

Lowering the taper needle will weaken the mixture up to  $\frac{3}{4}$  throttle, but this alteration can also impair acceleration.

If an increase in petrol consumption becomes apparent, its cause should be investigated, and reference to details on "tracing faults" should be made, to find a remedy.

#### TO CONSERVE PETROL DO NOT :-

Flood the carburettor unnecessarily.

Leave the machine standing with the petrol tap on.

Indulge in the practice of "blipping the throttle."

Use an unnecessary amount of throttle to accelerate.

**DECARBONISING.** There is no fixed mileage, or stipulated interval, when the engine should be decarbonised, and the necessity for this work is usually indicated by a deterioration in the performance and petrol consumption. When a machine is used continually for short journeys, the formation of carbon deposit in the combustion chamber also the exhaust system, will be more acute than on a machine which is used for frequent long journeys.

With the availability of high octane fuel, detonation or "pinking" is uncommon, consequently decarbonising is less frequently needed. The exhaust port is designed to prevent a carbon formation at this point of the system, in contrast an accumulation of burnt oil or carbon in the exhaust system can cause back pressure which will impair both performance and petrol consumption.

In the event of a loss of performance, it should be verified that the contact breaker gap or sparking plug are not at fault before the cylinder head is removed.

In the case of a machine that is used mainly for short journeys, driving at full throttle, where permissible, for a reasonable distance, will tend to dislodge loose carbon from the combustion chamber and exhaust system, and act as a "tonic" to the engine.

When decarbonising, have available a replacement cylinder head gasket, cylinder base washer and if the engine has covered considerable mileage — a set of new piston rings.

**REMOVING THE CYLINDER HEAD.** Detach the H.T. cable at the sparking plug end and unscrew the plug. Should the plug become difficult to remove, do not use force; apply a little penetrating oil round the plug threads.

Take away the cylinder head steady and remove in turn the four cylinder head bolts. Some difficulty may occur in separating the cylinder head from the cylinder barrel, particularly after a long interval between decarbonising. In such an event, one or two light blows with a soft faced mallet ON THE FRONT OF THE CYLINDER HEAD will cause separation.

Carbon deposit formed on the sphere of the cylinder head and on the projections can be removed with a suitable tool, taking care not to scratch the machined surfaces. Do not use emery cloth or similar abrasive material for this purpose.

As it is a simple matter to remove the cylinder, the piston can be dealt with more effectively and without the risk of particles of carbon entering the transfer ports and crankcase if the cylinder is removed.

**TO REMOVE THE CYLINDER BARREL.** Remove the exhaust pipe and silencer as one unit. Do not unduly rock the exhaust pipe sideways, which can distort the pipe and cause gas leakage. Take off the petrol pipe, unscrew the cap on the carburettor body and pull out the throttle slide. Wrap the slide in a piece of clean rag and attach it to a convenient position on the frame rail to avoid damage. Remove rear engine lug bolt and Footrest bar allowing loop tube to swing forward. Take off the four cylinder base nuts and spring washers.

**SEPARATING ENGINE AND GEARBOX.** This necessitates the removal of the power unit from the motor cycle frame. This completed, the extraction of the five studs at rear of crankcase will facilitate the separation of the two units. The removal of remaining joint studs will enable the separation of crankcase halves, thus permitting access to main bearings which are interference fit in crankcase.

**NOTE :** The piston rings are located by metal pegs in the piston ring grooves, to prevent the rings turning and the ends fouling the transfer ports. It is, therefore, imperative that the cylinder is raised vertically without rotary movement to avoid piston ring breakage.

With some clean rag in the throat of the crankcase and wrapped round the piston skirt, the crown and recess each side of the piston can be carefully scraped to remove carbon deposits.

Any unburnt oil or carbon formed in the cylinder exhaust port should also be removed.

**TO REMOVE THE PISTON.** Using a pair of thin nosed pliers, remove one of the gudgeon pin circlips. The gudgeon pin is a close fit in the piston and if pieces of rag immersed in boiling water are placed on the piston crown in relays, this will cause the piston to expand and enable the gudgeon pin to be pushed out. If the pin resists removal, do not use force, but carefully scrape round the recess for the circlip to remove a burr or burnt oil. With the pin removed, lift off the piston and mark the inside of the skirt to indicate which way it was fitted, for re-assembly.

The piston rings should not be removed without good reason. Gas leakage past the piston rings is indicated by brown patches on the cylinder contact area or on the ring extremities; rings so affected should be discarded and new ones fitted.

The rings must be perfectly free in the ring grooves: carbon formed in the ring grooves will prevent free movement. When removing the rings they should be expanded with care and only sufficiently to clear the piston ring grooves.

The top compression ring, (which must be correctly fitted) is chrome plated (to reduce cylinder wear) and taper faced. Its position is indicated by the word TOP etched on the horizontal ring face.

The normal piston ring gap is .009" minimum: maximum permissible gap is .014". Piston rings supplied by our Spares Department do not require fitting, as the gap is allowed for in the process of manufacture. To check the ring gap, place the ring in the unworn part of the cylinder (crankcase end) and push it down about one inch, using the piston skirt to ensure the ring is square with the cylinder bore. The gap can be checked by feeler gauges. The normal cylinder bore sizes are given on page 44. When cylinder wear is to the extent of .008" or more, the cylinder should, whenever possible be rebored or be returned to the Service Department for rotary exchange.

**REFITTING THE PISTON.** Apply a little clean oil on the gudgeon pin and in the bush. Gently pre-heat the piston and fit it on the connecting rod in its original position and introduce the gudgeon pin. Fit the circlip with a rotary motion and verify it is snugly in its groove.

**REFITTING THE CYLINDER.** If desired the carburettor can be detached and cleaned before fitting the cylinder.

Remove any broken pieces of base washer from the flange also the crankcase face. Thoroughly clean the ports and cylinder bore. Apply a little jointing compound to one side of the new base washer and stick it to the cylinder. Apply some clean oil on the piston and cylinder bore. A generous chamfer is used on the cylinder to facilitate fitting. Offer up the cylinder and compress in turn the two piston rings, then gently lower the cylinder into position. Fit the four spring washers and base nuts and tighten these diagonally, not one side at a time.