My Hawk Build. Part 2
by Stuart Clarke

The Engine.

The decision on the engine was very difficult. Luckily the Hawk is a very flexible kit and can accommodate a wide range of engines from a 4 cylinder 1.8 MGB engine, a 6 cylinder 2.5 litre from a number of different manufacturers through to a V8.

The V8 options vary from any in the Rover range, starting with the 3.5 litre power plant, or a more authentic option is a Ford V8 engine. No doubt there have been Chevy V8's fitted into the Hawk too but I haven't seen any.

The engine is a matter of personal choice and size of budget. There are all kinds of options to suit every requirement. I decided that I wanted something authentic which meant going for a Small Block Ford V8. These engines have been built in one form or another (and varying engine capacity) from the early 1960's to virtually the present day.

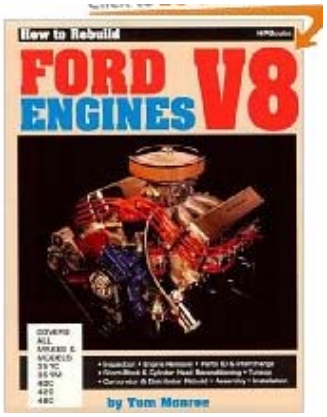
A very popular choice is the Ford 302 cubic inch diameter or 5 litre. These engines are readily available as "cut outs" (which literally means cut out of a car ready to either install or rebuild) to turn key engines tuned and rebuilt by a rebuilder or crate engines. These can be obtained from a number of engine providers and recommendations can be found by doing a Google search or researching details on V8 or Cobra related forums.

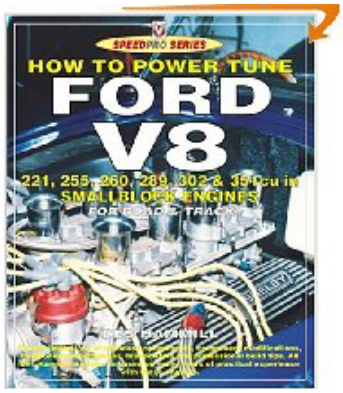
I wanted something, as I have already mentioned, a little more authentic. This meant that I had to look at a 289 CID or 4.7 litre engine. These were only built from 1963 until 1968 and although thousands were built and they were installed in a wide range of cars and trucks, they are now getting a little scarce.

They were also built in 2 forms and the difference is the bell housing connection. The earlier engines had 5 bolt connections and the later 6. These aren't interchangeable and thanks to many discussions with people "in the know" (many of which are members of The 289 Register) I was advised to go for a "6 Bolt" 289.

The "golden fleece" of 289 engines is the HiPo or K code engine. This was a High Performance version of the 289 that was introduced in 1963. These are now very rare and I knew before I started that the chances of getting a good example of one of these would be minimal.

I bought a number of books on Small Block Ford engines to try and understand what they were all about. This was very interesting reading and I learnt a lot.
The two best books that I found were "How to Rebuild Ford V8 Engines" and "How to Power Tune Ford V8 Engines".

