



*Piston in the lower right is the modern JE Piston. The others are original.*

### **Austin Healey 3000 BJ6**

It all started innocently enough. J.M. had wanted to rebuild the driveline on his 1964 Austin Healey 3000 B18 for several years. Previously the engine had had problems with smoking exhaust, with pushing oil out from the crankcase breather, and with low oil pressure. I had read Norman Knock's Tech Tips about worn rocker shaft bushings causing 2 of 3 of these problems. After replacing the rocker shaft and re-bushing the rocker arms, the blow-by and oil pressure both improved staving off the rebuild. More recently, after hearing a loud clanking noise from the engine, J.M. decided the "winter" of '99 was finally the time to do the rebuild.

After removing and disassembling the big Healey's drive train, we discovered the following:

- One mismatched connecting rod.
- The wrong flywheel and clutch, (possibly) explaining the scatter marks which covered the interior of the bell housing.

Thanks to another article "Experiences In Building A Strong Vintage Race Engine," we noted that the engine mount stands on the frame rails should be checked for cracks. Sure enough, his needed repair and welding. We also touched up the engine compartment paint when we were finished with the strengthening.

With the engine out, we removed and shipped the steering box to Steering Services in England to be rebuilt. We have not found a domestic re-builder for British Car steering boxes that has been satisfactory. As usual

they did a great job and the box was reinstalled.

After disassembling, cleaning, and inspecting the engine and researching the options for some “performance tuning”, we opted for the following:

- Custom-made three ring (as opposed to the original 4 ring heavy pistons) lightweight forged high silicon content forged aluminum pistons from IE.
- We had the steel flywheel lightened.
- A mild grind new cam from Dennis Welch that had 268-degree duration and .252 lift at .016 valve clearance. We opted not to use a cam with significantly more lift so we didn't have to machine the block. We used “bucket” style lifters and longer pushrods, which eliminate side loading and corresponding valve train wear.
- Every rotating and reciprocating part was balanced.
- The clanking noise J.M. had heard was the front crank pulley/damper being loose on the crank! We purchased a more modern replacement for it. After purchase, the original crank pulley nut only threaded on 50% of the way. After a call to the manufacturer we were told that no one else had complained of this problem, but that they would check it out. Low and behold we were correct! We ended up machining the nut to half thickness and installing it with Loctite™.
- We installed the rear main seal kit in the block.
- We used Welch's lightweight aluminum rear engine plate, which comes preshaped to fit the rear main seal housing.
- The block also needed to be align honed. This straightens out the crankshaft main bearing saddles in the block.
- The original oil pan like most big Healeys was. smashed, bashed and previously poorly repaired. After researching options we ended up with a Dennis Welch aluminum sump and oil pump baffle. The one we had gotten domestically was not nearly as nice and was returned. We also opted for a Welch high volume oil pump, as it was significantly less money than an original.
- All new timing components as well as an adjustable cam sprocket to “dial in the cam”. The cylinder head was gas flowed and ported.
- The intake manifold was extrude honed. A process which uses “abrasive paste” to do smoothing and contouring for places where handwork is not possible due to accessibility problems.
- The engine needed all new valve train components- even the spring seats were pounded out!
- We ordered headers again from Welch. We needed to do extensive reworking to make the headers fit correctly and sent them out to be coated with an aluminized ceramic finish. I have found the coatings last at least 10 years! It greatly improves the life expectancy of headers and any exhaust parts in general.
- We replaced the points with a Pertronix™ system, which fits totally in the distributor for an “OE” look! We have had some problems with the high voltage arcing inside the distributor cap, which were caused by the small diameter of the distributor and the proximity of the terminals. Our untested repair was to drill two holes in the cap, due to the small diameter of the distributor and proximity of the terminals, at rotor height opposite the direction of travel to help prevent the air inside the distributor from ionizing, which leads to arcing.
- Another nice touch was some air cleaners that actually filtered air. We custom made some K&N filter backplates with welded on studs to somewhat ease the chore of removing and replacing the air filters that is always a pain on the big Healeys.
- Running warm has always been a problem with the big Healeys, at least in our environment (6,000 feet in elevation). We installed the biggest core on the existing radiator tanks that would fit and J.M. opted for a Hayden fan, which moves an incredible amount of air and does lower operating temperature. It is quite noisy when revved up at idle, but inaudible once under way. Hayden also recommends checking it for stress cracks every 2-3 years.

In addition to the engine rebuild and performance tuning:

- The transmission and overdrive were shipped to \*\*\*\*\* for a complete rebuild, including new gears, synchros, and bearings where needed.
- The SU carbs were rebuilt by Joe Curto. We have found him to be more reliable and consistent than any other rebuild service.
- We used the opportunity of having everything out to clean and repaint the engine, transmission and overdrive before re-installing them in the car.

The project was a huge success. J.M. reports that the car is very strong and runs much better than it ever did before, and that it meets his objective of making the fine old gem a great driver.