From the lands of Cossacks, Vodka, *Pravda* and Uncle Joe, comes this 643 cc flat twin, the Ural. Like many of the older "heavies" it appears to have been built more for comfort and durability than speed. And if the thickness and weight of many of the engine components are anything to go by, the Ural should be as rugged as the mountains from which it takes its name.

At first glance, it reminds you of a Bee-em, but the engine is over square, having a stroke of 68 mm and a bore of 78. The clutch, too, is different from the German machine, as it has two plates to the Bee-em's one. One rather surprising thing about the Ural is that the engine peaks at between 4800 and 5200 rpm, according to the handbook. All of which means that this particular Red's revolutions are not all that impressive.

Fred Wells, of Wells Motorcycles, however, has great faith in these machines and intends to tune one for racing. Judging by the weight of the massive flywheel, there should be plenty of scope for the tuner and at about £316 for the 650 the price is right! Working on the Ural is not difficult and the only extractor needed was for the flywheel. The flywheel nut itself can be very tight and a socket spanner is essential to undo it. In fact, it might be an idea to buy a spare flywheel nut if you are contemplating a complete overhaul— just in case you do have to resort to the chisel!

Removing the engine from the frame takes 10 minutes maximum. Take off the exhaust pipes, cables, engine steady and four holding bolts. The engine/ gearbox unit will then lift from the frame. Once on the bench with the gearbox detached, it is best to start by dismantling the two-

plate clutch. The screws which hold the outer plate must be very tight and centre-popped to ensure that they stay that way.

An impact screwdriver will be an asset when removing this plate. You will see that there is a square hole in the pressure plate centre for the square end of the clutch release rod. The clutch-driven parts consist of two friction discs, lined on both sides with a friction material made of a type of plastic! One disc fits between the pressure and intermediate plates, the second between intermediate and thrust plates. Both friction plates are splined to the gearbox shaft. The normal clutch checks apply. Spring length should be uniform and friction discs unworn and true. Clutch lever needs 5-8mm play to ensure freedom from slip.

To facilitate ignition timing, a hole is provided on the engine crankcase near the oil filler. To the left of the hole are the Russian letters BMT which stand for TDC and the mark on the right, P3, means fully advanced. It is as well to check the TDC position against the mark—just to be sure. Remove the rubber bung from the hole, turn the engine over slowly by hand and you will see two arrows marked on the flywheel. The first arrow will align with P3 as soon as the crankshaft reaches 40 deg. before TDC, or 9.5 to 10.5mm if judged by piston travel. At this point the contacts should be breaking with the automatic advance set in the fully advanced position. The second arrow should correspond to the BMT/TDC mark. The exact moment of point’s separation may be determined as follows. Take the front cover off. Switch on the ignition and place a metal screwdriver against the end of the ignition coil core. While the points are closed, current flows through the coil winding, magnetising the core. The latter attracts and holds the screwdriver. As soon as the points open, the core becomes demagnetised and the screwdriver will drop off.

Contact clearance should be set at 0.4—0.6 mm. Retarding or advancing the ignition is a simple matter of slackening the adjusting screws and turning the distributor body.

Valve timing is marked on the timing wheels and, therefore, cannot be set up wrongly. Tappet clearance is .05 mm and can be adjusted by slackening a locknut on the rockers and turning the adjusting bolt.

Valve trouble is rare on the Ural providing that low octane fuel is used. In the handbook, it is 72-76 octane rating, in other words, the cheapest available. Not many of us will grumble at that! Incidentally, when undoing the camshaft holding nut through the holes in the large timing wheel, in preparation for camshaft removal, don't forget to pull the cam followers lightly off their lobes, or the shaft will be stuck.

Note also the peg on the large timing wheel which locates in the timed breather when rebuilding the motor. This atmospheric breather is timed to open at approx 80 deg. before BDC and is designed to prevent oil being forced through the sealing joints by the build-up of crankcase pressure. The oil pump drive gear is press-fitted on to the camshaft rear end and can be inspected through the hole in the crank-case after undoing an inspection cap.