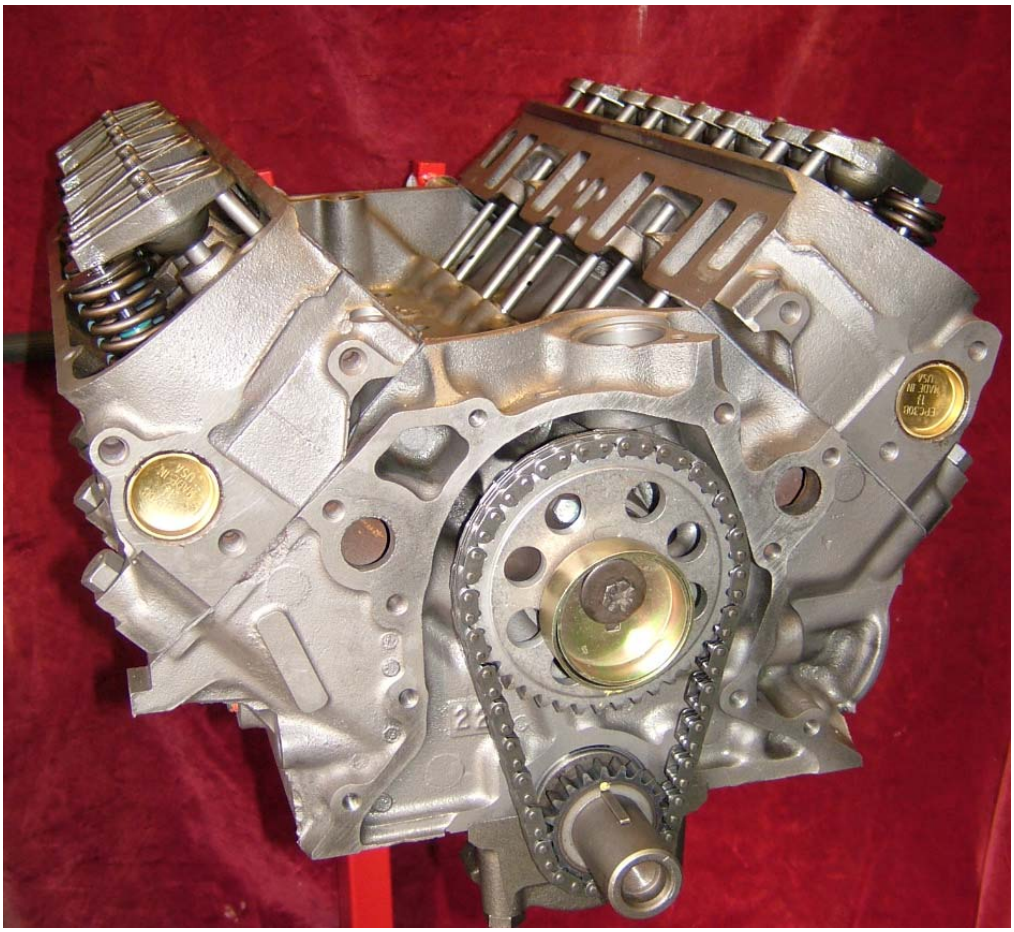




These books gave me a bit more confidence in understanding what I needed and also asking the right questions.

The next thing was to find one and this took a long time. I spoke to lots of companies, some here and some in the USA. I was finally sweet talked by an engine rebuilder in Spokane, Washington State on the West Coast of the USA. They had a regular supply of 289 short blocks (engine blocks fitted with crankshaft, pistons and camshaft). I specified a 6 bolt engine refurbished and over bored to a maximum of 0.030”. I wanted a set of refurbished original heads which they also fitted and were able to set up for me. They also supplied a guarantee with their work so I placed an order with them. Six weeks later I received a large box.

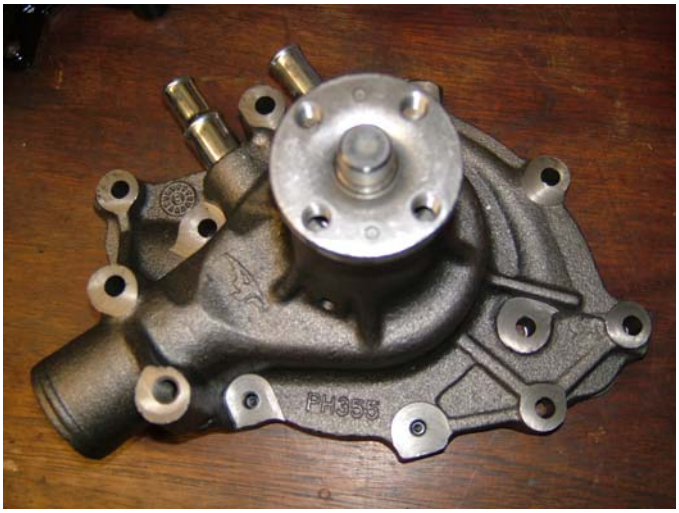
I unpacked it and I was very happy with the quality of the work. I went out and bought an engine stand and bolts to bolt the block to the stand.



