

Don Morley has removed the primary transmission of his Royal Enfield's transmission and is now ready to take off the final drive sprocket and get to the Albion gearbox itself.

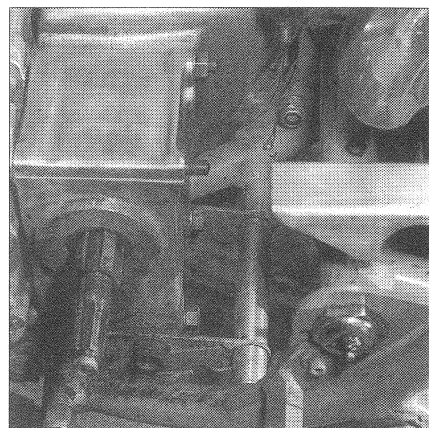
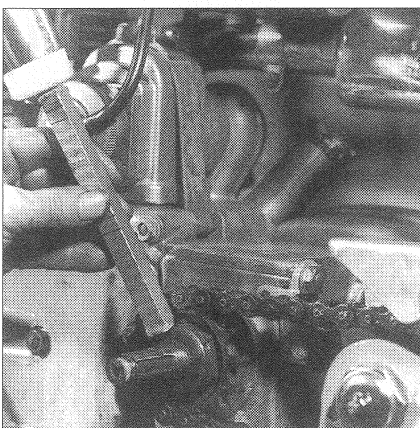
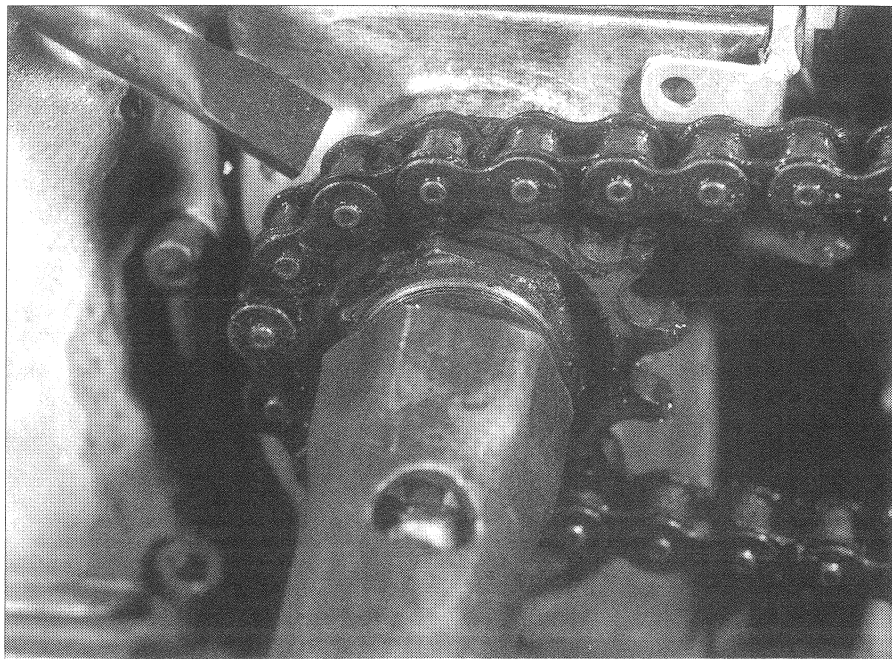
**I**N all probability, you'll discover at this stage that everything is covered in years of accumulated swarf and road crud, so clean everything in sight with paraffin and brush, and — for reasons which will become apparent later — it is best to leave the rear chain fitted.

- A clean-off, incidentally, will reveal that Enfield final drive sprockets all have deeply recessed centres in which the retaining nut for the sprocket (which holds in the oil seal), unfortunately lies.

It is exceedingly difficult to get at this with anything other than a long, large, fairly thin-walled box spanner, (**pic one**) the type of tool very few of us are likely to have to hand. More of this potential problem later.

- Unless everything has been properly cleaned it is all too easy to miss the presence (hopefully!) of a taper threaded and headless lock screw fitted into one of the two holes within the hardened sprocket's centre (**diagram two**). More specifically, the screw should be fitted to the hole is closest to the sleeve nut to stop the latter undoing itself when the machine is in motion.

