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B Group and M33 Models

ENGINE DISMANTLING FOR DECARBONISING

Symptoms which indicate that decarbonising is necessary

Decarbonising and "top overhaul" of an engine is extremely simple, but it should only be carried out when the engine really needs it, which normally should be only at periods over 2,000 miles. The usual symptoms are an increased inclination to "pink" (a metallic knocking when under heavy load) due to the building-up of carbon on the top of the piston and inside the cylinder head; a general falling-off of power noticeable mainly on hills, and a tendency for the engine to run hotter than usual.

The correct procedure for decarbonising is described by stages.

Removal of Petrol Tank, etc.

It is first necessary to remove the petrol tank. Turn off the petrol tap and detach the petrol pipe. If the speedometer is mounted in the tank, disconnect the speedometer drive by releasing the strainer bolt under the tank, raising the speedometer clear of the tank and unscrewing the knurled nut connecting the drive to the instrument. If the speedometer is mounted on the fork yoke it need not be disturbed. Remove the tank securing bolts and lift the tank from the frame top tube.

Next detach the high tension lead and remove the sparking plug. Disconnect the steady-stay from the rear of the cylinder to the frame, and then take off the carburetter by removing the flange bolts. Take care not to damage the carburetter flange washer. By unscrewing the ring nut at the top of the carburetter, the slide can be pulled right out and tied up to the top tube out of the way, while the main body of the instrument can be completely removed. By unscrewing the exhaust pipe and silencer clips to the frame, the pipe and silencer can be removed complete.

Removing Cylinder Head

Disconnect the oil feed pipe from the rocker spindles and the return pipe from the inlet rocker box. Note that the union screw plugs for the oil pipe to the rockers have a much smaller hole in the side than the union for the return pipe a point to remember when re-assembling.

The exhaust valve lifter cable can either be disconnected, or the exhaust rocker box cover removed leaving the cable intact. Remove the inlet valve rocker box cover. Slacken the castellated gland nut securing the push-rod cover tube to the cylinder head (a special C spanner is provided for this). Detach the tappet inspection cover at the base of the tube and undo the two acorn nuts clamping the base of the tube to the crankcase.

Lastly unscrew the four long bolts holding the cylinder head and barrel to the crankcase, applying the spanner to the top, or smaller diameter, hexagon. The larger diameter hexagon screws the bolt sockets into the crankcase and should not be touched unless it becomes necessary to replace a holding down bolt, when the complete assembly of bolt and socket must be fitted.

The cylinder head, complete with push-rod cover tube, should now be raised, the push-rods lifted off the tappets and dropped to the crankcase face. The head and push-rod cover tube can now be lifted upwards and forwards clear of the barrel. Note that the head has plain ground joint to the barrel, no gasket being used. If the head shows a tendency to stick, a few light taps with a wooden mallet under the exhaust port will loosen it. With the head clear of the machine, the push-rod cover tube can be detached.

Decarbonising

Rotate the engine by means of the kickstarter until the piston is at the top of its stroke, and scrape off the carbon deposit with an old penknife, taking care not to damage the piston crown.

All traces of carbon must be cleaned from the cylinder head in a similar manner. This is preferably done after the valves have been removed (see below) in which case care must be taken to avoid damaging the valve seats.

Grinding-in Valves

It is not necessary to remove the rockers in order to take out the valves and springs, but if it is decided to strip the head completely, it is only necessary to undo the acorn nuts on the rocker spindles and tap these out, preferably using a small centre punch so as not to damage the threads on the spindle ends. Careful note should be kept of the rocker assembly for replacement—i.e., the spring, followed by the steel washer, and finally the aluminium oil seal washer.

To remove the valves place a wooden block, of a size which will fit inside the cylinder head, on a bench, and then lay the head over the block with the valve heads resting on it. Lift off the hardened end caps if fitted from the valve ends, and then compress the valve springs until the split collets can be removed. When the collets are out, the valve springs and top collar can be lifted off.

Valve grinding should only be attempted if the seatings are not pitted. If badly pitted the seats must be re-cut, and a special tool 61-3305 is available for this operation Fig. B3. Attempts at grinding-in in this case will result in wear of the valve seats, and the valves may become pocketed.