It had been totally stripped, blasted, cleaned and tested for cracks. It had then been checked, balanced and reassembled.

The next step was to start ordering all of the other components that I needed along with a set of AF sockets and spanners, AF Allen keys, UNC thread chasers, feeler gauges ……. Virtually another tool box full. Oh, and the most important thing... a good torque

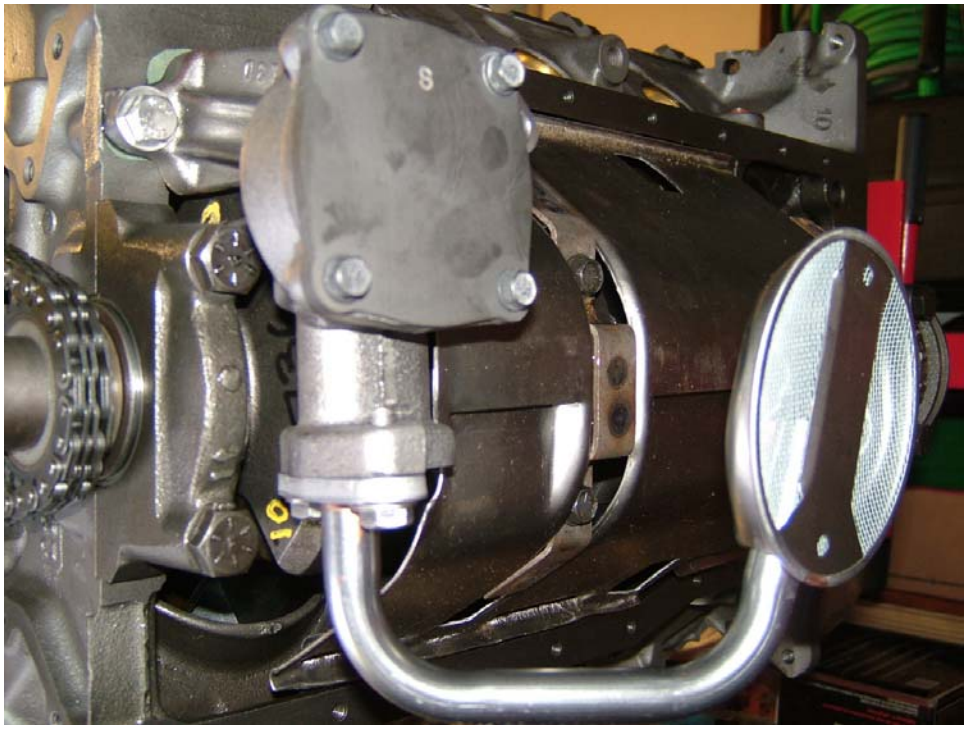
wrench. The books that I bought were fantastic as I could work out exactly what I needed both tools and parts. I also got a great deal of help from Real Steel who also supplied most of the parts I needed.



First job was timing cover, water pump, Harmonic damper gaskets and bolts and more bolts and more bolts.

I decided that I would fit a windage tray, recommended in all of the books this allows the oil in the sump to flow from the crankshaft in a more controlled manner and reduces the foaming of the oil due to aeration. To fit this you need to exchange four of the bearing block mounting bolts for special bolts with integral female threads to allow the windage tray mounting bolts to screw into them.

