

# **BSA SERVICE SHEET No. 421**

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## **MODEL C15 ENGINE DISMANTLING FOR DECARBONISING**

It will facilitate this work if the dual seat and petrol tank are removed. Take off the seat which is attached to the frame by the top bolts of the rear suspension units and clipped to a cross tube at the front.

Turn off the petrol tap and detach the petrol pipe by unscrewing the union nut. The tank is mounted on rubber pads and secured by a single bolt which passes through a rubber sleeve in the centre of the tank. Remove the rubber cap on the tank top, unscrew the nut, and withdraw the tank leaving the bolt in the frame.

Disconnect the engine steady bracket from the frame and the rubber connection between the air cleaner and carburettor.

The exhaust pipe is a push on fit and can be removed after the finned collar has been slackened and the bolts securing the pipe to the frame released.

### **Removing the Cylinder Head and Valves**

Take off the oil feed pipe to the rocker spindles and remove the sparking plug.

Remove the two 5/16 in. nuts holding the engine steady bracket to the rocker box, revolve the engine to set the piston at T.D.C. on the compression stroke, i.e., with both valves closed, and take off the four nuts *H* (Fig. C1A) holding the cylinder head and barrel.

With the rocker box in position on the head raise the head until it clears the fixing studs, rotate the whole assembly about the push rods to clear the frame tube, and lift off.

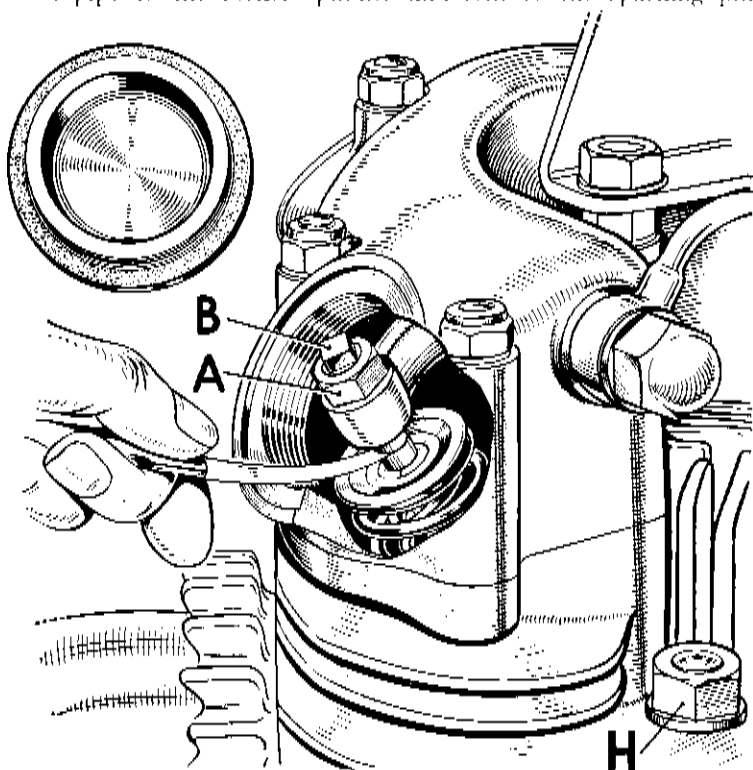


Fig. C1A. Tappet Adjustment.

## B.S.A. Service Sheet No. 421 (contd.)

Take the push rods out of the tube and remove the tube. There are sealing rings at each end, and if there has been any sign of leakage the seals should be replaced.

Now take off the two thin nuts on the steady stay studs and the seven 1/4 in. nuts holding the rocker box to the head, unscrew the two circular inspection covers, remove the cover above the push rod tube by unscrewing the centre bolt, and lift the rocker box from the head.

There should be no need to disturb the rockers unless it is known that they require attention. Carefully remove the head gasket.

It is not necessary or desirable to remove the cylinder barrel unless it is suspected that the piston or its rings are the cause of some trouble.

Compress the valve springs with Service Tool 61 3340 and remove the split cotters and springs. Take out the valves.

