

Projects to Date

Martin Lucas

Progress on the 23B kit has been slow this year. Mainly due to trying to work within a sensible budget, and having sufficient time to make the various bits and pieces necessary.

My mind has been changing continuously on the specification of the engine. Initially the Lotus Twin Cam engine I bought in bits was going to have a stroked Datsun crank fitted. Special pistons were going to be made to suit the Datsun crank and rods. That was until a strange set of events changed my mind. Overhearing a conversation at the Manfeild race track led me to making contact with a guy who had a Cosworth BDA for sale. I was looking for a set of camshafts so approached him to see if he was interested in selling them. In short the answer was I could have them if I bought the whole engine. At the same time it so happened that Barry Leitch had bought a project car and was looking for a suitable engine - preferably a BDA. Many phone calls and car trips to the seller resulted in Barry getting a BDA, I got the camshafts. At one meeting with the seller the conversation turned to other engine makes. Lotus popped up - the seller had a spare Lotus Twin Cam head which I could buy for \$500. A deal too good to pass up. It soon became apparent that he had other Lotus engine bits as well. In the end the final parts tally was one Twin Cam head, the front cover, four 0.030" oversized Twin Cam pistons, four unused 1.625" (41.3mm) inlet valves - standard size is 38.8mm, with the added bonus of a set of Lotus Twin Cam conrods.

The purchase of the conrods made me decide to keep the first Twin Cam engine semi original. Instead of fitting a longer stroke Datsun crank I have opted back for a 'standard' stroke Datsun crank with Lotus rods. I can retain the 85mm forged Mahle pistons (82.55mm standard). This means a serious saving in the rebuild of the bottom end. To date I have fully machined yet another Datsun crank to suit the Ford/Lotus block. It has also been fully ground to standard

Ford main and big end sizes. The flywheel (machined from EN25 high tensile) is complete but for some lightening slots. I'm having to wait for the toolmaker at work to have some free time to CNC mill the slots. The flywheel has been dowelled to the crank for added security. The conrods have been crack tested and checked for alignment. Pleased to say they passed. Weighing them on the work scales revealed a 3 gram weight range between heaviest to lightest - so they have been balanced by a previous owner. I wouldn't mind the weight range closed up a bit though.

The purchase of a spare Twin Cam head got me thinking. The head is generally the hard part to source. I could build a spare engine around it. I had a 'period' 1500 pre-crossflow bottom end purchased last year for \$50 via the Trade and Exchange and I had the recently acquired 0.030" oversized pistons. The 1500 pre-crossflow block is a later 'lip seal' not rope seal block which is good. Unfortunately it had 'round' main bearing caps - not the later stronger 'square' main caps. The standard Ford 1500 rod is the same length as the Lotus rod but it isn't as strong. The Lotus rod is heavier in section and has 3/8" rod bolts as opposed to the Ford rod which has 5/16" bolts. The very first Lotus Twin Cam engines ran the Ford rod but were soon changed to the stronger 'Lotus' rod as the standard Ford rod was deemed to be marginal. The Lotus piston has the same compression height as Ford piston but it is a stronger/superior piston. The Ford piston has slots behind the oil control ring, the Lotus is solid with drilled holes. The Ford crank is cast iron and has less counterweighting than a Lotus crank. I did end up with a spare Lotus crank but was found to be cracked when tested. If I was to try and build a spare engine I needed to have the right bits. Block was okay but needed square main caps. This was easy to solve - I had a spare set from a stuffed 1600 Xflow Ford bottom end that I had stripped for bits. I fitted these and have taken

the block to Kerry Lindsey to line bore the mains. The Ford pistons were thrown out and will be replaced with the cast Lotus 0.030" pistons (83.25mm). Not as good as forged but certainly up to the task required for a spare engine. A few phone calls resulted in locating a set of Lotus conrods from a Club Lotus NZ club member I know. These replaced the Ford rods which I gave away. The Ford 1500 crank was scraped - the Ford crank was incorrectly ground - the fillet radii were ground too small. A spare L16 crank has been modified to fit (yes another one). The camshaft in the block was modified to be a shorter jackshaft. I modified the block to incorporate a few ideas that I had been mulling over after Peter Zivkovics interesting club talk. Basically the oil drillings were 'ported' with an air tool. Restrictors and plugs were fitted to various oil drillings to restrict oil from being pumped away from the crank main bearings. Frost plugs have been retained with cap screws, and the rough cast internal block surfaces smoothed to aid oil return. The block was also

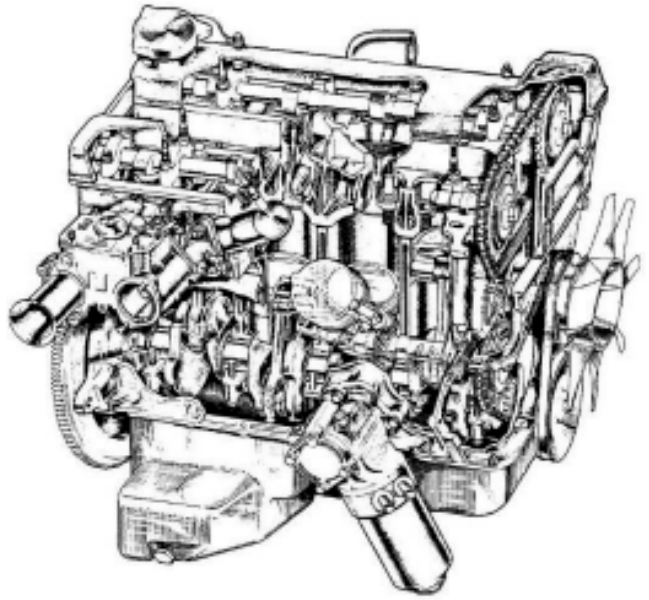
machined to enable the Datsun cranks' larger throw counterweights to turn without fouling certain parts of the block .

The spare Lotus cylinder head was cheap but it requires a lot of work. The exhaust ports appear to be larger in diameter compared to the other head. The inlet ports appear to be standard but may have been attacked by a previous owner. Hopefully the port/venturi section hasn't been touched - if done incorrectly it can seriously affect the engines power in a negative way. I plan to send the head to Bryan Hartly in Palmerston North when I finish fitting new cam caps so he can line bore them and check the ports/seats etc. I have been lucky in locating an original early type Lotus cam cover as fitted to early Elans and Lotus Cortinas. This will suit the 23B more than the Hart cam cover I have. Whilst the cam sprockets are standard Ford items with different timing marks I have opted for a set of vernier adjustable. I have made these myself using a machined alloy disc and modified Ford sprocket. All I need now is to locate a pair



of Lotus camshafts plus a few other bits.

Although I am only part way through the spare engine diversion I have learnt quite a bit from it. For example line boring of the crank changes the crank to gearbox input shaft alignment. I plan to get around this by machining a matched Hewland adaptor. The vernier cam sprocket from a twin cam also suits a crossflow. Crossflow pistons are generally accepted as being heavy and as a result limit revs. The lighter twin cam piston is only lighter by 35 grams !! ACL engine bearings can be purchased for less than a third the price than listed in UK catalogues.





The Britten -The picture was taken when John Britten brought along the bike to F&P when I worked there. They fired the bike up for a few runs up the drive. Most impressive. A real constructor if ever there was one

SAKER CARS



Saker Sprint

Saker SV1



By TURNBULL ENGINEERING
P.O. Box 9, Bunnythorpe, Manawatu, New Zealand

Phone/Fax: 06 329 2923
web site: <http://www.saker.co.nz> e-mail: tull@inspire.net.nz