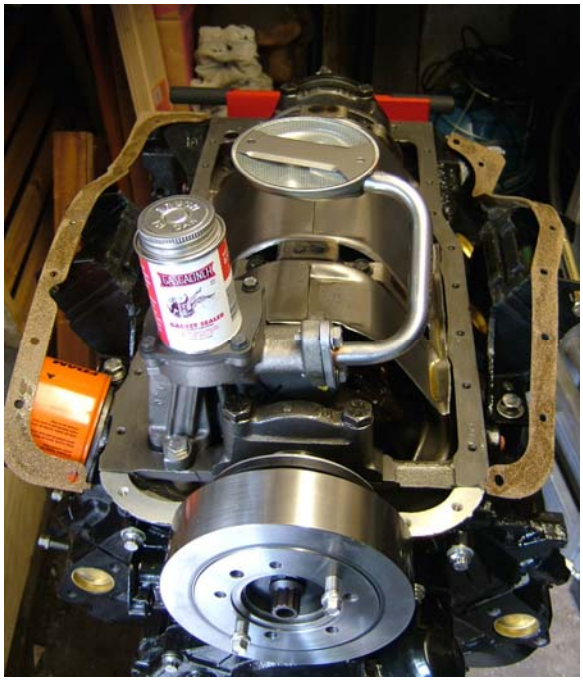
The next job was the oil pump.



After the oil pump I had to think of the sump pan. I ordered a nice chrome pan and thanks to my research I found out that the oil temperature is best measured when the oil is in the sump. If you try and measure it in the engine block then you generally measure the block temperature. This doesn't give the required warning of too high oil temperature.

I'd opted for mechanical gauges which meant that I would need a fitting that accommodated the "bulb" of the mechanical gauge. Electrical temperature gauges work by having a "sender" that convert the temperature measurement to an electrical signal that is sent to the gauge by a wire. Mechanical gauges have a "bulb" filled with liquid that expands or contracts by the rise and fall of the oil temperature, the fluid connected to the gauge by way of a thin capillary tube.. This causes a spiral tube in the gauge to twist (actually straighten) causing the dial on the gauge to move.

I got the correct sump adaptor and fitted it into the sidewall of the sump. I then fitted the sump. Its best to do a dry run with the gaskets and they do only go one way round as one side of the engine block is stepped along its length. After quite a bit of research I found that "Gasgacinch" is widely recommended to help gaskets stick in place on the side that doesn't normally have any RTV sealant (room temperature vulcanising sealant). It also stops the gaskets being squeezed out when the bolts are tightened up.



This was followed by some good quality engine enamel.

Then I fitted the Intake manifold using the correct gaskets and Gasgacinch. The key is also to add some RTV sealant around the water passage holes. The “How to Rebuild a Small Block Ford Engine” book explains this in detail.

