BSA SERVICE SHEET No. 405

C Group Models (except C15)

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ENGINE DISMANTLING FOR DECARBONISING

When decarbonising, it is not necessary or desirable to dismantle the cylinder barrel unless it is suspected that the valves, piston, or its rings are the cause of some trouble.

It is sufficient to remove the cylinder head and gasket, thus exposing the piston crown and valves.

Removing Cylinder Head C10 and C10L

Detach the high-tension lead to the sparking plug and remove the plug. Slacked the cylinder head bolts in the reverse order shown in Fig. C.10. If, when the bolts are removed, the head is inclined to stick, a few taps with a wooden mallet low down on the vertical fins will loosen it, but be careful not to crack or break the fins.

With the head removed, the piston and valves are now exposed. Set the piston at the top of its stroke and scrape off all carbon with an old blunt penknife or similar tool, taking care not to damage the piston crown.

Scrape all carbon from the cylinder head. Rotate the engine so that both valves are open and examine the seatings.

If these show a bright unbroken surface all round, leave well alone, but if they show traces of pitting, it is necessary to remove them for grinding in. This will be facilitated if the barrel is removed.

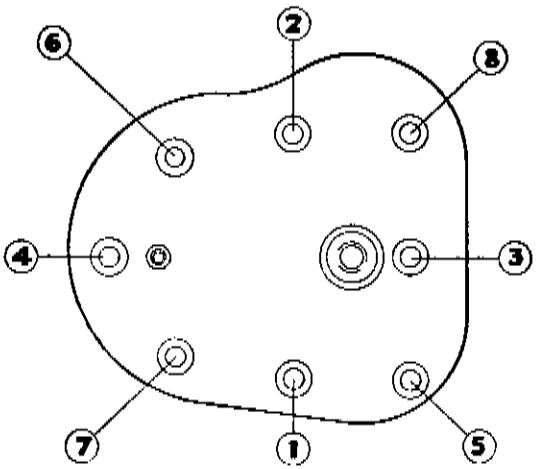


Fig. C.10. Order of tightening cylinder head bolts (S.V.)

Removing Cylinder Head C11 and C11G

It is easier to detach the cylinder head if the petrol tank is first removed. This is attached at the front to the steering head lug and at the rear to the frame top tube. Before removing the tank, turn off the petrol tap, and detach the petrol pipe. The rubber pads on which the tank is mounted should be marked so that they can be replaced in their original positions.

Detach the high-tension lead and the sparking plug. Next disconnect the petrol pipe at the carburetter and remove the carburetter. Take off the exhaust pipe. Take off the rocker box cover after removing the central bolt.

Unscrew the six nuts holding the cylinder head to the barrel. These are located between the fins at the sides of the barrel.

A gentle tap with a wooden mallet under the exhaust port will free the head, which should be raised just sufficiently at first to enable the push rods to be freed from the rocker ballpins and the push rods withdrawn. Then the head can be lifted right off.

Removing the Valves C10 and C10L

Stand the cylinder on a bench with valve heads downwards, and with a screwdriver or similar tool, press hard on the valve spring collars until the springs are compressed sufficiently to clear the cotters. The split cotters can then be freed, and the valves removed from the cylinder. A special spring compressor tool Part No. 61-3340 can be purchased from your B.S.A. dealer if desired. Scrape all carbon from the valve pockets but be careful not to damage the valve seats.

Removing the Valves C11 and C11G

Place a wooden block which will fit inside the cylinder head on a bench and then lay the head on to the block with the valve heads resting on it. Then compress the valve springs and remove collets as described for the side valve model.

Scrape all carbon from the piston and from the cylinder head and ports. The head may be polished with emery cloth, but take care not to damage the valve seats, and to remove all traces of dust before reassembly.

Valve Springs

After a period of several thousand miles it may be desirable to fit new valve springs, as these tend to lose their efficiency due to heat. If the springs are renewed whilst decarbonising it will save dismantling specially to do the job at a later date.

Grinding in Valves

Valve grinding should only be attempted if pitting is not deep. If deep pit marks appear, the valve should be refaced, as attempts at grinding in this case will cause wear of the seats and the valves may become pocketed.