- This vital screw is re-usable but is



made of mild steel and can be easily damaged. It is very important, therefore to use a screwdriver that is a good fit into the screw's slot, so good in fact that there is no risk at all of it slipping and damaging the head. Do that and the screw will need to be chiselled off and the remainder drilled out.

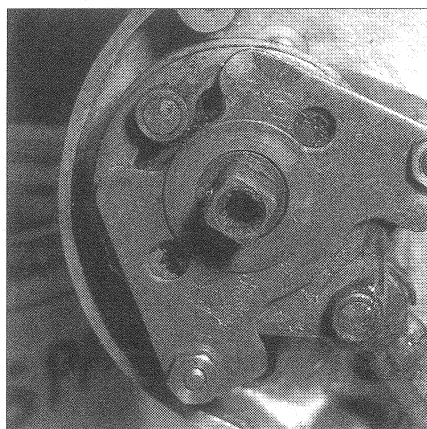
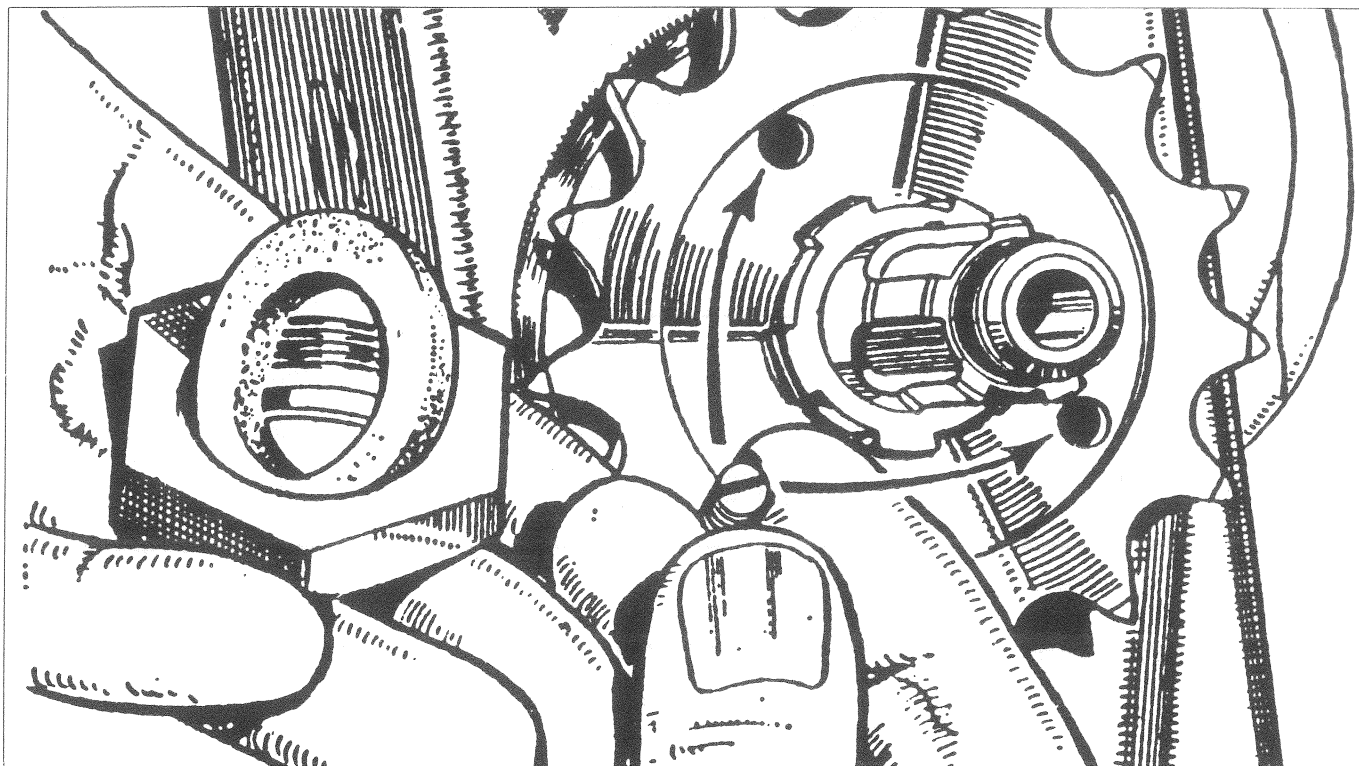
- If it is already butchered, don't panic. As long as some semblance of slot remains, gentle application of a well fit-

ting impact driver can get things moving. Once out, repair any damaged lock screw with a file and restore the slot with careful use of the right size hacksaw blade.