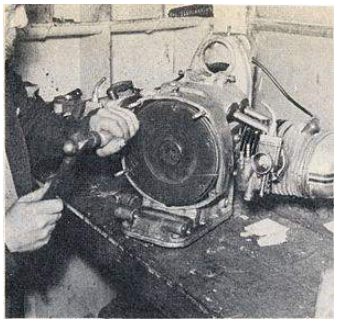
It is important to keep this cap securely tightened while the bike is in use. Failure to do so could mean loss of cap, pump and lubrication. Behind the flywheel, you will see the rear bearing housing with its holding bolts wired up. Presumably there is a need for this wiring. Maybe this particular area is affected by vibrations. Anyway, to be safe, don't forget the locking wire when

replacing the rear bearing housing.

All oil seals, including the oil ring in the annular groove on the pushrod, which prevents oil from entering the clutch chamber from the gearbox end, should be renewed. The generator is a 6-volt, single pole unit with a maximum rated load of 10 amps at 6.5 volts. This is mounted in a special hollow on the upper half of the crankcase and held by a strap. Rotation of the armature is effected by a train of gears from the camshaft.

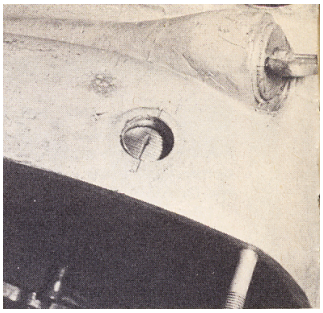
When refitting the generator, it is essential to set it only very lightly in mesh with its driving gear. Technical data was somewhat vague in the handbook. Compression ratio is 6:1 and rated BMP is 30. The rest of the data given was mainly for sidecar work, for which the Ural was presumably originally designed.

As yet, we have not had the opportunity to road test one of these machines, but engine-wise, it looks reasonable and the task of stripping and rebuilding the unit would be well within the scope of the average home mechanic.



1.

The clutch plate retaining screws are always centre-popped to keep them tight. You'll probably need an impact 'driver to release them

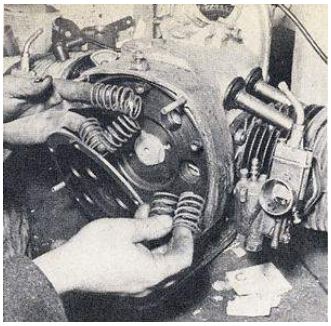


2.

There is a timing mark on the flywheel which aligns with marks on the crankcase. This mark can mean TDC, or fully advanced. Check it!

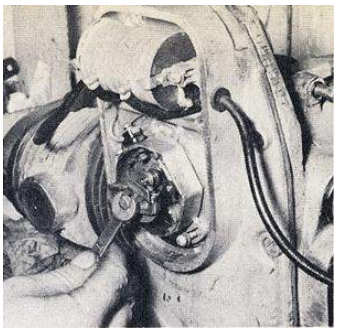
3.

Clutch is a two-plate type with a plastic facing on the driven plates. A square in the pressure-plate lines up with pushrod . . .



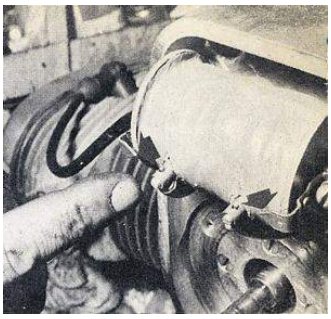
4.

. . . end, which is also square. Take care when replacing it. Behind the inner plate are the springs, which locate in recesses in the flywheel



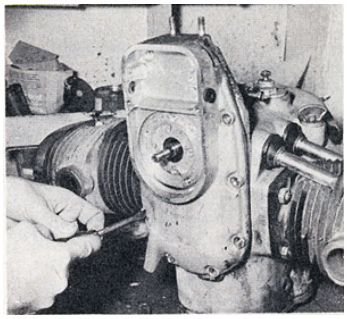
5.

Undo the electrics cover and remove the one set of points. Timing is fixed, the only adjustment is by the slots in the body (arrowed)



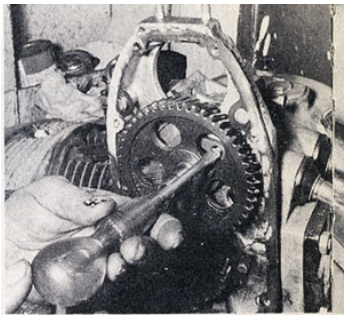
6.

