



SERVICE SHEETS

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BSA SERVICE SHEET No. 305

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B Group Models RE-ASSEMBLING THE ENGINE

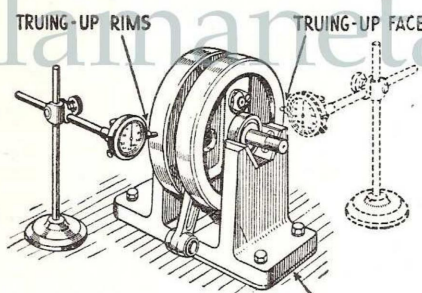
The need for extreme cleanliness cannot be over-emphasized.

Parts should be thoroughly cleaned and all trace of any anti-rust preparations with which new parts may be coated must be removed.

All bearing surfaces should be liberally smeared with engine oil when assembling.

Flywheels

If the big-end assembly is to be renewed it is as well to check the weight of the new components against those which have been removed. A slight variation in the weights is inevitable, but provided that the discrepancy does not exceed $1\frac{1}{2}$ ozs. no further action need be taken. This tolerance should not be exceeded, since in the first instance the flywheels have been balanced to suit the original parts, and the balance may be adversely affected if the weight of the new components varies considerably from that of the original ones.



Suitable packing under timing side "vee" block
to compensate for smaller diameter bearing

Fig. B.9

The driving side flywheel should now be fitted to the crankpin (this is the side with the keyway) and the nut tightened up by hand. Fit the timing side flywheel and again tighten the crankpin nut by hand.

In order to tighten the crankpin nuts properly, the whole flywheel assembly must be held rigidly. For this purpose, it should be mounted in a large vice (fitted with lead clamps) with the driving side flywheel uppermost. If a large enough vice is not readily available an alternative method is to fix rigidly to the bench in a vertical position, two $1\frac{1}{16}$ in. diameter posts, the distance between their centres being $3\frac{3}{8}$ in. Midway between the posts a hole of 1 in. diameter should be bored in the bench to receive the mainshaft. The flywheel assembly is mounted on these posts so that they pass through the holes bored

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in the flywheels, and the driving side flywheel should be uppermost. Tighten the crankpin nut very firmly, using a tubular extension to the spanner as when dismantling, and fit the locking plate and screw.

Now turn the assembly over, so that the gearside flywheel is on top, and tighten the crankpin nut lightly. The grub screw in the end of the crankpin must be riveted over or centre-punched to prevent its unscrewing. If it unscrews, serious damage may result to the engine. Check that the side clearance of the connecting rod in the flywheels does not exceed .012 in. and is not less than .010 in.

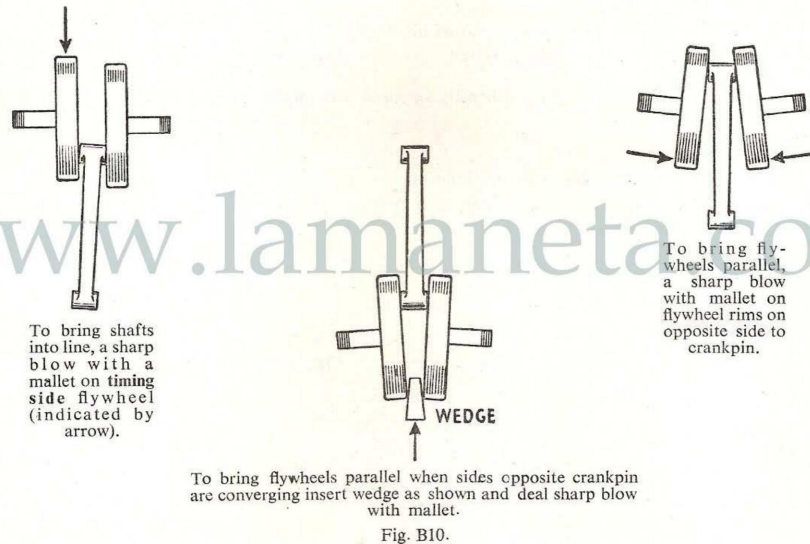


Fig. B10.

The flywheels will now be aligned only very approximately and further steps must be taken to ensure that the wheels are aligned as true as possible. Two of the actual (or similar) bearings to be used in the engine should be fitted to the mainshafts and the latter mounted on vee-blocks. The flywheels must be trued up, both on faces and rims, for which purpose a dial micrometer is necessary (Fig. B.9), and after the wheels are trued to within at least .005 in. tighten the timing side crankpin nut fully. A mallet or lead hammer applied to the flywheels will provide a sufficiently heavy blow for final truing, and will not harm the flywheels (Fig. B.10). The shafts must not be struck. The shafts should be finally trued to within .002 in. maximum.

Crankcase

Withdraw the bearings from the shaft and press them into their appropriate positions in the crankcase halves. A new washer will be required behind the small drive side bearing and a new retaining ring must be fitted. In the case of single lip roller bearings, only the outer race can be so fitted. Do not omit the retaining ring which holds the driving side bearing in position, and check that the ends of the spacing sleeve between the bearings are parallel to within .002 in. In order that the inner bearing and the sleeve will stay in position, it is advisable to lay the crankcase half on a bench with the outer bearing lowest.