Scrape all carbon from cylinder head and ports and from the top of the piston, finally polishing with fine emery cloth. Take care not to damage the valve seats. Remove all traces of loose carbon and dust. Rotate the engine so that the piston descends to allow removal of dust from the upper cylinder walls.

### Valve Springs

After a period of several thousand miles, valve springs tend to lose their efficiency due to heat, and as their cost is relatively low, it is good policy to renew them at this stage rather than dismantle specially for this purpose at a later date. The correct free length is, inner 1-5/8 in., outer 2-1/32 in.

### Grinding in Valves

Valve grinding should only be carried out where the pitting is not deep. If deep pit marks are evident the valve should be refaced on a machine, as grinding in would only cause wear of the seats and the valve may become pocketed.

Clean all carbon off the valve and from the stem underneath the head, being careful not to damage the face or the portion of the stem which moves in the valve guide.

Smear a small quantity of grinding compound obtainable from any garage, over the valve face and return it to its seat.

Using Tool number 65 9240 rotate the valve backwards and forwards maintaining a steady pressure, every few strokes lifting the valve from its seat and turning to a new position.

Continue until the face shows a smooth surface all round with no dark spots.

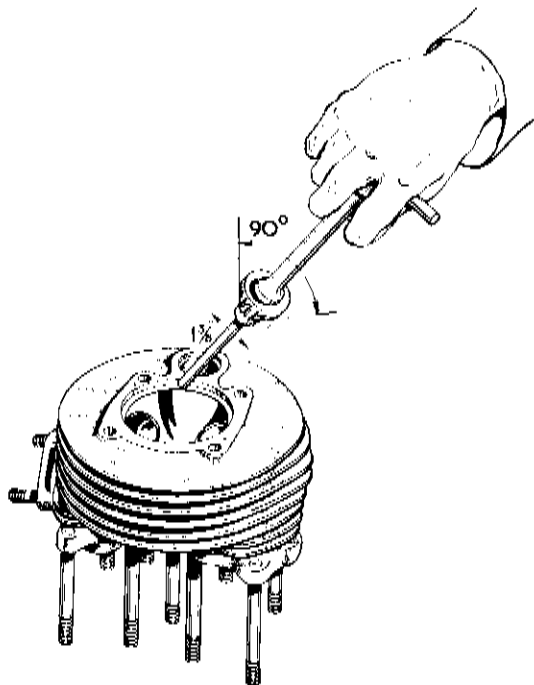


Fig. C2A. Cutting the Valve Seats.

## **B.S.A. Service Sheet No. 421 (contd.)**

It is most important that valves are ground in on their correct seats, for this reason both valves are marked, one "IN" and the other "EX."

After grinding remove all traces of compound from both valve face and seating, and smear the stems with clean engine oil.

If the valve seats in the head require re-cutting, use Service Tools number 61 3293 Pilot, 61 3298 Cutter (Fig. C2A).

### **Fitting New Guides**

When new guides are to be fitted, the old ones can be driven out with Service Tool number 61 3265 from inside the combustion chamber and new ones fitted with the same punch from above.

Before driving in the new guides make sure that the circlips are a good fit. Valve seats in the head must always be re-cut when new guides are fitted to ensure that the seat is concentric with the guide bore.

### **Removing the Cylinder Barrel**

Slacken off the two nuts on the crankcase at the base of the cylinder and slide the cylinder off, steadying the piston as it emerges from the barrel. Cover the crankcase mouth with clean rag to prevent dust and grit falling in.