The ignition coil is double-ended and has spark safety gaps which must be 9 mm. Be careful not to bend "ears" and alter gap



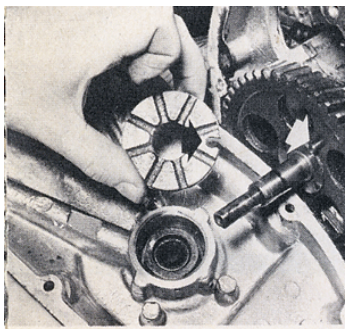
7.

Remove coils and then undo the timing cover holding screws. Do not forget the screw up in the left-hand corner of coil compartment



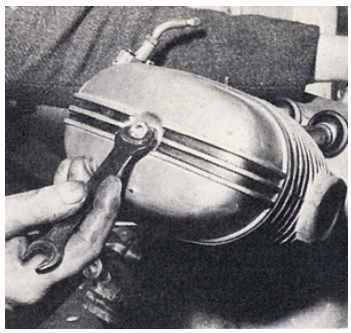
8.

Behind the large timing wheel is the camshaft retaining screw which can be reached through the holes in the wheel. Note that there . .



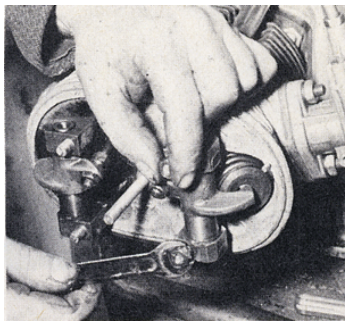
9.

. . . is a peg on the cam wheel which locates a cutaway in the timed breather. Check that the off seal in the cover is in good condition



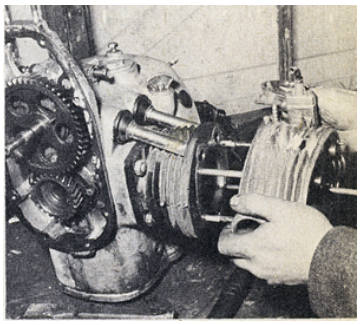
10.

A single nut holds the rocker cover to the head. Do not over-tighten these nuts. In fact, most torque settings on the Ural are very low



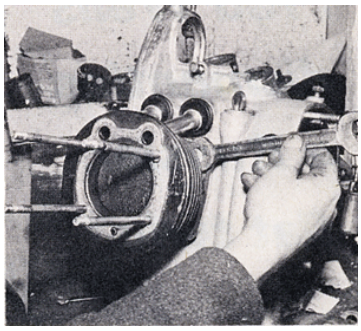
11.

Two 12 mm nuts hold each set of rockers. Like most other parts on this machine, the rockers are good, hefty components and should last



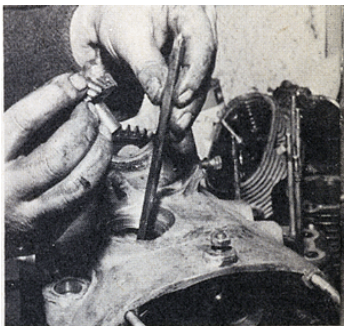
12.

Cylinder head and valve removal is straightforward, but valves may burn out if cheap fuel has not been used—use low octane fuel



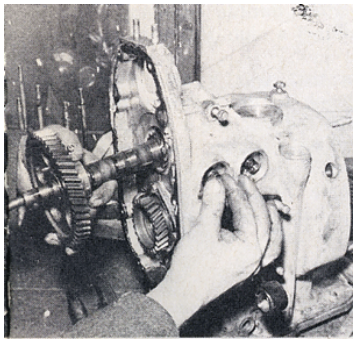
13.

Cylinder barrels come off after four base nuts have been undone. Base gaskets are fitted and the barrels are interchangeable, too



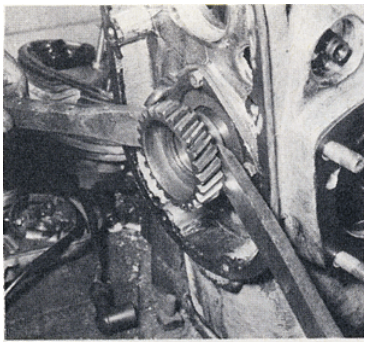
14.