- The sleeve nut itself is, in my experience, unlikely to be particularly tight or difficult to get off once the lock screw is out. That's fortunate for me because I've never possessed the ideal size box spanner I described earlier. Luckily a few sharp hammer taps with an alloy drift (**pic three**) on the butt's extreme hexagon edges (obviously in an anti-clockwise direction) has never yet failed to work!

- During this particular exercise it is wise, and probably necessary, to lock on the rear brake to stop the wheel and gear-

# TACKLING THE GEARBOX — THE EASY BIT!



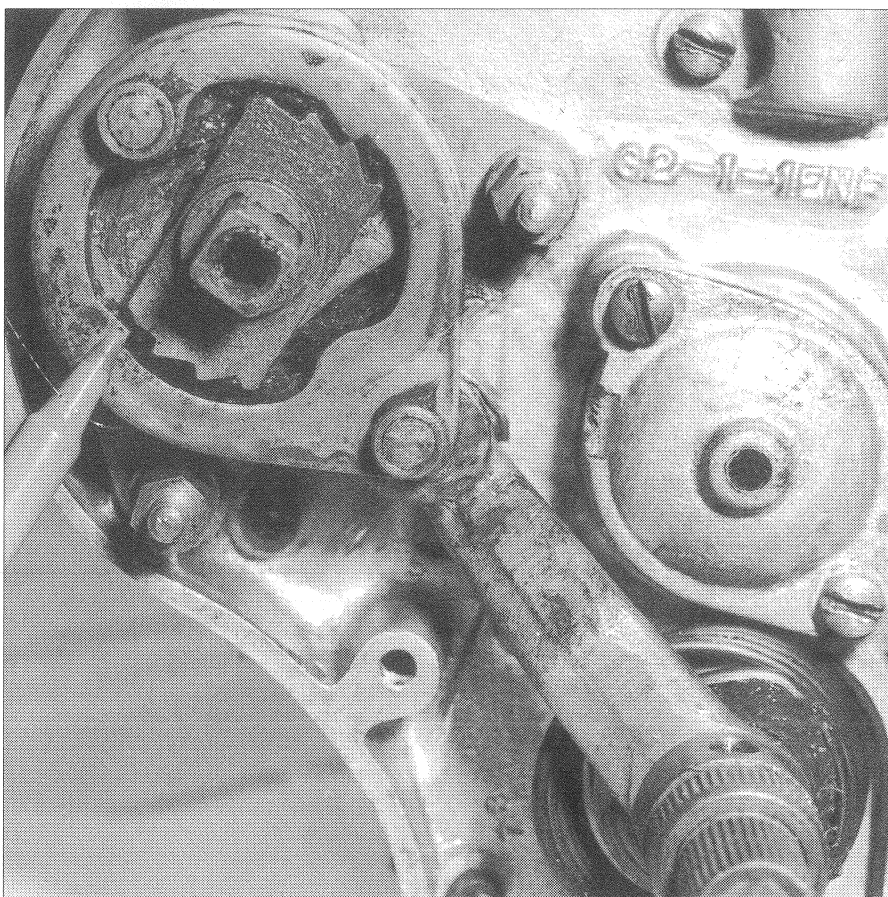
box shaft from turning. That's precisely why we deliberately left the rear chain fitted. Now this job is done it too can be removed complete with the final drive sprocket (pic four).

- Now is literally the time to commence ripping the gearbox apart prior to repairing, modifying, and replacing parts. Having got this far, it is hard to believe that stripping and re-building Messers Albion's will be the simplest duty of all in this transmission rebuild.

- If it has not already been done we should undo the drain plug and decant any remaining oil into a shallow tray. This oil will not be re-used, of course, but should be inspected for tell-tale broken bits of gear teeth or metallic particles in general.

- Make the coming task easier by removing any unwanted external impediments like the kick starter blade, neutral selector and gear levers. All have single bolt fittings.

- Then remove all of the gearbox's visible outer cover screws and, most especially, those holding the two small round (tin plate) inspection covers as fitted to all post-1954 boxes. The screw



holding the upper one of these also helps hold the box's outer and inner covers together.