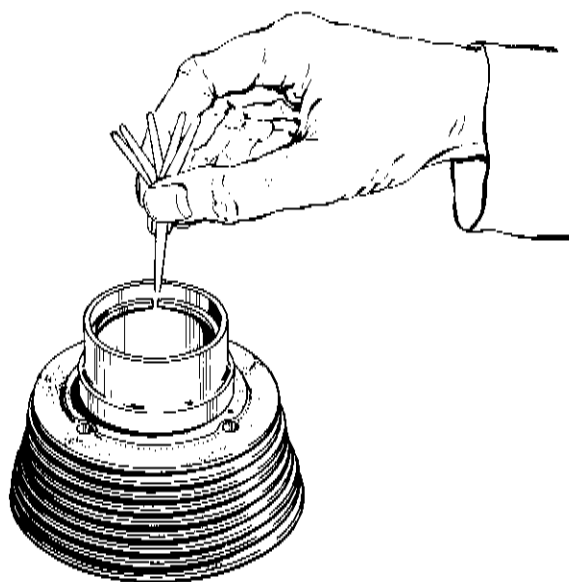


Fig. C3A. Checking Piston Ring Gap

### **Piston Rings**

The gudgeon pin is located by means of wire circlips which must be removed with the tang of a file or similar tool. Warm the piston and withdraw the gudgeon pin, thus freeing the piston, and immediately after its removal mark the inside of the piston so that it may be reassembled in its original position.

If inspection of the piston rings shows that they are stuck, prise them out very carefully, and clean them. Remove any carbon from the grooves and rings, but before replacing, check them in the cylinder for gap. (Fig. C3A). If the gaps are excessive, new rings having gaps of between .009 in and .013 in. when in position must be fitted.

## **B.S.A. Service Sheet No. 421 (contd.)**

At this stage it is advisable to check the big end bearing for wear. Turn the engine until the piston is at the top of its stroke, and resting both hands on the sides of the crankcase mouth, hold the connecting rod between fingers and thumbs, and feel for up and down play. It should be remembered that, even though there may be a little play present it will not necessarily mean sudden failure of the bearing, though it will inevitably become worse. Where play seems excessive, and big end noise has been noticed with the engine running, the engine should be completely dismantled, and a new big end assembly fitted.

### **Assembly after Decarbonising**

Replace the valves and springs in the cylinder head, making sure that the valves are assembled on the seats from which they were removed, and take care to see that the split collets are seated correctly in their grooves in the valve stems—a dab of grease on the stem will assist this operation.

Pour a little oil into the crankcase, and smear the cylinder walls liberally with oil. See that the cylinder base washer is in good condition—if damaged, replace, otherwise oil leaks will develop. Turn the engine until the crankshaft is a little past bottom dead centre, then compressing the top piston ring with the fingers, slide the cylinder barrel over the piston and top ring. Compress each ring in turn as the barrel is refitted, and take care to avoid breaking the rings. It is essential to see that the mouth of the crankcase is completely covered with rag before commencing to replace the cylinder as if it is uncovered, and a ring is broken, the pieces may drop into the crankcase and will be difficult to recover. Return the piston to top dead centre on the compression stroke, ready for the cylinder head to be fitted.

Replace the push rod tube in position alongside the cylinder barrel, apply a little grease to the lower ends of the push rods and place the rods in position on the tappets. Replace the head gasket.

Refit the rocker box to the cylinder head leaving off the inspection covers, and slacken off the rocker adjusting screws.

Place the head in position over the studs, locate the outer push rod in the inlet rocker (rear) and the inner push rod on exhaust rocker (front) as in Fig. C4A.

Screw on the four cylinder head nuts and washers and tighten down firmly and evenly. Check that the push rods are correctly fitted and replace the inspection covers and washers.

Securely tighten the two nuts on the crankcase immediately below the cylinder base and check over the rocker box nuts.

Replace the engine steady stay over the two thin 5/16 in. nuts screw on the thick 5/16 in. nuts and spring washers and tighten securely, re-connect the steady stay to the frame.

### Tappet Adjustment

Rotate the engine forward until the inlet valve is just closed and the push rod is free to rotate and set the exhaust valve clearance to .014 in. by screwing the adjuster pin *B* (Fig. C1A) in or out and tighten the locknut *A* (Fig. C1A) securely.

Rotate the engine forward again until the exhaust valve clearance is just taken up but before the valve starts to open, and set the inlet valve clearance to .012 in. Check both settings after the locknuts have been tightened to make sure that they have not altered.