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Fit the oil flinger washer to the driving side mainshaft and note this washer is bent over in one place to prevent accidental movement when fitting. If a new washer is being used it should be bent in a similar manner to the one which has been removed. Insert the driving shaft carefully into the crankcase, taking care not to disturb the flinger washer. The shaft should fit into the bearing without the use of unnecessary force and although the shaft must be a fairly tight fit in the bearings it should be possible to assemble it by hand. If necessary, ease the shaft with emery cloth, carefully cleaning off any trace of emery afterwards.

It is advisable to attend to the timing side of the crankcase before continuing further. Replace the oil pump driving spindle together with its locating pin (see Fig. B.7) and then fit the oil pump in position. The fibre washer between the pump and the crankcase should be smeared with jointing compound, but an excessive amount must not be used, since any surplus will be squeezed out and may find its way into the oil passage. The pins securing the oil pump must not be screwed up too tightly. Check that the pump spindle can be rotated between finger and thumb.

Now replace the tappets and guides, the latter being screwed well home, and insert the cam pinion spindles. These should be pressed home, taking great care to keep them dead square, and must be fitted so that the flat on the spindle shoulder is parallel to the tappet foot, for which it provides clearance and consequently its position is most important.

Assembly of the crankcase will be made easier if the flywheel assembly, together with the driving side portion of the crankcase fitted on as previously explained, is mounted in a vice. Lead clamps must be used and the splined portion of the shaft held.

The mainshaft bearings may now be pressed into the gearside half of the crankcase and the latter replaced on the mainshaft. Bolt up the crankcase and check that the flywheels, etc., spin easily. Fit sprocket centre, tighten up, and verify also that the connecting rod is centrally disposed in the crankcase mouth. Provided that the connecting rod is not visibly out of the centre, there is no necessity for any adjustment to be made. If the connecting rod is out of centre, it will invariably be towards the driving side of the crankcase. In this event a shim will have to be made and inserted between the driving side flywheel and the oil flinger washer. It may also be that the distance sleeve between the driving side bearings has become a little worn on its end faces, and a new component (one specially chosen so that its length is on the maximum limit) will rectify the connecting rod alignment.

When the connecting rod alignment is found correct, remove the gearside half of the crankcase and clean the joint of any compound used previously. Fit the magdyno straps on their hinge pins, smear jointing compound lightly on the crankcase joint face and again bolt up the crankcase. Check that top of crankcase, where cylinder base flange fits, is dead flat.

Timing Gears

Replace the engine shaft pinion, taking special care to note that the worm is engaging properly with the oil pump spindle and that rotation of the flywheels drives the pump.

The came pinions are interchangeable and consequently the timing marks are duplicated on both pinions. This should not cause any difficulty when timing the valves if it is remembered that the dash mark only is used for the inlet cam and the dot for the exhaust cam (Fig. B.11).

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The magdyno can now be fitted to the crankcase and its straps loosely coupled up. Make sure that the dowels in the base engage properly in their holes in the platform, and that any packing shims are refitted. Refit the idler pinion between the inlet cam pinion and the magdyno pinion, but do not replace the pinion retaining plate at this stage.

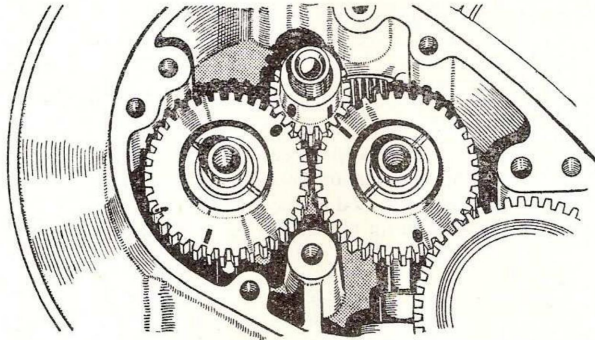


Fig. B.11. Valve Timing

An oil sealing washer is fitted behind the magdyno pinion, and this should be temporarily removed. Replace the magdyno pinion on its taper; it need not be driven on very firmly, but just tight enough to prevent slip. Check the backlash between this pinion and the idler. If excessive, the gear will be noisy; if insufficient, a whining noise will result.

In order to adjust the backlash, shims are fitted under the magdyno if necessary, when the engine is first built. If a different magdyno is being fitted, it is essential this backlash be checked carefully, shims of a different thickness being used as required.

Remove the magdyno pinion once more, replace the oil sealing washer and again fit the magdyno pinion loosely in position. It is preferable to leave the setting of the ignition until the barrel and piston are in position, and for this reason the magdyno pinion should not be tightened up. The valve timing can now be set. Replace the pinion retaining plate, noting that the coarse threaded bolts screw into the crankcase bosses, and then fit the lockwasher and nut on the engine mainshaft. Play between the pinions and the retaining plate should be .002 in./ .003 in.

ASSEMBLY FROM THIS POINT WILL BE THE SAME AS AFTER DECARBONISING. (SERVICE SHEET No. 303).