

CARE OF THE BERINI ENGINE

Decarbonizing and Checking the Power Unit of a Popular Moped

IN designing the power unit of the Berini M. 21 and M. 22 mopeds, its Dutch manufacturers were careful to simplify maintenance as much as possible, partly through meticulous attention to detail design; partly by making the unit sturdy, thereby minimizing wear and tear.

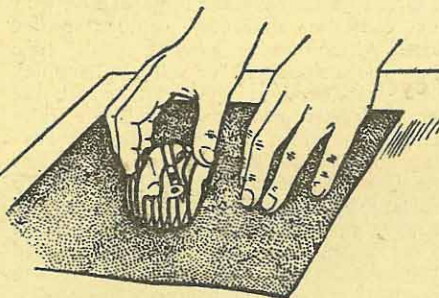
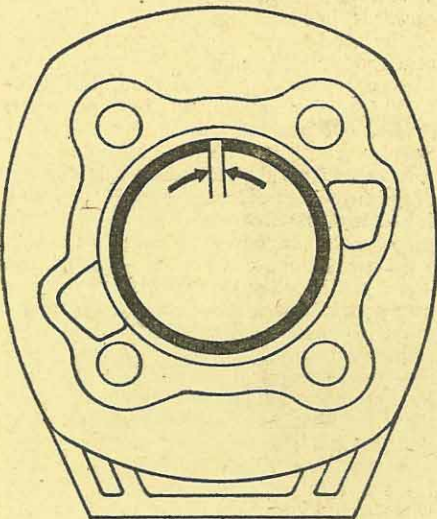
There is no major difference between the engine parts of the single-speed M. 21 and the two-speed M. 22; only the inclusion of a second gear train and the requisite selector mechanism on the latter model differentiates the two, and the instructions given in this article are, consequently, applicable as much to the single-speed model as to the two-speeder.

When carrying out a simple decarbonization, there is no need to remove the engine from the frame. The manufacturers, however, strongly advise that the exterior of the unit should first be cleaned with pure petrol, paying particular attention to the area around the cylinder/crankcase joint. Dismantling can then commence.

head gasket—this is quite normal, so don't panic!

With the head off, cylinder removal is simply a case of lifting the barrel off the long studs. It is a wise precaution, once the barrel has been raised far enough, to stuff some clean, non-fluffy rag around the crankcase mouth *before* barring the piston. This will prevent pieces of broken ring falling into the crankcase if, by any chance, one happens to be broken. When the rag is in place, lift the barrel completely off, and replace the base gasket on the crankcase mouth.

Maintaining Your Moped No. 20



To check ring gap (left) the ring should be inserted into the barrel and the gap measured with a feeler gauge. Facing the cylinder head (above) can be accomplished with the aid of fine emery cloth and plate glass. (Above, right). The piston supported on wood blocks while the crown is freed of carbon.

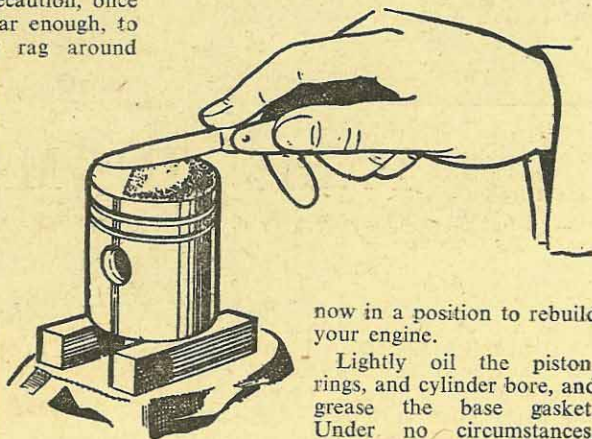
At this stage, you can turn to the actual work of freeing the engine of carbon. Attend to the barrel first, carefully scraping away any carbon which has formed beyond the limit of piston travel. Then repeat the process with each of the cylinder ports, subsequently washing the barrel in petrol and, ideally, blowing it dry with an air line.

Cleaning the Piston

The piston is next for attention. The top should be decarbonized, and the rings removed so that the grooves can be cleaned. Be careful not to mix up the

rings—each should be replaced in its original position. Before doing so, though, don't forget to scrape the back of the ring free of carbon. It would be a good idea, too, to check the ring gap. This is done quite simply by placing each ring in the cylinder and measuring the gap with a feeler gauge. It should be between .125 and .138 in. This is especially important where new rings are to be used. If the gap is too small, ease the rings with a very fine file. If the gap is too large, new rings are *definitely* needed.

