



# Handbook

*for the*

## 600 cc. s.v. Mark III Type 5 Engine

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This Handbook has been prepared for the engine specially developed for Rotary Hoes Limited, of Horndon, Essex.

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**J. A. PRESTWICH INDUSTRIES LTD.,**

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Type : J.A.P. Mark III 600 c.c. side valve.

Bore : 85.7 millimetres.

Stroke : 104 millimetres.

Compression ratio : 5 to 1.

Piston material : Aluminium alloy.

Piston ring equipment :

- Top: Plain compression ring, cast iron.
- 2nd: Plain compression ring, cast iron.
- 3rd: Slotted oil return ring, cast iron.

Gudgeon Pin :  $\frac{3}{8}$ " dia. circlip located.

Connecting rod : Steel forging.

Connecting rod bearings :

- Small end: Plain phosphor bronze bush.
- Big end: Caged roller bearing.

Crankshaft bearings :

- Driving side: Ball bearing.
- Timing Side: Needle roller  $\frac{3}{8}$ " dia. rollers.

Lubrication : Dry sump.

Ignition system : Magneto. Wico, type A1041 BZ.

Magneto rotation : Anti-clockwise.

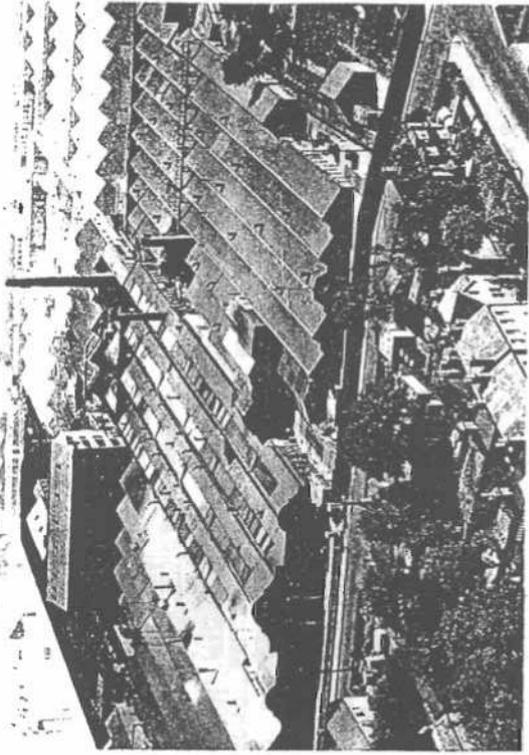
Carburettor : Amal type 225, with variable main jet.

Carburettor adjustments :

- Idle mixture: 1 screw.
- Main mixture: 1 screw.
- Idle speed: 1 screw.

Cooling : Air from fan flywheel.

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An aerial view of the J.A.P. Works. Occupying five acres, the Works have been described as "the stables housing horse power, with quality and efficiency."

## ...OURSELVES AND OUR ENGINES

FOR more than half a century we have been making high-quality engines. Their success has been due, not only to our long manufacturing experience, but to the careful research and experimental work that has characterised the development of the J.A.P. engine.

There is not space here to tell the fascinating story of "JAP'S", of how we have come to reach the forefront of the industry; or to describe the special manufacturing processes which experience and ingenuity have given us, and which uphold our proud reputation for first-class workmanship and precision engineering.

Present-day trends in engine design are fairly clear. The obvious developments, such as the general substitution of aluminium for cast-iron as a piston material, are of less significance than the growing tendency to vary engine types and sizes to suit the conditions in which the engine will have to work. This tendency, which is well-reflected in the J.A.P. range of engines, is an undoubted move to greater efficiency and has led us to develop the 600 c.c. Mark III Engine specially for the Rotary Hoe 'Gem'.

J. A. PRESTWICH INDUSTRIES LTD.

Replace the rotary valve with the timing mark on the face corresponding with the mark on the camwheel.

