

*Reprinted March, 1960*

## MODELS D1, D3, D5 and D7

### ENGINE DISMANTLING FOR DECARBONISING

Decarbonising should be carried out at regular intervals of about three thousand miles (5,000 km.) if consistent results are to be expected. The symptoms indicating an excessive deposit of carbon are undue roughness of the engine and a tendency to pink under load, erratic running with excessive four and eight stroking, and an appreciable falling off in power. This latter item is particularly noticeable when the exhaust port becomes fouled with carbon as it causes an obstruction to the free escape of the exhaust gas, and interferes with the correct scavenging of the cylinder which is so necessary for the efficient transfer of combustible mixture from the crankcase.

Before commencing to decarbonise the engine it is necessary to slacken the two bolts holding the petrol tank to the steering head, and to remove entirely the rear petrol tank securing bolt which passes through the frame, and carries the earth wire of the electrical system. Disconnect the petrol pipe from the tank tap, after turning fuel off at tap and raise the rear of the tank about 1 in. to allow the removal of the cylinder barrel over the long securing studs.

#### **Removal of Cylinder**

First remove the carburetter from its stub at the rear of the cylinder by releasing the clip bolt by means of which it is attached. The exhaust pipe must also be disconnected by releasing the union nut at the front of the cylinder barrel by means of the special "C" spanner included in the tool kit. If this nut should prove unduly obstinate, a few drops of penetrating oil should be applied to the threaded portion immediately above the nut and a little time should be allowed for this to act before attempting to unscrew the nut. Disconnect the high tension lead from the sparking plug and unscrew the latter.

The cylinder head and barrel are attached to the crankcase by means of four long studs and when the four nuts on the top of the cylinder head are removed, the head can easily be lifted clear, followed by the cylinder barrel. Take care when removing the latter to support the piston as it emerges from the end of the bore in order that it may not be damaged as it falls clear.

#### **Piston**

Place the cylinder head and barrel on one side on a bench and examine the piston. It should not be necessary to remove this from the connecting rod, but if it should be desired to do this for any reason, first remove the circlip from one end of the gudgeon pin using a pair of pointed nose pliers or some suitable instrument to lever the circlip out. Then holding the piston firmly in the hand, tap the gudgeon pin out from the other end. If it is too tight to move, it can be released by warming the piston by means of a rag soaked in hot water and wrung out. Application of this rag will cause the aluminium alloy of the piston to expand more than the steel gudgeon pin, thus releasing the latter which can then be freely pushed or tapped out. Mark the inside of the piston skirt to indicate the front of the piston as originally fitted.

## **B.S.A. Service Sheet No. 504 (contd.)**

Scrape any carbon which has accumulated on the crown of the piston, taking care not to damage the relatively soft surface of the metal itself, and after removing all the carbon, polish lightly with fine emery cloth if desired and finally wipe clean with an oily rag.

### **Piston Rings**

Now examine the piston rings noting that these are located in their grooves by means of pegs which engage in the piston ring gaps. If in good condition, the rings will be found to present a uniformly smooth metallic surface over their entire peripheries, and if they are in this condition and obviously have a certain amount of "springiness" as evidenced by the fact that their free gap is considerably greater than the closed gap when in the bore (*see Service Sheet 506*) they should not be disturbed. If, on the other hand, the rings shew signs of heat as evidenced by brown or more highly discoloured patches, they should be replaced by new rings, and in this case particular attention should be paid to the fit of the ends of the rings on their locating pegs in the piston ring grooves, and they should also be checked in the bore to ensure that they have an adequate gap. These points will not arise if genuine B.S.A. spares are fitted as the gaps on these are already correct when the rings are sent out, but if for any reason genuine B.S.A. spares are not obtainable, these points must receive careful attention. First place the ring in the cylinder bore in a position where it is clear of the ports and, making certain that it is square by pressing the skirt of the piston against it or a suitable bar of material of the correct diameter, examine the gap which should be not less than .008 in. (.2 mm.). Having satisfied yourself on this point, place the ring in its groove on the piston and make certain that it is free without perceptible up and down play. If it is not free and the groove itself is clean, rub the ring down on a piece of fine emery cloth laid on a dead flat surface, using a rotary motion of the arm to ensure uniform pressure on the ring. As soon as ring is found to be free in its groove, wipe it absolutely clean and fit it into position.

Check also that there is sufficient clearance between the inner portion of the gap and the locating peg in the groove. Do this by closing the ring in its groove by finger pressure until there is no gap, thus shewing that there is clearance at the peg underneath. If the gap will not close, indicating that the steps are binding on the peg, ease the steps gently with a dead smooth file. If the piston has been removed from the connecting rod refit it, first putting a smear of oil on the gudgeon pin, not forgetting a new circlip to replace the one which was removed. Note that the piston ring gaps should face towards the rear on D1 models and towards the front on D3, D5 and D7 models. Then put a piece of clean rag over the piston and crankcase mouth and turn your attention to the cylinder barrel and head.

### **Cylinder Head and Ports**

Remove all carbon deposit from the cylinder head, bearing in mind again that the aluminium is soft and easily damaged if the decarbonising tool is carelessly applied, and carefully wipe clean to ensure the removal of all loose particles. Most of the carbon deposit likely to have accumulated in the cylinder will be in the exhaust port, and this is most important as explained above. Scrape this out carefully, taking care not to let the tool slip into the bore and damage the surface of the latter. Examine the transfer and inlet ports for the presence of carbon, although this is unlikely to be heavy, and finally wipe the ports and the cylinder bore absolutely clean.

## **B.S.A. Service Sheet No. 504** *(continued)*

### **Big-end Bearing**

While the cylinder is off it is as well to test the big-end bearing for wear. This is done by taking hold of the connecting rod stem and pulling it upwards until the crank is at top dead centre. Then holding it in this position try gently but firmly to pull and push the connecting rod in the direction of its travel in order to feel whether there is any play. If the big-end is in a sound condition there should be no play in this direction, although it may be possible to rock the rod sideways, i.e., at right angles to the axis of the machine. If vertical play is perceptible in the big end it must be decided whether the amount in evidence is permissible or not. The assembly is not likely to require replacement, however, provided that the machine has been carefully used and adequately lubricated, for the big-end bearing is of ample dimensions for the work it has to do. But if for any reason the big-end bearing has deteriorated as the result of neglect or abuse, it should be replaced.

### **Re-assembly**

Before attempting to replace the cylinder barrel over the piston, smear the latter generously with engine oil and then place it over the piston, carefully manipulating the rings into the end of the bore and seeing that they enter freely without the application of force. As soon as the cylinder barrel is home, replace the cylinder head and put the washers and nuts on the four holding down bolts. Tighten the nuts in diagonal order so as to avoid distortion.

Examine the sparking plug (*see Service Sheet 503*) and refit if sound.

Before refitting, the exhaust pipe and silencer should be examined for freedom from carbon and cleaned if necessary. Refit the exhaust pipe and carburetter, lower the rear of the tank into position and insert the long securing bolt, after passing it through the earth connection tag attached to the electric wiring harness. Ensure that face of tag is clean and free from dirt or corrosion so that it makes a good contact.

Tighten up rear and front tank securing bolts.