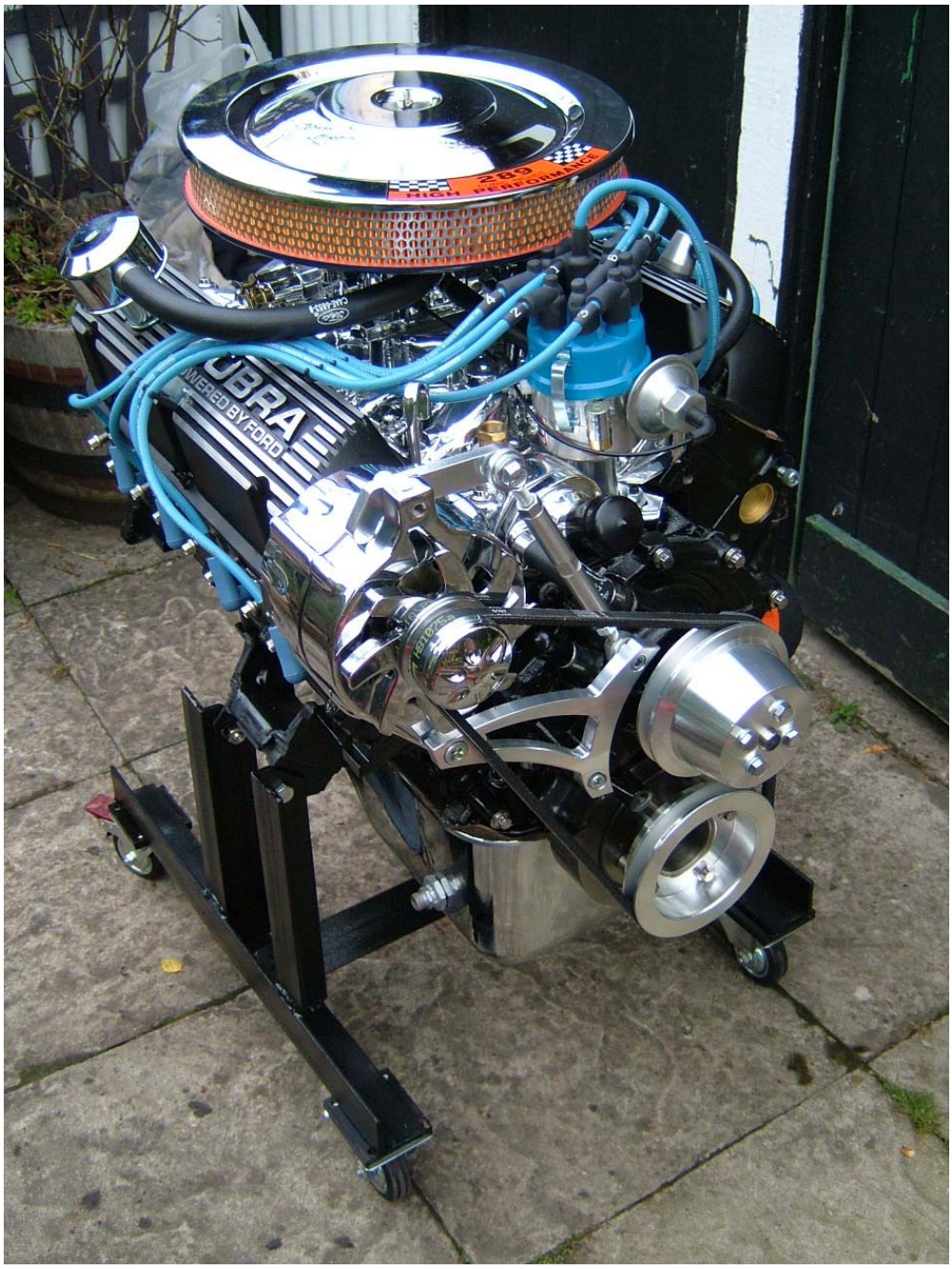
Next was to fit the distributor and I went for a Mallory dual point distributor. Some people don’t rate these but everyone I spoke to said that they are OK. I can always upgrade the internals to an electronic version at a later date. I also needed an alternator and I went for a 100amp chrome version which shouldn’t every give me any problems with the battery not charging in the future.

I sorted out the alternator mounting brackets, this turned out to be a bit of a problem as they are nearly all designed to mount the alternator in the position shown in the following picture. Well that is exactly where the steering column will be in the Hawk. I could mount the alternator on the other side but that’s where I’d be fitting the header tank. Oh well I’ll sort that out later.

I fitted the rocker covers that I bought and now it really started to look the part.

I didn’t like the red distributor cap so I found out that they do a marine version that is blue. I also got some blue spark plug leads. I machined a small aluminium bracket to enable me to mount the alternator up high on the near side. This way I could use the same tensioner and it worked out really well. Final couple of bits: carburettor, air cleaner, fuel pump blanking plate, water pump drive belt, a couple of hoses for the breather and PCV (positive crankcase ventilation) valve and I was finished.