Smear a small quantity of grinding compound—obtainable from any garage or accessory shop —over the face of the valve and return it to its seat. On the S.V. model a screwdriver can be used to rotate the valve, but on the O.H.V. model the stem of the valve must be gripped by the special tool provided in the tool kit.

The valve should be rotated backwards and forwards while a steady pressure is maintained, and every few strokes the valve should be lifted and turned to a new position. Continue this operation until the valve face shows a smooth polished surface all round.

It is most important that the valves should be ground in on their correct seats, and 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 seat, and before replacing the valves, smear the stems with engine oil.

When replacing the springs make sure that the split collets are located correctly.

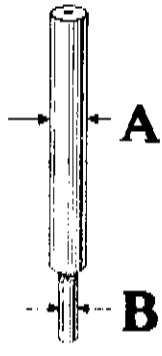
Removing Cylinder Barrel C10 and C10L

First turn off the petrol and detach the carburetter, which can be tied to the frame out of the way.

Next take off the exhaust pipe which is a push fit into the cylinder and can be pulled out when the clip bolts holding it to the frame are slackened.

Now remove the five cylinder base nuts (four outside and one inside the tappet chamber), and then the cylinder barrel can be lifted off.

When removing the cylinder barrel the simplest way is to lift it up and tilt it forward into the front angle of the frame. The piston should be steadied as it emerges from the barrel to prevent possible damage. Cover the crankcase mouth with clean rag to prevent dust and grit falling in.



"A" ⅛in. dia.
"B" .310in. dia.

Fig. C.11. Valve guide fitting punch. Service Tool 61-3264 complete with gauges for Model C.10. Punch only 61-3265 for C.11., C.12 models.

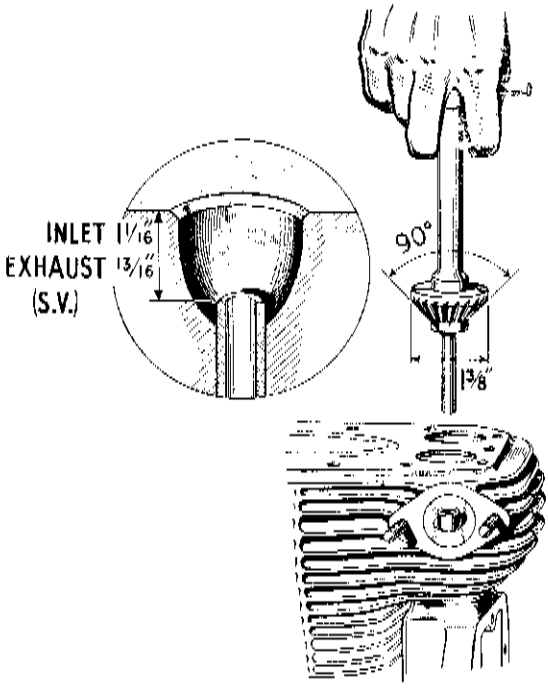


Fig. C.12. Cutting the valve seats. Service Tool 61-3305.

Fitting New Guides

If new guides are to be fitted, the old ones can be driven out by means of a simple punch made from a bar of steel not more than $\frac{1}{2}$ in. dia. (see Fig. C.11). Service Tool 61-3264 includes gauges which control the position of the guides.

The new guides can be driven in from the top using the same punch.

After fitting new guides the valve seats must be re-cut with a pilot cutter to ensure concentricity of seats and stems (Fig. C.12).

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. Withdraw the gudgeon pin, thus freeing the piston, and immediately after its removal mark the inside of the piston so that it may be re-assembled 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 them, check them in the cylinder for gap. (Fig. C.13.) If the gaps are excessive, new rings having gaps of between .008 in. and .012 in. when in position must be fitted.

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.

