent that the handling had been affected. Four of us were selected to act as a handling panel and were given the task of evaluating changes to the car. We would go out in the car over a set circuit, then a change would be made and we would evaluate this, not knowing what change had been made. Sometimes none had been made. One change we picked up was as simple as moving the battery from the rear to the front. Eventually this testing resulted in the very big difference between the front and rear tyre pressures.

In the prototype engine build shop ('The Atom Shed'!)
Photo supplied by Phillip Laughton

In the meantime I had been working on other projects including a five-main bearing version of the Minx engine to overcome a crank rumble and various combustion chamber-in-piston designs.

Further Imp Developments. At the same time as other work I acted as competition liaison with Marcus Chambers who ran the Competition Department. He was later followed by Des O'Dell. This role was subsequently taken over by Wynn Mitchell.

It had been envisioned that a further increase in capacity of the engine would be required and a taller block with increased stroke giving 998cc was designed and sand castings made. I produced a five-main bearing version of this and some cranks were made but never machined to my knowledge, although some three-bearing engines were made. When the cylinder block transfer machine line was designed, provision was made so that the taller blocks could be machined on it but this never came to fruition.

To try to increase the capacity quickly I designed larger bore press-fit liners to replace the cast-in liners. The cast-in liners were machined out and these thin-wall liners were fitted. We ran some but the liners were squeezed out like pips and we could not solve this. Eventually the Competitions Department solved it by completely machining out the cylinders and fitting wet liners with Wills rings instead of the head gasket. This became the basis of the 998cc Rally engine.

As increased performance was required I was allowed to design a twin-carburettor version

Fry Climax Formula Two car (designed by Sir Alec Issigonis)
Photo: Phillip Laughton

using Zenith CD carburettors. This had a higher lift camshaft with twin valve springs. Unfortunately there was no room for the valve stem seals that were necessary because of the installation angles of the engine so the casting dies were modified to allow for a drain tube at the rear of the cylinder head into the block. The twin-branch manifold was designed in conjunction with Cheswick and Wright to use a common pipe bend radius to keep it simple and cost effective. The air cleaner was designed with AC Delco to use paper element air cleaners. A plastic foam element had been tried with another supplier but this was a disaster. When the element became blocked it just unloaded all the dirt straight into the engine. An adapter was easily arranged between the oil filter and cylinder block to allow for an oil cooler to be fitted. The larger valves and ports were developed on our air-flow rig and the performance prediction method we used agreed with the engine test results, much to our satisfaction.

Coventry Climax had produced some further design studies for an improved performance version but these were much more radical and would have been difficult to fit in the car. However, I produced some design schemes for a four valve per cylinder, twin overhead camshaft, crossflow cylinder head. This would have kept the carburettors under the rear parcel shelf. A wooden flow model was made and the results were very promising but I was never allowed to proceed.

That was the end of my involvement with the Imp apart from owning one of the ex-development cars with a 998cc engine and later a bright yellow Rally Imp.

After the Imp. During my time in the Research Department in the evenings and weekends I worked with Mike Parkes and one the fitters, Dave Newton on a Formula Two car powered by a 1.5 litre Coventry Climax. It was called the Fry Climax , the Fry name deriving from Joe Fry of hillclimb fame. Mike raced the car and we were his race mechanics. However, that's another story.

Mike subsequently went on to drive Formula One cars for Ferrari, and after a serious accident at Spa left to work for company in Switzerland involved with Ferraris. He later died in a road accident.

My career continued in engine design and I was in charge of the design team for the Avenger engine when we were taken over by Chrysler. After that went into production I was in charge of powertrain design in the Advanced Design Department and was also involved in liaison with Simca and eventually PSA (Peugeot). When Peugeot took over from Chrysler the design department was obviously going to close and so I made the decision to leave in 1980 and took the position of Chief Designer at Hepworth and Grandage in Bradford.