I made the transport stand out of some angle iron and a couple of castors. This made it

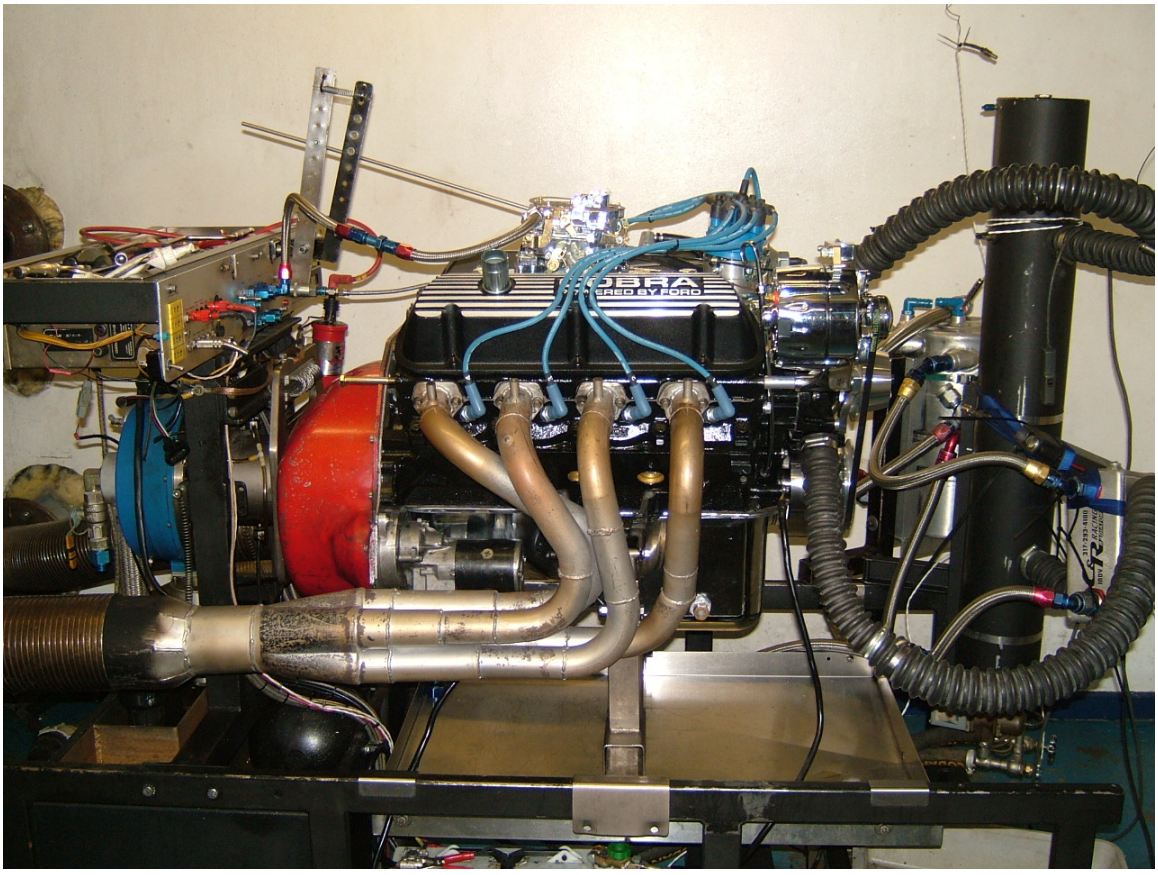


much easier to move it around, as a fully built Ford engine must weigh something in the region of 200kg.

I then needed to find out if it worked…..

I arranged to get it tested at Tim Adams Racing. Tim builds race engines for a living so a stock 289 would be pretty small fry for his Dyno.

I had a good day and learnt a great deal. He helped me set it up on the dyno, bedded in the cam and jetted the carb to give the best output for my application.



After 2 coughs it ran up like a dream. We ran it for ½ hour at 2300 RPM to bed the cam in and then wound it up to 5200rpm. After some adjustments it made 210HP and had a nice flat torque curve of 275ft/Ib from 1000 RPM up to 4500RPM, perfect for a street car engine.

It should make the Hawk quite nippy! ☺

All in all a very satisfying job that worked out well.