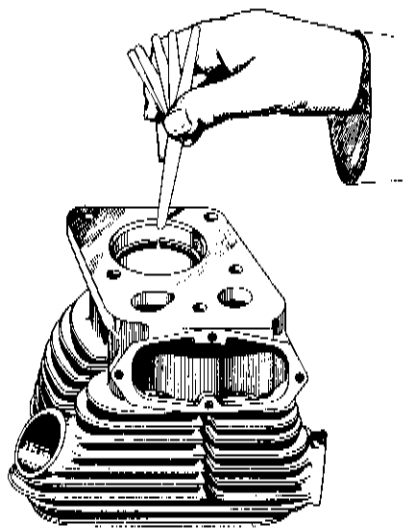


Fig. C.13. Checking piston ring gaps.

Assembly after Decarbonising

Side Valve Model. Replace the valves and springs in the cylinder barrel, 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.

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. Each ring must be compressed in turn as the barrel is refitted, and care is necessary 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 left uncovered, and a ring is broken, the pieces may drop into the crankcase and will be difficult to recover.

Before trying to bolt the cylinder down, make sure that both tappets are in their lowest positions, otherwise the cylinder may not seat properly due to the pressure of the valve springs. Screw up the base nuts lightly at first, and then tighten one quarter turn at a time, working on the outer nuts in diagonal order and then the nut inside the tappet chest.

When the cylinder is finally tightened down, replace the cylinder head gasket—first seeing that the latter is undamaged. If is it damaged, or shows sign of leakage (indicated by black patches) replace with a new one. Now fit the cylinder head, tightening the bolts one quarter turn at a time in the order shown in Fig. C.10. Check these bolts for tightness after 250 miles—particularly if a new head gasket has been fitted.

Replace the exhaust pipe, tightening the frame clips when in position, and then the carburetter. When replacing the carburetter slide take care not to damage the point of the needle. Next fit the petrol pipe.

If the sparking plug is of the detachable type, dismantle and clean it before refitting. If it is non-detachable, and obviously dirty, have it cleaned by a garage equipped for this purpose, or, failing this, fit a new one.

Finally check the tappet clearances and if necessary, adjust. Note, that if a new cylinder base washer has been fitted, it is advisable to check the nuts for tightness after 250 miles, and then again to check the tappet clearances.

O.H.V. Model. Replace the cylinder barrel as described for the side valve model, first checking that the base washer is undamaged. Now replace the valves and springs in the cylinder head, making sure that they are on the correct seats and that the split collets are positioned correctly.

See that the cylinder head gasket is in good condition, replace it, and then fit cylinder head loosely in position. Before the head is bolted down the push rods must be fitted. It should be noted that these are crossed, and the exhaust must be fitted first, the plain end fitting into the cup formed on the cam rocker (bottom left), and the cupped end fitting over the rocker ball end (top right). Fig. C.14, shows a section illustrating how the push rods are fitted.

With the push rods in position, the cylinder head can be bolted down. Before replacing the rocker box cover, check tappet clearances and adjust if necessary. Note that the tightness of the head should be checked after the first 250 miles, and that if the nuts are tightened at this period it will probably be necessary to re-adjust the tappets.

Next replace carburetter, taking care not to damage the needle when inserting the slide, and see that the flange washer is in good condition. Then fit exhaust pipe, and finally, replace the petrol tank and petrol pipe.

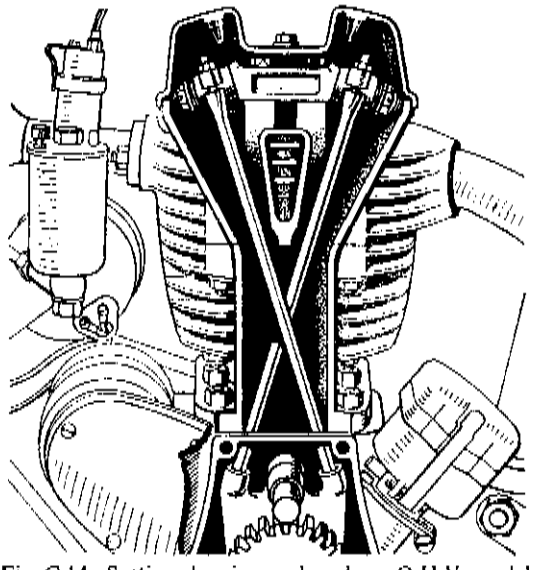


Fig. C.14. Section showing push rods on O.H.V. models.

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