Lastly, turn your attention to the cylinder head, the combustion chamber of which should be thoroughly cleansed before reassembly is commenced. You are



now in a position to rebuild your engine.

Lightly oil the piston, rings, and cylinder bore, and grease the base gasket. Under no circumstances, should jointing compound be used. Then place the cylinder over its studs, and ease it over the piston crown and rings. You will, of course, have brought the piston to its Top Dead Centre Position first. Ease the top ring into the bore first, by pressing it tightly against its locating peg with your fingers; then repeat with the lower ring, and press the barrel down until it is firmly against the head—again without the use of jointing compound, but with a touch of graphite grease on the bearing surfaces—and tighten it down evenly.

Re-facing the Head

Should there have been signs of an escape of gas through the head joint, you can re-face the head by placing a sheet of fine emery cloth over a sheet of plate glass—and it must *be* plate glass—and rubbing the head over it, face down, with a circular motion of the wrist. Alternatively, fine grinding paste can be used instead of emery cloth. When the head face is shiny all round the job is complete. Wash it well in petrol before reassembly.

Every two or three thousand miles, you will have to detach the exhaust system for cleaning. Undo the nuts which hold the fish-tail end in place, and draw out the baffles. The small holes in the baffles must be cleaned out to prevent loss of efficiency.

In the next article in this series, we will deal with the Berini gearbox; the unusual Encarwi carburetter; and the electrics, as well as the care of the cycle parts of both Berini mopeds.

First step is to detach the exhaust system, though it is not necessary to remove the pipe and silencer. Consequently, the silencer connection on the bottom engine bolt need only be loosened. The two screws which affix the exhaust flange to the cylinder should then be removed, when the system can be lowered clear of the engine.

Now, using a box spanner, loosen and remove the four nuts which hold the cylinder head in place, and put them carefully to one side, together with their plain and spring washers. Now remove the head itself. You will notice that there is no

COMPLETING THE BERINI

*Tips on Fettleing the Encarwi Carburetter,
the Ignition and Cycle Parts of Dutch Moped*

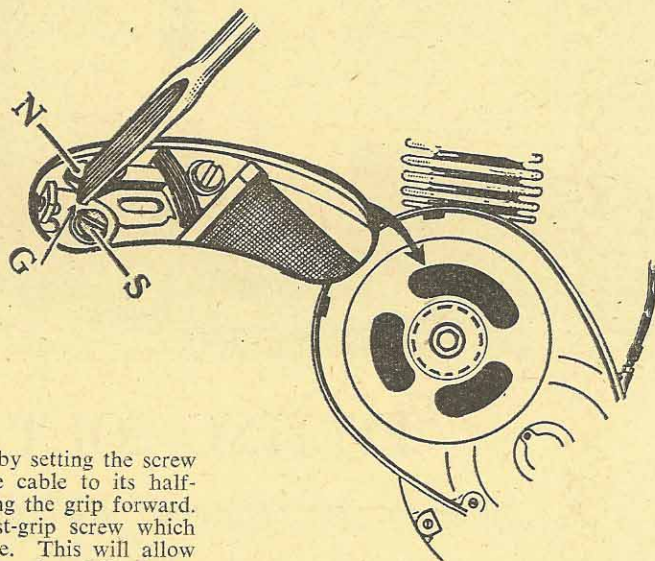
UNIQUE in its employment of an angled mixing chamber, the Encarwi carburetter fitted to the Berini M.21 and M.22 mopeds is a simple instrument of the needleless type. It is held to the induction stub by a clamp and can be easily dismantled by loosening the clamp screw, putting the twist grip into its "starting" position—i.e., right forward—disconnecting the fuel pipe and sliding the instrument off its stub. This done, the top of the mixing chamber should be unscrewed and the throttle valve assembly pulled out. Care should be taken to place the valve safely on the machine so that it is not brought into contact with dirt.