Finally replace the tappet inspection covers, sparking plug, H.T. lead, carburetter, air cleaner connection, petrol tank, petrol pipe and dual seat.

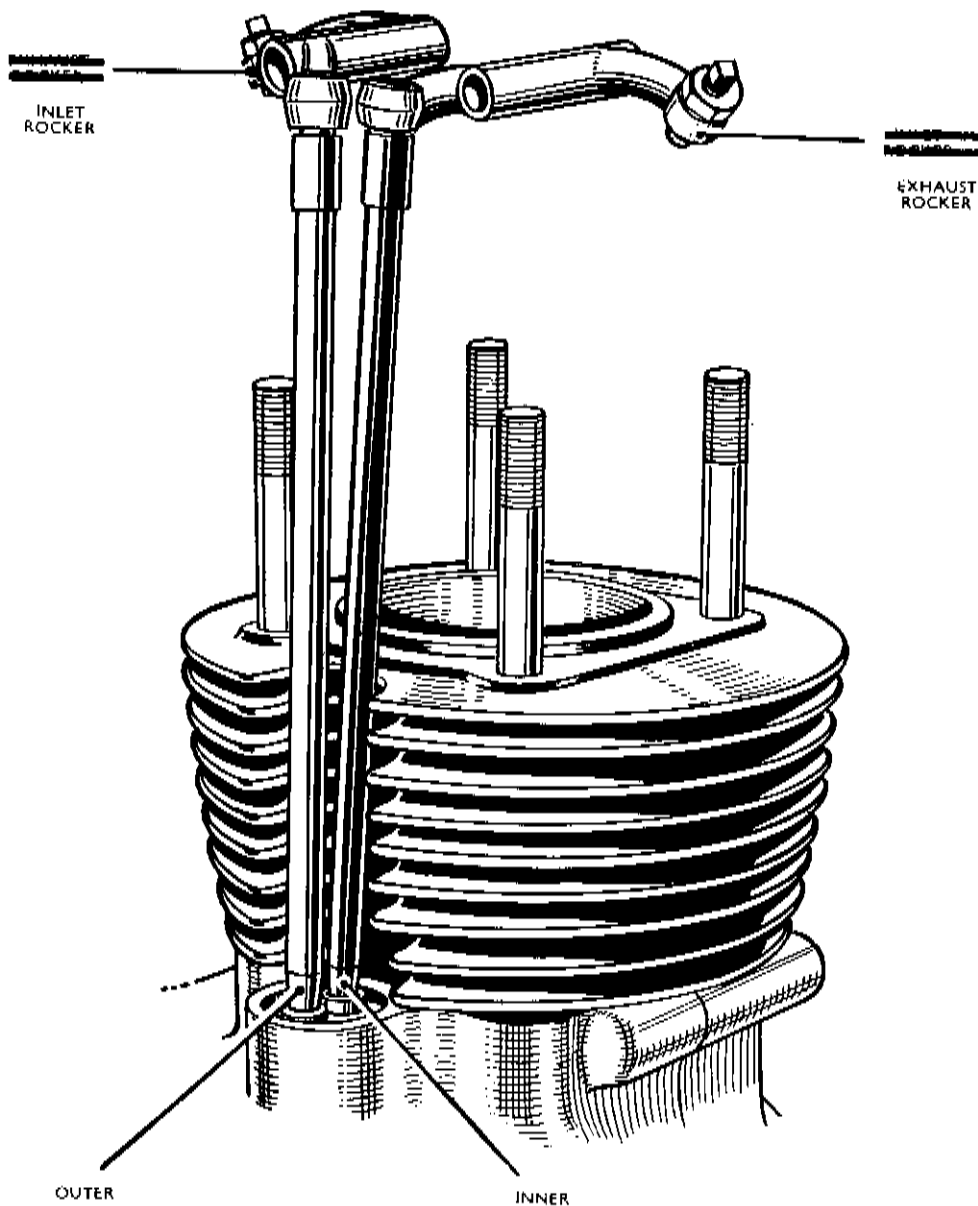


Fig. C4A. Fitting the Push Rods.