

# Lister JP4 Fuel Injection Pump

Peter Slater tells how his search for parts was assisted by the 'Tower of London Lister'

**A** recent plea in *Stationary Engine* for news about the Tower of London's ex-standby Lister JP4 engine, rescued by the North Lindsay College, Scunthorpe (following a story about it in the magazine nearly 16 years ago) resulted in the following tale:

I had a request earlier last year from an Irish Stationary Engine collector. He had a Lister JP4 Engine nearly complete but the CAV Fuel Injection Pump was missing! Could I please help him to find a replacement: I knew I didn't have one in stock, and after telephoning around to other "old time" Diesel fuel injection repairers, nothing was to be found in the way of an old unit.

Back in 1955 I was doing National Service in the RAF, stationed at Safi camp on Malta, and in the workshops they serviced the Lister JP 4 & 6 cylinder engines. I was in charge of the fuel pump repair shop at Tal Handaq on Malta where I handled a few of these fuel pumps which came in for reconditioning.

## A MEMORY FOR PART NUMBERS!

I remembered that it was a basic CAV BPE4B70S/400 with no governor fitted, after a look on the CAV Fuel Pump register I found the type number of the pump to be BPE4B70S400/3S561, 1955 to 1957 and BPF4B75W400/3S6473, 1957 onwards.

His being an early engine it had the 7.00mm element as against the 7.5mm on the 1957 onwards fuel pump.

So far so good, looking on the spares list I found I had a housing which would do the job, although it was not drilled for an oil dipstick. On checking stock, would you believe two brand new camshafts came to light. The control rack was a different tale, I had a box full of racks (all ex WD, boxed, wrapped in green paper, greased as good as the day packed) but with only one fork eye on the end, and the JP4 required two, one with the Max fuel Stop, the other connected to the Governor Linkage.

So a modification on the rack was undertaken. With a piece being screwed into the blank end, fastened with Loctite, turned to size, placed in the dividing head and the flat milled and hole drilled for the clevis pin.



*Flashback sixteen years: The recovery of the Tower of London JP4 standby engine. Dave Dean at the Tower reading a copy of 'Stationary Engine', with the engine and his rescue team. (photo: Gordon Wright).*

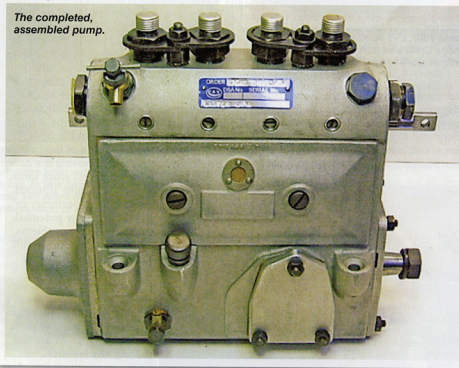


*Over two tons of Lister JP4 Generator set had to be man-handled on steel tubes used as rollers. The Tower of London engineer to the right (wearing a suit) looked on. (photo: Gordon Wright).*



All the parts assembled for the JP fuel injection pump.

The completed, assembled pump.



I was confident on building up the fuel pump, but to the position of the air-vents and oil drains, I really needed a picture of the pump in situ on an engine.

## TOWER OF LONDON LISTER & BEER!

I remembered an article in a back issue of the Stationary Engine in June 1994 on a JP4 Powered Standby Generating Set,

being removed from the Tower Bridge in London by North Lindsey College and a follow-up up article on the refurbishment of the set, by the College's Dave Dean.

The North Lindsey College being here in Scunthorpe, it was relatively easy to find Dave Dean, who was now retired from the college, and would you believe had taken a pub "The Dog & Gun" in East Butterwick, a delightful little village

on the banks of the River Trent.

A phone call to Dave, who now had the JP4 Generating set at The Dog & Gun, and he would be pleased to show me the engine. The best part I kept till last was that Dave brewed his own beer for sale in the pub!

Now it is one thing being interested in stationary engines, but Home Brewed Beer seems to compliment visits to stationary engines, and a speedy date was made to see the engine and of course, sample the beer in that order.

Meanwhile the aluminium housing & inspection cover and bearing endplates were sent locally for bead blasting, using plastic beads, which gave the aluminium a very soft satin finish.

## THE ELEMENTS COME TOGETHER

With all of the parts now located and cleaned, assembly could be started. New control rod bushes were fitted and reamed out in-line using the special CAV reamers and guides, checking that the control rod was a very good free sliding fit.

The element, delivery valves, quadrant and tappet assemblies were fitted (making certain that the element plunger "ident" number was facing the front) and the tappets held in the "up" position, the pump could be pressure tested with air at 30psi for 5 minutes, submersed in a oil tank.

No leakage found, the bearing endplates fitted and the camshaft end-float checked which is between: 0.05mm to 0.15mm. The pump was now ready for Calibration and Phasing Settings: The initial calibration is set to a basic chart for "B" sized fuel pumps. Test injectors are standard set at 175 atm. The pump element is 7.00mm diameter.

Adjustment to the quadrant's at a 9.00mm control rod opening (From Stop Position) at 600rpm a balance reading of the fuel levels are taken between 4.9ccs - 5.7ccs at 100 stokes, all outlets to read the same. Then a check dropping the speed to 200rpm is taken at 6.00 mm control rod is taken to ensure a figure of 1.7ccs - 2.2ccs. All being correct the quadrant screws are tightened.

The phasing is done by removing the Delivery valve and spring and fitting a swan necked pipe on the delivery union. Upon rotating the pump in the order of directional running. The oil flow should cease at the time of point of injection on each cylinder in firing order. The tappet screws have to be adjusted if this is not correct. The degree angle is given on the test machine.

Taken off the calibration machine, the fuel pump was now ready for final sealing and capping.

## OH DEAR!!

Only one thing now, I had taken so long, writing about it, photographing it, drinking ale at "The Dog and Gun", that the chap in Ireland had got fixed up with a pump... he no longer required mine!

Can anyone use a JP4 Fuel Injection Pump! ●