- Albion Enfield gearboxes do not use gaskets of any description but are put together with gasket solution. If the outer casting refuses to slide off easily at this point, it means a fixing screw has been overlooked or it is stuck with gasket solution. All that's required to shift it is a sharp tap against the recalcitrant casting

with a hide mallet.

- Nothing can fall out, become accidentally dislodged, or go permanently out of adjustment so don't worry.

- Put the kettle on now while we pause before moving to the next stage — stripping out the gearchange selector mechanism. This is not difficult but we do need to mark a few components and take note of how others fit to help us avoid problems on re-assembly.



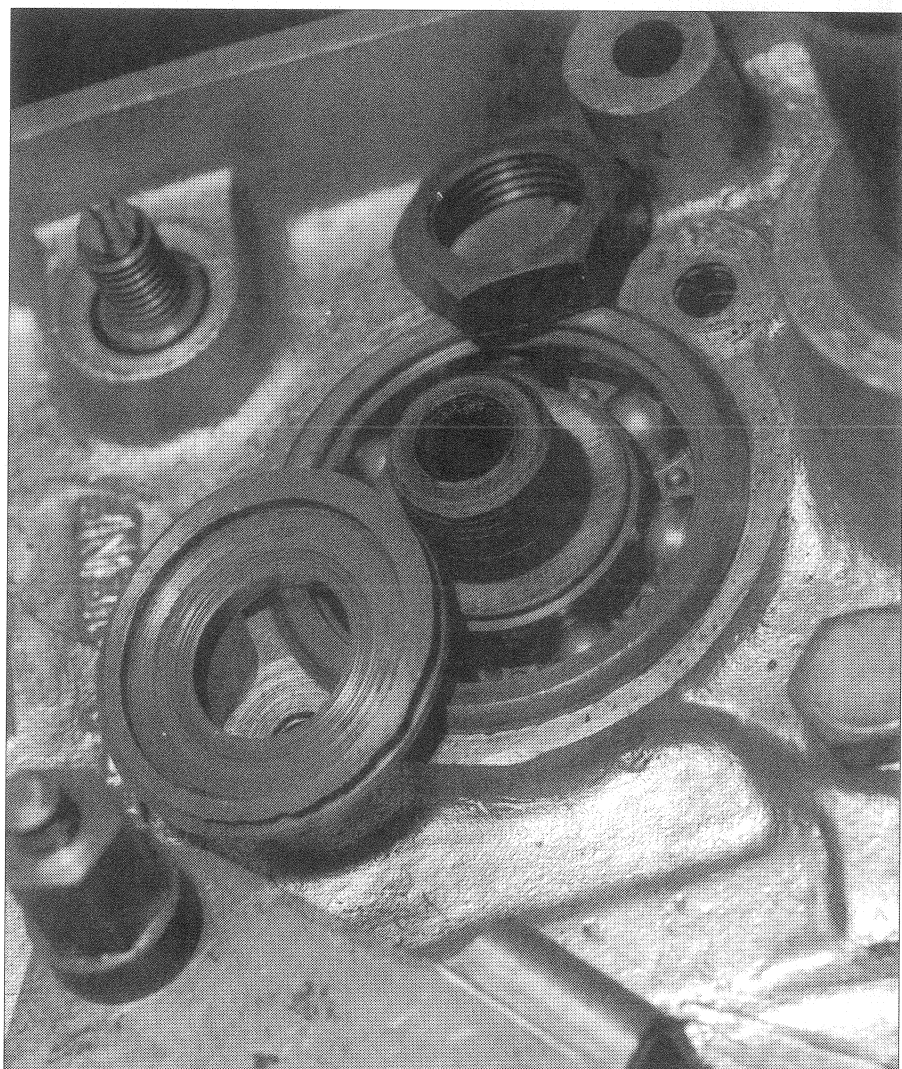
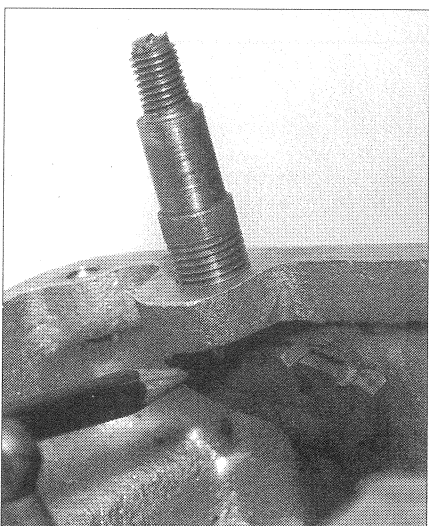
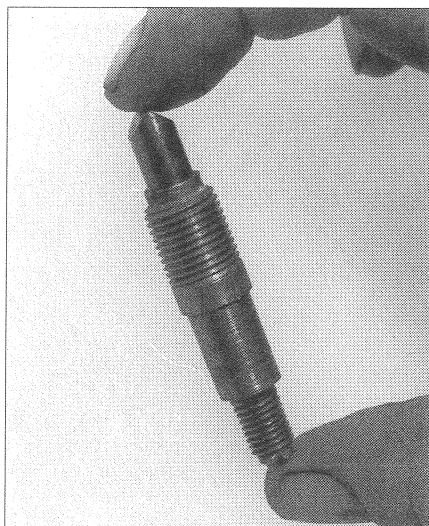
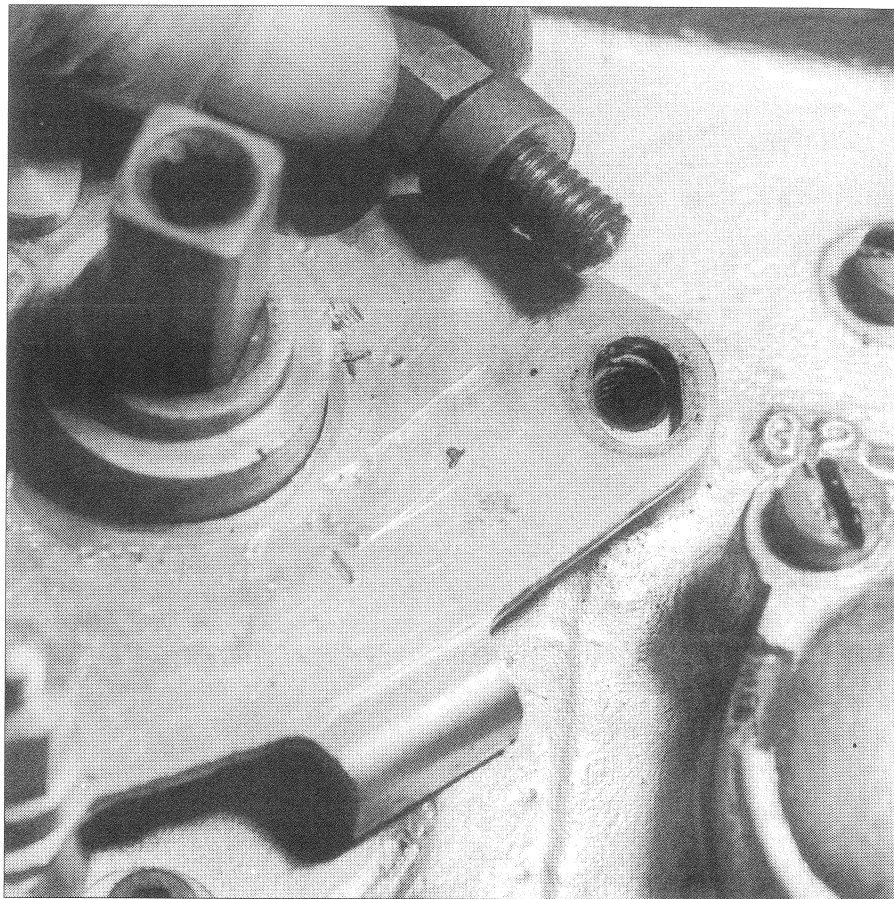
● For instance, be warned that the selector striker cam plate can very easily be re-fitted upside down or back to front. Although no serious mechanical harm would occur, the gearbox would just refuse to work!

● Similarly, there are two quite innocent looking pillar bolts and a separate nut. These might appear to be mere fixers, but their secondary duty is to loosen and activate a range of pivotal or torsional gear selection adjustments (which might, incidentally, have best been left).