### THE ROTARY VALVE

The rotary valve rotates clockwise. When it is replaced, the leading edge of the slot in the rotary valve spindle should correspond with the leading edge of the slot in the bush when the exhaust valve just begins to open. Failure to time the rotary valve correctly will cause excessive oil consumption.

Replace the distance collar on the camlever spindle and fit the timing cover, making sure that the two rubber sealing washers are in the recesses. Add a little sealing compound to the joint faces and tighten the nuts.

If new cam gear parts, unmarked for timing, are fitted, you must experiment with the various key-ways on the pinion to obtain the correct timing. Both valves should open equally with the piston at top dead centre.

Dry the camshaft taper thoroughly and place the camshaft sprocket, with the magneto chain attached, to the camshaft. Replace the camshaft nut loosely, in readiness for timing the magneto.

### TIMING THE MAGNETO

Rotate the flywheel until the piston is at top dead centre with both valves closed. Then, watching the blower flywheel side, rotate the flywheel clockwise until the piston is  $\frac{1}{4}$ " down the stroke.

Remove the contact breaker cover from the magneto, rotate the magneto spindle in a clockwise direction (looking at the breaker points) until the breaker points just begin to open.

Press the camshaft sprocket on to the camshaft spindle and tighten up lightly. Then check. If the breaker points begin to open at  $\frac{1}{4}$ " before top dead centre, the timing is correct.

Tighten the camshaft nut and replace the chaincase cover and joint gasket. Check the exhaust lifter operation. The cylinder head and gasket can now be fitted, after sealing compound has been placed on the gasket, and the bolts tightened diagonally. Check compression by turning the flywheel with the sparking plug in position.

Take the engine out of the vice and place it face downwards on the bench so that the flywheel housing can be fitted to the crankcase.

After drying the taper of the driving spindle, fit the key and fan flywheel. Tighten the nut by putting a tommy bar between the fan blades and the flywheel housing.

Fit the cylinder cowl and baffle to the flywheel housing, together with the valve box cover and washer.

## DECARBONISING

Thoroughly clean the engine, taking particular care round the cylinder base. Remove sparking plug, carburettor, and exhaust pipe, also exhaust lifter wire. Undo the four nuts which hold the cylinder to the crankcase. The cylinder is now free to be lifted upwards until it leaves the piston.

After removal, the inside of the piston should be filled with rag to prevent damage by the connecting rod. A good plan also is to cut pieces of rubber hose a little longer than the cylinder studs in the crankcase, and slip them over the studs. This prevents the skirt of the piston being damaged by the studs.

It is advisable to cover the crankcase opening to prevent any deposit falling inside the case before scraping the carbon from the piston.

Piston rings should not be removed unless there is carbon deposit behind them which chokes up the grooves.

The whole operation needs care and cleanliness.

If there is any necessity to remove the piston, one circlip only needs removal, and the gudgeon pin can be tapped out from the opposite side.

The valves can be removed from the cylinder, carbon scraped off the heads, and valves ground in carefully with fine emery and oil. When grinding, lift the valve off its seating frequently during the process; this prevents deep scores.

Scrape all carbon from cylinder head and ports, and if necessary finish off with a little fine emery cloth and oil. Thoroughly clean all parts and refit valves.

Before replacing cylinder see that the piston ring slots are spaced equidistant round the piston, smear with thick oil, also bore of cylinder.

See that cylinder and crankcase faces are perfectly clean.

Gently ease cylinder on to piston, closing each ring together with the fingers just as it enters the cylinder. A little goldsize can be smeared on the cylinder base or crankcase face.

Press cylinder on to its base and rotate the engine so that both the tappets are down, and not touching the valves.

Screw on cylinder nuts finger tight, tightening up finally a little at a time diagonally across. It is important that the nuts should be evenly tightened, otherwise the base will be strained, and there is a risk of the cylinder fracturing. Adjust the tappets to the clearances shown on page 7.