Contained within the banjo bolt atop the float chamber is a small fuel filter. Undo the bolt (11 mm. spanner required) and slip the filter out of its housing for its periodic cleaning. It can be freed from dirt by a wash in petrol and by blowing through with an airline. When reassembling, you may find that the filter is not a snug fit; in this case, hold it between your thumb

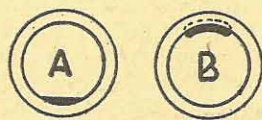
side of the carburetter. The jet itself is screwed into the end of this. Clean it with petrol, and by blowing through in the reverse direction of the petrol flow.

The automatic choke, which is brought into play by reverse action of the twist grip, should be checked for adjustment once in

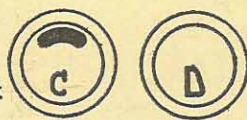
Maintaining
Your Moped
No. 21



An important routine job is checking and re-setting the contact-breaker mechanism. Note how the flywheel is turned to expose the contacts. Adjustment is effected by twisting a screw-driver in slots N and G, after loosening the screw S.



WRONG
THROTTLE VALVE HIGH
SCREW IN ADJUSTER



Start **C** **D** O-Position
CORRECT

These diagrams clearly show how the throttle slide height should be adjusted.

a while. This is done by setting the screw adjuster of the throttle cable to its half-way position and putting the grip forward. Then unscrew the twist-grip screw which holds the throttle cable. This will allow the spring to push the valve right down. Next, adjust the cable in such a way that the outer case has a free play of between 1/64-3/64 in., and then tighten the screw holding the inner cable. Open the throttle fully, and then close it so that it remains in its "neutral" position. Now detach the carburetter and look into it from the induction pipe side. When the adjustment is correct it will be seen that the choke is completely closed by the throttle slide. If it is not, correct this on the adjuster. If the slide is too far down the chamber you will see a portion of the semi-circular "easy starting" slot cut in the upper face of the slide. Now put the throttle to its starting position. The slot should be fully visible, just clear of the upper surface of the choke.

Though the air filter on older models was non-detachable, and must be rinsed with petrol *in situ*, later machines have a filter which is screwed into place. This should be removed and cleaned every 650 miles.

A Bosch flywheel magneto is fitted to the Berini. This is of standard type, and should require no attention beyond periodic checking of the contact-breaker points gap. To do this, remove the left-hand engine cover, and turn the flywheel so that the largest slot is directly beneath the cylinder. The points are now at maximum gap, which should be 0.018 in. Adjustment is effected by loosening the

clamping screw, and inserting a screw-driver into the adjuster slots on the fixed and base plates. Turning the screwdriver clockwise will increase the gap; to the left it will decrease. When it is correct, tighten the clamp screw, and re-check.

The Berini's manufacturers do not advise lubrication of the pre-greased felt lubricating washer on the cam, since oil thrown from this could have detrimental effects on the points. Instead, the wick should be replaced every 10,000 miles. This will entail flywheel removal, for which a standard Bosch extractor must be used.

Beyond the normal—and obvious—tasks of periodic cable adjustment and lubrication of the free wheel, there is little to be

done to the cycle parts of either Berini model. However, the sliding bushes of the front forks need to be greased every 600 miles, and for this purpose a nipple is fitted to each fork leg.

Unusual Adjustment

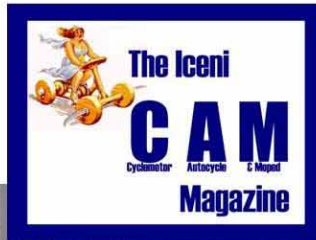
Chain adjustment is important. Before carrying it out, it is essential to loosen the upper and lower engine bolts slightly, and then to carry out the adjustment of the pedalling chain by means of the normal adjusters provided. When this has been done, the engine should be pivoted about its upper fixing bolt, pushing it forward to tighten the chain, backwards to slacken it, until the play is 3/4 in. up and down, measured on the bottom run of the chain. Retighten the bolts once the correct adjustment has been found. If, in doing the job, it is found to be difficult to pivot the engine, it is permissible to insert a tyre lever between the frame and the rear of the crankcase.

and index finger and press it gently to "fatten" it.

Two screws hold the float chamber top in place. On older models, removal of one of these can be effected only by detaching the fuel pipe union, which in the early carburetters was screwed into an angled housing. On later types, with a right-angle banjo, this is obviated. It is advised that the gasket on the chamber top should be renewed whenever the chamber is opened, as it should be once or twice a year to check that no sludge has formed in the bottom.

Access to the main jet is gained by unscrewing the jet-holder on the right-hand

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