● **Picture five** shows the cleaned-up gear selector mechanism and the two very thin nuts which need removing from their pillar bolts. As will soon be seen, these bolts should always be stopped from accidentally turning by using a separate locking spanner when the thin nuts are removed — or fitted.

● The selector striker can be seen in its *correctly* fitted position after the thin nuts and outer cover plate has been removed (**pic six**). Note that there should also be a large diameter shim laying outside of the outer cover plate.

● This shim, the selector striker and all of its ancillaries can now be slid off. As we have noted the position of the striker, the only item that could be re-fitted wrongly, there is no need to worry



about how it all goes back together.

- Now undo the first of those pillar bolts (**pic seven**). This will reveal the back plate, slotted to provide the selector mechanism with a pivotal range of adjustments.

- The precise position of this backplate should be accurately marked by scribing lines or centre-popping indentations on both the backplate and the gearbox housing *before* the second pillar bolt is undone to reveal the two final inner gearbox cover fixing bolts lurking behind it.

- Royal Enfield's workshop manuals, like most other manufacturers', were somewhat less than detailed on many major items — including their gearboxes — so even if you can get one its of limited use. The Enfield one doesn't even show the gear selector's sprung-plunger type locating assembly, the position of which must be noted before moving on.

- This little spring loaded detente device (**pic eight**) passes through an unthreaded hole in the gearbox's inner

cover and screws into the box's main casing behind it.

- Its hardened, wedge-shaped end locates in notches on the final gear selector fork (**pic nine**) and the further in the plunger is screwed, the more the pressure on the selector fork. This can be tightened to the point where brute force is required on the gear lever, or loosened to steadily lighten the gearshift feel. Too loose, however, and there's the risk of the bike jumping out of gear.

- Having explained that, pause at this point if you were contemplating stripping the whole gearbox because it has been jumping out of gear — adjustment to this plunger may be all that is necessary!

- But we will press onwards into the gearbox internals and inspect every bearing, the shafts and their pinions. But assuming gear selection previously worked at least reasonably, it is also worth noting also that there is no actual need to disturb the detente plunger at all apart from checking for wear on the wedge shaped point — seen from inside the

gearbox. The plunger's lock nut *does* have to be removed because it also fixes the inner cover to the gearbox main shell.

- A most important point when dealing with the detente plunger, is to make sure the slot on the adjustment end must always lie horizontally across the gearbox. If not, the wedge shaped end will not be in the right position to slot into the selector grooves. This is why the plunger should be held in position with a screwdriver in its slot while adjusting the lock nut.

- Now we must remove the gearbox main shaft's retaining nut and oil thrower (**pic ten**). Note this particular nut has a *left hand* thread. Also note that, regardless of how it is actually fitted, the correct position for the oil thrower ring is to have the left hand threaded nut lying inside the thrower's recess; ie with its flange facing outwards.

- Again, this is ignored in Royal Enfield's manual, along with the fact there is an identical thrower ring situated inside the gearbox, up against the same bearing, that should be fitted facing inwards; ie in the exact opposite direction.

- A tap or two with the hide mallet should loosen any gasket solution's bond and allow the inner cover to slide off easily — probably with the kick starter spindle assembly still attached.