It is important to keep the oil pump lid in crankcase very tight. If it's not, the drive gear and shaft could pop out—very nasty!



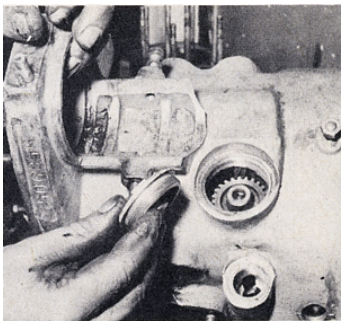
15.

Pull the cam followers back off lobes and the camshaft can be withdrawn. Both timing wheels have marks to align on assembly



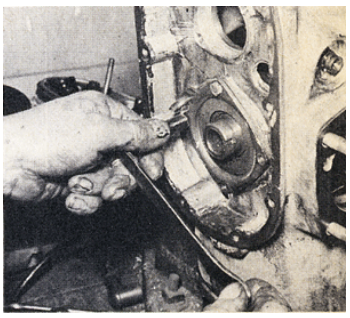
16.

Crude, but effective. Two tyre levers can be used to extract the main shaft pinion, but be careful not to damage the crankcase faces



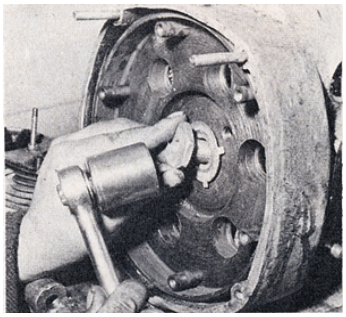
17.

Here you can see the oil pump drive cap and dynamo location. Note when refilling the dynamo, it must be only very lightly in mesh



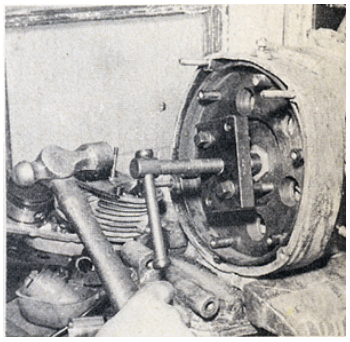
18.

Next to come off are the front bearing housing bolts and bearing housing. Then we turn the engine round to remove the flywheel. ..



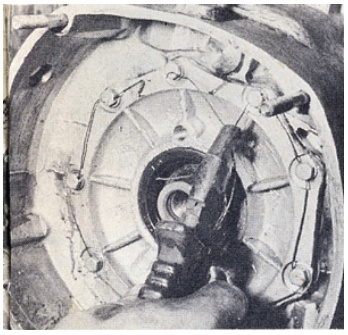
19.

. . . holding nut after knocking back the tab washer. This nut can be a pig to undo and must have a very good socket with long leverage



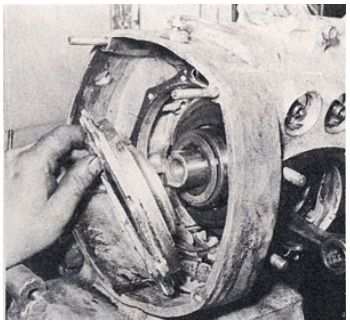
20.

An extractor is necessary to remove the flywheel, but a chunk of angle-iron with holes drilled in it can easily be made up at home



21.

With the flywheel off, you will see the rear bearing housing with all its bolts wired up securely. Don't forget this when rebuilding

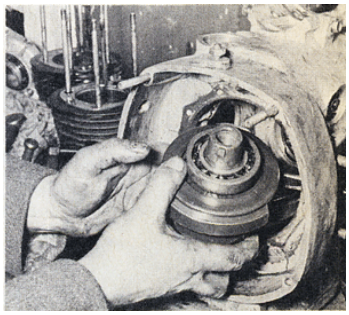


22.

Undo the bolts and the rear bearing housing, complete with its oil seal will come off. You might need to tap it from the inside

23.

Tap the front bearing housing through into the crankcase and the crankshaft should be free and ready for withdrawal from the case



24.

You may need to waggle the crankshaft assembly about a bit to get it out. but this is the position you'll finally need to do it