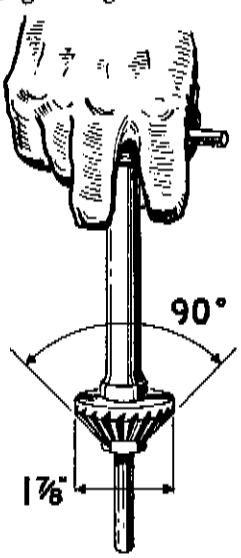

Fig. B3. The Valve Seat Cutter

Smear a small quantity of grinding compound (obtainable from any garage or accessory shop) over the face of the valve, and return the valve to its seat. Hold the valve with the special tool provided and rotate the valve backwards and forwards whilst maintaining a steady pressure. The valve should be raised and turned to a new position after every few strokes. Grinding should be continued until the valve seat and face show a uniformly polished surface all round. It is most important that valves should be ground-in on their correct seats. Both valves are marked, one "IN" and the other "EX", for identification purposes.

Before replacing the valves and springs, all traces of grinding compound must be removed from both faces and seats, and the valve stems smeared with engine oil.

Replacing Valve Guides

If new valve guides are to be fitted, the removal of the original ones is quite a simple operation, and necessitates the use of a valve guide punch (Fig. B4) and a hammer to drive the guides out of the cylinder head.

For B31, B32 and Gold Star inlet guides use Service Tool No. 61-3265, the dimensions of which are "A" ½" diameter, "B" .310" diameter.

Service Tool No. 61-3268, "A" ½" diameter, "B", .350" diameter should be used for B31, B32 and Gold Star exhaust valve guides and for inlet guides on models B33/34 and M33.

For exhaust guides on B33/34 and M33 use Service Tool No. 61-3263 "A" ½" diameter, "B" .370" diameter.

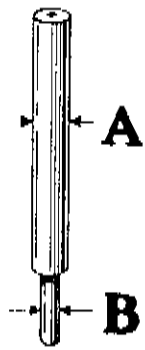

Fig. B4

Valve Springs

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

Piston and Ring

While the engine is dismantled, it is advisable to examine the piston, rings and cylinder barrel. Lift the barrel upwards and forwards into the front angle of the frame, and as the piston emerges from the barrel it should be steadied to prevent possible damage. When the barrel is removed, cover the mouth of the crankcase with rag to prevent dust and grit falling in. To remove the piston from the connecting rod it is first necessary to take out one of the gudgeon pin circlips. This is best accomplished with a pointed instrument such as the tang of a file suitably ground.

Before the gudgeon pin can be withdrawn it may be necessary to heat the piston with the aid of rags immersed in hot water, wrung out, and held round the piston. Then, supporting the piston, tap the gudgeon pin through using a light hammer and a punch.

When the piston is free, mark the inside of the piston skirt at the back, so that it can be replaced the correct way.

If the rings are stuck in the grooves they will need to be carefully prised free and removed from the piston. All carbon deposit should be carefully scraped from the grooves and the inside edges of the rings. If either of the rings shows brown patches on the face, replace with a new ring.

Check the piston ring gap by inserting the piston in the barrel and sliding each ring independently up to the skirt of the piston. Check the gap with feeler gauges; this should not be less than .008" or more than .012". Fit new rings if the gap exceeds the figure stated. It is advisable to check the gap of new rings before fitting, and if the gap is less than .008" the ends of the rings should be carefully filed to the correct limit.

It should be noted that piston rings are very brittle, and unless handled very carefully are easily broken.

Re-assembly

Re-assembly is carried out in the reverse order and points to note are as follows:

When assembling the piston it is advisable to heat it as explained in 'dismantling' in order that the gudgeon pin can be fitted easily (if a degreaser is available the required temperature can be reached by a few seconds immersion). Make sure that the piston is fitted the correct way round and that the gudgeon pin circlips are firmly located. The piston ring gaps should be 'staggered' around the piston circumference and the piston oiled liberally before the barrel is fitted.

Remember that it is essential that the valves are fitted to their correct seats.

Before fitting the cylinder head place the push rod cover tube in position, but do not screw up the gland nut. Place the push rods inside the tube and lift the head into position, keeping the head raised until the rods are located on the tappet, then position them on the rockers. Lower the head into position and replace the acorn nuts securing the push rod tube. Screw up the long cylinder head and barrel bolts in diagonal order until they are tight. The push rod cover gland nut can now be tightened up and the tappets adjusted as described in Service Sheet No. 604. Connect up the oil feed pipes to the rockers and replace the engine steady stay.

The fitting of the exhaust pipe, valve lifter cable and fuel tank are perfectly straightforward and should present no difficulty.

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