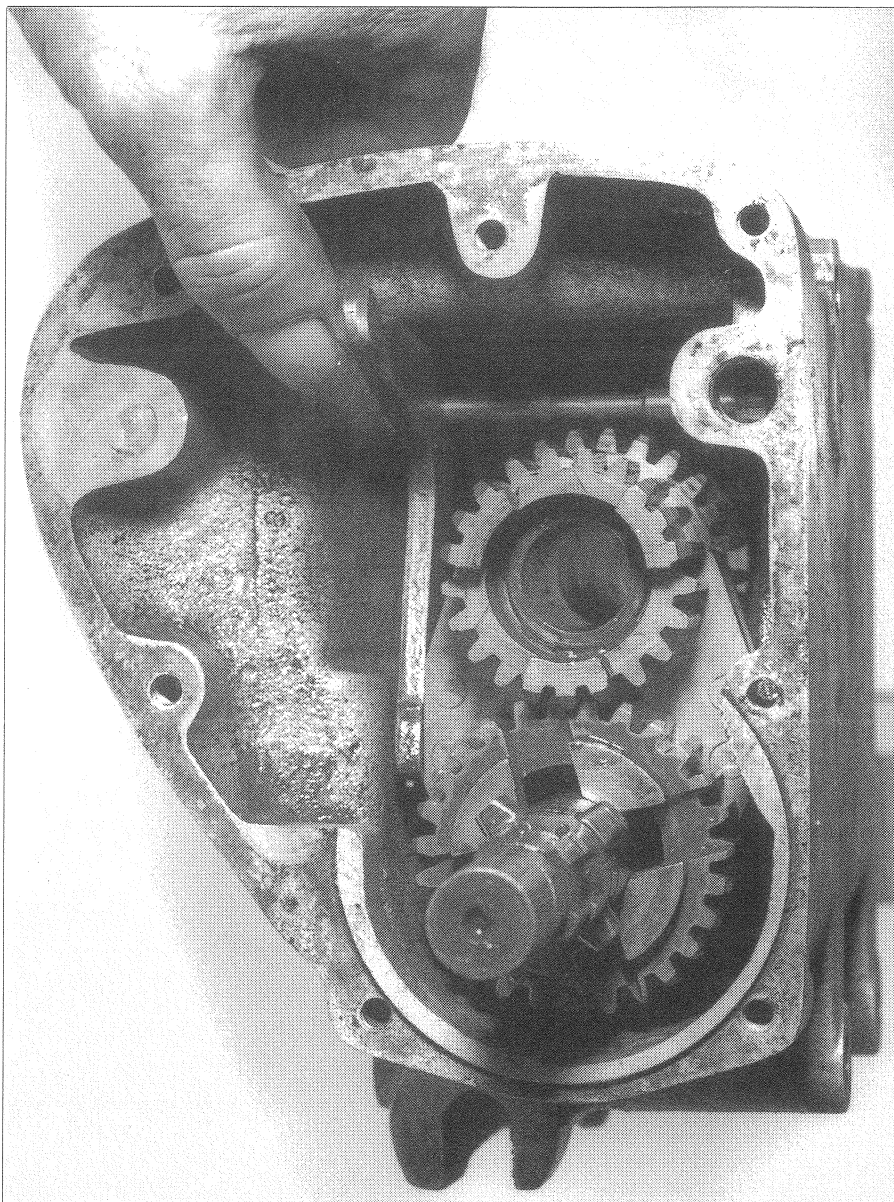
- This is of no particular importance other than there may (or may not) be shims fitted between this shaft and the inner cover. What there should be in evidence is a hardened steel ring of much more substantial proportions lying loosely between the kick starter pinion and shaft. Be sure neither to lose these — or become unsure from whence they came!

- Albion's mainshaft gear pinions, uniquely amongst British motorcycle gearboxes, are mounted on a separate hardened sleeve that runs quite loosely on the mainshaft. This means the mainshaft can simply be pulled out, leaving the layshaft and the gear cluster complete within the gearbox's main casing.

- All it takes then is a firm upward press against the selector fork toggle (**pic 11**) to literally eject what remains as a complete assembly — apart from the final drive sleeve gear pinion.

- Tap this out through the gearbox's main bearing using a hide mallet or alloy drift and hammer. Note at the time there is also a hardened and splined external spacer of about 1/4" thickness which lies between the gearbox main bearing and its oil seal. Indeed, the seal runs directly on to this spacer and thus gradually wears into it rather than into the sprocket.

- The gearbox's large diameter drive side main bearing is a shrunk-in or interference fit in the casting, so do not attempt to remove it without first evenly heating the entire gearbox shell. This is obviously much easier to do with the gearbox detached from the engine — but ours is not. Never fear. Although it might





sound dangerous and messy, the easiest way is to douse the entire assembly with a bucket of boiling hot water!

● Then work rapidly, wearing an old pair of oven gloves, of course. Slip the hardened and shouldered gearbox mainshaft sleeve (we removed it a short while ago) back into the main bearing. Do this from the outside rather than inside (**pic 12**) using it as a perfectly square and made-to-measure drift to tap out the bearing before it goes cold. Use a hide mallet of course.

● **Diagram 13** is Royal Enfield's original exploded drawing — as always, minus the selector detente plunger. Neither does it adequately show which oil thrower or shim fits which way round, or where, though in this series we most certainly shall.

● **NEXT MONTH: Checking, making good, modifying and re-assembly.**

